State of Texas
Regional ITS Architectures and Deployment Plans

West Central Texas Region

Regional ITS Deployment Plan

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LIST OF ACRONYMS

APC	Automated Passenger Counter
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CAD	Computer-Aided Dispatch
CARR	City and Rural Rides
CCTV	Closed-Circuit Television
DMS	Dynamic Message Sign
DPS	Department of Public Safety
EMS	Emergency Medical Services
EOC	Emergency Operations Center
ETC	Electronic Toll Collection
FHWA	Federal Highway Administration
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HCRS	Highway Condition Reporting System
HRI	Highway-Rail Intersections
ISP	Information Service Provider
ITS	Intelligent Transportation System
MDT	Mobile Data Terminal
MPO	Metropolitan Planning Organization
NTCIP	National Transportation Communications for ITS Protocol
PTZ	Pan/Tilt/Zoom
RFID	Radio Frequency Identification
RWIS	Road Weather Information System
TEA-21	Transportation Equity Act for the 21st Century

LIST OF ACRONYMS

TMC	Transportation Management Center
TOC	Traffic Operations Center Transit Operations Center
TxDOT	Texas Department of Transportation
VIVDS	Video Image Vehicle Detector System

SUMMARY

In January 2001, 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) requiring that Intelligent Transportation System (ITS) projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards.

To meet these requirements the Texas Department of Transportation (TxDOT) initiated the development of regional ITS architectures and deployment plans throughout the State of Texas. Although not required by the FHWA final rule, TxDOT took the opportunity to also develop an ITS deployment plan for each Region. The West Central Texas Regional ITS Architecture and Regional ITS Deployment Plan was prepared as part of this initiative.

The West Central Texas Regional ITS Deployment Plan outlines a vision for ITS deployment, and identifies and prioritizes projects that are needed to implement the ITS architecture on a short, medium, and long-term basis. In doing so, this plan also helps the Region to prioritize funding decisions. As infrastructure is incrementally built-out over a 20-year horizon, integration among key foundation systems in the Region can occur as the system grows and expands.

Stakeholders from throughout the Region participated in the development of the Regional ITS Deployment Plan. Participants included representatives from TxDOT, the City of Abilene, City of Brownwood, counties, transit, and emergency management agencies.

Building on the dialogue, consensus, and vision outlined in the Regional ITS Architecture, stakeholders in the West Central Texas Region prioritized market packages and potential ITS projects for deployment in the Region. Projects were identified to correspond to the needs and priorities identified by the regional stakeholders, and were categorized into 5-year, 10-year, and 20-year timeframes.

The majority of ITS projects recommended for the West Central Texas Region were identified in the following key areas:

- Travel and Traffic Management;
- Emergency Management; and
- Public Transportation Management.

Recommended ITS projects in the 5-year, 10-year, and 20-year deployment timeframes were summarized in tables for each deployment horizon. This summary included the project name and a brief description, primary responsible agency, a planning level estimate of probable cost, an indication of whether or not funding had been identified for that project, as well as an estimated duration for implementation. For each recommended ITS project, more detailed project descriptions were developed which mapped each project back to applicable market packages and also identified any prerequisite project requirements.

With the substantial amount of effort invested by stakeholders in the West Central Texas Region to develop both the Regional ITS Architecture and the Deployment Plan, developing a plan for maintaining these important tools was a key component of the process.

1. INTRODUCTION

1.1 Project Overview

The FHWA final rule to implement Section 5206(e) of the TEA-21 requires that ITS projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards. The rule requests that the National ITS Architecture be used to develop a local implementation of the National ITS Architecture, which is referred to as a "Regional ITS Architecture."

In order to meet these requirements, the TxDOT initiated the development of regional ITS architectures and deployment plans throughout the State of Texas. Although not required by the FHWA final rule, TxDOT sought to have an ITS deployment plan developed for each Region. The ITS Deployment Plan outlines a vision for ITS deployment in the Region and identifies and prioritizes projects that are needed to implement the ITS architecture on a short, medium, and long-term basis. In doing so, this plan also helps the Region to prioritize funding decisions by having a comprehensive, phased approach to the regional ITS programs, so that the infrastructure can be incrementally built-out over a 20-year horizon, and integration among key foundation systems in the Region can occur as the system grows and expands.

The West Central Texas Regional ITS Deployment Plan was developed using the Regional ITS Architecture developed in 2003. Through the architecture development process, stakeholders reached consensus on the transportation needs in the Region that could be addressed with ITS, worked with the architecture team to customize and prioritize market packages that formed the basis for the ITS Deployment Plan, and identified the required interfaces to provide the desired level of integration of systems and agencies within the West Central Texas Region.

The West Central Texas Regional ITS Architecture provided the framework and prioritized the key functions and services desired by stakeholders in the Region. The ITS Deployment Plan builds on the architecture by 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.

1.2 Document Overview

The West Central Texas Regional ITS Deployment Plan is organized into four key sections:

Section 1 – Introduction

This section provides a brief overview of the West Central Texas Regional ITS Deployment Plan, as well as an overview of some of the key features and stakeholders in the West Central Texas Region.

Section 2 – Prioritization of Market Packages

Section 2 contains the prioritized market packages for the West Central Texas Region. Included in this section is an overview of the prioritization process and detailed descriptions of the high, medium and low priority market packages.

Section 3 – Prioritization of Planned Projects

Project recommendations have been developed for the West Central Texas Region to provide an incremental, phased build-out of the Region's ITS. These projects are categorized into 5-year, 10-year, and 20-year deployment timeframes. Each project recommendation includes a brief description, responsible agency, associated market packages, pre-requisite projects or systems, and an estimate of probable cost.

Section 4 – Maintaining the Regional ITS Architecture and Deployment Plan

A procedure for maintaining the ITS Architecture and Deployment Plan and submitting new projects to add to the plan is recommended in this section.

1.3 The West Central Texas Region

1.3.1 Geography and Regional Characteristics

The West Central Texas Region is bordered by the TxDOT Childress, Wichita Falls, and Fort Worth Districts to the north, the TxDOT San Angelo and Austin Districts to the south, the TxDOT Waco District to the east, and the TxDOT Odessa and Lubbock Districts to the west. For the West Central Texas Regional ITS Architecture and Deployment Plan, the study area included all 13 counties that comprise the TxDOT Abilene District and the 9 counties that comprise the TxDOT Brownwood District. The geographic boundaries of the West Central Texas Region are highlighted in **Figure 1**.

The counties included in the West Central Texas Region area are:

- Borden;
- Brown;
- Callahan;
- Coleman;
- Comanche;
- Eastland;
- Fisher;
- Haskell;
- Howard;
- Jones;
- Kent;
- Lampasas;
- McCulloch;
- Mills;
- Mitchell;
- Nolan;
- San Saba;
- Scurry;
- Shackelford;
- Stephens;
- Stonewall; and
- Taylor.

TxDOT partners with local governments for roadway construction, maintenance, and traffic operations support, and serves as the responsible agency for on-system roadways in cities with populations less than 50,000. The City of Abilene is the only city in the project Region with a population that exceeds the 50,000 threshold.

1.3.2 Transportation Infrastructure

The West Central Texas Region has an extensive transportation infrastructure. The primary roadway facilities include I-20, US-67, US-83, US-84, US-87, US-180, US-183, US-277, US-283, and US-377.

I-20 is as east-west, divided interstate highway. The effective operation of this highway is critical to the movement of goods and people through the State of Texas and the United States. I-20 starts in South Carolina and ends at I-10 in west Texas. Blockages along I-20 can have serious implications for 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-20 has been closed due to a major incident or weather, and motorists are informed of the closure in advance, they can alter their travel plans with an alternate route or wait to begin their travels.

1.3.3 Existing ITS in the West Central Texas Region

Within the West Central Texas Region there are currently several ITS applications in place. TxDOT has several portable dynamic message signs (DMS) that are utilized primarily for displaying construction and delay information.

Video Image Vehicle Detection Systems (VIVDS) have been installed at several intersections in the Region by TxDOT.

Signal preemption for emergency vehicles is in place within the City of Abilene for fire vehicles and several emergency management agencies are utilizing computer aided dispatch systems.

1.3.4 West Central Texas Stakeholders

Stakeholder coordination and involvement is one of the key elements to the development of a Regional ITS Architecture and Deployment Plan. Because ITS often transcends traditional transportation infrastructure, it is important to involve non-traditional stakeholders in the architecture development and visioning process. Input from these stakeholders, both public and private, is a critical part of defining the interfaces, integration needs, and overall vision for ITS in the West Central Texas Region.

The following is a list of stakeholders in the West Central Texas 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 West Central Texas Regional ITS Architecture.

- Abilene Regional Airport;
- Aspermont Small Business Development Center;
- Central Texas Rural Transit District;
- City of Abilene;
- City of Breckenridge;
- City of Brownwood;
- City of Comanche;
- City of Eastland;
- Department of Public Safety;
- Dyess Air Force Base;
- Federal Highway Administration;
- Hill Country Transit;

- Jones County;
- McCulloch County;
- Nolan County;
- Taylor County;
- Texas Commission on Environmental Quality;
- Texas Department of Public Safety;
- TxDOT Abilene District;
- TxDOT Austin Traffic Operations Division;
- TxDOT Brownwood District; and
- US Geological Survey.

Stakeholder agencies that are participating in the development of the West Central Texas Regional ITS Deployment Plan are listed in **Table 1** along with contact information for agency representatives that have participated.

Table 1 – West Central Texas Stakeholder Agencies and Contacts

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
Abilene Regional Airport	Paula Edwards	2933 Airport Boulevard Abilene, Texas 79604	325-676-6367	N/A
Aspermont Small Business Development Center, Inc	Mylissa Gholson	620 Washington Street Aspermont, Texas 79601	940-989-3538	asbdc@westex.net
Aspermont Small Business Development Center, Inc.	Dana Myers	620 Washington Street Aspermont, Texas 79601	940-989-3538	asbdc@westex.net
Central Texas Rural Transit District	J.R. Salazar	2310 South Concho Street Coleman, Texas 76834	325-625-4491	carr@web-access.net
City of Abilene	James Condry	555 Walnut Street Abilene, Texas 79604	325-676-6489	james.condry@abilenetx.com
City of Abilene	Amy Foerster	1189 South Second Street Abilene, Texas 79602-1411	325-676-6403	amy.foerster@abilenetx.com
City of Abilene	Kevin Riney	1189 South Second Street Abilene, Texas 79602-1411	325-676-6463	kevin.riney@abilenetx.com
City of Breckenridge	Virgil Moore, Jr.	126 E. Walter Breckenridge, Texas 76424	254-559-8287	vefm@wtconnect.com
City of Brownwood	Gary Butts	501 Center Avenue Brownwood, Texas 76801	325-643-3631	gbutts@ci.brownwood.tx.us
City of Brownwood	Don Hatcher	501 Center Avenue Brownwood, Texas 76801	325-643-6626	dhatcher@ci.brownwood.tx.us
City of Brownwood	Keith Pulaski	501 Center Avenue Brownwood, Texas 76801	325-646-5775	kpulaski@ci.brownwood.tx.us
City of Comanche	Darwin Dickerson	114 W Central Comanche, Texas 76442	325-356-2616	N/A

Table 1 – West Central Texas Stakeholder Agencies and Contacts (continued)

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
City of Eastland	Cecil Funderburgh	416 S. Seaman Street Eastland, Texas 76448	254-629-1700	epdchief@bryrus.net
City of Eastland	Frank Saylors	416 S. Seaman Street Eastland, Texas 76448	254-629-1700	N/A
City of Eastland	Dale Squires	P.O. Box 749 Eastland, Texas 76448	254-629-3171	N/A
Department of Public Safety – Lampasas	Stephen Bynum	1690 N. U.S. 281 Lampasas, Texas 76550	512-556-6871	N/A
Department of Public Safety – Eastland		1002 Laga Vista Eastland, Texas 76448	254-629-2849	N/A
Dyess AFB	Donald Emerson	626 Alert Avenue Abilene, Texas 79607	325-696-5222	donald.emerson@dyess.af.mil
Dyess AFB	Robert Simpson	626 Alert Drive Abilene, Texas 79607	325-696-5227	N/A
Dyess AFB	William Warren	466 5th Street Abilene, Texas 79607	325-696-1435	william.warren@dyess.af.mil
Federal Highway Administration Texas Division	Mark Olson	300 East 8th Street Room 826 Austin, Texas 78701	512-536-5972	mark.olson@fhwa.dot.gov
Hill Country Transit	Carole Warlick	2905 W. Wallace San Saba, Texas 76877	325-372-4677	hctd@hccaa.com
Jones County	Dale Spurgin	1100 12th Street Anson, Texas 79501	325-823-3741	jonescty@nts-online.net
McCulloch County	Randy Young	199 County Courthouse, Room 202 Brady, Texas 76825	325-597-0733	judgeyoung@hotmail.com
Nolan County	Tim Fambrough	100 East 3rd Street, Suite 105 Sweetwater, Texas 79556	325-235-2263	N/A
Taylor County	George Newman	300 Oak Street Abilene, Texas 79602	325-674-1235	newmang@taylorcountytexas.org
Texas Commission on Environmental Quality	Winonna Henry	1977 Industrial Boulevard Abilene, Texas 79602	325-698-9674	whenry@tceq.state.tx.us
TxDOT Abilene District	Paul Hoelscher	4250 North Clack Abilene, Texas 79601	325-676-6801	N/A
TxDOT Abilene District	Alan Hufstutler	102 E College Drive Abilene, Texas 79604	325-676-6930	ahufstu@dot.state.tx.us
TxDOT Abilene District	Pat McKennon	4250 North Clack Abilene, Texas 79601	325-676-6856	pmckenn@dot.state.tx.us
TxDOT Abilene District	Debra Rector	102 E. College Drive Abilene, Texas 79604	325-676-6811	drecto1@dot.state.tx.us

Table 1 – West Central Texas Stakeholder Agencies and Contacts (continued)

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
TxDOT Abilene District	Roy Wright	4250 North Clack Abilene, Texas 79601	325-676-6805	rwright@dot.state.tx.us
TxDOT Austin Traffic Operations	Alex Power	Attn: TRF-Cedar Park #51 125 East 11th Street Austin, Texas 78701-2483	512-506-5153	apower@dot.state.tx.us
TxDOT Brownwood District	Tom Dahl	1133 North Hwy 281 Lampasas, Texas 76550	512-556-5435	N/A
TxDOT Brownwood District	Howard Holland	2495 Hwy 183 N Brownwood, Texas 76802	325-643-0417	N/A
TxDOT Brownwood District	Bryan Raschke	2150 CR 381 Brownwood, Texas 76801	325-643-0320	N/A
TxDOT Brownwood District	Elias Rmeili	2495 US 183 N Brownwood, Texas 76801	325-643-0441	ermeili@dot.state.tx.us
TxDOT Brownwood District	Larry Smith	906 E. Main Eastland, Texas 76448	254-629-3845	N/A
US Geological Survey	Dave Holmes	3010 Buchanan Wichita Falls, Texas 76308	940-692-4283	dholmes@usgs.gov
US Geological Survey	Jimmy Pond	944 Ahoyo Drive San Angelo, Texas 76903	325-944-4600	jgpond@usgs.gov

2. PRIORITIZATION OF MARKET PACKAGES

2.1 Prioritization Process

Of the 75 available market packages in the National ITS Architecture Version 4.0, 35 were selected and customized for deployment in the West Central Texas Region. Stakeholders were asked to prioritize the market packages into high, medium, and low priorities, based on regional needs, feasibility, and likelihood of deployment, and overall contribution of the market package to the goals and vision for ITS functionality in the Region. A summary of these prioritized market packages is shown in **Table 2**.

The market package prioritization was a key factor in developing recommendations for ITS deployment and integration in the West Central Texas Region. These priorities identified the key needs and services that are desired in the West Central Texas Region, as well as the interfaces that need to be established to provide integrated functionality and establish communication between elements.

This section includes detailed descriptions of the prioritized market packages for the West Central Texas Region. The market packages are organized into high, medium, and low priorities. It is important to note that the high, medium, and low prioritization does not necessarily correspond to any specific time frame (such as five, ten, or twenty 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 were other factors for prioritizing the market packages. Other considerations included whether or not the market package was better suited for private deployment and operations rather than public. As an example, ISP-based Route Guidance might be viewed as a valuable traveler information service for motorists in the Region, but stakeholders felt this market package was best suited for deployment by a private service provider, and as such, deemed it a low priority for agencies in the Region.

Each market package in the following subsections includes:

- A brief definition of the market package (which have been modified from the National ITS Architecture definitions);
- Any existing infrastructure from that market package that is already existing in the West Central Texas 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.

Table 2 – Summary of Prioritized Market Packages for the West Central Texas Region

High Priority	Medium Priority	Low Priority
▪ Network Surveillance ▪ Surface Street Control ▪ Traffic Information Dissemination ▪ Regional Traffic Control ▪ Incident Management System ▪ Standard Railroad Grade Crossing ▪ Railroad Operations Coordination ▪ Emergency Response ▪ Road Weather Data Collection ▪ Weather Information Processing and Distribution ▪ Work Zone Management ▪ Maintenance and Construction Activity Coordination ▪ Transit Vehicle Tracking ▪ Transit Fixed-Route Operations ▪ Demand Response Transit Operations ▪ Transit Passenger and Fare Management ▪ Transit Security ▪ Transit Traveler Information ▪ Weigh-in-Motion ▪ HAZMAT Management ▪ Broadcast Traveler Information ▪ ITS Data Mart	▪ Freeway Control ▪ Speed Monitoring ▪ Emergency Vehicle Routing ▪ Emergency Evacuation by Transit ▪ Multi-modal Coordination ▪ Roadway Maintenance and Construction	▪ Probe Surveillance ▪ Maintenance and Construction Vehicle Tracking ▪ Maintenance and Construction Vehicle Maintenance ▪ Work Zone Safety Monitoring ▪ Transit Maintenance ▪ ISP Based Route Guidance ▪ ITS Data Warehouse

2.2 High Priority Market Packages

Market packages that were selected as high priorities for the West Central Texas Region are listed and described in **Table 3**. These market packages typically represent systems or functions that serve as foundations on which to build regional ITS programs. Listed in this section are market packages that address baseline control, monitoring and coordination technologies for surface streets and freeways, road/weather conditions data gathering, transit, incident management and emergency response.

Many of these high priority market packages have components that are in various stages of deployment and operation in the West Central Texas Region; that is, there are already systems and technologies deployed to deliver some of these high priority services and functions. For example, the TxDOT Abilene District closed loop signal systems and VIVDS have already been deployed and these are key components of the Surface Street Control market package. Although these devices are in place, this market package is still listed as a high priority. There are additional capabilities and functionality contained in this market package that are planned for implementation in the near-term, thus building on the existing infrastructure and expanding the services of this particular market package in the West Central Texas Region.

Table 3 – High Priority Market Packages for the West Central Texas Region

Network Surveillance (ATMS01)	**High Priority**
This market package includes traffic detectors, other surveillance equipment, the supporting field equipment, and wireline communications to transmit the collected data back to the Traffic Management Subsystem. The derived data can be used locally or remotely. The data generated by this market package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect equipment faults, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Information Service Provider (ISP) Subsystem.	
Existing Infrastructure ▪ TxDOT Abilene Closed Loop Signal System ▪ TxDOT Abilene VIVDS ▪ TxDOT Brownwood Closed Loop Signal System ▪ TxDOT Brownwood VIVDS ▪ City of Abilene Closed Loop Signal System	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District ▪ City of Abilene
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Abilene CCTV Implementation Phase 1 ▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 1 ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 1	
Additional Needs ▪ City of Abilene CCTV Camera Implementation ▪ City of Abilene Closed Loop Signal System Expansion Phase 1 ▪ City of Abilene Closed Loop Signal System Expansion Phase 2 ▪ City of Abilene Closed Loop Signal System Expansion Phase 3 ▪ City of Abilene Flood Detection Stations Phase 1 ▪ City of Abilene Flood Detection Stations Phase 2 ▪ City of Abilene Traffic Operations Center Development/Expansion ▪ City of Brownwood Closed Loop Signal System Implementation Phase 3 ▪ City of Brownwood Closed Loop Signal System Implementation Phase 1 ▪ City of Brownwood Closed Loop Signal System Implementation Phase 2 ▪ City of Brownwood Flood Detection Stations Phase 1 ▪ City of Brownwood Flood Detection Stations Phase 2 ▪ City of Brownwood Traffic Operations Center Development/Expansion ▪ Portable CCTV Emergency Command ▪ TxDOT Abilene CCTV Implementation Phase 2 ▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 2	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Network Surveillance (ATMS01)	High Priority
Additional Needs (continued)	
▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 3 ▪ TxDOT Abilene RWIS Implementation Phase 1 ▪ TxDOT Abilene RWIS Implementation Phase 2 ▪ TxDOT Abilene TMC Expansion ▪ TxDOT Brownwood CCTV Implementation Phase 1 ▪ TxDOT Brownwood CCTV Implementation Phase 2 ▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 2 ▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 3 ▪ TxDOT Brownwood RWIS Implementation Phase 1 ▪ TxDOT Brownwood RWIS Implementation Phase 2 ▪ TxDOT Brownwood TMC Expansion	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Surface Street Control (ATMS03)	**High Priority**
This market package provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management. A range of traffic signal control systems are represented by this market package ranging from static pre-timed control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This market package is consistent with typical urban traffic signal control systems.	
Existing Infrastructure ▪ TxDOT Abilene TMC ▪ TxDOT Abilene Closed Loop Signal System ▪ TxDOT Abilene VIVDS ▪ TxDOT Abilene Railroad Traffic Signal Preemption ▪ TxDOT Abilene School Zone Flasher Paging System ▪ TxDOT Brownwood TMC ▪ TxDOT Brownwood Closed Loop Signal System ▪ TxDOT Brownwood VIVDS ▪ TxDOT Brownwood Railroad Traffic Signal Preemption ▪ TxDOT Brownwood School Zone Flasher Paging System ▪ City of Abilene Closed Loop Signal System ▪ City of Abilene Emergency Vehicle Signal Preemption for Fire	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District ▪ City of Abilene
Planned Projects ▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 1 ▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 1	
Additional Needs ▪ City of Abilene CCTV Camera Implementation ▪ City of Abilene Closed Loop Signal System Expansion Phase 1 ▪ City of Abilene Closed Loop Signal System Expansion Phase 2 ▪ City of Abilene Closed Loop Signal System Expansion Phase 3 ▪ City of Abilene Emergency Vehicle Signal Preemption ▪ City of Abilene Traffic Operations Center Development/Expansion ▪ City of Brownwood Closed Loop Signal System Implementation Phase 1 ▪ City of Brownwood Closed Loop Signal System Implementation Phase 2 ▪ City of Brownwood Closed Loop Signal System Implementation Phase 3 ▪ City of Brownwood Emergency Vehicle Signal Preemption	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Surface Street Control (ATMS03)	High Priority
Additional Needs (continued)	
▪ City of Brownwood Flooding Detour Plans	
▪ City of Brownwood Traffic Operations Center Development/Expansion	
▪ Municipal Closed Loop Signal System Implementation	
▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 2	
▪ TxDOT Abilene Closed Loop Signal System Expansion Phase 3	
▪ TxDOT Abilene Emergency Vehicle Signal Preemption Implementation	
▪ TxDOT Abilene TMC Expansion	
▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 2	
▪ TxDOT Brownwood Closed Loop Signal System Expansion Phase 3	
▪ TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation	
▪ TxDOT Brownwood TMC Expansion	
▪ West Central Texas Detour Plans	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Traffic Information Dissemination (ATMS06)	**High Priority**
This market package allows traffic information and road/bridge closures due to construction, maintenance, and weather, to be disseminated to drivers and vehicles using roadway equipment such as dynamic message signs or highway advisory radio. This package also covers the equipment and interfaces that provide traffic information from a TMC to the media (for instance via a direct tie-in between a TMC and radio or television station computer systems), Transit Management, Emergency Management, and ISPs.	
Existing Infrastructure ▪ TxDOT Abilene Portable DMS ▪ TxDOT Brownwood Portable DMS	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT Center to Center Communications ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ City of Abilene EOC/TxDOT Abilene District TMC Connection ▪ City of Abilene Traffic Operations Center Development/Expansion ▪ City of Brownwood EOC/TxDOT Brownwood District TMC Connection ▪ City of Brownwood Traffic Operations Center Development/Expansion ▪ DPS/TxDOT Abilene District TMC Connection ▪ DPS/TxDOT Brownwood District TMC Connection ▪ ISP-Based Route Guidance ▪ Media Liaison and Coordination ▪ Municipal TOC/TxDOT TMC Communications Connection ▪ Regional 511 Advanced Traveler Information System Server ▪ State EOC/TxDOT Abilene TMC Communications Connection ▪ State EOC/TxDOT Brownwood TMC Communications Connection ▪ TxDOT Abilene DMS Implementation Phase 1 ▪ TxDOT Abilene DMS Implementation Phase 2 ▪ TxDOT Abilene TMC Expansion ▪ TxDOT Brownwood DMS Implementation Phase 1 ▪ TxDOT Brownwood DMS Implementation Phase 2 ▪ TxDOT Brownwood TMC Expansion ▪ TxDOT Highway Advisory Radio	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Regional Traffic Control (ATMS07)	**High Priority**
This market package provides for the sharing of traffic information and control among TMCs to support a regional control strategy. This package relies on roadside instrumentation supported by the Surface Street Control and Freeway Control Market Packages and adds hardware, software, and communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. The extent of information and control sharing is determined through working arrangements between jurisdictions.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT Center-to-Center Communication	
Additional Needs ▪ City of Abilene TOC/TxDOT Abilene TMC Communications Connection ▪ City of Brownwood TOC/TxDOT Brownwood TMC Communications Connection ▪ Municipal TOC/TxDOT TMC Communications Connection	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Incident Management System (ATMS08)	**High Priority**
This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. closed-circuit television [CCTV]) and through regional coordination with other traffic management, maintenance and construction management, and emergency management centers as well as weather service entities and event promoters. Information from these diverse sources is collected and correlated by this market package to detect and verify incidents and implement an appropriate response. The response may include traffic control strategy modifications or resource coordination between center subsystems. The coordination with emergency management might be through a computer-aided dispatch (CAD) system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination, Broadcast Traveler Information, or Interactive Traveler Information market packages.	
Existing Infrastructure ▪ TxDOT Abilene TMC ▪ TxDOT Abilene Portable DMS ▪ TxDOT Brownwood TMC ▪ TxDOT Brownwood Portable DMS	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Abilene CCTV Implementation Phase 1 ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT Center to Center Communication	
Additional Needs ▪ City of Abilene CCTV Camera Implementation ▪ City of Abilene Emergency Vehicle Signal Preemption Implementation ▪ City of Abilene EOC/TxDOT Abilene District TMC Connection ▪ City of Abilene TOC/TxDOT Abilene TMC Communications Connection ▪ City of Abilene Traffic Operations Center Development/Expansion ▪ City of Brownwood Emergency Vehicle Signal Preemption Implementation ▪ City of Brownwood EOC/TxDOT Brownwood District TMC Connection ▪ City of Brownwood Flooding Detour Plans ▪ City of Brownwood TOC/TxDOT Brownwood TMC Communications Connection ▪ City of Brownwood Traffic Operations Center Development/Expansion ▪ DPS/TxDOT Abilene District TMC Connection ▪ DPS/TxDOT Brownwood District TMC Connection ▪ Media Liaison and Coordination ▪ Municipal TOC/TxDOT TMC Communications Connection ▪ Regional 511 Advanced Travel Information System Server ▪ State EOC/TxDOT Abilene TMC Communications Connection ▪ State EOC/TxDOT Brownwood TMC Communications Connection	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Incident Management System (ATMS08)	High Priority
Additional Needs (continued) ▪ TxDOT Abilene CCTV Implementation Phase 2 ▪ TxDOT Abilene DMS Implementation Phase 1 ▪ TxDOT Abilene DMS Implementation Phase 2 ▪ TxDOT Abilene Emergency Vehicle Signal Preemption Implementation ▪ TxDOT Abilene Lane Control Signals ▪ TxDOT Abilene TMC Expansion ▪ TxDOT Brownwood CCTV Implementation Phase 1 ▪ TxDOT Brownwood CCTV Implementation Phase 2 ▪ TxDOT Brownwood DMS Implementation Phase 1 ▪ TxDOT Brownwood DMS Implementation Phase 2 ▪ TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation ▪ TxDOT Brownwood TMC Expansion ▪ TxDOT Highway Advisory Radio ▪ West Central Texas Detour Plans	

Standard Railroad Grade Crossing/ Railroad Operations Coordination (ATMS13/ATMS15)	High Priority
This market package manages highway traffic at highway-rail intersections (HRIs) where rail operational speeds are less than 80 miles per hour. Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification by interfaced wayside equipment of an approaching train. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the traffic management subsystem. The Railroad Operations Coordination component provides an additional level of strategic coordination between rail operations and traffic management centers. Rail operations provides train schedules, maintenance schedules, and any other forecast events that will result in HRI closures. This information is used to develop forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.	
Existing Infrastructure ▪ TxDOT Abilene Railroad Traffic Signal Preemption ▪ TxDOT Brownwood Railroad Traffic Signal Preemption	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District
Planned Projects None identified at this time	
Additional Needs ▪ City of Abilene Railroad Operations Coordination	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Emergency Response (EM01)	**High Priority**
This market package includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification and coordinated response between agencies.	
Existing Infrastructure ▪ Taylor County Computer Aided Dispatch for Police, Fire, EMS and Sheriff ▪ City of Abilene Police Department Mobile Data Terminals ▪ City of Abilene Emergency Vehicle Signal Preemption for Fire	**Agency** ▪ Taylor County Sheriff ▪ City of Abilene
Planned Projects None identified at this time	
Additional Needs ▪ City of Abilene Emergency Vehicle Signal Preemption Implementation ▪ City of Abilene EOC/TxDOT Abilene District TMC Connection ▪ City of Abilene Police AVL ▪ City of Brownwood Emergency Vehicle Signal Preemption Implementation ▪ City of Brownwood EOC/TxDOT Brownwood District TMC Connection ▪ DPS AVL and MDTs ▪ DPS/TxDOT Abilene District TMC Connection ▪ DPS/TxDOT Brownwood District TMC Connection ▪ Portable CCTV Emergency Command ▪ State EOC/TxDOT Abilene TMC Communications Connection ▪ State EOC/TxDOT Brownwood TMC Communications Connection ▪ TxDOT Abilene Emergency Vehicle Signal Preemption Implementation ▪ TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Road Weather Data Collection (MC03)	**High Priority**
This market package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed road weather information system (RWIS) stations at the roadside, sensing of the roadway environment can also occur from sensor systems located on Maintenance and Construction Vehicles. The collected environmental data is used by the Weather Information Processing and Distribution Market Package to process the information and help operators make decisions on operations.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ City of Abilene Flood Detection Stations Phase 1 ▪ City of Abilene Flood Detection Stations Phase 2 ▪ City of Brownwood Flood Detection Stations Phase 1 ▪ City of Brownwood Flood Detection Stations Phase 2 ▪ TxDOT Abilene RWIS Implementation Phase 1 ▪ TxDOT Abilene RWIS Implementation Phase 2 ▪ TxDOT Brownwood RWIS Implementation Phase 1 ▪ TxDOT Brownwood RWIS Implementation Phase 2	

Weather Information Processing and Distribution (MC04)	**High Priority**
This market package processes and distributes the environmental information collected from the Road Weather Data Collection market package. This market package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, and dense fog, so system operators and decision support systems can make decisions on corrective actions to take. The continuing updates of road condition information and current temperatures can be used by system operators to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination market package, and aid operators in scheduling work activity.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT Center to Center Communications ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Travel Information System Server	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Work Zone Management (MC08)	**High Priority**
This market package directs activity in work zones, controlling traffic through portable DMS and informing other groups of activity (e.g., ISP, TM, other maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones.	
Existing Infrastructure ▪ TxDOT Abilene Portable DMS ▪ TxDOT Brownwood Portable DMS ▪ Highway Conditions Reporting System	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District
Planned Projects ▪ TxDOT Center-to-Center Communications ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Travel Information System Server ▪ TxDOT Abilene DMS Implementation Phase 1 ▪ TxDOT Abilene DMS Implementation Phase 2 ▪ TxDOT Brownwood DMS Implementation Phase 1 ▪ TxDOT Brownwood DMS Implementation Phase 2 ▪ TxDOT Highway Advisory Radio	

Maintenance and Construction Activity Coordination (MC10)	**High Priority**
This market package supports the dissemination of maintenance and construction activity information to centers which can utilize it as part of their operations, or to the ISPs who can provide the information to travelers.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ TxDOT Center-to-Center Communications ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Travel Information System Server	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Transit Vehicle Tracking (APTS1)	**High Priority**
This market package monitors current transit vehicle location using an Automated Vehicle Location (AVL) System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ CityLink AVL and Mobile Data Terminals	
Additional Needs ▪ CARR AVL ▪ Double Mountain Coach AVL ▪ Hill Country Transit AVL and Mobile Data Terminals ▪ Hill Country Transit CAD	

Transit Fixed-Route Operations (APTS2)	**High Priority**
This market package performs vehicle routing and scheduling, as well as automatic driver assignment and system monitoring for fixed-route transit services. This service determines current schedule performance using AVL data and provides information displays for the Transit Management Subsystem. Static and real time transit data is exchanged with ISPs where it is integrated with that from other transportation modes (e.g. rail, ferry, air) to provide the public with integrated and personalized dynamic schedules.	
Existing Infrastructure ▪ CityLink Transit Operations Center ▪ CityLink Website ▪ CityLink Computer Aided Dispatch and Scheduling System	**Agency** ▪ City of Abilene
Planned Projects ▪ City Link AVL and Mobile Data Terminals	
Additional Needs ▪ CityLink Automated Passenger Counters ▪ CityLink CCTV at Transfer Stations ▪ CityLink Electronic Fare Payment ▪ CityLink Maintenance System ▪ CityLink On-Board Security Cameras ▪ Multi-modal Coordination	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Demand Response Transit Operations (APTS3)	**High Priority**
This market package performs vehicle routing and scheduling as well as automatic driver assignment and monitoring for demand responsive transit services. This package monitors the current status of the transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Transit Management Subsystem provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet. This service includes the capability for a traveler request for personalized transit services to be made through the ISP Subsystem.	
Existing Infrastructure ▪ CityLink Transit Operations Center ▪ CityLink Website ▪ CityLink Computer Aided Dispatch and Scheduling System ▪ Hill Country Transit Center Dispatch ▪ Hill Country Transit Website	**Agency** ▪ City of Abilene ▪ Hill Country Transit District
Planned Projects ▪ CityLink AVL and Mobile Data Terminals ▪ Hill Country Transit Emergency Silent Alarms	
Additional Needs ▪ CARR AVL ▪ CARR Mobile Data Terminals ▪ CARR Transit Data Management ▪ CARR Transit Maintenance System ▪ CityLink Electronic Fare Payment ▪ CityLink Maintenance System ▪ Double Mountain Coach AVL ▪ Double Mountain Coach Emergency Silent Alarms ▪ Double Mountain Coach Mobile Data Terminals ▪ Double Mountain Coach On-Board Security Cameras ▪ Double Mountain Coach Transit Maintenance System ▪ Hill Country Transit Automated Passenger Counters ▪ Hill Country Transit AVL and Mobile Data Terminals ▪ Hill Country Transit CAD ▪ Hill Country Transit Data Management ▪ Hill Country Transit Electronic Fare Payment ▪ Hill Country Transit Maintenance System ▪ Hill Country Transit On-Board Security Cameras Phase 1 ▪ Hill Country Transit On-Board Security Cameras Phase 2 ▪ Multi-modal Coordination	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Transit Passenger and Fare Management (APTS4)	**High Priority**
This market package manages passenger loading and fare payments on-board vehicles using electronic means. It allows transit patrons to use a traveler card or other electronic payment device. Sensors mounted on the vehicle permit the driver and central operations to determine vehicle loads, and readers located either in the infrastructure or on-board the transit vehicle allow electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Subsystem.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ CityLink Automated Passenger Counters ▪ CityLink Electronic Fare Payment ▪ Hill Country Transit Automated Passenger Counters ▪ Hill Country Transit Electronic Fare Payment	

Transit Security (APTS5)	**High Priority**
This market package provides for the physical security of transit passengers. An on-board security system is deployed to perform surveillance and warn of potentially hazardous situations. Public areas (e.g. stops, park and ride lots, stations) are also monitored. Information is communicated to the Transit Management Subsystem using wireless or wireline infrastructure. Security related information is also transmitted to the Emergency Management Subsystem when an emergency is identified that requires an external response. Incident information is communicated to the Information Service Provider.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ Hill Country Transit Emergency Silent Alarms	
Additional Needs ▪ City Link CCTV at Transfer Stations ▪ CityLink On-Board Security Cameras ▪ Double Mountain Coach Emergency Silent Alarms ▪ Double Mountain Coach On-Board Security Cameras ▪ Hill Country Transit On-Board Security Cameras Phase 1 ▪ Hill Country Transit On-Board Security Cameras Phase 2	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Transit Traveler Information (APTS8)	**High Priority**
This market package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this market package.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs None identified at this time	

Weigh-In-Motion (CVO06)	**High Priority**
This market package provides for high speed weigh-in-motion with or without AVI capabilities. This market package provides the roadside equipment that could be used as a stand-alone system or to augment the Electronic Clearance (CVO03) market package.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ TxDOT Abilene Weigh-in-Motion Phase 1 ▪ TxDOT Abilene Weigh-in-Motion Phase 2 ▪ TxDOT Brownwood Weigh-in-Motion Phase 1 ▪ TxDOT Brownwood Weigh-in-Motion Phase 2	

HAZMAT Management (CVO10)	**High Priority**
This market package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of Hazardous Materials (HAZMAT) materials and incidents. HAZMAT tracking is performed by the Fleet and Freight Management Subsystem. The Emergency Management Subsystem is notified by the Commercial Vehicle if an incident occurs and coordinates the response. The response is tailored based on information that is provided as part of the original incident notification or derived from supplemental information provided prior to the beginning of the trip or gathered following the incident depending on the selected policy and implementation.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs None identified at this time	

Table 3 – High Priority Market Packages for the West Central Texas Region (continued)

Broadcast Traveler Information (ATIS1)	**High Priority**
This market package collects traffic conditions, advisories, general public transportation information, toll and parking information, incident information, air quality and weather information, and broadly disseminates this information through existing infrastructure and low cost user equipment (e.g., FM subcarrier, cellular data broadcast). This market package differs from the Traffic Information Dissemination market package, which provides localized highway advisory radio (HAR) and DMS information capabilities. The information may be provided directly to travelers by an ISP or other traveler service providers so that they can better inform travelers of conditions. Successful deployment of this market package relies on availability of real-time traveler information from roadway instrumentation, probe vehicles, or other sources.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ TxDOT Abilene ATMS Implementation ▪ TxDOT Brownwood ATMS Implementation ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ ISP-Based Route Guidance ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Traveler Information System Server	

ITS Data Mart (AD1)	**High Priority**
This market package provides a focused archive that houses data collected and owned by a single agency, district, private sector provider, research institution, or other organization. This focused archive typically includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides general query and report access to archive data users.	
Existing Infrastructure ▪ City of Abilene Crash Database ▪ Statewide Crash Record Information System ▪ Hill Country Transit Ridership Database ▪ CityLink Ridership Database	**Agency** ▪ City of Abilene ▪ DPS/TxDOT ▪ Hill Country Transit ▪ City of Abilene
Planned Projects None identified at this time	
Additional Needs ▪ CARR Transit Data Management ▪ Hill Country Transit Data Management	

2.3 Medium Priority Market Packages

Table 4 outlines market packages that were deemed medium priority by stakeholders in the West Central Texas Region. These market packages were identified as useful and desirable services and functions for the Region, although very few of these market packages have existing infrastructure in place or planned over the next few years. The feasibility of funding for these market packages was a factor in the prioritization. Availability and maturity of technology also was a consideration, particularly for the maintenance and construction management market packages. Many of these market packages were recently developed and added to the National ITS Architecture, and are not yet widely deployed.

Table 4 – Medium Priority Market Packages for the West Central Texas Region

Freeway Control (ATMS04)	**Medium Priority**
This market package provides the communications and roadside equipment to support ramp control, lane controls, and interchange control for freeways. This package is consistent with typical urban traffic freeway control systems. This package incorporates the instrumentation included in the Network Surveillance Market Package to support freeway monitoring and adaptive strategies as an option. This market package also includes the capability to utilize surveillance information for detection of incidents.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ TxDOT Abilene Lane Control Signals	

Speed Monitoring (ATMS19)	**Medium Priority**
This market package monitors the speeds of vehicles traveling through a roadway system. If the speed is determined to be excessive, roadside equipment can suggest a safe driving speed. Environmental conditions may be monitored and factored in to the safe speed advisories that are provided to the motorist. This service can also support notifications to an enforcement agency to enforce the speed limit on a roadway system.	
Existing Infrastructure ▪ TxDOT Abilene Speed Trailers ▪ TxDOT Abilene Speed Detection and Warning Beacons ▪ TxDOT Abilene School Zone Radar and Speed Display Signs ▪ TxDOT Brownwood Speed Trailers	**Agency** ▪ TxDOT Abilene District ▪ TxDOT Brownwood District
Planned Projects None identified at this time	
Additional Needs None identified at this time	

Table 4 – Medium Priority Market Packages for the West Central Texas Region (continued)

Emergency Vehicle Routing (EM02)	**Medium Priority**
This market package supports automated vehicle location and dynamic routing of emergency vehicles. The service also supports coordination with the Traffic Management Subsystem, collecting detailed road network conditions and requesting special priority or other specific emergency traffic control strategies on the selected route(s). The service provides for information exchange between care facilities and both the Emergency Management Subsystem and emergency vehicles.	
Existing Infrastructure ▪ Taylor County Computer Aided Dispatch for Police, Fire, EMS and Sheriff ▪ City of Abilene Police Department Mobile Data Terminals ▪ City of Abilene Emergency Vehicle Signal Preemption for Fire	**Agency** ▪ Taylor County Sheriff ▪ City of Abilene
Planned Projects None identified at this time	
Additional Needs ▪ City of Abilene Emergency Vehicle Signal Preemption ▪ City of Abilene Police AVL ▪ City of Brownwood Emergency Vehicle Signal Preemption ▪ City of Brownwood Flooding Detour Plans ▪ DPS AVL and MDTs ▪ DPS/TxDOT Abilene District TMC Connection ▪ DPS/TxDOT Brownwood District TMC Connection ▪ State EOC/TxDOT Abilene TMC Communication Connection ▪ State EOC/TxDOT Brownwood TMC Communication Connection ▪ TxDOT Abilene Emergency Vehicle Signal Preemption Implementation ▪ TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation ▪ West Central Texas Detour Plans	

Table 4 – Medium Priority Market Packages for the West Central Texas Region (continued)

Emergency Evacuation by Transit (EMEX1)	**Medium Priority**
This is a user defined market package created for the West Central Texas Region to meet stakeholder needs. The market package will allow coordination directly from emergency operations centers (EOCs) to transit agencies to assist in the evacuation of those without transportation means. It provides for automated service requests and real time updating of routes and status for EOC coordinators. Some of the user defined flows will provide Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs None identified at this time	

Multi-modal Coordination (APTS7)	**Medium Priority**
This market package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transfer points and also improve operating efficiency. Coordination between traffic and transit management is intended to improve on-time performance of the transit system to the extent that this can be accommodated without degrading overall performance of the traffic network. More limited local coordination between the transit vehicle and the individual intersection for signal priority is also supported by this package.	
Existing Infrastructure None identified	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ Multi-modal Coordination	

Table 4 – Medium Priority Market Packages for the West Central Texas Region (continued)

Roadway Maintenance and Construction (MC07)	**Medium Priority**
This market package supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal, routine maintenance activities, and repair and maintenance of both ITS and non-ITS equipment on the roadway. Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.	
Existing Infrastructure None identified	**Agency**
Planned Projects ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ City of Abilene Flood Detection Stations Phase 1 ▪ City of Abilene Flood Detection Stations Phase 2 ▪ City of Brownwood Flood Detection Stations Phase 1 ▪ City of Brownwood Flood Detection Stations Phase 2 ▪ TxDOT Abilene RWIS Implementation Phase 1 ▪ TxDOT Abilene RWIS Implementation Phase 2 ▪ TxDOT Brownwood RWIS Implementation Phase 1 ▪ TxDOT Brownwood RWIS Implementation Phase 2	

2.4 Low Priority Market Packages

Seven of the market packages that were identified and customized for the West Central Texas Region were ranked as low priority by stakeholders. These market packages are listed in **Table 5**. The services contained in these lower priority market packages were deemed useful and desirable for the Region, but stakeholders did not feel that public agencies should put a strong focus on these market packages in the near-term. These market packages were included as part of the Regional ITS Architecture so as not to preclude them from future deployment in the Region.

Some of these market packages were identified as candidates for private sector deployment and operations, such as ISP-Based Route Guidance. Others, such as Maintenance and Construction Vehicle Maintenance, are just more feasible for future implementation.

Table 5 – Low Priority Market Packages for the West Central Texas Region

Market Package Name	Description	Comments
Probe Surveillance (ATMS02)	This market package provides an alternative approach for surveillance of the roadway network. Two general implementation paths are supported by this market package: 1) wide-area wireless communications between the vehicle and Information Service Provider is used to communicate current vehicle location and status and 2) dedicated short range communications between the vehicle and roadside is used to provide equivalent information directly to the Traffic Management Subsystem. It requires either wide area or short-range communications equipment, roadside beacons and wireline communications for the short-range communications option, data reduction software, and utilizes wireline links between the Traffic Management Subsystem and Information Service Provider Subsystem to share the collected information. Both “Opt out” and “Opt in” strategies are available to ensure that the user has the ability to turn off the probe functions to ensure individual privacy.	This market package was not deemed a high priority at this time. It is anticipated that at some time in the future probe surveillance could provide a feasible method for collecting traffic data with minimal infrastructure deployment if transponder saturation levels in the Region increase.
Maintenance and Construction Vehicle Tracking (MC01)	This market package will track the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.	This market package was not deemed a high priority at this time, however, it was expected that the information from this market package may be useful to the Region some time in the future if maintenance activities were to become more automated. Included in this market package would be instrumentation of maintenance and construction vehicles with AVL.

Table 5 – Low Priority Market Packages for the West Central Texas Region (continued)

Market Package Name	Description	Comments
Maintenance and Construction Vehicle Maintenance (MC02)	This market package performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities on vehicles and other maintenance and construction equipment. It includes on board sensors capable of automatically performing diagnostics for maintenance and construction vehicles, and the systems that collect this diagnostic information and use it to schedule and manage vehicle maintenance.	Based on the current state of technology, this market package was not identified as needed in the West Central Texas Region at this time. As technology evolves, the Region may consider implementation of this market package in the future.
Work Zone Safety Monitoring (MC09)	This market package includes systems and strategies to improve work crew safety and reduce collisions between the motoring public and maintenance vehicles and activities. Included in this market package is detection for vehicle intrusions to the work zone and warning systems to alert workers and drivers of potential safety hazards. This market package support both stationary and mobile work zones.	Based on the current state of technology, this market package was not identified as needed in the West Central Texas Region at this time. As technology evolves, the Region may consider implementation of this market package in the future.
Transit Maintenance (APTS6)	This market package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Subsystem. Hardware and software in the Transit Management Subsystem processes this data and schedules preventative and corrective maintenance.	Based on the current state of technology, this market package was identified as a future need in the West Central Texas Region. As technology evolves, the Region has expressed an interest in implementing this market package.
ISP-Based Route Guidance (ATIS5)	This market package offers the user pre-trip route planning and turn-by-turn route guidance services, which are generated by an ISP. Routes may be based on static information or reflect real time network conditions. This approach simplifies the user equipment requirements and can provide the infrastructure better information on which to predict future traffic. The package includes two way data communications and optionally also equips the vehicle with the databases, location determination capability, and display technology to support turn by turn route guidance.	This market package is best suited for deployment and ongoing operations by a private sector ISP. Fee-based subscription services are typically required for delivery of this service. Stakeholders recognized a need to support this market package but will not take an active role in its implementation.

Table 5 – Low Priority Market Packages for the West Central Texas Region (continued)

Market Package Name	Description	Comments
ITS Data Warehouse (AD2)	This market package includes all of the data collection and management capabilities provided by the ITS Data Mart, and adds the functionality and interface definitions that allow the collection of data from multiple agencies and data sources spanning across modal and jurisdictional boundaries. It performs the additional transformations and provides the additional data management features that are necessary so that all the data can be managed in a single repository. The potential for large volumes of carried data suggests additional on-line analysis and data mining features that are also included in this market package in addition to the basic query and reporting user access features offered by the ITS Data Mart.	The West Central Texas Region might want to consider this market package as a future deployment.

3. PRIORITIZATION OF PROJECTS

In order to achieve the vision of the Regional ITS Architecture, a Region must deploy carefully developed projects that provide the functionality and interoperability identified in the architecture. A key step toward that vision is the development of an ITS Deployment Plan that identifies specific projects, timeframes, and responsible agencies.

Input from all stakeholders is required in order for the stakeholders to have ownership of the ITS Deployment Plan and also to be sure that the plan has realistically identified projects and timeframes for the Region. Cost is another important factor. Cost can vary a great deal for many ITS elements, depending on the level of deployment, maturity of the technology, type of communications, etc. For example, freeway network surveillance could be adequately achieved for one Region by the deployment of still frame CCTV cameras only at freeway interchanges. In another Region, there may be a desire for full motion cameras deployed at one mile intervals to provide complete coverage of the freeway. The infrastructure and telecommunications costs for these two projects would vary a great deal, yet either one could be suitable for a particular Region.

In order to achieve input from stakeholders, a workshop was held in the West Central Texas Region on March 25, 2004 to present the draft Regional ITS Deployment Plan and discuss potential projects. Each project recommended for the Regional ITS Deployment Plan was discussed, and consensus was reached by the stakeholders on the project description and the timeframe for implementation.

In the following sections, projects are categorized into short-term projects (5-year deployment timeframe), mid-term projects (10-year deployment timeframe), and long-term projects (20-year deployment timeframe). For each timeframe, a summary table has been included that provides a brief project description, responsible agency, probable cost, an indication as to whether funding has been identified, and an estimated duration for the project to be designed and implemented. The agency identified as the responsible agency will be responsible for implementation, operations, and maintenance unless otherwise noted.

Following each table, a more detailed description of individual projects is included. This section also lists the market packages associated with each project and any pre-requisite projects that are required.

3.1 Short-Term Projects (5-Year)

Table 6 provides a description of projects for the West Central Texas Region in the 5-year timeframe. These projects represent the highest priority for the Region and should be strongly considered for implementation in the short-term. Immediately following **Table 6** are project descriptions for each of the short-term recommendations.

3.2 Mid-Term Projects (10-Year)

Table 7 provides a description of projects in the 10-year timeframe. Several of these projects are continuations of projects that will begin in the 5-year timeframe. These projects are important to the Region, but will need further review at the time of their deployment to ensure they are still a priority for the Region. Immediately following **Table 7** are project descriptions for each of the mid-term recommendations.

3.3 Long-Term Projects (20-Year)

Table 8 provides a description of projects in the 20-year timeframe. While these projects represent market packages and anticipated future needs identified for the Region, they will need to be closely reviewed prior to implementation. It is expected that a major update to the Region's ITS Deployment Plan will occur prior to year 10 which would allow stakeholders to reassess these long-term projects to be sure that they are still feasible for the Region. Immediately following **Table 8** are project descriptions for each of the long-term recommendations.

Table 6 – Short-Term Projects (5-Year)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management					
TxDOT Center-to-Center Communications (Statewide TxDOT District Communications)	Enhance coordination with other TxDOT Districts through the implementation of center-to-center communications between TxDOT Traffic Management Centers (TMCs)	TxDOT (Statewide)	N/A	Yes	1 year
TxDOT Abilene ATMS Implementation	Implement TxDOT Advanced Traffic Management System (ATMS) in TxDOT Abilene TMC	TxDOT Abilene	N/A	Yes	2 years
TxDOT Abilene TMC Expansion	Expand the TxDOT Abilene TMC. The expansion includes the implementation of end equipment to allow video feed and control for Video Image Vehicle Detector Systems (VIVDS) and closed-circuit television (CCTV) camera pan/tilt/zoom (PTZ).	TxDOT Abilene	$200,000	No	1 year
TxDOT Abilene Closed Loop Signal System Expansion Phase 1	Expand TxDOT closed loop signal system at signalized intersections throughout the Abilene District. Also includes the implementation of VIVDS.	TxDOT Abilene	To Be Determined	Yes	2 years
TxDOT Abilene DMS Implementation Phase 1	Implement dynamic message signs (DMS) along I-20 and other priority corridors for traffic information dissemination	TxDOT Abilene	$100,000/sign	No	1 year
TxDOT Abilene CCTV Implementation Phase 1	Implement CCTV cameras along I-20 and arterial routes in the Abilene District for traffic monitoring and incident detection	TxDOT Abilene	$20,000-$25,000/site	Yes	1 year
TxDOT Brownwood ATMS Implementation	Implement TxDOT ATMS in TxDOT Brownwood TMC	TxDOT (Statewide)	N/A	Yes	2 years
TxDOT Brownwood TMC Expansion	Expand the TxDOT Brownwood TMC. The expansion includes the implementation of end equipment to allow video feed and control for VIVDS and CCTV camera PTZ.	TxDOT Brownwood	$200,000	No	1 year
TxDOT Brownwood Closed Loop Signal System Expansion Phase 1	Expand the TxDOT closed loop signal system at signalized intersections throughout the Brownwood District. Also includes the implementation of VIVDS.	TxDOT Brownwood	To Be Determined	Yes	2 years

Table 6 – Short-Term Projects (5-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management (continued)					
TxDOT Brownwood DMS Implementation Phase 1	Implement DMS along I-20 at Ranger Hill for traffic information dissemination	TxDOT Brownwood	$100,000/sign	No	1 year
TxDOT Brownwood CCTV Implementation Phase 1	Implement CCTV cameras along I-20 in the Ranger Hill area for traffic monitoring and incident detection	TxDOT Brownwood	$20,000-$25,000/site	No	1 year
City of Abilene TOC/TxDOT Abilene TMC Communications Connection	Implement a connection between the City of Abilene TOC and the TxDOT Abilene District TMC to allow video sharing, traffic data sharing, and other joint functions.	TxDOT Abilene/City of Abilene	To Be Determined	No	1 year
City of Abilene Traffic Operations Center Development/Expansion	Implement/expand a traffic operations center for the City of Abilene for operation of closed-loop signal system	City of Abilene	To Be Determined	No	2 years
City of Abilene Closed Loop Signal System Expansion Phase 1	Expand the City of Abilene closed loop signal system at additional signalized intersections in the City of Abilene. Also includes the implementation of VIVDS.	City of Abilene	To Be Determined	No	2 years
City of Brownwood TOC/TxDOT Brownwood TMC Communications Connection	Implement a connection between the City of Brownwood TOC and the TxDOT Brownwood District TMC to allow video sharing, traffic data sharing, and other joint functions.	TxDOT Brownwood/City of Brownwood	To Be Determined	No	1 year
City of Brownwood Traffic Operations Center Development/Expansion	Implement/expand a traffic operations center for the City of Brownwood for operation of closed-loop signal system	City of Brownwood	To Be Determined	No	2 years
City of Brownwood Closed Loop Signal System Implementation Phase 1	Implement a closed loop signal system at signalized intersections in the City of Brownwood. Also includes the implementation of VIVDS.	City of Brownwood	To Be Determined	No	2 years
City of Brownwood Flooding Detour Plans	Develop detour plans for the City of Brownwood to utilize during flooding conditions	City of Brownwood	To Be Determined	No	1 year
West Central Texas Detour Plans	Develop detour plans for incidents along I-20 throughout the West Central Texas Region	TxDOT/City of Abilene	$100,000	No	1 year

Table 6 – Short-Term Projects (5-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management (continued)					
Media Liaison and Coordination	Develop agreements/enhanced coordination with local media to improve information sharing and dissemination. Provide CCTV camera feeds to media.	TxDOT/City of Brownwood/ City of Abilene	N/A	N/A	6 months
Emergency Management					
DPS/TxDOT Abilene District TMC Connection	Install connection between the Department of Public Safety (DPS) and the TxDOT Abilene District TMC for CCTV camera shared monitoring and control and data sharing	TxDOT Abilene/DPS	To Be Determined	No	3 months
DPS/TxDOT Brownwood District TMC Connection	Install connection between the DPS and the TxDOT Brownwood District TMC for CCTV camera shared monitoring and control and data sharing	TxDOT Brownwood/DPS	To Be Determined	No	3 months
State EOC/TxDOT Abilene TMC Communications Connection	Establish a connection between the State EOC and the TxDOT Abilene TMC for coordination and sharing of incident and traffic information	State EOC/TxDOT Abilene	To Be Determined	No	1 year
State EOC/TxDOT Brownwood TMC Communications Connection	Establish a connection between the State EOC and the TxDOT Brownwood TMC for coordination and sharing of incident and traffic information	State EOC/ TxDOT Brownwood	To Be Determined	No	1 year
TxDOT Abilene Emergency Vehicle Signal Preemption Implementation	Implement signal pre-emption for emergency vehicles at TxDOT Abilene District Signals	TxDOT Abilene/Cities	$8,000-$10,000/ intersection	No	1 year
TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation	Implement signal pre-emption for emergency vehicles at TxDOT Brownwood District Signals	TxDOT Brownwood/Cities	$8,000-$10,000/ intersection	No	1 year
City of Abilene Emergency Vehicle Signal Preemption	Expand signal pre-emption for emergency vehicles by implementing at additional City of Abilene intersections	City of Abilene	$8,000-$10,000/ intersection	No	1 year
City of Abilene Police AVL	Implement automated vehicle location (AVL) on City of Abilene police vehicles to provide location information	City of Abilene	$10,000/vehicle	No	2 years

Table 6 – Short-Term Projects (5-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Emergency Management (continued)					
City of Abilene EOC/TxDOT Abilene District TMC Connection	Install a connection between the City of Abilene Emergency Operations Center (EOC) and the TxDOT Abilene District TMC for emergency coordination	TxDOT Abilene/ City of Abilene	To Be Determined	No	3 months
City of Brownwood EOC/TxDOT Brownwood District TMC Connection	Install a connection between the City of Brownwood EOC and the TxDOT Brownwood District TMC for emergency coordination	TxDOT Brownwood/ City of Brownwood	To Be Determined	No	3 months
DPS AVL and MDTs	Implement AVL and mobile data terminals to provide location information of DPS vehicles and enable communication	DPS	$10,000/vehicle	No	3 years
Maintenance and Construction Management					
TxDOT HCRS Enhancement	Implement enhancements to the Highway Conditions Reporting System (HCRS). Improvements will be for both TxDOT Abilene and Brownwood Districts.	TxDOT (Statewide)	N/A	Yes (statewide initiative)	1 year
TxDOT Abilene RWIS Implementation Phase 1	Implement road weather information system (RWIS) sites in the TxDOT Abilene District to monitor road weather conditions including ice detection	TxDOT Abilene	$75,000 per site	No	1 year
TxDOT Brownwood RWIS Implementation Phase 1	Implement RWIS stations in the Ranger Hill area to monitor road weather conditions including ice detection	TxDOT Brownwood	$75,000 per site	No	1 year
City of Abilene Flood Detection Stations Phase 1	Implement flood detection stations on city streets prone to flooding in the City of Abilene	City of Abilene	$25,000 per site	No	6 months
City of Brownwood Flood Detection Stations Phase 1	Implement flood detection stations on city streets prone to flooding in the City of Brownwood	City of Brownwood	$25,000 per site	No	6 months

Table 6 – Short-Term Projects (5-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Public Transportation Management					
CityLink AVL and Mobile Data Terminals	Implement AVL and mobile data terminals to provide location information of buses and enable communication	CityLink	$10,000/vehicle (Includes software)	Partial	6 months
CityLink Automated Passenger Counters	Implement passive system on fixed route buses to accurately count ridership	CityLink	$2,000/vehicle	No	6 months
CityLink On-Board Security Cameras	Install security cameras on CityLink buses and paratransit vehicles	CityLink	$10,000/vehicle	No	6 months
Hill Country Transit CAD	Implement a Computer Aided Dispatch (CAD) system for the Hill Country Transit	Hill Country Transit	To Be Determined	No	6 months
Hill Country Transit Emergency Silent Alarms	Implement silent alarms on Hill Country Transit vehicles	Hill Country Transit	To Be Determined	Yes	1 year
Hill Country Transit Automated Passenger Counters	Implement a passive system on fixed route buses to accurately count ridership	Hill Country Transit	$2,000/vehicle	No	6 months
Hill Country Transit AVL and Mobile Data Terminals	Implement AVL and mobile data terminals to provide location information of buses and enable communication	Hill Country Transit	$10,000/vehicle (Includes software)	No	6 months
Hill Country Transit On-Board Security Cameras Phase 1	Install security cameras on Hill Country buses and paratransit vehicles	Hill Country Transit	$10,000/vehicle	No	6 months
CARR AVL	Implement AVL to provide bus location information	CARR Transit	$10,000/vehicle (Includes software)	No	6 months
Double Mountain Coach On-Board Security Cameras	Install security cameras on Double Mountain Coach vehicles	Aspermont Small Business	$10,000/vehicle	No	6 months
Commercial Vehicle Operations					
TxDOT Abilene Weigh-in-Motion Phase 1	Implement a weigh-in-motion system on I-20 in the Abilene District	TxDOT Abilene	$50,000/site	No	1 year

Table 6 – Short-Term Projects (5-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Archived Data					
Hill Country Transit Data Management	Implement a data management system for Hill Country transit ridership information	Hill Country Transit	$200,000	No	3 years
CARR Transit Data Management	Implement a data management system City and Rural Rides (CARR) transit ridership information	CARR	$200,000	No	3 years

*Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

**The design has not been undertaken and thus this is only an opinion of probable cost for planning purposes.

West Central Texas Region
Short-Term Projects (5-Year)

Travel and Traffic Management

TxDOT Center-to-Center Communications (Statewide TxDOT District Communications)

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control and Coordination (ATMS07)
- Incident Management System (ATMS08)
- Weather Information Processing and Distribution (MC04)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: None

Description: The Center-to-Center Communications project will enhance coordination with TxDOT Districts through a connection to the statewide center-to-center core infrastructure. A communication backbone must be developed with sufficient capacity between the TxDOT District Office and existing center-to-center infrastructure. Determination of whether the backbone should be TxDOT owned, leased, or a combination thereof will be determined at a later date. The software required to support center-to-center communications is integrated with the TxDOT developed ATMS, so significant software development efforts are not anticipated. Resources will be required to oversee installation of the communications backbone between the TxDOT Abilene and Brownwood District Offices and statewide center-to-center facilities. As part of connecting to the statewide center-to-center infrastructure, the West Central Texas Region will provide data to the statewide web server and statewide data archiving database. In return, access to information from other TxDOT Districts (and potentially other agencies) will be available to enhance operations throughout the Region.

TxDOT Abilene ATMS Implementation

Associated Market Packages:

- Network Surveillance (ATMS01)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Weather Information Processing and Distribution (MC04)
- Broadcast Traveler Information (ATIS1)

Prerequisite Projects: None

Description: This project involves the implementation of ATMS software to facilitate control of DMS, CCTV cameras and other TxDOT field equipment.

The TxDOT ATMS is a software and hardware based platform developed by the TxDOT Traffic Operations Division. The function of this software is to provide a platform for the integration of various subsystems. The high level functions of the TxDOT ATMS include:

- Collect traffic information (e.g., speed, incidents, lane closures) through a variety of collection methods such a loops, video image detection, etc.;
- Data archiving;
- Graphical map with traffic information;
- Status information, command and control for DMS, ramp metering and CCTV;
- Video switching; and
- User ID/password provided with each transaction for tracking use and establishing device control authority.

Future development efforts include software modules to provide status information and command/control of HAR and environmental sensors (such as flood detection systems). An integrated maintenance database management module is also under development. Lastly, several modules are currently being upgraded to support recently approved National Transportation Communications for ITS Protocol (NTCIP) standards for CCTV, Center-to-Center Communications, and data collection devices.

This ATMS implementation project will include the software and hardware necessary to have an operational central system to routinely poll devices and support archiving of data.

TxDOT Abilene TMC Expansion

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: This project includes the expansion of the capabilities of the TxDOT Abilene TMC. Currently, the TMC is used primarily to monitor the operations of the controllers and detectors at signalized intersections. Additionally, VIVDS video images are not currently being transmitted to the TMC. The planned expansion of the TMC would include the implementation of end equipment to allow the transmission of the video feed from the VIVDS in the field back to the TMC. This project would also include the capabilities to control the VIVDS remotely from the TMC as well as control of the PTZ of the planned CCTV cameras.

The estimated cost associated with this expansion is $200,000.

TxDOT Abilene Closed Loop Signal System Expansion Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will also become part of the closed loop signal system. This project includes the installation of VIVDS.

TxDOT Abilene DMS Implementation Phase 1

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Work Zone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of permanent DMS along I-20 and other priority corridors for purposes of traffic information dissemination and incident management. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The estimated cost per sign is approximately $100,000.

TxDOT Abilene CCTV Implementation Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Incident Management (ATMS08)

Prerequisite Projects: None

Description: This project includes the deployment of CCTV cameras along key segments of roadway in the Abilene District. The CCTV cameras can be used for incident detection and verification, to monitor congestion and to aid in the dispatch of emergency vehicles. The information gathered by the CCTV cameras (video feed) can be shared with the area emergency management agencies.

TxDOT Brownwood ATMS Implementation

Associated Market Packages:

- Network Surveillance (ATMS01)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Weather Information Processing and Distribution (MC04)
- Broadcast Traveler Information (ATIS1)

Prerequisite Projects: None

Description: This project involves the implementation of ATMS software to facilitate control of DMS, CCTV cameras and other TxDOT field equipment.

The TxDOT ATMS is a software and hardware based platform developed by the TxDOT Traffic Operations Division. The function of this software is to provide a platform for the integration of various subsystems. The high level functions of the TxDOT ATMS include:

- Collect traffic information (e.g., speed, incidents, lane closures) through a variety of collection methods such a loops, video image detection, etc.;
- Data archiving;
- Graphical map with traffic information;
- Status information, command and control for DMS, ramp metering and CCTV;
- Video switching; and
- User ID/password provided with each transaction for tracking use and establishing device control authority.

Future development efforts include software modules to provide status information and command/control of HAR and environmental sensors (such as flood detection systems). An integrated maintenance database management module is also under development. Lastly, several modules are currently being upgraded to support recently approved NTCIP standards for CCTV, Center-to-Center Communications, and data collection devices.

This ATMS implementation project will include the software and hardware necessary to have an operational central system to routinely poll devices and support archiving of data.

TxDOT Brownwood TMC Expansion

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: This project includes the expansion of the capabilities of the TxDOT Brownwood TMC. Currently, the TMC is used primarily to monitor the operations of the controllers and detectors at signalized intersections. Additionally, VIVDS video images are not currently being transmitted to the TMC. The planned expansion of the TMC would include the implementation of end equipment to allow the transmission of the video feed from the VIVDS in the field back to the TMC. This project would also include the capabilities to control the VIVDS remotely from the TMC as well as control of the PTZ of the planned CCTV cameras.

The estimated cost associated with this expansion is $200,000.

TxDOT Brownwood Closed Loop Signal System Expansion Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. This project also includes the installation of VIVDS.

TxDOT Brownwood DMS Implementation Phase 1

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Work Zone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of permanent DMS along I-20 near Ranger Hill for purposes of traffic information dissemination and incident management. DMS also will be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The estimated cost per sign is approximately $100,000.

TxDOT Brownwood CCTV Implementation Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Incident Management (ATMS08)

Prerequisite Projects: None

Description: This project includes the deployment of CCTV cameras along I-20 in the Ranger Hill Area. The CCTV cameras can be used for incident detection and verification, to monitor congestion and to aid in the dispatch of emergency vehicles. The information gathered by the CCTV cameras (video feed) can be shared with the area emergency management agencies.

City of Abilene TOC/TxDOT Abilene TMC Communications Connection

Associated Market Packages:

- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install a connection between the City of Abilene TOC and the TxDOT Abilene TMC to allow video sharing, traffic data sharing and other joint functions. The type of connection (fiber, wireless, leased line) will need to be determined prior to implementation of this project based on desired band width and cost of technologies available.

City of Abilene Traffic Operations Center Development/Expansion

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: This project includes the expansion of the capabilities of the City of Abilene TOC. Currently, the City of Abilene TOC is used primarily to monitor the operations of the controllers and detectors at signalized intersections. Additionally, VIVDS video images are not currently being transmitted to the TMC. The planned expansion of the TMC would include the implementation of end equipment to allow the transmission of the video feed from the VIVDS in the field back to the TMC. This project would also include the capabilities to control the VIVDS remotely from the TMC as well as control of the PTZ of future CCTV cameras.

City of Abilene Closed Loop Signal System Expansion Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Expand the closed loop signal system in the City of Abilene. This project also includes the implementation of VIVDS.

City of Brownwood TOC/TxDOT Brownwood TMC Communications Connection

Associated Market Packages:

- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install a connection between the City of Brownwood TOC and the TxDOT Brownwood TMC to allow video sharing, traffic data sharing and other joint functions. The type of connection (fiber, wireless, leased line) will need to be determined prior to implementation of this project based on desired band width and cost of technologies available.

City of Brownwood Traffic Operations Center Development/Expansion

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: This project includes the expansion of the capabilities of the City of Brownwood TOC. Currently, the City of Brownwood TOC is used primarily to monitor the operations of the controllers and detectors at signalized intersections. Additionally, VIVDS video images are not currently being transmitted to the TMC. The planned expansion of the TMC would include the implementation of end equipment to allow the transmission of the video feed from the VIVDS in the field back to the TMC. This project would also include the capabilities to control the VIVDS remotely from the TMC as well as control of the PTZ of future CCTV cameras.

City of Brownwood Closed Loop Signal System Implementation Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Implement a closed loop signal system in the City of Brownwood. This project also includes the implementation of VIVDS.

City of Brownwood Flooding Detour Plans

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: This project will identify detour routes for the City of Brownwood to be used during flooding conditions. Established detour routes will facilitate emergency dispatch operations as well as general traffic operations.

West Central Texas Detour Plans

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: This project will identify detour routes for the interstate, state, and local arterials to be used during times of major incidents on the respective roadways. Once an incident has been detected and verified, the Abilene or Brownwood TMC can post a message to a DMS along the subject roadway providing information not only on the incident (expected duration and delay), but also provide potential alternate routes. Additionally, if the detour routes are designated, the owning agency can provide alternate signal timing (from the typical timing plans) that will help move detoured traffic efficiently through the detour route.

Media Liaison and Coordination

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management (ATMS08)
- Weather Information Processing and Distribution (MC04)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)
- Broadcast Traveler Information (ATIS1)

Prerequisite Projects: None

Description: Develop agreements/enhanced coordination with local media to disseminate traveler information. Develop a link for local media to tap into CCTV camera images for dissemination of traffic and weather advisories to the public via television and radio news broadcasts. Most television and radio stations typically already have microwave licenses and infrastructure in place to support wireless transmission of video. Therefore, TxDOT should provide a connection point at the TMC for media providers (e.g., video switch including video images and traffic conditions map), but not design and install the entire connection between the TMC and the media. An initial task in the project will be to meet with interested news providers to determine information needs to support media interface design activities. Each agency that will be sharing information directly with the media will likely need an agreement or policy in place to determine what type of information will be shared. A subgroup of the stakeholders will need to work on the process of sharing data with the media and what broadcasts will be allowed to attempt to provide similar data to the media from each individual stakeholder.

Emergency Management

DPS/TxDOT Abilene District TMC Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Install a telecommunications connection and end equipment from the DPS dispatch center to TxDOT Abilene TMC to share CCTV and incident data/images and provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the communications used to implement the connection (i.e., fiber connection or leased lines).

DPS/TxDOT Brownwood District TMC Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Install telecommunications connection and end equipment from the DPS dispatch center to TxDOT Brownwood TMC to share CCTV and incident data/images and provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the communications used to implement the connection (i.e., fiber connection or leased lines).

State EOC/TxDOT Abilene TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Install telecommunications connection and end equipment from the State EOC to the TxDOT Abilene TMC to share CCTV and incident data/images and provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the communications used to implement the connection (i.e., fiber connection or leased lines).

State EOC/TxDOT Brownwood TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Install telecommunications connection and end equipment from the State EOC to the TxDOT Brownwood TMC to share CCTV and incident data/images and provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the communications used to implement the connection (i.e., fiber connection or leased lines).

TxDOT Abilene Emergency Vehicle Signal Preemption Implementation

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Equip traffic signals in the Abilene District with traffic signal preemption equipment. Typical installations include mounting hardware at the intersection and on each vehicle authorized to preempt the signal. The intersection equipment includes a detector(s) positioned at the intersection approach(es) connected to the traffic signal controller. As a vehicle equipped with a preemption emitter approaches an intersection, the detector activates a change in signal timing to allow fast and safe passage. Preemption systems have proven to improve safety of emergency personnel and vehicles en-route to an incident. Emergency vehicle signal preemption will be implemented as a joint effort with cities in the District.

TxDOT Brownwood Emergency Vehicle Signal Preemption Implementation

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Equip traffic signals in the Brownwood District with traffic signal preemption equipment. Typical installations include mounting hardware at the intersection and on each vehicle authorized to preempt the signal. The intersection equipment includes a detector(s) positioned at the intersection approach(es) connected to the traffic signal controller. As a vehicle equipped with a preemption emitter approaches an intersection, the detector activates a change in signal timing to allow fast and safe passage. Preemption systems have proven to improve safety of emergency personnel and vehicles en-route to an incident. Emergency vehicle signal preemption will be implemented as a joint effort with cities in the District.

City of Abilene Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Equip additional traffic signals in the City of Abilene with traffic signal preemption equipment. Typical installations include mounting hardware at the intersection and on each vehicle authorized to preempt the signal. The intersection equipment includes a detector(s) positioned at the intersection approach(es) connected to the traffic signal controller. As a vehicle equipped with a preemption emitter approaches an intersection, the detector activates a change in signal timing to allow fast and safe passage. Preemption systems have proven to improve safety of emergency personnel and vehicles en-route to an incident.

City of Abilene Police AVL

Associated Market Packages:

- Emergency Response (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Install AVL on City of Abilene police vehicles. The AVL system will convey information regarding real-time vehicle location to the dispatch centers, which will allow for enhanced dispatch, routing (or re-routing), as well as provide for precise vehicle location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of vehicles, and relay that information back to a dispatch center, usually via global positioning system.

The costs will vary depending on the number of vehicles equipped with the units. For planning purposes, it is estimated that the cost per vehicle is approximately $10,000.

City of Abilene EOC/TxDOT Abilene District TMC Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Management (EM01)

Prerequisite Projects: None

Description: Install a telecommunications connection between the City of Abilene EOC and TxDOT Abilene TMC to allow for CCTV camera shared monitoring and control and data sharing. The cost of this connection will be determined based on the communications method chosen.

City of Brownwood EOC/TxDOT Brownwood District TMC Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Management (EM01)

Prerequisite Projects: None

Description: Install telecommunications connection between the City of Brownwood EOC and TxDOT Brownwood TMC to allow for CCTV camera shared monitoring and control and data sharing. The cost of this connection will be determined based on the communications method chosen.

DPS AVL and MDTs

Associated Market Packages:

- Emergency Response (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Install AVL and mobile data terminals on DPS vehicles. The AVL system will convey information regarding real-time vehicle location to the dispatch centers, which will allow for enhanced dispatch, routing (or re-routing), as well as provide for precise vehicle location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of vehicles, and relay that information back to a dispatch center, usually via global positioning system.

Mobile data terminals (MDTs) allow officers to send and receive digital messages. MDTs can be used by dispatchers to notify drivers of adverse conditions and recommended routes. MDTs can also transmit information from the driver to the dispatch center, including status, disruptions, or silent alarms. An additional feature that can be built-in to the MDT is the ability for vehicle-to-vehicle digital communications, in addition to the vehicle to dispatch communications.

The costs will vary depending on the number of vehicles equipped with the units. For planning purposes, it is estimated that the cost per vehicle is approximately $10,000.

Maintenance and Construction Management

TxDOT HCRS Enhancement

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Weather Information Processing and Distribution (MC04)
- Roadway Maintenance and Construction (MC07)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)
- Broadcast Traveler Information (ATIS1)

Prerequisite Projects: None

Description: TxDOT's HCRS will be enhanced on a statewide basis. The HCRS will use data from the Abilene and Brownwood District Offices, both automated (ATMS) and manually entered. It is envisioned that the ATMS software will enhance the data collection and consolidation processes for automated information. This is a statewide effort; the Abilene and Brownwood Districts will be affected by this project, and will contribute information to the HCRS, but will not be responsible for funding the enhancements or for the implementation schedule.

TxDOT Abilene RWIS Implementation Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: None

Description: Install RWIS stations in the Abilene District. The RWIS will be remotely monitored by the TxDOT Abilene District. Real time weather information improves response time, increases winter maintenance efficiency, and minimizes the traveling public's exposure to hazardous weather related roadway conditions. Archived RWIS information also provides valuable historic information for planning purposes. Data including temperature (atmospheric and pavement), precipitation, wind, humidity, visibility (white out/heavy fog) and even pavement surface conditions (i.e., snow, chemical) are collected by sensors placed at the roadside (typically on a 30 foot tower) and embedded in the roadway. Remote processing units placed along the roadway communicate with various types of road and weather sensors. Data from the units are transmitted to the central ATMS server, via dial-up modem or other low bandwidth telecommunications methods, which will be located at the TxDOT Abilene District Office. A future module for the ATMS software will support environmental sensor data and provides collection, archiving, and distribution of the data.

The estimated cost for one RWIS station is $75,000.

TxDOT Brownwood RWIS Implementation Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: None

Description: Install RWIS stations in the Brownwood District. The RWIS will be remotely monitored by the TxDOT Brownwood District. Real time weather information improves response time, increases winter maintenance efficiency, and minimizes the traveling public's exposure to hazardous weather related roadway conditions. Archived RWIS information also provides valuable historic information for planning purposes. Data including temperature (atmospheric and pavement), precipitation, wind, humidity, visibility (white out/heavy fog) and even pavement surface conditions (i.e., snow, chemical) are collected by sensors placed at the roadside (typically on a 30 foot tower) and embedded in the roadway. Remote processing units placed along the roadway communicate with various types of road and weather sensors. Data from the units are transmitted to the central ATMS server, via dial-up modem or other low bandwidth telecommunications methods, which will be located at the TxDOT Brownwood District Office. A future module for the ATMS software will support environmental sensor data and provides collection, archiving, and distribution of the data.

The estimated cost for one RWIS station is $75,000.

City of Abilene Flood Detection Stations Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: None

Description: Implement flood detection systems on flood-prone segments of roadways in the City of Abilene. This will enable faster response times by maintenance crews to close flooded or near flooded roadway segments as necessary. The typical flood detection station is composed of a stream gauge, a rain gauge, a temperature sensor, a wind speed sensor, a wind direction sensor, and remote communications support. Other upgrades that may support operational decision making include sensors to measure relative humidity, soil moisture content, solar radiation, and air and water quality. The flood detection systems will be monitored by the City of Abilene. Communications between the flood detection stations and city maintenance personnel can be achieved through a variety of wireless and wireline telemetry methods.

City of Brownwood Flood Detection Stations Phase 1

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: None

Description: Implement flood detection systems on flood-prone segments of roadways in the City of Brownwood. This will enable faster response times by maintenance crews to close flooded or near flooded roadway segments as necessary. The typical flood detection station is composed of a stream gauge, a rain gauge, a temperature sensor, a wind speed sensor, a wind direction sensor, and remote communications support. Other upgrades that may support operational decision making include sensors to measure relative humidity, soil moisture content, solar radiation, and air and water quality. The flood detection systems will be monitored by the City of Brownwood. Communications between the flood detection stations and city maintenance personnel can be achieved through a variety of wireless and wireline telemetry methods.

Public Transportation Management

CityLink AVL and Mobile Data Terminals

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Transit Fixed-Route Operations (APTS2)
- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install AVL and MDT units on CityLink Transit vehicles. The AVL system will convey information regarding real-time vehicle location to the Transit Operations Center, which will allow for enhanced system monitoring, scheduling, routing (or re-routing), as well as provide for precise bus location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of transit vehicles, and relay that information back to a transit operations center, usually via global positioning system. Used with a geographic information system map, bus locations can be displayed for any vehicles in the fleet equipped with the on-board AVL unit. AVL, in conjunction with CAD, allows for improved bus tracking capability, as well as archiving and managing historical data. AVL systems also can be equipped with additional features, including tie-ins to alarm/security systems, vehicle component monitoring, and automated passenger counter and fare payment systems. Information from the AVL/CAD system can be used by transit managers for real-time operations and management as well as for transit traveler information. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations.

MDTs allow bus operators to send and receive digital messages. MDTs can be used by dispatchers to notify drivers of adverse conditions, route changes, or other impacts to the route. MDTs can also transmit information from the driver to the dispatch center, including status, disruptions, or silent

alarms. An additional feature that can be built-in to the MDT is the ability for vehicle-to-vehicle digital communications, in addition to the vehicle-to-center communications.

Cost will vary depending on the number of vehicles equipped with AVL/MDT systems, as well as the functions and features designed into the systems (above the basic location and digital communication functions).

The estimated cost is $10,000 per vehicle.

City Link Automated Passenger Counters

Associated Market Packages:

- Transit Fixed-Route Operations (APTS2)
- Transit Passenger and Fare Management (APTS4)

Prerequisite Projects: None

Description: Install APC systems on transit vehicles to accurately count ridership. APC systems collect ridership information and it is possible determine total boardings and alightings at each stop when used in conjunction with AVL to determine where those boardings and alightings take place.

This project is estimated to cost $2,000 per vehicle.

CityLink On-board Security Cameras

Associated Market Packages:

- Transit Fixed Route Operations (APTS2)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will install security cameras on CityLink Transit vehicles. It is a possibility that the security cameras would provide video feed from the buses to the transit operations center for monitoring.

Hill Country Transit CAD

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Implement CAD for Hill Country Transit to monitor and manage transit operations. The CAD system will provide data processing support to assist the dispatchers in managing communications with vehicles and generate management reports. The main goal of this project is to automate daily planning of optimal routes where origins, destinations, common locations, and client requested times

and equipment needs are grouped so that the most efficient routes with the maximum number of shared rides (several clients sharing a vehicle) are created for the transit services.

This CAD system will provide reporting functions by automatically logging all communications between the dispatch center and the driver; including time, vehicle/driver ID, nature of the communication, and response.

Hill Country Transit Emergency Silent Alarms

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will install silent alarm buttons on the buses. If the driver feels there is a threat on the bus, the bus has been involved in an accident, or any other situation occurs where the driver may need assistance, he or she can activate the alarm. The alarm notifies the dispatch center of the potential problem so that help can be dispatched.

Hill Country Transit Automated Passenger Counters

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Passenger and Fare Management (APTS4)

Prerequisite Projects: None

Description: Install APC systems on transit vehicles to accurately count ridership. APC systems collect ridership information and it is possible to determine total boardings and alightings at each stop when used in conjunction with AVL to determine where those boardings and alightings take place.

This project is estimated to cost $2,000 per vehicle.

Hill Country Transit AVL and Mobile Data Terminals

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install AVL and MDT units on Hill Country Transit vehicles. The AVL system will convey information regarding real-time vehicle location to the Transit Operations Center, which will allow for enhanced system monitoring, scheduling, routing (or re-routing), as well as provide for precise bus location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of transit vehicles, and relay that information back to a transit operations center, usually via global positioning system. Used with a geographic information system map, bus

locations can be displayed for any vehicles in the fleet equipped with the on-board AVL unit. AVL, in conjunction with CAD, allows for improved bus tracking capability, as well as archiving and managing historical data. AVL systems also can be equipped with additional features, including tie-ins to alarm/security systems, vehicle component monitoring, and automated passenger counter and fare payment systems. Information from the AVL/CAD system can be used by transit managers for real-time operations and management as well as for transit traveler information. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations. Hill Country Transit will use the AVL to track trips by category of trip, providing them with more detailed information for trip scheduling and efficiency improvements.

Mobile data terminals allow bus operators to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify drivers of adverse conditions, route changes, or other impacts to the route. MDTs can also transmit information from the driver to the dispatch center, including status, disruptions, or silent alarms. In addition to the vehicle-to-center communications, the ability for vehicle-to-vehicle digital communications can be built in to the MDT.

Cost will vary depending on the number of vehicles equipped with AVL/MDT systems, as well as the functions and features designed into the systems (above the basic location and digital communication functions). The estimated cost is $10,000 per vehicle.

Hill Country Transit On-board Security Cameras Phase 1

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will install security cameras on Hill Country Transit vehicles. It is a possibility that the security cameras would provide video feed from the buses to the transit operations center for monitoring. While the main objective of on-board surveillance projects has been to identify individuals committing criminal acts or creating disturbances on buses, there have been noticeable maintenance benefits such as a reduction of litter and debris.

CARR AVL

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install AVL units on CARR transit vehicles. The AVL system will convey information regarding real-time vehicle location to the Transit Operations Center, which will allow for enhanced system monitoring, scheduling, routing (or re-routing), as well as provide for precise bus location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of transit vehicles, and relay that information back to a transit operations center, usually via

global positioning system. Used with a geographic information system map, bus locations can be displayed for any vehicles in the fleet equipped with the on-board AVL unit. AVL, in conjunction with CAD, allows for improved bus tracking capability, as well as archiving and managing historical data. AVL systems also can be equipped with additional features, including tie-ins to alarm/security systems, vehicle component monitoring, and automated passenger counter and fare payment systems. Information from the AVL/CAD system can be used by transit managers for real-time operations and management as well as for transit traveler information. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations.

Cost will vary depending on the number of vehicles equipped with AVL systems, as well as the functions and features designed into the systems. The estimated cost is $10,000 per vehicle.

Double Mountain Coach On-board Security Cameras

Associated Market Packages:
- Demand Response Transit Operations (APTS3)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will include the installation of security cameras on Double Mountain Coach vehicles. Cameras will be for on-board recording only, and are not envisioned to be monitored remotely from the Double Mountain Coach Dispatch. Video will be stored for a pre-determined amount of time via video tape or emerging digital video recording technology. While the main objective of on-board surveillance projects has been to identify individuals committing criminal acts or creating disturbances on buses, there have been noticeable maintenance benefits such as a reduction of litter and debris.

Commercial Vehicle Operations

TxDOT Abilene Weigh-in-Motion Phase 1

Associated Market Packages:
- Weigh-in-Motion (CVO06)

Prerequisite Projects: None

Description: Implement a weigh-in-motion system on I-20 in the Abilene District. Weigh-in-motion sites can be located on the mainline for high speed weigh-in-motion, or at pull out locations for low speed weigh-in-motion. There are several types of weigh-in-motion systems, including bending plate, piezo electric, and load cell. These systems typically cost between $10,000-$20,000; however, a majority of the cost in deploying a weigh-in-motion system is for the installation.

For mainline weigh-in-motion, a smooth, straight approach prior to the scale is required to eliminate vehicle vibrations, which can greatly reduce the accuracy. In order to achieve the smooth surface, a new concrete pad is often installed prior to the weigh-in-motion site. Pull out sites typically weigh trucks at slower speeds and do not require as significant construction as the main-line sites for installation, providing room for a pull out site is available. For estimation purposes, a cost of $50,000 per weigh-in-motion site was used to account for equipment and installation costs.

Archived Data Management

Hill Country Transit Data Management

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- ITS Data Mart (AD1)

Prerequisite Projects: None

Description: Create a transit data database to collect and store ridership, fare, asset, maintenance, and other data related to transit operations. This project will design the frequency, quantity, and quality of data to be collected and stored.

CARR Transit Data Management

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- ITS Data Mart (AD1)

Prerequisite Projects: None

Description: Create a transit data database to collect and store ridership, fare, asset, maintenance, and other data related to transit operations. This project will design the frequency, quantity, and quality of data to be collected and stored.

Table 7 – Mid-Term Projects (10-Year)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management					
TxDOT Abilene Closed Loop Signal System Expansion Phase 2	Continue the expansion of closed loop signal system at TxDOT intersections throughout the Abilene District	TxDOT Abilene	To Be Determined	No	2 years
TxDOT Abilene DMS Implementation Phase 2	Implement dynamic message signs (DMS) in the Abilene District for traffic information dissemination along alternate routes for I-20	TxDOT Abilene	$100,000/sign	No	1 year
TxDOT Abilene CCTV Implementation Phase 2	Implement additional closed-circuit television (CCTV) cameras at select locations in the Abilene District for traffic monitoring and incident detection	TxDOT Abilene	$20,000-$25,000/site	No	1 year
TxDOT Highway Advisory Radio	Implement highway advisory radio along I-20 and associated detour routes (i.e. US 180)	TxDOT Abilene/TxDOT Brownwood	To Be Determined	No	2 years
TxDOT Brownwood Closed Loop Signal System Expansion Phase 2	Continue the expansion of closed loop signal system at TxDOT intersections throughout the Brownwood District	TxDOT Brownwood	To Be Determined	No	2 years
TxDOT Brownwood DMS Implementation Phase 2	Implement additional DMS in the Brownwood District for traffic information dissemination along I-20 and other major arterials	TxDOT Brownwood	$100,000/sign	No	1 year
TxDOT Brownwood CCTV Implementation Phase 2	Implement additional CCTV cameras at select locations in the Brownwood District for traffic monitoring and incident detection	TxDOT Brownwood	$20,000-$25,000/site	No	1 year
City of Abilene Closed Loop Signal System Expansion Phase 2	Continue the implementation of closed loop signal systems in the City of Abilene. Also includes the implementation of Video Image Vehicle Detector Systems (VIVDS).	City of Abilene	To Be Determined	No	2 years
City of Abilene CCTV Camera Implementation	Implement CCTV cameras in the City of Abilene at select intersections along the railroad and at select interchanges for traffic monitoring and incident detection	City of Abilene	$20,000-$25,000/site	No	1 year

Table 7 – Mid-Term Projects (10-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management (continued)					
City of Abilene Railroad Operations Coordination	Develop communications between City of Abilene Traffic Operations Center (TOC) and railroad companies to provide schedules and crossing closure times	City of Abilene/Railroad Companies	To Be Determined	No	1 year
City of Brownwood Closed Loop Signal System Implementation Phase 2	Continue the implementation of closed loop signal systems in the City of Brownwood. Also includes the implementation of VIVDS.	City of Brownwood	To Be Determined	No	2 years
Municipal Closed Loop Signal System Implementation	Implement a closed loop signal systems in other cities in the Region as needed	West Central Texas Cities	To Be Determined	No	2 years
Regional 511 Advanced Traveler Information System Server	Implement an advanced traveler information system (ATIS) server in the TxDOT Abilene and Brownwood District TMCs that will collect, consolidate, and distribute traveler information to a 511 based phone system, web, and private Information Service Providers (ISPs)	TxDOT Abilene/TxDOT Brownwood	To Be Determined	No	1 year
Emergency Management					
City of Brownwood Emergency Vehicle Signal Preemption	Install signal pre-emption for emergency vehicles at City of Brownwood intersections	City of Brownwood	$8,000-$10,000/ intersection	No	1 year
Portable CCTV Emergency Command	Procure a mobile incident command center with portable CCTV monitoring capabilities	Counties	To Be Determined	No	1 year
Maintenance and Construction Management					
TxDOT Abilene RWIS Implementation Phase 2	Implement additional road weather information system (RWIS) sites in the TxDOT Abilene District to monitor road weather conditions including ice detection	TxDOT Abilene	$75,000/site	No	1 year
TxDOT Abilene Work Zone Safety Monitoring	Implement portable work zone safety monitoring equipment at work zones in the Abilene District	TxDOT Abilene	$500,000	No	1 year

Table 7 – Mid-Term Projects (10-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Maintenance and Construction Management (continued)					
TxDOT Brownwood RWIS Implementation Phase 2	Implement additional RWIS sites in the TxDOT Brownwood District to monitor road weather conditions including ice detection	TxDOT Brownwood	$75,000/site	No	1 year
TxDOT Brownwood Work Zone Safety Monitoring	Implement portable work zone safety monitoring equipment at work zones in the Brownwood District	TxDOT Brownwood	$500,000	No	1 year
City of Abilene Flood Detection Stations Phase 2	Continue to implement flood detection stations on city streets prone to flooding in the City of Abilene	City of Abilene	$25,000 per site	No	6 months
City of Brownwood Flood Detection Stations Phase 2	Continue to implement flood detection stations on city streets prone to flooding in the City of Brownwood	City of Brownwood	$25,000 per site	No	6 months
Public Transportation Management					
CityLink Electronic Fare Payment	Implement a smart card electronic fare collection for CityLink	CityLink	To Be Determined	No	6 months
CityLink CCTV at Transfer Stations	Implement CCTV security cameras at the CityLink transfer stations	CityLink	To Be Determined	No	1 year
Hill Country Transit Electronic Fare Payment	Implement a smart card electronic fare collection for Hill Country Transit	Hill Country Transit	To Be Determined	No	6 months
Hill Country Transit On-Board Security Cameras Phase 2	Install security cameras on Hill Country buses and paratransit vehicles	Hill Country Transit	$10,000/vehicle	No	6 months
CARR Mobile Data Terminals	Implement mobile data terminals to enable communication	CARR Transit	$10,000/vehicle (Includes software)	No	6 months
Double Mountain Coach Emergency Silent Alarms	Implement silent alarms on Double Mountain Coach vehicles	Aspermont Small Business	To Be Determined	Yes	1 year
Double Mountain Coach Mobile Data Terminals	Implement mobile data terminals to enable communication	Aspermont Small Business	$10,000/vehicle (Includes software)	No	6 months

Table 7 – Mid-Term Projects (10-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Commercial Vehicle Operations					
TxDOT Abilene Weigh-in-Motion Phase 2	Implement a weigh-in-motion system on additional major roadways in the Abilene District	TxDOT Abilene	$50,000/site	No	1 year
TxDOT Brownwood Weigh-in-Motion Phase 1	Implement a weigh-in-motion system on I-20 in the Brownwood District	TxDOT Brownwood	$50,000/site	No	1 year
Archived Data					
Abilene MPO Data Warehouse	Implement a data warehouse to archive data from cities and transit agencies in the Abilene Metropolitan Planning Organization (MPO) service area	Abilene MPO	$100,000	No	3 years

*Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

**The design has not been undertaken and thus this is only an opinion of probable cost for planning purposes.

West Central Texas Region
Mid-Term Projects (10-Year)

Travel and Traffic Management

TxDOT Abilene Closed Loop Signal System Expansion Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: TxDOT Abilene Closed Loop Signal System Expansion Phase 1

Description: Continue to expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. This project also includes the installation of VIVDS.

TxDOT Abilene DMS Implementation Phase 2

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Work Zone Management (MC08)

Prerequisite Projects: TxDOT Abilene DMS Implementation Phase 1

Description: This project consists of the deployment of permanent DMS along alternate routes for I-20 for purposes of traffic information dissemination and incident management. DMS also will be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The estimated cost per sign is approximately $100,000.

TxDOT Abilene CCTV Implementation Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Incident Management (ATMS08)

Prerequisite Projects: TxDOT Abilene CCTV Implementation Phase 1

Description: This project includes the deployment of CCTV cameras along key segments of roadway in the Abilene District. The CCTV cameras can be used for incident detection and verification, to monitor congestion and to aid in the dispatch of emergency vehicles. The information gathered by the CCTV cameras (video feed) can be shared with the area emergency management agencies.

TxDOT Highway Advisory Radio

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Work Zone Management (MC08)

Prerequisite Projects: None

Description: This project will implement HAR transmitters at sites throughout the Region. HAR will allow operators at the Abilene and Brownwood TMCs to record travel advisory messages related to traffic, incidents, and weather for transmission at the roadside to vehicles traveling in the vicinity of the HAR transmitter(s).

The cost of the project will depend on the number of transmitters installed as well as the cost and number of accompanying beacon signs that will be needed.

TxDOT Brownwood Closed Loop Signal System Expansion Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: TxDOT Brownwood Closed Loop Signal System Expansion Phase 1

Description: Continue to expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. This project also includes the installation of VIVDS.

TxDOT Brownwood DMS Implementation Phase 2

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Work Zone Management (MC08)

Prerequisite Projects: TxDOT Brownwood DMS Implementation Phase 1

Description: This project consists of the deployment of permanent DMS along I-20 and other major arterials for purposes of traffic information dissemination and incident management. DMS also will be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The estimated cost per sign is approximately $100,000.

TxDOT Brownwood CCTV Implementation Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Incident Management (ATMS08)

Prerequisite Projects: TxDOT Brownwood CCTV Implementation Phase 1

Description: This project includes the deployment of CCTV cameras along key segments of roadway in the Brownwood District. The CCTV cameras can be used for incident detection and verification, to monitor congestion and to aid in the dispatch of emergency vehicles. The information gathered by the CCTV cameras (video feed) can be shared with the area emergency management agencies.

City of Abilene Closed Loop Signal System Expansion Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: City of Abilene Closed Loop Signal System Expansion Phase 1

Description: Continue to expand the closed loop signal system in the City of Abilene. This project includes the implementation of VIVDS.

City of Abilene CCTV Camera Implementation

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: This project includes the deployment of CCTV cameras at selected intersections in the City of Abilene. High priority locations include several intersections with at-grade railroad crossings in close proximity. The CCTV cameras can be used to monitor congestion associated with recurring events and signal control adjusted according to the vehicular demand. The information gathered by the CCTV cameras (video feed) can be shared with the TxDOT TMC for shared or after-hours viewing/monitoring.

City of Abilene Railroad Operations Coordination

Associated Market Packages:

- Standard Railroad Grade Crossing (ATMS13)
- Railroad Operations Coordination (ATMS15)

Prerequisite Projects: None

Description: Implement a communications link between rail operations and the City of Abilene TOC to exchange HRI information and railroad advisories as well as schedules. This provides an additional level of strategic coordination between rail operations and traffic management centers. Rail operations will provide train schedules, maintenance schedules, and any other planned events that will result in HRI closures. This information will be used to forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.

The estimated cost for this project is $100,000.

City of Brownwood Closed Loop Signal System Implementation Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: City of Brownwood Closed Loop Signal System Implementation Phase 1

Description: Continue to implement the closed loop signal system in the City of Brownwood. This project includes the implementation of VIVDS.

Municipal Closed Loop Signal System Implementation

Associated Market Packages:

- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Implement a closed loop signal systems in smaller cities in the West Central Texas Region as needed.

Regional 511 Advanced Travel Information System Server

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Broadcast Traveler Information (ATIS1)
- ISP-Based Route Guidance Support (ATIS5)
- Weather Information Processing and Distribution (MC04)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: TxDOT ATMS Implementation, TxDOT Center-to-Center Communications, TxDOT HCRS Enhancements

Description: Install a server dedicated to ATIS in the TxDOT Abilene and Brownwood District Offices. This server would be installed as part of a 511 rollout in Texas and would provide a gateway for public and private entities to access current conditions, closures, restrictions, weather, and other valuable travel information. Relevant data from the ATMS and HCRS would be sent to the ATIS server where it would be consolidated and 'packaged' for distribution via phone (511) and web and also to private partners who desire access to information in the West Central Texas Region. These private partners could include local media and information service providers, which would link to the ATIS server to download information, or obtain real-time feeds, depending on the link provided by the private partner. Appropriate security measures and firewalls could be designed into the server to allow or restrict access to registered, authorized users. By fusing various types of data from a variety of sources (traffic management, incident management, and others), this data can be converted to usable information for travelers as well as other agencies.

Emergency Management

City of Brownwood Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Incident Management (ATMS08)
- Emergency Response (EM01)
- Emergency Routing (EM02)

Prerequisite Projects: None

Description: Equip traffic signals in the City of Brownwood with traffic signal preemption equipment. Typical installations include mounting hardware at the intersection and on each vehicle authorized to preempt the signal. The intersection equipment includes a detector(s) positioned at the intersection approach(es) connected to the traffic signal controller. As a vehicle equipped with a preemption emitter approaches an intersection, the detector activates a change in signal timing to allow fast and safe passage. Preemption systems have proven to improve safety of emergency personnel and vehicles en-route to an incident.

Portable CCTV Emergency Command

Associated Market Packages:

- Network Surveillance (ATMS01)
- Emergency Response (EM01)

Prerequisite Projects: None

Description: Procure a mobile emergency command center. A portable CCTV camera should be part of the command center equipment. It is envisioned that the command center would be set up in case of disaster or large scale traffic incident where field command presence is needed to facilitate clean up efforts.

Maintenance and Construction Management

TxDOT Abilene RWIS Implementation Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: TxDOT Abilene RWIS Implementation Phase 1

Description: Install additional RWIS stations in the Abilene District. The RWIS will be remotely monitored by the TxDOT Abilene District. Real time weather information improves response time, increases winter maintenance efficiency, and minimizes the traveling public's exposure to hazardous weather related roadway conditions. Archived RWIS information also provides valuable historic information for planning purposes. Data including temperature (atmospheric and pavement), precipitation, wind, humidity, visibility (white out/heavy fog) and even pavement surface conditions (i.e., snow, chemical) are collected by sensors placed at the roadside (typically on a 30 foot tower) and embedded in the roadway. Remote processing units gather the data from the various types of road and weather sensors. Data from the units is transmitted to the central ATMS server, via dial-up modem or other low bandwidth telecommunications methods, which will be located at the TxDOT Abilene District Office. A future module for the ATMS software will support environmental sensor data and provides collection, archiving, and distribution of the data.

The estimated cost for one RWIS station is $75,000.

TxDOT Abilene Work Zone Safety Monitoring

Associated Market Packages:

- Work Zone Safety Monitoring (MC09)

Prerequisite Projects: None

Description: This project will include the use of advanced warning systems to detect unauthorized vehicles that have entered the perimeter of the work zone. The intent of such systems is to help decrease the number of accidents in work zones due to motorists getting too close to workers or their equipment. Intrusion detection devices can alert construction workers and the motorist that a motorist has entered the safe zone and they should take evasive action. It is anticipated that this project will be conducted on, and possibly required by TxDOT on, a per-project basis.

TxDOT Brownwood RWIS Implementation Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: TxDOT Brownwood RWIS Implementation Phase 1

Description: Install additional RWIS stations in the Brownwood District. The RWIS will be remotely monitored by the TxDOT Brownwood District. Real time weather information improves response time, increases winter maintenance efficiency, and minimizes the traveling public's exposure to hazardous weather related roadway conditions. Archived RWIS information also provides valuable historic information for planning purposes. Data including temperature (atmospheric and pavement), precipitation, wind, humidity, visibility (white out/heavy fog) and even pavement surface conditions (i.e., snow, chemical) are collected by sensors placed at the roadside (typically on a 30 foot tower) and embedded in the roadway. Remote processing units placed along the roadway communicate with various types of road and weather sensors. Data from the units are transmitted to the central ATMS server, via dial-up modem or other low bandwidth telecommunications methods, which will be located at the TxDOT Brownwood District Office. A future module for the ATMS software will support environmental sensor data and provides collection, archiving, and distribution of the data.

The estimated cost for one RWIS station is $75,000.

TxDOT Brownwood Work Zone Safety Monitoring

Associated Market Packages:

- Work Zone Safety Monitoring (MC09)

Prerequisite Projects: None

Description: This project will include the use of advanced warning systems to detect unauthorized vehicles that have entered the perimeter of the work zone. The intent of such systems is to help decrease the number of accidents in work zones due to motorists getting too close to workers or their equipment.

Intrusion detection devices can alert construction workers and the motorist that the motorist has entered the safe zone and should take evasive action. It is anticipated that this project will be conducted on, and possibly required by TxDOT on, a per-project basis.

City of Abilene Flood Detection Stations Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: City of Abilene Flood Detection Stations Phase 1

Description: Implement additional flood detection systems on flood-prone segments of roadways in the City of Abilene. This will enable faster response times by maintenance crews to close flooded or near flooded roadway segments as necessary. The typical flood detection station is composed of a stream gauge, a rain gauge, a temperature sensor, a wind speed sensor, a wind direction sensor, and remote communications support. Other upgrades that may support operational decision making include sensors to measure relative humidity, soil moisture content, solar radiation, and air and water quality. The flood detection systems will be monitored by the City of Abilene. Communications between the flood detection stations and city maintenance personnel can be achieved through a variety of wireless and wireline telemetry methods.

City of Brownwood Flood Detection Stations Phase 2

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: City of Brownwood Flood Detection Stations Phase 1

Description: Implement additional flood detection systems on flood-prone segments of roadways in the City of Brownwood. This will enable faster response times by maintenance crews to close flooded or near flooded roadway segments as necessary. The typical flood detection station is composed of a stream gauge, a rain gauge, a temperature sensor, a wind speed sensor, a wind direction sensor, and remote communications support. Other upgrades that may support operational decision making include sensors to measure relative humidity, soil moisture content, solar radiation, and air and water quality. The flood detection systems will be monitored by the City of Brownwood. Communications between the flood detection stations and city maintenance personnel can be achieved through a variety of wireless and wireline telemetry methods.

Public Transportation Management

CityLink Electronic Fare Payment

Associated Market Packages

- Transit Fixed Route Operations (APTS2)
- Demand Response Transit Operations (APTS3)
- Transit Passenger and Fare Management (APTS4)

Prerequisite Projects: None

Description: Implement an electronic fare collection systems on CityLink Transit vehicles. There are three primary benefits of these collection systems. The first is enhanced revenue collection ability. The second is increased security by not having large amounts of cash or tokens on the vehicle. The third is the increased convenience and security for the transit patron. These systems are often implemented in conjunction with AVL or mobile data terminals, or are implemented as an add-on to those systems. To enable automated fare collection, fare boxes would need to be upgraded to accept smart cards (i.e., cards with passive Radio Frequency Identification (RFID) technology or a magnetic information strip, such as a credit card) with rider and account information. Electronic fare payment and passenger information technology is rapidly advancing, and there will be several technological considerations that will need to be examined, such as standards for smart cards and interoperability issues.

CityLink CCTV at Transfer Stations

Associated Market Packages:

- Transit Fixed Route Operations (APTS2)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will include the installation of security cameras at CityLink transfer stations. Cameras will record, but will also likely be monitored at the Transit Dispatch. Video will be stored for a pre-determined amount of time via video tape or emerging digital video recording technology. The main objective of this project will be to provide increased security for transit patrons waiting at a transfer station.

Hill Country Transit Electronic Fare Payment

Associated Market Packages

- Demand Response Transit Operations (APTS3)
- Transit Passenger and Fare Management (APTS4)

Prerequisite Projects: None

Description: Implement electronic fare collection systems on Hill Country Transit vehicles. There are three primary benefits of these collection systems. The first is enhanced revenue collection ability. The second is increased security by not having large amounts of cash or tokens on the vehicle. The third is

the increased convenience and security for the transit patron. These systems are often implemented in conjunction with AVL or mobile data terminals, or are implemented as an add-on to those systems. To enable automated fare collection, fare boxes would need to be upgraded to accept smart cards (i.e., cards with passive RFID technology or a magnetic information strip, such as a credit card) with rider and account information. Electronic fare payment and passenger information technology is rapidly advancing, and there will be several technological considerations that will need to be examined, such as standards for smart cards and interoperability issues.

Hill Country Transit On-board Security Cameras Phase 2

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Security (APTS5)

Prerequisite Projects: Hill Country Transit On-board Security Cameras Phase 1

Description: This project will install additional security cameras on Hill Country Transit vehicles. It is a possibility that the security cameras would provide video feed from the buses to the transit operations center for monitoring. While the main objective of on-board surveillance projects has been to identify individuals committing criminal acts or creating disturbances on buses, there have been noticeable maintenance benefits such as a reduction of litter and debris.

CARR Mobile Data Terminals

Associated Market Packages:

- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install MDT units on CARR transit vehicles. Mobile data terminals allow bus operators to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify drivers of adverse conditions, route changes, or other impacts to the route. MDTs can also transmit information from the driver to the dispatch center, including status, disruptions, or silent alarms. An additional feature that can be built-in to the MDT is the ability for vehicle-to-vehicle digital communications, in addition to the vehicle-to-center communications.

Double Mountain Coach Emergency Silent Alarms

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will install silent alarm buttons on the buses. If the driver feels there is a threat on the bus, the bus has been involved in an accident, or any other situation occurs where the driver may need assistance, he or she can activate the alarm. The alarm notifies the dispatch center of the potential problem so that help can be dispatched.

Double Mountain Coach Mobile Data Terminals

Associated Market Packages:

- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install MDT units on Double Mountain Coach vehicles. Mobile data terminals allow bus operators to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify drivers of adverse conditions, route changes, or other impacts to the route. MDTs can also transmit information from the driver to the dispatch center, including status, disruptions, or silent alarms. An additional feature that can be built-in to the MDT is the ability for vehicle-to-vehicle digital communications, in addition to the vehicle-to-center communications.

Commercial Vehicle Operations

TxDOT Abilene Weigh-in-Motion Phase 2

Associated Market Packages:
- Weigh-in-Motion (CVO06)

Prerequisite Projects: TxDOT Abilene Weigh-in-Motion Phase 1

Description: Implement weigh-in-motion systems on additional major roadways in the Abilene District. weigh-in-motion sites can be located on the mainline for high speed weigh-in-motion, or at pull out locations for low speed weigh-in-motion. There are several types of weigh-in-motion systems, including bending plate, piezo electric, and load cell. These systems typically cost between $10,000-$20,000; however, a majority of the cost in deploying a weigh-in-motion system is for the installation.

For mainline weigh-in-motion, a smooth, straight approach prior to the scale is required to eliminate vehicle vibrations, which can greatly reduce the accuracy. In order to achieve the smooth surface, a new concrete pad is often installed prior to the weigh-in-motion site. Pull out sites typically weigh trucks at slower speeds and do not require as significant construction as the main-line sites for installation, providing a pull out site is available. For estimation purposes, a cost of $50,000 per weigh-in-motion site was used to account for equipment and installation costs.

TxDOT Brownwood Weigh-in-Motion Phase 1

Associated Market Packages:
- Weigh-in-Motion (CVO06)

Prerequisite Projects: None

Description: Implement a weigh-in-motion system on I-20 in the Brownwood District. weigh-in-motion sites can be located on the mainline for high speed weigh-in-motion, or at pull out locations for low speed weigh-in-motion. There are several types of weigh-in-motion systems, including bending plate, piezo electric, and load cell. These systems typically cost between $10,000-$20,000; however, a majority of the cost in deploying a weigh-in-motion system is for the installation.

For mainline weigh-in-motion, a smooth, straight approach prior to the scale is required to eliminate vehicle vibrations, which can greatly reduce the accuracy. In order to achieve the smooth surface, a new concrete pad is often installed prior to the weigh-in-motion site. Pull out sites typically weigh trucks at slower speeds and do not require as significant construction as the main-line sites for installation, providing a pull out site is available. For estimation purposes, a cost of $50,000 per weigh-in-motion site was used to account for equipment and installation costs.

Archived Data Management

Abilene MPO Data Warehouse

Associated Market Packages:

- ITS Data Warehouse (AD2)

Prerequisite Projects: None

Description: Implement a system to collect, store and process transportation data from agencies in the MPO service area such as transit and traffic management. This project will design the frequency, quantity, and quality of data to be collected and stored. User interfaces will be required at each local agency to be able to access, search, and upload archived data as needed. The interface will likely be web-based.

Table 8 – Long-Term Projects (20-Year)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management					
TxDOT Abilene Closed Loop Signal System Expansion Phase 3	Continue the expansion of closed loop signal system at TxDOT intersections throughout the Abilene District	TxDOT Abilene	To Be Determined	No	2 years
TxDOT Brownwood Closed Loop Signal System Expansion Phase 3	Continue the expansion of closed loop signal system at TxDOT intersections throughout the Brownwood District	TxDOT Brownwood	To Be Determined	No	2 years
City of Abilene Closed Loop Signal System Expansion Phase 3	Continue the implementation of closed loop signal systems in the City of Abilene. Also includes the implementation of Video Image Vehicle Detector Systems (VIVDS).	City of Abilene	To Be Determined	No	2 years
City of Brownwood Closed Loop Signal System Implementation Phase 3	Continue the implementation of closed loop signal systems in the City of Brownwood. Also includes the implementation of VIVDS.	City of Brownwood	To Be Determined	No	2 years
TxDOT Abilene Lane Control Signals	Implement lane control signals along I-20 in the Abilene District	TxDOT Abilene	$15,000/site	No	1 year
Municipal TOC/TxDOT TMC Communications Connection	Implement a connection between a Municipal Traffic Operations Center (TOC) and the TxDOT Abilene or Brownwood District Traffic Management Centers (TMCs) to allow video sharing, traffic data sharing, and other joint functions	West Central Texas Region Cities/TxDOT	To Be Determined	No	6 months
ISP-based Route Guidance	Provide direct support to Information Service Provider (ISP)-based route guidance systems through sharing of traveler information	Public Agencies/Private Sector	Public: $100,000	No	1 year
Public Transportation Management					
CityLink Maintenance System	Install a maintenance system on CityLink vehicles to monitor the maintenance needs of the vehicles	CityLink	To Be Determined	No	1 year
Hill Country Transit Maintenance System	Install a maintenance system on Hill Country Transit vehicles to monitor the maintenance needs of the vehicles	Hill Country Transit	To Be Determined	No	1 year

Table 8 – Long-Term Projects (20-Year) (continued)

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Public Transportation Management (continued)					
CARR Transit Maintenance System	Install a maintenance system on City and Rural Rides (CARR) vehicles to monitor the maintenance needs of the vehicles	CARR	To Be Determined	No	1 year
Double Mountain Coach AVL	Implement automated vehicle location (AVL) to provide bus location information	Aspermont Small Business	$10,000/vehicle (Includes software)	No	6 months
Double Mountain Coach Transit Maintenance System	Install a maintenance system on Double Mountain Coach vehicles to monitor the maintenance needs of the vehicles	Aspermont Small Business	To Be Determined	No	1 year
Multi-modal Coordination	Implement connections necessary for transit agencies in the Region to coordinate with one another for regional schedule coordination for transfers	Hill Country Transit/CARR/ CityLink/Aspermont Small Business	To Be Determined	No	6 months
Commercial Vehicle Operations					
TxDOT Brownwood Weigh-in-Motion Phase 2	Implement a weigh-in-motion system on additional major roadways in the Brownwood District	TxDOT Brownwood	$50,000/site	No	1 year

*Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

**The design has not been undertaken and thus this is only an opinion of probable cost for planning purposes.

West Central Texas Region
Long-Term Projects (20-Year)

Travel and Traffic Management

TxDOT Abilene Closed Loop Signal System Expansion Phase 3

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: TxDOT Abilene Closed Loop Signal System Expansion Phase 1, TxDOT Abilene Closed Loop Signal System Expansion Phase 2

Description: Continue to expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. This project also includes the installation of VIVDS.

TxDOT Brownwood Closed Loop Signal System Expansion Phase 3

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: TxDOT Brownwood Closed Loop Signal System Expansion Phase 1, TxDOT Brownwood Closed Loop Signal System Expansion Phase 2

Description: Continue to expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. This project also includes the installation of VIVDS.

City of Abilene Closed Loop Signal System Expansion Phase 3

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: City of Abilene Closed Loop Signal System Expansion Phase 1, City of Abilene Closed Loop Signal System Expansion Phase 2

Description: Continue to expand the closed loop signal system in the City of Abilene. This project includes the implementation of VIVDS.

City of Brownwood Closed Loop Signal System Implementation Phase 3

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: City of Brownwood Closed Loop Signal System Implementation Phase 1, City of Brownwood Closed Loop Signal System Implementation Phase 2

Description: Continue to implement the closed loop signal system in the City of Brownwood. This project includes the implementation of VIVDS.

TxDOT Abilene Lane Control Signals

Associated Market Packages:

- Freeway Control (ATMS04)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install lane control signals on I-20 in the Abilene District. These signals will indicate lane blockage to motorists. The signals can be utilized to provide drivers with early warning for congested lanes, incidents, or maintenance activities that are obstructing a lane.

The estimated cost per site is approximately $15,000.

Municipal TOC/TxDOT TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install a connection between a municipal TOC in the West Central Texas Region and the TxDOT Abilene and/or Brownwood TMC to allow video sharing, traffic data sharing and other joint functions. The type of connection (fiber, wireless, leased line) will need to be determined prior to implementation of this project based on desired band width and cost of technologies available.

ISP-Based Route Guidance

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Broadcast Traveler Information (ATIS1)
- ISP-Based Route Guidance (ATIS5)

Prerequisite Projects: TxDOT ATMS Implementation

Description: Provide ISPs with data relative to current travel conditions. The project extends current static capabilities of the OnStar, in-vehicle route guidance systems, (or equivalent) currently being equipped in new vehicles (OnStar is equipped on some GM, Acura, Audi, Saab, and Subaru models). Currently, the OnStar system will help guide a motorist to a location based on static information. By providing real-time traveler information to ISPs, the guidance systems could modify the recommended route based on dynamic roadway conditions (e.g., variation on congestion levels, accidents, roadwork, etc.). The project will require a public/private sector partnership, because route guidance and navigation services are typically subscription services.

Public Transportation Management

CityLink Maintenance System

Associated Market Packages:

- Transit Fixed-Route Operations (APTS2)
- Demand-Response Transit Operations (APTS3)
- Transit Maintenance (APTS6)

Prerequisite Projects: None

Description: Implement a system to monitor the maintenance status of CityLink Transit vehicles and alert the driver and the dispatch center when maintenance is required or preventative maintenance needs to be scheduled. Such a system will enable maintenance issues to be addressed as soon as possible, hopefully preventing a break down and unplanned down time for a transit vehicle.

Hill Country Transit Maintenance System

Associated Market Packages:

- Demand-Response Transit Operations (APTS3)
- Transit Maintenance (APTS6)

Prerequisite Projects: None

Description: Implement a system to monitor the maintenance status of Hill Country Transit vehicles and alert the driver and the dispatch center when maintenance is required or preventative maintenance needs to be scheduled. Such a system will enable maintenance issues to be addressed as soon as possible, hopefully preventing a break down and unplanned down time for a transit vehicle.

CARR Transit Maintenance System

Associated Market Packages:

- Demand-Response Transit Operations (APTS3)
- Transit Maintenance (APTS6)

Prerequisite Projects: None

Description: Implement a system to monitor the maintenance status of CARR transit vehicles and alert the driver and the dispatch center when maintenance is required or preventative maintenance needs to be scheduled. Such a system will enable maintenance issues to be addressed as soon as possible, hopefully preventing a break down and unplanned down time for a transit vehicle.

Double Mountain Coach AVL

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install AVL units on Double Mountain Coach transit vehicles. The AVL system will convey information regarding real-time vehicle location to the Transit Operations Center, which will allow for enhanced system monitoring, scheduling, routing (or re-routing), as well as provide for precise bus location information in the event of a breakdown or emergency situation. AVL systems measure actual, real-time position of transit vehicles, and relay that information back to a transit operations center, usually via global positioning system. Used with a geographic information system map, bus locations can be displayed for any vehicles in the fleet equipped with the on-board AVL unit. AVL, in conjunction with CAD, allows for improved bus tracking capability, as well as archiving and managing historical data. AVL systems also can be equipped with additional features, including tie-ins to alarm/security systems, vehicle component monitoring, and automated passenger counter and fare payment systems. Information from the AVL/CAD system can be used by transit managers for real-time operations and management as well as for transit traveler information. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations.

Cost will vary depending on the number of vehicles equipped with AVL systems, as well as the functions and features designed into the systems. The estimated cost is $10,000 per vehicle.

Double Mountain Coach Transit Maintenance System

Associated Market Packages:

- Demand-Response Transit Operations (APTS3)
- Transit Maintenance (APTS6)

Prerequisite Projects: None

Description: Implement a system to monitor the maintenance status of Double Mountain Coach vehicles and alert the driver and the dispatch center when maintenance is required or preventative maintenance needs to be scheduled. Such a system will enable maintenance issues to be addressed as soon as possible, hopefully preventing a break down and unplanned down time for a transit vehicle.

Multi-modal Coordination

Associated Market Packages:

- Transit Fixed Route Operations (APTS2)
- Demand Response Transit Operations (APTS3)
- Multi-modal Coordination (APTS7)

Prerequisite Projects: None

Description: Implement connections necessary for West Central Texas Region transit agencies to coordinate with each other for regional schedule coordination, especially to facilitate passenger transfers. It is envisioned that by linking the CAD systems and electronic schedules, that a passenger traveling through the Region that needed to use multiple agencies to complete their trip could arrange those transfers by contacting one of the agencies who would be able to request the necessary transfers through the CAD system.

Commercial Vehicle Operations

TxDOT Brownwood Weigh-in-Motion Phase 2

Associated Market Packages:

- Weigh-in-Motion (CVO06)

Prerequisite Projects: TxDOT Brownwood Weigh-in-Motion Phase 1

Description: Implement weigh-in-motion systems on additional major roadways in the Brownwood District. Weigh-in-motion sites can be located on the mainline for high speed weigh-in-motion, or at pull out locations for low speed weigh-in-motion. There are several types of weigh-in-motion systems, including bending plate, piezo electric, and load cell. These systems typically cost between $10,000-$20,000; however, a majority of the cost in deploying a weigh-in-motion system is for the installation.

For mainline weigh-in-motion, a smooth, straight approach prior to the scale is required to eliminate vehicle vibrations, which can greatly reduce the accuracy. In order to achieve the smooth surface, a new concrete pad is often installed prior to the weigh-in-motion site. Pull out sites typically weigh trucks at slower speeds and do not require as significant construction as the main-line sites for installation, providing a pull out site is available. For estimation purposes, a cost of $50,000 per weigh-in-motion site was used to account for equipment and installation costs.

4. MAINTAINING THE REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

The West Central Texas 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 West Central Texas 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 March 2004, stakeholders recommended that the group meet every two years to correspond with the Transportation Improvement Plan update process to review the Regional ITS Architecture and 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 West Central Texas 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 West Central Texas 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 West Central Texas 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.