State of Texas
Regional ITS Architectures and Deployment Plans

Atlanta Region

Regional ITS Deployment Plan

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LIST OF ACRONYMS

AHP	Arkansas Highway Police
AHTD	Arkansas State Highway and Transportation Department
ATCOG	Ark-Tex Council of Governments
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVI	Automated Vehicle Identification
AVL	Automatic Vehicle Location
C2C	Center-to-Center
CAD	Computer-Aided Dispatch
CCTV	Closed-Circuit Television
CV	Commercial Vehicle
CVO	Commercial Vehicle Operations
DMS	Dynamic Message Sign
DPS	Department of Public Safety
EMS	Emergency Medical Services
FHWA	Federal Highway Administration
GPS	Global Positioning System
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HCRS	Highway Condition Reporting System
HRI	Highway-Rail Intersections
ISP	Information Service Provider
ITS	Intelligent Transportation System
LADOTD	Louisiana Department of Transportation and Development
LED	Light Emitting Diode
MDT	Mobile Data Terminal

LIST OF ACRONYMS

MPO	Metropolitan Planning Organization
NTCIP	National Transportation Communications for ITS Protocol
RWIS	Road Weather Information System
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvements Program
TMC	Traffic Management Center
TOC	Traffic Operations Center Transit Operations Center
TxDOT	Texas Department of Transportation
VIVDS	Video Image Vehicle Detector System

SUMMARY

In January 2001, the Federal Highway Administration (FHWA) issued a final rule to implement Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21) requiring that Intelligent Transportation System (ITS) projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards.

To meet these requirements the Texas Department of Transportation (TxDOT) initiated the development of regional ITS architectures 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 Atlanta Region was the seventh in the series of regional ITS architectures and deployment plans to be prepared as part of this initiative.

The Atlanta 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, Texas Department of Public Safety (DPS), the Texarkana MPO, Louisiana Department of Transportation and Development (LADOTD), Arkansas State Highway and Transportation Department (AHTD), cities, counties, transit agencies, police, and fire.

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

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

The Atlanta Regional ITS Architecture provided the framework and prioritized the key functions and services desired by stakeholders in the Region. The Atlanta Regional 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 Atlanta Regional ITS Deployment Plan is organized into four key sections:

Section 1 – Introduction

This section provides a brief overview of the State of Texas Regional ITS Architectures and Deployment Plans Program, the ITS Deployment Plan for the Atlanta Region, as well as an overview of some of the key features and stakeholders in the Atlanta Region.

Section 2 – Prioritization of Market Packages

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

Section 3 – Prioritization of Planned Projects

Project recommendations have been developed for the Atlanta Region to provide an incremental, phased build-out of the Region's ITS. These projects are categorized into five, ten and twenty year deployment timeframes. Each project recommendation includes a brief description of the project, responsible agency, associated market packages, pre-requisite projects or systems, and an estimate of probable cost. These recommendations took into consideration existing as well as planned ITS deployments in the Atlanta Region.

Section 4 – Maintaining the Regional ITS Architecture and Deployment Plan

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

1.3 The Atlanta Region

1.3.1 Geography and Regional Characteristics

The Atlanta Region is bordered by the TxDOT Lufkin District to the southeast, the TxDOT Tyler District to the southwest, Louisiana to the east, Oklahoma to the north, Arkansas to the northeast and the TxDOT Paris District to the northwest. For the Atlanta Regional ITS Architecture and Deployment Plan, the study area included all nine counties that comprise the TxDOT Atlanta District as well as Miller and Little River counties in Arkansas, and the City of Texarkana, Arkansas. Connections to elements in Caddo Parish, Louisiana were also identified in the architecture.

Counties included in the Atlanta Region are:

- Bowie;
- Caddo Parish (Louisiana);
- Camp;
- Cass;
- Harrison;
- Little River (Arkansas);
- Marion;
- Miller (Arkansas);
- Morris;
- Panola;
- Titus; and
- Upshur.

TxDOT partners with local governments for roadway construction, maintenance, and traffic operations support. For cities with a population of less than 50,000, TxDOT is the responsible agency for on-system roadways. There are no cities in the Atlanta Region with populations that exceed the 50,000 threshold.

1.3.2 Transportation Infrastructure

The primary facilities in the Atlanta Region include I-20, I-30, US 59, US 79, US 80, US 82, US 259, and US 271.

One of the most heavily traveled truck routes in the southern United States is the I-20 corridor. I-20 is an east/west, four-lane divided interstate highway. The effective operation of this highway is critical to the movement of goods and people across the United States. I-20 extends from South Carolina to California. I-30 is also an east-west, four-lane divided interstate highway. This facility runs from Little Rock, Arkansas to Dallas, Texas. Blockages along I-20 and I-30 can have serious implications on travel times due to the lack of alternate routes. Knowing the road and travel conditions within this transportation corridor and having the ability to get this information to the motorist is an important element for this project. For example, if I-20 has been closed due to a major incident or weather, and motorists are informed of the closure in advance, they can alter their travel plans with an alternate route.

1.3.3 Existing ITS in the Atlanta Region

Within the Atlanta Region there are currently several ITS programs that are underway or are planned for deployment. The TxDOT Atlanta District Office has video detection at several intersections in the Region and a CCTV camera in place in one location prone to heavy fog conditions to monitor fog levels and provide a decision making tool for determining when road closures are necessitated. TxDOT also has an RWIS station in the Region collecting road weather data and 15 Smart Curves.

The Texas Department of Public Safety is utilizing a computer aided dispatch (CAD) system in the Atlanta Region. The City of Marshall Fire and Police Departments are also using a limited CAD system.

1.3.4 Atlanta 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 Atlanta Region.

The following is a list of stakeholders in the Atlanta 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 Atlanta Regional ITS Architecture:

- Arkansas State Highway and Transportation Department;
- Ark-Tex Council of Governments;
- Ark-Tex Council of Governments 911 Services;
- City of Atlanta;
- City of Marshall;
- City of Texarkana, Arkansas;
- City of Texarkana, Texas;
- Department of Public Safety;

- Federal Highway Administration Arkansas Division
- Louisiana Department of Transportation and Development;
- Texarkana Metropolitan Planning Organization;
- Texarkana Urban Transit District;
- TxDOT Atlanta District; and
- TxDOT Traffic Operations Division (Austin).

Key stakeholder agencies that are participating in the development of the Atlanta Regional ITS Deployment Plan are listed in **Table 1**.

Table 1 – Atlanta Stakeholder Agencies and Contacts

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
Arkansas State Highway and Transportation Department	Don Donaldson	2911 Highway 29 North Hope, Arkansas 71802	(870) 777-3457	don.donaldson@ahtd.state.ar.us
Arkansas State Highway and Transportation Department	Dorothy Rhodes	10324 I-30 Little Rock, Arkansas	(501) 569-2072	dorothy.rhodes@ahtd.state.ar.us
Arkansas State Highway and Transportation Department	Julia Hart	P.O. Box 2261 Little Rock, Arkansas 72203	(501) 569-2602	julia.hart@ahtd.state.ar.us
Arkansas State Highway and Transportation Department	Kenny Bennett	2911 Highway 29 North Hope, Arkansas 71802	(870) 777-3457	kenny.bennett@ahtd.state.ar.us
Arkansas State Highway and Transportation Department	Lonnie Hazel	5025 Blackman Ferry Road Texarkana, AR 71854	(870) 779-1515	N/A
Ark-Tex Council of Governments – TRAX	Lynda Pugh	P.O. Box 5307 Texarkana, Texas 75505-5307	(903) 832-8686	lwoods@atcog.org
ATCOG 911 Services	Sandi Brown	122 Plaza West Texarkana, Texas 75501	(903) 832-8636	sbrown@atcog.com
City of Atlanta	Mike Ahrens	P.O. Box 669 Atlanta, Texas 75551	(903) 796-2192	atlantatex@aol.com
City of Marshall	John Porterfield	401 South Alamo Marshall, Texas 75670	(903) 935-4402	jporterfield@marshalltexas.net
City of Marshall Fire Department	Kenneth Snyder	P.O. Box 698 Marshall, Texas 75671	(903) 935-4580	N/A
City of Texarkana, Texas	Kyle Dooley	220 Texas Blvd. Texarkana, Texas 75501	(903) 798-3947	kdooley@txkusa.org
City of Texarkana, Texas	Russell Meadows	220 Texas Blvd. Texarkana, Texas 75501	(903) 798-3942	meadows@txkusa.org
DPS Linden Office	Harvey Stamper	P.O. Box 117 Linden, Texas 75563	(903) 756-3024	N/A
DPS Marshall Office	John Vance	P.O. Box 1597 Marshall, TX 75671	(903) 935-5108	johnv@co.harrison.tx.us
DPS Mt. Pleasant Office	Neal Roney	1906 N Jefferson Ave Mount Pleasant, Texas 75455	(903) 572-3616	mpdps@netex.quik.com

Table 1 – Atlanta Stakeholder Agencies and Contacts (continued)

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
Federal Highway Administration Arkansas Division	Gary Dalporto	700 W Capitol Ave Room 3130 Little Rock, AR 72201-3298	(501) 324-6441	gary.dalporto@fhwa.dot.gov
Federal Highway Administration Arkansas Division	David Blakeney	700 W Capitol Ave Room 3130 Little Rock, AR 72201-3298	(501) 324-6438	david.blakeney@fhwa.dot.gov
Louisiana DOTD	Keith Tindell	3339 Industrial Drive Bossier City, LA 71112	(318) 549-8300	ktindell@dotdmail.dotd.state.la.us
Texarkana MPO	Brad McCaleb	220 Texas Blvd. Texarkana, Texas 75501	(903) 798-3927	mccaleb@txkusa.org
Texarkana Urban Transit District	Ken Smithson	818 Elm Street Texarkana, Texas 75501-5014	(903) 794-8883	smithson@tutd.org
Texarkana Urban Transit District	Jim Wright	818 Elm Street Texarkana, Texas 75501	(903) 794-0437	wrightj@txkusa.org
TxDOT Atlanta District	Carlos Ibarra	701 E. Main Street Atlanta, Texas 75551-2418	(903) 799-1480	cibarra@dot.state.tx.us
TxDOT Atlanta District	Marcus Sandifer	701 E. Main Street Atlanta, Texas 75551-2418	(903) 799-1306	msand@dot.state.tx.us
TxDOT Atlanta District	Sonya Hudson	701 E. Main Street Atlanta, Texas 75551-2418	(903) 799-1310	shudson@dot.state.tx.us
TxDOT Traffic Operations Division	Janie Light	Attn: TRF-TM 125 East 11th Street Austin, Texas 78701-2483	(512) 416-3258	jlight@dot.state.tx.us
TxDOT Traffic Operations Division	Alex Power	Attn: TRF-TM 125 East 11th Street Austin, Texas 78701-2483	(512) 416-3444	apower@dot.state.tx.us

2. PRIORITIZATION OF MARKET PACKAGES

2.1 Prioritization Process

Of the 75 available market packages in the National ITS Architecture, 37 were selected and customized for deployment in the Atlanta 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 Atlanta Region. These priorities identified the key needs and services that are desired in the Atlanta 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 Atlanta Region. The market packages are organized into high, medium and low priorities. It is important to note that the high, medium and low prioritization does not necessarily correspond to any specific time frame (such as five, ten or twenty year deployment horizon). For example, a market package can be a high priority, but because of funding or prerequisite project requirements, it might not be feasible for deployment for several years. Maturity and availability of technology were other factors for prioritizing the market packages. Other considerations included whether or not the market package was better suited for private deployment and operations rather than public. As an example, ISP-based Route Guidance might be viewed as a valuable traveler information service for motorists in the Region, but stakeholders felt this market package was best suited for deployment by a private service provider, and as such, deemed it a low priority for agencies in the Region.

Each market package in the following subsections includes:

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

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

2.2 High Priority Market Packages

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

Many of these high priority market packages have components that are in various stages of deployment and operation in the Atlanta Region; that is, there are already systems and technologies deployed to deliver some of these high priority services and functions. For example, the TxDOT Atlanta District has deployed a RWIS station which is a key component of the Road Weather Data Collection market package. Although these devices are in place, this market package is still listed as a high priority. There are additional capabilities and functionality as part of 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 Atlanta Region.

Table 3 – High Priority Market Packages for the Atlanta 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 Subsystem.	
Existing Infrastructure ▪ TxDOT Atlanta TMC ▪ TxDOT CCTV ▪ TxDOT RWIS ▪ City of Texarkana, TX VIVDS	**Agency** ▪ TxDOT ▪ City of Texarkana, TX
Planned Projects ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 1	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT CCTV Cameras on I-30 ▪ TxDOT/AHTD CCTV on Loop ▪ TxDOT Fog Detection in Titus County ▪ City of Texarkana, TX TOC ▪ City of Texarkana, TX VIVDS Expansion Phase 1 ▪ City of Texarkana, TX Railroad Advance Warning ▪ TxDOT Additional RWIS Sites ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 2 ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC ▪ City of Texarkana, TX VIVDS Expansion Phase 2 ▪ City of Texarkana, AR VIVDS Expansion Phase 1 ▪ TxDOT Flood Detection ▪ City of Marshall Flood Detection ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 3 ▪ TxDOT CCTV Cameras on I-49	

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

Surface Street Control (ATMS03)	**High Priority**
This market package provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management. A range of traffic signal control systems are represented by this market package ranging from static pre-timed control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This market package is consistent with typical urban traffic signal control systems.	
Existing Infrastructure ▪ TxDOT Closed Loop Signal System ▪ City of Texarkana Closed Loop Signal System ▪ TxDOT Atlanta TMC ▪ TxDOT Advance Signal Notification ▪ TxDOT Smart Curves ▪ City of Texarkana, TX VIVDS ▪ Miller County Arkansas Closed Loop Signal System	**Agency** ▪ TxDOT ▪ City of Texarkana, TX ▪ Arkansas State Highway and Transportation Department
Planned Projects ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 1	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT Changeable Message Speed Display Signs ▪ City of Texarkana, TX TOC ▪ City of Texarkana, TX Closed Loop Signal System Expansion Phase 1 ▪ City of Texarkana, TX VIVDS Expansion Phase 1 ▪ City of Texarkana, TX Railroad Advance Warning ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 2 ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC ▪ City of Texarkana, TX Closed Loop Signal System Expansion Phase 2 ▪ City of Texarkana, AR Closed Loop Signal System Expansion Phase 1 ▪ City of Texarkana, TX VIVDS Expansion Phase 2 ▪ City of Texarkana, AR VIVDS Expansion Phase 1 ▪ TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 3 ▪ T Line Signal Priority for Buses ▪ TxDOT Emergency Vehicle Signal Preemption ▪ City of Texarkana, TX Emergency Vehicle Signal Preemption ▪ City of Texarkana, AR Emergency Vehicle Signal Preemption ▪ City of Marshall Fire/EMS Signal Preemption ▪ Other Cities/Counties Emergency Vehicle Signal Preemption	

Table 3 – High Priority Market Packages for the Atlanta 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 to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Information Service Providers.	
Existing Infrastructure ▪ TxDOT Portable DMS ▪ City of Texarkana, TX Advance Warning for Trains Blocking Roadway ▪ AHTD Portable DMS	**Agency** ▪ TxDOT ▪ City of Texarkana, TX ▪ Arkansas State Highway and Transportation Department
Planned Projects ▪ TxDOT HCRS Enhancement	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT DMS on I-20 and I-30 ▪ AHTD DMS on I-30 ▪ TxDOT/AHTD DMS on Loop ▪ City of Texarkana, TX TOC ▪ City of Texarkana, TX Railroad Advance Warning ▪ HAZMAT Management Plans ▪ TxDOT Additional Portable DMS ▪ Regional 511 Advanced Traveler Information System Server ▪ Media Liaison and Coordination ▪ TxDOT/AHTD DMS on I-49 ▪ TxDOT/AHTD DMS on I-69 ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC ▪ DPS/TxDOT TMC Communications Connection ▪ ATCOG TOC/TxDOT TMS Communications Connection ▪ T Line Dispatch/TxDOT TMC/AHTD District TMC Communications Connection ▪ Other EM/TxDOT TMC Communications Connection	

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

Regional Traffic Control (ATMS07)	**High Priority**
This market package provides for the sharing of traffic information and control among traffic management centers 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 ▪ TxDOT Atlanta TMC	**Agency** ▪ TxDOT
Planned Projects ▪ TxDOT Center to Center Communications (Statewide) ▪ TxDOT HCRS Enhancements	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT DMS on I-20 and I-30 ▪ AHTD DMS on I-30 ▪ TxDOT/AHTD DMS on Loop ▪ City of Texarkana, TX TOC ▪ City of Texarkana, TX TOC/TxDOT Atlanta TMC Communications Connection ▪ AHTD District TMC/TxDOT Atlanta TMC Communications Connection ▪ HAZMAT Management Plans ▪ Other Cities/Counties/TxDOT Atlanta TMC Communications Connection ▪ Regional 511 Advanced Travel Information System Server ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC	

Table 3 – High Priority Market Packages for the Atlanta 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. 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 are 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 CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination, Broadcast Traveler Information or Interactive Traveler Information market packages.	
Existing Infrastructure ▪ TxDOT Atlanta TMC ▪ Texarkana Motorist Assistance Patrol	**Agency** ▪ TxDOT ▪ TxDOT/AHTD
Planned Projects ▪ TxDOT HCRS Enhancement ▪ TxDOT Center to Center Communications (Statewide)	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT DMS on I-20 and I-30 ▪ AHTD DMS on I-30 ▪ TxDOT/AHTD DMS on Loop ▪ TxDOT CCTV on I-30 ▪ TxDOT/AHTD CCTV on Loop ▪ City of Texarkana, TX TOC ▪ City of Texarkana, TX TOC/TxDOT Atlanta TMC Connection ▪ AHTD District TMC/TxDOT Atlanta TMC Communications Connection ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC ▪ HAZMAT Management Plans ▪ TxDOT Additional Portable DMS ▪ Regional 511 Advanced Traveler Information System Server ▪ DPS/TxDOT TMC Communications Connection ▪ TxDOT/AHTD DMS on I-49 ▪ TxDOT/AHTD DMS on I-69 ▪ TxDOT CCTV Cameras on I-49 ▪ Other Emergency Management/TxDOT TMC Connection ▪ Other Cities/Counties/TxDOT Atlanta TMC Connection	

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

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 ▪ City of Texarkana, TX Advance Warning for Trains Blocking Roadway	**Agency** ▪ City of Texarkana, TX
Planned Projects None identified at this time	
Additional Needs ▪ City of Texarkana, TX Railroad Advance Warning	

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

Advanced Railroad Grade Crossing (ATMS14)	**High Priority**
This market package manages highway traffic at highway-rail intersections (HRIs) where operational requirements demand advanced features (e.g., where rail operational speeds are greater than 80 miles per hour). This market package includes all capabilities from the Standard Railroad Crossing Market package and augments these with additional safety features to mitigate the risks associated with higher rail speeds. The active warning systems supported by this market package include positive barrier systems that preclude entrance into the intersection when the barriers are activated. Like the Standard Package, the HRI equipment is activated on notification by wayside interface equipment which detects, or communicates with the approaching train. In this market package, the wayside equipment provides additional information about the arriving train so that the train's direction of travel, estimated time of arrival, and estimated duration of closure may be derived. This enhanced information may be conveyed to the driver prior to, or in context with, warning system activation. This market package also includes additional detection capabilities that enable it to detect an entrapped or otherwise immobilized vehicle with the HRI and provide an immediate notification to highway and railroad officials.	
Existing Infrastructure ▪ City of Texarkana, TX Advance Warning for Trains Blocking Roadway	**Agency** ▪ City of Texarkana, TX
Planned Projects None identified at this time	
Additional Needs ▪ City of Texarkana, TX Railroad Advance Warning	

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 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 ▪ TxDOT RWIS ▪ TxDOT CCTV	**Agency** ▪ TxDOT
Planned Projects None identified at this time	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT Fog Detection in Titus County ▪ TxDOT Additional RWIS Sites ▪ TxDOT Flood Detection ▪ City of Marshall Flood Detection ▪ TxDOT Ice Detection and Anti-icing Equipment on Bridges	

Table 3 – High Priority Market Packages for the Atlanta 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 decision on corrective actions to take. The continuing updates of road condition information and current temperatures can be used by system operators to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination market package, and aid operators in scheduling work activity.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects ▪ TxDOT Center to Center Communications (Statewide)	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT Fog Detection in Titus County ▪ TxDOT Additional RWIS Sites ▪ TxDOT Ice Detection and Anti-icing Equipment on Bridges ▪ Media Liaison and Coordination ▪ TxDOT Flood Detection ▪ City of Marshall Flood Detection	

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 Information Service Providers who can provide the information to travelers.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects ▪ TxDOT HCRS Enhancement ▪ TxDOT Center to Center Communications (Statewide)	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ Regional 511 Advanced Traveler Information System Server	

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

Transit Vehicle Tracking (APTS01)	**High Priority**
This market package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ ATCOG AVL ▪ T Line AVL ▪ ATCOG Transit Operations Center with CAD System	

Transit Fixed-Route Operations (APTS02)	**High Priority**
This market package performs vehicle routing and scheduling, as well as automatic driver assignment and system monitoring for fixed-route transit services. This service determines current schedule performance using AVL data and provides information displays at the Transit Management Subsystem. Static and real time transit data is exchanged with Information Service Providers 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 ▪ T Line Transit Web Site	**Agency** ▪ Texarkana Urban Transit District
Planned Projects None identified at this time	
Additional Needs ▪ ATCOG TOC with CAD System ▪ T Line AVL ▪ T Line Dispatch/TxDOT TMC/AHTD District TMC Communications Connection ▪ ATCOG TOC/TxDOT TMC Communications Connection ▪ T Line Signal Priority for Buses ▪ ATCOG Communications System Upgrade ▪ ATCOG AVL ▪ ATCOG MDTs	

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

Demand Response Transit Operations (APTS03)	**High Priority**
This market package performs vehicle routing and scheduling as well as automatic driver assignment and monitoring for demand responsive transit services. This package monitors the current status of the transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Transit Management Subsystem provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet. This service includes the capability for a traveler request for personalized transit services to be made through the Information Service Provider (ISP) Subsystem.	
Existing Infrastructure ▪ ATCOG Transit Web Site	**Agency** ▪ ATCOG
Planned Projects None identified at this time	
Additional Needs ▪ ATCOG TOC with CAD System ▪ ATCOG TOC/TxDOT TMC Communications Connection ▪ ATCOG MDTs ▪ ATCOG Web-based Ride Scheduling ▪ ATCOG Communications System Upgrade ▪ ATCOG AVL ▪ T Line AVL	

Transit Traveler Information (APTS08)	**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 ▪ T Line Transit Web Site ▪ ATCOG Transit Web Site	**Agency** ▪ Texarkana Urban Transit District ▪ ATCOG
Planned Projects None identified at this time	
Additional Needs ▪ ATCOG TOC with CAD ▪ ATCOG Web-based Ride Scheduling ▪ ATCOG Transit Traveler Information Kiosks ▪ T Line AVL ▪ ATCOG AVL ▪ ATCOG MDTs	

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

Broadcast Traveler Information (ATIS01)	**High Priority**
This market package collects traffic conditions, advisories, general public transportation, 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 HAR and DMS information capabilities. The information may be provided directly to travelers by an information service provider (ISP) or other traveler service providers so that they can better inform travelers of conditions. Successful deployment of this market package relies on availability of real-time traveler information from roadway instrumentation, probe vehicles or other sources.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects ▪ TxDOT HCRS Enhancements	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ Regional 511 Advanced Traveler Information System Server ▪ City of Texarkana, TX TOC ▪ Media Liaison and Coordination ▪ City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC	

Emergency Response (EM01)	**High Priority**
This market package includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification and coordinated response between agencies.	
Existing Infrastructure ▪ Harris County 911 Dispatch ▪ City of Marshall Police and Fire CAD System ▪ DPS CAD Dispatch ▪ DPS AVL	**Agency** ▪ Harris County ▪ City of Marshall ▪ DPS
Planned Projects None identified at this time	
Additional Needs ▪ City of Texarkana, TX Emergency Vehicle AVL ▪ City of Texarkana, AR Emergency Vehicle AVL ▪ City of Marshall Emergency Vehicle AVL ▪ HAZMAT Management Plans ▪ City of Atlanta Emergency Vehicle AVL ▪ DPS MDTs ▪ AHP MDTs	

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

ITS Data Mart (AD01)	High Priority
This market package provides a focused archive that houses data collected and owned by a single agency, district, private sector provider, research institution, or other organization. This focused archive typically includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides general query and report access to archive data users.	
Existing Infrastructure ▪ ATCOG Traffic Count and Accident Data ▪ Texarkana MPO At-grade Railroad Crossing Inventory	**Agency** ▪ ATCOG ▪ Texarkana MPO
Planned Projects None identified at this time	
Additional Needs None identified at this time	

2.3 Medium Priority Market Packages

Table 4 outlines market packages that were deemed medium priority by stakeholders in the Atlanta 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 also was a factor in the prioritization. Availability and maturity of technology also was a consideration, particularly for the maintenance and construction management market packages. These market packages were recently developed and added to the National ITS Architecture, and are not yet widely deployed. It is recommended that stakeholders in the Atlanta Region review deployments of some of the maintenance and construction technologies in other areas over the next several years to assess how well they have performed, benefits, and cost-effectiveness.

Table 4 – Medium Priority Market Packages for the Atlanta Region

Roadway Automated Treatment (MC05)	**Medium Priority**
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.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ TxDOT Additional RWIS Sites ▪ TxDOT Ice Detection and Anti-icing Equipment on Bridges	

Winter Maintenance (MC06)	**Medium Priority**
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 removal 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.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ TxDOT Ice Detection and Anti-icing Equipment on Bridges	

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

Workzone Management (MC08)	**Medium Priority**
This market package directs activity in work zones, controlling traffic through portable DMS and informing other groups of activity (e.g., ISP, TM, and other maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones.	
Existing Infrastructure ▪ TxDOT Portable DMS ▪ City of Texarkana, TX Portable Speed Trailers ▪ City of Marshall Portable Speed Trailers ▪ AHTD Portable DMS ▪ AHTD Portable Speed Trailers	**Agency** ▪ TxDOT ▪ City of Texarkana, TX ▪ City of Marshall ▪ AHTD
Planned Projects ▪ TxDOT HCRS Enhancement ▪ TxDOT Center to Center Communications	
Additional Needs ▪ TxDOT Atlanta TMC Expansion and ATMS Implementation ▪ TxDOT DMS on I-20 and I-30 ▪ AHTD DMS on I-30 ▪ TxDOT/AHTD DMS on Loop ▪ TxDOT Additional Portable DMS ▪ TxDOT Portable Speed Trailers ▪ TxDOT/AHTD DMS on I-49 ▪ TxDOT/AHTD DMS on I-69 ▪ Media Liaison and Coordination	

Transit Security (APTS05)	**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 None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ T Line On Board Security Cameras ▪ ATCOG On Board Security Cameras	

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

Weigh-in-Motion (CVO06)	**Medium Priority**
This market package provides for high speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities. This market package provides the roadside equipment that could be used as a stand-alone system or to augment the Electronic Clearance (CVO03) market package.	
Existing Infrastructure ▪ LADOTD and AHTD Weigh-in-Motion and Pre-Pass along I-20 and I-23	**Agency** ▪ LADOTD ▪ AHTD
Planned Projects None identified at this time	
Additional Needs None identified at this time	

HAZMAT Management (CVO10)	**Medium Priority**
This market package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material 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 by the Fleet and Freight Management Subsystem. The latter information can be provided prior to the beginning of the trip or gathered following the incident depending on the selected policy and implementation.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs None identified at this time	

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

Emergency 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 ▪ DPS AVL ▪ DPS CAD	**Agency** ▪ DPS
Planned Projects None identified at this time	
Additional Needs ▪ City of Texarkana, TX Emergency Vehicle AVL ▪ City of Texarkana, AR Emergency Vehicle AVL ▪ City of Marshall Emergency Vehicle AVL ▪ City of Texarkana, TX Emergency Vehicle Signal Preemption ▪ City of Texarkana, AR Emergency Vehicle Signal Preemption ▪ City of Marshall Fire/EMS Signal Preemption ▪ City of Atlanta Emergency Vehicle AVL ▪ DPS/TxDOT TMC Communications Connection ▪ TxDOT Emergency Vehicle Signal Preemption ▪ Other Emergency Management/TxDOT TMC Communications Connection ▪ DPS MDTs ▪ AHP MDTs ▪ Other Cities/Counties Emergency Vehicle Signal Preemption	

Roadway Service Patrols (EM4)	Medium Priority
This market package supports roadway service patrol vehicles that monitor roads that typically have incidents, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median).	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs None identified at this time	

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

ITS Data Warehouse (AD2)	Medium Priority
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.	
Existing Infrastructure ▪ Statewide Crash Record Information Systems	**Agency** ▪ DPS
Planned Projects None identified at this time	
Additional Needs ▪ Texarkana MPO Data Warehouse	

ITS Virtual Data Warehouse (AD3)	Medium Priority
This market package provides the same broad access to multimodal, multidimensional data from varied data sources as in the ITS Data Warehouse Market Package, but provides this access using enhanced interoperability between physically distributed ITS archives that are each locally managed. Requests for data that are satisfied by access to a single repository in the ITS Data Warehouse Market Package are parsed by he local archive and dynamically translated to requests to remote archives which relay the data necessary to satisfy the request.	
Existing Infrastructure None identified at this time	**Agency**
Planned Projects None identified at this time	
Additional Needs ▪ Texarkana MPO Virtual Data Warehouse	

2.4 Low Priority Market Packages

Nine market packages were identified and customized for the Atlanta Region, but 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. Stakeholders also did not want to preclude these market packages from future deployment in the Region, so it was decided to keep these market packages as part of the Regional ITS Architecture.

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

Table 5 – Low Priority Market Packages for the Atlanta Region

Market Package Name	Description	Comments
Probe Surveillance (ATMS02)	This market package provides an alternative approach for surveillance of the roadway network. Two general implementation paths are supported by this market package: 1) wide-area wireless communications between the vehicle and Information Service and 2) dedicated short range communications between the vehicle and roadside is used to provide equivalent information directly to the Traffic Management Subsystem. It requires either wide area or short-range communications equipment, roadside beacons and wireline communications for the short-range communications option, data reduction software, and utilizes wireline links between the Traffic Management Subsystem and Information Service Provider Subsystem to share the collected information. Both “Opt out” and “Opt in” strategies are available to ensure the user has the ability to turn off the probe functions to ensure individual privacy.	Probe surveillance was not deemed a high priority market package at the time of the initial architecture development in the Atlanta Region. For probe data to be consistent and accurately reflect current conditions there must be a quantifiable amount of vehicles equipped with probes on the roadways at any given time. The Atlanta Region might want to investigate the feasibility of using probe surveillance in the future to assist with determining near-real-time volume information on roads or freeways. Two potential probe vehicle candidates could be buses or commercial vehicles.

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

Market Package Name	Description	Comments
Maintenance and Construction Vehicle Tracking (MC01)	This market package will track the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.	This market package was not identified as needed for the Atlanta Region at this time. However it was expected that the information from Maintenance and Construction Vehicle Tracking may be useful to the Region some time in future if these activities were to become more automated. Included in this market package would be instrumentation of maintenance and construction vehicles with AVL.
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 Atlanta Region did not have a need for this market package based on the current state of technology. As technology evolves, the Region may consider implementation in the future.
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 Atlanta Region may consider this market package as a future deployment to assist with maintenance functions.
Work Zone Safety Monitoring (MC09)	This market package includes systems and strategies to improve work crew safety and reduce collisions between the motoring public and maintenance vehicles and activities. Included in this market package is detection for vehicle intrusions to the work zone and warning systems to alert workers and drivers of potential safety hazards. This market package support both stationary and mobile work zones.	The Atlanta Region might want to consider this market package as a future deployment.

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

Market Package Name	Description	Comments
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 Atlanta Region might want to consider this market package as a future deployment.
Multi-Modal Coordination (APTS7)	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.	The Atlanta Region might want to consider this market package as a future deployment.
CV Administrative Processes (CVO04)	This market package provides for electronic application, processing, fee collection, issuance, and distribution of CVO credential and tax filing. Through this process, carriers, drivers, and vehicles may be enrolled in the electronic clearance program by a separate market package which allows commercial vehicles to be screened at mainline speeds at roadside check facilities. Through this enrollment process, current profile databases are maintained in the Commercial Vehicle Administration subsystem and snapshots of this database are made available to the roadside check facilities at the roadside to support the electronic clearance process.	The Atlanta Region might want to automate the process of permitting in the cities and counties of the Region as a future deployment.

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

Market Package Name	Description	Comments
ISP-Based Route Guidance (ATIS06)	This market package offers the user pre-trip route planning and turn-by-turn route guidance services, which are generated by an Information Service Provider. 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 deemed 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.

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 in the deployment of those projects 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 every mile 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 Atlanta Region on May 15, 2003 to present the draft Regional ITS Deployment Plan and discuss potential projects. Each project recommended for the Regional ITS Deployment Plan was discussed, and consensus was reached by the stakeholders on the project description and the timeframe for implementation.

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

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

3.1 Short-Term Projects (5-Year)

Table 6 provides a description of projects for the Atlanta 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 Atlanta TMC Expansion and ATMS Implementation	Expand the TxDOT Atlanta TMC to accommodate video feed and control for VIVDS and CCTV cameras. Implement TxDOT Advanced Traffic Management System as part of the expansion.	TxDOT	$400,000	No	2 years
TxDOT DMS on I-20 and I-30	Implement DMS on I-20 and I-30 for traffic information dissemination	TxDOT	$100,000/sign	No	2 years
AHTD DMS on I-30	Implement DMS on I-30 for traffic information dissemination	AHTD	$100,000/sign	No	2 years
TxDOT CCTV Cameras on I-30	Implement CCTV cameras at select locations on I-30 for traffic monitoring and incident detection	TxDOT	$20,000-$25,000/site	No	2 years
TxDOT/AHTD DMS on Loop	Implement DMS on planned loop around City of Texarkana. Approximately 10 DMS.	TxDOT/AHTD	$1,000,000	No	2 years
TxDOT/AHTD CCTV on Loop	Implement CCTV on planned loop around Texarkana. Approximately 10 CCTV.	TxDOT/AHTD	$250,000	No	2 years
TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 1	Expand TxDOT closed loop signal system on signalized intersections in the TxDOT Atlanta District and upgrade existing signal detection to video image vehicle detection systems (VIVDS)	TxDOT	$1,500,000	Yes	2 years
TxDOT Fog Detection in Titus County	Implement fog detection system in fog prone area of Titus County to provide information on current conditions so that warnings can be issued to motorists and road closure decisions made when necessary	TxDOT	$200,000	No	2 years
TxDOT Changeable Message Speed Display Signs	Implement additional changeable message speed display signs as needed throughout the TxDOT Atlanta District	TxDOT	$6,000/sign	No	1 year
TxDOT Center-to-Center Communications (Statewide)	Enhance coordination with other TxDOT Districts through implementation of center-to-center communications between TxDOT TMCs	TxDOT	NA	Yes	1 year

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Travel and Traffic Management (continued)					
City of Texarkana, TX TOC	Implement a traffic operations center for the City of Texarkana, TX for operation of closed loop signal systems	City of Texarkana, TX	$300,000	No	2 years
City of Texarkana, TX TOC/TxDOT Atlanta TMC Connection	Implement a connection between the City of Texarkana, TX TOC and the TxDOT Atlanta TMC to allow video sharing and control, traffic data sharing, and other joint functions	City of Texarkana, TX	$100,000	No	1 year
City of Texarkana, TX Closed Loop Signal System Expansion Phase 1	Expand City of Texarkana, TX closed loop signal system on signalized intersections in the City of Texarkana, TX	City of Texarkana, TX	$100,000	No	2 years
City of Texarkana, TX VIVDS Expansion Phase 1	Implement video image vehicle detection systems (VIVDS) on additional intersections in the City of Texarkana, TX	City of Texarkana, TX	$100,000	No	6 months
City of Texarkana, TX Railroad Advance Warning	Implement system to detect train approach location and speed to predict when and where it will block intersections so that the public can be notified via blankout detour signs or DMS and emergency vehicles can be re-routed	City of Texarkana, TX	$400,000	No	2 years
AHTD District TMC/TxDOT Atlanta TMC Communications Connection	Install connection between the TxDOT Atlanta TMC and the AHTD District TMC for data sharing	AHTD	To Be Determined	No	2 years
Emergency Management					
City of Texarkana, TX Emergency Vehicle AVL	Install automated vehicle location (AVL) on City of Texarkana, TX fire and EMS vehicles	City of Texarkana, TX	$10,000/vehicle	No	6 months
City of Marshall Emergency Vehicle AVL	Install automated vehicle location (AVL) on City of Marshall fire and EMS vehicles	City of Marshall	$10,000/vehicle	No	6 months
HAZMAT Management Plans	Develop plans for emergency response to a hazardous materials incident including cleanup, detours, evacuations, etc.	TxDOT/AHTD/LADOTD	$100,000	No	1 year

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Maintenance and Construction Management					
TxDOT Additional RWIS Sites	Implement additional RWIS sites in the TxDOT Atlanta District to monitor road weather conditions, including ice detection	TxDOT	$75,000 - $100,000/site (includes communication)	No	1 year
TxDOT Additional Portable DMS	Deploy 2 additional portable DMS for traffic information dissemination	TxDOT	$65,000	No	6 months
TxDOT Portable Speed Trailers	Deploy 4 portable speed trailers for use in workzones	TxDOT	$70,000	No	6 months
TxDOT HCRS Enhancements	Implement enhancements to the Highway Conditions Reporting System (HCRS)	TxDOT	N/A	Yes (statewide initiative)	1 year
Public Transportation Management					
ATCOG Transit Operations Center with CAD System	Implement hardware and software applications to optimize route and schedule planning used in a TOC for routine and emergency operations	ATCOG	$100,000	No	6 months
ATCOG Communications System Upgrade	Gradual replacement program to upgrade radio communications equipment on ATCOG buses.	ATCOG	$1,000/vehicle	No	2 years
T Line On Board Security Cameras	Install security cameras on T Line buses and paratransit vehicles	TUTD	$10,000/vehicle	No	6 months
Information Management					
Texarkana MPO Data Warehouse	Develop information warehouse to include automated archival of data from the City of Texarkana, TX, City of Texarkana, AR, Texarkana Urban Transit District, ATCOG, and TxDOT Atlanta TMC	Texarkana MPO/ATCOG	$200,000	No	3 years

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

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

Atlanta Region
Short-Term Projects (5-Year)

Travel and Traffic Management

TxDOT Atlanta TMC Expansion and Advanced Traffic Management System (ATMS) Implementation

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Broadcast Traveler Information (ATIS01)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)
- Workzone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)
- ITS Data Mart (AD1)

Prerequisite Projects: None

Description: This project includes the expansion of the capabilities of the Atlanta District TMC. The planned expansion of the TMC would include the implementation of end equipment to allow the transmission of the video feed from the VIVDS in the field back to the TMC. This project would also include the capabilities to control the VIVDS remotely from the TMC as well as those needed to control the pan/tilt/zoom of the planned CCTV cameras.

This project involves the implementation of ATMS software to facilitate control of DMS, future CCTV cameras and other TxDOT field equipment as well as the expansion of the TMC to accommodate bringing back video images from the field.

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

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

Future development efforts include software modules to provide status information and command/control of HAR and environmental sensors (such as RWIS or 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 (C2C) Communications, and data collection devices.

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

TxDOT DMS on I-20 and I-30

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Workzone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of DMS along I-20 and I-30 within the Atlanta District for purposes of traffic information dissemination and incident management. When appropriate, special messaging may be provided for special events. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The cost of DMS implementation varies depending on factors such as the technology used (e.g., fiber optic, LED, etc.) and the sign size. For this estimate, a cost of $100,000 per sign was used.

AHTD DMS on I-30

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Workzone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of DMS I-30 in Arkansas within the Atlanta Region for purposes of traffic information dissemination and incident management. When appropriate, special messaging may be provided for special events. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The cost of DMS implementation varies depending on factors such as the technology used (e.g., fiber optic, LED, etc.) and the sign size. For this estimate, a cost of $100,000 per sign was used.

TxDOT CCTV Cameras on I-30

Associated Market Packages:

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

Prerequisite Projects: None

Description: This TxDOT project consists of the deployment of CCTV cameras at various locations along I-30 within the Atlanta Region for purposes of traffic monitoring and incident management. The estimated cost per CCTV site is between $20,000 and $25,000. This includes the camera, physical infrastructure and required communications equipment as well as installation costs.

TxDOT/AHTD DMS on Loop

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Workzone Management (MC08)

Prerequisite Projects: None

Description: This project consists of the deployment of DMS along the Texarkana Loop in both Texas and Arkansas within the Atlanta Region for purposes of traffic information dissemination and incident management. When appropriate, special messaging may be provided for special events. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The cost of DMS implementation varies depending on factors such as the technology used (e.g., fiber optic, LED, etc.) and the sign size. For this estimate, a cost of $100,000 per sign was used.

TxDOT/AHTD CCTV on Loop

Associated Market Packages:

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

Prerequisite Projects: None

Description: This TxDOT project consists of the deployment of CCTV cameras at various locations along the Texarkana Loop in both Texas and Arkansas within the Atlanta Region for purposes of traffic monitoring and incident management. The estimated cost per CCTV site is between $20,000 and $25,000. This includes the camera, physical infrastructure and required communications equipment as well as installation costs.

TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 1

Associated Market Packages:

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

Prerequisite Projects: None

Description: Expand the closed loop signal system by converting existing signalized intersections to the closed-loop signal system. New signals that are installed as part of other projects will become part of the closed loop signal system. Implementation of VIVDS is included as part of these upgrades. VIVDS implementation is discussed in more detail under the VIVDS project description.

TxDOT Fog Detection in Titus County

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement a fog detection system in Titus County along a roadway segment prone to heavy fog. The system would monitor visibility conditions along the roadway through the use of visiometers. When visibility falls below a certain pre-determined threshold, warning messages could be placed on DMS or blank-out signs installed as part of the system near the fog prone areas. Automated barrier systems could also be installed to allow officials to close down a roadway from a remote location during heavy fog. Connections between the fog detection system and maintenance and law enforcement officials could also be established to allow these agencies to be automatically notified so that they can monitor the situation and take any necessary action such as closing the roadway. The cost of the system will depend largely on the number of DMS, blank-out signs, and barriers that are implemented as part of the project.

TxDOT Changeable Message Speed Display Signs

Associated Market Packages:

- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Implement additional changeable message speed display signs as needed in the TxDOT Atlanta District. Changeable message speed display signs are traffic control devices with a large light emitting diode (LED) speed display sign run by radar. They help reduce speeds on curves and other sites dangerous conditions or through school zones and neighborhoods.

TxDOT Center-to-Center Communication (Statewide)

Associated Market Packages:

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

Prerequisite Projects: TxDOT TMC and ATMS Implementation

Description: The Center-to-Center Communications project is a logical extension of the TxDOT ATMS and field equipment deployments. The project will enhance coordination with TxDOT Districts (and potentially other agencies) through connection to the statewide C2C core infrastructure. A communication backbone must be developed with sufficient capacity between the TxDOT Atlanta District Office and existing C2C 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 C2C 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 Atlanta District Office and statewide C2C facilities. As part of connecting to the statewide C2C infrastructure, the Atlanta District 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.

City of Texarkana, TX TOC

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Broadcast Traveler Information (ATIS01)

Prerequisite Projects: None

Description: This project includes the establishment of a Texarkana, TX TOC. The TOC would be used primarily to monitor the operations of the controllers and detectors at signalized intersections. When implementing the TOC, consideration should be given for the planned inclusion of Texarkana, AR traffic operations as part of a future project.

City of Texarkana, TX TOC/TxDOT Atlanta TMC Connection

Associated Market Packages:
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install telecommunications connection between the City of Texarkana, TX TOC and the TxDOT Atlanta District TMC to allow for CCTV camera shared monitoring and control and data sharing. The cost of this connection will depend on the communications method chosen.

City of Texarkana, TX Closed Loop Signal System Expansion Phase 1

Associated Market Packages:
- Surface Street Control (ATMS03)

Prerequisite Projects: None

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

City of Texarkana, TX VIVDS Expansion Phase 1

Associated Market Packages:
- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Implement VIVDS at signalized intersections in Texarkana, TX. By installing cameras and processors that can determine change in gray scale over a predetermined detection zone within the field of vision, VIVDS will provide Texarkana with increased flexibility to determine traffic detector placement at signalized intersections. Typically a camera is mounted approximately 20 to 30 feet above the roadway and is positioned to look at oncoming vehicles. A processor is then connected to the traffic signal controller and as detection zones are activated, the controller recognizes the inputs as traditional induction loops. Many agencies operating closed loop signal systems install VIVDS and do not transport that data or video to a central location. As sufficient communications bandwidth becomes available at VIVDS field locations, both raw (without detection zones) and processed (with detection zones) video could be sent to the City of Texarkana TOC to provide information to support better operational decisions, enhanced traveler information, and improved signal maintenance. Another capability of VIVDS includes various alarm features. In addition to drawing vehicle detection zones in the camera field of vision, additional zones can be created and tied to alarms. For example, if a VIVDS was located near a high vandalism area, an alarm zone could be created to assist public safety officials in protecting public property.

The City of Texarkana has VIVDS at some of its signalized intersections. This project includes the implementation of VIVDS at additional existing signalized intersections.

City of Texarkana, TX Railroad Advance Warning

Associated Market Packages:

- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Standard Railroad Grade Crossing (ATMS13)
- Advanced Railroad Grade Crossing (ATMS14)
- Railroad Operations Coordination (ATMS15)

Prerequisite Projects: None

Description: This project will include highway/rail intersection warning systems that will alert motorists of arriving trains, amount of time the train will occupy the crossing, and the length of time a motorist can expect to be delayed. The deployment of instrumentation will be along roadways at railroad grade crossings. Information will be gathered either directly from the railroad operators or from sensors placed along the railroad right-of-way that monitor train length and speed. Data will be transferred from the field sensors to the City of Texarkana TOC where operators can make decisions regarding changes in signal operations to facilitate flow around the closed crossing or to clear traffic once the train has passed the crossing.

AHTD District TMC/TxDOT Atlanta TMC Communications Connection

Associated Market Packages:

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

Prerequisite Projects: None

Description: Install telecommunications connection between the AHTD District TMC and the TxDOT Atlanta District TMC to allow for data sharing. The cost of this connection will depend on the communications method chosen.

Emergency Management

City of Texarkana, TX Emergency Vehicle AVL

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Texarkana, TX emergency response vehicles (including fire trucks, ambulances and police vehicles) with GPS based vehicle locators to track, in real-time, vehicle locations. The location of the vehicle would be overlaid on a base map showing real-time positions of each equipped vehicle. The main purpose of the system is to assist dispatchers in deciding which vehicle is closest to an emergency call location and to know the exact location of each vehicle in case an officer needs assistance, or other emergency occurs.

City of Marshall Emergency Vehicle AVL

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Marshall emergency response vehicles (including fire trucks, ambulances and police vehicles) with GPS based vehicle locators to track, in real-time, vehicle locations. The location of the vehicle would be overlaid on a base map showing real-time positions of each equipped vehicle. The main purpose of the system is to assist dispatchers in deciding which vehicle is closest to an emergency call location and to know the exact location of each vehicle in case an officer needs assistance, or other emergency occurs.

HAZMAT Management Plans

Associated Market Packages:
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Emergency Response (EM1)

Prerequisite Projects: None

Description: Develop HAZMAT Management Plans for scenarios to respond to hazardous materials emergencies and disasters in the Atlanta Region. The scenarios will deal with cleanup, detour, and evacuation issues that could result from a HAZMAT incident. The purpose of this project is to design policies to guide disaster management planners and emergency responders, and to provide a consistently high level of preparedness at the different agencies in the Region. The estimated cost is $100,000.

Maintenance and Construction Management

TxDOT Additional RWIS Sites

Associated Market Packages:
- Network Surveillance (ATMS01)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)
- Roadway Automated Treatment (MC05)

Prerequisite Projects: None

Description: The TxDOT Atlanta Region currently has RWIS stations in the Region. The expansion project will implement additional stations to provide expanded coverage in the Atlanta Region. The RWIS will be remotely monitored from the TxDOT Atlanta District TMC. 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., ice, 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 RPU are transmitted to the central ATMS server, via dial-up modem or other low bandwidth telecommunication methods, which will be located at the TxDOT TMC. A future module for the ATMS software will support environmental sensor data and provides collection, archiving, and distribution of the data.

In most installations, RWIS devices are installed at problem areas where rapidly changing weather has a direct, negative impact on travel conditions, such as bridges. Pavement sensors are installed in the bridge deck and approach. The variation in pavement temperatures can allow maintenance engineers to better determine appropriate pavement treatments (e.g., salt, bridge deck pre-wetting, other chemicals, etc.) and more efficiently schedule personnel/equipment based on current and forecast weather

conditions. More sophisticated RWIS stations are equipped with integrated cameras to transmit snapshots or streaming video to a central control facility. In the event that streaming video is a functional requirement, a telecommunications solution supporting higher bandwidth than standard telephone dial-up is required. RWIS data also can be included as part of web or phone-based travel information systems, as well as broadcast to motorists via HAR or commercial radio broadcasts (through an Information Service Provider).

The estimated cost per site (including communications) is between $75,000 and $100,000.

TxDOT Additional 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 ice or flooding. Portable DMS can be stand-alone signs or mounted to the back of a maintenance vehicle. Programming is typically done manually at the sign. The TxDOT Atlanta Region currently has portable DMS that are used throughout the Region. Two additional portable DMS will be deployed as part of this project, for an estimated cost of $65,000.

TxDOT Portable Speed Trailers

Associated Market Packages:

- Work Zone Management (MC08)
- Work Zone Safety Monitoring (MC09)

Prerequisite Projects: None

Description: Procure work zone speed trailers for use by TxDOT Maintenance crews. Speed trailers are portable traffic control devices that are relatively easy to implement, operate, and dismantle. With a large LED speed display run by radar sitting atop a trailer, speed trailers are routinely used in residential neighborhoods and urban settings to slow drivers. As drivers approach, their speeds are typically displayed in 24-inch numbers. Recent studies have shown speed trailers particularly suited to temporary work zones and are more effective than radar drones in helping to reduce speeds of both large trucks and passenger vehicles throughout work zones.

Costs will very depending on the number of speed zone trailers purchased. For planning purposes, 4 speed zone trailers at $17,500 each was used to arrive at the estimate.

TxDOT HCRS Enhancements

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Broadcast Traveler Information (ATIS01)
- Regional Traffic Control and Coordination (ATMS07)
- Incident Management System (ATMS08)
- Workzone Management (MC08)
- Maintenance and Construction Activity Coordination (MC10)

Prerequisite Projects: None

Description: TxDOT's HCRS will be enhanced on a statewide basis. The HCRS will use data from the Atlanta 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 Atlanta Region 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.

Public Transportation Management

ATCOG Transit Operations Center (TOC) with CAD System

Associated Market Packages:

- Transit Vehicle Tracking (APTS1)
- Transit Fixed-Route Operations (APTS2)
- Demand-Response Transit Operations (APTS3)
- Transit Traveler Information System (APTS8)

Prerequisite Projects: None

Description: Implement a centralized transit management and operations center for ATCOG transit services. A centralized transit management center will serve as the hub for transit operations, dispatch, transit travel information (including customer call center) and other functions. Upgrading to computer-aided dispatch (CAD) will streamline communications between dispatchers and drivers. Used in conjunction with automated vehicle location (AVL) and mobile data terminals, dispatchers can assess vehicle locations, status, route adherence, as well as communicate vehicles that are in the field. A CAD system also improves the system reporting functions, by automatically logging all communications between the dispatch center and the driver, including time, vehicle/driver, nature of the communication, and response.

ATCOG Communications System Upgrade

Associated Market Packages:

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

Prerequisite Projects: None

Description: This project is for the upgrade of the ATCOG communications system. Due to the cost of the project, this will be a phased project. The estimated cost per vehicle is $1,000 and additional equipment upgrades will be required at the dispatch center.

T Line On Board Security

Associated Market Packages:

- Transit Security (APTS05)

Prerequisite Projects: None

Description: This project will include the installation of security cameras on T Line fixed route buses and paratransit vehicles. Cameras will be for on-board recording only, and are not envisioned to be monitored remotely from the dispatch center. 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.

Information Management

Texarkana MPO Data Warehouse

Associated Market Packages:

- ITS Data Warehouse (AD02)

Prerequisite Projects: None

Description: Implement a system to archive accident data from multiple agencies in the Region. A central archived data server will be developed at the Texarkana MPO that will collect, process, store and provide access to historical accident data from throughout the Region. Communications links will be necessary between the Texarkana MPO and the other data sources, such as the City of Texarkana, TX, City of Texarkana, AR and Texarkana Urban Transit District. This project will design the frequency, quantity, and quality of data to be collected and stored. User interfaces will be required at each "user" agency to be able to access, search, and upload archived data as needed.

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 Closed Loop Signal System Expansion and VIVDS Upgrade Phase 2	Expand TxDOT closed loop signal system on signalized intersections in the TxDOT Atlanta District and upgrade existing signal detection to video image vehicle detection systems (VIVDS)	TxDOT	$1,500,000	No	2 years
Regional 511 Advanced Traveler Information System Server	Implement advanced traveler information system (ATIS) server in the TxDOT Atlanta District TMC that will collect, consolidate, and distribute traveler information to a 511 based 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/LADOTD/AHTD/City of Texarkana/ArkLaTex	N/A	N/A	6 months
City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC	Establish the Texarkana, AR TOC co-located with the Texarkana, TX TMC to facilitate coordination	City of Texarkana, AR/City of Texarkana, TX	$150,000	No	1 year
City of Texarkana, TX Closed Loop Signal System Expansion Phase 2	Expand City of Texarkana closed loop signal system on signalized intersections in the City of Texarkana, TX	City of Texarkana, TX	$100,000	No	1 year
City of Texarkana, AR Closed Loop Signal System Phase 1	Establish City of Texarkana, AR closed loop signal system on signalized intersections in the City of Texarkana, AR	City of Texarkana, AR	$15,000-20,000 per intersection	No	2 years
City of Texarkana, TX VIVDS Expansion Phase 2	Implement video image vehicle detection systems (VIVDS) on additional intersections in the City of Texarkana, TX	City of Texarkana, TX	$100,000	No	1 year
City of Texarkana, AR VIVDS Phase 1	Implement video image vehicle detection systems (VIVDS) on intersections in the City of Texarkana, AR	City of Texarkana, AR	$100,000	No	6 months
Other Cities/Counties/TxDOT Atlanta TMC Communications Connection	Install connection between other cities and counties in the Atlanta Region (possibly including the City of Marshall and the City of Atlanta) for video sharing and control, traffic data sharing and other joint functions	Other Cities/Counties/TxDOT	To Be Determined	No	2 years

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Emergency Management					
DPS/TxDOT TMC Communications Connection	Establish a connection between the DPS and TxDOT TMC to allow video sharing and possible control and exchange of incident information	DPS/TxDOT	To Be Determined	No	2 years
TxDOT Emergency Vehicle Signal Preemption	Implement signal pre-emption at TxDOT maintained signalized intersections in the Region for fire and EMS	TxDOT	$200,000	No	1 year
City of Texarkana, TX Emergency Vehicle Signal Preemption	Implement signal pre-emption at City of Texarkana, TX intersections for fire and EMS	City of Texarkana, TX	$200,000	No	1 year
City of Texarkana, AR Emergency Vehicle Signal Preemption	Implement signal pre-emption at City of Texarkana, AR intersections for fire and EMS	City of Texarkana, AR	$200,000	No	1 year
City of Texarkana, AR Emergency Vehicle AVL	Install automated vehicle location (AVL) on City of Texarkana, AR fire and EMS vehicles	City of Texarkana, AR	$10,000/vehicle	No	6 months
City of Marshall Fire/EMS Signal Preemption	Implement signal pre-emption at City of Marshall intersections for fire and EMS	City of Marshall	$100,000	No	1 year
Maintenance and Construction Management					
TxDOT Flood Detection	Implement flood detection stations on state routes prone to flooding in the Atlanta Region	TxDOT	$25,000/site	No	6 months
City of Marshall Flood Detection	Implement flood detection stations on roadways prone to flooding in the City of Marshall	City of Marshall	$25,000/site	No	6 months

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Public Transportation Management					
T Line Dispatch/TxDOT TMC/AHTD District TMC Communications Connection	Establish a connection between T Line Dispatch and the TxDOT Atlanta TMC and AHTD District TMC to allow T Line access to traffic condition data and facilitate the exchange of incident information	TUTD/TxDOT/AHTD	To Be Determined	No	2 years
T Line AVL	Install automated vehicle location on T Line buses. There are 8 vehicles in the fleet.	TUTD	$10,000/bus	No	6 months
ATCOG AVL	Install on ATCOG transit vehicles. There are 43 vehicles in the ATCOG fleet.	ATCOG	$10,000/bus	No	6 months
ATCOG TOC/TxDOT TMC Communications Connection	Establish a connection between the ATCOG TOC and the TxDOT Atlanta TMC to allow ATCOG access to traffic condition data and facilitate the exchange of incident information	ATCOG/TxDOT	To Be Determined	No	2 years
ATCOG On Board Security Cameras	Install security cameras on ATCOG transit vehicles	ATCOG	$10,000/vehicle	No	6 months
ATCOG MDTs	Install mobile data terminals on ATCOG transit vehicles	ATCOG	$5,000/vehicle	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.

Atlanta Region
Mid-Term Projects (10-Year)

Travel and Traffic Management

TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 2

Associated Market Packages:

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

Prerequisite Projects: TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 1

Description: Expand the closed loop signal system by integrating additional signals and implementing VIVDS at select TxDOT intersections throughout the Region.

Regional 511 Advanced Travel Information System Server

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Broadcast Traveler Information (ATIS01)
- Regional Traffic Control and Coordination (ATMS07)
- Incident Management System (ATMS08)
- Maintenance and Construction Activity Coordination (MC010)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation, TxDOT Center-to-Center Communications

Description: Install a server dedicated to ATIS in the TxDOT Atlanta 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) and also web and to private partners who desire access to information in the Atlanta Region. These private partners could include local media and information service providers, which would link to the ATIS server to download information, or obtain real-time feeds, depending on the link provided by the private partner. Appropriate security measures and firewalls could be designed into the server to allow or restrict access to registered, authorized users. By fusing various types of data from a variety of sources (traffic management, incident management, and others), this data can be converted to usable information for travelers as well as other agencies.

Media Liaison and Coordination

Associated Market Packages:
- Traffic Information Dissemination (ATMS06)
- Weather Information Processing and Distribution (MC04)
- Workzone Management (MC08)
- Broadcast Traveler Information (ATIS01)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation

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 TV and radio stations typically already have microwave licenses and infrastructure in place to support wireless transmission of video; therefore, TxDOT should provide a connection point at the TMC for media providers (e.g., video switch for video images and traffic conditions map), but not design and install the entire connection between the TMC and the media. An initial task in the project will be to meet with interested news providers to determine information needs to support media interface design activities. Each agency that will be sharing information directly with the media will likely need an agreement or policy in place to determine what type of information will be shared. A subgroup of the stakeholders will need to work on the process of sharing data with the media and what broadcasts will be allowed , in an attempt to provide similar data to the media from each individual stakeholder.

City of Texarkana, TX/City of Texarkana, AR Joint Operations TOC

Associated Market Packages:
- Network Surveillance (ATMS01)
- Surface Street Control (ATMS03)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)
- Broadcast Traveler Information (ATIS01)

Prerequisite Projects: None

Description: This project includes the establishment of a Texarkana, AR TOC. The TOC will be an addition to the Texarkana, TX TOC established through another project in the short term. It will also be used primarily to monitor the operations of the controllers and detectors at signalized intersections.

City of Texarkana, TX Closed Loop Signal System Expansion Phase 2

Associated Market Packages:

- Surface Street Control (ATMS03)

Prerequisite Projects: City of Texarkana, TX Closed Loop Signal System Expansion Phase 1

Description: Continue expansion and implementation of the City of Texarkana, TX closed-loop signal system.

City of Texarkana, AR Closed Loop Signal System Phase 1

Associated Market Packages:

- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: Establish a closed loop signal system in Texarkana, AR by converting existing signalized intersections to closed-loop signal systems. New signals that are installed as part of other projects will become part of the closed loop signal system. Implementation of VIVDS is included as part of these upgrades. VIVDS implementation is discussed in more detail under the VIVDS project description.

City of Texarkana, TX VIVDS Expansion Phase 2

Associated Market Packages:

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

Prerequisite Projects: City of Texarkana, TX VIVDS Expansion Phase 1

Description: Continue implementation of VIVDS at additional signalized intersections in the City of Texarkana, TX.

City of Texarkana, AR VIVDS Phase 1

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement VIVDS at signalized intersections in Texarkana, AR. By installing cameras and processors that can determine change in gray scale over a predetermined detection zone within the field of vision, VIVDS will provide Texarkana with increased flexibility to determine traffic detector placement at signalized intersections. Typically a camera is mounted approximately 20 to 30 feet above the roadway and is positioned to look at oncoming vehicles. A processor is then connected to the traffic signal controller and as detection zones are activated, the controller recognizes the inputs as traditional

induction loops. Many agencies operating closed loop signal systems install VIVDS and do not transport that data or video to a central location. As sufficient communications bandwidth becomes available at VIVDS field locations, both raw (without detection zones) and processed (with detection zones) video could be sent to the City of Texarkana TOC to provide information to support better operational decisions, enhanced traveler information, and improved signal maintenance. Another capability of VIVDS includes various alarm features. In addition to drawing vehicle detection zones in the camera field of vision, additional zones can be created and tied to alarms. For example, if a VIVDS was located near a high vandalism area, an alarm zone could be created to assist public safety officials in protecting public property.

Other Cities/Counties/TxDOT Atlanta TMC Connection

Associated Market Packages:
- Regional Traffic Control (ATMS07)
- Incident Management System (ATMS08)

Prerequisite Projects: None

Description: Install telecommunications connection between other cities and counties in the Atlanta Region (possibly including the City of Marshall and the City of Atlanta) and the TxDOT Atlanta District TMC to allow for CCTV camera shared monitoring and control and data sharing. The cost of this connection will depend on the communications method chosen.

Emergency Management

DPS/TxDOT TMC Communications Connection

Associated Market Packages:
- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Routing (EM2)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation

Description: Install telecommunications connection and end equipment from the DPS to TxDOT Atlanta TMC to share weather sensor and CCTV data. The connection will also provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the technology used to implement the connection.

TxDOT Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Routing (EM2)

Prerequisite Projects: None

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

City of Texarkana, TX Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Texarkana, TX signalized intersections 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. Installing preemption in both Texarkana, TX and Texarkana, AR will assist vehicles in crossing state lines in mutual aid situations.

City of Texarkana, AR Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Texarkana, AR signalized intersections 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. Installing preemption in both Texarkana, TX and Texarkana, AR will assist vehicles in crossing state lines in mutual aid situations.

City of Texarkana, AR Emergency Vehicle AVL

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Texarkana, AR emergency response vehicles (including fire trucks, ambulances and police vehicles) with GPS based vehicle locators to track, in real-time, vehicle locations. The location of the vehicle would be overlaid on a base map showing real-time positions of each equipped vehicle. The main purpose of the system is to assist dispatchers in deciding which vehicle is closest to an emergency call location and to know the exact location of each vehicle in case an officer needs assistance, or other emergency occurs.

City of Marshall Fire/EMS Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Marshall signalized intersections 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.

Maintenance and Construction Management

TxDOT Flood Detection

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement flood detection systems on flood-prone segments of Interstates and state routes in the Atlanta 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, and 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 Atlanta 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 (i.e., RWIS), and development of this module could be extended to include the needs of flood detection stations.

Costs for this project will vary based on the number of locations and detection stations installed, as well as communications. For planning purposes, a cost per station was estimated at $25,000 each (including communications).

City of Marshall Flood Detection

Associated Market Packages:

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

Prerequisite Projects: None

Description: Implement flood detection systems on flood-prone segments roadways in the City of Marshall. 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, and 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 City of Marshall public works department. Communications between the flood detection stations and the public works department can be achieved through a variety of wireless and wireline telemetry methods.

Costs for this project will vary based on the number of locations and detection stations installed, as well as communications. For planning purposes, a cost per station was estimated at $25,000 each (including communications).

Public Transportation Management

T Line Dispatch/TxDOT TMC/AHTD District TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Transit Fixed-Route Operations (APTS02)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation

Description: Install telecommunications connection from the T Line Dispatch to the TxDOT Atlanta TMC and AHTD District TMC so that T Line can access current traffic and roadway conditions information. The connection can also facilitate the exchange of incident information should a T Line vehicle ever be involved in or otherwise impacted by an incident or utilized for an evacuation. The cost for this project will depend on the technology used to implement the connection.

T Line AVL

Associated Market Packages:

- Transit Vehicle Tracking (APTS01)
- Transit Fixed Route Operations (APTS02)
- Demand Response Transit Operations (APTS03)
- Transit Traveler Information (APTS08)

Prerequisite Projects: None

Description: Install AVL on T Line fixed routes buses and para-transit vehicles. The AVL system will convey information regarding real-time vehicle location to the T Line Dispatch 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 automatic passenger counter and fare payment systems. Transit managers for real-time operations and management as well as for transit traveler information can use information from the AVL/CAD system. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations.

Costs will vary depending on the number of vehicles equipped with the on-board AVL units. For planning purposes it was estimated that it would cost $10,000 per vehicle to install AVL equipment. There are currently 8 vehicles in the T Line fleet.

ATCOG AVL

Associated Market Packages:
- Transit Vehicle Tracking (APTS01)
- Transit Fixed Route Operations (APTS02)
- Demand Response Transit Operations (APTS03)
- Transit Traveler Information (APTS08)

Prerequisite Projects: None

Description: Install AVL on ATCOG fixed routes buses and para-transit vehicles. The AVL system will convey information regarding real-time vehicle location to the ATCOG TOC, 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 automatic passenger counter and fare payment systems. Transit managers for real-time operations and management as well as for transit traveler information can use information from the AVL/CAD system. In areas where AVL technology has been installed on buses, agencies report a 5-25 percent increase in on-time performance, which translates directly to improved efficiency and operations.

Costs will vary depending on the number of vehicles equipped with the on-board AVL units. For planning purposes it was estimated that it would cost $10,000 per vehicle to install AVL equipment. There are currently 43 vehicles in the ARCOG fleet.

ATCOG TOC/TxDOT TMC Communications Connection

Associated Market Packages:
- Traffic Information Dissemination (ATMS06)
- Transit Fixed-Route Operations (APTS02)
- Transit Demand Response Operations (APTS03)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation

Description: Install telecommunications connection from the ATCOG TOC to the TxDOT Atlanta TMC and so that ATCOG dispatchers can access current traffic and roadway conditions information. The connection can also facilitate the exchange of incident information should as ATCOG vehicle ever be involved in or otherwise impacted by an incident or utilized for an evacuation. The cost for this project will depend on the technology used to implement the connection.

ATCOG On Board Security Cameras

Associated Market Packages:

- Transit Security (APTS05)

Prerequisite Projects: None

Description: This project will include the installation of security cameras on ATCOG vehicles. Cameras will be for on-board recording only, and are not envisioned to be monitored remotely from the dispatch center. 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.

ATCOG MDTs

Associated Market Packages:

- Transit Fixed Route Operations (APTS2)
- Demand-Response Transit Operations (APTS3)
- Transit Traveler Information (APTS8)

Prerequisite Projects: ATCOG Transit Operations Center with CAD

Description: Install MDT units on ATCOG transit vehicles. Mobile data terminals allow bus operators to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify drivers of adverse conditions, route changes, or other impacts to the scheduled route for both fixed-route and demand-response transit operations. MDTs also can 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 MDT systems, as well as the functions and features designed into the systems (above the basic location and digital communication functions). MDTs will be expand upon the AVL project, using much of the same equipment and communications. For planning purposes, 43 vehicles were used at $5,000 per vehicle.

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 Closed Loop Signal System Expansion and VIVDS Upgrade Phase 3	Expand TxDOT closed loop signal system on signalized intersections in the TxDOT Atlanta District and upgrade existing signal detection to video image vehicle detection systems (VIVDS)	TxDOT	$1,000,000	No	2 years
TxDOT/AHTD DMS on I-49	Implement DMS on I-49 for traffic information dissemination	TxDOT/AHTD	$100,000/sign	No	2 years
TxDOT/AHTD DMS on I-69	Implement DMS on I-69 for traffic information dissemination	TxDOT/AHTD	$100,000/sign	No	2 years
TxDOT CCTV Cameras on I-49	Implement CCTV cameras at select locations on I-49 for traffic monitoring and incident detection	TxDOT	$20,000-$25,000/site	No	2 years
Emergency Management					
City of Atlanta Emergency Vehicle AVL	Installation of AVL system for City of Atlanta fire and EMS vehicles	City of Atlanta	$10,000/vehicle	No	6 months
Other Emergency Management/TxDOT TMC Connection	Establish connection between other emergency management agencies and TxDOT Atlanta TMC for the purpose of video sharing and incident management coordination	Other Emergency Management/TxDOT	To Be Determined	No	1 year
DPS MDTs	Install mobile data terminals in DPS vehicles	DPS	$10,000/vehicle	No	2 years
AHP MDTs	Install mobile data terminals in Arkansas Highway Police vehicles	AHP	$10,000/vehicle	No	2 years
Other Cities/Counties Emergency Vehicle Signal Preemption	Implement signal pre-emption at signalized intersections in the Region for fire and EMS	Cities/Counties	$200,000	No	1 year

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

Program Area/Project	Description	Responsible Agency*	Probable Cost**	Funding Identified	Estimated Project Duration
Maintenance and Construction Management					
TxDOT Ice Detection and Anti-Icing Equipment on Bridges	Install ice detection and anti-icing equipment at key locations in the Region prone to early icing	TxDOT	To Be Determined	No	1 year
Public Transportation Management					
ATCOG Web-based Ride Scheduling	Develop web-based ride scheduling program for ATCOG transit that would allow patrons to schedule their own rides	ATCOG	$100,000	No	6 months
T Line Signal Priority for Buses	Implement signal priority system in the City of Texarkana to provide priority for transit vehicles	TUTD	$200,000	No	1 year
ATCOG Transit Traveler Information Kiosks	Install kiosks at ATCOG transfer stations (including Mount Pleasant) to provide transit travelers with dynamic information	ATCOG	$20,000/kiosk	No	6 months
Information Management					
Texarkana MPO Virtual Data Warehouse	Enhance information warehouse for archival of data from the City of Texarkana, TX, City of Texarkana, AR, Texarkana Urban Transit District, ATCOG, and TxDOT Atlanta TMC to be a web-based warehouse.	Texarkana MPO/ATCOG	$100,000	No	2 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.

Travel and Traffic Management

TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phase 3

Associated Market Packages:

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

Prerequisite Projects: TxDOT Closed Loop Signal System Expansion and VIVDS Upgrade Phases 1 and 2

Description: Expand the closed loop signal system by integrating additional signals and implementing VIVDS at select TxDOT intersections throughout the Region.

TxDOT/AHTD DMS on I-49

Associated Market Packages:

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

Prerequisite Projects: None

Description: This project consists of the deployment of DMS along future I-49 within the Atlanta Region for purposes of traffic information dissemination and incident management. When appropriate, special messaging may be provided for special events. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The cost of DMS implementation varies depending on factors such as the technology used (e.g., fiber optic, LED, etc.) and the sign size. For this estimate, a cost of $100,000 per sign was used. This project will be a coordinated effort with AHTD.

TxDOT/AHTD DMS on I-69

Associated Market Packages:

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

Prerequisite Projects: None

Description: This project consists of the deployment of DMS along future I-69 in the Atlanta Region for purposes of traffic information dissemination and incident management. When appropriate, special messaging may be provided for special events. DMS will also be utilized in conjunction with emergency evacuation coordination (i.e., HAZMAT, weather, etc.).

The cost of DMS implementation varies depending on factors such as the technology used (e.g., fiber optic, LED, etc.) and the sign size. For this estimate, a cost of $100,000 per sign was used. This project will be a coordinated effort with AHTD.

TxDOT CCTV Cameras on I-49

Associated Market Packages:

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

Prerequisite Projects: None

Description: This TxDOT project consists of the deployment of CCTV cameras at various locations along future I-49 within the Atlanta Region for purposes of traffic monitoring and incident management. The estimated cost per CCTV site is between $20,000 and $25,000. This includes the camera, physical infrastructure and required communications equipment as well as installation costs.

Emergency Management

City of Atlanta Emergency Vehicle AVL

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip City of Atlanta fire and EMS vehicles with GPS based vehicle locators to track, in real-time, vehicle locations. The location of the vehicle would be overlaid on a base map showing real-time positions of each equipped vehicle. The main purpose of the system is to assist dispatchers in deciding which vehicle is closest to an emergency call location and to know the exact location of each vehicle in case additional assistance is needed.

Other Emergency Management/TxDOT TMC Communications Connection

Associated Market Packages:

- Traffic Information Dissemination (ATMS06)
- Incident Management System (ATMS08)
- Emergency Routing (EM2)

Prerequisite Projects: TxDOT Atlanta TMC Expansion and ATMS Implementation

Description: Install telecommunications connection and end equipment from the emergency management agency to the TxDOT Atlanta TMC to share weather sensor and CCTV data. The connection will also provide information on current road conditions that could assist with incident/emergency management. The cost for this project will depend on the technology used to implement the connection.

DPS MDTs

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: none

Description: Install MDT units in DPS patrol vehicles. Mobile data terminals allow officers to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify officers of incident details for the call they are responding to, route to the incident, weather conditions to be aware of or any other information that would aid them in performing their job. MDTs also can transmit information from the driver to the dispatch center, including status, accident data, 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 MDT systems, as well as the functions and features designed into the systems (above the basic location and digital communication functions). MDTs will be expand upon the AVL project, using much of the same equipment and communications. For planning purposes $10,000 per vehicle was used as a cost estimate. This project will likely be implemented as part of a statewide effort.

AHP MDTs

Associated Market Packages:

- Emergency Response (EM1)
- Emergency Routing (EM2)

Prerequisite Projects: none

Description: Install MDT units in AHP patrol vehicles. Mobile data terminals allow officers to send and receive digital messages. Mobile data terminals can be used by dispatchers to notify officers of

incident details for the call they are responding to, route to the incident, weather conditions to be aware of or any other information that would aid them in performing their job. MDTs also can transmit information from the driver to the dispatch center, including status, accident data, 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 MDT systems, as well as the functions and features designed into the systems (above the basic location and digital communication functions). MDTs will be expand upon the AVL project, using much of the same equipment and communications. For planning purposes $10,000 per vehicle was used as a cost estimate.

Other Cities/Counties Emergency Vehicle Signal Preemption

Associated Market Packages:

- Surface Street Control (ATMS03)
- Emergency Routing (EM2)

Prerequisite Projects: None

Description: Equip signalized intersections 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.

Maintenance and Construction Management

TxDOT Ice Detection and Anti-icing Equipment on Bridges

Associated Market Packages:

- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)
- Roadway Automated Treatment (MC05)
- Winter Maintenance (MC06)

Prerequisite Projects: TxDOT Additional RWIS Sites

Description: This project will install ice detection and anti-icing systems at select bridge locations in the Atlanta Region. The systems would be remotely monitored from the TxDOT Atlanta District TMC.

Anti-icing is a technique of applying a liquid, chemical de-icing agent directly onto the surface before the temperature and humidity levels permit an ice bond to occur. This technique requires the chemical de-icing agents be applied in a timely and accurate manner. Permanent auto anti-icing systems must be activated by some means, and the level of service is directly impacted by the method that is used to activate the system. To achieve full autonomous operation (non-human intervention), the anti-icing system must be controlled by input from a Road Weather Information System (RWIS) that measures

atmospheric and pavement surface conditions, accurately measures the freeze point of the moisture/chemical solution on the road surface and in turn activates the permanent automated anti-icing system when icing conditions are imminent.

Public Transportation Management

ATCOG Web-Based Scheduling

Associated Market Packages:
- Demand-Response Transit Operations (APTS03)
- Transit Traveler Information (APTS08)

Prerequisite Projects: ATCOG AVL

Description: Provide enhanced transit related traveler information to ATCOG network customers. The on-demand nature of the transit services requires that up-to-the minute information about pick-ups, drop-offs, vehicle location, and any disruptions in service be available not only to the dispatch staff, but also to transit passengers pre-trip. General (static) and near-real-time information about 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.

T Line Signal Priority for Buses

Associated Market Packages:
- Transit Fixed-Route Operations (APTS02)
- Surface Street Control (ATMS03)

Prerequisite Projects: None

Description: This project would provide signal priority along major corridors in Texarkana. Signal priority works in the same way that signal preemption for emergency vehicles does to notify a signal that the vehicle is approaching. Each vehicle has a transmitter and there is a sensor at each intersection equipped for priority. However, unlike preemption for emergency vehicles, priority does not give buses the right of way on demand, instead it merely favors the bus, facilitating movement through the intersection. This could mean extension of the green if a bus is approaching the intersection, or other modifications to the signal timing to accommodate the bus. Signal priority is often used by buses when they are behind schedule to catch back up and allows transit operators to improve on-time performance of buses.

ATCOG Transit Traveler Information Kiosks

Associated Market Packages:

- Transit Traveler Information (APTS08)

Prerequisite Projects: None

Description: Install static and real-time transit and traveler information devices at transit transfer stations, major shopping centers and the regional airport. The project will build on information available from the transit AVL project. Either kiosks, monitors, or dynamic signs will relay information on current bus operating conditions (e.g., Next bus – 5 minutes, on schedule, delayed 10 minutes, etc.). Communications from the kiosks or other traveler information devices to the ATCOG dispatch will also need to be included as part of this project.

Information Management

Texarkana MPO Virtual Data Warehouse

Associated Market Packages:

- ITS Data Warehouse (AD02)

Prerequisite Projects: Texarkana MPO Data Warehouse

Description: This project will take the data warehouse developed previously to archive accident data from multiple agencies in the Region and develop a web-based user interface. This interface will allow each "user" agency to be able to access, search, and upload archived data as needed.

4. MAINTAINING THE REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

The Atlanta 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 Atlanta Regional ITS Architecture and the ITS Deployment Plan, however, these plans will continue to be driven by stakeholder consensus rather than a single stakeholder.

It is recommended that stakeholders meet on an annual basis to review the existing Regional ITS Architecture and ITS Deployment Plan. At these annual meetings, stakeholders should identify which projects in the ITS Deployment Plan have been deployed. New projects that are recommended by a stakeholder for inclusion in the ITS Deployment Plan should also be discussed to ensure that the Region as a whole feels that the project agrees with regional needs and priorities. This same type of consensus building should also be used should the geographic scope of the Region need to change or should additional stakeholders need to be added to the Regional ITS Architecture and ITS Deployment Plan.

It is also recommended that the Atlanta Regional ITS Architecture and ITS Deployment Plan be updated every two years to correspond with the TIP update. At this time, input and changes agreed upon at the annual review meeting will be incorporated into the document. Any new market packages that have been added to the National Architecture should be reviewed to see if they are applicable to the Atlanta Region. Data flows in existing market packages should also be reviewed to determine if any planned/future flows are now existing. The Deployment Plan will be updated 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 current ITS Architecture for the Atlanta 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.

Both the Atlanta 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.