State of Texas
Regional ITS Architectures and Deployment Plans

Paris Region

Regional ITS Deployment Plan

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REGIONAL ITS DEPLOYMENT PLAN

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LIST OF ACRONYMS

ATCOG	Ark-Tex Council of Governments
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CAD	Computer Aided Dispatch
CCTV	Closed-Circuit Television
DMS	Dynamic Message Signs
EAS	Emergency Alert System
FHWA	Federal Highway Administration
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HCRS	Highway Conditions 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
PTZ	Pan/Tilt/Zoom
RWIS	Road Weather Information System
TAPS	Texoma Area Paratransit Service
TEA-21	Transportation Equity Act for the 21st Century
TMC	Transportation Management Center
TOC	Traffic Operations Center Transit Operations Center
TxDOT	Texas Department of Transportation
VIVDS	Video Image Vehicle Detection 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 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 Paris Regional ITS Architecture and Regional ITS Deployment Plan was prepared as part of this initiative.

The Paris 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, cities, counties, emergency management, and area transit agencies.

Building on the dialogue, consensus, and vision outlined in the Regional ITS Architecture, stakeholders in the Paris 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 Paris 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 Paris 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, TxDOT initiated the development of regional ITS architectures throughout the State of Texas. Although not required by the FHWA final rule, TxDOT also 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 Paris Regional ITS Deployment Plan was developed using the Regional ITS Architecture developed in 2004. 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 Paris Region.

The Paris 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 Paris Regional ITS Deployment Plan is organized into four key sections:

Section 1 – Introduction

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

Section 2 – Prioritization of Market Packages

Section 2 contains the prioritized market packages for the Paris 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 Projects

Project recommendations have been developed for the Paris 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 Paris Region

1.3.1 Geography and Regional Characteristics

The Paris Region is bordered by Oklahoma to the north, the TxDOT Atlanta District to the east, the TxDOT Tyler District to the south, the TxDOT Dallas District to the southwest, and the TxDOT Wichita Falls District to the west. For the Paris Regional ITS Architecture and Deployment Plan, the study area included all nine counties that comprise the TxDOT Paris District.

The counties included in the Paris Region are:

- Delta;
- Fannin;
- Franklin;
- Grayson;
- Hopkins;
- Hunt;
- Lamar;
- Rains; and
- Red River.

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. All of the cities in the Paris Region have a population less than 50,000; however, the Sherman urban area has a population of approximately 56,000 and therefore the Sherman-Denison Metropolitan Planning Organization (MPO) is responsible for transportation planning within the urban area.

1.3.2 Transportation Infrastructure

The Paris Region has an extensive transportation infrastructure. The primary roadway facilities include I-30, US-69, US-75, US-82, and US-271.

I-30 is an east-west divided interstate highway. Its' effective operation is critical to the movement of goods and people through the State of Texas and the United States. Blockages along I-30 can have serious implications on drive-time for commercial vehicles

and motorists alike due to the lack of obvious alternate routes. Knowing the road and travel conditions within this transportation corridor and having the ability to disseminate this information to motorists are important elements for this project. For example, if I-30 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 Paris Region

Within the Paris Region there are currently several ITS applications in place. 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 in several jurisdictions for fire vehicles and several emergency management agencies are utilizing computer aided dispatch systems.

1.3.4   Paris 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 Paris Region.

The following is a list of stakeholders in the Paris 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 Paris Regional ITS Architecture.

- Ark-Tex Council of Governments;
- City of Bonham;
- City of Greenville;
- City of Paris;
- City of Sherman;
- Grayson County;
- Hopkins County;
- Hunt County Committee on Aging, Inc.;
- Rains County;
- Sherman-Denison MPO;
- Texoma Area Paratransit System, Inc.;
- Texoma Council of Governments;
- TxDOT Paris District; and
- TxDOT Traffic Operations Division (Austin).

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

Table 1 – Paris Stakeholder Agencies and Contacts

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
Ark-Tex Council of Governments	Lynda Pugh	122 Plaza West Texarkana, Texas 75501	(903) 832-8636	lwoods@atcog.org
City of Bonham	Blaine Hinds	301 E. 5th Street Bonham, Texas 75418	(903) 583-7555	city-manager@cobon.net
City of Greenville	Keith Hawkins	P.O. Box 1049 Greenville, Texas 75403	(903) 457-3116	N/A
City of Paris	Shawn Napier	150 SE 1st Paris, Texas 75460	(903) 784-9234	s_napier@ci.paris.tx.us
City of Paris 911 Communications	Bob Hundley	811 Bonham Street Paris, Texas 75460	(903) 784-6688	N/A
City of Paris EMS	Kent Klinkerman	150 SE 1st Paris, Texas 75460	(903) 784-9228	k_klinkerman@ci.paris.tx.us
City of Paris Police Department	William Hodge	811 Bonham Street Paris, Texas 75460	(903) 784-6688	w_hodge@ci.paris.tx.us
City of Paris Police Department	Karl Louis	811 Bonham Street Paris, Texas 75460	(903) 737-4100	k_louis@ci.paris.tx.us
City of Sherman	Jeff Miller	405 N Rusk Street Sherman, Texas 75090	(903) 892-7035	jeffm@ci.sherman.tx.us
City of Sherman	Bruce Simpson	800 S East Street Sherman, Texas	(903) 892-7254	N/A
Grayson County	Gene Short	100 W Houston Sherman, Texas 75090	(903) 813-4318	shortg@co.grayson.tx.us
Grayson County	Jerry White	100 W. Houston Sherman, Texas 75090	(903) 813-4247	jdwhite@co.grayson.tx.us
Grayson County Sheriff	Mark Hudson	200 S Crockett Sherman, Texas 75090	(903) 813-4010	hudsonm@co.grayson.tx.us
Hopkins County	Cletis Milsap	P.O. Box 288 Sulphur Springs, Texas 75483	(903) 438-4006	N/A
Hunt County Committee on Aging, Inc.	David Caldwell	3720 O'Neal Street Greenville, Texas 75401	(903) 454-1444	dcaldwell@huntrockwallseniorservices.org
Rains County	Gary Bishop	P.O. Box 158 Emory, Texas 75440	(903) 473-2565	N/A
Rains County	Joe Ray Doughtery	P.O. Box 158 Emory, Texas 75440	(903) 473-2565	N/A
Sherman-Denison MPO	Wally Johnson	1117 Gallagher, Suite 300 Sherman, Texas 75090	(903) 813-3531	wjohnson@sdmpo.org
Sherman-Denison MPO/ Texoma COG	Bob Wood	1117 Gallagher, Suite 300 Sherman, Texas 75090	(903) 813-3534	rwood@texoma.cog.tx.us rwood@sdmpo.org

Table 1 – Paris Stakeholder Agencies and Contacts (continued)

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
Texoma Area Paratransit System, Inc.	Ven Hammonds	6104 Texoma Parkway Sherman, Texas 75090-2128	(903) 893-4601	tapsinc1@airmail.net
TxDOT Paris District	Tommie Cox	1365 N Main Street Paris, Texas 75460	(903) 737-9358	tcox@dot.state.tx.us
TxDOT Paris District	Richard Harper	3600 S.W. Loop 286 Paris, Texas 75460	(903) 784-1357	rharper@dot.state.tx.us
TxDOT Paris District	Steve Hodges	3600 S.W. Loop 286 Paris, Texas 75460	(903) 784-1357	shodges@dot.state.tx.us
TxDOT Paris District	Jerry Keisler	1365 N Main Street Paris, Texas 75460	(903) 737-9251	jkeisle@dot.state.tx.us
TxDOT Paris District	Bobby Littlefield	1365 Main Street Paris, Texas 75460	(903) 737-9206	blittle@dot.state.tx.us
TxDOT Paris District	Darius Samuels	1365 N Main Street Paris, Texas 75460	(903) 737-9498	dsamuel@dot.state.tx.us
TxDOT Paris District	Penny Sansom	1365 N Main Street Paris, Texas 75460	(903) 737-9373	psansom@dot.state.tx.us
TxDOT Paris District Greenville Area Office	R. Craig Miser	5900 Joe Ramsey Greenville, Texas 75402	(903) 455-2363	cmiser@dot.state.tx.us
TxDOT Paris District Sherman Area Office	Kevin Harris	3711 US 75 South Sherman, Texas 75091	(903) 892-6529	kharris@dot.state.tx.us
TxDOT Paris District Sherman Area Office	Noel Paramanantham	3711 US 75 South Sherman, Texas 75091	(903) 892-6529	nparama@dot.state.tx.us
TxDOT Traffic Operations Division	Alesia Gamboa	Attn: TRF-Cedar Park #51 125 East 11th Street Austin, Texas 78701-2483	(512) 506-5154	agamboa@dot.state.tx.us
TxDOT Traffic Operations Division	Fabian Kalapach	Attn: TRF-Cedar Park #51 125 East 11th Street Austin, Texas 78701-2483	(512) 506-5134	fkalapa@dot.state.tx.us

2. PRIORITIZATION OF MARKET PACKAGES

2.1 Prioritization Process

Of the 85 market packages currently available in the National ITS Architecture Version 5.0, 42 were selected and customized for deployment in the Paris 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 Paris Region. These priorities identified the key needs and services that are desired in the Paris 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 Paris 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 infrastructure from that market package that is already existing in the Paris 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 Paris Region

High Priority	Medium Priority	Low Priority
▪ Network Surveillance	▪ Regional Traffic Control	▪ Freeway Control
▪ Surface Street Control	▪ Standard Railroad Grade Crossing	▪ Electronic Toll Collection
▪ Traffic Information Dissemination	▪ Railroad Operations Coordination	▪ Emissions Monitoring and Management
▪ Traffic Incident Management System	▪ Emergency Vehicle Routing	▪ Transportation Infrastructure Protection
▪ Emergency Call-Taking and Dispatch	▪ Disaster Response and Recovery	▪ Early Warning System
▪ Wide-Area Alert	▪ Work Zone Safety Monitoring	▪ Evacuation and Reentry Management
▪ Road Weather Data Collection	▪ Transit Vehicle Tracking	▪ Maintenance and Construction Vehicle Tracking
▪ Weather Information Processing and Distribution	▪ Transit Fixed-Route Operations	▪ Maintenance and Construction Vehicle Maintenance
▪ Work Zone Management	▪ Demand Response Transit Operations	▪ Roadway Automated Treatment
▪ Maintenance and Construction Activity Coordination	▪ Transit Passenger and Fare Management	▪ Winter Maintenance
▪ Transit Traveler Information	▪ Transit Security	▪ Roadway Maintenance and Construction
	▪ Multi-modal Coordination	▪ Transit Maintenance
	▪ HAZMAT Management	▪ Weigh-in-Motion
	▪ Broadcast Traveler Information Systems	▪ ISP Based Route Guidance
	▪ Interactive Traveler Information	▪ ITS Data Mart
		▪ ITS Data Warehouse

2.2 High Priority Market Packages

Market packages that were selected as high priorities for the Paris 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 Paris Region; that is, there are already systems and technologies deployed to deliver some of these high priority services and functions. For example, the TxDOT Paris 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 Paris Region.

Table 3 – High Priority Market Packages for the Paris 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	Agency
■ VIVDS ■ Overheight Detection	■ TxDOT Paris

Planned Projects

- TxDOT ATMS Implementation
- TxDOT Signal System Upgrades Phase 1

Additional Needs

- City of Sherman CCTV Camera Implementation
- City of Sherman RWIS Station and Automated Closure System
- City of Sherman Signal System Upgrades Phase 1
- City of Sherman Signal System Upgrades Phase 2
- City of Sherman Signal System Upgrades Phase 3
- City of Sherman TOC
- Municipal Signal System Implementation Phase 1
- Municipal Signal System Implementation Phase 2
- TxDOT Area Office Remote TMC Workstations
- TxDOT CCTV Camera Implementation
- TxDOT Flood Detection Stations Phase 1
- TxDOT Flood Detection Stations Phase 2
- TxDOT Paris District TMC
- TxDOT RWIS Stations Phase 1
- TxDOT RWIS Stations Phase 2
- TxDOT Signal System Upgrades Phase 2
- TxDOT Signal System Upgrades Phase 3
- TxDOT Vehicle Detection

Table 3 – High Priority Market Packages for the Paris 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	**Agency**
▪ VIVDS ▪ Closed Loop Signal System	▪ TxDOT Paris
Planned Projects	
▪ TxDOT Signal System Upgrades Phase 1	
Additional Needs	

- City of Paris Emergency Vehicle Traffic Signal Preemption
- City of Sherman CCTV Camera Implementation
- City of Sherman Emergency Vehicle Traffic Signal Preemption
- City of Sherman Signal System Upgrades Phase 1
- City of Sherman Signal System Upgrades Phase 2
- City of Sherman Signal System Upgrades Phase 3
- City of Sherman TOC
- Municipal Emergency Vehicle Traffic Signal Preemption
- Municipal Signal System Implementation Phase 1
- Municipal Signal System Implementation Phase 2
- TxDOT Area Office Remote TMC Workstations
- TxDOT Emergency Vehicle Traffic Signal Preemption
- TxDOT Paris District TMC
- TxDOT Signal System Upgrades Phase 2
- TxDOT Signal System Upgrades Phase 3

Table 3 – High Priority Market Packages for the Paris 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 traffic management center (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	Agency
▪ HCRS	▪ TxDOT

Planned Projects

- ▪ TxDOT ATMS Implementation
- ▪ TxDOT Center-to-Center Communications
- ▪ TxDOT HCRS Enhancements

Additional Needs

- ▪ City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection
- ▪ City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection
- ▪ City of Sherman TOC
- ▪ City of Sherman TOC/TxDOT Paris District TMC Communications Connection
- ▪ ISP Based Route Guidance
- ▪ Media Liaison and Coordination
- ▪ Regional 511 Advanced Traveler Information System Server
- ▪ TxDOT Area Office Remote TMC Workstations
- ▪ TxDOT DMS Phase 1
- ▪ TxDOT DMS Phase 2
- ▪ TxDOT Paris District TMC
- ▪ TxDOT Portable DMS
- ▪ TxDOT Web Page Customization and Enhancement

Table 3 – High Priority Market Packages for the Paris 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	Agency
▪ HCRS	▪ TxDOT

Planned Projects

▪ TxDOT ATMS Implementation

▪ TxDOT Center-to-Center Communications

▪ TxDOT HCRS Enhancements

Additional Needs

▪ City of Sherman 911 Dispatch/City of Sherman TOC Communication Connection

▪ City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection

▪ City of Sherman CCTV Camera Implementation

▪ City of Sherman Emergency Vehicle Traffic Signal Preemption

▪ City of Sherman TOC

▪ City of Sherman TOC/TxDOT Paris District TMC Communications Connection

▪ Detour Planning Phase 1

▪ Detour Planning Phase 2

▪ Media Liaison and Coordination

▪ Regional 511 Advanced Traveler Information System Server

▪ TxDOT Area Office Remote TMC Workstations

▪ TxDOT CCTV Camera Implementation

▪ TxDOT DMS Phase 1

▪ TxDOT DMS Phase 2

▪ TxDOT Lane Control Signals

▪ TxDOT Paris District TMC

▪ TxDOT Portable DMS

▪ TxDOT Vehicle Detection

▪ TxDOT Web Page Customization and Enhancement

Table 3 – High Priority Market Packages for the Paris Region (continued)

Emergency Call-Taking and Dispatch (EM01)	High Priority
This market package provides basic public safety call-taking and dispatch services. It 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 between agencies. Wide area wireless communications between the Emergency Management Subsystem and an Emergency Vehicle supports dispatch and provision of information to responding personnel.	

Existing Infrastructure	Agency
▪ CAD	▪ Grayson County Sheriff
▪ Limited Emergency Vehicle Signal Preemption	▪ City of Paris

Planned Projects

None identified at this time

Additional Needs

- City of Paris Emergency Vehicle Traffic Signal Preemption
- City of Paris Police Department AVL and CAD Upgrade
- City of Sherman Emergency Vehicle Traffic Signal Preemption
- Grayson County Centralized 911 Dispatch
- Grayson County Sheriff AVL and MDTs
- Municipal Emergency Vehicle Traffic Signal Preemption
- TxDOT Emergency Vehicle Traffic Signal Preemption

Table 3 – High Priority Market Packages for the Paris Region (continued)

Wide-Area Alert (EM06)	High Priority
This market package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information web sites.	
Existing Infrastructure	**Agency**
None identified	
Planned Projects	
None identified at this time	
Additional Needs	
▪ Regional 511 Advanced Traveler Information System Server ▪ TxDOT DMS Phase 1 ▪ TxDOT DMS Phase 2 ▪ TxDOT Web Page Customization and Enhancement	

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	**Agency**
None identified	
Planned Projects	
▪ TxDOT HCRS Enhancements	
Additional Needs	
▪ City of Sherman RWIS Station and Automated Closure System ▪ TxDOT Flood Detection Stations Phase 1 ▪ TxDOT Flood Detection Stations Phase 2 ▪ TxDOT RWIS Stations Phase 1 ▪ TxDOT RWIS Stations Phase 2	

Table 3 – High Priority Market Packages for the Paris Region (continued)

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	**Agency**
▪ HCRS	▪ TxDOT
Planned Projects	
▪ TxDOT ATMS Implementation ▪ TxDOT Center-to-Center Communications ▪ TxDOT HCRS Enhancements	
Additional Needs	
▪ Media Liaison and Coordination ▪ Regional 511 Advanced Traveler Information System ▪ TxDOT Flood Detection Stations Phase 1 ▪ TxDOT Flood Detection Stations Phase 2 ▪ TxDOT Paris District TMC ▪ TxDOT Web Page Customization and Enhancement	

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	**Agency**
▪ HCRS	▪ TxDOT
Planned Projects	
▪ TxDOT HCRS Enhancements ▪ TxDOT Center-to-Center Communications	
Additional Needs	
▪ City of Sherman TOC/TxDOT Paris District TMC Communications Connection ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Traveler Information System Server ▪ TxDOT DMS Phase 1 ▪ TxDOT DMS Phase 2 ▪ TxDOT Portable DMS	

Table 3 – High Priority Market Packages for the Paris Region (continued)

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	Agency
▪ HCRS	▪ TxDOT

Planned Projects

- ▪ TxDOT HCRS Enhancements
- ▪ TxDOT Center-to-Center Communications

Additional Needs

- ▪ City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection
- ▪ City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection
- ▪ City of Sherman TOC
- ▪ City of Sherman TOC/TxDOT Paris District TMC Communications Connection
- ▪ ISP Based Route Guidance
- ▪ Media Liaison and Coordination
- ▪ Regional 511 Advanced Traveler Information System Server
- ▪ TxDOT Paris District TMC
- ▪ TxDOT Web Page Customization and Enhancement

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	Agency
None identified	

Planned Projects

None identified at this time

Additional Needs

- ▪ TAPS Website
- ▪ The Connection Web-based Ride Scheduling System

2.3 Medium Priority Market Packages

Table 4 outlines market packages that were deemed medium priority by stakeholders in the Paris 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 Paris Region

Regional Traffic Control (ATMS07)	Medium 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	**Agency**
None identified	
Planned Projects	
▪ TxDOT ATMS Implementation ▪ TxDOT Center-to-Center Communications	
Additional Needs	
▪ TxDOT Area Office Remote TMC Workstations ▪ City of Sherman TOC/TxDOT Paris District TMC Communications Connection	

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	**Agency**
None identified	
Planned Projects	
None identified at this time	
Additional Needs	
None identified at this time	

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	Agency
▪ CAD	▪ City of Paris
	▪ Grayson County Sheriff

Planned Projects

None identified at this time

Additional Needs

- City of Paris Emergency Vehicle Traffic Signal Preemption
- City of Paris Police Department AVL and CAD Upgrade
- City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection
- City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection
- City of Sherman Emergency Vehicle Traffic Signal Preemption
- Detour Planning Phase 1
- Detour Planning Phase 2
- Grayson County Centralized 911 Dispatch
- Grayson County Sheriff AVL and MDTs
- Municipal Emergency Vehicle Traffic Signal Preemption
- TxDOT Emergency Vehicle Traffic Signal Preemption

Disaster Response and Recovery (EM08)	Medium Priority

This market package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). The market package supports coordination of emergency response plans, provides enhanced access to the scene and better information about the transportation system in the vicinity of the disaster, and maintains situation awareness.

Existing Infrastructure	Agency
None identified	

Planned Projects

- TxDOT Center-to-Center Communications

Additional Needs

- City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection
- City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection
- City of Sherman TOC/TxDOT Paris TMC Communications Connection

Table 4 – Medium Priority Market Packages for the Paris Region (continued)

Work Zone Safety Monitoring (MC09)	Medium Priority
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.	
Existing Infrastructure	**Agency**
None identified	
Planned Projects	
None identified at this time	
Additional Needs	
None identified at this time	

Transit Vehicle Tracking (APTS1)	Medium 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	**Agency**
▪ AVL (limited deployment)	▪ TAPS
Planned Projects	
None identified at this time	
Additional Needs	
▪ ATCOG AVL and MDTs	
▪ TAPS AVL	
▪ The Connection AVL	

Transit Fixed-Route Operations (APTS2)	Medium 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	Agency
▪ AVL (limited deployment)	▪ TAPS

Planned Projects

None identified at this time

Additional Needs

▪ Regional Smart Card

▪ TAPS AVL

▪ TAPS Website

▪ TAPS Transit Operations Center Enhancements

▪ TAPS Security Alarms and On-board Video Surveillance

Demand Response Transit Operations (APTS3)	Medium 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	Agency
■ AVL (limited deployment)	■ TAPS

Planned Projects
None identified at this time

Additional Needs
■ ATCOG AVL and MDTs
■ ATCOG CAD Upgrade
■ Regional Smart Card
■ TAPS AVL
■ TAPS Website
■ TAPS Transit Operations Center Enhancements
■ TAPS Security Alarms and On-board Video Surveillance
■ The Connection AVL
■ The Connection Electronic Fare Collection
■ The Connection MDTs
■ The Connection Web-based Ride Scheduling System

Transit Passenger and Fare Management (APTS4)	Medium 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	Agency
None identified	

Planned Projects
None identified at this time

Additional Needs
■ The Connection Electronic Fare Payment
■ Regional Smart Card

Transit Security (APTS5)	Medium 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	**Agency**
▪ On-board Video Surveillance	▪ The Connection
Planned Projects	
▪ TAPS Maintenance Facility Surveillance System	
Additional Needs	
▪ TAPS Security Alarms and On-board Video Surveillance	

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 None identified at this time	

Table 4 – Medium Priority Market Packages for the Paris Region (continued)

HAZMAT Management (CVO10)	Medium 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	**Agency**
None identified	
Planned Projects	
None identified at this time	
Additional Needs	
None identified at this time	

Broadcast Traveler Information (ATIS1)	Medium 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 dynamic message sign (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	**Agency**
None identified	
Planned Projects	
TxDOT HCRS Enhancements	
Additional Needs	
▪ ISP Based Route Guidance ▪ Media Liaison and Coordination ▪ Regional 511 Advanced Traveler Information System Server ▪ TxDOT Web Page Customization and Enhancement	

Interactive Traveler Information (ATIS2)	Medium Priority
This market package provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, transit services, ride share/ride match, parking management, and pricing information. Information can be accessed via phone, kiosk, Personal Digital Assistant, personal computer, and a variety of in-vehicle devices. Successful deployment of this market package relies on availability of real-time transportation data from roadway instrumentation, probe vehicles, or other means.	
Existing Infrastructure	**Agency**
None identified	
Planned Projects	
None identified at this time	
Additional Needs	
▪ Regional 511 Advanced Traveler Information System Server	

2.4 Low Priority Market Packages

Sixteen of the market packages that were identified and customized for the Paris 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 Paris Region

Market Package Name	Description	Comments
Freeway Control (ATMS04)	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.	The Paris Region might want to consider this market package for deployment in the future if adequate network surveillance infrastructure was in place.
Electronic Toll Collection (ATMS10)	This market package provides toll operators with the ability to collect tolls electronically and detect and process violations. The fees that are collected may be adjusted to implement demand management strategies. Vehicle tags of toll violators are read and electronically posted to vehicle owners. Standards, inter-agency coordination, and financial clearinghouse capabilities enable regional, and ultimately national, interoperability for these services.	No toll roads are currently planned for the Paris Region, but it is likely that there could be toll roads in the Region in the future. At that time this market package will be a higher priority for the Region.

Table 5 – Low Priority Market Packages for the Paris Region (continued)

Market Package Name	Description	Comments
Emissions Monitoring and Management (ATMS11)	This market package monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. The collected information is transmitted to the emissions management subsystem for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this market package. For area wide monitoring, this market package measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores, and reports supporting statistical data. For point emissions monitoring, this market package measures tail pipe emissions and identifies vehicles that exceed emissions standards. The gathered information can be used to implement environmentally sensitive travel demand management programs, policies, and regulations.	The Paris Region might want to consider this market package for future deployment as air quality management becomes a higher priority.
Transportation Infrastructure Protection (EM05)	This market package includes the monitoring of transportation infrastructure for potential threats using sensors and surveillance equipment and barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. Threats can result from acts of nature, terrorist attacks, or other incidents causing damage to the infrastructure. Infrastructure may be monitored with acoustic, environmental threat, infrastructure condition and integrity, motion and object sensors, and video and audio surveillance equipment. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated by Traffic Management Subsystems to deter an incident, control access to an area, or mitigate the impact of an incident.	The Paris Region might want to consider this market package as a future deployment as technology is further developed to help manage threats on infrastructure.
Early Warning System (EM07)	This market package monitors and detects potential, looming, and actual disasters including natural disasters and technological and man-made disasters. The market package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.	The Paris Region might want to consider this market package as a future deployment.

Table 5 – Low Priority Market Packages for the Paris Region (continued)

Market Package Name	Description	Comments
Evacuation and Reentry Management (EM09)	This market package supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The market package addresses evacuations for all types of disasters, including disasters like hurricanes that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. It employs a number of strategies to maximize capacity along an evacuation route including coordination with transit.	The Paris Region might want to consider this market package as a future deployment.
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.	The Paris Region might want to consider this market package as a future deployment. There are likely institutional issues that will need to be worked out before this market package can be implemented.
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.	The Paris Region might want to consider this market package as a future deployment as the existing fleet is replaced with vehicles that have the capability to provide the diagnostic information.
Roadway Automated Treatment (MC05)	This market package automatically treats a roadway section based on environmental or atmospheric conditions. Treatments include fog dispersion, anti-icing chemicals, etc. The market package includes the environmental sensors that detect adverse conditions, the automated treatment system itself, and driver information systems (e.g., dynamic message signs) that warn drivers when the treatment system is activated.	At this time this market package is not a priority for the Paris Region, but as the technology evolves the Region could be interested in deployment.

Table 5 – Low Priority Market Packages for the Paris Region (continued)

Market Package Name	Description	Comments
Winter Maintenance (MC06)	This market package supports winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This package monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.	At this time this market package is not a priority for the Paris Region, but as the technology evolves the Region could be interested in deployment.
Roadway Maintenance and Construction (MC07)	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.	The Paris Region might want to consider this market package as a future deployment. Several road weather data collection projects in the deployment plan support this market package.
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.	The Paris Region might want to consider this market package as a future deployment as the existing fleet is replaced with vehicles that have the capability to provide the diagnostic information.
Weigh-in-Motion (CVO06)	This market package provides for high speed weigh-in-motion with or without automated vehicle identification 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.	The Paris Region might want to consider this market package as a future deployment.

Table 5 – Low Priority Market Packages for the Paris Region (continued)

Market Package Name	Description	Comments
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. Because this market package is considered a private sector initiative, it is not recommended that the public sector play a significant role, other than as a data provider to private ISPs.
ITS Data Mart (AD1)	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.	Individual agencies in the Paris Region might want to consider projects to implement this market package as future deployments.
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.	A project is included for this market package in the mid term, but other agencies in the Paris Region might want to consider this market package for additional future deployments.

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 Paris Region on December 7, 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. A summary diagram of the connections between systems was developed at the meeting during the project discussions. **Figure 1** provides a visual representation of the key projects included in this deployment plan and their interactions with other ITS elements.

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 prerequisite projects that are required.
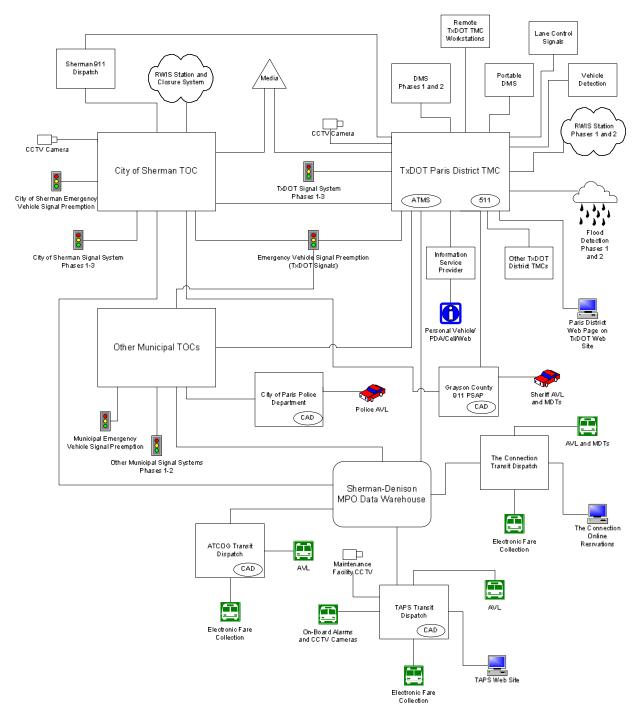
Figure 1 – ITS Deployment Plan Connection Diagram

3.1 Short-Term Projects (5-Year)

Table 6 provides a description of projects for the Paris 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 Paris District TMC	Establish a Traffic Management Center (TMC) for the TxDOT Paris District. Project includes the implementation of end equipment to allow video feed and control for video image vehicle detection systems (VIVDS) and closed circuit television (CCTV) camera pan/tilt/zoom (PTZ).	TxDOT	To Be Determined	No	2 years
TxDOT ATMS Implementation	Implement the TxDOT Advanced Traffic Management System (ATMS) software in the TxDOT Paris District TMC	TxDOT	N/A	N/A	2 years
TxDOT Center-to-Center Communications	Statewide project to enhance coordination with other TxDOT Districts through the implementation of center-to-center communications between TxDOT TMCs. The software to facilitate this connection is included in the ATMS Implementation. Some hardware may be required at the District level.	TxDOT	N/A	N/A	1 year
TxDOT DMS Phase 1	Implement 12 dynamic message signs (DMS) along US 75 and I-30 for traffic information dissemination	TxDOT	$150,000/sign	No	2 years
TxDOT Signal System Upgrades Phase 1	Upgrade traffic signal controllers in the TxDOT Paris District. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	TxDOT	$25,000/ intersection	Yes	5 years
City of Sherman TOC	Establish a Traffic Operations Center (TOC) for the City of Sherman. Project includes the implementation of end equipment to allow video feed as well as control for VIVDS and CCTV camera PTZ.	City of Sherman	To Be Determined	No	2 years
City of Sherman Signal System Upgrades Phase 1	Upgrade traffic signal controllers in the City of Sherman. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	City of Sherman	$25,000/ intersection	No	5 years
TxDOT Web Page Customization and Enhancement	Customize and enhance the Paris District webpage on the TxDOT Expressway website to provide traffic information that will include information on current roadway conditions	TxDOT	To Be Determined	No	1 year

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Emergency Management					
City of Sherman Emergency Vehicle Traffic Signal Preemption	Install emergency vehicle signal preemption in the City of Sherman	City of Sherman/TxDOT	$5,000/ intersection $1,000/vehicle	No	2 years
Grayson County Sheriff AVL and MDTs	Install automated vehicle location (AVL) and mobile data terminals (MDTs) on Grayson County Sheriff vehicles for real-time vehicle location information and data communication	Grayson County	$10,000/vehicle	No	5 years
City of Paris Emergency Vehicle Traffic Signal Preemption	Install emergency vehicle signal preemption in the City of Paris	City of Paris/TxDOT	$5,000/ intersection $1,000/vehicle	No	2 years
City of Paris Police Department AVL and CAD Upgrade	Implement AVL on City of Paris Police vehicles for real-time location information. This project also includes a CAD upgrade.	City of Paris	$10,000/vehicle	No	1 year
Detour Planning Phase 1	Identify detour routes for US 75 in case of a major incident. Special consideration should be given to routes that are instrumented with ITS elements such as CCTV, road weather information system (RWIS) and closed loop signal systems.	TxDOT/Municipalities	To Be Determined	No	1 year
Maintenance and Construction Management					
TxDOT Portable DMS	Procure four portable DMS for use in the Sherman, Sulphur Springs, and Greenville Areas	TxDOT	$50,000/sign	Yes	6 months
TxDOT RWIS Stations Phase 1	Install four to six RWIS stations to collect road weather information in the Paris District	TxDOT	$25,000/station	No	1 year
TxDOT HCRS Enhancements	Implement enhancements to the Highway Conditions Reporting System (HCRS)	TxDOT	N/A	Yes (statewide initiative)	1 year
TxDOT Flood Detection Stations Phase 1	Implement flood detection stations at flood prone locations on roadways in the Paris District. Signs with flashing beacons will also be installed to warn motorists when there is water on the roadway.	TxDOT	$10,000/station	No	1 year

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Public Transportation Management					
TAPS Maintenance Facility Surveillance System	Install CCTV cameras to monitor the Texoma Area Paratransit Service (TAPS) maintenance facility.	Texoma Area Paratransit Service	$6,500	Yes	6 months
ATCOG AVL and MDTs	Install AVL and MDTs on Ark-Tex Council of Governments (ATCOG) transit vehicles to provide real-time location information and enable communications	ATCOG	$10,000/vehicle	No	6 months
The Connection Web-based Ride Scheduling System	Implement a web-based travel reservation system that patrons can utilize to schedule a trip directly or operators can use to schedule a trip for a patron who calls in a reservation	Hunt County Committee on Aging	$50,000	No	6 months

*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.

Paris Region
Short-Term Projects (5-Year)

Travel and Traffic Management

TxDOT Paris District TMC

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Weather Information Processing and Distribution (MC04)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: None

Description: Establish a TMC for the TxDOT Paris District to monitor and manage traffic flow in the District. Control of closed loop signal systems as well as operations of any future ITS deployments will occur from the TMC. The project will also include the implementation of end equipment to allow video feed and control for VIVDS and CCTV PTZ.

TxDOT 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)

Prerequisite Projects: None

Description: This project involves the implementation of Advanced Traffic Management System (ATMS) software to facilitate control of DMS, CCTV cameras and other TxDOT field equipment.

The TxDOT ATMS is a software platform developed by the TxDOT Traffic Operations Division whose function is to integrate the 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 as 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 necessary to have an operational central system to routinely poll devices and support archiving of data.

TxDOT Center-to-Center Communication

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control and Coordination (ATMS07)
- Incident Management System (ATMS08)
- Disaster Response and Recovery (EM08)
- Weather Information Processing and Distribution (MC04)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: TxDOT ATMS Implementation

Description: The Center-to-Center Communications project will enhance coordination with TxDOT Districts through connection to the statewide center-to-center core infrastructure. A communication backbone must be developed with sufficient capacity between the TxDOT Paris District TMC 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 Paris District TMC and statewide center-to-center facilities. As part of connecting to the statewide center-to-center infrastructure, the Paris 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 DMS Phase 1

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Wide Area Alert (EM06)
- Work Zone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of 12 permanent DMS along roadway facilities in the Region including US 75 and I-30 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 $150,000.

TxDOT Signal System Upgrades Phase 1

Associated Market Packages:

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

Prerequisite Projects: None

Description: Upgrade the traffic signal controllers at TxDOT signalized intersections. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS when needed. Coordination of this project with the traffic signal preemption projects identified under Emergency Management can reduce the overall cost of both projects. The estimated cost is approximately $25,000 per intersection.

City of Sherman TOC

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: None

Description: Installation of equipment needed to monitor and manage traffic flow in the City of Sherman. Control of closed loop signal systems in the City of Sherman as well as operations of any future ITS deployments within the city will occur from the TOC. The project will also include the implementation of end equipment to allow video feed and control for VIVDS and CCTV PTZ.

City of Sherman Signal System Upgrades Phase 1

Associated Market Packages:

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

Prerequisite Projects: None

Description: Upgrade the traffic signal controllers at signalized intersections in the City of Sherman. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS. Coordination of this project with the traffic signal preemption projects identified under Emergency Management can reduce the overall cost of both projects. The estimated cost is approximately $25,000 per intersection.

TxDOT Web Page Customization and Enhancement

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Wide Area Alert (EM06)
- Maintenance and Construction Activity Coordination (MC10)
- Broadcast Traveler Information (ATIS1)

Prerequisite Projects: TxDOT ATMS Implementation

Description: Customize and enhance the Paris District webpage on the TxDOT Expressway website to provide information that on traffic, current roadway conditions, construction and any weather advisories.

Emergency Management

City of Sherman Emergency Vehicle Traffic Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Equip traffic signals in the City of Sherman 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. Coordination of this project with the signal system upgrade projects identified under Travel and Traffic Management can reduce the overall cost of both projects.

The approximate cost per intersection is $5,000. An emitter is needed for each emergency vehicle desiring preempt capabilities and costs approximately $1,000 per vehicle.

Grayson County Sheriff AVL and MDTs

Associated Market Packages:

- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Install AVL and MDTs on Grayson County Sheriff's Department vehicles. The AVL system will convey information regarding real-time vehicle location to the dispatch center, 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.

MDTs allow the sheriff's department to send and receive digital messages. MDTs can be used by dispatchers to notify officers 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.

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 Paris Emergency Vehicle Signal Preemption Implementation

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Equip traffic signals in the City of Paris 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.

The approximate cost per intersection is $5,000. An emitter is needed for each emergency vehicle desiring preempt capabilities and costs approximately $1,000 per vehicle.

City of Paris Police Department AVL and CAD Upgrade

Associated Market Packages:

- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Install AVL on City of Paris Police Department 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. This project also includes a CAD upgrade to maximize the utility of the AVL.

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.

Detour Planning Phase 1

Associated Market Packages:

- Incident Management System (ATMS08)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Identify detour routes for US 75 in case of a major accident or other incident requiring the closure of the roadway. When selecting detour routes, special consideration should be given to routes that are instrumented with ITS elements such as CCTV, RWIS and closed loop signal systems or have ITS elements planned.

Maintenance and Construction Management

TxDOT Portable DMS

Associated Market Packages:

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

Prerequisite Projects: None

Description: Portable DMS are a valuable tool to communicate existing and future closures, restrictions, detours, alternate routes, and other important information to motorists while they are en-route. These signs can be used at or near work zones to notify motorists of activity and appropriate measures to take (i.e., detour, slow down), but also can be mobilized at specific locations as conditions warrant, such as flooding or other closures. Portable DMS can be stand-alone signs or mounted to the back of a maintenance vehicle. Programming is typically done manually at the sign. This project will procure 4 portable DMS for use in the Sherman, Sulphur Springs, and Greenville areas. The estimated cost is $50,000 a sign.

TxDOT RWIS Stations 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 Paris Region. The RWIS will be remotely monitored by the TxDOT Paris 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 (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 Paris District Traffic 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 site is $25,000. The District is interested in installing four to six sites.

TxDOT HCRS Enhancements

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (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: TxDOT's HCRS will be enhanced on a statewide basis. The HCRS will use data from the Paris District Office, 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 Paris District 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 Flood Detection Stations Phase 1

Associated Market Packages:
- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)

Prerequisite Projects: None

Description: Implement flood monitoring equipment on flood-prone segments of roadway in the Paris Region. 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 from the TxDOT Paris District Office. Communications between the flood detection stations and the District Office can be achieved through a variety of wireless and wireline telemetry methods. There is a future module of the ATMS software planned to support environmental sensors, and development of this module could be extended to include the needs of flood detection stations. This project also includes the implementation of low water crossing warning flasher signs that would be activated when water was detected to be obstructing the roadway to alert motorists.

The estimated cost per station is $10,000.

Public Transportation Management

TAPS Maintenance Facility Surveillance System

Associated Market Packages:

▪ Transit Security (APTS5)

Prerequisite Projects: None

Description: Install CCTV cameras at the TAPS maintenance facility to monitor facility security. Video feeds will be monitored locally at this time. In the future it is planned that they will be monitored by operators at the Transit Operations Center. The estimated cost of this project is $6,500.

ATCOG AVL and MDTs

Associated Market Packages:

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

Prerequisite Projects: None

Description: Install AVL and MDT units on ATCOG 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 to 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.

The Connection Web-based Ride Scheduling System

Associated Market Packages:

- Demand Response Transit Operations (APTS3)
- Transit Traveler Information (APTS8)

Prerequisite Projects: None

Description: This project will implement a web-based ride scheduling system for The Connection. Users of the system will be able to enter their origination and destination addresses and the system will identify the best routes and times for arrivals for the trip and allow the patron to schedule a demand-response transit trip. The estimated cost for the project is $50,000.

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 Area Office Remote TMC Workstations	Implement workstations at Sherman, Greenville, Sulphur Springs and Paris area offices so that TMC functions such as CCTV camera control can be performed remotely	TxDOT	To Be Determined	No	1 year
TxDOT DMS Phase 2	Implement additional DMS in the Paris Region for traffic information dissemination. Potential locations include I-30, US 75, US 82, US 271, and Business 271	TxDOT	$100,000/sign	No	2 years
TxDOT CCTV Camera Implementation	Implement CCTV cameras along US 75, US 82 and I-30 for traffic monitoring and incident detection	TxDOT	$20,000-25,000/site	No	2 years
TxDOT Signal System Upgrades Phase 2	Upgrade traffic signal controllers in the TxDOT Paris District. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	TxDOT	$25,000/intersection	No	5 years
TxDOT Vehicle Detection	Implement vehicle detection on US 75 and other routes in the Sherman area as needed for incident detection and travel time calculations	TxDOT	To Be Determined	No	1 year
TxDOT Lane Control Signals	Implement lane control signals on US 75 and other routes in the Sherman area for freeway traffic control	TxDOT	$15,000/site	No	1 year
City of Sherman Signal System Upgrades Phase 2	Upgrade traffic signal controllers in the City of Sherman. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	City of Sherman	$25,000/intersection	No	5 years
Municipal Signal System Implementation Phase 1	Implement closed loop signal system at signalized intersection in municipalities. May also include the implementation of VIVDS.	Municipalities	$25,000/intersection	No	5 years
City of Sherman TOC/TxDOT Paris District TMC Communications Connection	Implement a connection between the City of Sherman TOC and the TxDOT Paris District TMC to allow video sharing, traffic data sharing, and other joint functions	City of Sherman/TxDOT	To Be Determined	No	1 year
City of Sherman CCTV Camera Implementation	Implement CCTV cameras in select locations in the City of Sherman for traffic monitoring and incident detection. Potential locations include the Grand Avenue Overpass.	City of Sherman	$20,000-25,000/site	No	2 years

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)					
Regional 511 Advanced Traveler Information System Server	Implement an advanced traveler information system server in the TxDOT Paris District TMC that will collect, consolidate, and distribute traveler information to a 511 phone system, web, and private information service providers (ISPs)	TxDOT	To Be Determined	No	1 year
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 Sherman/ Municipalities	N/A	N/A	6 months
Emergency Management					
TxDOT Emergency Vehicle Traffic Signal Preemption	Implement emergency vehicle signal preemption equipment at TxDOT signals in the Paris District	TxDOT/Municipality	$5,000/ intersection	No	1 year
Municipal Emergency Vehicle Traffic Signal Preemption	Install emergency vehicle signal preemption equipment in municipal emergency vehicles	Municipality	$1,000/vehicle	No	1 year
City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection	Establish a connection between the City of Sherman 911 Dispatch and the TxDOT Paris District TMC for coordination and sharing of incident and traffic information	City of Sherman/TxDOT	To Be Determined	No	1 year
City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection	Establish a connection between the City of Sherman 911 Dispatch and the City of Sherman TOC for coordination and sharing of incident and traffic information	City of Sherman	To Be Determined	No	1 year
Detour Planning Phase 2	Identify detour routes for additional key corridors in the Region in case of a major incident. Special consideration should be given to routes that are instrumented with ITS elements such as CCTV, RWIS and closed loop signal systems.	TxDOT/Municipalities	To Be Determined	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					
TxDOT RWIS Stations Phase 2	Install additional RWIS stations to collect road weather information in the Paris District	TxDOT	$25,000/station	No	1 year
City of Sherman RWIS Station and Automated Closure System	Install an RWIS station on the Grand Avenue Overpass and a closure gate to detect and close the overpass when icing conditions are present	City of Sherman	$40,000	No	2 years
TxDOT Flood Detection Stations Phase 2	Implement flood detection stations at flood prone locations on roadways in the Paris District	TxDOT	$10,000/station	No	1 year
Public Transportation Management					
ATCOG CAD Upgrade	Upgrade the ATCOG CAD system	ATCOG	To Be Determined	No	6 months
TAPS Transit Operations Center Enhancements	Enhance the current TAPS operations/dispatch center. Includes the implementation of CAD.	Texoma Area Paratransit	$200,000	No	1 year
TAPS Security Alarms and Video Surveillance	Install alarms and video cameras for surveillance on-board TAPS transit vehicles.	Texoma Area Paratransit	$10,000/vehicle	No	1 year
The Connection MDTs	Implement MDTs on The Connection transit vehicles to enable communications	Hunt County Committee on Aging	$10,000/vehicle (includes software)	No	6 months
Archived Data					
Sherman-Denison MPO Data Warehouse	Establish a data warehouse to archive data from cities and transit agencies in the Metropolitan Planning Organization (MPO) service area	Sherman-Denison 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.

**Paris Region
Mid-Term Projects (10-Year)**

Travel and Traffic Management

TxDOT Area Office Remote TMC Workstations

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: TxDOT Paris District TMC

Description: Implement remote TMC workstations at the Sherman, Greenville, Sulphur Springs, and Paris area offices so that TMC functions such as CCTV camera control can be performed remotely.

TxDOT DMS Phase 2

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Wide Area Alert (EM06)
- Work Zone Management (MC08)

Prerequisite Projects: TxDOT DMS Phase 1

Description: This project continues the deployment of permanent DMS at locations along roadways in the Region for purposes of traffic information dissemination and incident management. Potential locations include US 75, US 82, US 271, and Business 271. The estimated cost per sign is approximately $150,000.

TxDOT CCTV Camera Implementation

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 Paris Region. Potential locations include US 75, US 82, and I-30. 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. The estimated cost per camera is $20,000 - $25,000.

TxDOT Signal System Upgrades Phase 2

Associated Market Packages:

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

Prerequisite Projects: TxDOT Signal System Upgrades Phase 1

Description: Upgrade the traffic signal controllers at TxDOT signalized intersections. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS when needed. The estimated cost is approximately $25,000 per intersection.

TxDOT Vehicle Detection

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement vehicle detection along US 75 and other routes as needed in the Sherman area for the purpose of incident detection and travel time calculations. Probe surveillance using transponders that already exist on many trucks passing through the Region is a potential method of data collection. Other detection methods could include in pavement loop detectors, VIVDS, or microwave detection. The cost will vary based on the detection method chosen.

TxDOT Lane Control Signals

Associated Market Packages:

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

Prerequisite Projects: TxDOT CCTV Camera Implementation

Description: Install lane control signals on US 75 and other routes as needed in the Sherman area. 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.

City of Sherman Signal System Upgrades Phase 2

Associated Market Packages:

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

Prerequisite Projects: City of Sherman Signal System Upgrades Phase 1

Description: Upgrade the traffic signal controllers at signalized intersections in the City of Sherman. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS. The estimated cost is approximately $25,000 per intersection.

Municipal Signal System Implementation Phase 1

Associated Market Packages:

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

Prerequisite Projects: None

Description: Upgrade the traffic signal controllers at signalized intersections in municipalities in the Region and add those signals to a closed loop signal system. This project also includes the installation of VIVDS. The estimated cost is approximately $25,000 per intersection.

City of Sherman TOC/TxDOT Paris District TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Disaster Response and Recovery (EM08)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: TxDOT Paris District TMC, City of Sherman TOC

Description: Install a connection between the City of Sherman TOC and the TxDOT Paris District 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 Sherman CCTV Camera Implementation

Associated Market Packages:

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

Prerequisite Projects: None

Description: This project includes the deployment of CCTV cameras along key segments of roadway in the City of Sherman. 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. The estimated cost per camera is approximately $20,000 - $25,000.

Regional 511 Advanced Traveler Information System Server

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Wide Area Alert (EM06)
- Weather Information Processing and Distribution (MC04)
- Work Zone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)
- Broadcast Traveler Information (ATIS1)
- Interactive Traveler Information (ATIS2)

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

Description: Install a server dedicated to Advanced Traveler Information System (ATIS) in the TxDOT Paris District Office. 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), the internet, and to private partners who desire access to information in the Paris 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), the data can be converted to usable information for travelers as well as other agencies.

Media Liaison and Coordination

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (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 stronger liaison and 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 Traffic Office for media providers (e.g., video switch including video images and traffic conditions map), but not design and install the entire connection between the Traffic Office 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

TxDOT Emergency Vehicle Traffic Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: This project implements preemption equipment at select traffic signals in the Paris District. This project includes required controller modifications, sensors, and transmitters. 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 been shown to improve safety of emergency personnel and vehicles en-route to an incident. TxDOT will have responsibility for implementing and maintaining preemption sensors on traffic signals, and fire and emergency services will be responsible for installing the on-board units.

Coordination of this project with the signal system upgrade projects identified under Travel and Traffic Management can reduce the overall cost of both projects.

The estimated cost is $5,000 per intersection.

Municipal Emergency Vehicle Traffic Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: The project includes the installation of preemption equipment in municipal emergency services vehicles. 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 been shown to improve safety of emergency personnel and vehicles en-route to an incident.

The estimated cost is $1,000 per vehicle.

City of Sherman 911 Dispatch/TxDOT Paris District TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Vehicle Routing (EM02)
- Disaster Response and Recovery (EM08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: TxDOT Paris District TMC

Description: Install telecommunications connection between the City of Sherman 911 Dispatch and TxDOT Paris District TMC to allow for CCTV camera shared monitoring and control and data sharing. Cost of this connection will be determined based on the communications method chosen.

City of Sherman 911 Dispatch/City of Sherman TOC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Vehicle Routing (EM02)
- Disaster Response and Recovery (EM08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: City of Sherman TOC

Description: Install telecommunications connection between the City of Sherman 911 Dispatch and City of Sherman TOC to allow for CCTV camera shared monitoring and control and data sharing. Cost of this connection will be determined based on the communications method chosen.

Detour Planning Phase 2

Associated Market Packages:

- Incident Management System (ATMS08)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: Detour Planning Phase 1

Description: Identify detour routes for additional key corridors in the Region in case of a major accident or other incident requiring the closure of the roadway. When selecting detour routes, special consideration should be given to routes that are instrumented with ITS elements such as CCTV, RWIS and closed loop signal systems or have ITS elements planned.

Maintenance and Construction Management

TxDOT RWIS Stations Phase 2

Associated Market Packages:

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

Prerequisite Projects: None

Description: Install additional RWIS stations in the Paris Region. The RWIS will be remotely monitored by the TxDOT Paris 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 Paris District Traffic 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 $25,000.

City of Sherman RWIS Station and Automated Closure System

Associated Market Packages:

- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)
- Roadway Maintenance and Construction (MC07)

Prerequisite Projects: None

Description: Install an RWIS station on the Grand Avenue Overpass. The RWIS will be remotely monitored by the City of Sherman. When adverse conditions such as ice are detected on the overpass, the automated closure system will close the overpass to traffic.

The estimated cost for the RWIS station and closure system is $40,000.

TxDOT Flood Detection Stations Phase 2

Associated Market Packages:
- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)

Prerequisite Projects: None

Description: Implement additional flood monitoring equipment on flood-prone segments of roadway in the Paris Region. 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 from the TxDOT Paris District Office. Communications between the flood detection stations and the District Office can be achieved through a variety of wireless and wireline telemetry methods. There is a future module of the ATMS software planned to support environmental sensors, and development of this module could be extended to include the needs of flood detection stations. This project also includes the implementation of low water crossing warning flasher signs that would be activated when water was detected to be obstructing the roadway to alert motorists. The estimated cost is approximately $10,000 per station.

Public Transportation Management

ATCOG CAD Upgrade

Associated Market Packages:

▪ Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None identified

Description: Upgrade the CAD system for ATCOG 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 use automation to plan daily 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 paratransit 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.

TAPS Transit Operations Center Enhancements

Associated Market Packages:

▪ Transit Fixed-Route Operations (APTS2)
▪ Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None identified

Description: Enhance the capabilities of the existing TAPS operations/dispatch center. This project includes the implementation of a CAD system.

The estimated cost of this project is $200,000.

TAPS Security Alarms and On-board Video Surveillance

Associated Market Packages:
▪ Transit Fixed-Route Operations (APTS2)
▪ Demand-Response Transit Operations (APTS3)
▪ Transit Security (APTS5)

Prerequisite Projects: None

Description: This project will install alarm buttons and video surveillance 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.

This project will include the installation of security cameras on TAPS transit vehicles. Cameras will be for on-board recording only, and are not envisioned to be monitored remotely. 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. The estimated cost per vehicle is $10,000.

The Connection MDTs

Associated Market Packages:

▪ Demand-Response Transit Operations (APTS3)

Prerequisite Projects: None

Description: Install MDT units on The Connection transit vehicles. 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. The estimated cost per vehicle is $10,000.

Archived Data Management

Sherman-Denison 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 selected locations. 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. The estimated cost if this project is approximately $100,000.

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 Signal System Upgrades Phase 3	Upgrade traffic signal controllers in the TxDOT Paris District. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	TxDOT	$25,000/ intersection	No	5 years
City of Sherman Signal System Upgrades Phase 3	Upgrade traffic signal controllers in the City of Sherman. May also include the implementation of VIVDS and addition of signals to a closed loop signal system.	City of Sherman	$25,000/ intersection	No	5 years
Municipal Signal System Implementation Phase 2	Implement closed loop signal system at signalized intersection in municipalities. May also include the implementation of VIVDS.	Municipalities	$25,000/ intersection	No	5 years
ISP Based Route Guidance	Provide direct support to ISP-based route guidance systems through sharing of traveler information	Public Agencies/Private Sector	N/A	N/A	1 year
Emergency Management					
Grayson County Centralized 911 Dispatch	Establish a centralized 911 answering point and dispatch center for Grayson County. This project also includes a connection to the TxDOT Paris TMC for sharing of incident and traffic information.	Grayson County	To Be Determined	No	2 years
Public Transportation Management					
TAPS AVL	Implement AVL on TAPS vehicles to provide real-time vehicle location information	Texoma Area Paratransit Service	$10,000/vehicle	No	1 year
TAPS Website	Implement a website for TAPS that will provide information about services (hours, fares, etc.), allow patrons to schedule service, and include links to other transit agencies	Texoma Area Paratransit Service	$50,000	No	1 year
The Connection AVL	Implement AVL on The Connection transit vehicles to provide real-time vehicle location information	Hunt County Committee on Aging	$10,000/vehicle	No	1 year
The Connection Electronic Fare Payment	Implement smart card electronic fare collection for The Connection	Hunt County Committee on Aging	To Be Determined	No	6 months

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)					
Regional Smart Card	Establish a smart card electronic fare payment system for transit agencies in the Region	Hunt County Committee on Aging/ATCOG/Texoma Area Paratransit	To Be Determined	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.

**Paris Region
Long-Term Projects (20-Year)**

Travel and Traffic Management

TxDOT Signal System Upgrades Phase 3

Associated Market Packages:

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

Prerequisite Projects: TxDOT Signal System Upgrades Phase 1, TxDOT Signal System Upgrades Phase 2

Description: Upgrade the traffic signal controllers at TxDOT signalized intersections. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS when needed. The estimated cost is approximately $25,000 per intersection.

City of Sherman Signal System Upgrades Phase 3

Associated Market Packages:

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

Prerequisite Projects: City of Sherman Signal System Upgrades Phase 1, City of Sherman Signal System Upgrades Phase 2

Description: Upgrade the traffic signal controllers at signalized intersections in the City of Sherman. Signals that are not currently part of the closed loop signal system will be added to a closed loop. This project also includes the installation of VIVDS. The estimated cost is approximately $25,000 per intersection.

Municipal Signal System Implementation Phase 2

Associated Market Packages:

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

Prerequisite Projects: Municipal Signal System Implementation Phase 1

Description: Upgrade additional traffic signal controllers at signalized intersections in municipalities in the Region and add those signals to a closed loop signal system. This project also includes the installation of VIVDS. The estimated cost is approximately $25,000 per intersection.

ISP-Based Route Guidance

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Maintenance and Construction Activity Coordination (MC10)
- 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.

Emergency Management

Grayson County Centralized 911 Dispatch

Associated Market Packages:

- Emergency Call Taking and Dispatch (EM01)
- Emergency Vehicle Routing (EM02)

Prerequisite Projects: None

Description: Establish a centralized 911 Dispatch Grayson County. This project will also install telecommunications connection and end equipment from the Grayson County 911 Dispatch to the TxDOT Paris District TMC to share CCTV and incident data/images and provide information on current road conditions that could assist with incident/emergency management.

Public Transportation Management

TAPS AVL

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement an AVL system on TAPS 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 to 25 percent increase in on-time performance, which translates directly to improved efficiency and operations. The estimated cost per vehicle is $10,000.

TAPS Website

Associated Market Packages:
- Transit Fixed-Route Operations (APTS2)
- Demand-Response Transit Operations (APTS3)
- Transit Traveler Information (APTS8)

Prerequisite Projects: TAPS AVL

Description: Provide enhanced transit related traveler information to TAPS patrons. General (static) and near-real-time information about fixed routes, dial-a-ride services and status, as well as interactive trip scheduling and reservations could be made available to patrons via Internet-based travel information systems. Web-based maps could show locations of the vehicles in near-real-time. This real-time information also would be available at the dispatch/call center for passengers who do not have access to the Internet. Coordination with TxDOT and the local cities would allow for current traffic conditions, incidents, closures and other impacts to the roadway network to be displayed with the transit route and status information. The estimated cost of this project is $50,000.

The Connection AVL

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement an AVL system on The Connection 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 to 25 percent increase in on-time performance, which translates directly to improved efficiency and operations. The estimated cost per vehicle is approximately $10,000.

The Connection 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 The Connection 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 MDTs, 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 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.

Regional Smart Card

Associated Market Packages

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

Prerequisite Projects: None

Description: Implement a regional smart card common fare payment system for transit agencies in the Region. A common payment card would facilitate transfers between transit agencies and simplify fare payment for patrons.

4. MAINTAINING THE REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

The Paris 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 Paris 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 December 2004, stakeholders recommended that a meeting be held on an annual basis to review the existing Regional ITS Deployment Plan to update project status and include any new projects. These updates will be documented and included in the next formal revision of the plans. It was also recommended that the group meet every two years to correspond with the Transportation Improvement Plan update process to review the Regional ITS Architecture and formally update both the Regional ITS Architecture and the ITS Deployment Plan. Any new market packages that have been added to the National Architecture should be reviewed to see if they are applicable to the Paris 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 Paris 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 Paris 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.