I-35 Central Texas Expansion Project

Mobility Coordination and Traveler Information System

Project Report

Jan 2015 – Dec 2015
It was with a high level of trust that the Texas legislature, voters and the Texas Transportation Commission allocated over $2.1 billion to the Waco District to expand and improve Interstate 35. As a corridor of national significance, reliable travel on this interstate is vital to Texas’ economy. While there are always challenges during construction — working through unexpected design changes and unforeseen field conditions — The TxDOT Waco District staff along with the TTI mobility coordination and traveler information efforts helped improve coordination and produced, what I believe, are unprecedented levels of customer service to the communities and travelers along the corridor. Together, they reached out to more than a dozen communities, 1,000+ business owners, and provide real-time information to hundreds of thousands of travelers along the corridor. The TxDOT personnel in the Waco District have exceeded expectations when it comes to caring for the citizens of Texas. I look forward to sharing this model with my other DOT colleagues around the country.”

— Mr. Bobby Littlefield, Waco District Engineer, Texas Department of Transportation
Purpose
Coordinated from Waco, this 96-mile, multi-year Texas Department of Transportation (TxDOT) construction project spans McLennan, Bell, Falls, and Hill Counties. The purpose of the project is to widen the highway from four to six lanes in rural areas and eight lanes in the cities of Temple and Waco. The project also changes two-way frontage roads to one way to improve safety. The expansion encompasses 17 different projects, which are being constructed using multiple contractors. TxDOT has approached the individual construction projects as one large coordinated project, mitigating conflicts between projects and providing local and long-distance travelers with real-time traveler information about construction activities, work zones, and lane closures. Intelligent transportation systems (ITS) provide innovative traveler information during this reconstruction effort. Throughout the project, TxDOT is using a comprehensive approach to help maximize safety and minimize travel disruptions for affected travelers and businesses.

By the Numbers

- **$2.1 billion**
  - 96-MILE corridor construction project cost
- **Coordination of 17 different projects**
- **55,000 to 111,000 vehicles**
- **30 million travelers**
- **25% to 35% truck traffic**
- **Peak construction 2012–2015**
- **Estimated complete 2019**

The Brazos River Bridges, as shown, were completed in 2014.
**Background**

The diverse travelers on I-35 create substantial demand, with well over 100,000 vehicles a day traveling on many sections of the interstate, making it one of the most heavily traveled corridors in the country.

More than 1,000 businesses are located on I-35 in the 96-mile span of this project, resulting in significant challenges to minimize the impacts on customers and employees. Knowing the location of work zones and when to expect slower travel is vital to deliver goods from major distribution centers to stores.

The time-saving potential of efficient traveler information is extremely valuable. For those transporting perishable products, traffic backups can mean the difference between produce making it to store shelves or not—and that can translate into lost revenue for the company and higher prices for consumers. Similarly, with better information available, travelers can minimize travel disruptions resulting from lane closures and traffic crashes.

**Benefits**

The benefits of this ambitious construction project include:

- Reducing congestion by expanding freeway capacity from four lanes to six or eight lanes in both directions.
- Converting from two-way to one-way continuous frontage roads to improve safety, while maintaining quality access to adjacent businesses.
- Upgrading freeway entrance and exit ramps to improve safety and mobility.
- Addition of permanent Dynamic Message Signs (DMSs) to increase communications to the traveler.
- Adding cross roads and U-turns at selected crossings to improve access to area businesses.
- Developing modern and welcoming traveler safety rest areas at safe distances from the freeway.
- Increasing the economic development and competitiveness of Texas.

End-of-queue warning systems are deployed at night to alert drivers that the traffic ahead is slowing down or has stopped altogether.
Bridge piers are being installed at a new overpass.

Construction

Construction Partners
The prime construction contractors are vitally important to the success of this project. The primary contractors for the project are:

• James Construction Group
• Lane Construction
• Webber, LLC
• Williams Brothers Construction

Construction Requirements
TxDOT established numerous contractor construction parameters to help alleviate the construction impacts on residents and businesses, including:

• Access to all businesses adjacent to I-35 must be maintained.
• The construction teams work a six-day work week to move the project forward as efficiently as possible.
• No mainlane closures occur during weekends, major holidays or on dates with major corridor activities that the project team is aware of ahead of time.
• All freeway construction-related lane closures are limited to the nighttime hours (7 p.m. to 7 a.m.).
• Contractors receive financial incentives for completing construction ahead of schedule.
Extensive efforts have been made to increase wayfinding into and out of the downtown Salado area. The project team meets weekly with the village leadership to learn of specific requests and events from the village citizens and Chamber of Commerce. Six extra portable message boards have been deployed to provide added guidance into the downtown Main St. area of Salado. Social media has also been employed to increase awareness of access to downtown artisans and retailers for special events.

Tight turning radii and concrete barriers have made it difficult for two mobile home and trailer park businesses to access the southbound frontage road. TxDOT project staff, on the Belton Project, went to work to clear signage and barrels. TxDOT also had the contractor add extra pavement millings to widen the driveway turning radius. This has helped alleviate the problem of long vehicles entering and exiting the mobile home park property.

In Temple, several exit and entrance ramps have had to be closed as construction progresses. Exit #302-Nugent St. proved to be cumbersome to four hotels and a mobile home park. Increased signage was added to the detour route to guide travelers to the lodging area of the hotels. Maps were drawn and provided to the hotel owners for publishing on their individual websites. A special detour map was developed for the mobile home park. The detour that was planned for the hotels was not practical for a large mobile home transport. The use of Loop 363 around the west side of Temple proved to be the optimal solution. The mobile home park manager now has the proper information to convey to the drivers who pick up and drop off at the park.

A local tractor company in Temple had only one entry and exit point for their business, making construction of their new driveway difficult during business hours. TxDOT used high early strength concrete and worked while the business was not open to create minimum disruption of operations.
A neighborhood that abuts the southbound frontage road near Troy had citizens that were concerned about construction progress, upcoming traffic control changes, and their near-term inconveniences. TxDOT had a meeting with one of the property owners, and from that meeting, the neighborhood erected a message board near the community mailboxes. TxDOT agreed to post any upcoming changes to that board as the way to communicate with that specific community. The community appreciates receiving updates and the TxDOT PIO appreciates having a specific channel of communication that benefits the whole neighborhood.

The elevation difference between the new and existing southbound frontage road near Lorena was 5 feet in some locations. TxDOT worked with businesses to ensure that this excavation work would not disrupt their activities. A time of day was chosen when no disruption to the eight businesses in that area would happen. In the midst of this conversation, a business owner was able to describe how his property had changed since the project was designed. Because of TxDOT’s proactive communications, the project manager was able to direct the contractor to adjust the driveway locations to match the ingress and egress needs of the business.

A primary stakeholder of the I-35 reconstruction effort is the emergency responders of each agency along the interstate. TxDOT routinely attends the monthly meeting of the Central Texas Area Chiefs of Police and Sheriff’s Association. As the newly developed Incident Management Plan (IMP) was being drafted, these meetings provided the avenue for TxDOT to receive constructive feedback. These conversations helped the emergency responders take ownership of the IMP. This has made implementation of the plan easier and more fluid.

Even though construction in the Elm Mott area is essentially complete, two landowners needed TxDOT assistance with relieving some drainage issues. As atypical rains hit the area, it became apparent where some improvements could be made. TxDOT continues to stay engaged to ensure the final construction product is operating optimally.

**Mobility Coordination**

Mobility coordinators act as independent ombudsmen for the project. TTI has successfully developed state-of-the-art skills and approaches to coordinate mobility during construction projects. TTI’s mobility coordinators are responsible for anticipating mobility challenges and ensuring that stakeholder concerns are satisfied in support of timely project completion. TTI is applying its expertise to coordinate multiple projects with multiple contractors in a single corridor. The experience gained is being documented to contribute to the state of the practice in transportation engineering.

- Facilitate open lines of communication among key stakeholders and develop solutions to problems resulting from the construction project.
- Work with construction contractors to assess and adjust phases of construction to minimize negative impacts for businesses and the traveling public.
- Coordinate and facilitate an expert traffic management team.
- Assist TxDOT in making presentations to public officials, school districts, civic and service organizations as requested, to provide...
Salado’s Traffic Switch to a Temporary Detour

During the fall of 2015, TxDOT and the contractor worked to develop a new detour through Salado to open up a larger area for the construction of new mainlane pavement. The proposed detour contained a super elevation that required several layers of hot mix. The contractor needed at least 16 hours to complete this work. The construction of the detour required mainlane I-35 traffic to have to be diverted to the frontage road. TxDOT asked TTI to review the average traffic data for Salado over a seven-day period. The data were analyzed, and a timeframe was found that minimized delay, would have the lowest percentage of truck traffic, and not disrupt downtown Salado activities. TxDOT maintained communications with the leadership of the Village of Salado during these discussions. TxDOT once again ended up with a smooth construction activity due to being proactive and including all impacted stakeholders.

Water Conservation during Construction

At a time when drought still lingers in the backs of our minds, saving water has become a pressing issue to everyone, including highway contractors. Making concrete uses a lot of water. It’s estimated that the concrete to construct the 40 miles of I-35 main highway lanes and access roads near Lorena will consume 11 million gallons of water. Other construction uses will consume another 50 million gallons.

Lane Construction, the contractor responsible for building I-35 in the Lorena area, is using treated wastewater from the Waco Metropolitan Area Regional Sewerage System (WMARSS) to make its concrete. WMARSS is a joint wastewater treatment effort by the cities of Bellmead, Hewitt, Lacy Lakeview, Lorena, Robinson, Waco and Woodway.

Ricky Garrett, the Waco Water Utility Services Director, said that WMARSS hoped to sell its treated water as a conservation effort. “We wanted to stop using potable water where we could,” he said. “This was part of an expansion program anticipating future reclaimed water users.” The treated water is destined for Bull Hide Creek, a tributary of the Brazos River. The Bull Hide Wastewater Treatment Plant went into service in February of 2012 and continues to run today.

Eric Pruemer, Assistant Project Manager for Lane Construction, said that the contractor discovered the treated water line ran through the property that Lane leases for its concrete production facility. “It’s treated water. There is little market for it right now. It would typically be discharged back into the environment. They found a new customer, and it helps them recoup some of the cost of their new treatment plant,” Pruemer said.

Ordinarily, a contractor uses drinking water from the closest access point, often a fire hydrant. The treated water makes no difference when used in concrete. Contractors have to supply periodic water samples to the Texas Department of Transportation (TxDOT) even when drinking water is used. “TxDOT checks to make sure there is nothing in the treated water that will be detrimental to the service life of the concrete,” Pruemer noted.

Pavement Recycling

“Recycling is actually part of the contract,” Bruce Johnson said. Johnson is the TxDOT project manager for Section 5A (Waco to West). The project, contracted by Williams Bros. Construction, required demolishing some 16 major bridges in Section 5A alone. “The concrete rubble is hauled to a quarry, where it’s crushed and then mixed back into road materials. All of the rubble from the bridges actually becomes part of the base material for the concrete pavement of the new interstate,” he said.

“The fact that the recycling requirements are in the contract, as well as a requirement that bridge demolitions be done only at night, are examples of how traffic safety issues and the environment are both TxDOT priorities,” says Jason Hudson, TxDOT project manager.
Safety is Priority One

The following are just a few of the more than 20 recommendations from the safety summits that are in various stages of development and implementation in the corridor:

- Work zone speed limits in the corridor were reduced to 60 mph where justified, and additional speed limit signs have been installed.
- Representatives of Texas DPS are working more closely with TxDOT and TTI on work zone safety enforcement efforts.
- TTI has created a messaging system to allow first responders, TxDOT and its I-35 maintenance contractors to create and update incident alerts in a simple and time-efficient manner. This information is provided to the traveling public, media, local government, and first responders to alert drivers of possible delays.
- Portable speed display trailers that display a vehicle’s speed as it passes by the unit have been placed along the freeway to make drivers aware of their speed and to help slow speeds throughout the corridor.
- Horizontal pavement markings have been installed in Temple and Salado to bring added awareness to the 60 mph section on southbound I-35.
- Increased Signage Frequency:
  - Bridge Height Warning Signs.
  - Red-Border Speed Limit Signs.
  - Trucks Use Right Lane (Advisory).
- Outreach materials were developed and placed at truck stops along the corridor to provide short- and long-haul truckers with links to the real-time traffic map and lane closure notification system.

Law enforcement and emergency services are always affected by road construction projects, depending on the location of work zones and proximity to the most efficient travel routes. In October 2012, TxDOT and the Texas Department of Public Safety (DPS) initiated the first Safety Summit to discuss traffic safety issues related to the project. One outcome was the decision to hold the summits bimonthly during peak construction, with representatives from TxDOT, contractors, and state and local law-enforcement personnel. These summits are now held quarterly as multiple projects have been completed. This group discusses new safety tools, strategies, and initiatives to reduce the potential for incidents while construction is under way.
Safety Requirements Built into Construction Contracts

For the first time in Texas, safety requirements have been built into construction contracts. In part, that means road construction companies bidding on the I-35 projects must conduct extensive safety training for employees. “Reinforcing the need to continue the practice of making sure contractors implement the new safety requirements is groundbreaking stuff,” noted Bobby Littlefield, TxDOT Waco district engineer. “I think it shows everyone that TxDOT is serious about work zone safety. Of course, we want a quality job completed on time, but the main goal is to make sure everyone gets home at night—free from accidents or fatalities. I’m hoping the new contract requirements become the norm across the state.”

Safety during Construction

To support minimizing safety impacts while reconstructing the corridor, TTI researchers conduct ongoing analyses of crash data available through the TxDOT-maintained Crash Records Information System. Crash analyses have included the change in crash rates across segments before and during construction, the total number of crashes, and the number of vehicles per accident. These analyses have been presented to TxDOT traffic operations staff, Texas DPS district personnel, contractors, and local government staff. TTI has solicited feedback from these groups to assist in recommending changes to the corridor design or operations that improve safety in the corridor.
SAFETY IS PRIORITY ONE

End of Queue

Another outcome of the I-35 corridor construction effort has been the deployment of an innovative end-of-queue warning system that has reduced crashes by up to 45 percent. Frequent nighttime lane closures were inducing queues upstream of the merging taper. (Daytime closures are prohibited.) The queues are of concern for four reasons: 1) the corridor is predominantly rural, so drivers do not expect traffic queues, especially at night. 2) Lane closure necessity and locations vary nightly so travelers are unable to develop an expectation of queues. 3) Contractors are using all available right-of-way for construction activities, so queue warning equipment could not be easily positioned and left until needed. 4) The corridor is heavily used by large trucks, which increases the severity risk of any end-of-queue crashes.

Experiences with the system effectiveness to date:

- Deployed on more than 300 nighttime lane closures in the corridor.
- Crashes on those nights reduced by 44 percent (compared to an estimate of what they would have been if the end-of-queue system had not been deployed).
- Fewer high-speed rear-end collisions and less severe crashes (no fatalities) at lane closures with the end-of-queue system deployed.
- Savings of $2 million in societal costs to date in the corridor during construction.
- Ongoing savings of societal crash costs of $6,300 per night of deployment. The effectiveness of this safety countermeasure will continue to be monitored. It has been implemented by the Waco District on I-35 construction projects since its inception and its use has extended to other districts in the state.

“End-of-queue warning systems are designed to alert approaching vehicles that the traffic ahead of them is slowing down or has stopped altogether,” Jerry Ullman, senior research engineer and manager of TTI’s Work Zone and Dynamic Message Sign Program, said. “It’s a simple concept that has the potential for preventing rear-end collisions at work zones. The systems are proving to be very effective in reducing rear-end collisions, one of the most deadly types of highway crashes.”
SAFETY IS PRIORITY ONE

Speed sensors are mounted in orange and white construction drums ahead of work zone lane closures to monitor and measure the speeds of approaching vehicles. Data from multiple sensors are analyzed, and as vehicles slow down, an algorithm triggers a message for display on portable changeable message signs (PCMSs) located a few miles upstream of the construction site. As a result, motorists are warned well in advance of the slow-down as it is happening.

For example, when traffic slows or stops, the messages on the PCMSs will read “Slow Traffic — 3 Miles,” or “Stopped Traffic Ahead.” When no queue is detected by the system, the signs will display a more generic “Road Work Ahead” message.

Rumble strips installed in conjunction with the system alert travelers well in advance of a nighttime lane closure when they feel the subtle “bump-bump” as their vehicle rolls over three hard-rubber strips. Soon afterward, a PCMS provides details about the closure ahead and predicted travel times from point A to point B. Before they reach the closure itself, travelers will roll over another set of rumble strips.

Based on the positive experiences of deploying the end-of-queue warning system for temporary nighttime closures, TTI is working with TxDOT to identify locations for semi-permanent deployments in areas where regular queuing is occurring. TxDOT and TTI’s partners in this effort are N-Line, iCone®, Ver-Mac and Plastic Safety Systems, Inc., all of which manufacture and install various parts of the system.

The end-of-queue warning system was recommended as a safety measure during a project safety summit to help reduce the likelihood of crashes.
Safety Performance

The crash rate (i.e., crashes per month per mile) has been monitored during the construction of each project. This crash rate is monitored against the 3-year average crash rate before each construction project began, and will continue to be monitored for 3 years after construction ends.

For the segments with increased crash rates during construction, TxDOT and the contractors have been implementing crash mitigation strategies to lower the number of crashes while the segment is still under construction. Some of the safety improvements implemented are:

- Reduced Speed Limits per Commission Minute Order
- Speed Display Trailers
- Rumble Strips
- Signage
- Pavement milling to eliminate ponding water
- Increased Signage Frequency
  - Bridge Height Warning Signs
  - Red-Border Speed Limit Signs
  - Trucks Use Right Lane (Advisory)
- Semi-Permanent End-of-Queue System
- Priority of Diverted Traffic
- Continuous Monitoring of Crashes
- Bi-monthly Safety Summit Meetings with contractors, Texas DPS, and Local Law Enforcement
- Deployment of Law Enforcement with Lane Closures
- Horizontal Speed Limit Pavement Markings
Outreach and Communication

Researchers and communication staff at TxDOT and TTI worked to develop a system of getting information that travelers wanted, when they wanted, and how they wanted to receive it.

Communications

The TxDOT/TTI corridor communications team is delivering primary messages about the construction project through:

- Construction lane-closure email notices
- Email incident alerts
- Twitter and Facebook
- My35.org
- My35 Central Texas Newsletter (monthly)
- Area media outlets
- Billboards
- One-on-one visits with stakeholders
- Presentations to local groups as requested

The primary information being communicated is:

- Construction updates and potential traffic delays, such as lane closures.
- Incident alerts, such as stalled vehicles or vehicle crashes.
- Information about how to obtain real-time travel times in the corridor—both pre-trip and en route.
- Permanent changes resulting from the construction, such as new exits and/or the change from two-way to one-way frontage roads.
- Progress on the construction projects and what’s next.

Woven into this outreach are strategic messages that benefit the traveling public:

- Time frame and length of construction project and cost.
- Innovative approaches being used in the I-35 corridor, such as state-of-the-art research and technology.
- Green building standards and environmental reclamation.
- Accelerated construction techniques and technology.
- ITS and other innovative components.
- Economic development, such as jobs created and the effect on area communities.
- Partnerships with local, state, and federal agencies to expedite the project.
- Other messages as appropriate.
Getting Travelers the Information They Need

To better understand the needs of the public for travel through the I-35 corridor during the expansion efforts, TTI designed three surveys to reach a variety of drivers that use I-35 in Texas. In the first survey, conducted in early 2011, respondents identified which types of information would be most useful and how they preferred to receive it. The two follow-up surveys to date, conducted in 2013 and 2014, allowed travelers to express how well their needs were being met. Overall, the responses to traveler information provided during construction have been extremely positive. The primary objectives of the surveys were to determine:

- What types of traveler information are considered most useful by motorists?
- When would motorists prefer to receive various types of traveler information?
- What methods, tools, and information channels do motorists typically use to obtain traveler information?
- Are the motorists’ needs being met?
- Are the motorists’ satisfied with the information being provided?

The surveys also requested information on motorists’ typical travel patterns in terms of the purpose, frequency, and origin and destination of their trips along the I-35 corridor. In addition, survey respondents were asked to provide comments and suggestions to improve the effectiveness of the dynamic traveler information system. A summary of the survey responses and outputs is shown below.

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<th>What Travelers Requested</th>
<th>What We’re Doing</th>
<th>How Travelers Responded</th>
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<tr>
<td><strong>SURVEY 1</strong></td>
<td><strong>MEETING THE NEEDS</strong></td>
<td><strong>SURVEY RESULTS</strong></td>
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<tr>
<td>Notice of expected lane closures between major points along I-35</td>
<td>Daily, 7-day and high-impact lane closure notifications are sent to travelers who sign up to receive them via email.</td>
<td>Overall, 90% of those responding to both the second and third follow-up surveys were satisfied with the lane closure notification emails.</td>
</tr>
<tr>
<td>Current travel times between major points along I-35.</td>
<td>Portable changeable message signs (PCMSs) indicate travel times between major points between Salado and Hillsboro — northbound and southbound.</td>
<td>Combined data shows 93% of respondents who recalled seeing the PCMSs found them useful in traveling through the I-35 construction area.</td>
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<tr>
<td>Current locations of incidents; locations and times of lane closures and main lane closures.</td>
<td>Email alerts and a Twitter feed are available to stakeholders, such as local media, ISDs, chambers of commerce, emergency responders as well as the general public.</td>
<td>Respondents also indicated a desire for texting message options, which will be available shortly.</td>
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<td>Projected delay from lane closures between major points along I-35 when they plan to travel.</td>
<td>A comprehensive trip planner is available on the real-time traffic map and can be tailored by start and end points along the corridor as well as the day, time, and direction of travel.</td>
<td>Responses in the follow-up surveys emphasize the public’s desire for high-quality travel time and delay information.</td>
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<td>Current speeds on each segment of I-35; traffic camera views of freeway conditions at selected points along I-35.</td>
<td>A supplemental map to DriveTexas.org that provides speed, lane closures and traffic cameras is now available online. Travel time alerts are issued automatically to @My35TravelTimes.</td>
<td>70%+ of corridor travelers responding to the surveys confirmed they like the current methods of receiving information about closures along all of I-35.</td>
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Pre-Trip Traveler Information

Based on the results of these surveys, TTI researchers created a system of automated email alerts for travelers. Travelers can receive information about the next day, the next seven days or only full freeway closures, delivered straight to their email.

Motorists are now able to plan their trips by subscribing to or checking status of traffic and lane closures via:

- Daily lane closure email notifications twice a day—at about 5:00 a.m. for planned closures for the next 24 hours and about 4:00 p.m. for notification of any construction updates or cancellations.
- Twice-weekly email notifications of projected lane closures for the next seven days.
- Twice-weekly email notifications of only high-impact lane closures, if any are occurring in the next 14 days (a high-impact closure occurs when all I-35 main lanes are closed in at least one direction).

- Newsletters
- Email Alerts
- Twitter and Facebook
- My35.org
- Area media outlets
- Real-time Traffic Map

### By the numbers:

- Website traffic: 140,466 page views
- Newsletter subscriptions: 1,020
- Tweets: 2,500+
- Media releases: 275
- Lane closure notification subscriptions: 2,670
- Unique visitors to I-35 real-time traffic map: 32,646
Real-time Traveler Information

In order to provide both pre-trip and en-route traveler information, TTI researchers have created systems to distribute information across multiple channels:

Motorists can get trip and delay information via:
- Portable dynamic message signs
- Permanent dynamic message signs north of Waco
- Incident alerts
- Real-time traffic map
- Twitter and Facebook notifications
Mobility Coordination

The mobility coordination function for the project represents TxDOT’s desire to let the public know exactly how the agency is working on their behalf. TTI’s mobility coordinators are responsible for anticipating mobility challenges and ensuring that stakeholder concerns are satisfied in support of timely project completion. The mobility coordinator serves as a project ombudsman, representing the needs of the traveling public and local stakeholders between and among TxDOT staff, contractors and engineers. The following examples show the broad range of outreach and communication options the mobility coordination team utilizes to keep corridor stakeholders informed and engaged to the successful conclusion of the construction projects.

- Facilitate open lines of communication among key stakeholders and develop solutions to problems resulting from the construction project.
- Working with construction contractors to assess and adjust phases of construction to minimize negative impacts for businesses and the traveling public.
- Support an ongoing public information campaign to educate property owners, businesses and the general public about the project and its impacts.
- Assist TxDOT in making presentations to public officials, school districts, civic and service organizations as requested, to provide information about the project.
- Serving as a project ombudsman, representing the needs of the traveling public and local stakeholders between and among TxDOT staff, contractors and engineers.

"At the end of the day, it’s about connecting with the citizens of Texas,” says John Habermann, TTI I-35 mobility coordinator. “TxDOT doesn’t just want to build roads,” he says. “The agency also wants to build and maintain relationships with their residents. For me, that’s the most rewarding part of my job.”

I-35 Mobility Project Goals

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<th>Mobility Coordination</th>
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<td>Anticipate mobility challenges, ensure stakeholder concerns are addressed, and support timely project completion.</td>
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Outreach and Communication

Corridor Stakeholders

The list of diverse stakeholders along the I-35 Central Texas corridor is significant and includes all of the following:

- Inter-city and intra-city commuters
- Non-local travelers
- Commercial vehicle operators
- Emergency services providers
- Law enforcement agencies
- More than 1,000 businesses adjacent to I-35
- The cities of Waco, Lorena, Robinson, Temple, Killeen, Salado, Hillsboro, West, Hewitt, Bellmead, Lacy Lakeview, Ross, Bruceville-Eddy, Troy, and Belton
- Fort Hood
- Bell, Hill, Falls, and McLennan Counties
- Metropolitan Planning Organizations
- Freight and trucking industry representatives
- Local community leaders
- Civic organizations and chambers of commerce
- The area independent school districts
- Regional traffic management centers in Dallas/Fort Worth, Austin, and San Antonio
- Corridor media
- Construction contractors and workers
- TxDOT staff

Community Meetings

To help keep community leaders and business owners along I-35 informed of construction plans and timelines, the mobility coordination team has conducted frequent meetings to discuss all I-35 projects that are active in their areas. Invitations to these gatherings are hand-delivered to most of the 1,000+ businesses along the interstate between Salado and Hillsboro.

For the convenience of participants, the meetings are held in various locations in three counties where construction is under way. Through these gatherings, TxDOT is:

- Introducing the I-35 construction and mobility coordination teams.
- Providing updated information about construction in their areas.
- Conducting an open forum for these stakeholders to ask questions, express concerns, and provide feedback on the process.
- Allowing its project team to identify major impacts on area businesses and develop mitigation plans.
- Communicating important safety information.

Following the meetings, the communications team follows up with meeting participants and provides ways to receive updates on the construction, including links to real-time traffic maps, the My35 website, and sign-up information for lane closure notifications via email and I-35 Central Texas News subscription information.
Special Events and Recognition

Light Shows and Ribbon Cuttings
There were a total of 12 ground breakings from 2010 through 2014 on I-35 between Salado and Hillsboro. The 96-mile corridor is the longest consecutive construction project TxDOT has undertaken, with peak construction ending in 2015. Significant project completion celebrations for 2015 included the Brazos River Bridges which saw full completion with a light show that wowed the public. An additional 20 miles of three lanes of new pavement was completed, meeting up with a three-lane section already finished just north of Waco, through Lacy Lakeview and Bellmead. The entire section north of Waco to Hillsboro is now complete.
Celebrating the Czech Murals of West Marks Completion of Project

I-35 motorists who take Exit #353 at West are now greeted with three completed murals depicting the area’s Czech heritage. The images of dancers and polka-band musicians adorning the retaining walls of the highway overpass at FM 2114 are eye-catching and memorable, but for the residents of West—who endured a deadly fertilizer plant explosion in 2013 that rocked their small community—the murals symbolize deeply personal and heartwarming stories of dedication, heartache, and perseverance.

“The city has been through a lot in the last few years,” says West Mayor Tommy Muska, who was part of a ribbon-cutting ceremony in May celebrating the opening of the I-35 mainlanes at the intersection. The completed murals on the southwest retaining wall acted as a backdrop for the event. The other mural on the east side was completed shortly afterward. “This location is West’s front door. It’s a vast improvement to what was here before the completion of this intersection. And with the murals, it’s a proud representation of our heritage,” Muska says.

Plans to incorporate murals on the new overpass began years ago before the I-35 expansion project began. It was TxDOT’s vision to have artwork represent the unique aspects of the numerous communities along the corridor in the Waco District. For the West project, TxDOT artist Mike Ford and Waco district employees held numerous meetings with city residents, and together, they decided upon a theme representing the area’s Czech influence.

At the ribbon-cutting, Ford described the lengthy process of meeting with city leaders, photographing musicians and citizen dancers dressed in traditional Czech costumes. Their participation, he says, helped design the finished product.

“I see the murals in West as a rallying point. It’s a visual representation of their community and their heritage,” Ford explains. “The murals will certainly bring a smile, but they are also a symbol of how much they lost, and in the end, how strong they are.”

“People of West have been extremely patient. Now, things are coming together,” Mayor Muska says. “A lot of progress has been made in repairing and rebuilding the city. This is an appropriate time for the mural project to be completed.”
Progress and Performance

Traffic Control Performance

Over 2,426 planned construction closures have been implemented by the contractors since January 2013. These closures include mainlane (full and partial), frontage road, ramps, and cross streets. Multiple closures on the same night in the same direction can occur with construction activity from different contractors. As shown in the first graph, anywhere between 20 and 90 lane closures occur in a month. This highlights the challenge in keeping travelers informed of construction impacts. The goal of the project has been to keep the overall delay to travelers below 30 minutes. Since January 2013, 96 percent of the closures have resulted in delays of less than 30 minutes, with over half the closures resulting in delays of less than 5 minutes of maximum traveler delay, as shown in the second graph.
The Path Forward

Next Steps

During the final years of the I-35 expansion effort, the focus areas will include determining what technologies should be sustained from the construction phase to continue to maximize the safety and mobility in the corridor, choosing which emerging technologies can be brought to the Texas highways, and reviewing near-term demonstrations of these technologies. TTI has been charged with using the rapidly evolving experience in the project to develop a vision and concept for an intelligent corridor along major corridors in Texas. This vision will build upon the technologies being deployed along I-35 during the Central Texas expansion project. The study will also draw upon national research and development, including emerging and futuristic technologies. TTI will use the I-35 corridor as a case study of how these technologies would be deployed. The recommendations from the case study will lead to significant planning, design, and implementation activities to be performed by the private sector. TxDOT has recently completed a new ITS Strategic Plan for Texas. Using the strategic plan and the experience gained from the I-35 Central Texas Expansion Project, TTI will develop a long-term plan for TxDOT to use in implementing significant operations and technology investments in major corridors to continue to provide the best travel options and information to the public.

Technology and infrastructure that have been emerged as a best practice for public information during construction will continue with implementation in 2016:

- Signage – comparative travel times around Loop 363 and Loop 340.
- Alternate routes equipment deployed to provide increased level of traveler information when route is being used as an alternate or detour.
- All equipment installed will be left behind for permanent ITS system in the TxDOT Waco District.

In addition to transitioning technologies from construction to standard operation and maintenance functions, the District has worked towards improving mobility and safety by developing and implementing the Waco District Incident Management Plan. The District staff recognized that improved incident response times and improved incident coordination would go far in decreasing traffic delays and secondary crashes. Since the Safety Summit meetings create an arena to engage emergency services, the District used these meetings to receive feedback on a drafted Incident Management Plan. Over the course of 2015, several iterations of the plan occurred. By October, the District Engineer signed the plan and launched its implementation. Part of the work of good incident response is the post incident evaluation. The District plans to evaluate quarterly crash data. Any major incident identified in the crash data evaluation will be placed on the quarterly Safety Summit Meeting agenda. The District will make sure all those who responded to the incident provide feedback as to what went well and what parts of the response could be improved. When construction ends, the Waco District Incident Management Plan will remain in effect. It will be used to maintain the effort to increase mobility and safety along I-35.
For More Information

My35.org

I-35 traffic real-time map
Lane closure notification sign-up link
Newsletter sign-up link

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I-35 Central Texas Expansion Project
Mobility Coordination and Traveler Information System
Project Report
Jan 2015 – Dec 2015