



**CENTRAL TEXAS
Regional Mobility Authority**

AGENDA ITEM #6 SUMMARY

Approve a new work authorization with Telvent USA LLC relating to design, development, testing, and integration of a dynamic tolling system for the MoPac Improvement Project.

Strategic Plan Relevance:	Regional Mobility
Department:	Operations
Associated Costs:	Not to Exceed \$5,840,021
Funding Source:	MoPac Improvement Project Funds
Board Action Required:	Yes

Description of Matter: This proposed work authorization with Telvent USA LLC provides for the design, development, installation and testing of a dynamic tolling system and related Intelligent Transportation System for the MoPac Improvement Project. The System will be an all-electronic system that uses a dynamic pricing structure to manage operations of the Express Lanes and will be fully compatible with the toll collection systems which have been designed and implemented for 183A and the Manor Expressway.

Based on the review of the proposed Work Authorization by Mobility Authority staff and the GEC, it was determined that the Scope of Services addresses the anticipated project requirements, and that the level of effort and associated fee is appropriate. We recommend approval of this work authorization.

Reference documentation:	Draft Resolution Work Authorization No. 10
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Contact for further information: Tim Reilly, Director of Operations

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 14-___

**APPROVING A NEW WORK AUTHORIZATION WITH TELVENT USA LLC
RELATING TO DESIGN, DEVELOPMENT, TESTING, AND INTEGRATION OF A
DYNAMIC TOLLING SYSTEM FOR THE MOPAC IMPROVEMENT PROJECT.**

WHEREAS, effective April 27, 2005, the Mobility Authority executed a Contract for Toll System Implementation with Caseta Technologies, Inc., subsequently acquired by Telvent USA Corporation, for Telvent to provide toll systems implementation services to the Mobility Authority (the "Telvent Contract"); and

WHEREAS, development of the MoPac Improvement Project will require the design and installation of a toll system and related network infrastructure; and

WHEREAS, the Executive Director and Telvent have discussed and agreed to a new work authorization under the Telvent Contract relating to design, development, testing, and integration of a dynamic tolling system for the MoPac Improvement Project; and

WHEREAS, the Executive Director recommends approval of the new work authorization attached as Exhibit 1.

NOW, THEREFORE, BE IT RESOLVED that the new work authorization with Telvent is hereby approved; and

BE IT FURTHER RESOLVED that the Executive Director may finalize and execute for the Mobility Authority the new work authorization in the form or substantially the same form attached as Exhibit 1.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of January, 2014.

Submitted and reviewed by:

Approved:

Andrew Martin
General Counsel for the Central
Texas Regional Mobility Authority

Ray A. Wilkerson
Chairman, Board of Directors
Resolution Number: 14-___
Date Passed: 1/29/2014

EXHIBIT 1 TO RESOLUTION 14-
NEW TELVENT WORK AUTHORIZATION

[on the following 7 pages]

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

WORK AUTHORIZATION

WORK AUTHORIZATION NO. 10

TOLL SYSTEM AND TOLL-RELATED ITS DESIGN, INSTALLATION, AND TESTING

MOPAC IMPROVEMENT PROJECT

THIS WORK AUTHORIZATION (“WA No.10”) is made pursuant to the terms and conditions of Article 1 of the GENERAL PROVISIONS, Attachment A to the original Contract for Toll System Implementation, dated April 27, 2005 (the Contract) entered into by and between the Central Texas Regional Mobility Authority (the “Authority”) and Telvent USA, LLC, as the successor in interest to Caseta Technologies, Inc. (the “Contractor,” also referred to in attachments to this WA No. 10 as the “System Integrator” or “SI”), as that Contract has been amended on February 26, 2010, and on May 2, 2011 (the “Contract”).

PART I. The Contractor will perform toll system design, installation, and testing services described in **Exhibit A** and System Integrator Proposal **Exhibit B** to this WA No. 10. The Contractor’s duties and responsibilities to coordinate with the Authority’s Design/Build Contractor for the MoPac Improvement Project are detailed in (i) the MoPac - Dynamic Pricing and Toll System Layout in **Exhibit C**, (ii) the Express Lane Toll Facilities Guidelines in **Exhibit D**, and (iii) the Toll Facility Responsibility Matrix in **Exhibit E**. The Contractor shall purchase and provide the equipment and software described in the Bill of Materials in **Exhibit F**. The Contractor shall perform all work in accordance with Federal Requirements in **Exhibit J**.

PART II. The maximum amount payable to Contractor under this WA No.10 is \$5,840,021.00. This amount is based on the cost estimate shown in Pricing Schedule in **Exhibit H**.

PART III. Payment to the Contractor for the services established under this WA No. 10 shall be made in accordance with the Contract and is listed in Payment Schedule in **Exhibit I**.

PART IV. This WA No. 10 is effective on the date both parties have signed this WA No. 10. This WA No. 10 will terminate on 365 days after the Authority’s Design/Build Contractor for the MoPac Improvement Project has achieved Substantial Completion, unless extended by a supplemental Work Authorization as provided in Attachment A,

Article 1 of the GENERAL PROVISIONS. The work shall be performed in accordance with the Express Lanes Project Schedule and Milestones set forth in **Exhibit G**.

PART V. This WA No. 10 does not waive any party's responsibilities and obligations established by the Contract; and except as specifically modified by this WA No. 10, all such responsibilities and obligations under the Contract remain in full force and effect.

IN WITNESS WHEREOF, this Work Authorization No. 10 is executed in duplicate counterparts and hereby accepted and acknowledged below.

THE CONTRACTOR: Telvent USA, LLC

Signature	Date
Typed/Printed Name and Title	

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Mike Heiligenstein, Executive Director
Date:

LIST OF EXHIBITS

- EXHIBIT A SCOPE OF WORK
- EXHIBIT B SYSTEM INTEGRATOR PROPOSAL
- EXHIBIT C MOPAC - DYNAMIC PRICING AND TOLL SYSTEM LAYOUT
- EXHIBIT D EXPRESS LANE TOLL FACILITIES GUIDELINES
- EXHIBIT E TOLL FACILITY RESPONSIBILITY MATRIX
- EXHIBIT F BILL OF MATERIALS
- EXHIBIT G EXPRESS LANES PROJECT SCHEDULE AND MILESTONES
- EXHIBIT H PRICING SCHEDULE
- EXHIBIT I PAYMENT SCHEDULE
- EXHIBIT J FEDERAL REQUIREMENTS

EXHIBIT A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
TOLL SYSTEM AND TOLL-RELATED ITS DESIGN, INSTALLATION,
AND TESTING
MoPac Improvement Project

SCOPE OF WORK for SYSTEM INTEGRATOR

A1.0 General

A1.01. Background

The Central Texas Regional Mobility Authority (“Authority”) is developing the MoPac Improvement Project on Loop 1 (MoPac) from Parmer Lane to Cesar Chavez Street, for a total length of approximately 11.2 miles (the “Project”). The Project includes construction of one tolled Express Lane in each direction which will be dynamically priced. The Authority has procured a Design/Build Contractor (“D/B Contractor”) and has entered into a design-build contract (the “D/B Contract”) with CH2M HILL who will design and build the Project.

The Toll System Integrator (SI) is responsible for the design, development, testing and installation of a dynamic tolling system (“Toll System”) and related Intelligent Transportation Systems in support of the Toll System (“Toll-Related ITS”), as further described in this Work Authorization No. 10 (the “Toll System and Toll-Related ITS Design, Installation and Testing”). The Project shall be implemented in accordance with the Project schedule in *Exhibit G - “Express Lanes Project Schedule and Milestones”*.

A1.02. Summary of Scope of Work

The Scope of Work for this Work Authorization No. 10 includes:

- SI shall design the Toll System and Toll-Related ITS.
- SI shall develop and install the Toll System and Toll-Related ITS.
- SI shall implement and test the Toll System and Toll-Related ITS.
- SI shall monitor and provide maintenance and operations support for the duration specified in *Exhibit G - “Express Lanes Project Schedule and Milestones”*.

EXHIBIT A

A2.0 General Description – Express Lane Toll System and Toll-Related ITS Work

The Project's Toll System will be an all-electronic toll (AET) facility that uses a dynamic pricing structure to manage the operations of the Express Lanes. The proposed facility will consist of four (4) gantry locations where the toll system will be installed, five (5) variable toll message signs (VTMS) with VTMS cameras, traffic detection systems (TDS) every ½ mile, and CCTV cameras which shall provide visual coverage of the entire project. Preliminary facility layout is shown in *Exhibit C - "MoPac - Dynamic Pricing and Toll System Layout"*. Locations of tolling facilities are approximate and are subject to change as the D/B Contractor progresses towards the completion of plan development. The Project's Toll System also includes a primary and secondary Project Host Systems installed at the Field Operations Building (FOB) and at a second site as specified in *Exhibit B - "System Integrator Proposal"*.

The Toll System for the Project will be fully compatible with the Toll Collection System (TCS) which has been designed and implemented for the 183A Toll Road and 290 East (Manor Expressway) Toll Projects, using Automatic Vehicle Identification (AVI) technology, a Violation Enforcement System (VES) with an integrated camera and triggering system to capture referenced digital images of license plates, and a Remote Online Management System (ROMS). In support of the MoPac Express Lanes, the Toll System will include Dynamic Pricing Systems, and Image Review Systems and Trip Matching Systems. The Toll System shall be interoperable with other Texas electronic toll collection systems.

A3.0 Detailed Scope of Services

The D/B Contractor is responsible for the design and construction of the Toll System Infrastructure, as established by the D/B Contract. The general locations, layouts, and guidelines for the Toll System, as established by the D/B Contract, are indicated in *Exhibit D - "Express Lane Toll Facilities Guidelines"*.

The SI is responsible for the design, development, testing and installation of the Toll System and Toll-Related ITS Infrastructure identified in *Exhibit E - "Toll Facility Responsibility Matrix"*. The SI shall also work with the Authority, its GEC, the D/B Contractor, and others as described herein. The SI shall purchase, provide and install all equipment detailed in *Exhibit F - "Bill of Materials"*.

A3.01. Toll System Design, Installation, and Testing

The SI shall design and install the Toll System at the four (4) Toll Zones identified in *Exhibit D - "Express Lane Toll Facilities Guidelines"* so that it is fully compatible with and meets the requirements for the Project. The Toll System at each Toll Zone shall meet the requirements in *Exhibit B - "System Integrator Proposal"* and shall include:

- Zone Controllers/Image Capture Station: Redundant and independent servers shall be provided capable of stand-alone operation, each processing all data in parallel and providing control/monitoring of all in-lane hardware.

EXHIBIT A

- Automatic Vehicle Identification (AVI) System: Readers and antennas shall be installed that read transponders in each lane and determine its speed and location to enable the system to accurately assign transponders to the correct vehicle.
- Automatic Vehicle Detection System (AVDS): Redundant vehicle detection system comprising of loops, pucks and SICK laser scanners shall be installed in each lane to detect and track vehicles in the toll zone including motorcycles and trigger the image capture cameras.
- Image Capture and Processing System (ICPS): Front and rear high resolution cameras shall be installed in each lane and shoulder to capture images of all vehicles traveling through the lanes. The solution shall analyze image quality degradation and correlate the images to the correct vehicle.
- Digital Video Audit System (DVAS): Each Toll Zone shall have digital video cameras that monitor traffic activity in the Toll Zone. In addition, security cameras shall be installed at each Toll Zone to monitor the equipment cabinet. The DVAS shall integrate the video from all cameras into a video database that stores recorded video and can be accessed by users for auditing.
- Uninterruptible Power Supplies (UPS): All Toll System equipment and electronics shall be on UPS and the UPS shall support the Toll System with one hour of battery backup.
- Equipment Cabinets: Environmentally controlled cabinets shall be provided to house the Toll System electronics.
- Generators: Each Toll Zone will have a generator to be used if there is a prolonged power outage.

A3.02. Toll-Related ITS Design, Installation, and Testing

The SI shall design and install the Toll-Related ITS at the locations identified in *Exhibit C - "MoPac - Dynamic Pricing and Toll System Layout"*. The Toll-Related ITS shall meet the requirements in *Exhibit B - "System Integrator Proposal"* and shall include:

- Traffic Detection System (TDS): Radar Vehicle Sensing Devices shall be installed at every half mile spanning the entire corridor in both directions to provide full coverage on the general purpose lanes and the Express Lanes. These units shall collect traffic data (volumes, occupancy and speed) and report this data in real-time to Project Host to be utilized in the dynamic pricing algorithm.
- Variable Toll Message Sign (VTMS): VTMS panels shall be attached to static signs mounted to existing or new overhead sign bridges and cantilever overhead sign structures. VTMS controllers shall be installed in cabinets and shall control the panels to display the TollTag and Pay By Mail (PBM) toll rates to the downstream exits. The number of panels per VTMS shall be based on the location of the VTMS.
- VTMS Cameras: A digital video camera shall be installed at each VTMS location to capture the toll rate display at configurable intervals.

EXHIBIT A

- VTMS AVI System: At each VTMS location AVI readers and antennas shall be installed to read transponders on vehicles traveling in the general purpose lanes.
- Closed Circuit Television (CCTV) System: High definition digital video cameras shall be installed throughout the Express Lanes corridor to provide full visual coverage of the Express Lanes in both directions of travel.

A3.03. Toll System Project Host Design, Installation, and Testing

The SI shall design and install a Project Host that supports the monitoring and control of the Toll Systems and Toll-Related ITS. The Project Host shall meet the requirements in *Exhibit B - "System Integrator Proposal"* and shall include:

- Project Host Servers/Storage: Sufficient number of servers and storage devices shall be provided to support the various functions and processes described in *Exhibit B - "System Integrator Proposal"*. There shall be a primary Project Host installed at the FOB and the secondary Project Host shall be at a separate location but connected to the CTRMA fiber communications system. The Project Host shall interface to the CTRMA Host System for processing transponder and PBM trips.
- Dynamic Pricing System: The dynamic pricing algorithm shall utilize the real-time characteristics of the corridor to determine the toll rates. Default toll rates shall be provided to support degraded mode of operations. The dynamic pricing algorithm shall meet the CTRMA operational and revenue generation requirements.
- Optical Character Recognition (OCR)/AutoMatch Software: OCR and AutoMatch software shall be provided to extract the license plate number, jurisdiction and plate type and vehicle characteristics from images of vehicles. The OCR and AutoMatch results shall help with trip building and images review.
- Image Review: Image review and operations functionality shall be provided that allow users to efficiently review images, monitor operations and audit the image processing results.
- Trip Building: Trip Matching software shall be provided that correctly and successfully creates TollTag and PBM trips for customers who drive through the Express Lanes.
- ROMS: The CTRMA ROMS shall be used to monitor and track the overall health of the Express Lanes Toll System and Toll-Related ITS and maintenance activities through real-time displays. Failure of equipment and processes shall result in the creation of work orders through ROMS that are tracked to closure. Maintenance Reports shall be available through ROMS to validate the performance of the Toll System and SI maintenance.
- Dashboards: The Toll System shall include Dashboards that are a graphical representation of information valuable to the management and oversight of the Express Lanes operations. These shall include graphs, charts, and meters that provide as-a-glance real time representation of the system health, Express Lanes traffic conditions, dynamic pricing results, VTMS displays, traffic forecasting and hot links to DVAS, CCTV and VTMS video feeds.

EXHIBIT A

- Remote Operations and Adjustments: The System shall provide authorized users the capability to over-ride dynamic prices; control the VTMS, and make adjustments to toll rates and trip transactions.
- Express Lanes Reports: Traffic, Revenue, Audit, Reconciliation and Operations reports shall be provided to enable CTRMA to audit and reconcile the toll data, transactions and trips; report traffic and revenue and monitor operations.

A3.04. Express Lanes Command Center (ELCC)

The SI shall provide the required workstations and monitors at the FOB to enable the monitoring and operations of the Express Lanes. The SI will provide monitoring, operations and maintenance support for a period of four (4) months after Go Live to monitor and validate the accurate operations of the Express Lanes and the Toll System.

A3.05. Toll System and Toll-Related ITS Documentation

The SI shall provide all documentation for CTRMA review and Approval as listed in *Exhibit G - "Express Lanes Project Schedule and Milestones"*.

A3.06. Toll System and Toll-Related ITS Testing

The SI shall perform all testing as listed in *Exhibit G - "Express Lanes Project Schedule and Milestones"*.