



State of Texas
ITS Architectures and Deployment Plans

Yoakum Region

Executive Summary

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PROJECT APPROACH

The Federal Highway Administration (FHWA) issued a final rule to implement Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21) in January of 2001. This final rule requires that Intelligent Transportation System (ITS) projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards. The rule went into effect on April 8, 2005. After that date, any region with existing ITS deployments must have an ITS architecture in order to receive federal funding for ITS projects.

To meet these requirements and ensure future federal funding eligibility for ITS, the Texas Department of Transportation (TxDOT) initiated the development of regional ITS architectures throughout the State of Texas. There are several metropolitan areas in the state that already have ITS architectures in place or under development. The focus of the State of Texas Regional ITS Architectures and Deployment Plans program is to develop architectures in those areas outside of the Austin, Houston, Dallas, Fort Worth, and San Antonio Regions. TxDOT expanded upon the ITS architecture requirements outlined in the FHWA Final Rule, and included an ITS deployment plan as part of the regional efforts. The regional ITS architecture provides a framework for ITS systems, services, integration, and interoperability, and the regional ITS deployment plan identifies specific projects and timeframes for ITS implementation to support the vision developed by stakeholders in the architecture.

TxDOT's process for developing the regional ITS architectures and deployment plans followed a consensus-based approach to meeting the requirements in the FHWA Final Rule and supporting guidelines. This process was further tailored to meet the specific multi-agency needs of these regional plans, and was structured around stakeholder input and involvement. The addition of an ITS deployment plan provides a tangible road map for regional ITS deployment and integration. **Figure 1** shows the development process for each of the State of Texas Regional ITS Architectures and Deployment Plans.

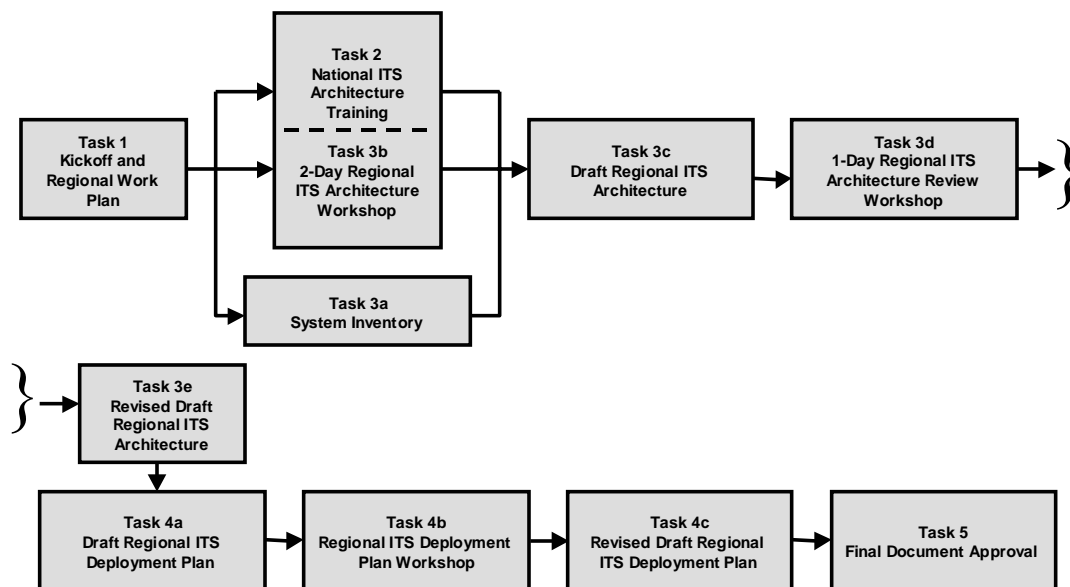


Figure 1 – Yoakum Regional ITS Architecture and Deployment Plan Development Process



OVERVIEW OF THE YOAKUM REGION

The Yoakum Region is bordered by the TxDOT Austin District to the northwest, the TxDOT Bryan District to the northeast, the TxDOT Houston District to the east, the TxDOT Corpus Christi District to the southwest, and the TxDOT San Antonio District to the west. For the Yoakum Regional ITS Architecture and Deployment Plan, the study area included all 11 counties that comprise the TxDOT Yoakum District. **Figure 2** illustrates the Regional boundaries.

The Yoakum Region's transportation infrastructure is primarily US and State Highway Routes. The primary roadway facilities include I-10, US-59, US-77, US-87, and US-90.

I-10 is an east-west divided interstate highway. Its effective operation is critical to the movement of goods and people through the State of Texas and the United States. Blockages along I-10 can have serious implications on drive-time for commercial vehicles and motorists alike due to the lack of obvious alternate routes. Knowing the road and travel conditions within this transportation corridor and having the ability to disseminate this information to motorists are important elements for this project. For example, if I-10 has been closed due to a major incident or weather, and motorists are informed of the closure in advance, they can modify their travel plans with an alternate route or wait to begin their travels.

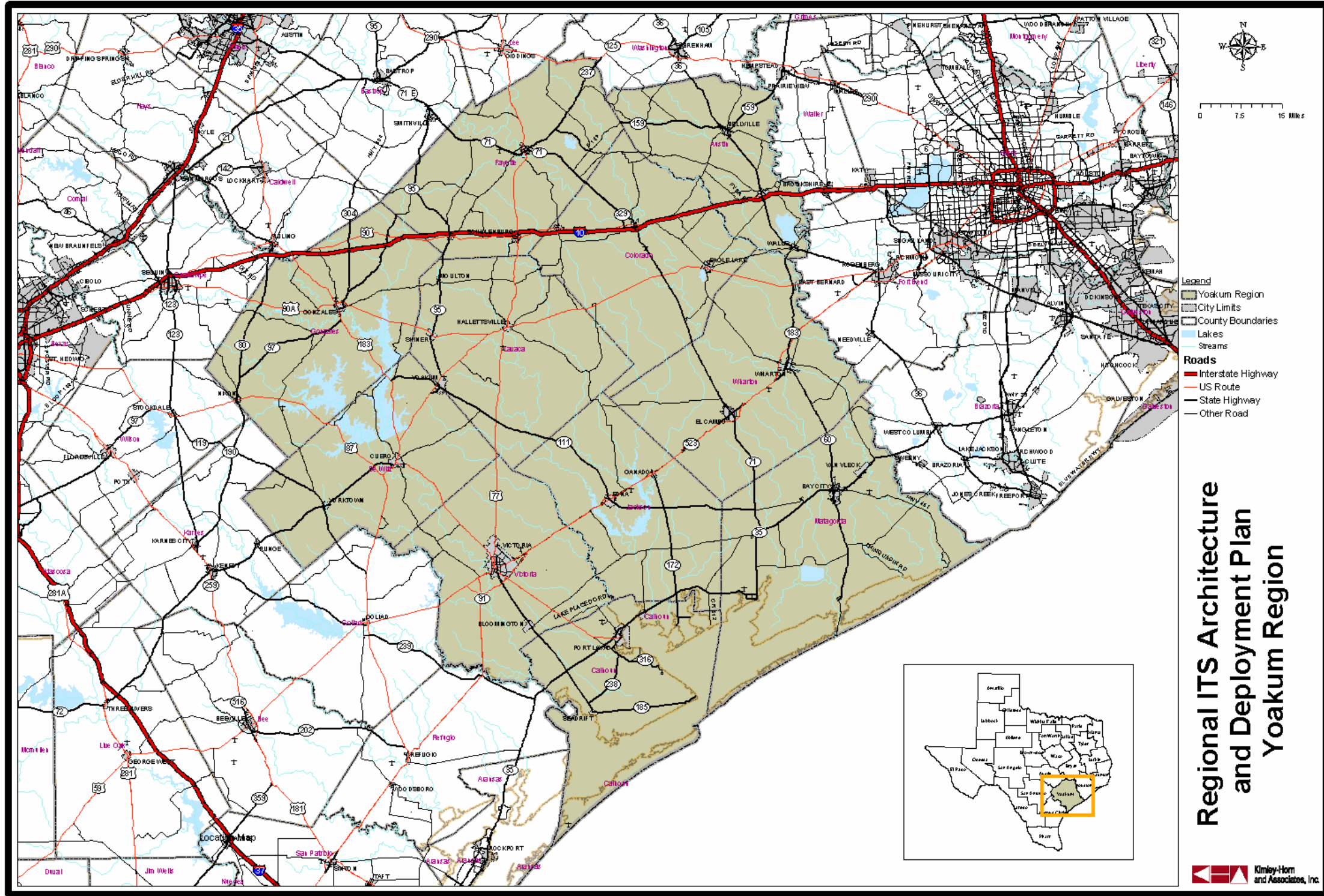


Figure 2 – Yoakum Region Map

YOAKUM REGION STAKEHOLDERS

Involving a range of perspectives in the development of a regional ITS architecture and deployment plan, and obtaining consensus on the vision and recommendations are key components to the process. Stakeholders from throughout the Yoakum Region participated in the development of the Yoakum Regional ITS Architecture and Deployment Plan. Key participants included representatives from TxDOT, cities, public safety, transit agencies, and planning organizations. These stakeholders provided input and review at key steps in the development process, including a project kick-off meeting, architecture development and review workshops, a deployment plan workshop, and review of the final project documentation.

The following is a list of stakeholders in the Yoakum Region who have participated in the project workshops or provided input to the study team as to the needs and issues that should be considered as part of the Yoakum Regional ITS Architecture and Deployment Plan:

- Capital Area Rural Transportation System (CARTS);
- City of Victoria;
- Colorado Valley Transit;
- Federal Highway Administration;
- Golden Crescent Regional Planning Commission;
- Gonzales County;
- I-10 Corridor Chamber of Commerce;
- Lavaca County;
- Lower Colorado River Authority (LCRA);
- Port of Victoria;
- Texas Department of Public Safety;
- TxDOT Corpus Christi District;
- TxDOT Houston District;
- TxDOT San Antonio District;
- TxDOT Traffic Operations Division (Austin);
- TxDOT Yoakum District; and
- Wharton County.

CARTS operates in Fayette County, which is included in the Yoakum District boundaries, as well as in eight additional counties in the Austin District. The CARTS operations center is located in the Austin District and since most of the transit agency's functions occur in the Austin District, CARTS will primarily be covered in the Austin Regional ITS Architecture. However, several projects will be included in the Deployment Plan for the Yoakum Region since they affect transit operations in the Region.

YOAKUM REGIONAL ITS ARCHITECTURE

The process for developing the Regional ITS Architecture for the Yoakum Region included several key steps:

- Preparing an inventory of planned and existing systems in the Region;
- Identifying needs in the Region that could be addressed by ITS deployment or integration;
- Customizing and prioritizing market packages to address the specific needs and services identified by stakeholders;
- Developing interconnects and interfaces for system elements to map out data flows and agency links;
- Preparing an operational concept to illustrate how the systems, components, and agencies will be integrated and function as a result of the architecture framework;
- Identifying high-level functional requirements;
- Identifying standards that could be applicable to the Yoakum Region; and
- Outlining potential agreements that would be needed to facilitate information or resource sharing as a result of ITS implementation.

Inventory and Needs in the Region

The Yoakum Regional ITS Architecture began with a project kick-off meeting in June 2004. At that meeting, stakeholders provided information about existing and planned ITS elements in the Region. A diverse range of needs were identified by stakeholders who attended. The inventory of planned and existing ITS infrastructure provided the basis for the architecture development. Needs that could be addressed by ITS technologies guided the selection of market packages, data flows, and integration requirements.

The needs identified by the Yoakum Region stakeholders were categorized into functional areas and are shown in **Table 1**.

Table 1 – Yoakum Region: Summary of ITS Needs

Yoakum Region
Summary of ITS Needs
Yoakum Regional ITS Architecture and Deployment Plan Kick-Off Meeting
June 9, 2004
Travel and Traffic Management Needs
<ul style="list-style-type: none">▪ Need coordination with San Antonio and Houston to maximize dynamic message sign (DMS) placement effectiveness▪ Need SH 59 DMS for incident early warnings▪ Need I-10 DMS▪ Need DMS for Causeway▪ Need Causeway Management System (wind detection/advisories, lane closures, other)▪ Need portable DMS with closed-circuit television (CCTV) and radio communications at stations▪ Need coordination with Corpus Christi for evacuations▪ Need hurricane evacuation plan and coordination with nearby Districts▪ Need US 77, US 87, and US 183 evacuation routes▪ Need evacuation signal timing plans▪ Need improved traveler information for Lavaca County▪ Need vehicle detection on I-10 (speed data)▪ Need highway advisory radio (HAR)▪ Need City of Victoria TOC
Public Transportation Management Needs
<ul style="list-style-type: none">▪ Need automated vehicle location (AVL) for Colorado Valley Transit▪ Need CAD upgrades for Colorado Valley Transit▪ Need Smart Card fare payment for Colorado Valley Transit▪ Need kiosks for Colorado Valley Transit information▪ Need communications between Emergency Management and Colorado Valley Transit▪ Need AVL for Golden Crescent Transit▪ Need CAD upgrade for Golden Crescent Transit▪ Need Smart Card fare payment for Golden Crescent Transit▪ Need on-board surveillance cameras on Golden Crescent Transit▪ Need CCTV at Golden Crescent Transit transfer stations▪ Need kiosks for Golden Crescent Transit information▪ Need communications between Emergency Management and Golden Crescent Transit▪ Need coordination between transit agencies
Electronic Payment Needs
None Identified
Commercial Vehicle Operations Needs
None Identified
Emergency Management Needs
<ul style="list-style-type: none">▪ Need emergency vehicle signal preemption for the City of Victoria▪ Need emergency vehicle signal preemption for other cities on TxDOT signals▪ Need fire station emergency vehicle warning flasher on US 183▪ Need TxDOT/DPS coordination▪ Need Emergency Call Out System/Reverse 911▪ Need cell phone emergency priority▪ Need satellite communication

Table 1 – Yoakum Region: Summary of ITS Needs (continued)

<p>Advanced Vehicle Safety Systems Needs None Identified</p> <p>Information Management Needs (Data Archiving) None Identified</p> <p>Maintenance and Construction Management Needs</p> <ul style="list-style-type: none"> ▪ Need additional portable DMS for TxDOT ▪ Need portable DMS for counties ▪ Need flood warning systems on US 59, US 87, and US 183 ▪ Need improved coordination with LCRA and USGS to get accurate weather data ▪ Need standardized flood data information ▪ Need flood information dissemination for Lavaca County ▪ Need flood detection for Lavaca County ▪ Need road weather information system (RWIS) wind speed information
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Market Packages

A 2-Day ITS Architecture Workshop was held in Yoakum in August 2004. At this workshop, stakeholders were provided with architecture training that included background information about the National ITS Architecture and the process that would be used to develop the Yoakum Regional ITS Architecture.

The next step in developing the Yoakum Regional ITS Architecture was to identify the services that would be needed to address the stakeholder needs. In the National ITS Architecture, services are referred to as market packages. Market packages can include several stakeholders and elements that work together to provide a service in the Region. Examples of market packages from the National ITS Architecture include Network Surveillance, Traffic Information Dissemination, and Transit Vehicle Tracking. There are a total of 85 market packages identified in Version 5.0 of the National ITS Architecture.

At the 2-Day ITS Architecture Workshop, stakeholders selected the market packages that corresponded to the desired services and functions identified for the Region, and then customized these market packages. They included services and functions such as Network Surveillance, Traffic Information Dissemination, and Emergency Response as well as market packages to address coordination needs, including an Incident Management System and Regional Traffic Control and Coordination. Because market packages are groups of services and functions, they can be deployed incrementally and over time. Of the 85 market packages in the National ITS Architecture Version 5.0, stakeholders identified 41 as being applicable to the Yoakum Region.

Interconnects, Interfaces, and Standards

Stakeholders also began the process of mapping existing and planned ITS elements in the Yoakum Region to the subsystems in the National ITS Architecture. These elements included agencies, systems, and essentially all of the ITS components in the Region. Subsystems are the highest level building blocks of the physical architecture, and the National ITS Architecture groups them into four major classes: Centers, Roadside, Vehicles, and Travelers. This mapping resulted in an interconnect diagram for the Yoakum Region that is shown in **Figure 3**. This architecture diagram, also referred to as the “sausage diagram” shows the relationship of existing, planned, and future systems in the Yoakum Region.

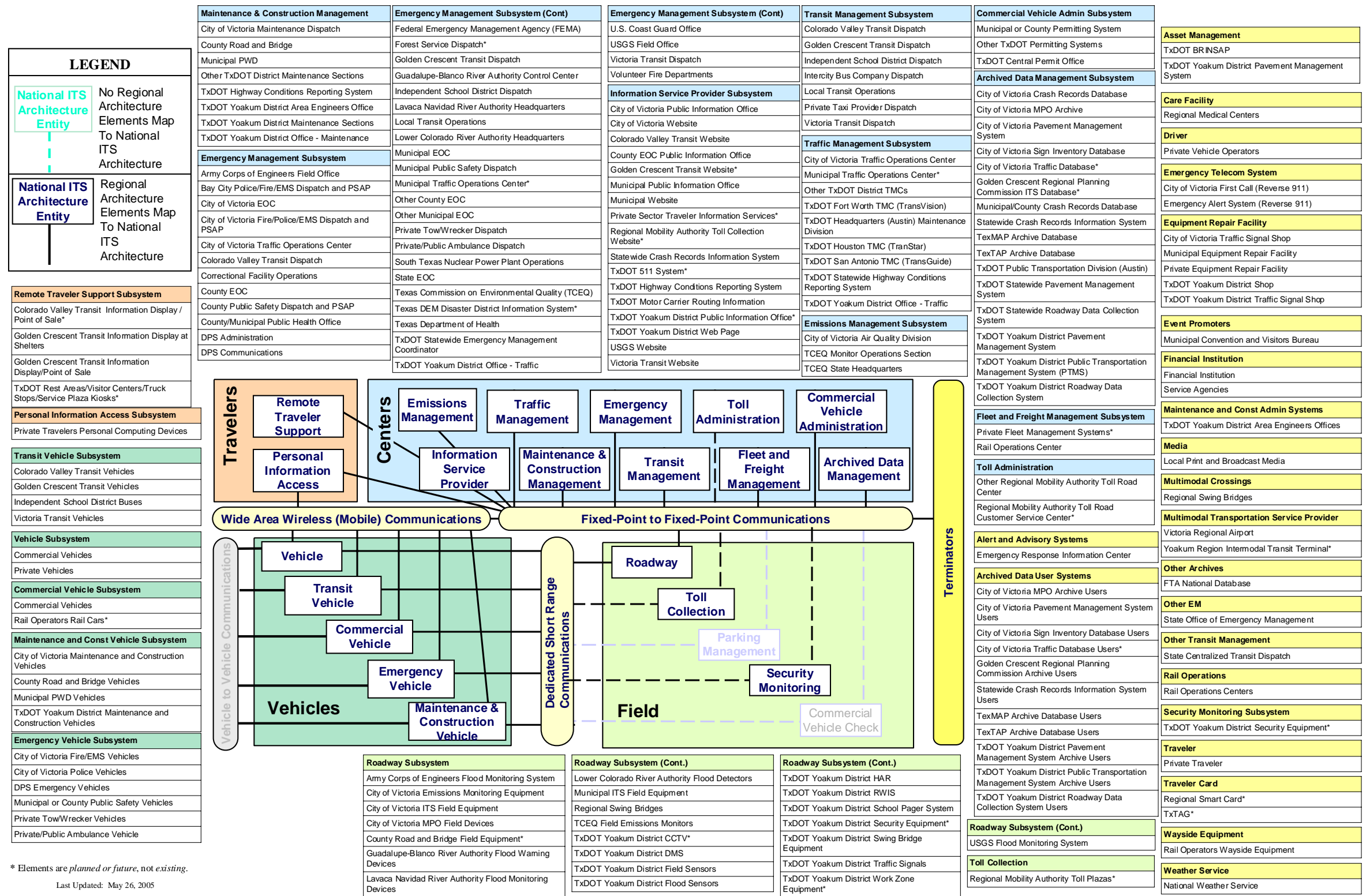


Figure 3 – Yoakum Regional System Interconnect Diagram

The market packages in the National ITS Architecture were customized to reflect the unique systems, subsystems, and terminators in the Yoakum Region. Each market package was shown graphically, with the market package name, Yoakum Region specific element, and the unique agency and system identifiers within the subsystems and terminators.

Figure 4 is an example of an advanced traffic management system (ATMS) market package for Surface Street Control that has been customized for the Yoakum Region. This market package shows the two subsystems, Traffic Management and Roadway, and the associated entities (TxDOT Yoakum District Traffic Signals, TxDOT Yoakum District Field Sensors, etc.) for the TxDOT Yoakum District signal system. Data flows between the subsystems indicate what information is being shared. All of the Yoakum Region market package diagrams are included in the Regional ITS Architecture report.

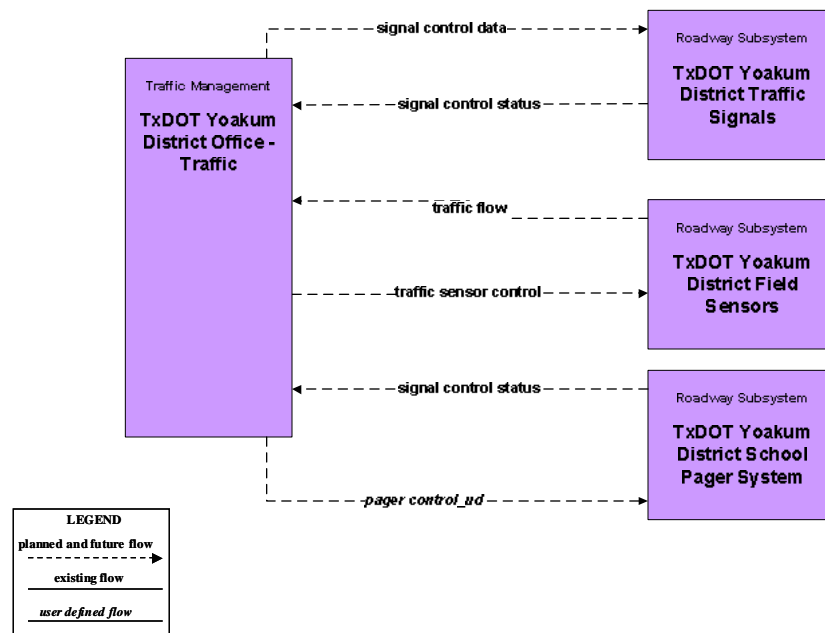


Figure 4 – TxDOT Yoakum District Surface Street Control Customized Market Package

More detailed interfaces were developed which identified the connectivity between the systems and elements. Each element identified in the ITS architecture for the Yoakum Region was mapped to the other elements that it must interface with. These interfaces were further defined by architecture data flows between individual elements that specify the information to be exchanged. The data flows include requests for information, alerts and messages, status requests, confirmations, and other information requirements.

While it is important to identify the various systems and stakeholders as part of a regional ITS, a primary purpose of the architecture is to identify the connectivity between transportation systems in the Yoakum Region. There are 177 different elements identified as part of the Yoakum Regional ITS Architecture. These elements include local and state traffic management/operations centers, transit vehicles, dispatch systems, emergency management agencies, and others – essentially all of the existing and planned physical components that contribute to a Regional ITS.

Interfaces have been identified for each element in the Yoakum Regional ITS Architecture, and each element has been mapped to those other elements with which it must interface.

An example of one of the system interfaces is included as **Figure 5**. This graphic shows the TxDOT Yoakum District Traffic Signals and the existing and planned interfaces with other elements throughout the Region. These interfaces are shown as existing or future. Interfaces defined as planned have funding identified, while future interfaces are desired by stakeholders but funding has not yet been identified.

Architecture flows between the subsystems and terminators define the specific information (data) that is exchanged between subsystems and terminators. Each architecture flow has one or more data flows that specify what information is exchanged and the direction of the exchange.

An example of the architecture flows between two elements is shown in **Figure 6**. In this interface, the flows between the TxDOT Yoakum District Office – Traffic and Other TxDOT District TMCs show information that must go from the Yoakum District Office to other TxDOT TMCs, as well as information that the District Office needs from devices. Similar to the interfaces, architecture flows also are defined as existing or future. Diagrams of all of the architecture flows between elements have been included on the project website.

With the required interfaces and interconnections identified, standards that could potentially be applied to the Yoakum Region were identified. Standards are an important tool that will allow efficient implementation of the elements in the Yoakum Regional ITS Architecture over time. They facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances, vendors change, and as new approaches evolve.

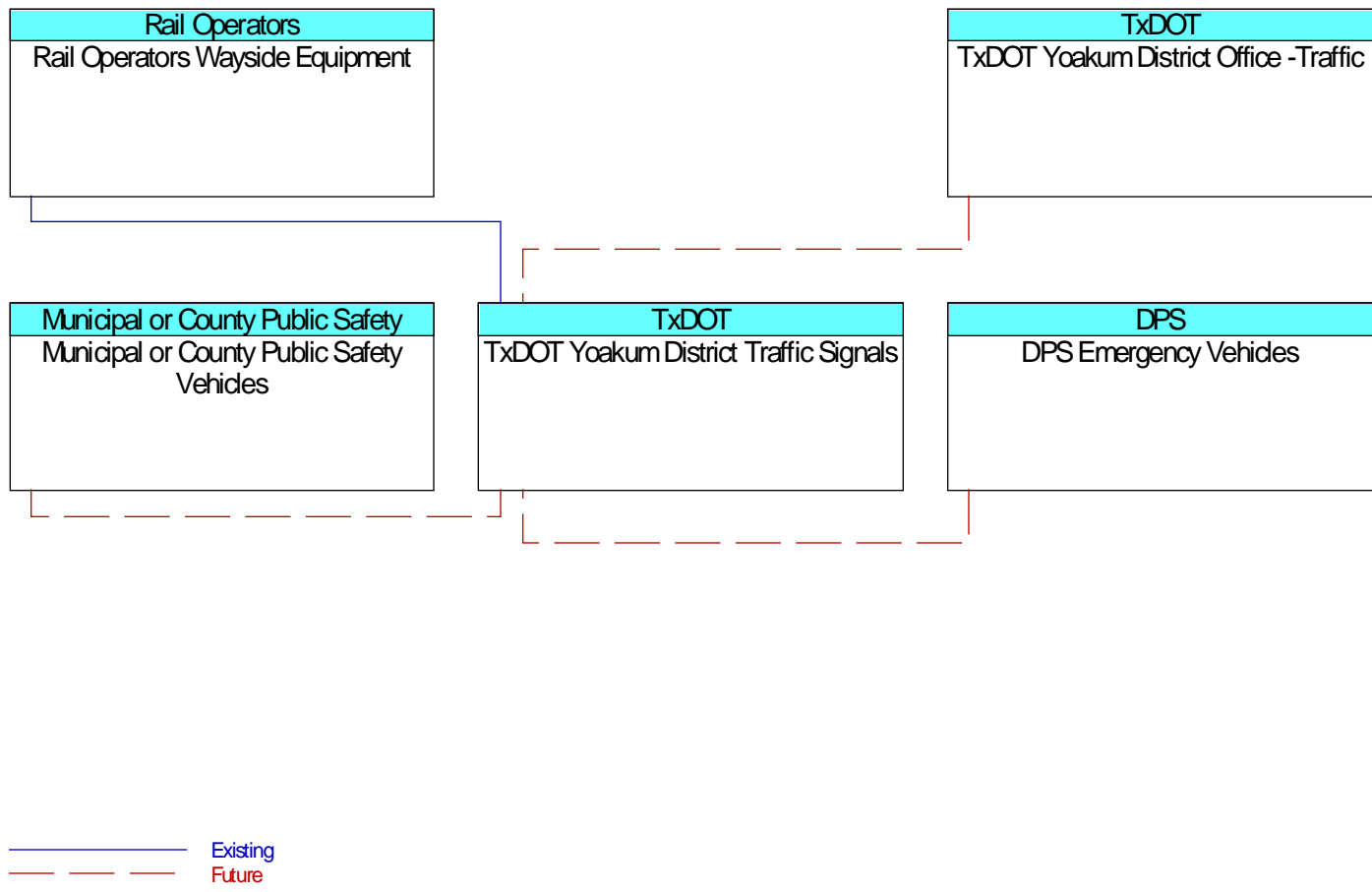


Figure 5 – TxDOT Yoakum District Traffic Signals Interfaces

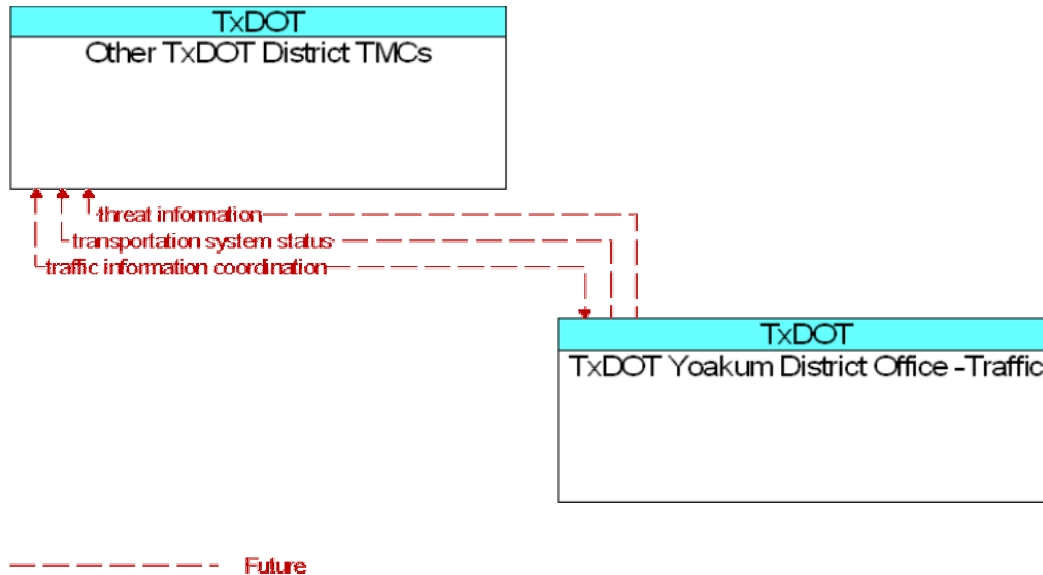


Figure 6 – TxDOT Yoakum District Office – Traffic to Other TxDOT District TMCs Architecture Flows

Operational Concept and Scenarios

An operational concept for the Yoakum Region was developed as part of the architecture process to illustrate how systems, components, and agencies will be integrated and function as a result of the framework provided by the Regional ITS Architecture. For the Yoakum Region, two concepts were illustrated. The first describes how ITS technologies could be used to manage a multi vehicle crash on US 59 in the City of Victoria. The scenario shows how ITS technologies are used to monitor the incident and assist in implementing strategies to manage traffic, inform motorists, and facilitate the dispatch of emergency vehicles. The second scenario describes how ITS supports the management of nightly lane closures on I-10 between San Antonio and Houston for paving operations. The systems keep motorists informed and also assist in the coordination of emergency management personnel.

Agreements

Interfaces and data flows among public and private entities in the Yoakum Region will require agreements among agencies that establish parameters for sharing agency information to support traffic and incident management, provide traveler information, and perform other functions identified in the Regional ITS Architecture. Recommended projects will result in systems and interfaces that will require inter-agency agreements, both public and private, to facilitate the exchange of information.

Currently, there are no formal ITS agreements in place in the Region. With the implementation of ITS technologies, integration of systems from one or more agencies, and the anticipated level of information exchange identified in the architecture, it is likely that formal agreements will be needed in the future.

The following is a list of potential agreements for the Yoakum Region based on the interfaces identified in the Regional ITS Architecture and recommended ITS projects in the Deployment Plan:

- Data sharing and usage agreements among public agencies;
- Data sharing and usage agreements among public agencies and private media and information service providers;
- Shared video monitoring agreements between TxDOT, public sector agencies, and public safety agencies;
- Mutual aid agreements among primarily fire, police, emergency services, DPS, and TxDOT; and
- Joint operations/shared control agreements between TxDOT, the City of Victoria, and possibly DPS.

It is important to note that as ITS services and systems are implemented in the Region, part of the planning and review process for those projects should include a review of potential agreements that would be needed for implementation or operations.

ITS Architecture Documentation

The Regional ITS Architecture for the Yoakum Region is documented in a final report. Stakeholders were brought together to review the Regional ITS Architecture and provide feedback. The final architecture report was not prepared until after completion of the Yoakum Regional ITS Deployment Plan to allow for modifications based on information and input received for the ITS Deployment Plan recommendations.

A website with all of the Regional ITS Architectures also was maintained. The website allowed stakeholders to review the architecture and provide comments directly to the project team through the website. At the time this report was published, the Yoakum Regional ITS Architecture website was being hosted at www.consystem.com. The site can be accessed by selecting the link to Texas Regional, and then the link to Yoakum. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.

YOAKUM REGIONAL ITS DEPLOYMENT PLAN

Although development of an ITS deployment plan was not required by the FHWA Final Rule for the architecture, the Final Rule does request a sequence of projects required for implementation. Capitalizing on the momentum and interagency dialogue established during the development of the Yoakum Regional ITS Architecture, TxDOT chose to expand on the project sequence requirement to develop a formal ITS deployment plan for the Region.

The Yoakum Regional ITS Architecture provided the framework and prioritized the key functions and services desired by stakeholders in the Region. The Yoakum Regional ITS Deployment Plan builds on the architecture by prioritizing market packages, outlining specific ITS project recommendations and strategies for the Region, and identifying deployment timeframes so that the recommended projects and strategies can be implemented over time. Agency responsibilities for implementing and operating the systems also are a key component of the Regional ITS Deployment Plan.

Prioritized Market Packages

Market packages for the Yoakum Region previously identified as part of the architecture were categorized into high, medium, and low priorities by stakeholders. The market package prioritization was a key factor in developing recommendations for ITS deployment and integration in the Yoakum Region. These priorities identified the key needs and services that are desired in the Region, as well as the interfaces that need to be established to provide integrated functionality and establish communication between elements.

It is important to note that the high, medium, and low priorities were not directly related to anticipated deployment timeframes (such as 5, 10, or 20 year deployment horizon). For example, a market package can be a high priority, but because of funding or prerequisite project requirements, it might not be feasible for deployment for several years. Maturity and availability of technology was another factor for prioritizing the market packages. Because market packages often represent groups of technologies or services to deliver a particular functionality, certain components of the market package could be identified as a high priority or existing capability, while other components would have a lower priority. Other considerations included whether or not the market package was better suited for deployment and operations by the private sector rather than public agencies in the Region.

Table 2 shows the prioritization of the selected market packages for the Yoakum Region. The majority of these market packages fall into the high priority category. This category also includes market packages (or portions of market packages) that are already deployed in the Yoakum Region, such as surface street control and traffic information dissemination.

Table 2 – Summary of Prioritized Market Packages for the Yoakum Region

High Priority	Medium Priority	Low Priority
<ul style="list-style-type: none"> ▪ Network Surveillance ▪ Surface Street Control ▪ Traffic Information Dissemination ▪ Regional Traffic Control ▪ Traffic Incident Management System ▪ Emergency Call Taking and Dispatch ▪ Emergency Vehicle Routing ▪ Transportation Infrastructure Protection ▪ Wide Area Alerts ▪ Disaster Response and Recovery ▪ Evacuation and Reentry Management ▪ Disaster Traveler Information ▪ Road Weather Data Collection ▪ Weather Information Processing and Distribution ▪ Maintenance and Construction Activity Coordination ▪ Transit Vehicle Tracking ▪ Demand Response Transit Operations ▪ Transit Passenger and Fare Management ▪ Transit Security ▪ Multi-modal Coordination ▪ Transit Traveler Information ▪ HAZMAT Management ▪ Broadcast Traveler Information 	<ul style="list-style-type: none"> ▪ Probe Surveillance ▪ Electronic Toll Collection ▪ Standard Railroad Grade Crossing ▪ Railroad Operations Coordination ▪ Work Zone Management ▪ Work Zone Safety Monitoring ▪ Transit Fixed-Route Operations ▪ Interactive Traveler Information ▪ ITS Data Mart 	<ul style="list-style-type: none"> ▪ Emissions Monitoring and Management ▪ Speed Monitoring ▪ Drawbridge Management ▪ Maintenance and Construction Vehicle and Equipment Tracking ▪ Maintenance and Construction Vehicle Maintenance ▪ Roadway Maintenance and Construction ▪ Transit Maintenance ▪ CV Administrative Processes ▪ ISP Based Route Guidance

Each of the prioritized market packages was assessed from the perspective of deployment status (which components, if any, were already existing in the Region), as well as any planned projects or additional new projects needed to fully implement the market package in the Yoakum Region. Each market package analysis included:

- A brief definition of the market package (modified from the National ITS Architecture definitions);
- Any infrastructure or components from that market package that is already existing in the Yoakum Region;
- Agencies currently operating or maintaining systems that apply to that market package;
- Planned projects that will address some or all of the services that are contained in the market package; and
- Any additional needs to bring the market package to the desired level of deployment or functionality.

ITS Project Recommendations for the Yoakum Region

Using the needs, market package priorities, and any planned projects identified by the stakeholders during the architecture process, a list of recommended ITS projects for the Yoakum Region was developed. These projects were refined and additions and deletions were made by the Regional stakeholders at the ITS Deployment Plan Workshop in January 2005.

Recommended ITS projects for the Yoakum Region were categorized into short-, medium-, and long-term timeframes for programming in the 5, 10, and 20 year horizons. This was done based on current status if the project had previously been identified and planned by the Region, market package priority, and dependency on other project completions. The majority of the short-term or 5-year recommendations serve as “foundation” projects to implement basic functionality, infrastructure, and interfaces, with the intent of continuing to build out those foundation projects over the 10 and 20 year timeframes. Most projects for the Yoakum Region are infrastructure based; however, there are some recommendations that focus more on institutional practices and interconnectivity to enhance coordination and communications.

Each recommended project for the Yoakum Region was included in a short-, medium-, or long-term table. These tables provided the name of the project, primary operating/implementing agency, a planning level estimate of probable cost, an indication of whether or not funding had been identified for that specific project, and an estimated project duration. Following each table, detailed descriptions of each project were developed, which also included associated market packages and any pre-requisite project requirements.

Table 3 summarizes the ITS projects recommended for the Yoakum Region. This summary is divided into the major program areas and subdivided by timeframe. As can be seen from this summary, the majority of the project recommendations focus on the Travel and Traffic Management category which would implement surface street traffic management, traveler information, and inter-agency coordination elements.

Table 3 – Recommended ITS Projects for the Yoakum Region

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
Travel and Traffic Management		
Short Term Projects 5-year Horizon	TxDOT Yoakum District TMC	No
	TxDOT ATMS Implementation	N/A
	TxDOT Center to Center Communications	N/A
	TxDOT DMS on I-10	Yes (TxDOT Yoakum, Houston, and San Antonio Districts)
	TxDOT DMS on US 59	No
	TxDOT Vehicle Detection on I-10	No
	TxDOT Port Lavaca Causeway Management System	No
	TxDOT Signal System Upgrades/Closed Loop Expansion Phase 1	Partial (TxDOT Yoakum District)
	City of Victoria TOC Capability Expansion	No
	City of Victoria TOC/TxDOT Yoakum District TMC Communications Connection	No
	City of Victoria CCTV Camera Implementation	No
	City of Victoria Signal System Upgrades/Closed Loop Expansion Phase 1	Partial (City of Victoria)
Mid Term Projects 10-year Horizon	TxDOT DMS on SH 35	No
	TxDOT HAR	No
	TxDOT Signal System Upgrades/Closed Loop Expansion Phase 2	No
	City of Victoria Signal System Upgrades/Closed Loop Expansion Phase 2	No
	Municipal Closed Loop Signal System Implementation Phase 1	No
	Regional 511 Advanced Traveler Information System Server	No
	Media Liaison and Coordination	N/A
Long Term Projects 20-year Horizon	TxDOT Signal System Upgrades/Closed Loop Expansion Phase 3	No
	City of Victoria Signal System Upgrades/Closed Loop Expansion Phase 3	No
	Municipal Closed Loop Signal System Implementation Phase 2	No
	ISP Based Route Guidance	No

Table 3 – Recommended ITS Projects for the Yoakum Region (continued)

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
<i>Emergency Management</i>		
Short Term Projects 5-year Horizon	City of Victoria Emergency Vehicle Traffic Signal Preemption Expansion	No
	Evacuation Route Planning and Signal Timing	No
	Nuclear Power Plant Transportation System Security Monitoring	No
Mid Term Projects 10-year Horizon	Municipal Emergency Vehicle Traffic Signal Preemption	No
	Emergency Call-Out System	No
	DPS/TxDOT Yoakum District TMC Communications Connection	No
	City of Victoria 911 Dispatch/City of Victoria TOC Communications Connection	No
Long Term Projects 20-year Horizon	None identified at this time	N/A
<i>Maintenance and Construction Management</i>		
Short Term Projects 5-year Horizon	TxDOT Portable DMS	No
	TxDOT Flood Warning System Phase 1	No
	TxDOT RWIS Stations	No
	Maintenance and Construction Information Clearinghouse	No
	City of Victoria Portable DMS	No
	City of Victoria Portable Speed Trailers	No
Mid Term Projects 10-year Horizon	TxDOT Portable Smart Work Zone Equipment	No
	TxDOT Flood Warning System Phase 2	No
	TxDOT Yoakum District/LCRA Communications Connection	No
	TxDOT Yoakum District/USGS Communications Connection	No
Long Term Projects 20-year Horizon	County Portable DMS	No
<i>Public Transportation Management</i>		
Short Term Projects 5-year Horizon	Colorado Valley Transit AVL and CAD Upgrade	No
	Golden Crescent Transit AVL and CAD Upgrade	No
	Victoria Transit AVL and CAD Upgrade	No
	CARTS Electronic Fare Collections, Website Upgrade, and CAD Improvements	Yes (FTA, CARTS)

Table 3 – Recommended ITS Projects for the Yoakum Region (continued)

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
Public Transportation Management (continued)		
Mid Term Projects 10-year Horizon	Colorado Valley Transit Smart Card Electronic Fare Collection	No
	Colorado Valley Transit Information Kiosks	No
	Golden Crescent Transit Smart Card Electronic Fare Collection	No
	Golden Crescent Transit Information Kiosks	No
	Victoria Transit Smart Card Electronic Fare Collection	No
	Victoria Transit Information Kiosks	No
Long Term Projects 20-year Horizon	Multi-modal Coordination	No
Commercial Vehicle Operations		
Short Term Projects 5-year Horizon	None identified at this time	N/A
Mid Term Projects 10-year Horizon	None identified at this time	N/A
Long Term Projects 20-year Horizon	None identified at this time	N/A
Archived Data		
Short Term Projects 5-year Horizon	None identified at this time	N/A
Mid Term Projects 10-year Horizon	Golden Crescent Regional Planning Commission Data Warehouse	No
	TxDOT Transit Data Archive System	No
Long Term Projects 20-year Horizon	None identified at this time	N/A

MAINTAINING THE REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

The Yoakum Regional ITS Deployment Plan is a living document. The recommended projects and their timeframes for implementation reflect the needs of the Region at the time the plan was developed. It is expected that the needs of the Region will change as ITS deployments are put into place, population and travel patterns change, and as new technology is developed. In order for the ITS Deployment Plan to remain a useful document for Regional stakeholders, the plan must be updated over time.

TxDOT will serve as the lead agency for maintaining both the Yoakum Regional ITS Architecture and the ITS Deployment Plan; however, these plans will continue to be driven by stakeholder consensus rather than a single stakeholder.

At the ITS Deployment Plan Meeting in January 2005, stakeholders recommended that a meeting be held on an annual basis to review the existing Regional ITS Deployment Plan to update project status and include any new projects. These updates will be documented and included in the next formal revision of the plans. It was also recommended that the group meet every two years to correspond with the Transportation Improvement Plan update process to review the Regional ITS Architecture and formally update both the Regional ITS Architecture and the ITS Deployment Plan. Any new market packages that have been added to the National Architecture should be reviewed to see if they are applicable to the Yoakum Region. Data flows in existing market packages should also be reviewed to determine if any planned/future flows have been implemented. The Deployment Plan will also be updated at that time to reflect projects that have been deployed, new projects that are necessary, and to reprioritize projects currently shown in the plan. Projects that are added to the ITS Deployment Plan should also be reviewed closely to determine if they fit into the ITS Architecture for the Yoakum Region. If a new project does not fit into the ITS Architecture, then the ITS Architecture will need to be revised to include the necessary links and data flows for the project. Any changes to the geographic scope of the Region should be agreed upon by the stakeholders.

Both the Yoakum Regional ITS Architecture and the ITS Deployment Plan were developed with a consensus approach from the stakeholders. In order for these documents to continue to reflect the needs of the Region, changes in the documents will need to be driven by consensus of all of the stakeholders.

MEMORANDUM OF UNDERSTANDING

As a final step in the development of the Yoakum Regional ITS Architecture and Deployment Plan, a Memorandum of Understanding (MOU) was prepared for the participating stakeholder agencies. The MOU was developed for stakeholders to acknowledge their participation and approval of the plan, and pledge their support in the implementation and operation of ITS in the Yoakum Region. Also included in the MOU was a pledge to provide TxDOT with the information necessary to maintain the Regional ITS Architecture and ITS Deployment Plan.

Those stakeholders that were asked to sign the MOU represented agencies that participated in the planning process. In most cases these agencies will have the greatest impact in the Region in terms of ITS deployments and system operations. Stakeholder agencies that were asked to sign the MOU for the Yoakum Regional ITS Architecture and Deployment Plan included the following:

- City of Victoria;
- Colorado Valley Transit;
- Golden Crescent Regional Planning Commission;
- Gonzales County;
- Lavaca County;
- Lower Colorado River Authority;
- Port of Victoria;
- Texas Department of Public Safety;
- Texas Department of Transportation; and
- Wharton County.