

IH-35 Corridor – Georgetown to Hillsboro Value Priced Managed Lanes

FHWA Value Pricing Program
Detailed Proposal

Submitted by: Texas Department of Transportation – Waco District
March 15, 2005

Introduction

The Waco District of TxDOT is developing a 94-mile expansion of IH-35 to add one new lane in each direction. With the growing costs of highway construction coupled with the declining buying power of the gas tax, recent TxDOT policy requires all new highway capacity to be evaluated for tolling. The IH-35 expansion project is therefore being developed with one toll lane in each direction, and these lanes are proposed to be variable priced managed lanes.

The purpose of variable pricing on the added lanes is to offer a congestion-free trip at all times and to provide price incentives that ensure maximum usage of the lanes during off-peak periods. Peak time periods on IH-35 are Fridays, weekends, and all holidays, and it is during these times that toll rates will be set to maintain free-flow travel. Alternatively, price incentives are envisioned as a mechanism to encourage use of the managed lanes during the non-peak times.

Most of IH-35 through the Waco District is designed as a rural interstate but operates much like a suburban freeway in its non-urbanized areas, with ADTs currently in the tolerable flow range but growing rapidly. IH-35 volumes represent a LOS E to F operation when evaluated as a rural freeway using highway capacity standards. Truck percentages during nighttime hours are in the 30 to 50 percent range as IH-35 is a major NAFTA Corridor. The prospect of a 94-mile, one-lane directional managed lane with non-traditional peak operating periods and truck operations pose unique challenges related to pricing strategy, design and operations. This proposal outlines a pre-project study that will seek to address those unique challenges.

This value pricing proposal has been developed in accordance with the application guidelines for the Value Pricing Pilot Program authorized by Section 1216 (a) of the Transportation Equity Act for the 21st Century (TEA-21) in the Federal Register Document from May 7, 2001, Volume 66, Number 88, Page 23077 - 23081. Included in this proposal are estimated expenses for each of the anticipated tasks. Note that these are cost estimates and may need to be refined. This plan outlines the pre-project activities necessary prior to project implementation.

Detailed Proposal

1. CONGESTION PROBLEM TO BE ADDRESSED

Interstate Highway 35 (IH-35) through the Waco District generally operates at Level-of-Service (LOS) E-F under rural freeway criteria. Historically, the IH-35 corridor has doubled its traffic volume every 20 years. This trend has continued over the past 10 years with an increase exceeding 50% in traffic volumes since 1994. A parallel facility is possible as Trans-Texas Corridor-35 (TTC-35) is developed in the coming years. The timeframe for its development is unknown at this time.

The IH-35 corridor was originally designed as a rural freeway facility but there are a number of indicators of its transition to a suburban/urban facility. Current traffic volumes are more representative of suburban freeway facilities serving in excess of 50,000 vehicles per day. It has continuous frontage roads with breaks only at major rivers or railroads. Driveway densities along frontage roads range from 10 to 20 per mile, and interchange spacing is at one to two-mile intervals with no spacing greater than three miles. Major congestion and delays occur frequently on weekends from Friday noon to Sunday midnight and during any holiday period. Because of this peaking characteristic, lane closures for roadway maintenance or construction are restricted to nights and no closures are allowed whatsoever on weekends or during holiday periods throughout the entire corridor length, not just in urban areas. Furthermore, an Intelligent Transportation System (ITS) is being installed throughout the entire length of the corridor - not only in the urban areas - to better operate the system during peak periods and when incidents occur, and to provide the traveling public with timely information on roadway conditions.

In addition to traffic volume and congestion, IH-35 through Bell, Falls, McLennan and Hill Counties witnessed 4,787 accidents during the five year period from 1996 to 2000. This equates to 958 accidents per year or 2.6 accidents every day. In the year 2000 alone, there were 15 fatal accidents and 202 accidents involving injuries requiring medical attention. Nearly two out of every three days, someone is injured or killed on this section of IH-35. The safety of vehicles and their occupants are a primary concern to the region. In addition to protecting life and property, local entities must often spend considerable resources dealing with accidents on IH-35. During these periods, the protections and services provided to local residents is decreased as rescue and police services are called to provide assistance specifically for the IH-35 corridor.

Trucks are a major component of traffic volumes using the IH-35 corridor. IH-35 is a major north-south NAFTA Corridor for the central portion of the nation. A study completed in 1999 titled *I-35 Trade Corridor Study* provided recommended corridor investment strategies to be considered from Texas to Minnesota and all states in between. For the portion of the corridor through the Waco District the number of lanes required by 2025 using LOS C for rural areas and LOS D for urban areas was determined to be eight

to twelve lanes. Other recommendations for this portion of the corridor included truckway provisions, use of ITS, and separate relief lanes. Even though some elements of NAFTA have not been fully implemented, trucks currently account for 25 to 30 percent of all daily traffic on this portion of IH-35 making truck travel a major factor when considering traffic congestion and safety issues.

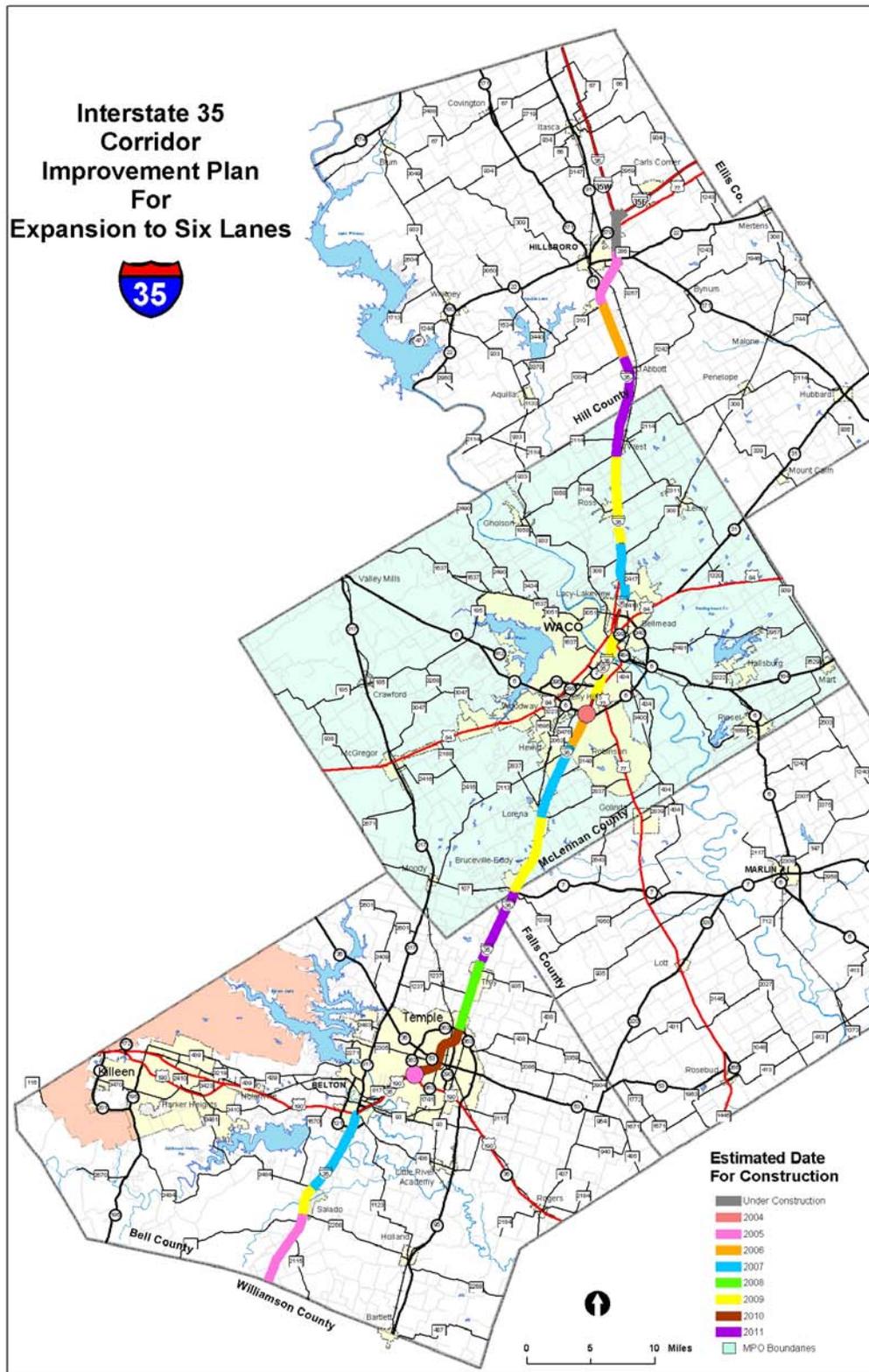
Lastly, as the level of congestion continues to escalate, an increase in travel delays becomes more apparent. This increase in travel delays equates to greater fuel consumption and negative impacts to air quality throughout this corridor.

The Waco District of the Texas Department of Transportation (TxDOT) is evaluating managed lane options for the 94-mile portion of IH-35 in Bell, Falls, McLennan and Hill Counties. The map on the following page shows the corridor through the four counties. In addition, an approximate 11-mile segment of IH-35 in Williamson County should be included in this analysis; this segment would provide a more logical southern terminus since the managed lanes would tie to the new SH 130 currently under construction. All or parts of SH 130 may become elements of TTC-35 an intermodal facility (road, rail and utilities) that would stretch from the international border with Mexico to Oklahoma. TxDOT initiated the development of the TTC-35 corridor in 2003 as a parallel facility that is also expected to lead to the diversion of trucks and automobiles from the existing IH-35. The proposed managed lanes would provide a direct connection to SH 130, which could potentially become part of near-term implementation of TTC-35.

Project Description

Currently, the Waco District portion of IH-35 is primarily rural, comprised of two general-purpose lanes in each direction serving in excess of 50,000 to 90,000 vehicles daily. The exceptions to this standard configuration are that the urban segments through the City of Waco and the Belton-Temple area, which already have three general purpose lanes in each direction. Also, the Williamson County segment has three general purpose lanes in each direction, as does the entire IH-35 corridor through the Austin District.

The concept for this study, shown on the diagram in Figure 1, would be to add a third lane to the rural segments in each direction throughout the Waco District as a tolled managed lane, which will provide access/egress points to the non-tolled existing third lane in the Waco and Belton-Temple areas. (Eventually, a fourth lane could be added in the two urban areas so that the managed lane can run the length of the district uninterrupted, while the urban areas retain three non-tolled mainlanes). A fourth lane would be added to the Williamson County segment, connecting the new managed lanes in Bell County with the tolled-only lanes of SH-130, which is currently under construction.



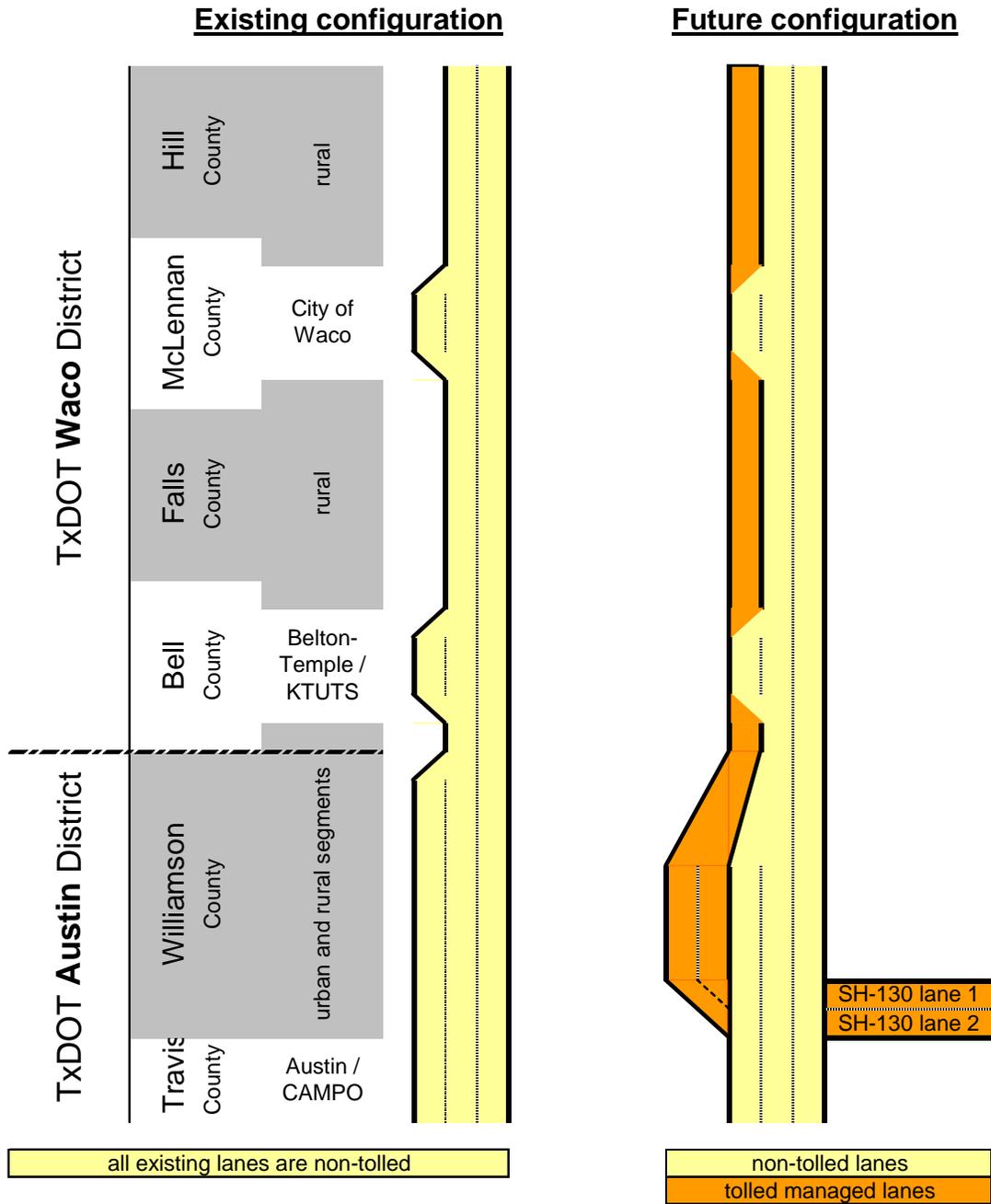


Figure 1. Proposed Lane Configuration for IH-35

2. PROPOSED PROGRAM DESCRIPTION

The objective of this value pricing study is to develop and evaluate ways to insure the managed lane is fully utilized both day and night using value pricing. It is also desired to use value pricing strategies to encourage usage by trucks, particularly at night. In addition, the program will analyze the need for providing opportunities for vehicles using the managed lane to pass slower vehicles. Design considerations are necessary to insure the managed lanes save travel time and are dependable in terms of trip quality.

The study for the proposed IH-35 added capacity will examine how value pricing can potentially be used as a tool for future management of travel demand in the corridor and how alternative pricing scenarios can be utilized.

The specific goals for the Pre-Project Study are:

- To examine the use of value pricing for the managed lanes in the rural sections of IH-35 in order to achieve maximum utilization, both day and night.
- To evaluate project design and motorist communication methods to ensure maximum appeal and utilization.
- To examine how value pricing can be used to encourage truck utilization of the managed lanes.

3. SOCIAL AND ECONOMIC EFFECTS

The social and economic effects of the pricing program are unknown at this time. Through a corridor profile analysis using the Statewide Analysis Modeling in conjunction with the two local MPO's (Waco Urban Transportation Study and Killeen-Temple Urban Transportation Study), regional planning models to assess the demographics of the traveler groups in the corridor can be conducted, including a review of income levels. A Transportation Economic Impact Analysis can be conducted to provide insight into the short and long-term economic impacts value pricing would have on Central Texas.

The IH-35 project has been designed using the segmented approach in order to move the project progressively toward construction. Design for the project was underway prior to TxDOT's decision to evaluate tolling for the added lanes. An environmental re-evaluation of the entire corridor will be conducted in the coming year, at which time environmental justice issues will be reviewed.

4. ROLE OF ALTERNATIVE TRANSPORTATION MODES

Given the rural nature of the project, no other alternative transportation modes will be utilized in the project in conjunction with the managed lanes.

5. **TIMELINE**

Pre-Project Study – September 2005 through April 2007

Implementation – The first project to be constructed will be a 6-mile portion of IH-35 in Bell County from the Williamson County Line to the City of Salado. This project is expected to be completed in 2008.

The value pricing program could be implemented on this completed project at that time. Additional portions of IH-35 will be constructed in the coming years with the final rural portion of the 105 miles completed in 2013 (see table below). The program would be expanded as each subsequent portion is completed culminating in the expected full implementation in 2013.

Segment Limits (from north to south)	Length in Miles, Segments	Length in Miles, Between Urban Areas	Calendar Year of Letting	Year of Construction Completion
Hillsboro to IH35 E/W Split	3.2	31.1	2003	2007
Southeast side of Hillsboro	3.8		2005	2008
Abbott to Hillsboro	4.9		2006	2009
West to Abbott	7.8		2011	2014
Elm Mott to West	6.9		2009	2012
Waco to Elm Mott (near FM308)	4.5		2007	2010
In Waco	10.7	Existing 6 lanes, no current plans for tolling		
Lorena to Waco	6.7	29.1	2007	2010
Bruceville-Eddy to Lorena	6.4		2009	2012
Troy to Bruceville-Eddy	6.7		2001	2014
Temple to Troy	3.9		2008	2011
In Temple	5.4		2010	2013
Belton to Temple	6.9	Existing 6 lanes, no current plans for tolling		
Salado to Belton	6.8	26.7	2007	2010
In Salado	2.2		2009	2012
Bell County Line to Salado	6.7		2005	2008
SH 130 to Bell County Line*	11		Possible 2011*	

*SH 130 to Bell County Line is not currently programmed for funding

6. DETAILED PROJECT TASKS

Task 1. Collect Traffic Data

Estimated cost: \$75,000

Conduct pre-project data collection as needed to supplement data previously collected, including AADT, 24-hour traffic patterns, trip characteristics, toll feasibility analysis forecasts, managed lane access locations, social and economic impacts as mentioned above, congestion and delay. Based on the data gathered from existing sources and collected, identify potential managed lane operating strategies for rural sections of the corridor.

Task 2. Develop Variable Pricing Strategies.

Estimated cost: \$200,000

In order to assess the expected level of utilization it will be necessary to measure acceptability of the managed lanes in a non-urbanized setting by potential users, and examine perceptions of alternate pricing strategies. There may be pricing options that can attract travelers to use the managed lanes such as lower tolls, discounts for repeat users, discounts for off-peak users, etc.

Given the high percentage of trucks on IH-35 and the safety concerns that have been documented, the study will examine truck-only and mixed vehicle operating strategies with geographic and/or temporal variations as necessary throughout the corridor. Since trucks cannot be required to use the tolled managed lanes, the study will explore credit-based scenarios to incentivize truck usage during desired operating periods.

In this task user acceptability of alternative pricing strategies will be evaluated through surveys of potential users and interviews with truckers. User perceptions will be analyzed to assess potential utilization of the managed lanes, including perceived value and motivating factors for using the managed lanes as well as conditions that would discourage use. The results of this task will be a set of refined operating strategies and price-demand relationships for the strategies based on information obtained in the surveys. In addition, the surveys will be able to offer valuable user perception data that can offer insight into public outreach needs, including knowledge gaps, target audience/market for the managed lanes, and communication/outreach methods. The information will be summarized for use in developing a public education and outreach program for the overall expansion project and for each segment as they are developed.

Task 3. Analyze Design and Operational Conditions

Estimated cost: \$250,000

Given the unique nature of the project as a rural, long-distance managed lane, there are design and operational considerations for which there is no previous experience. Concerns related to passing opportunities, barrier type, enforcement coverage, emergency access and motorist communication pose unprecedented challenges for this type of pricing project on long stretches of rural interstate highway.

- Passing opportunities – The project cross section, which is based on current state and national design guidance, does not offer opportunities for passing slow vehicles. This is not of particular concern on single lane projects of 10 to 15 miles in length, but for 25 and 30-mile lengths the inability to pass slow vehicles, including trucks, may inhibit the use of the managed lane.
- Barrier type – Currently the project is considering either concrete barrier or delineators. What are the advantages and disadvantages of lane separation options over long stretches of single lane toll facilities? TxDOT will be initiating a research project in September 2005 to investigate barrier options between toll and non-toll lanes, and this study will be closely coordinated with that investigation to ensure that the unique aspects of this project are addressed.
- Enforcement and emergency access – There are questions related to the design that will impact enforcement, incident management, and emergency access. What is the best cross section, access design/spacing, and barrier technique to insure adequate emergency access and enforcement over long sections of rural managed lanes?
- Communication methods – The surveys will reveal the factors that are important to motorists in choosing to use the managed lanes. What are the best methods and information messages to elicit use of the lanes? At what point is the information best communicated?

Utilizing the latest traffic simulation software and advanced model features, this study will conduct a variety of pricing and utilization schemes for the directional managed lane on IH-35. The VISSIM transportation simulation package has been successfully utilized in Texas to model extended sections of freeway for the performance of truck lane facilities and, in other studies, to examine the operational effects of congestion pricing scenarios. For the current study of I-35, these experiences will be combined to identify the design features required to maintain high-quality operation of the managed lane under various tolled scenarios. Several issues that will certainly require attention include the presence and frequency of passing lanes required for areas with different vertical profiles and the weaving area length and geometric features of access/egress points for the managed lanes.

VISSIM will also be used to examine the operation of the managed facility should it be used for other strategic objectives, including the separation of truck (heavy vehicle) and automobile traffic. Whereas pricing schemes would most likely be employed for the managed lane where I-35 passes through urban areas, in the more rural areas where safety (rather than peak period congestion) is the overriding mobility concern the most beneficial use of the lane may be to separate vehicles by type. To support such operations, the managed lane would again need to be examined to identify the location and design of geometric features (passing lanes, merging areas, etc.) to accommodate this use and guarantee - to the extent possible - high-quality travel and travel time reliability.

Using the simulation results, combined with data from surveys and other research efforts, recommendations will be made regarding design and operational elements that will

maximize utilization of the managed lanes. An evaluation plan will be developed to assess the ultimate design, operation, and usage of the project.

Task 4. Identify and Evaluate Revenue Impacts Estimated cost: \$25,000

Evaluate the potential impact that the use of value pricing may have on the financial viability of the project. Review of the role of discounts, truck incentives, and other value pricing strategies in achieving project objectives, and how they impact the ability to fund capital costs as well as costs for operations and maintenance.

7. EVALUATION

An evaluation framework will be formulated in Task 3 in order to assess the ultimate operation of the managed lanes. The evaluation framework will identify the objectives, corresponding measures of effectiveness, and data collection needs to support the evaluation. The results of the evaluation will provide valuable information for other agencies pursuing similar projects.

8. FINANCIAL PLAN

A detailed financial and revenue plan for the project is under development separately. The financial objective of the managed lanes is to fund operations costs initially and maintenance costs as well in later years, not to support the construction of the project. TxDOT will be using internal financing tools and does not intend to pursue financing through the bond revenue markets. Results of this pre-project study will be incorporated into the TxDOT financial plan for the overall project.

9. PLANS FOR INVOLVING KEY AFFECTED PARTIES

The Waco District has and continues to work with U.S., State and local elected officials regarding transportation needs for the Waco District. Also, the District remains continuously involved with the two local MPO's (WUTS and KTUTS), community leaders, local organizations and individual stakeholders to keep them informed and educated in transportation issues. Additionally, the two MPO's have included the IH-35 Corridor expansion as their number one priority project in their respective 2025 Metropolitan Transportation Plans. Public involvement is proceeding as part of the project development and environmental process for each segment, and the results of this study will be incorporated into the public outreach efforts. The formation of a regional mobility authority (RMA) is not being pursued at this time.

Although, the trucking industry and its professional group, the American Trucking Association, have recently voiced significant opposition to tolling on existing interstates, the industry has been accepting of toll roads in general under certain circumstances. This particular project will evaluate the feasibility of incentives provided to truckers through reduced tolls by way of credits. TxDOT will contact the American Transportation

Research Institute (ATRI), the research group of the American Trucking Association, to solicit input during the study. Additionally, TxDOT proposes to involve local trucking contacts such as the Texas Motor Transportation Association to provide input on the project and to generate local stakeholder support. If this study is funded concurrently with the value pricing proposal to evaluate incentives for truck use on SH 130, the two projects can be closely coordinated on truck pricing issues.

10. LEGAL AND ADMINISTRATIVE REQUIREMENTS

The Texas Legislature passed SB 370 during the 75th Legislative session that gave legal authority for TxDOT, Toll Authorities, Transit Agencies, and the private sector to participate in congestion pricing. TxDOT also has the authority, under Section 224.154(a) of the Texas Transportation Code, to charge a toll on the facility with FHWA's approval.