



State of Texas
ITS Architectures and Deployment Plans

Del Rio Region

Executive Summary

Prepared by:



Kimley-Horn
and Associates, Inc.

ConSysTec Corp

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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. FHWA has further established a deadline of April 2005 for regions to have an ITS architecture in place.

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 and deployment plans 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 for 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.

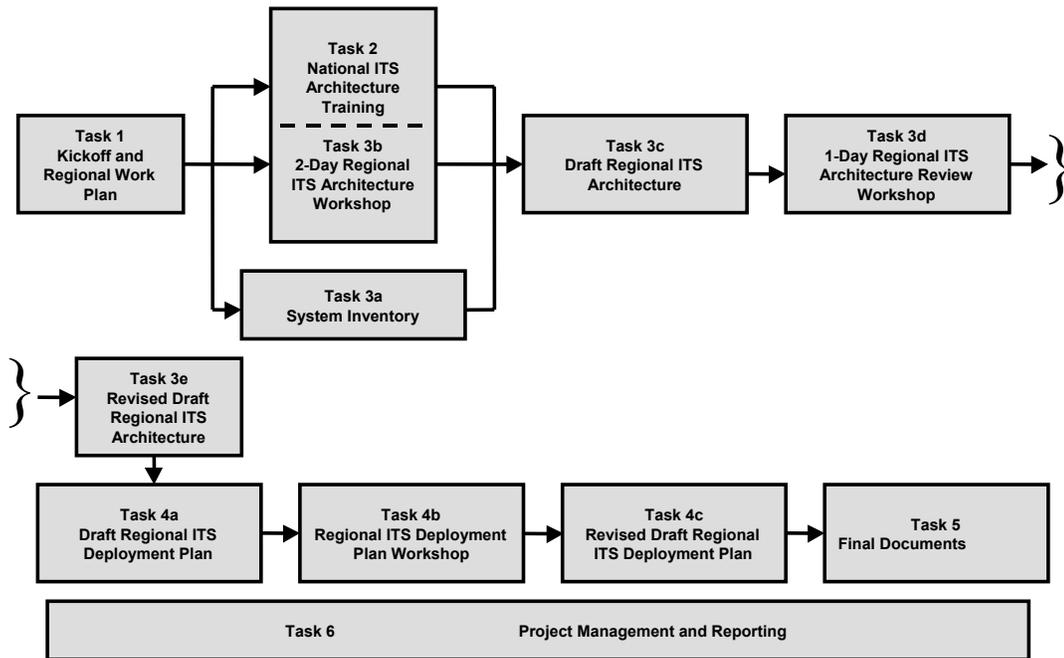


Figure 1 – Del Rio Regional ITS Architecture and Deployment Plan Development Process



OVERVIEW OF THE DEL RIO REGION

The Del Rio Region is located in southwest Texas on the Mexican border. The Region is bordered by the Odessa and San Angelo TxDOT Districts and is part of the TxDOT Laredo District. For the Del Rio Regional ITS Architecture and Deployment Plan, the study area is comprised of Val Verde County. **Figure 2** illustrates the Regional boundaries.

The primary roadway facilities in the Del Rio Region transportation infrastructure include US 90, US 277, US 377, and SH 163.

US 90 travels east-west along the border with Mexico in the Del Rio Region. The effective operation of this highway is critical to the movement of goods and people through the Region. US 90 extends all the way across the state of Texas from Orange, Texas, through San Antonio and Del Rio, to El Paso. US 90 connects the southern portion of Texas to Louisiana and New Mexico. Within the Del Rio Region blockages can have serious implications on drive-time for commercial vehicles and motorists alike due to the lack of obvious alternate routes. Knowing road and travel conditions within this transportation corridor and having the ability to disseminate this information to motorists are important elements for this project.

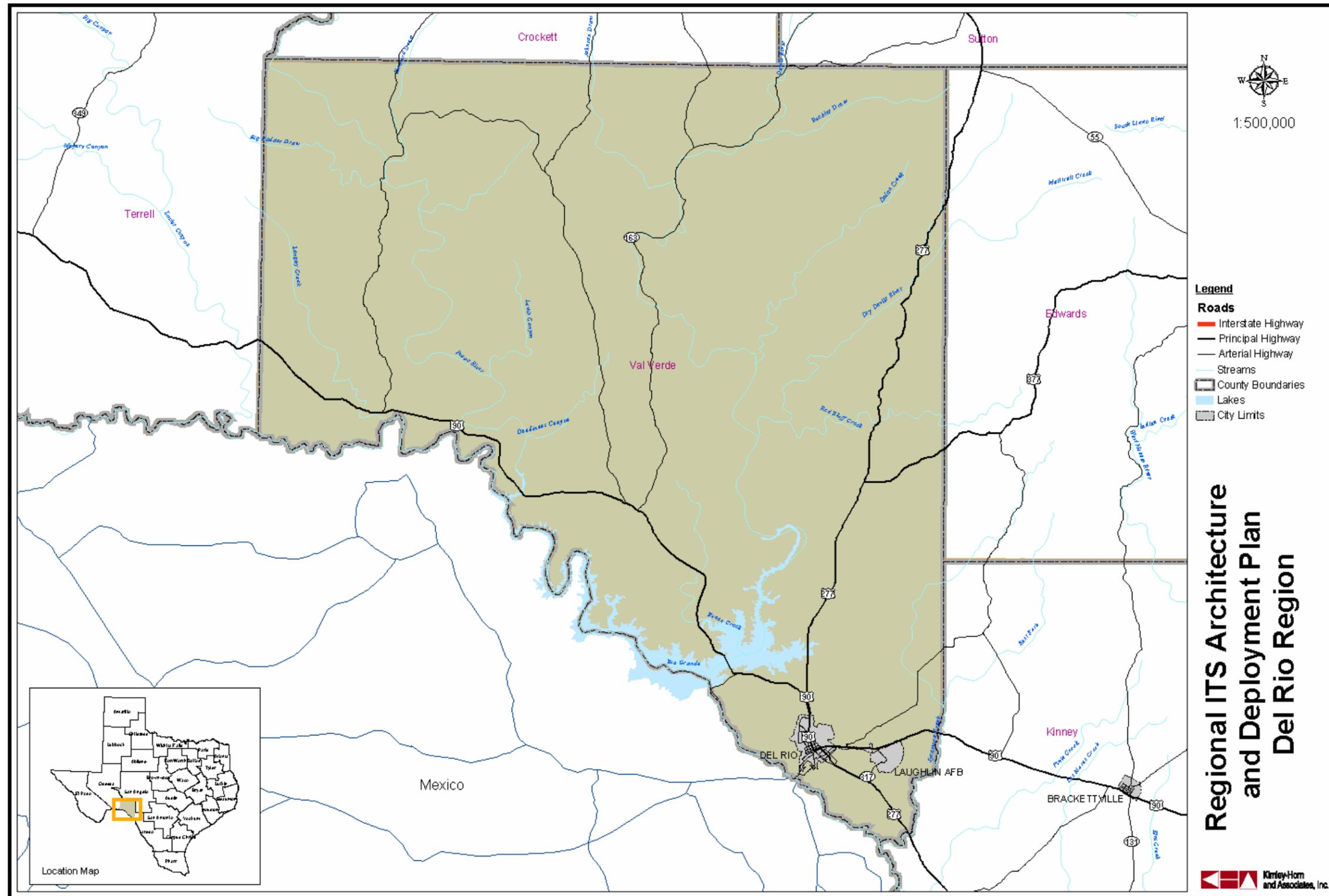


Figure 2 – Del Rio Region Map



DEL RIO 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 Del Rio Region and neighboring Regions participated in the development of the Del Rio Regional ITS Architecture and Deployment Plan. Key participants included representatives from TxDOT, the Texas Department of Public Safety (DPS), City of Del Rio, Val Verde County, and the US Bureau of Customs and Border Patrol. 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.

Del Rio Region stakeholders included:

- City of Del Rio;
- Federal Highway Administration;
- San Felipe/Del Rio CISD;
- Texas Department of Public Safety;
- TxDOT;
- US Border Patrol;
- US Customs;
- Val Verde County; and
- Val Verde County Sheriff.



DEL RIO REGIONAL ITS ARCHITECTURE

The process for developing the Regional ITS Architecture for Del Rio 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 Del Rio 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 Del Rio Regional ITS Architecture began with a project kick-off meeting in April of 2003. 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. High priority needs focused on flood monitoring and warning systems, congestion management during special events and holidays, emergency management, and improvements to traveler information at U.S. Border checkpoints.

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

Table 1 – Del Rio Region: Summary of ITS Needs

<p style="text-align: center;">Del Rio Region Summary of ITS Needs Del Rio Regional ITS Architecture and Deployment Plan Kick-Off Meeting April 16, 2003</p> <p>Traffic Management Needs</p> <ul style="list-style-type: none">▪ Need railroad preemption of traffic signals in City of Del Rio▪ Need flood detection and procedure for information dissemination▪ Need automatic flood gates or warning lights in remote areas prone to flooding▪ Need small traffic management center (TMC) at 911 Dispatch location with link to the school district▪ Need closed loop signal system for the City of Del Rio▪ Need improved method for US Customs to disseminate bridge closure information▪ Need special event coordination and traffic management (i.e. for parades)▪ Need advanced congestion warning system for high traffic occurrences including incidents, the rodeo, Christmas travel season, and Amistad Day▪ Need dynamic message signs (DMS) approaching US Border Patrol checkpoints▪ Need signage approaching US Border Patrol checkpoints for congestion warnings▪ Need communication infrastructure capable of supporting ITS technologies <p>Traveler Information Needs</p> <ul style="list-style-type: none">▪ Need highway advisory radio (HAR) in the Del Rio Region <p>Public Transportation Management Needs</p> <ul style="list-style-type: none">▪ Need improved coordination with emergency management agencies for evacuation efforts▪ Need automatic vehicle location (AVL) on transit vehicles <p>Commercial Vehicle Operations Needs</p> <ul style="list-style-type: none">▪ Need undercarriage video detection at US Border Patrol checkpoints <p>Emergency Management Needs</p> <ul style="list-style-type: none">▪ Need central dispatch for City of Del Rio fire, police and EMS▪ Need emergency operations center (EOC) with connection to DPS and Border Patrol as well as City of Del Rio central dispatch▪ Need automated call out system (will likely be issues with communications backbone)▪ Need emergency vehicle signal preemption▪ Need AVL and mobile data terminals (MDTs) on emergency vehicles▪ Need video exchange center for City of Del Rio, Border Patrol, Customs and TxDOT <p>Archived Data Management Needs None Identified</p> <p>Maintenance and Construction Management Needs None Identified</p>

Market Packages

A 2-Day ITS Architecture Workshop was held in Del Rio in June 2003. At this workshop, stakeholders were provided with architecture training that included background information about the National ITS Architecture, the purpose and benefits of a regional ITS architecture, and the process that would be used to develop the Del Rio Regional ITS Architecture.

The next step in developing the Del Rio 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 may 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 currently a total of 75 market packages identified in 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 75 market packages in the National ITS Architecture, stakeholders identified 34 as being applicable to the Del Rio Region.

Interconnects, Interfaces, and Standards

Stakeholders also began the process of mapping existing and planned ITS elements in Del Rio 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 Del Rio Region, which is shown in **Figure 3** on the following page. This architecture diagram, also referred to as the “sausage diagram” shows the relationship of existing, planned, and future systems in the Del Rio Region.

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

Figure 4 is an example of an ATMS market package for Surface Street Control that has been customized for the Del Rio Region. This market package shows the two subsystems, Traffic Management and Roadway, and the associated entities (City of Del Rio Traffic Operations Center [TOC], TxDOT Del Rio TOC, City of Del Rio Field Equipment and TxDOT Del Rio Field Equipment). Data flows between the subsystems indicate what information is being shared. The solid data flow lines in this market package indicate existing information flows and the dashed lines indicate planned or future flows. All of the Del Rio Region market package diagrams are included in the Regional ITS Architecture report.

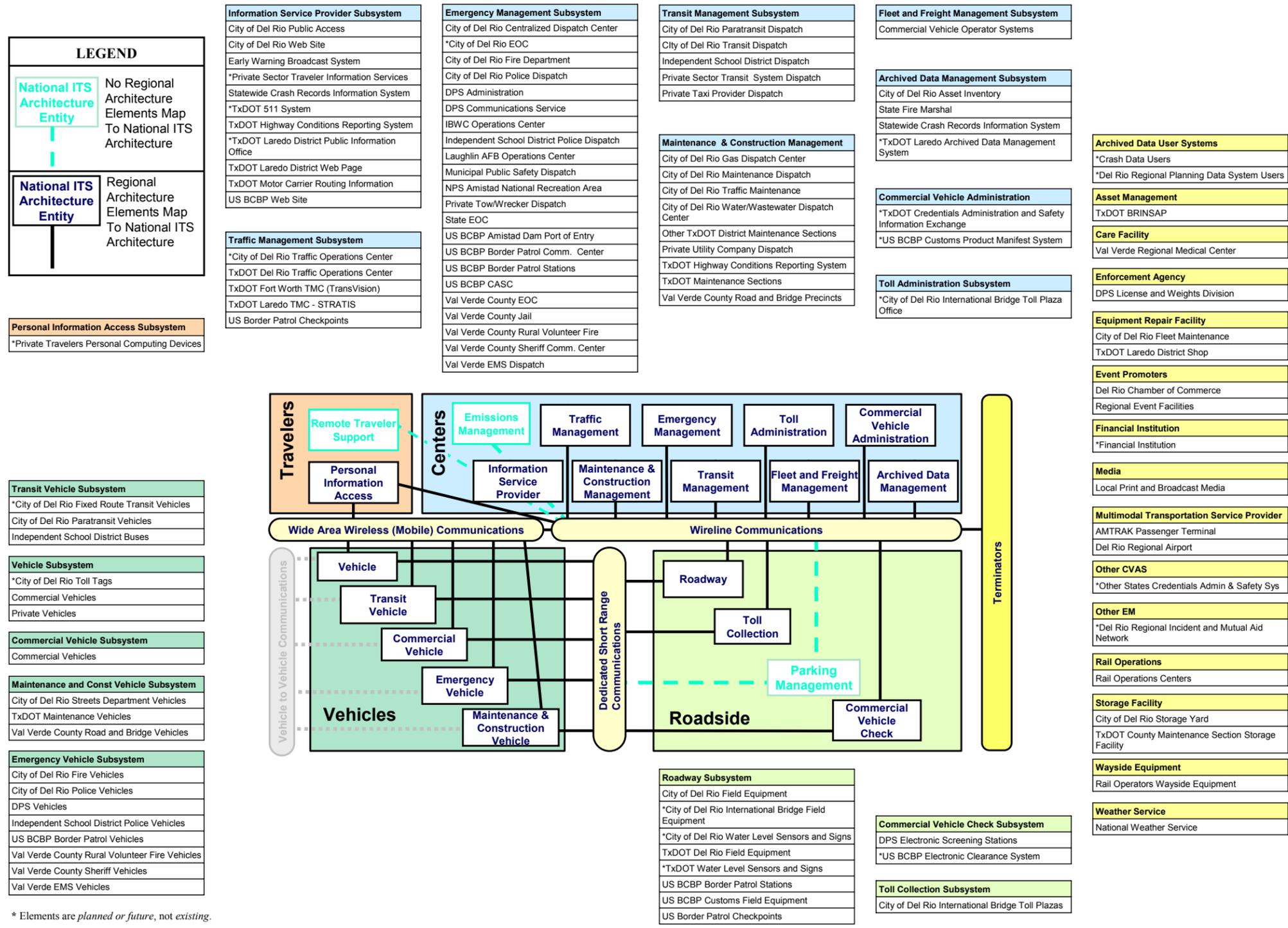


Figure 3 – Del Rio Regional System Interconnect Diagram

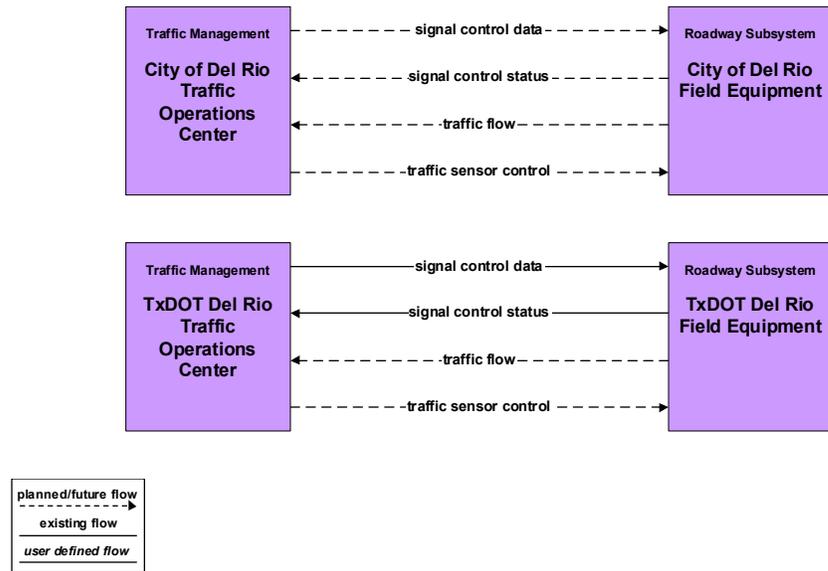


Figure 4 – Del Rio Surface Street Control Customized Market Package

More detailed interfaces were developed which identified the connectivity between the systems and elements. Each element identified in the ITS architecture for the Del Rio 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 Del Rio Region. There are 105 different elements identified as part of the Del Rio 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 Del Rio 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 Del Rio ITS Field Equipment and the existing and planned interfaces with other elements throughout the Region. These interfaces are shown as existing, planned, 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.

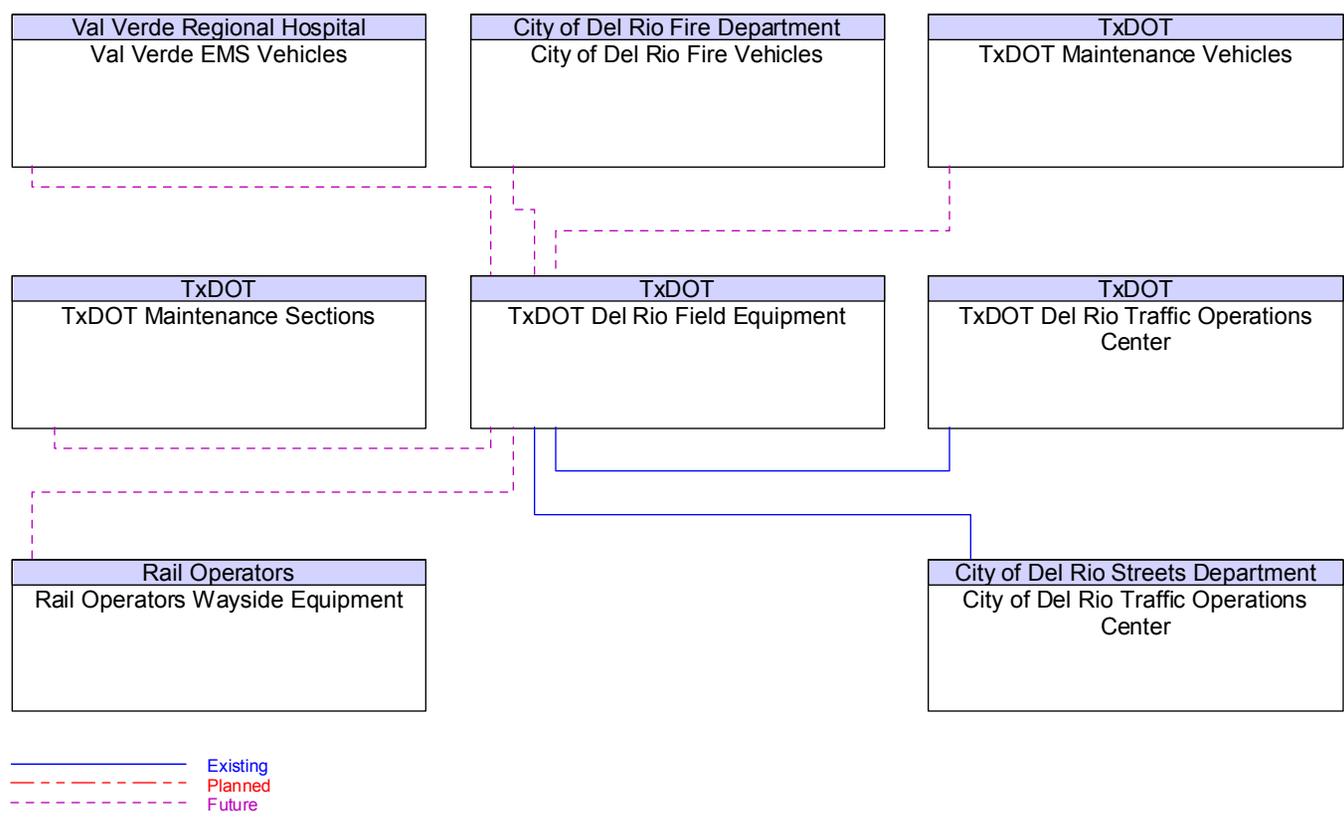


Figure 5 – TxDOT Del Rio Field Equipment Interfaces

An example of the architecture flows between two elements is shown in **Figure 6**. In this interface, the flows between the City of Del Rio TOC and the City’s Field Equipment show information that must go from the TOC to the field equipment, as well as information that the TOC needs from devices. Similar to the interfaces, architecture flows also are defined as existing, planned, or future. All of the architecture flows between elements have been included on the project website.

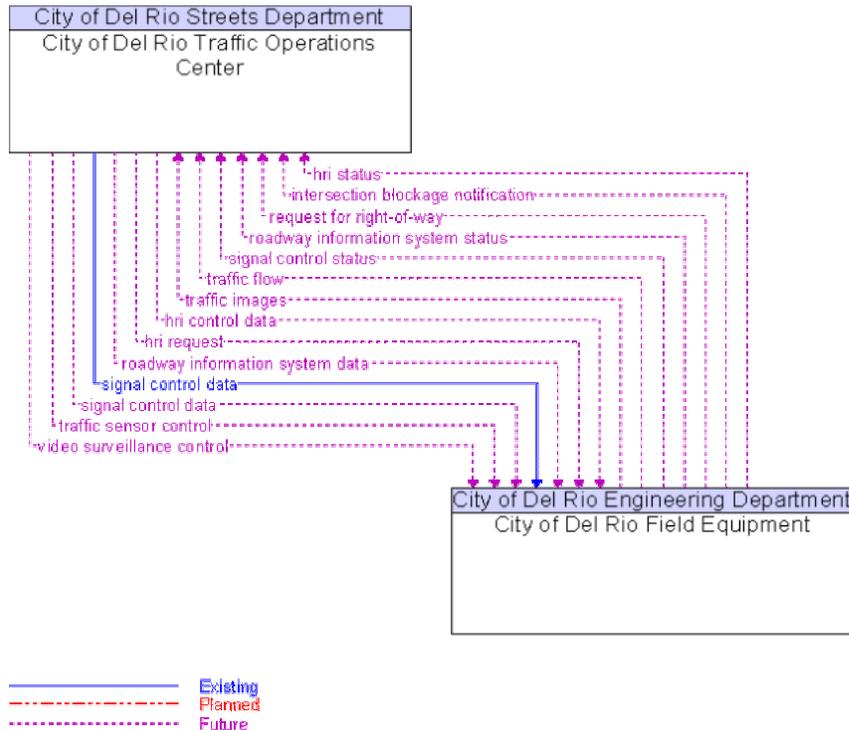


Figure 6 – City of Del Rio TOC to Field Equipment Architecture Flows

With the required interfaces and interconnections identified, standards that could potentially be applied to the Del Rio Region were identified. Standards are an important tool that will allow efficient implementation of the elements in the Del Rio 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.

Operational Concept and Scenarios

An operational concept for the Del Rio 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 Del Rio Region, two concepts were illustrated. The first operational scenario describes how the integrated elements of the Del Rio Region’s ITS program will function together in the event of a HAZMAT spill near the border crossing at the International Bridge. The second scenario describes how flood detection systems and traveler information devices will be used during a heavy flooding scenario.

Agreements

Interfaces and data flows among public and private entities in the Del Rio 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 agreements in place in the Del Rio Region. Stakeholders indicated that while there is a high degree of cooperation among agencies, there hasn't been a need for formal agreements to facilitate multi-jurisdictional resource sharing, cooperation, or mutual aid. 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 more formal agreements will be needed.

The following is a list of potential agreements for the Del Rio 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 and private media and information service providers;
- Shared video monitoring agreements between TxDOT and traffic and public safety agencies;
- Mutual aid agreements among public sector agencies, primarily fire, police, emergency services, DPS, and TxDOT; and
- Joint operations/shared control agreements between TxDOT, City of Del Rio, US BCBP 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 Del Rio Region is documented in a final report. Stakeholders were brought together to review the Regional ITS Architecture and provide feedback. The final report was not prepared until after completion of the Del Rio 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 Del Rio Regional ITS Architecture website was being hosted at www.consystec.com. The site can be accessed by selecting the link to Texas, and then the link to Del Rio. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.



DEL RIO 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 Del Rio Regional ITS Architecture, TxDOT chose to expand on the project sequence requirement to develop a formal ITS deployment plan for the Region.

The Del Rio Regional ITS Architecture provided the framework and prioritized the key functions and services desired by stakeholders in the Region. The Del Rio 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 ITS Deployment Plan.

Prioritized Market Packages

Market packages for the Del Rio 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 Del Rio 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 Del Rio 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 Del Rio Region, such as surface street control and traffic information dissemination.

Table 2 – Summary of Prioritized Market Packages for the Del Rio Region

High Priority	Medium Priority	Low Priority
<ul style="list-style-type: none"> ▪ Network Surveillance ▪ Surface Street Control ▪ Traffic Information Dissemination ▪ Regional Traffic Control ▪ Incident Management System ▪ Electronic Toll Collection ▪ Emergency Response ▪ Emergency Routing ▪ Road Weather Data Collection ▪ Weather Information Processing and Distribution ▪ Maintenance and Construction Activity Coordination ▪ Transit Vehicle Tracking ▪ Transit Fixed-Route Operations ▪ Demand Response Transit Operations ▪ Transit Traveler Information ▪ Electronic Clearance ▪ HAZMAT Management ▪ Broadcast Traveler Information ▪ ITS Data Mart 	<ul style="list-style-type: none"> ▪ Standard Railroad Grade Crossing ▪ Advanced Railroad Grade Crossing ▪ Railroad Operations Coordination ▪ Roadway Maintenance and Construction ▪ Work Zone Management ▪ Transit Security ▪ ITS Data Warehouse 	<ul style="list-style-type: none"> ▪ Probe Surveillance ▪ Maintenance and Construction Vehicle Tracking ▪ Maintenance and Construction Vehicle Maintenance ▪ Work Zone Safety Monitoring ▪ Transit Maintenance ▪ Multi-modal Coordination ▪ Interactive Traveler Information ▪ 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 or additional new needs to bring the market package to the desired level of functionality in the Del Rio 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 are already existing in the Del Rio 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 Del Rio 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 Del Rio Region was developed. These projects were refined and additions and deletions were made by the Regional stakeholders at the ITS Deployment Plan Workshop in October 2003.

Recommended ITS projects for the Del Rio 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 Del Rio 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 Del Rio 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 Del Rio 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 Del Rio Region

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
<i>Travel and Traffic Management</i>		
Short Term Projects 5-year Horizon	TxDOT Closed Loop Signal System Expansion Phase 1	Yes (TxDOT)
	TxDOT Highway Advisory Radio (HAR) Phase 1	Yes (TxDOT)
	City of Del Rio Closed Loop Signal System Implementation	No
	City of Del Rio TOC	No
	Dynamic Message Signs for Border Patrol Checkpoints Phase 1	No
	Del Rio Regional Communications Master Plan	No
Mid Term Projects 10-year Horizon	TxDOT Advanced Traffic Management System (ATMS)	Yes (TxDOT Statewide)
	TxDOT Center-to-Center Communications	Yes (TxDOT Statewide)
	TxDOT Highway Advisory Radio (HAR) Phase 2	No
	TxDOT Closed Loop Signal System Expansion Phase 2	No
	TxDOT Del Rio Area Office Web Page	No
	Dynamic Message Signs for Border Patrol Checkpoints Phase 2	No
	Regional 511 Advanced Traveler Information System Server	No
	City of Del Rio Closed Loop Signal System Expansion Phase 1	No
	City of Del Rio CCTV	No
	City of Del Rio TOC/TxDOT Area Office TMC Communications Connection	No
Long Term Projects 20-year Horizon	TxDOT Closed Loop Signal System Expansion Phase 3	No
	City of Del Rio Closed Loop Traffic Signal System Expansion Phase 2	No
	ISP-based Route Guidance	No

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

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
<i>Emergency Management</i>		
Short Term Projects 5-year Horizon	Evacuation Planning	No
	City of Del Rio Emergency Services Central Dispatch	Yes (City of Del Rio)
	Del Rio Regional Emergency Operations Center (EOC)	Yes (City of Del Rio, Val Verde County)
	Emergency Vehicle Traffic Signal Preemption	Yes (TxDOT, City of Del Rio)
Mid Term Projects 10-year Horizon	TxDOT Flood Monitoring Phase 2	No
	DPS/TxDOT Area Office TMC Connection	No
	EOC/TxDOT Area Office TMC Connection	No
	EOC/DPS Connection	No
	EOC/US Border Patrol Connection	No
	EOC/Del Rio Centralized Dispatch Connection	No
	City of Del Rio Emergency Vehicle AVL and MDTs	No
Long Term Projects 20-year Horizon	Emergency Call-Out System	No
<i>Maintenance and Construction Management</i>		
Short Term Projects 5-year Horizon	TxDOT Flood Monitoring Phase 1	Yes (TxDOT)
	TxDOT HCRS Enhancements	Yes (TxDOT Statewide)
	TxDOT Portable DMS	No
Mid Term Projects 10-year Horizon	County Portable DMS	No
Long Term Projects 20-year Horizon	N/A	N/A
<i>Public Transportation Management</i>		
Short Term Projects 5-year Horizon	City of Del Rio Transportation Transit Operations Center, AVL and MDTs	Yes (City of Del Rio Transportation)
Mid Term Projects 10-year Horizon	City of Del Rio Transportation Security System	No
	Transit Operations Center/City of Del Rio TOC Communications Connection	No
Long Term Projects 20-year Horizon	Del Rio Paratransit Web-Based Scheduling System and Trip Planner	No



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

Project Time Frame	Project Name	Funding Identified (Funding Agency if Applicable)
<i>Information Management</i>		
Short Term Projects 5-year Horizon	Regional Accident/Crash Database	No
Mid Term Projects 10-year Horizon	N/A	N/A
Long Term Projects 20-year Horizon	N/A	N/A
<i>Commercial Vehicle Operations</i>		
Short Term Projects 5-year Horizon	N/A	N/A
Mid Term Projects 10-year Horizon	N/A	N/A
Long Term Projects 20-year Horizon	N/A	N/A



MAINTAINING THE REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

The Del Rio Regional ITS Deployment Plan is a living document. The recommended projects and timeframes for their 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, as 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 reviewed and updated over time.

TxDOT will serve as the lead agency for maintaining both the Del Rio Regional ITS Architecture and the ITS Deployment Plan. These plans will continue to be driven by stakeholder consensus rather than a single stakeholder. In order for changes to occur in the plan, it is recommended that all stakeholders be invited to a consensus building meeting to discuss any proposed changes to the Regional ITS Architecture or ITS Deployment Plan.

It is recommended that stakeholders meet every two years to review and update the existing Regional ITS Architecture and ITS Deployment Plan. At these meetings, stakeholders should identify which projects in the ITS Deployment Plan have been deployed. Project status (existing, planned, or future) may have to be updated for many of the projects as they move from the future to planned to existing status. New projects that are recommended by a stakeholder for inclusion in the ITS Deployment Plan should also be discussed to ensure that the Region as a whole feels that the project agrees with regional needs and priorities. This same type of consensus building should also be used should the geographic scope of the Region need to change or should additional stakeholders need to be added to the Regional ITS Architecture and ITS Deployment Plan.

Projects that are added to the ITS Deployment Plan should also be reviewed closely to determine if they fit into the current ITS Architecture for the Del Rio 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. The two-year update of the Del Rio Regional ITS Architecture and Deployment Plan should correspond to the two-year update of the Transportation Improvement Program.

Both the Del Rio 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 Del Rio 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 intelligent transportation systems in the Del Rio 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 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 Del Rio Regional ITS Architecture and Deployment Plan included the following:

- City of Del Rio;
- County of Val Verde;
- San Felipe Consolidated Independent School District;
- Texas Department of Public Safety;
- Texas Department of Transportation;
- U.S. Border Patrol; and
- U.S. Customs.