



State of Texas
Regional ITS Architectures and Deployment Plans

Atlanta Region

Regional ITS Architecture Report

Prepared by:



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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
AHP	Arkansas Highway Police
AHTD	Arkansas Highway and Transportation Department
ASP	Arkansas State Police
ASTM	American Society for Testing and Materials
ATCOG	Ark-Tex Council of Governments
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
BRINSAP	Bridge Inventory Inspection System
CAD	Computer Aided Dispatch
CC	Control Center
CCTV	Closed-Circuit Television
CPT	Common Public Transportation
CVO	Commercial Vehicle Operations
DMS	Dynamic Message Sign
DOT	Department of Transportation
DPS	Department of Public Safety
DSRC	Dedicated Short Range Communications
EIA	Electronic Industries Association
EOC	Emergency Operations Center
ETMCC	External TMC Communication
EV	Emergency Vehicle
FC	Fare Collection
FHWA	Federal Highway Administration
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials

LIST OF ACRONYMS

HCRS	Highway Condition Reporting System
HRI	Highway-Rail Intersections
I/F	Interface
IM	Incident Management
IMMS	Incident Management Message Sets
ISP	Information Service Provider
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System
LADOTD	Louisiana Department of Transportation and Development
MCM	Maintenance and Construction Management
MCV	Maintenance and Construction Vehicle
MOU	Memorandum of Understanding
MS	Message Sets
NEMA	National Electrical Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration
NTCIP	National Transportation Communications for ITS Protocol
OB	Onboard
PI	Passenger Information
PTMS	Public Transportation Management System
RWIS	Road Weather Information System
SAE	Society of Automotive Engineers
SDO	Standards Development Organization
SP	Spatial Representation
STIC	Subcarrier Traffic Information Channel
TCIP	Transit Communication Interface Protocol
TEA-21	Transportation Equity Act for the 21st Century
TM	Traffic Management



LIST OF ACRONYMS

TMC	Traffic Management Center
TMDD	Traffic Management Data Directory
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation
VIVDS	Video Image Vehicle Detector System
WIM	Weigh-in-Motion

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, in 2001 the Texas Department of Transportation (TxDOT) initiated the development of regional ITS architectures and deployment plans throughout the State of Texas. The Atlanta Region was the seventh in the series of regional ITS architectures to be prepared as part of this initiative.

The Atlanta Region is located in the northeastern portion of the state. The City of Texarkana is the largest population center in the Region. Other cities and towns include Atlanta, Marshall, Gilmer, and Pittsburg. The Atlanta Region is bordered by three other TxDOT Districts (Lufkin, Tyler, and Paris) as well as the states of Oklahoma, Arkansas, and Louisiana.

The Atlanta Regional ITS Architecture followed a comprehensive process focused on stakeholder outreach and education, identifying market packages and interfaces tailored to the needs of the Atlanta Region, and developing a consensus-based architecture for the Region. This architecture provides a framework for ITS infrastructure to be deployed and integrated in the Atlanta Region over the next 20 years.

Stakeholders from throughout the Region participated in the development of the Atlanta Regional ITS Architecture, including representatives from TxDOT, local cities, Arkansas and Louisiana, and transit agencies. These stakeholders provided input and review at key steps in the architecture development process, including a project kick-off meeting, architecture development and review workshops, and final review of the architecture documentation.

An inventory of existing and planned ITS infrastructure in the Region provided the basis for the architecture development. Stakeholder needs that could be addressed by ITS technologies guided the selection of market packages, data flows, and integration requirements. A diverse range of needs were identified by stakeholders in the Region. The highest priority needs focused on improving emergency coordination and response, and providing accurate, timely advisories about road and weather conditions to travelers, especially to hurricane evacuees seeking refuge in the Region. Coordination with Arkansas and Louisiana also was a priority for stakeholders.

Market packages were selected that corresponded to the desired services and functions identified for the Region, and were customized for Atlanta Region agencies and equipment. These market packages included high priority ‘foundation’ services and functions, such as network surveillance and road weather information systems, as well as market packages to address coordination needs, including incident management system and regional traffic control and coordination. Stakeholders then prioritized these market packages as high, medium, and low. These priorities were used in the second phase of the project to develop the ITS deployment plan for the Atlanta Region.

An interconnect, or “Sausage Diagram” was developed for the Atlanta Region which provided a top-level overview of system functions and primary interconnects. More detailed interfaces were then developed which identified the connectivity between the systems and elements. Each element identified in the ITS architecture for the Atlanta Region was mapped to the other elements that it must interface with. These interfaces were further defined by architecture data flows between individual elements that

specify the information to be exchanged. These data flows could include requests for information, alerts and messages, status requests, confirmations, and other information requirements.

Functional requirements for the Atlanta Region were identified through customized market packages and data flows, and the equipment packages that deliver specific capabilities. The equipment packages that were identified provide more detailed descriptions of functionality and can be deployed incrementally. Standards that could apply to the Atlanta Region also were identified as part of the architecture development process.

An Operational Concept for the Atlanta Region was developed to illustrate how systems, components, and agencies will be integrated and function as a result of the framework provided by the Regional ITS Architecture. The purpose of the Operational Concept is to demonstrate the roles and responsibilities of the various stakeholders in the Atlanta Region. Potential agreements that could be required to support information sharing among agencies, joint operations, and other functions also were identified. Potential agreements that could be required for maintenance and operations, data sharing (among agencies and with the private sector), or joint operations are listed.

The regional ITS architecture for the Atlanta Region is documented in the final report. In addition, a companion web site was developed that contains all of the architecture information, stakeholders, regional inventory, customized market packages, interfaces, and standards.

1. INTRODUCTION

1.1 Project Overview

In January 2001, FHWA issued a final rule to implement Section 5206(e) of the TEA-21. This rule required 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. In addition to meeting the federal requirements for funding, the development of regional ITS architectures provides a framework for implementing ITS on a regional level, encourages interoperability and resource sharing, identifies applicable standards, and allows for cohesive long range planning among stakeholders in the Region. Although not required by the FHWA final rule, TxDOT sought to expand on the project sequence requirement and have an ITS deployment plan developed for each Region. An ITS deployment plan identifies and prioritizes projects that are needed to implement the ITS architecture on a short-, medium-, and long-term basis.

A key goal in the development of the regional ITS architectures was to develop a consensus-based architecture with as many stakeholders as possible involved. Each stakeholder had an equal voice in determining the direction of the architecture for the Region. Stakeholders included representatives from TxDOT, cities, counties, Metropolitan Planning Organizations (MPOs), and transit agencies. A series of five meetings were held with the ITS stakeholders to discuss the development and gather input into the Atlanta Regional ITS Architecture and Deployment Plan. In addition, a project web site was developed which contains all of the information on the Atlanta Regional ITS Architecture and provides stakeholders with an opportunity to review and comment on the architecture directly from the web.

The result is an ITS architecture that establishes a vision and direction for the Region. ITS needs of the Atlanta Region were established early in the project. Existing and planned elements of the architecture have been identified and the key agencies required to develop the ITS services, or market packages as they are referred to in the National ITS Architecture, for the Atlanta Region have been identified. An operational concept has been developed that focuses on the roles and responsibilities of the various agencies involved in the Atlanta Region, as well as any potential agreements that would be needed. A separate ITS deployment plan was developed that identifies projects in the Atlanta Region that are required to implement the architecture.

1.2 Document Overview

The Atlanta Regional ITS Architecture report is organized into five key sections:

Section 1 – Introduction

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

Section 2 – Integration Strategy

This section discusses Atlanta Region stakeholder needs and issues, regional ITS initiatives and potential regional ITS programs, and opportunities for integration to achieve regional goals and contribute to regional and national ITS interoperability. Stakeholders and their contact information are also provided.

Section 3 – Regional ITS Architecture Development Process

An overview of the key steps involved in developing the ITS architecture for the Atlanta Region is provided in this section. It includes a discussion of the methodology, stakeholder involvement, architecture workshops, and architecture development process.

Section 4 – Conceptual Design

The conceptual design contains the key sections of the Atlanta Regional ITS Architecture. The inventory of existing and planned systems is presented in Section 4, and is sorted by both stakeholder as well as by entity for easy reference. The market packages that were selected for the Atlanta Region also are included in this section, as are the system functional requirements. The Atlanta Region interconnects are presented, including the “Sausage Diagram” showing the relationships of the key subsystems and elements in the Region, system interfaces, and the physical subsystem architecture flows. Standards that apply to the Atlanta Regional ITS Architecture also are listed.

Section 5 – Operational Concept

An operational concept has been prepared that discusses the key functions and services of the envisioned ITS for the Atlanta Region. As part of this concept, several operational scenarios are described and roles and responsibilities of stakeholders are discussed. Potential agreements that could potentially be required to support integration and information sharing are described.

The Atlanta Regional ITS Architecture also contains two appendices:

- Appendix A – Customized Market Packages; and
- Appendix B – Interface Diagrams.

A project web site has been established that contains the architecture documentation, inventories, interconnects, market packages, interfaces, and functional requirements. The web site provides hyperlinks to more detailed information about the Atlanta Regional ITS Architecture than what could feasibly be included in the printed document. In certain sections of the document, readers are referred to the project web site for additional information and details. At the time this report was published, the Atlanta Regional ITS Architecture web site was being hosted at www.consystem.com. The site can be accessed by selecting the link to Texas, and then the link to Atlanta. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.



1.3 The Atlanta Region

1.3.1 Geographic Overview

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 we also included. Connections to elements in Caddo Parish Louisiana were also identified in the architecture. The geographic boundaries of the Atlanta Region are highlighted in **Figure 1**.

The counties included in the Atlanta Region area:

- 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, and serves as the responsible agency for on-system roadways in cities with populations less than 50,000. There are no cities in the Atlanta Region with populations that exceed the 50,000 threshold.

1.3.2 Roadway Infrastructure

As illustrated in **Figure 1**, the primary facilities in the Atlanta Region's transportation infrastructure include I-20, I-30, US 59, US 79, US 80, US 82, US 259, US 271, SH 8, SH 11, SH 43, SH 49, SH 77, SH 98, SH 154, and SH 155.

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 in the east to California in the west. 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 for drive-time for commercial vehicles and motorists alike due to the lack of limited alternate routes. Knowing the road and travel conditions within this transportation corridor and having the ability to disseminate this information to motorists are important elements for this project. For example, if I-30 has been closed due to a major incident or weather, and motorists are informed of the closure in advance, they can alter their travel plans with an alternate route or wait to begin their travels.

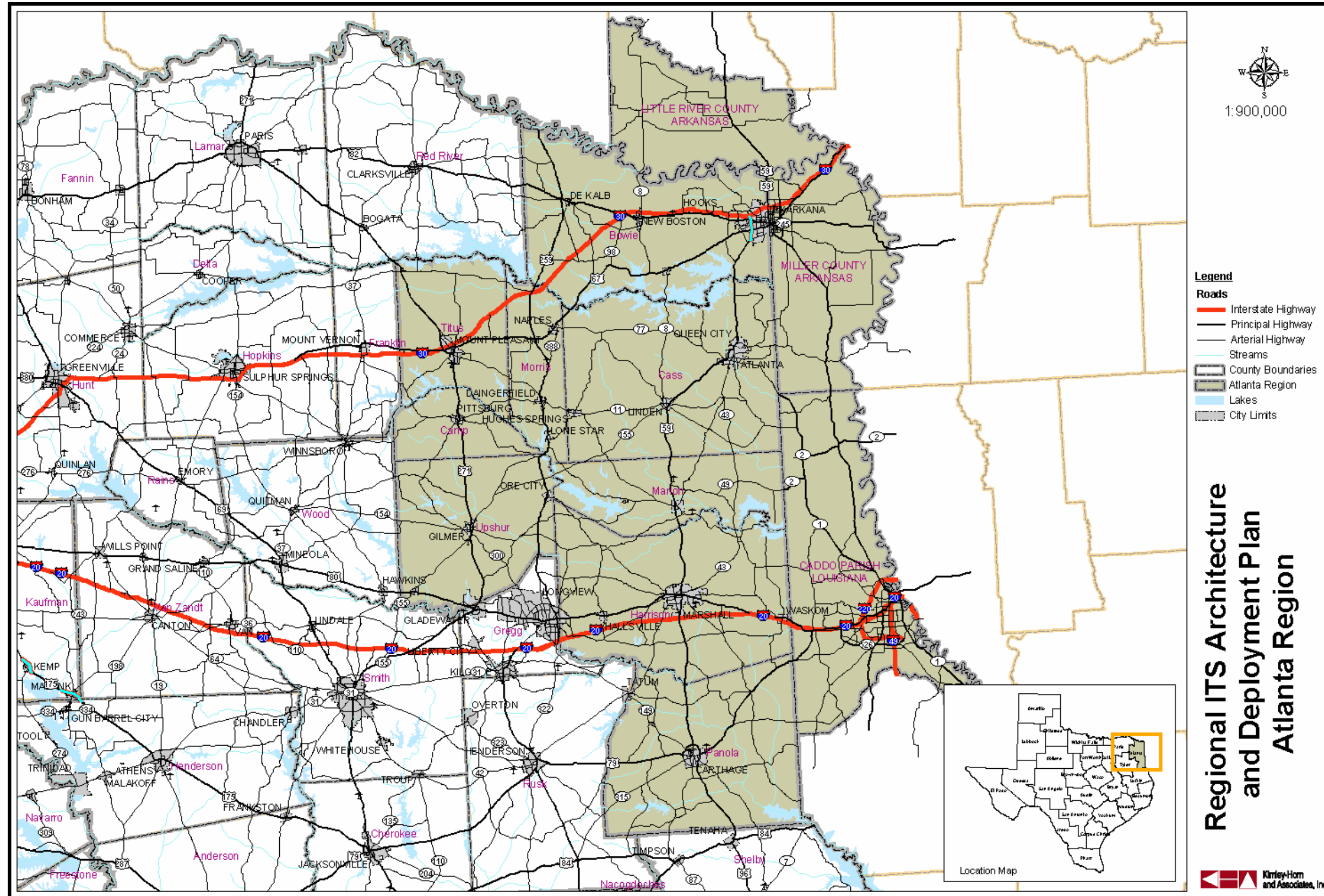


Figure 1 – Atlanta Region Map

1.3.3 Atlanta Region ITS Plans

There are several agencies in the Atlanta Region that have previously deployed ITS components. It is important to recognize the initial deployment of ITS infrastructure in a Region because federal requirements mandate that a Region, in order to secure future funding for ITS projects, must have an ITS architecture in place within four years of the initial deployment of ITS strategies and components. As the Atlanta Region pursues funding opportunities for proposed projects, it will be necessary to show that the proposed project fits within the ITS architecture developed for the Region as part of this project.

Currently, the Atlanta Region has several ITS components deployed in the field including closed loop signal systems with video image vehicle detection systems (VIVDS), closed-circuit television cameras (CCTV) for fog detection and monitoring, a road weather information system (RWIS), Smart Curves, and some computer aided dispatch (CAD). The following sections discuss these deployments.

Video Detection and CCTV Monitoring

TxDOT and the City of Texarkana, Texas are using VIVDS at several intersections within the Region. Unlike loop detection, VIVDS will not be affected by paving operations, and the detection zone of a VIVDS can be quickly changed to accommodate lane shifts during construction. VIVDS can detect vehicles approaching or stopping at a signalized intersection, and, under actuated conditions, place a call for the service of the appropriate phase for that vehicle.

TxDOT also has CCTV monitoring in place at one location prone to heavy fog conditions during the winter months to monitor fog levels and determine when road closures might be necessitated.

Road Weather Information System

Currently, TxDOT has deployed one RWIS station in the City of Texarkana, Texas. RWIS stations provide data on roadway conditions. This data can include weather conditions such as air temperature, amount and type of precipitation, visibility, dew point, relative humidity, and wind speed and direction, as well as surface condition information that can include pavement temperature, subsurface temperature, surface condition (dry, wet, or frozen), amount of deicing chemical on the roadway, and freezing point of the road surface. The data is collected by sensors placed at the roadside or in the roadway.

Smart Curves

TxDOT currently has deployed 15 Smart Curves in the Atlanta Region. These curves detect the speed of vehicles approaching the curve and display that speed on a dynamic speed advisory sign.

Computer Aided Dispatch

The Texas Department of Public Safety (DPS) is utilizing a CAD system in the Atlanta Region. The Marshall Fire and Police Departments are also using a CAD system in the City of Marshall, but that operation is limited at this time.

1.3.4 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;
- ATCOG 911 Services;
- City of Atlanta;
- City of Texarkana, Texas;
- City of Texarkana, Arkansas;
- Federal Highway Administration;
- Texarkana MPO;
- City of Marshall;
- Department of Public Safety;
- Louisiana Department of Transportation and Development;
- Texarkana Urban Transit District;
- TxDOT Atlanta District; and
- TxDOT Traffic Operations Division (Austin).

2. INTEGRATION STRATEGY

2.1 Integration Purpose

The purpose of the integration strategy is to identify the needs, stakeholders, and strategy for regional integration in the Atlanta Region.

For each operating agency or stakeholder entity identified through the development of the Regional ITS Architecture, there are operations that currently exist as a normal practice in order to accomplish the primary business goals and objectives for each stakeholder. As an example, a primary operation of the City of Marshall dispatch is to dispatch emergency personnel to the appropriate locations when a call for help is placed within the City of Marshall. The integration of the City of Marshall dispatch with any of the other stakeholders will not change this primary function of the dispatch or disrupt typical business practices. The integration of the City of Marshall dispatch with another agency such as the TxDOT Atlanta District will require that the data that will be exchanged between the two entities (such as the blockage of a lane of traffic due to a crash) meet certain requirements for that particular data type. Identifying the need for this connection between agencies and the opportunities for integration and interoperability in the Region are key purposes of this section.

This section will provide an overview of the major issues and stakeholders' needs within the Atlanta Region and the primary areas of concern that were uncovered in the preparation of the Atlanta Regional ITS Architecture. Additionally, this section will discuss the need for interregional integration with agencies external to the Atlanta Region such as the need for integration with other TxDOT Districts and possibly Louisiana DOT during major incidents along I-20.

A key step in developing any regional ITS architecture is the identification of major stakeholders in the Region. Key stakeholder agencies that participated in the development of the Atlanta Regional ITS Architecture are listed in **Table 1**. A number of other stakeholders were identified and invited to participate. In many cases, these stakeholders were not able to attend due to time constraints. Minutes of meetings, copies of reports, and access to the project web site was provided to these stakeholders to encourage their participation as much as possible.

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
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

Table 1 – Atlanta Stakeholder Agencies and Contacts (continued)

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
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

2.2 Regional Needs

Needs from the Region were identified in the project kick-off meeting held on November 19, 2002. Stakeholders participating in that meeting identified the needs in the Region according to the eight user service areas defined in the National ITS Architecture. The needs identified in the project kick-off meeting are documented in **Table 2**.

A major issue for the Region is accommodation of hurricane evacuees from Louisiana and Southeast Texas. Coordination between TxDOT Districts and with Louisiana could enable the TxDOT Atlanta District to provide up to date information about resource status in the Atlanta Region to evacuees prior to their entering the Region. For instance it would be useful to know as you entered Texas from Louisiana on I-20 that all accommodations in Marshall and Longview were saturated and that evacuees would need to continue on to Tyler. Roadway delay conditions and incident status would also be useful information to disseminate during an evacuation. This type of collaborative effort between areas has the potential to greatly facilitate evacuation efforts.

Weather detection systems, particularly for fog and flood conditions, and improved technologies for transit operations were also identified as key needs for the Region.

Table 2 – Atlanta Region: Summary of ITS Needs

Atlanta Region
Summary of ITS Needs
Atlanta Regional ITS Architecture and Deployment Plan Kick-Off Meeting
November 19, 2002

Travel and Traffic Management Needs

- Need low water crossing and underpass flood detection
- Need railroad notification/blocked roadway detection
- Need improved emergency response coordination
- Need joint operations between Texas and Arkansas for Texarkana TMC or TOC
- Need improved coordination and planning for high school football/special event traffic
- Need coordination with other TXDOT Districts, Arkansas, Louisiana for incident management and roadway closings
- Need improved planning for accommodation of hurricane evacuees from Louisiana and Southeast Texas
- Need VMS on I-30, I-49 and the planned loop
- Need weather data collection

Public Transportation Management Needs

- Need Computer Aided Dispatch – ATCOG
- Need Transit Operations Center – ATCOG
- Need Automated Vehicle Location – ATCOG, T Line
- Need Mobile Data Terminals – ATCOG
- Need On-Board Video Security – ATCOG, T Line
- Need signal preemption – T Line
- Need improved transit traveler information – kiosks at transfer stations

Electronic Payment Needs

None Identified

Commercial Vehicle Operations Needs

None Identified

Emergency Management Needs

- Need Automated Vehicle Location for emergency vehicles
- Need signal preemption for emergency vehicles
- Need additional VMS for Amber Alerts
- Need to improve DPS communication and information dissemination coordination with TXDOT for incident management

Advanced Vehicle Safety System Needs

None Identified

Information Management Needs (Data Archiving)

None Identified

Maintenance and Construction Management Needs

None Identified

2.3 Regional Integration and Interoperability

The TxDOT Atlanta Region is bordered by Oklahoma to the north, the TxDOT Paris District to the northwest, Arkansas to the northeast, the TxDOT Lufkin District to the southeast, Louisiana to the east and the TxDOT Tyler District to the southwest. The Atlanta Region needs improved coordination with these surrounding areas for incident management and roadway closings.

A vision for the Atlanta Region is to integrate systems both on an intra-regional and an inter-regional basis. Within the Atlanta Region, nearly every stakeholder identified is involved in emergency management. During a hurricane evacuation, public safety agencies, transportation agencies, and transit agencies must share information and resources in order to coordinate the evacuation and minimize traffic impacts. While the Atlanta Region itself is not required to evacuate for the storm, the Region accepts many evacuees from southeast Texas and southwest Louisiana. It is imperative that the agency leading the evacuation is cognizant of road and weather conditions in the Atlanta Region, where people are being directed to seek shelter.

Incidents that occur on major roadways either in the Atlanta Region or on roadways that could impact the movement of people and goods in the Atlanta Region should be shared. The integration of the State EOC and the local EOC can facilitate the clearing of such an incident more efficiently. As an example, a chemical spill along I-20 west of the Atlanta Region would require a major clean-up in addition to other emergency personnel on site. Coordination between the two EOCs could identify the closest clean-up crew that could respond to the spill and dispatch them to the scene. Similarly, once on scene, the response team could provide the State EOC and the local EOC status reports on the clean-up and potential timing for return to normal operations. Traffic information could be disseminated to motorists on I-20 in the Atlanta Region or even in Louisiana depending on the impact of the incident, allowing time for motorists to make decisions involving alternate routes.

Road closures due to maintenance or incidents also lead to a number of opportunities for improved operations through integration. TxDOT and other transportation agencies would like to be able to share this information throughout the Region so that as soon as one agency is aware of a closure, whether planned or not planned, other agencies can also be made aware of the closure and make appropriate plans.

In addition to the integration opportunities within the Atlanta Region, integrating the Atlanta Region with surrounding Regions and the states of Arkansas and Louisiana offers great opportunity for improvements to the operations of the system.

Systems such as TxDOT's Highway Condition Reporting System (HCRS) provide an integrated method to gather consistent traveler information on a statewide basis. This type of system could eventually feed into a 511 traveler information number that would provide consistent traveler information throughout the state.

The headquarters of TxDOT maintains a database of traffic counts and accident records for roadways throughout the State of Texas. On occasion, agencies within the Atlanta Region will need access to these databases either to retrieve data or supply data to the database. These data exchanges also will require integrating the agencies' data flows such that neither of the agencies' normal business operations is disturbed to share these data.



One of the primary purposes of the development of an ITS architecture is to ensure that while various agencies are deploying ITS components, there are some commonalities between them that will allow and facilitate the exchange of data fairly seamlessly and automatically. This is not to say that all technologies or media that are used by the various agencies will be the same, but that there is an acknowledgement that the data that is being collected and disseminated is valuable to many different agencies; therefore, the integration strategy has to be implemented to ensure the data exchange is possible.

3. REGIONAL ITS ARCHITECTURE DEVELOPMENT PROCESS

Development of the Regional ITS Architecture and Deployment Plan for the Atlanta Region relied heavily on stakeholder input to ensure that the architecture reflected local needs. A series of five meetings was held with stakeholders to gather input, and a web site with the components of the regional architecture as well as hard copies of documents were made available to stakeholders for review and comment.

3.1 Atlanta Process

The process followed for the Atlanta Region was designed to ensure that stakeholders could provide input and review to the development of the Region’s ITS Architecture.

Prior to the first project kick-off meeting with the contractor and stakeholders, TxDOT identified relevant stakeholders in the Region to begin discussions on the development of a Regional ITS Architecture and Deployment Plan. Stakeholders signed a memorandum of understanding (MOU) stating that they would work together in the Region to develop the ITS architecture.

After selecting a contractor, the process shown in **Figure 2** was used to develop the Region’s ITS Architecture. In addition to the architecture, an ITS Deployment Plan for the Region also was developed to identify projects needed to implement the architecture.

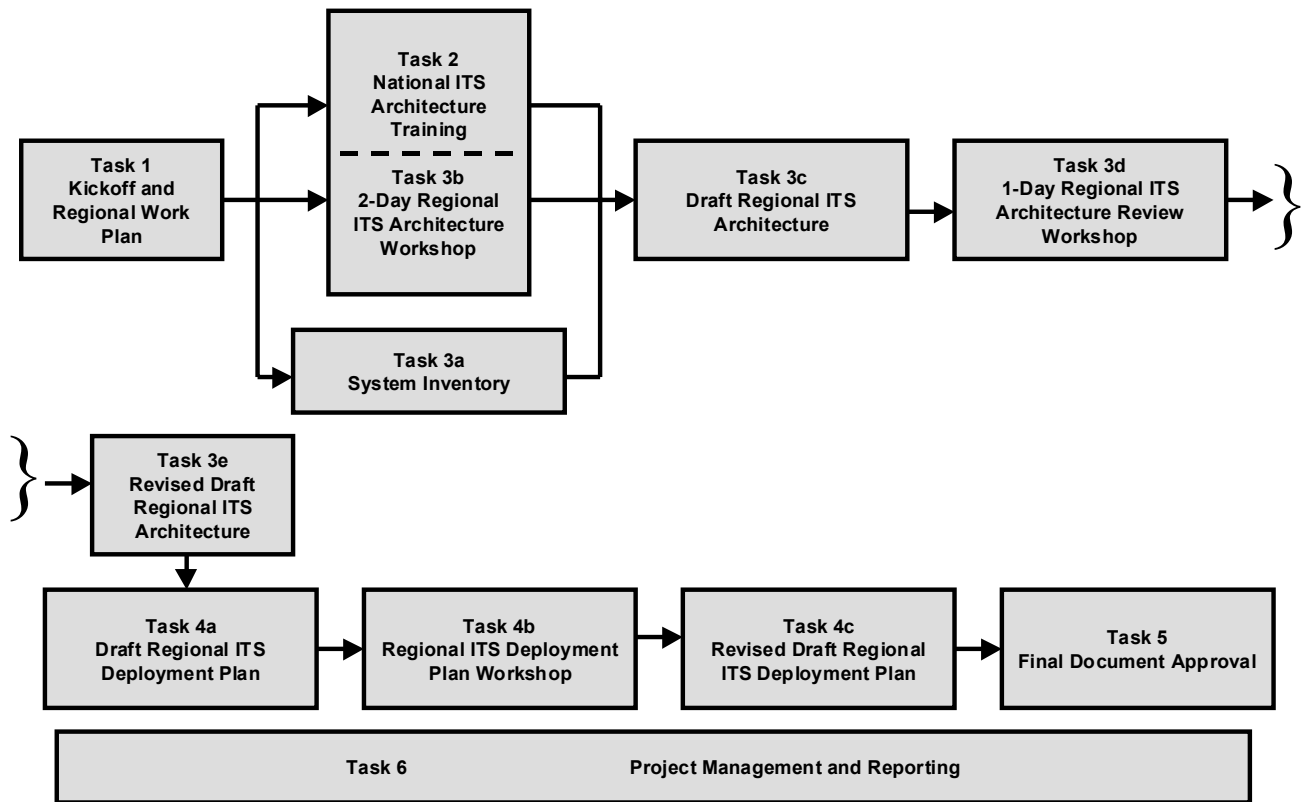


Figure 2 – Atlanta Regional ITS Architecture and Deployment Plan Development Process

A total of five meetings and workshops with stakeholders over a period of eleven months were used to develop the Atlanta Regional ITS Architecture and Deployment Plan. These meetings and workshops included:

- Kick-off and Regional Work Plan Meeting;
- 2-Day Regional ITS Architecture Workshop;
- 1-Day Regional ITS Architecture Review Workshop;
- ITS Deployment Plan Workshop; and
- Final Comment Resolution Meeting.

Key components of the process are described below:

Task 1 – Kick-Off and Regional Work Plan: Based on the initial stakeholder meeting and MOU that was signed, a number of key stakeholders were identified. Additional stakeholders that did not sign the initial MOU also were identified and invited to the project kick-off meeting. At this meeting, the regional work plan was presented to stakeholders for review and comment. Subsequent meeting dates were identified and agreed upon by the stakeholders.

As part of this meeting, a workshop was held with the stakeholders to identify three additional areas of information:

- Additional stakeholders to invite to participate in the process;
- Needs of the stakeholders in the Region; and
- Existing and planned ITS elements in the Region.

Task 2 – National ITS Architecture Training: Task 2 was the development and presentation of training on the National ITS Architecture. The purpose of the training was to familiarize stakeholders with the architecture terminology to the extent needed to allow them to provide input and review on the Atlanta Region’s ITS Architecture. The National ITS Architecture training was presented in conjunction with the 2-Day Regional ITS Architecture Workshop described in Task 3B.

Task 3A – System Inventory: Collecting information for the system inventory began at the kick-off meeting through the workshop with the stakeholders to determine existing and planned ITS elements in the Region. After the kick-off meeting, follow-up calls were conducted with a number of local stakeholders to gather additional input for the architecture. To complete the inventory, stakeholders were presented with the results of the inventory in the 2-Day Regional ITS Architecture Workshop described in Task 3B.

Task 3B – 2-Day Regional ITS Architecture Workshop: The purpose of the 2-Day Regional ITS Architecture Workshop was to review the inventory with stakeholders and begin the development of the Atlanta Regional ITS Architecture. Training on the National ITS Architecture also was integrated into the workshop so that key elements of the architecture, such as market packages, could be explained prior to the selection and editing of these elements. The result of the 2-Day Regional ITS Architecture Workshop was a Regional ITS Architecture for Atlanta, which included a system inventory, interconnect diagram, customized market packages, identification of functional requirements through process specifications, system interfaces, and relevant ITS standards.

Task 3C – Draft Regional ITS Architecture: After the 2-Day Regional ITS Architecture Workshop was completed, a web site was developed with a dedicated link to the Texas Regional ITS Architecture program. Stakeholders were asked to review the web site and provide comments through an email link set up on the site. A hard copy of the Draft Regional ITS Architecture for the Atlanta Region was sent to stakeholders prior to the 1-Day Regional ITS Architecture Review Workshop.

Task 3D – 1-Day Regional ITS Architecture Review Workshop: The 1-Day Regional ITS Architecture Review workshop was designed to allow stakeholders to review the draft architecture and provide comments. The primary focus of the workshop was to review the architecture flows between elements in the market packages. Training on architecture flows as well as ITS standards also was completed.

Task 3E – Revised Draft Regional ITS Architecture: Input from stakeholders in the 1-Day Regional ITS Architecture Review Workshop, as well as comments from stakeholders reviewing the web site and hard copy document, were used to revise the Draft Regional ITS Architecture. The revisions were incorporated into the web site as well as into the hard copy document. The Revised Draft Regional ITS Architecture was mailed to stakeholders for additional review.

Task 4A – Draft Regional ITS Deployment Plan: A Draft Regional ITS Deployment Plan was developed based on the prioritization of market packages and needs expressed by the stakeholders in the Region. The Draft Regional ITS Deployment Plan included a list of recommended projects in a 5-year, 10-year, and 20-year timeframe. Each project was linked to at least one or more market packages from the Atlanta Regional ITS Architecture.

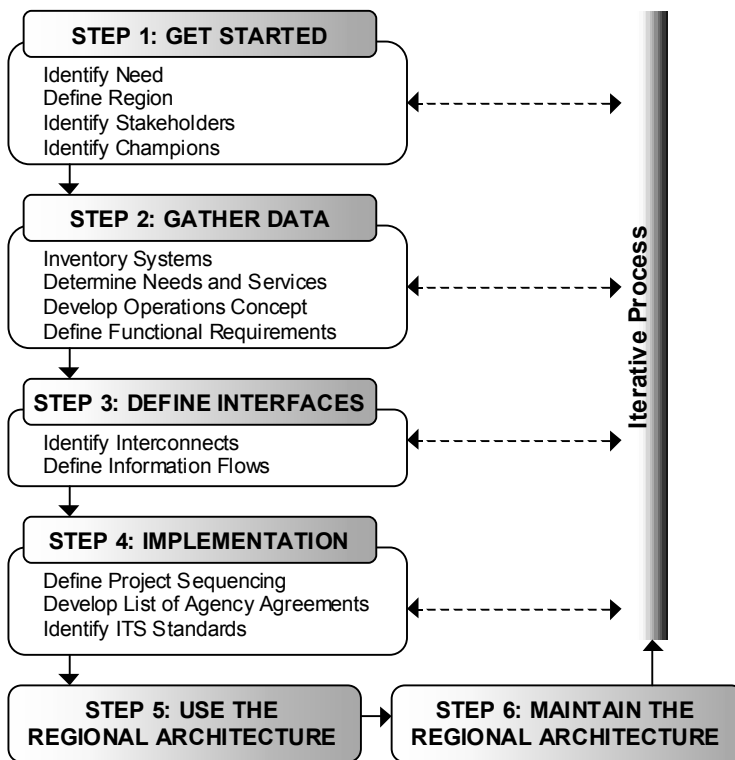
Task 4B – Regional ITS Deployment Plan Workshop: The Draft Regional ITS Deployment Plan was presented to stakeholders at the Regional ITS Deployment Plan Workshop. Stakeholders were asked to provide input on the recommended projects, priority, and deployment timeframe.

Task 4C – Revised Draft Regional ITS Deployment Plan: Based on the review and input from stakeholders at the Regional ITS Deployment Plan Workshop, as well as review comments received from stakeholders outside of the workshop, a Revised Draft Regional ITS Deployment Plan was developed and sent to stakeholders.

Task 5 – Final Document Approval: A final comment resolution meeting was held with stakeholders to review the Revised Draft Regional ITS Architecture and the Revised Draft Regional ITS Deployment Plan. Next steps for the Region were also discussed. Comments were incorporated and a final Regional ITS Architecture and Regional ITS Deployment Plan were developed.

3.2 USDOT Regional ITS Architecture Guidance

On October 12, 2001, the U.S. Department of Transportation (USDOT) issued guidance on development of a regional ITS architecture through the document “Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS Architecture for Your Region.” **Figure 3** summarizes the guidance provided by the USDOT.



(Source: Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS Architecture for Your Region, USDOT)

Figure 3 – USDOT Guidance on Regional ITS Architecture Development

The process used to develop the Atlanta Regional ITS Architecture and Deployment Plan follows Steps 1 through 4 of the guidance. Steps 5 and 6 are designed to provide guidance upon the completion of the development of the Regional ITS Architecture.

Step 1, Get Started, of the guidance was completed in Task 1 – Kick-off and Regional Work Plan, as well as preliminary work completed by TxDOT to identify initial stakeholders and the need to complete the architecture for the Atlanta Region. Through these efforts, the need for an architecture, appropriate stakeholders, and the Region was defined.

Step 2, Gather Data, was completed through Task 1 – Kick-off and Regional Work Plan, Task 3A – System Inventory, and Task 3B – 2-Day Regional ITS Architecture Workshop. These efforts allowed the inventory for the Atlanta Region to be completed, identified ITS needs in the Region, and led to the development of an operational concept and definition of functional requirements.

Step 3, Define Interfaces, was completed in Task 3B – 2-Day Regional ITS Architecture Workshop and Task 3D – 1-Day Regional ITS Architecture Review Workshop. These workshops engaged stakeholders in customizing Market Packages for the Region, which included identifying interconnects among elements in the architecture and reviewing and selecting data flows between elements.

Step 4, Implementation, was completed in Task 3D – 1-Day Regional ITS Architecture Review Workshop through the prioritization of market packages. Sequencing of projects began in this process and was completed in the ITS Deployment Plan. Applicable ITS standards to match the identified data flows also were identified through the 1-Day ITS Architecture Review Workshop. Based on the envisioned information exchanges and integration outlined in the Regional ITS Architecture, potential agreements were identified.

4. CONCEPTUAL DESIGN

4.1 Systems Inventory

An important initial step in the architecture development process is to establish an inventory of existing ITS elements. At the project kick-off meeting and through subsequent discussions with agency representatives throughout the Region, Atlanta stakeholders provided the team with a list of existing, planned, and future systems that would play a role in the Region's ITS architecture. "Planned" is defined as a system with funding identified while "future" is defined as a system that does not yet have funding identified.

Existing, planned, and future systems in the Atlanta Region were identified in the following categories:

- ***Travel and Traffic Management*** – includes state and local traffic management centers, center-to-center links, detection systems, CCTV, fixed and portable dynamic message signs, broadcast traveler information, and other related technologies.
- ***Public Transportation Management*** – includes transit and paratransit Automated Vehicle Location, transit security, and transit travel information systems.
- ***Commercial Vehicle Operations*** – includes weigh-in-motion and hazardous materials management.
- ***Emergency Management*** – includes emergency operations/management centers and improved information sharing among traffic and emergency services.
- ***Information Management*** – includes electronic data management and archiving systems.
- ***Maintenance and Construction Management*** – includes road weather information systems and workzone management.

The System Inventory is a valuable task for several reasons. First, it provides a baseline of existing and planned ITS projects and systems in the Region. Second, it outlines which agencies are currently deploying and operating ITS, as well as those that are planning to implement ITS programs. Third, it provides a foundation for identifying needed elements or agency participation for the regional ITS, which will be important for subsequent tasks including the market package identification and prioritization, system interface and integration requirements in the Region, and ultimately the ITS Deployment Plan.

4.1.1 Subsystems and Terminators

Each identified system or component in the Atlanta Regional ITS inventory was mapped to a subsystem or terminator in the National ITS Architecture. Subsystems and terminators are the 'entities' that represent systems in ITS. Subsystems are the highest level building blocks of the physical architecture, and the National ITS Architecture groups them into four major classes: Centers, Roadside, Vehicles, and Travelers. Each of these major classes includes various subsystems that represent a set of transportation functions (or processes) that are likely to be collected together under one agency, jurisdiction, or location, and correspond to physical elements, such as traffic operations centers, traffic signals, vehicles, and so on. **Figure 4** shows the National ITS Architecture subsystems. This figure, also known as the "sausage diagram" is a standard interconnect diagram, showing the relationships of the various subsystems within the architecture; a customized interconnect diagram for the

Atlanta Region is included in Section 4.3.1 of this report. Communication functions between the subsystems are represented in the ovals. It should be noted that “wireline” communication refers to fixed-point to fixed-point communications, which include not only twisted pair and fiber optic technologies, but also such wireless technologies as microwave and spread spectrum.

Terminators are the people, systems, other facilities, and environmental conditions outside of ITS that need to communicate or interface with ITS subsystems. They help to define the boundaries of the National ITS Architecture as well as a regional system. Examples of terminators include drivers, traffic operations personnel, information service providers, weather effects (snow, rain, ice), telecommunications systems, and government reporting systems, among others.

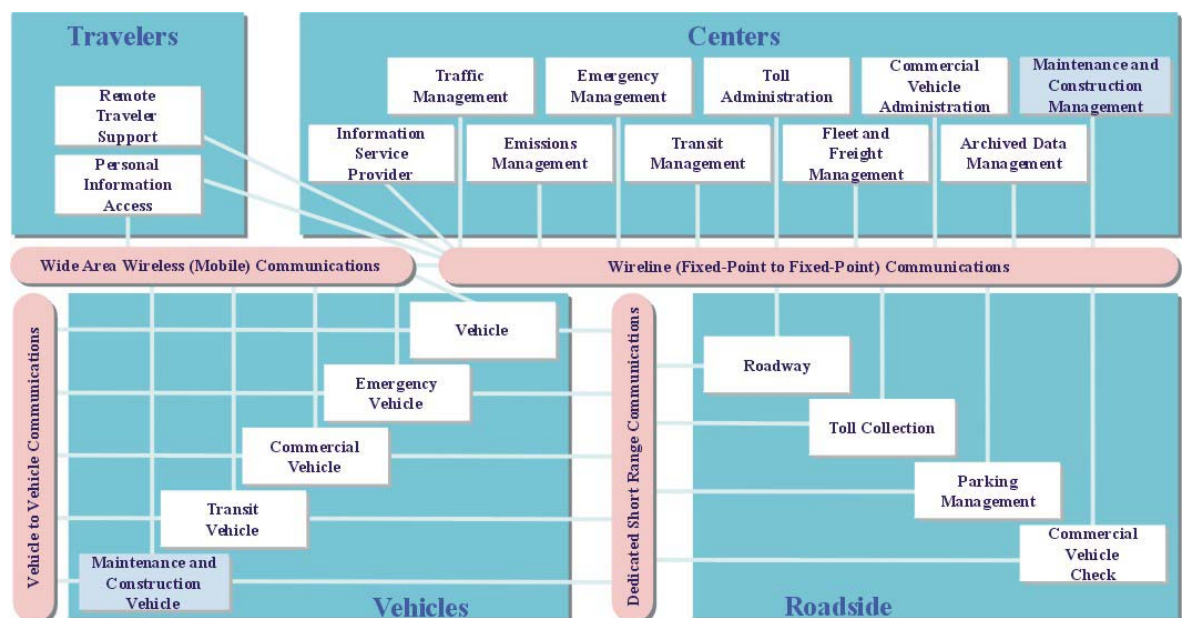


Figure 4 – Physical Subsystem Interconnect Diagram

4.1.2 Atlanta ITS Inventory by Stakeholder

The Atlanta Regional ITS Architecture inventory is made up of the transportation and communications centers, the field equipment, the vehicles, and other systems in the regional transportation system. Each stakeholder is associated with one or more systems or elements (subsystems and terminators) that make up the transportation system in the Atlanta Region. **Table 3** sorts the inventory by stakeholder, so each stakeholder can easily identify and review all their relevant assets that are identified in the Atlanta Regional ITS Architecture.

The information in **Table 3** also is included on the Atlanta ITS Architecture web site. Selecting the link to the Texas Regional ITS Architecture, then Atlanta Region, and then selecting the “Inventory by Stakeholder” button which will open the full inventory list. Each element in the list contains a hyperlink to more detailed information, including status, description, stakeholder, and other elements within the inventory with which it interfaces. At the time this report was published, the Atlanta Regional ITS Architecture web site was



being hosted at www.consystec.com. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.

4.1.3 Atlanta ITS Inventory by Entity

Each component that makes up the transportation system in the Atlanta Region has been assigned to a subsystem or terminator as defined by the National ITS Architecture. **Table 4** presents the Atlanta Region inventory using the associated National ITS Architecture subsystem or terminator. This sorts elements that perform similar functions together, so elements of a particular type can be easily identified. This inventory also can be accessed from the Atlanta Regional ITS Architecture web site by selecting the “Inventory by Entity” button.

Table 3 – Atlanta ITS Inventory (sorted by Stakeholder)

Stakeholder	Element	Entity	Status
AHP/ASP	AHP/ASP Emergency Vehicles	Emergency Vehicle Subsystem	Existing
AHTD	AHTD Area Maintenance HQs	Maintenance and Construction Management Subsystem	Existing
	AHTD District Office/TMC	Maintenance and Construction Management Subsystem	Existing
	AHTD District Office/TMC	Traffic Management Subsystem	Existing
	AHTD Equipment Repair Facility	Equipment Repair Facility	Existing
	AHTD Field Equipment	Roadway Subsystem	Existing
	AHTD Maintenance and Construction Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
	AHTD Planning Division	Archived Data Management Subsystem	Existing
	AHTD Resident Engineers Office	Maintenance and Construction Management Subsystem	Existing
	AHTD Storage Facilities	Storage Facility	Existing
AHTD Web Site	Information Service Provider Subsystem	Existing	
AHTD/Arkansas Highway Police	Arkansas Highway Police Dispatch	Emergency Management Subsystem	Existing
Amtrak	Amtrak Terminal	Transit Management Subsystem	Planned
Archive Data Users	Archive Data User Equipment	Archived Data User Systems	Existing
Arkansas Department of Emergency Management	Arkansas State EOC	Emergency Management Subsystem	Existing
Arkansas State Police	Arkansas State Police Crash Database	Archived Data Management Subsystem	Existing
	Arkansas State Police Dispatch	Emergency Management Subsystem	Existing

Table 3 – Atlanta ITS Inventory (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
ATCOG	ATCOG Mt. Pleasant Dispatch Office	Transit Management Subsystem	Existing
	ATCOG TRAX Dispatch	Transit Management Subsystem	Existing
	ATCOG TRAX Kiosks	Remote Traveler Support Subsystem	Planned
	ATCOG TRAX Traveler Information System	Information Service Provider Subsystem	Existing
	ATCOG TRAX Vehicles	Transit Vehicle Subsystem	Existing
Bi-State Justice Center	Bi-State Justice Center Crash Record Database	Archived Data Management Subsystem	Existing
City of Texarkana, AR	City of Texarkana, AR Field Equipment	Roadway Subsystem	Existing
	City of Texarkana, AR TMC	Traffic Management Subsystem	Planned
City of Texarkana, TX	City of Texarkana, TX Field Equipment	Roadway Subsystem	Existing
	City of Texarkana, TX TMC	Traffic Management Subsystem	Existing
Commercial Vehicle Operators	Commercial Vehicles	Commercial Vehicle Subsystem	Existing
	Commercial Vehicles	Vehicle Subsystem	Existing
County EOC	County EOC	Emergency Management Subsystem	Existing
DPS	DPS Communications Service	Emergency Management Subsystem	Existing
	DPS Emergency Vehicles	Emergency Vehicle Subsystem	Existing
	DPS Inspection Stations	Commercial Vehicle Check Subsystem	Existing
	DPS Weigh-in-Motion Station	Roadway Subsystem	Planned
DPS Division of Emergency Management	Texas State EOC	Emergency Management Subsystem	Existing
Independent School Districts	Independent School District Buses	Transit Vehicle Subsystem	Existing
	Independent School District Dispatch	Transit Management Subsystem	Existing
LADOTD	LADOTD Shreveport-Bossier District Office/TMC	Maintenance and Construction Management Subsystem	Planned
	LADOTD Shreveport-Bossier District Office/TMC	Traffic Management Subsystem	Planned
Lifenet	Lifenet Dispatch	Emergency Management Subsystem	Existing
Local Media	Local Print and Broadcast Media	Media	Existing

Table 3 – Atlanta ITS Inventory (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
Louisiana State Police	Louisiana State Police Dispatch	Emergency Management Subsystem	Existing
Municipal or County Government	Municipal/County Field Equipment	Roadway Subsystem	Existing
	Municipal/County Permitting System	Commercial Vehicle Administration Subsystem	Existing
	Municipal/County TMCs	Traffic Management Subsystem	Planned
Municipal or County Maintenance and Construction Agencies	Municipal/County Maintenance and Construction Central Systems	Maintenance and Construction Management Subsystem	Existing
	Municipal/County Maintenance and Construction Equipment Repair Facility	Equipment Repair Facility	Existing
	Municipal/County Maintenance and Construction Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
	Municipal/County Storage Facilities	Storage Facility	Existing
Municipal or County Public Safety	Municipal/County Emergency Vehicles	Emergency Vehicle Subsystem	Existing
	Municipal/County Public Safety Dispatch	Emergency Management Subsystem	Existing
NOAA	National Weather Service	Weather Service	Planned
Private Ambulance Companies	Private Ambulance Dispatch	Emergency Management Subsystem	Existing
	Private Ambulance Vehicles	Emergency Vehicle Subsystem	Existing
Private Carriers	Private Commercial Vehicle Fleet Management	Fleet and Freight Management Subsystem	Existing
Private Information Service Providers	Private Sector Traveler Information Services	Information Service Provider Subsystem	Planned
Private Inter-City Bus Operators	Private Inter-City Bus Carriers	Transit Management Subsystem	Existing
Private Tow/Wrecker Providers	Private Tow/Wrecker Dispatch	Emergency Management Subsystem	Existing
Private Travelers	Private Travelers Personal Computing Devices	Personal Information Access Subsystem	Planned
	Private Vehicles	Vehicle Subsystem	Existing
Rail Operators	Rail Operators	Rail Operations	Existing
	Rail Operators Wayside Equipment	Wayside Equipment	Existing

Table 3 – Atlanta ITS Inventory (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
Regional Airport Operators	Regional Airports	Intermodal Freight Depot	Planned
	Regional Airports	Multimodal Transportation Service Provider	Planned
Regional Emergency and Public Safety Agencies	Atlanta Regional Incident and Mutual Aid Network	Emergency Management Subsystem	Planned
Regional Hospitals	Atlanta Regional Medical Centers	Care Facility	Existing
	Atlanta Regional Medical Centers	Emergency Management Subsystem	Existing
Regional Multimodal Transfer Station Operators	Regional Multimodal Transfer Station	Multimodal Transportation Service Provider	Existing
Regional Public and Private Agencies	Other Agencies Environmental Information Systems	Weather Service	Planned
Taxi Operators	Taxi Dispatch Companies	Transit Management Subsystem	Existing
Texarkana MPO	Texarkana MPO Archive Data System	Archived Data Management Subsystem	Existing
Texarkana Urban Transit District	T Line Transit Dispatch	Transit Management Subsystem	Existing
	T Line Transit Vehicles	Transit Vehicle Subsystem	Existing
	T Line Traveler Information System	Information Service Provider Subsystem	Existing
TxDOT	Other Texas Region TMCs	Traffic Management Subsystem	Existing
	Other TxDOT District Maintenance Sections	Maintenance and Construction Management Subsystem	Existing
	TxDOT 511 System	Information Service Provider Subsystem	Planned
	TxDOT Atlanta District Anti-icing Equipment	Roadway Subsystem	Planned
	TxDOT Atlanta District Area Engineers Offices	Maintenance and Construction Management Subsystem	Existing
	TxDOT Atlanta District CCTV	Roadway Subsystem	Existing
	TxDOT Atlanta District CVO Corridor System	Roadway Subsystem	Planned
	TxDOT Atlanta District DMS	Roadway Subsystem	Planned
TxDOT Atlanta District Environmental Sensors	Roadway Subsystem	Planned	

Table 3 – Atlanta ITS Inventory (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
TxDOT (continued)	TxDOT Atlanta District Field Sensors	Roadway Subsystem	Planned
	TxDOT Atlanta District HAR	Roadway Subsystem	Planned
	TxDOT Atlanta District Maintenance and Construction Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
	TxDOT Atlanta District Maintenance Sections	Maintenance and Construction Management Subsystem	Existing
	TxDOT Atlanta District Portable Field Equipment	Roadway Subsystem	Planned
	TxDOT Atlanta District Storage Facilities	Storage Facility	Existing
	TxDOT Atlanta District TMC/Office	Archived Data Management Subsystem	Existing
	TxDOT Atlanta District TMC/Office	Maintenance and Construction Management Subsystem	Existing
	TxDOT Atlanta District TMC/Office	Traffic Management Subsystem	Existing
	TxDOT Atlanta District Traffic Data Archive	Archived Data Management Subsystem	Planned
	TxDOT Atlanta District Traffic Signals	Roadway Subsystem	Existing
	TxDOT Atlanta District Web Page	Information Service Provider Subsystem	Existing
	TxDOT Atlanta District Web Page	Maintenance and Construction Management Subsystem	Existing
	TxDOT Atlanta District Web Page	Traffic Management Subsystem	Existing
	TxDOT BRINSAP	Asset Management	Existing
	TxDOT District Shop	Equipment Repair Facility	Existing
	TxDOT Fort Worth TMC (TransVision)	Traffic Management Subsystem	Existing
	TxDOT Highway Condition Reporting System	Information Service Provider Subsystem	Existing
	TxDOT Motor Carrier Routing Information	Information Service Provider Subsystem	Existing
	TxDOT Public Transportation Division	Archived Data Management Subsystem	Existing
TxDOT Public Transportation Management System (PTMS)	Archived Data Management Subsystem	Existing	



Table 3 – Atlanta ITS Inventory (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
TxDOT (continued)	TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	Remote Traveler Support Subsystem	Planned
	TxDOT Traffic Data Collection Equipment	Roadway Subsystem	Planned
TXDOT/AHTD	TXDOT/AHTD Motorist Assistance Patrol Dispatch	Emergency Management Subsystem	Existing
	TXDOT/AHTD Motorist Assistance Patrol Vehicles	Emergency Vehicle Subsystem	Existing
TxDOT/DPS	TxDOT/DPS Crash Record Information System	Archived Data Management Subsystem	Existing
	TxDOT/DPS Crash Record Information System	Information Service Provider Subsystem	Existing

Table 4 – Atlanta ITS Inventory (sorted by Entity)

Entity	Element	Stakeholder	Status
Archived Data Management Subsystem	AHTD Planning Division	AHTD	Existing
	Arkansas State Police Crash Database	Arkansas State Police	Existing
	Bi-State Justice Center Crash Record Database	Bi-State Justice Center	Existing
	Texarkana MPO Archive Data System	Texarkana MPO	Existing
	TxDOT Atlanta District TMC/Office	TxDOT	Existing
	TxDOT Atlanta District Traffic Data Archive	TxDOT	Planned
	TxDOT Public Transportation Division	TxDOT	Existing
	TxDOT Public Transportation Management System (PTMS)	TxDOT	Existing
	TxDOT/DPS Crash Record Information System	TxDOT/DPS	Existing
Archived Data User Systems	Archive Data User Equipment	Archive Data Users	Existing
Asset Management	TxDOT BRINSAP	TxDOT	Existing
Care Facility	Atlanta Regional Medical Centers	Regional Hospitals	Existing
Commercial Vehicle Administration Subsystem	Municipal/County Permitting System	Municipal or County Government	Existing
Commercial Vehicle Check Subsystem	DPS Inspection Stations	DPS	Existing
Commercial Vehicle Subsystem	Commercial Vehicles	Commercial Vehicle Operators	Existing
Emergency Management Subsystem	Arkansas Highway Police Dispatch	AHTD/Arkansas Highway Police	Existing
	Arkansas State EOC	Arkansas Department of Emergency Management	Existing
	Arkansas State Police Dispatch	Arkansas State Police	Existing
	Atlanta Regional Incident and Mutual Aid Network	Regional Emergency and Public Safety Agencies	Planned
	Atlanta Regional Medical Centers	Regional Hospitals	Existing
	County EOC	County EOC	Existing
	DPS Communications Service	DPS	Existing

Table 4 – Atlanta ITS Inventory (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Emergency Management Subsystem (continued)	Lifenet Dispatch	Lifenet	Existing
	Louisiana State Police Dispatch	Louisiana State Police	Existing
	Municipal/County Public Safety Dispatch	Municipal or County Public Safety	Existing
	Private Ambulance Dispatch	Private Ambulance Companies	Existing
	Private Tow/Wrecker Dispatch	Private Tow/Wrecker Providers	Existing
	Texas State EOC	DPS Division of Emergency Management	Existing
	TXDOT/AHTD Motorist Assistance Patrol Dispatch	TXDOT/AHTD	Existing
Emergency Vehicle Subsystem	AHP/ASP Emergency Vehicles	AHP/ASP	Existing
	DPS Emergency Vehicles	DPS	Existing
	Municipal/County Emergency Vehicles	Municipal or County Public Safety	Existing
	Private Ambulance Vehicles	Private Ambulance Companies	Existing
	TXDOT/AHTD Motorist Assistance Patrol Vehicles	TXDOT/AHTD	Existing
Equipment Repair Facility	AHTD Equipment Repair Facility	AHTD	Existing
	Municipal/County Maintenance and Construction Equipment Repair Facility	Municipal or County Maintenance and Construction Agencies	Existing
	TxDOT District Shop	TxDOT	Existing
Fleet and Freight Management Subsystem	Private Commercial Vehicle Fleet Management	Private Carriers	Existing
Information Service Provider Subsystem	AHTD Web Site	AHTD	Existing
	ATCOG TRAX Traveler Information System	ATCOG	Existing
	Private Sector Traveler Information Services	Private Information Service Providers	Planned
	T Line Traveler Information System	Texarkana Urban Transit District	Existing
	TxDOT 511 System	TxDOT	Planned
	TxDOT Atlanta District Web Page	TxDOT	Existing
	TxDOT Highway Condition Reporting System	TxDOT	Existing

Table 4 – Atlanta ITS Inventory (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Information Service Provider Subsystem (continued)	TxDOT Motor Carrier Routing Information	TxDOT	Existing
	TxDOT/DPS Crash Record Information System	TxDOT/DPS	Existing
Intermodal Freight Depot	Regional Airports	Regional Airport Operators	Planned
Maintenance and Construction Management Subsystem	AHTD Area Maintenance HQs	AHTD	Existing
	AHTD District Office/TMC	AHTD	Existing
	AHTD Resident Engineers Office	AHTD	Existing
	LADOTD Shreveport-Bossier District Office/TMC	LADOTD	Planned
	Municipal/County Maintenance and Construction Central Systems	Municipal or County Maintenance and Construction Agencies	Existing
	Other TxDOT District Maintenance Sections	TxDOT	Existing
	TxDOT Atlanta District Area Engineers Offices	TxDOT	Existing
	TxDOT Atlanta District Maintenance Sections	TxDOT	Existing
	TxDOT Atlanta District TMC/Office	TxDOT	Existing
	TxDOT Atlanta District Web Page	TxDOT	Existing
Maintenance and Construction Vehicle Subsystem	AHTD Maintenance and Construction Vehicles	AHTD	Existing
	Municipal/County Maintenance and Construction Vehicles	Municipal or County Maintenance and Construction Agencies	Existing
	TxDOT Atlanta District Maintenance and Construction Vehicles	TxDOT	Existing
Media	Local Print and Broadcast Media	Local Media	Existing
Multimodal Transportation Service Provider	Regional Airports	Regional Airport Operators	Planned
	Regional Multimodal Transfer Station	Regional Multimodal Transfer Station Operators	Existing
Personal Information Access Subsystem	Private Travelers Personal Computing Devices	Private Travelers	Planned
Rail Operations	Rail Operators	Rail Operators	Existing

Table 4 – Atlanta ITS Inventory (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Remote Traveler Support Subsystem	ATCOG TRAX Kiosks	ATCOG	Planned
	TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	TxDOT	Planned
Roadway Subsystem	AHTD Field Equipment	AHTD	Existing
	City of Texarkana, AR Field Equipment	City of Texarkana, AR	Existing
	City of Texarkana, TX Field Equipment	City of Texarkana, TX	Existing
	DPS Weigh-in-Motion Station	DPS	Planned
	Municipal/County Field Equipment	Municipal or County Government	Existing
	TxDOT Atlanta District Anti-icing Equipment	TxDOT	Planned
	TxDOT Atlanta District CCTV	TxDOT	Existing
	TxDOT Atlanta District CVO Corridor System	TxDOT	Planned
	TxDOT Atlanta District DMS	TxDOT	Planned
	TxDOT Atlanta District Environmental Sensors	TxDOT	Planned
	TxDOT Atlanta District Field Sensors	TxDOT	Planned
	TxDOT Atlanta District HAR	TxDOT	Planned
	TxDOT Atlanta District Portable Field Equipment	TxDOT	Planned
	TxDOT Atlanta District Traffic Signals	TxDOT	Existing
TxDOT Traffic Data Collection Equipment	TxDOT	Planned	
Storage Facility	AHTD Storage Facilities	AHTD	Existing
	Municipal/County Storage Facilities	Municipal or County Maintenance and Construction Agencies	Existing
	TxDOT Atlanta District Storage Facilities	TxDOT	Existing

Table 4 – Atlanta ITS Inventory (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Traffic Management Subsystem	AHTD District Office/TMC	AHTD	Existing
	City of Texarkana, AR TMC	City of Texarkana, AR	Planned
	City of Texarkana, TX TMC	City of Texarkana, TX	Existing
	LADOTD Shreveport-Bossier District Office/TMC	LADOTD	Planned
	Municipal/County TMCs	Municipal or County Government	Planned
	Other Texas Region TMCs	TxDOT	Existing
	TxDOT Atlanta District TMC/Office	TxDOT	Existing
	TxDOT Atlanta District Web Page	TxDOT	Existing
	TxDOT Fort Worth TMC (TransVision)	TxDOT	Existing
Transit Management Subsystem	Amtrak Terminal	Amtrak	Planned
	ATCOG Mt. Pleasant Dispatch Office	ATCOG	Existing
	ATCOG TRAX Dispatch	ATCOG	Existing
	Independent School District Dispatch	Independent School Districts	Existing
	Private Inter-City Bus Carriers	Private Inter-City Bus Operators	Existing
	T Line Transit Dispatch	Texarkana Urban Transit District	Existing
	Taxi Dispatch Companies	Taxi Operators	Existing
Transit Vehicle Subsystem	ATCOG TRAX Vehicles	ATCOG	Existing
	Independent School District Buses	Independent School Districts	Existing
	T Line Transit Vehicles	Texarkana Urban Transit District	Existing
Vehicle Subsystem	Commercial Vehicles	Commercial Vehicle Operators	Existing
	Private Vehicles	Private Travelers	Existing
Wayside Equipment	Rail Operators Wayside Equipment	Rail Operators	Existing
Weather Service	National Weather Service	NOAA	Planned
	Other Agencies Environmental Information Systems	Regional Public and Private Agencies	Planned

4.2 Regional Market Packages

Upon completion of the system inventory, the next step in the development of the architecture was to identify the transportation services that are important to the Atlanta Region. In the National ITS Architecture, services are referred to as market packages. Market packages could include several stakeholders and elements that work together to provide a service in the Region. Examples of market packages from the National ITS Architecture include Network Surveillance, Traffic Information Dissemination, and Transit Vehicle Tracking. There are currently a total of 75 market packages identified in the National ITS Architecture.

In the Atlanta Region, the National ITS Architecture market packages were reviewed by the stakeholders and selected based on the relevance of the service that the market package could provide to the Region. All of the market packages that stakeholders in the Atlanta Region selected for implementation in the Region are identified in **Table 5**, as well as elements in the Region that serve a role in providing the market package service and the primary stakeholders responsible for implementing the market packages.

In several cases, there are multiple stakeholders in the Region that provide the same service at different levels. For example, Surface Street Control (ATMS03) could be provided on arterials by the City of Texarkana and on highways throughout the TxDOT Atlanta District. The market package status is identified as existing, planned, or future for each of the primary stakeholders in the Region. In many cases market packages classified as existing might still need to be enhanced to increase the service that the market package provides and establish all of the elements associated with it.

Upon selecting the market packages that were applicable for the Region, stakeholders then reviewed each market package and the elements that could be included to customize it for the Region. This customization is discussed further in the following section.

Table 5 – Atlanta Region Selected Market Packages

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
ATMS01	Network Surveillance	City of Texarkana, AR Field Equipment City of Texarkana, AR TMC City of Texarkana, TX Field Equipment City of Texarkana, TX TMC Municipal/County Field Equipment Municipal/County TMCs Private Sector Traveler Information Services TxDOT Atlanta District CCTV TxDOT Atlanta District Field Sensors	TxDOT Atlanta District	Future
			City of Texarkana, TX	Future
			City of Texarkana, AR	Future
			Municipalities/Counties	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
ATMS01 (continued)	Network Surveillance (continued)	TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page		
ATMS02	Probe Surveillance	Commercial Vehicles Private Vehicles TxDOT Atlanta District CVO Corridor System TxDOT Atlanta District TMC/Office	TxDOT Atlanta District	Future
ATMS03	Surface Street Control	City of Texarkana, AR Field Equipment City of Texarkana, AR TMC City of Texarkana, TX Field Equipment City of Texarkana, TX TMC Municipal/County Field Equipment Municipal/County TMCs TxDOT Atlanta District TMC/Office TxDOT Atlanta District Traffic Signals	TxDOT Atlanta District	Existing
			City of Texarkana, TX	Future
			City of Texarkana, AR	Future
			Municipalities/Counties	Existing
ATMS06	Traffic Information Dissemination	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Field Equipment Arkansas Highway Police Dispatch Arkansas State Police Dispatch ATCOG TRAX Dispatch City of Texarkana, AR Field Equipment City of Texarkana, AR TMC City of Texarkana, TX Field Equipment City of Texarkana, TX TMC County EOC DPS Communications Service Independent School District Dispatch Local Print and Broadcast Media	TxDOT Atlanta District	Future
			City of Texarkana, TX	Future
			City of Texarkana, AR	Future
			Municipalities/Counties	Future
			AHTD District	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
ATMS06 (continued)	Traffic Information Dissemination (continued)	Municipal/County Field Equipment Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Municipal/County Public Safety Dispatch T Line Transit Dispatch TxDOT Atlanta District DMS TxDOT Atlanta District HAR TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office		
ATMS07	Regional Traffic Control	AHTD District Office/TMC Arkansas State Police Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC DPS Communications Service LADOTD Shreveport-Bossier District Office/TMC Municipal/County TMCs Other Texas Region TMCs TxDOT Atlanta District TMC/Office TxDOT Fort Worth TMC (TransVision)	TxDOT Atlanta District	Future
			AHTD District	Future
ATMS08	Incident Management System	AHP/ASP Emergency Vehicles AHTD Area Maintenance HQs AHTD District Office/TMC Arkansas Highway Police Dispatch Arkansas State Police Dispatch ATCOG TRAX Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC County EOC DPS Communications Service DPS Emergency Vehicles	Traffic and Emergency Management Agencies	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
ATMS08 (continued)	Incident Management System (continued)	Independent School District Dispatch LADOTD Shreveport-Bossier District Office/TMC Louisiana State Police Dispatch Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Municipal/County Emergency Vehicles Municipal/County Public Safety Dispatch Private Ambulance Dispatch Private Ambulance Vehicles Other Agencies Environmental Information Systems Other Texas Region TMCs Other TxDOT District Maintenance Sections T Line Transit Dispatch TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Environmental Sensors TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office TXDOT/AHTD Motorist Assistance Patrol Dispatch TXDOT/AHTD Motorist Assistance Patrol Vehicles		
ATMS13	Standard Railroad Grade Crossing	City of Texarkana, AR Field Equipment	TxDOT Atlanta District	Existing
		City of Texarkana, AR TMC	Municipalities/Counties	Existing
		City of Texarkana, TX Field Equipment	City of Texarkana, TX	Existing
		City of Texarkana, TX TMC	City of Texarkana, AR	Existing
		Municipal/County Field Equipment		
		Municipal/County TMCs		

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
ATMS13 (continued)	Standard Railroad Grade Crossing (continued)	Rail Operators Wayside Equipment TxDOT Atlanta District TMC/Office TxDOT Atlanta District Traffic Signals		
ATMS14	Advanced Railroad Grade Crossing	City of Texarkana, TX Field Equipment City of Texarkana, TX TMC Rail Operators Rail Operators Wayside Equipment TxDOT Atlanta District CCTV TxDOT Atlanta District TMC/Office TxDOT Atlanta District Traffic Signals	TxDOT Atlanta District	Future
			City of Texarkana, TX	Future
ATMS15	Railroad Operations Coordination	AHTD District Office/TMC City of Texarkana, AR TMC City of Texarkana, TX TMC Municipal/County TMCs Rail Operators TxDOT Atlanta District TMC/Office	TxDOT Atlanta District	Future
			Municipalities/Counties	Future
			City of Texarkana, TX	Future
			City of Texarkana, AR	Future
			AHTD District	Future
EM1	Emergency Response	Arkansas Highway Police Dispatch Arkansas State EOC Arkansas State Police Dispatch Atlanta Regional Incident and Mutual Aid Network County EOC DPS Communications Service Lifenet Dispatch Louisiana State Police Dispatch Municipal/County Public Safety Dispatch Private Ambulance Dispatch Private Tow/Wrecker Dispatch Texas State EOC TXDOT/AHTD Motorist Assistance Patrol Dispatch	Traffic and Emergency Management Agencies	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
EM2	Emergency Routing	AHP/ASP Emergency Vehicles Arkansas Highway Police Dispatch Arkansas State Police Dispatch Atlanta Regional Medical Centers City of Texarkana, AR Field Equipment City of Texarkana, AR TMC City of Texarkana, TX Field Equipment City of Texarkana, TX TMC DPS Communications Service DPS Emergency Vehicles Municipal/County Emergency Vehicles Municipal/County Public Safety Dispatch TxDOT Atlanta District TMC/Office TxDOT Atlanta District Traffic Signals	TxDOT Atlanta District	Future
			City of Texarkana, TX	Future
			City of Texarkana, AR	Future
			Municipalities/Counties	Future
EM4	Roadway Service Patrols	TXDOT/AHTD Motorist Assistance Patrol Dispatch TXDOT/AHTD Motorist Assistance Patrol Vehicles	TxDOT Atlanta District	Future
			AHTD District	Future
MC01	Maintenance and Construction Vehicle Tracking	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Maintenance and Construction Vehicles Municipal/County Maintenance and Construction Central Systems Municipal/County Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections	TxDOT Atlanta District	Future
			Municipalities/Counties	Future
			AHTD District	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC02	Maintenance and Construction Vehicle Maintenance	AHTD Area Maintenance HQs AHTD Equipment Repair Facility AHTD Maintenance and Construction Vehicles Municipal/County Maintenance and Construction Central Systems Municipal/County Maintenance and Construction Equipment Repair Facility Municipal/County Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office TxDOT District Shop	TxDOT Atlanta District	Future
			Municipalities/Counties	Future
			AHTD District	Future
MC03	Road Weather Data Collection	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Field Equipment National Weather Service Other Agencies Environmental Information Systems TxDOT Atlanta District Environmental Sensors TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office	TxDOT Atlanta District	Future
			AHTD District	Future
MC04	Weather Information Processing and Distribution	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Web Site Arkansas Highway Police Dispatch Arkansas State Police Dispatch ATCOG TRAX Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC County EOC DPS Communications Service	TxDOT Atlanta District	Future
			AHTD District	Future
			Municipalities/Counties	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC04 (continued)	Weather Information Processing and Distribution (continued)	Independent School District Dispatch LADOTD Shreveport-Bossier District Office/TMC Local Print and Broadcast Media Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Municipal/County Public Safety Dispatch National Weather Service Private Sector Traveler Information Services Rail Operators T Line Transit Dispatch Other Texas Region TMCs TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page TxDOT Highway Condition Reporting System TXDOT/AHTD Motorist Assistance Patrol Dispatch		
MC05	Roadway Automated Treatment	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Field Equipment Municipal/County Field Equipment Municipal/County Maintenance and Construction Central Systems TxDOT Atlanta District Anti-icing Equipment TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance Sections	TxDOT Atlanta District	Future
			AHTD District	Future
			Municipalities/Counties	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC05 (continued)	Roadway Automated Treatment (continued)	TxDOT Atlanta District TMC/Office		
MC06	Winter Maintenance	AHTD Area Maintenance HQs	TxDOT Atlanta District	Future
		AHTD District Office/TMC	Municipalities/Counties	Future
		AHTD Maintenance and Construction Vehicles	AHTD District	Future
		AHTD Resident Engineers Office AHTD Storage Facilities AHTD Web Site Arkansas Highway Police Dispatch Arkansas State Police Dispatch ATCOG TRAX Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC County EOC DPS Communications Service Independent School District Dispatch LADOTD Shreveport-Bossier District Office/TMC Local Print and Broadcast Media Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Municipal/County Maintenance and Construction Vehicles Municipal/County Storage Facilities Municipal/County Public Safety Dispatch National Weather Service Other Texas Region TMCs Private Sector Traveler Information Services Private Tow/Wrecker Dispatch Rail Operators T Line Transit Dispatch		

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC06 (continued)	Winter Maintenance (continued)	TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District Storage Facilities TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page TxDOT Highway Condition Reporting System		
MC07	Roadway Maintenance and Construction	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Maintenance and Construction Vehicles AHTD Storage Facilities Municipal/County Maintenance and Construction Central Systems Municipal/County Maintenance and Construction Vehicles Municipal/County Storage Facilities TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District Storage Facilities	TxDOT Atlanta District	Future
			AHTD District	Future
			Municipalities/Counties	Future
MC08	Work Zone Management	AHTD Area Maintenance HQs AHTD District Office/TMC AHTD Field Equipment AHTD Maintenance and Construction Vehicles AHTD Resident Engineers Office AHTD Web Site Arkansas Highway Police Dispatch Arkansas State Police Dispatch	TxDOT Atlanta District	Future
			AHTD District	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC08 (continued)	Work Zone Management (continued)	ATCOG TRAX Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC County EOC DPS Communications Service Independent School District Dispatch LADOTD Shreveport-Bossier District Office/TMC Local Print and Broadcast Media Municipal/County Field Equipment Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Municipal/County Maintenance and Construction Vehicles Municipal/County Public Safety Dispatch Other Texas Region TMCs Private Sector Traveler Information Services Rail Operators T Line Transit Dispatch TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District Portable Field Equipment TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page TxDOT Highway Condition Reporting System TXDOT/AHTD Motorist Assistance Patrol Dispatch		

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
MC09	Work Zone Safety Monitoring	AHTD District Office/TMC AHTD Field Equipment AHTD Maintenance and Construction Vehicles AHTD Resident Engineers Office TxDOT Atlanta District Maintenance and Construction Vehicles TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District Portable Field Equipment	TxDOT Atlanta District	Future
			AHTD District	Future
MC10	Maintenance and Construction Activity Coordination	AHTD District Office/TMC AHTD Resident Engineers Office ATCOG TRAX Dispatch City of Texarkana, AR TMC City of Texarkana, TX TMC LADOTD Shreveport-Bossier District Office/TMC Local Print and Broadcast Media Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Private Sector Traveler Information Services Rail Operators TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page TxDOT BRINSAP TxDOT Highway Condition Reporting System	TxDOT Atlanta District	Future
			AHTD District	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
APTS1	Transit Vehicle Tracking	ATCOG TRAX Dispatch ATCOG TRAX Vehicles Independent School District Buses Independent School District Dispatch T Line Transit Dispatch T Line Transit Vehicles	Independent School District	Future
			T Line Transit	Future
			ATCOG TRAX	Future
APTS2	Transit Fixed-Route Operations	AHTD District Office/TMC City of Texarkana, AR TMC City of Texarkana, TX TMC Independent School District Buses Independent School District Dispatch Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems T Line Transit Dispatch T Line Transit Vehicles TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office	Independent School District	Future
			T Line Transit	Future
APTS3	Demand Response Transit Operations	AHTD District Office/TMC ATCOG TRAX Dispatch ATCOG TRAX Traveler Information System ATCOG TRAX Vehicles City of Texarkana, AR TMC City of Texarkana, TX TMC Municipal/County TMCs Municipal/County Maintenance and Construction Central Systems Private Sector Traveler Information Services Taxi Dispatch Companies T Line Transit Dispatch	T Line Transit	Future
			ATCOG TRAX	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
APTS3	Demand Response Transit Operations	T Line Transit Vehicles T Line Traveler Information System TxDOT Atlanta District Area Engineers Offices TxDOT Atlanta District Maintenance Sections TxDOT Atlanta District TMC/Office		
APTS5	Transit Security	Arkansas State Police Dispatch ATCOG TRAX Dispatch ATCOG TRAX Vehicles DPS Communications Service Independent School District Buses Independent School District Dispatch Municipal/County Public Safety Dispatch T Line Transit Dispatch T Line Transit Vehicles	T Line Transit	Future
			Independent School District	Future
			ATCOG TRAX	Future
APTS6	Transit Maintenance	ATCOG TRAX Dispatch ATCOG TRAX Vehicles Independent School District Buses Independent School District Dispatch T Line Transit Dispatch T Line Transit Vehicles	ATCOG TRAX	Future
			T Line Transit	Future
			Independent School District	Future
APTS7	Multi-modal Coordination	Amtrak Terminal ATCOG Mt. Pleasant Dispatch Office ATCOG TRAX Dispatch Private Inter-City Bus Carriers Regional Multimodal Transfer Station T Line Transit Dispatch	ATCOG TRAX	Future
			T Line Transit	Future
			Private Inter-City Bus Carriers	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
APTS8	Transit Traveler Information	ATCOG TRAX Dispatch ATCOG TRAX Kiosks ATCOG TRAX Traveler Information System ATCOG TRAX Vehicles Private Travelers Personal Computing Devices T Line Transit Dispatch T Line Transit Vehicles T Line Traveler Information System	ATCOG TRAX	Future
			T Line Transit	Future
CVO04	CV Administrative Processes	AHTD District Office/TMC Arkansas Highway Police Dispatch Arkansas State Police Dispatch City of Texarkana, TX TMC City of Texarkana, AR TMC County EOC DPS Communications Service Louisiana State Police Dispatch Municipal/County Permitting System Municipal/County Public Safety Dispatch Municipal/County TMCs Private Commercial Vehicle Fleet Management TxDOT Atlanta District TMC/Office	Municipalities/Counties	Future
CVO06	Weigh-In-Motion	Commercial Vehicles DPS Inspection Stations DPS Weigh-In-Motion Station TxDOT Atlanta District TMC/Office	TxDOT Atlanta District	Existing

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
CVO10	HAZMAT Management	Arkansas Highway Police Dispatch Arkansas State Police Dispatch Commercial Vehicles DPS Communications Service Municipal/County Public Safety Dispatch Private Commercial Vehicle Fleet Management	Public Safety Agencies	Future
ATIS1	Broadcast Traveler Information	AHTD District Office/TMC AHTD Web Site Local Print and Broadcast Media Private Sector Traveler Information Services Private Travelers Personal Computing Devices TxDOT 511 System TxDOT Atlanta District TMC/Office TxDOT Atlanta District Web Page TxDOT Highway Condition Reporting System TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	TxDOT Atlanta District	Future
			AHTD District	Future
ATIS2	Interactive Traveler Information	AHTD Web Site Private Travelers Personal Computing Devices TxDOT Atlanta District Web Page TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	TxDOT Atlanta District	Future
			AHTD District	Future
ATIS5	ISP Based Route Guidance	Private Commercial Vehicle Fleet Management Private Travelers Personal Computing Devices TxDOT Atlanta District TMC/Office TxDOT Motor Carrier Routing Information	TxDOT Motor Carrier Routing	Future

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
AD1	ITS Data Mart	AHTD Field Equipment	TxDOT Public Transportation Division	Future
		AHTD Planning Division	DPS Communications Service	Future
		Archive Data User Equipment	Arkansas State Police	Future
		Arkansas Highway Police Dispatch	Arkansas Highway Police	Future
		Arkansas State Police Crash Database	Municipal/County Public Safety	Future
		Arkansas State Police Dispatch	TxDOT Atlanta District	Future
		ATCOG TRAX Dispatch	AHTD Planning Division	Future
		Bi-State Justice Center Crash Record Database		
		DPS Communications Service		
		Municipal/County Public Safety Dispatch		
T Line Transit Dispatch				
TxDOT Atlanta District TMC/Office				
TxDOT Atlanta District Traffic Data Archive				
TxDOT Public Transportation Division				
TxDOT Public Transportation Management System (PTMS)				
TxDOT Traffic Data Collection Equipment				
TxDOT/DPS Crash Record Information System				
AD2	ITS Data Warehouse	Regional Airports	Texarkana MPO	Future
		Regional Multimodal Transfer Station		
		Texarkana MPO Archive Data System		
AD3	ITS Virtual Data Warehouse	AHTD Planning Division	Texarkana MPO	Future
		Archive Data User Equipment		
		Arkansas State Police Crash Database		
		ATCOG TRAX Dispatch		
		Bi-State Justice Center Crash Record Database		
		City of Texarkana, AR TMC		
City of Texarkana, TX TMC				

Table 5 – Atlanta Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Market Package Status
AD3 (continued)	ITS Virtual Data Warehouse (continued)	Independent School District Dispatch Municipal/County TMCs Private Inter-City Bus Carriers Rail Operators Texarkana MPO Archive Data System T Line Transit Dispatch TxDOT Atlanta District Traffic Data Archive TxDOT Public Transportation Division TxDOT/DPS Crash Record Information System		

4.3 Interconnections

4.3.1 Top Level Regional System Interconnect Diagram

A system interconnect diagram, or sausage diagram (shown previously in **Figure 4**), shows the systems and primary interconnects in the Region. The National ITS Architecture interconnect diagram has been customized for the Atlanta Region based on the information gathered from the stakeholders and system inventory. **Figure 5** summarizes the existing, planned, and future ITS elements for the Atlanta Region in the context of a physical interconnect. Subsystems and elements specific to Atlanta are called out in the boxes surrounding the main interconnect diagram, and these are color-coded to the subsystem to which they are associated. Elements with an asterisk (*) are planned and future system elements.

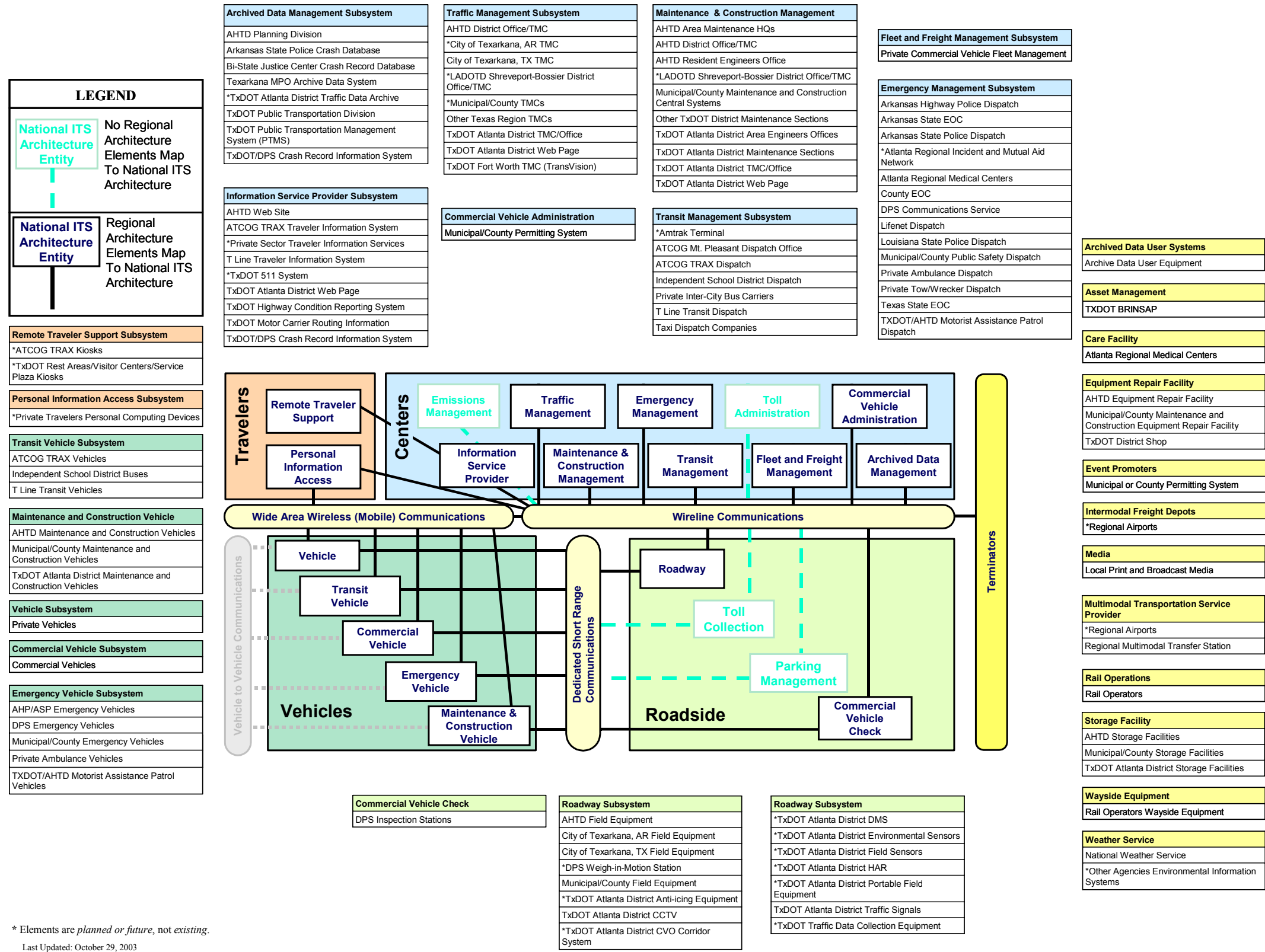
4.3.2 Customized Market Packages

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

Figure 6 is an example of an ATMS market package for Network Surveillance that has been customized for the Atlanta Region. This market package shows three subsystems, Traffic Management, Roadway, and Information Service Provider, and the associated entities (TxDOT Atlanta District TMC/Office, TxDOT Atlanta District CCTV, etc.). Data flows between the subsystems and the terminators indicate what information is being shared.



Market packages that were customized for the Atlanta Region are shown in **Appendix A**. These market packages also are included on the Atlanta Regional ITS Architecture web site by selecting the “Market Package” button. Market packages are grouped by functional area (Traffic Management, Maintenance and Construction, Public Transportation, etc.), and each of the customized market packages can be viewed by clicking on the Market Package Diagram icon under each area heading. It is important to note that while the market package table on the web site shows all of the available market packages from the National ITS Architecture, only those selected for the Atlanta Region are included in the diagrams. The selected market packages on the web site also are highlighted in the table with bold print, and are indicated as existing or planned.



* Elements are planned or future, not existing.
Last Updated: October 29, 2003

Figure 5 – Atlanta Regional System Interconnect Diagram

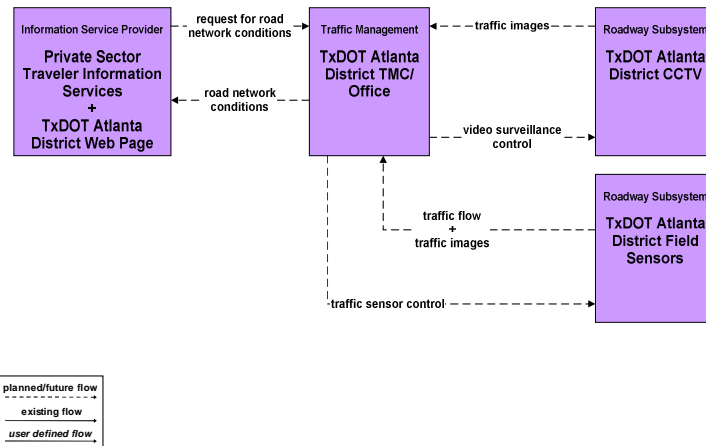


Figure 6 – Custom Market Package for TxDOT Atlanta District TMC Network Surveillance

4.3.3 Atlanta Architecture Interfaces

While it is important to identify the various systems and stakeholders as part of a regional ITS, a primary purpose of the architecture is to identify the *connectivity* between transportation systems in the Atlanta Region. The interconnect diagram shown previously in **Figure 5** showed the high-level relationships of the subsystems and terminators in the Atlanta Region and the associated local projects and systems. The customized market packages represent services that can be deployed as an integrated capability, and the market package diagrams show the information flows between the subsystems and terminators that are most important to the operation of the market packages. How these systems interface with each other is an integral part of the overall ITS architecture.

There are 100 different elements identified as part of the Atlanta Regional ITS Architecture. These elements include traffic management centers, transit vehicles, dispatch systems, emergency management agencies, media outlets, and others – essentially, all of the existing and planned physical components that contribute to the regional intelligent transportation system. Interfaces have been identified for each element in the Atlanta Regional ITS Architecture, and each element has been mapped to those other elements with which it must interface. For example, the TxDOT Atlanta District TMC has existing or planned interfaces with 46 other elements in the Atlanta Region, ranging from field equipment and dispatch centers, to other TxDOT District TMCs. Other interfaces are far less complex, such as the interface between the DPS vehicles and the DPS Communications Dispatch.

An example of one of the system interfaces is shown in **Figure 7**. This graphic shows the TxDOT Atlanta District traffic signals and the existing and planned interfaces with other elements throughout the Region. These interfaces are shown as existing, planned, or future. Interfaces defined as planned have funding identified, while future interfaces are desired by stakeholders but funding has not yet been identified.

Each element and its defined interfaces are listed in **Appendix B**. Elements and their interfaces also are accessible via the Atlanta Regional ITS Architecture web site by clicking on the “Interfaces” button. Elements are listed alphabetically in the column on the left, and each entry in the Interfacing Element column on the right is a link to more detailed information about the particular interface. The architecture flows between the individual element interfaces are described in more detail in the following section.

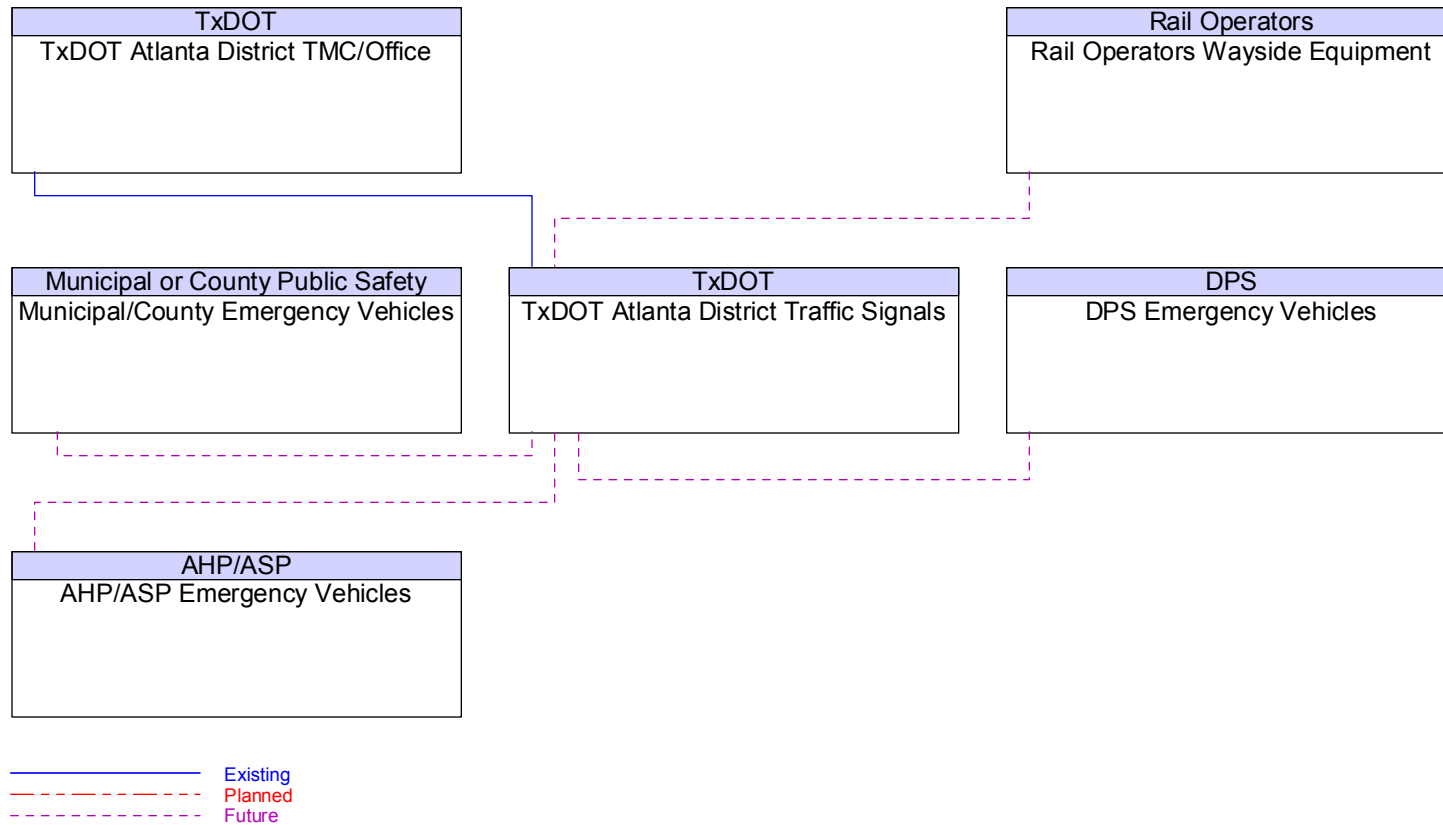


Figure 7 – TxDOT Atlanta District Traffic Signals Interfaces

4.3.4 Physical Subsystem Architecture Flows

Architecture flows between the subsystems and terminators define the specific information (data) that is exchanged between subsystems and terminators. Each architecture flow has one or more data flows that specify what information is exchanged and the direction of the exchange. These data flows could be requests for information, alerts and messages, status requests, broadcast advisories, event messages, confirmations, electronic credentials, and other key information requirements. These architecture flows define the interface requirements between the various elements in the Atlanta Regional ITS Architecture.

An example of the architecture flows between two elements is shown in **Figure 8**. In this interface, the flows between the TxDOT Atlanta District TMC and other Texas Region TMCs show information that must go from the Atlanta District TMC to other Texas TMCs, as well as information that the TMC needs from devices. Similar to the interfaces, architecture flows also are defined as existing, planned, or future.

Each of the individual element interfaces can be accessed on the Atlanta Regional ITS Architecture web site by clicking on the “Interfaces” button. Selecting any of the interfacing elements from the column on the right will display an interface diagram and architecture flows between two specific elements, similar to the diagram shown in **Figure 8**. Each data flow is defined, and any standards associated with that data flow are noted. Standards as they apply to the Atlanta Region are discussed in more detail in Section 4.5.

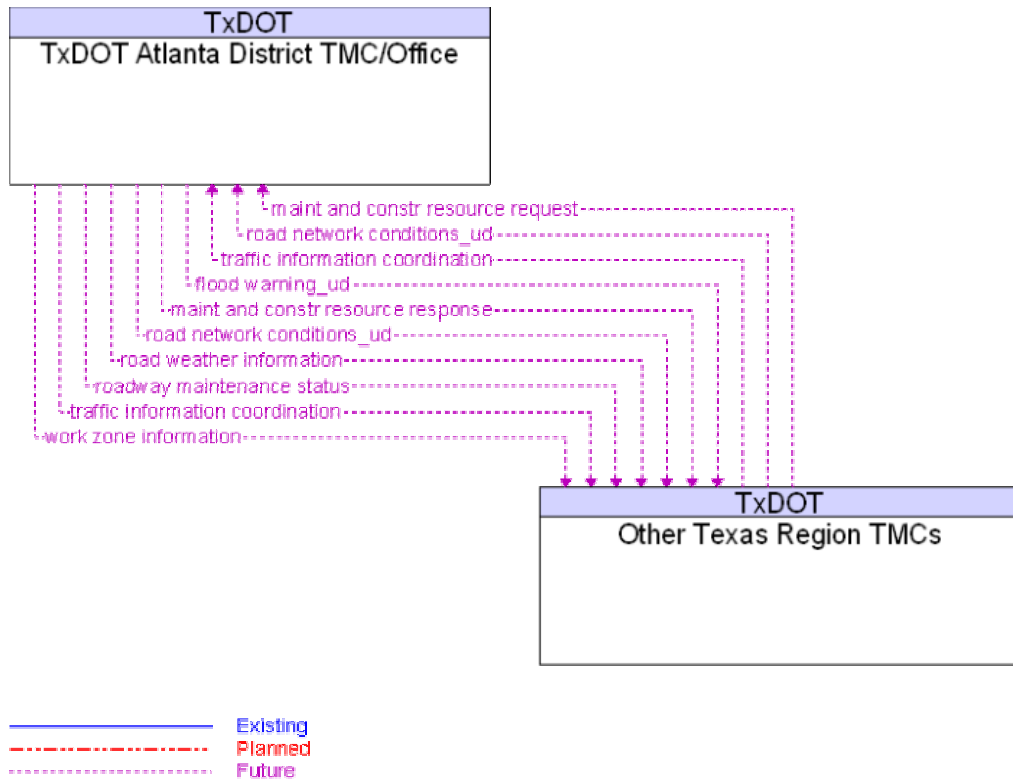


Figure 8 – TxDOT Atlanta District TMC/Office to Other Texas Region TMCs Architecture Flows

4.4 Functional Requirements

Functions are a description of what the system has to do. In the National ITS Architecture, functions are defined at several different levels, ranging from general subsystem descriptions through somewhat more specific equipment package descriptions to Process Specifications that include substantial detail. Guidance from the USDOT on developing a Regional ITS Architecture recommends that each Region determine the level of detail of the functional requirements for their Region. In the Atlanta Region, it is recommended that the development of detailed functional requirements such as the “shall” statements included in Process Specifications for a system be developed at the project level. These detailed “shall” statements identify all functions that a project or system needs to perform.

For the Atlanta Regional ITS Architecture, functional requirements have been identified at two levels. The customized market packages, discussed previously in Section 4.3.2, describe the services that ITS needs to provide in the Region and the architecture flows between the elements. These market packages and data flows describe what the ITS system in Atlanta has to do and the data that needs to be shared among elements.

At a more detailed level, functional requirements for the Atlanta Region also are described in terms of equipment packages that are associated with one or more subsystems in the Atlanta Regional ITS Architecture as shown in **Table 6**. An equipment package is a functional capability that could be deployed at a specific time. Each equipment package can be linked in the National ITS Architecture to the Process Specifications that might be applicable. It is recommended that during the design concept stage of a project, the applicable equipment package and associated Process Specifications from the National ITS Architecture be reviewed by the implementer to determine the appropriate functional requirements for the project. A link for each equipment package is available on the Atlanta Regional ITS Architecture web site by clicking on the “Functions” button.

Table 6 – Atlanta Region Equipment Packages

Subsystem	Equipment Package
Archived Data Management Subsystem	Government Reporting Systems Support
	ITS Data Repository
	On-Line Analysis and Mining
	Traffic and Roadside Data Archival
	Virtual Data Warehouse Services
Commercial Vehicle Administration Subsystem	Credentials and Taxes Administration
	CV Information Exchange
Commercial Vehicle Check Subsystem	Roadside WIM
Commercial Vehicle Subsystem	On-board Cargo Monitoring
	On-board CV Electronic Data
Emergency Management Subsystem	Emergency Call-Taking
	Emergency Data Collection
	Emergency Dispatch
	Emergency Environmental Monitoring
	Emergency Response Management

Table 6 – Atlanta Region Equipment Packages (continued)

Subsystem	Equipment Package
Emergency Management Subsystem (continued)	Mayday Support
	Service Patrol Management
Emergency Vehicle Subsystem	On-board EV En Route Support
	On-board EV Incident Management Communication
Fleet and Freight Management Subsystem	Fleet Administration
	Fleet Credentials and Taxes Management and Reporting
	Fleet HAZMAT Management
Information Service Provider Subsystem	Basic Information Broadcast
	Infrastructure Provided Route Selection
	Interactive Infrastructure Information
	ISP Data Collection
Maintenance and Construction Management Subsystem	MCM Automated Treatment System Control
	MCM Data Collection
	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Maintenance Decision Support
	MCM Roadway Maintenance and Construction
	MCM Vehicle and Equipment Maintenance Management
	MCM Vehicle Tracking
	MCM Winter Maintenance Management
	MCM Work Activity Coordination
	MCM Work Zone Management
	MCM Work Zone Safety Management
Maintenance and Construction Vehicle Subsystem	MCV Infrastructure Monitoring
	MCV Roadway Maintenance and Construction
	MCV Vehicle Location Tracking
	MCV Vehicle Safety Monitoring
	MCV Vehicle System Monitoring and Diagnostics
	MCV Winter Maintenance
	MCV Work Zone Support
Personal Information Access Subsystem	Personal Basic Information Reception
	Personal Interactive Information Reception
	Personal Location Determination
	Personal Provider-Based Route Guidance
Remote Traveler Support Subsystem	Remote Basic Information Reception
	Remote Interactive Information Reception
	Remote Transit Information Services

Table 6 – Atlanta Region Equipment Packages (continued)

Subsystem	Equipment Package
Roadway Subsystem	Advanced Rail Crossing
	Roadside Data Collection
	Roadside Signal Priority
	Roadway Automated Treatment
	Roadway Basic Surveillance
	Roadway Environmental Monitoring
	Roadway Equipment Coordination
	Roadway Incident Detection
	Roadway Probe Beacons
	Roadway Signal Controls
	Roadway Traffic Information Dissemination
	Roadway Work Zone Safety
	Roadway Work Zone Traffic Control
	Standard Rail Crossing
Traffic Management Subsystem	Collect Traffic Surveillance
	HRI Traffic Management
	Rail Operations Coordination
	TMC Environmental Monitoring
	TMC Incident Detection
	TMC Incident Dispatch Coordination/Communication
	TMC Probe Information Collection
	TMC Regional Traffic Control
	TMC Signal Control
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
	Traffic Data Collection
	Traffic Maintenance
	Transit Management Subsystem
Transit Center Information Services	
Transit Center Multi-Modal Coordination	
Transit Center Paratransit Operations	
Transit Center Security	
Transit Center Tracking and Dispatch	
Transit Data Collection	
Transit Environmental Monitoring	
Transit Garage Maintenance	
Transit Garage Operations	

Table 6 – Atlanta Region Equipment Packages (continued)

Subsystem	Equipment Package
Transit Vehicle Subsystem	On-board Fixed Route Schedule Management
	On-board Maintenance
	On-board Paratransit Operations
	On-board Transit Information Services
	On-board Transit Security
	On-board Transit Trip Monitoring
Vehicle Subsystem	Vehicle Location Determination
	Vehicle Mayday I/F
	Vehicle Probe Support

4.5 Standards

Standards are an important tool that will allow efficient implementation of the elements in the Atlanta Regional ITS Architecture over time. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances, vendors change, and as new approaches evolve. The USDOT’s ITS Joint Program Office is supporting Standards Development Organizations (SDOs) with an extensive, multi-year program of accelerated, consensus-based standards development to facilitate successful ITS deployment in the United States. **Table 7** identifies each of the ITS standards that could apply to the Atlanta Regional ITS Architecture. These standards are based on the physical subsystem architecture flows previously identified in Section 4.3.4. The connection of each standard to the applicable architecture flows between elements can be viewed on the Atlanta Regional ITS Architecture web site by clicking on the “Interfaces” or “Standards” buttons.

Table 7 – Applicable ITS Standards for the Atlanta Region

SDO	Document ID	Title	Type
AASHTO/ITE/NEMA	NTCIP 1201	Global Object Definitions	Message
	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller Units	Message
	NTCIP 1203	Object Definitions for Dynamic Message Signs	Message
	NTCIP 1204	Object Definitions for Environmental Sensor Stations and Roadside Weather Information System	Message
	NTCIP 1205	Data Dictionary for Closed Circuit Television (CCTV)	Message
	NTCIP 1206	Data Collection and Monitoring Devices	Message
	NTCIP 1208	Object Definitions for Video Switches	Message
	NTCIP 1209	Transportation System Sensor Objects	Message
	NTCIP 1210	Objects for Signal Systems Master	Message
	NTCIP 1211	Objects for Signal Control Priority	Message
	NTCIP 1301	Message Set for Weather Reports	Message
	NTCIP 1401	TCIP – Common Public Transportation (CPT) Business Area Standard	Message

Table 7 – Applicable ITS Standards for the Atlanta Region (continued)

SDO	Document ID	Title	Type
AASHTO/ITE/NEMA (continued)	NTCIP 1402	TCIP – Incident Management (IM) Business Area Standard	Message
	NTCIP 1403	TCIP – Passenger Information (PI) Business Area Standard	Message
	NTCIP 1404	TCIP – Scheduling/Runcutting (SCH) Business Area Standard	Message
	NTCIP 1405	TCIP – Spatial Representation (SP) Business Area Standard	Message
	NTCIP 1406	TCIP – Onboard (OB) Business Area Standard	Message
	NTCIP 1407	TCIP – Control Center (CC) Business Area Standard	Message
	NTCIP 1408	TCIP – Fare Collection (FC) Business Area Standard	Message
	Various	NTCIP Center-to-Center Standards Group	Communication
	Various	NTCIP Center-to-Field Standards Group	Communication
ASTM	ASTM 5 GHz Data Link	Standard Specification for 5.9 GHz Data Link Layer	Communication
	ASTM 5 GHz Phys	Standard Specification for 5.9 GHz Physical Layer	Communication
	ASTM DD 17.54.00.2	ADMS Data Dictionary Specifications	Data
	ASTM PS 105-99	Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control	Communication
	ASTM PS 111-98	Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz	Communication
EIA/CEA	CEA/EIA-794	Data Radio Channel (DARC) System	Communication
	CEA/EIA-795	Subcarrier Traffic Information Channel (STIC) System	Communication
IEEE	IEEE P1512.1	Standard for Traffic Incident Management Message Sets for Use by EMCs	Message
	IEEE P1512.2	Standard for Public Safety IMMS for use by EMCs	Message
	IEEE P1512.3	Standard for Hazardous Material IMMS for use by EMCs	Message
	IEEE P1512.a	Standard for Emergency Management Data Dictionary	Data
	IEEE P1512-2000	Standard for Common Incident Management Message Sets (IMMS) for use by EMCs	Message
	IEEE P1556	Security/Privacy of Vehicle/RS Communications including Smart Card Communications	Communication
	IEEE P1570	Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	Message
	IEEE Std 1455-1999	Standard for Message Sets for Vehicle/Roadside Communications	Message
ITE	ITE TM 1.03	Standard for Functional Level Traffic Management Data Dictionary (TMDD)	Data
	ITE TM 2.01	Message Sets for External TMC Communication (MS/ETMCC)	Message

Table 7 – Applicable ITS Standards for the Atlanta Region (continued)

SDO	Document ID	Title	Type
SAE	SAE J1746	ISP-Vehicle Location Referencing Standard	Data
	SAE J2313	On-Board Land Vehicle Mayday Reporting Interface	Message
	SAE J2353	Data Dictionary for Advanced Traveler Information System (ATIS)	Data
	SAE J2354	Message Set for Advanced Traveler Information System (ATIS)	Message
	SAE J2369	Standard for ATIS Message Sets Delivered Over Bandwidth Restricted Media	Message
	SAE J2529	Rules for Standardizing Street Names and Route IDs	Message
	SAE J2540	Messages for Handling Strings and Look-Up Tables in ATIS Standards	Message

4.6 Phases of Implementation

The Regional ITS Architecture will be implemented through a series of projects led by both public sector and private sector agencies. Key foundation systems will need to be implemented in order to support other systems that have been identified in the Regional ITS Architecture. The deployment of all of the systems required to achieve the final Regional ITS Architecture build out will occur over many years.

A sequence of projects and recommended time frames has been identified in the Atlanta Regional ITS Deployment Plan. These projects have been sequenced over a 20-year period with projects identified for deployment in 5-, 10-, and 20-year timeframes.

Some of the key market packages that will provide the functions for the key foundation systems in the Atlanta Region are listed below. Projects associated with these and other market packages identified for the Region have been included in the Atlanta Regional ITS Deployment Plan.

- Network Surveillance;
- Traffic Information Dissemination;
- Road Weather Data Collections;
- Transit Vehicle Tracking;
- Broadcast Traveler Information;
- Hazardous Materials Management; and
- Emergency Response.

In addition to the above market packages, the implementation of an appropriate communications system in the Region to support ITS is critical for continued deployment of projects.

5. OPERATIONAL CONCEPT

The operational concept for the Atlanta Region provides a description of the stakeholders' roles and responsibilities in the operation of the systems that exist of that are being proposed. This operational concept provides an "executive summary" view of the way the Atlanta Region's systems will work together and documents the roles and responsibilities for each of the services that the intelligent transportation system will provide. The approach to describing the operational concept is to present specific operational scenarios that describe and define the stakeholders' general roles in providing the services.

In addition to the operational scenarios that illustrate the roles and responsibilities of each agency, a list of the key agencies that are responsible for operations in the eight ITS areas is presented. This list will serve as a high level overview of the different roles and responsibilities in this operational concept. Specific roles and coordination requirements for operations are illustrated through the customized market package diagrams presented in **Appendix A**.

With the integration, information sharing, and in some cases joint operations of systems, there will likely be a requirement for agency agreements. Descriptions of potential agreements that may be needed in the Atlanta Region are included in Section 5.3.

5.1 Operational Scenarios

Scenario 1

The first operational scenario describes how ITS technologies may be used during a road construction project along I-30 near the Texas-Arkansas border. Road construction along I-30 in the Atlanta District of TxDOT will require lane closures for an extended period of time. These lane closures will impact the flow of vehicles along this portion of I-30 and affect traffic conditions in Arkansas. The TxDOT Atlanta TMC will contact the AHTD District Office/TMC to notify them of the construction and anticipated traffic impacts. The AHTD District Office/TMC will disseminate the information using available ITS resources in the District (i.e., HAR and DMS) and notify the AHTD Area Maintenance Headquarters so that they can deploy portable DMS as needed to alert motorists of the potential delay associated with the construction. This would allow motorists to be informed of conditions and impacts prior to entering the work zone in Texas. The AHTD District TMC will also notify the Arkansas State Police and the Arkansas Highway Patrol so that they can be prepared for any incidents.

The TxDOT Atlanta TMC will enter the closure on the Highway Conditions Reporting System, which also feeds the statewide 511 traveler information number. The TMC will post messages on DMS and HAR in the Region to alert motorists of the construction. CCTV cameras will be used to monitor the traffic conditions upstream of the construction and observe traffic, looking for potential incidents that could occur in the backup.

The TxDOT Atlanta TMC will also notify the joint Texarkana TMC (Texas and Arkansas) so that the Texarkana TMC can implement timing plans in its closed-loop signal system that could accommodate diverted traffic from I-30 along State Line Road.

Local emergency dispatch centers are notified of the closures so that they can determine appropriate response routes for emergencies, and local transit providers (T-LINE) are notified in case the closure will have an impact on their transit routes.

Once the construction is complete, the TxDOT Atlanta TMC will notify the Texarkana TMC, emergency dispatch, transit providers and the AHTD, who will in turn notify the Arkansas State Police and the Highway Patrol, so that any messages posted or preparations made can be removed and operations returned to normal.

Scenario 2

An ice storm is approaching the Atlanta Region. Temperatures begin to drop below freezing as the roadside weather data collection centers monitor the deteriorating weather conditions and send reports to the Atlanta TxDOT TMC. Ice formation is detected on an overpass along I-30 and the automated treatment of the bridge is begun. A second bridge begins to ice, as detected by the in-field sensors, but this bridge does not have automated treatment. Therefore, a message is sent from the ice-detection system to the Atlanta TxDOT TMC and sand trucks are deployed to the scene.

The ice storm is severe and the local EOC is activated. Video images captured along the interstates using TxDOT's CCTV cameras are fed to the EOC where officials monitor the situation as well as to emergency personnel watching for incidents along the roadways. As the storm continues, several bridges and steep inclines become impassable. This information is passed along to the local TMCs, emergency dispatch centers, and HCRS by the TxDOT Atlanta TMC. Notice is given to the media to alert the public of the dangers of trying to travel during current winter weather conditions. Once roadways are cleared, the public is once again notified that traveling conditions are safe and they can resume their normal activities.

5.2 Roles and Responsibilities

The operational scenarios described in the previous section illustrate the interagency cooperation and coordination that is required in two scenarios that might occur in the Atlanta. During any operational scenario, a number of agencies will be required to coordinate closely to perform their operational responsibilities. The key agencies that have a lead role or responsibility during operations are listed below for each ITS area. It is recognized that a number of other agencies will also need to be involved during a scenario in addition to the ones listed below, although it is not expected that these agencies will play as critical a role in operations.

Travel and Traffic Management

- City of Texarkana, Texas (Police, Street Services)
- City of Texarkana, Arkansas (Police, Street Services)
- County Road and Bridge
- Other Texas Department of Transportation Districts
- Texas Department of Public Safety
- Texas Department of Transportation

Public Transportation Management

- Independent School Districts
- Texarkana Urban Transit District
- Rural Transit Providers

Electronic Payment

- Not Applicable

Commercial Vehicle Operations

- Texas Department of Public Safety
- Texas Department of Transportation

Emergency Management

- City of Texarkana, TX (Police, Fire, Emergency Operations Center, Street Services)
- City of Texarkana, AR (Police, Fire, Emergency Operations Center, Street Services)
- City/County Public Safety Agencies (Emergency Operations Center, Public Safety Dispatch)
- Texas Department of Public Safety
- Texas Department of Transportation

Advanced Vehicle Safety System Needs

- Not Applicable

Information Management

- Texarkana MPO
- Texas Department of Transportation

Maintenance and Construction Management

- City of Texarkana, TX (Street Services)
- City of Texarkana, AR (Street Services)
- County Road and Bridge
- Texas Department of Transportation

5.3 Atlanta Agreements

The Regional ITS Architecture for the Atlanta Region has identified several agency interfaces, information exchanges, and integration strategies that would be needed to provide the ITS services and systems identified by the stakeholders in the Region. Interfaces and data flows among public and private entities in the Atlanta Region will require agreements among agencies that establish parameters for sharing agency information to support traffic management, incident management, provide traveler information, and other functions identified in the Regional ITS Architecture.

Currently, there are no formal agreements in place in the Atlanta Region with regards to ITS. Stakeholders indicated that while there is a high degree of cooperation among agencies, there hasn't been a need for formal agreements to facilitate multi-jurisdictional resource sharing and cooperation. With the implementation of ITS technologies, integrating systems from one or more agencies, the anticipated level of information exchange identified in the architecture, it is likely

that more formal agreements will be needed. These agreements, while perhaps not requiring a financial commitment from agencies in the Region, should outline specific roles, responsibilities, data exchanges, levels of authority, and other facets of regional operations. Some agreements also will outline specific funding responsibilities, where appropriate and applicable.

Table 8 provides a list of potential agreements for the Atlanta Region based on the interfaces identified in the Regional Architecture. It is important to note that as ITS services and systems are implemented in the Region, part of the planning and review process for those projects should include a review of potential agreements that would be needed for implementation or operations.

Table 8 – Potential Agreements for the Atlanta Region

Agreement and Agencies	Status	Agreement Description	Considerations
<p>Data Sharing and Usage (Public) TxDOT Atlanta District and Public Agencies within the Region</p>	Future	<p>This agreement would define the parameters, guidelines and policies for inter- and intra-agency ITS data sharing. This data sharing would support regional activities related to traffic management, incident management, and traveler information, and other functions. Data also would include video images from CCTV cameras. The terms of this agreement should generally address such items as:</p> <ul style="list-style-type: none"> ▪ Types of data and information to be shared ▪ Repository for information (i.e., TxDOT Atlanta TMC as central hub) ▪ How the information will be used (traffic incident management, displayed on web site for travel information, distributed to private media, etc.) ▪ Parameters for data format, quality, security 	<p>These agreements are typically zero-dollar agreements, in that there is no charge among agencies for the actual data, although there might be some cost incurred for infrastructure, systems or fiber to enable communications between agencies.</p>
<p>Data Sharing and Usage (Public-Private) TxDOT Atlanta District and Private Media/Information Service Providers</p>	Future	<p>This agreement would define the parameters, guidelines and policies for private media use of regional ITS-related information from TxDOT Atlanta. This type of agreement is recommended between TxDOT (data provider) and the media (data user) to define terms of use for broadcasting public-agency information regarding traffic conditions, closures, restrictions, as well as video images. Agreements can also include requirements for the media to 'source' the information (i.e., using the TxDOT logo on all video images broadcast).</p>	<p>These agreements can be zero-dollar agreements, although some agencies have stipulated identifying the information, public service announcements by the media, or other requirements as a term of use. The private media entity is typically responsible for paying any necessary costs for access (i.e., communications infrastructure to link to the TxDOT database or video switch). These agreements also typically include a sunset clause to allow the agency to periodically review the agreement and make any modifications prior to renewal.</p>

Table 8 – Potential Agreements for the Atlanta Region (continued)

Agreement and Agencies	Status	Agreement Description	Considerations
<p>Shared Video Monitoring (Public) TxDOT Atlanta, City of Texarkana, TX, City of Texarkana, AR, Local EOC, Police Dispatch, State EOC</p>	Future	<p>This agreement would enable shared video monitoring of TxDOT CCTV cameras by public safety and emergency services agencies in the Atlanta Region for incident management purposes. This agreement would define the parameters and policies for public safety agencies to access video images via the TxDOT video switch. It is recommended that the agreement include any TxDOT policies relating to video images (including archiving, privacy, disclaimers, use of video and redistribution) as well as processes for agency requests for specific views. Shared video monitoring does not address shared use or shared control of video equipment functions.</p>	<p>These agreements are typically zero-dollar agreements, in that there is no charge among agencies for the actual data, although there might be some cost incurred for infrastructure, systems or fiber to enable communications between agencies, particularly with the high bandwidth required for transmitting live video images.</p>
<p>Mutual Aid Agreements (Public) DPS, TxDOT Atlanta District, Texarkana, TX Police and Fire, Texarkana, AR Police and Fire, Local EOC</p>	Existing (Informal)	<p>Mutual aid agreements currently exist as informal arrangements in the Atlanta Region, although they are a routine practice among public safety and emergency services agencies. Formal mutual aid agreements will become more important as agencies integrate systems and capabilities, particularly automated dispatch and notification.</p>	<p>These agreements are typically zero-dollar agreements, although there might be some funding required to support regional incident management activities. The agreement also would outline resource commitments that would be part of any mutual aid arrangement (personnel, equipment, facilities, etc.).</p>
<p>Joint Operations/Shared Control Agreements (Public) TxDOT Atlanta District, City of Texarkana, DPS (potential)</p>	Future	<p>These agreements are formal arrangements to allow joint operations or control of certain systems and equipment. The agreement would need to define the terms of this arrangement, such as hours of operation and time of day/time of week where shared control would take effect, circumstances or incidents where shared control would take effect, notification procedures between the agencies agreeing to shared control arrangements, etc. Additional agencies (such as DPS) could be part of a joint operations/shared control agreement for certain types of devices.</p>	<p>Joint operations/shared control agreements could consider some form of mutual funding for certain system elements, primarily communication links.</p>