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16. Abstract The purpose of this research was to provide a framework to guide the development and deployment of an integrated statewide program for Intelligent Transportation Systems (ITS). ITS is a critical component of the transportation infrastructure that helps ensure the system operates in the most efficient way possible every day and night, and during all types of situations and weather conditions.					
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# ITS STRATEGIC PLAN FOR TEXAS

by

Edward J. Seymour  
Associate Agency Director  
Texas A&M Transportation Institute

Rajat Rajbhandari  
Associate Research Engineer  
Texas A&M Transportation Institute

Beverly Kuhn  
Senior Research Engineer  
Texas A&M Transportation Institute

Tony Voigt  
Research Engineer  
Texas A&M Transportation Institute

Kevin Balke  
Research Engineer  
Texas A&M Transportation Institute

Kristine Miller  
Associate Transportation Researcher  
Texas &M Transportation Institute

Nadeem Chaudhary  
Senior Research Engineer  
Texas A&M Transportation Institute

Tina Geiselbrecht  
Research Scientist  
Texas A&M Transportation Institute

Debbie Jasek  
Engineer  
Texas A&M Transportation Institute

and

Steven Venglar  
Research Engineer  
Texas A&M Transportation Institute

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## **DISCLAIMER**

This research was performed in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation.

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## BACKGROUND

TxDOT's mission is to provide safe and reliable transportation solutions for the citizens of Texas (1). ITS can play a pivotal role in meeting that mission. TxDOT can take advantage of advanced and emerging technologies to enhance safety and promote reliability by ensuring that travelers see the transportation network as a seamless system that helps get them to their destinations and deliver goods and services to the citizens of Texas with as little disruption as possible. ITS can also help support the values of TxDOT that are cornerstones of its philosophy: trust, integrity, responsibility, excellence, and service (1). ITS is a critical component of the transportation infrastructure that helps ensure the system operates in the most efficient way possible every day, every night, and during all types of situations and weather conditions. It helps travelers:

- Get to their destinations without getting lost.
- Alerts them to changing weather and traffic conditions that may impact their trip.
- Helps offer multimodal choices in congested corridors.
- Helps ensure a reliable trip.
- Even helps them evacuate in times of emergency.

Thus, ITS is an essential element of the TxDOT value system that needs to be sustainable into the future to help TxDOT attain this vision in a cost-effective manner.

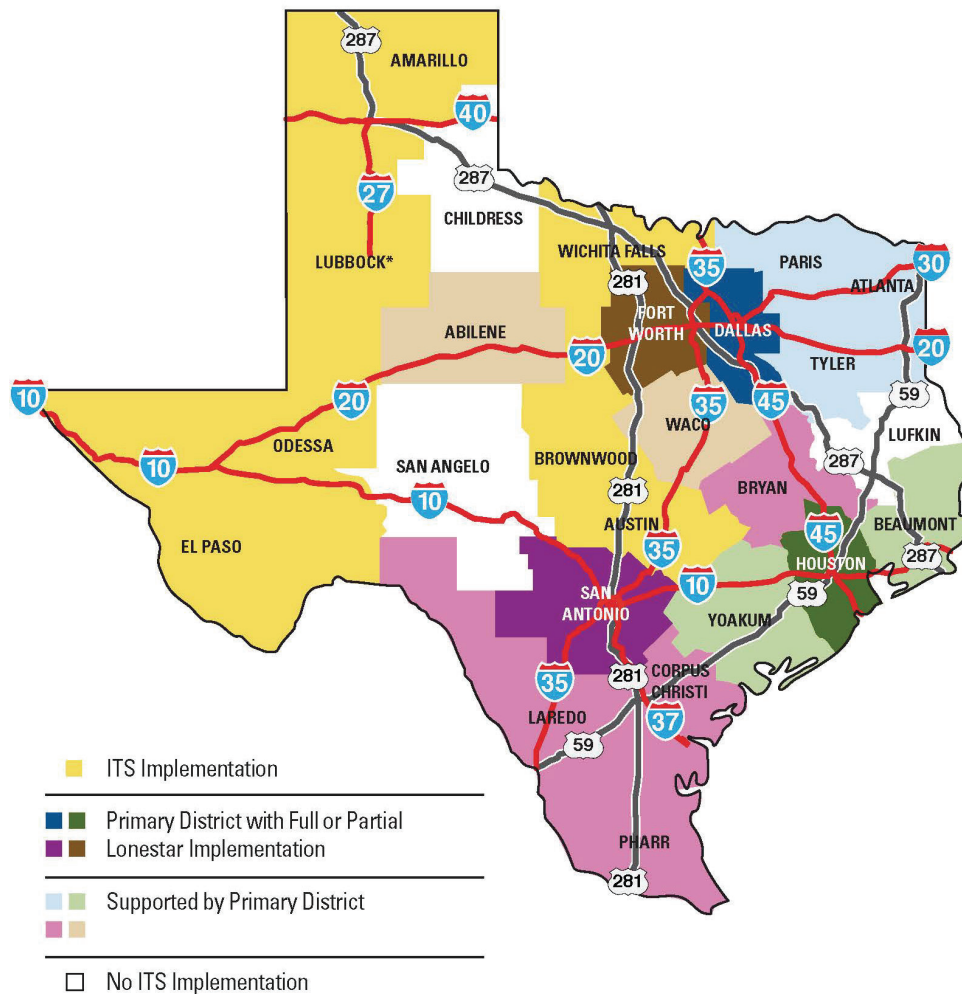
This purpose of this research was to provide a framework to guide the development and deployment of an integrated statewide program for Intelligent Transportation Systems. The Texas Transportation Commission, TxDOT, as well as the broad community of ITS providers, stakeholders, and agency partners, will use this plan to promote the development, deployment, and use of ITS statewide. If this plan is to succeed, it needs the cooperation of all affected groups involved in ITS and transportation planning, design, funding, and implementation in the state. The TxDOT ITS Strategic Plan 2013:

- Provides a concise ITS Strategic Plan Goals and Objectives for TxDOT.
- Highlights the ITS priorities from the regional and local perspective.
- Summarizes national trends in ITS strategies.
- Presents a status report on regional ITS in Texas.
- Introduces anticipated ITS services that TxDOT may need in the future.
- Presents a candidate ITS archetype as potential guidance for moving forward with ITS across the state.



## WHAT THE RESEARCHERS DID

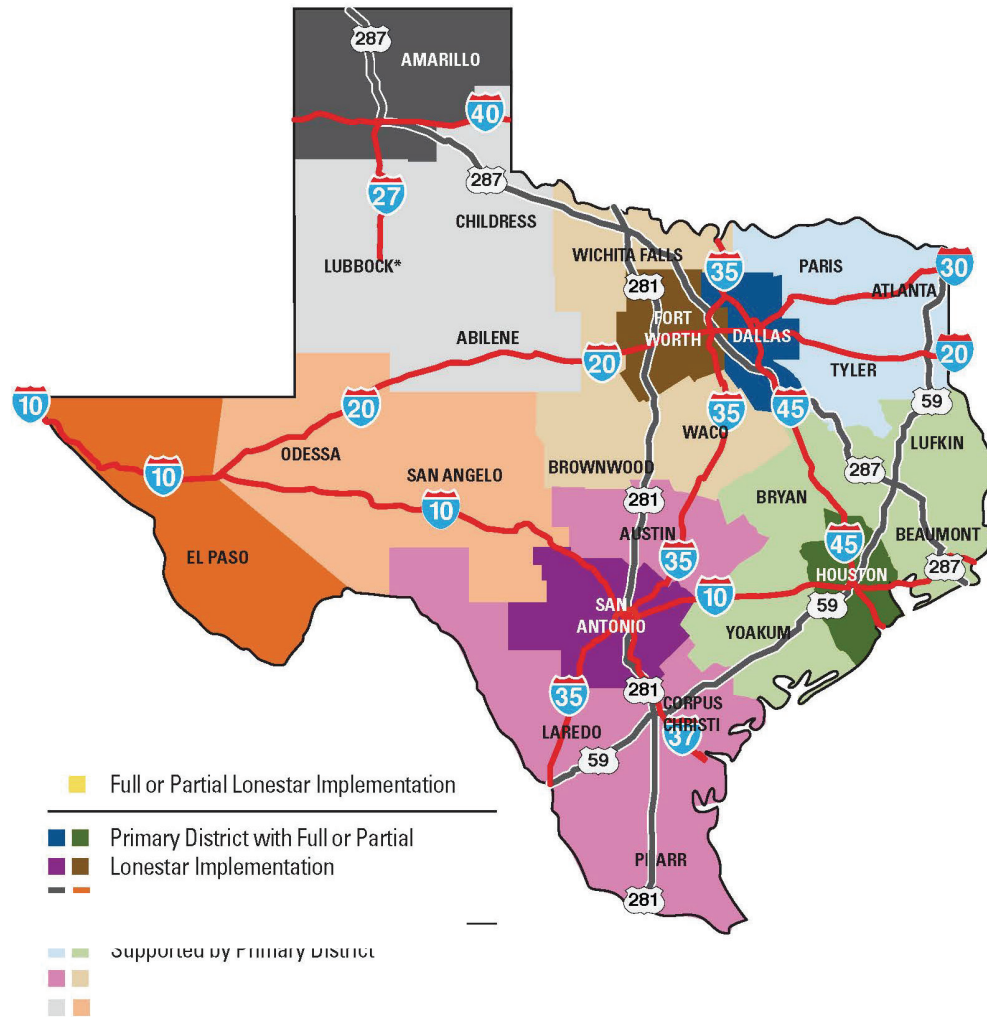
Initially, the researchers evaluated the presence of intelligent transportation systems for all 50 states and five U.S. territories. Of the 55 locations studied, evidence of statewide ITS architecture was found in 36. The research team then conducted interviews with stakeholders in various regions across Texas, including TxDOT district staff, municipal staff, representatives from metropolitan planning organizations, transit agencies, and other agencies involved in transportation, including police and fire departments, public works, DPS, and Customs/Border Patrol. Stakeholders were provided with maps showing current and potential TxDOT ITS implementation and coordination. The current ITS implementation and coordination map shows four primary districts with full or partial Lonestar™ implementation, 11 other districts supported by the primary districts, seven districts with ITS implementation, and three districts with no ITS implementation.



*\*Operated by the City and the District*

**Figure 1. Current TxDOT ITS Implementation and Coordination.**

Using information gathered from previous stakeholder interviews, researchers developed a sample ITS archetype, presented it to stakeholders, and discussed their concerns and perspective relative to their region. One candidate ITS scenario brought to stakeholders to consider is consolidation of the operations of core TxDOT ITS functions into six primary traffic management centers (see Figure 2).



*\*Operated by the City and the District*

**Figure 2. Potential TxDOT ITS Implementation and Coordination.**

In this scenario, the primary traffic management centers would be located in strategic metropolitan areas—Dallas, Fort Worth, Houston, San Antonio, El Paso, and Amarillo—and would assume responsibility for operating ITS devices on state-supported highway/freeway facilities and neighboring districts, primarily after regular business hours or as preferred by the districts. Local TxDOT district traffic management personnel would have the ability to remotely operate the ITS devices within their districts for specific traffic management purposes (such as local support of traffic incidents or special events), but the primary traffic management center

would maintain responsibility for the day-to-day operation of the TxDOT ITS systems. TxDOT Traffic Operations Division would be responsible for overseeing TxDOT's ITS programs, projects, equipment, and agreements statewide. With this role for TxDOT, local partners would be responsible for developing pre-trip planning and non-roadway based traveler information systems (such as 511, social media, etc.). Local partner agencies would also be responsible for maintaining their current responsibilities of operating and maintaining traffic signal systems and other traffic management systems, developing, operating, and maintaining their own ITS/traffic management infrastructure, and transit ITS. It is important to note that this archetype is only one potential concept of how the primary and supported districts could be aligned, and TxDOT would need to consider current operating strategies and partnerships before settling on a final conceptual framework.

Stakeholders at the follow-up interviews were asked several questions about this scenario, including:

- Would this be effective for your region?
- Is there a different way to structure it that would be more beneficial to you?
- How do you see your organization fitting into this structure?
- What would be your preferences in how this structure functions?



## WHAT THEY FOUND

There was a general consensus among stakeholders to move primary centers to urban areas, in terms of equipment and after-hours staffing capability, as long as there is coordination with local agencies and partners. Doing so would make efficient use of resources and limited funding.

Many of the responses were similar to those received in the previous interviews:

- Agencies found their existing ITS infrastructure to be useful to accomplish a number of ITS services.
- Agencies with ITS infrastructure desired to fill in the gaps in their deployment and complete the build-out of their systems.
- Many agencies did not have dedicated funding for ITS and desire budgets adequate for the ITS services they are providing.
- The desire for additional ITS services is tempered by funding and staffing limitations.

The following summarizes the other responses gathered from follow-up interviews with respect to consolidating core ITS functions and the example business scenario:

- Local needs should be the local partner's responsibility, particularly in matters regarding prioritizing local work zones or incidents, how video data can be shared, and operations and maintenance staff chain of command.
- There is a clear desire to have a regional vision for what constitutes a successful ITS system and having the appropriate people empowered with decision-making authority to effectively manage that system.
- Clear communication between partners is very important. A clear, detailed communication plan, or standard operation procedure manual, between primary traffic management center and local partners should be in place, and should clearly define when and under what circumstances local staff will take control of ITS systems, as well as agreements for two-way communication.
- The Traffic Operations Division must have enough staff in place if it plans to approve and handle all ITS procurement activities.

Many stakeholders felt that regionalization made sense for their area/district because there would be more consistency and potentially more cost savings, which would ultimately lead to more funding for ITS, though many questions remained regarding how the proposed regionalization would be implemented. During the follow-up interviews, researchers also asked stakeholders what additional ITS services they would like if funding was not a concern. There was an overall willingness to consider additional ITS services throughout the state, and many regions would like to expand their ITS system.





## WHAT THIS MEANS

TxDOT has four primary goals related to meeting its mission. These goals are: maintain a safe system, address congestion, connect Texas communities, and become a best-in-class state agency. The agency cannot hope to successfully meet these goals without ITS in its arsenal of strategies to advance transportation across the state. For example, maintaining a safe system translates into reducing crashes and fatalities, reducing the likelihood of crashes and those involving transportation workers, and helping facilitate safe evacuation efforts in the event of emergencies. ITS in its various forms can help address these safety challenges.

Congestion continues to grow on Texas' urban and suburban roadways. Regions can work to grapple with this problem by deploying ITS solutions that help optimize the existing infrastructure and make the most of every square foot of pavement and every installed device that helps manage traffic. Furthermore, ensuring that ITS is part of the connectivity between communities can help foster collaboration and efficient use of the infrastructure along major corridors that serve key regions of the state and beyond.

Finally, incorporating ITS into every aspect of TxDOT's traffic management approach helps ensure that every tax dollar from the citizens of Texas is used to optimize the valuable assets in the transportation system. It will also help TxDOT be a forward-thinking and proactive agency that promotes the development and deployment of innovative traffic management concepts and technologies to take Texas into the future and meet the challenges and demands of a growing population. This ITS Strategic Plan can help advance TxDOT in achieving its strategic plan both now and in the future.



## AN ITS STRATEGIC PLAN FOR TEXAS

The TxDOT ITS Strategic Plan supports the goals and objectives of the TxDOT agency Strategic Plan. It has the same four goals as the TxDOT Strategic Plan:

- Maintain a safe system.
- Address congestion.
- Connect Texas communities.
- Become a best-in-class state agency (*1*).

For some ITS objectives, specific strategies have been identified to further describe the objective.

The ITS Strategic Plan goals, objectives, and strategies are listed below. They have been prepared with input from both TxDOT agency staff and from partner agencies throughout the state.

The following sections outline key objectives that fall under each of the four plan goals. Each objective also has a list of strategies that, when implemented, help TxDOT meet the higher objective and goal in support of the agency strategic plan.

### **GOAL: MAINTAIN A SAFE SYSTEM**

The following objectives are integral to ITS playing a role in maintaining a safe system for the citizens of Texas:

- Objective: Deploy and operate ITS technologies and services to reduce crashes and fatalities.
  - Strategy: Deploy and operate ITS services that provide incident management, traffic control, emergency management, and other safety related capabilities.
  - Strategy: Use ITS in high accident locations and areas of high congestion to improve safety and increase traveler information.
  - Strategy: Expand the use of ITS by TxDOT and their contractors in construction zones to reduce the potential for crashes and improve worker safety.
  - Strategy: Incorporate the use of ITS systems and services in major evacuation efforts in order to both monitor events and share information with the public.
- Objective: Manage ITS infrastructure and services as an asset.
  - Strategy: Use ITS for data collection to support safety performance measures.
  - Strategy: Fill in critical gaps in ITS systems in TxDOT districts and along strategic routes using TxDOT, partner, or private sector resources.

## **GOAL: ADDRESS CONGESTION**

Two primary objectives listed can enable TxDOT to address congestion within the transportation network across the state:

- Objective: Deploy and operate ITS technologies and services to provide travel and traffic management services.
  - Strategy: Deploy and operate ITS services that provide pre-trip, en-route, and travel demand management capabilities through public and/or private sector paths.
  - Strategy: Deploy and operate ITS traffic management services to effectively manage the capacity of the roadway system.
  - Strategy: Provide active management of traffic and other progressive solutions services that can improve travel reliability and predictability.
- Objective: Work cooperatively with regional partners to provide regional ITS solutions, systems, and staffing.
  - Strategy: Support ITS services that enable public transit.
  - Strategy: Develop standard ITS operating procedures and systems that are consistent with regional needs and that serve the TxDOT Strategic Plan.
  - Strategy: Assign adequate staff and equipment resources to traffic management and maintenance operations to provide effective working relationships and performance outcomes.

## **GOAL: CONNECT TEXAS COMMUNITIES**

TxDOT can meet the goal of connecting Texas communities by meeting the three objectives described:

- Objective: Deploy and operate strategic corridors and regions to enhance the economic development, mobility, and safety.
  - Strategy: Partner with private sector, multimodal travel information providers to effectively reach different users in these strategic corridors.
  - Strategy: Provide interoperability of roadway toll revenue collections including parking within the state and between neighboring states.
- Objective: Deploy ITS in a cost-effective and beneficial manner that includes innovative services and technologies.
  - Strategy: Deploy compatible ITS software and systems to make operations seamless across district boundaries.
  - Strategy: Locate computer control elements of ITS technologies in larger urban centers that can provide supplemental staffing to rural districts.
  - Strategy: Incorporate automated and semi-automated decision support systems into the ITS software and systems.

- Objective: Deploy ITS systems and technologies that facilitate the efficient movement freight and goods along strategic, high-volume freight corridors including border crossings.
  - Strategy: Understand and address the freight community’s needs for information.
  - Strategy: Deploy ITS to provide more seamless information to freight community.

**GOAL: BECOME A BEST IN CLASS STATE AGENCY**

To reach the goal of being a best in class state agency, TxDOT can work to achieve the three key objectives that follow:

- Objective: Deploy equipment and staffing of ITS services in a cost effective manner.
  - Strategy: Continually evaluate the financial and service implications of alternative business models for ITS including private sector ownership and operations.
  - Strategy: Provide dedicated funding for ITS so that operations and maintenance can be planned and costs are identified.
  - Strategy: Develop a consistent performance monitoring system that computes operations, safety, and resource savings benefits of all TxDOT ITS deployments.
- Objective: Anticipate local and regional service needs and plan the services to accommodate those needs.
  - Strategy: Implement and operate communications systems that can be shared with partner agencies and that meet the requirements of ITS services as the marketplace develops.
  - Strategy: Provide a forum at the state and/or regional level for TxDOT and partner agency staff to share ITS knowledge, experience, and needs.
- Objective: Participate in connected vehicle and automated vehicle activities that will improve economic competitiveness for Texas.
  - Strategy: Participate in test beds, pilot programs, demonstration programs, and other venues that will allow Texas to effectively prepare for and engage in these transformational technologies.
  - Strategy: Identify and address institutional and policy issues that can facilitate successful ventures in the connected vehicle efforts.



## REFERENCE

1. *Texas Department of Transportation 2013-2017 Strategic Plan*. URL: [http://ftp.dot.state.tx.us/pub/txdot-info/oeo/strategic\\_plan2013.pdf](http://ftp.dot.state.tx.us/pub/txdot-info/oeo/strategic_plan2013.pdf). Accessed, June 2013.

