Arkansas State Highway and
Transportation Department
Regional ITS Architectures and Deployment Plans

Bi-State Region

BI-STATE
METROPOLITAN PLANNING
ORGANIZATION

Executive Summary

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

TABLE OF CONTENTS

EXECUTIVE SUMMARY

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

AD	Archived Data
AHTD	Arkansas State Highway and Transportation Department
APTS	Advanced Public Transportation Systems
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CAD	Computer Aided Dispatch
CCTV	Closed-circuit television
CVISN	Commercial Vehicle Information Systems and Networks
CVO	Commercial Vehicle Operations
DMS	Dynamic Message Sign
EM	Emergency Management
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System
HAR	Highway Advisory Radio
ITS	Intelligent Transportation System
MC	Maintenance and Construction
MDT	Mobile Data Terminal
MPO	Metropolitan Planning Organization
ODOT	Oklahoma Department of Transportation
SAFETEA-LU	Safe, Accountable, Flexible and Efficient Transportation Equity Act – A Legacy for Users
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMC	Transportation Management Center
TOC	Traffic Operations Center

PROJECT APPROACH

Development of a regional intelligent transportation system (ITS) architecture is one of the most important steps in planning for and implementing ITS in a region. ITS architectures provide a framework for implementing ITS projects, encourage interoperability and resource sharing among agencies, identify applicable standards to apply to projects, and allow for cohesive long-range planning among regional stakeholders. The ITS architecture allows stakeholders to plan for what they want their system to look like in the long-term and then break out the system into smaller pieces that can be implemented in the short-term.

ITS architectures satisfy the conformity requirements first established in the Transportation Equity Act for the 21st Century (TEA-21) highway bill and continued in the Safe, Accountable, Flexible and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) bill passed in 2005. In response to Section 5206(e) of TEA-21, the Federal Highway Administration (FHWA) issued a final rule and the Federal Transit Administration (FTA) issued a final policy that required regions implementing any ITS project to have an ITS architecture in place by April 2005. After this date, any ITS projects must show conformance with their regional ITS architecture in order to be eligible for funding from FHWA or FTA. Regions that had not yet deployed ITS were given four years to develop an ITS architecture after their first ITS project proceeded to final design.

In the Bi-State Region, the Bi-State Metropolitan Planning Organization (MPO) began development of their Regional ITS Architecture in 2004. Several stakeholder workshops were held and a draft Regional ITS architecture was developed. In 2005, the Arkansas State Highway and Transportation Department (AHTD), in partnership with the Bi-State MPO, completed the Regional ITS Architecture for the Region. The Regional ITS Architecture has the same geographic boundaries as the Bi-State MPO and focuses on a 20-year vision for ITS in the Region. A project website is located at www.consystec.com by following the link to Arkansas and contains additional information that was not feasible to include in the report. In addition, a separate ITS Deployment Plan was developed to identify and prioritize specific ITS projects recommended for the Region in order to implement the Regional ITS Architecture. The process used to develop the plan is illustrated in **Figure 1**.

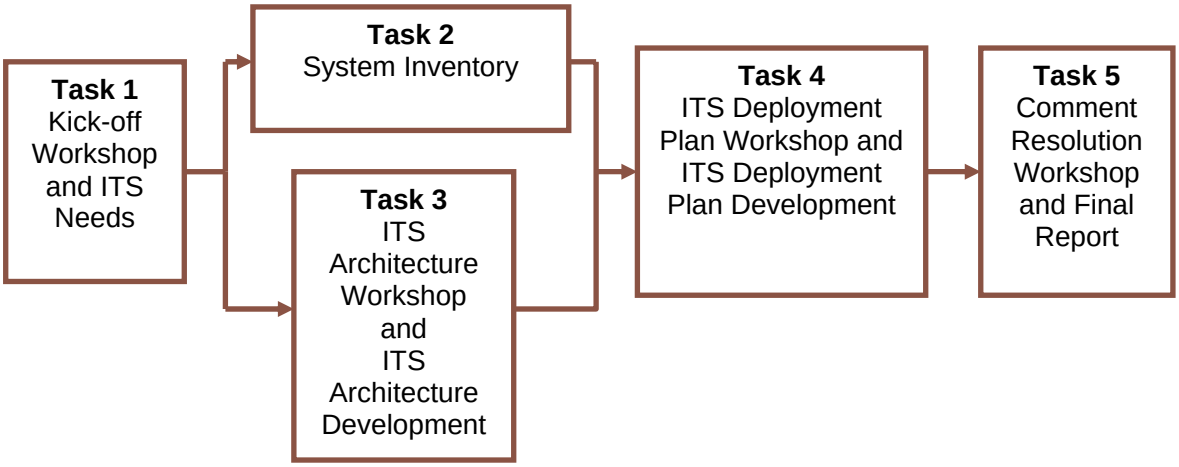


Figure 1 – Bi-State Regional ITS Architecture and Deployment Plan Development Process

The ITS Deployment Plan, while not required by FHWA and FTA, is a useful tool for Regions to identify specific projects that are able to be deployed in order to implement the architecture. The Regional ITS Deployment Plan builds on the architecture by outlining specific ITS project recommendations and strategies for the Region, and by identifying deployment timeframes so that the recommended projects and strategies can be implemented over time.

The Bi-State Regional ITS Architecture and Regional ITS Deployment Plan were both developed with significant input from local, state, and federal officials. A series of four workshops were held to solicit input from stakeholders and ensure that the plans reflected the unique needs of the Region. Copies of the draft reports were sent to all stakeholders and the project website allowed stakeholders to submit comments directly to the project team. The Regional ITS Architecture and Deployment Plan developed reflects an accurate snapshot of existing ITS deployment and future ITS plans in the Region. Needs and priorities of the Region will change over time and, in order to remain effective, these documents should be periodically reviewed and updated.

OVERVIEW OF THE BI-STATE REGION

The Bi-State Region is defined by the boundaries of the Bi-State MPO as shown by the dark line in **Figure 2**. The Region encompasses 545 square miles in western Arkansas and eastern Oklahoma. It includes southwestern Crawford County and northwestern Sebastian County in Arkansas, and eastern Sequoyah County and northeastern LeFlore County in Oklahoma. The two major cities in the area are Fort Smith and Van Buren, which are both situated in Arkansas on opposite sides of the Arkansas River. The population of the Bi-State MPO area is 154,640 according to the 2000 Census.

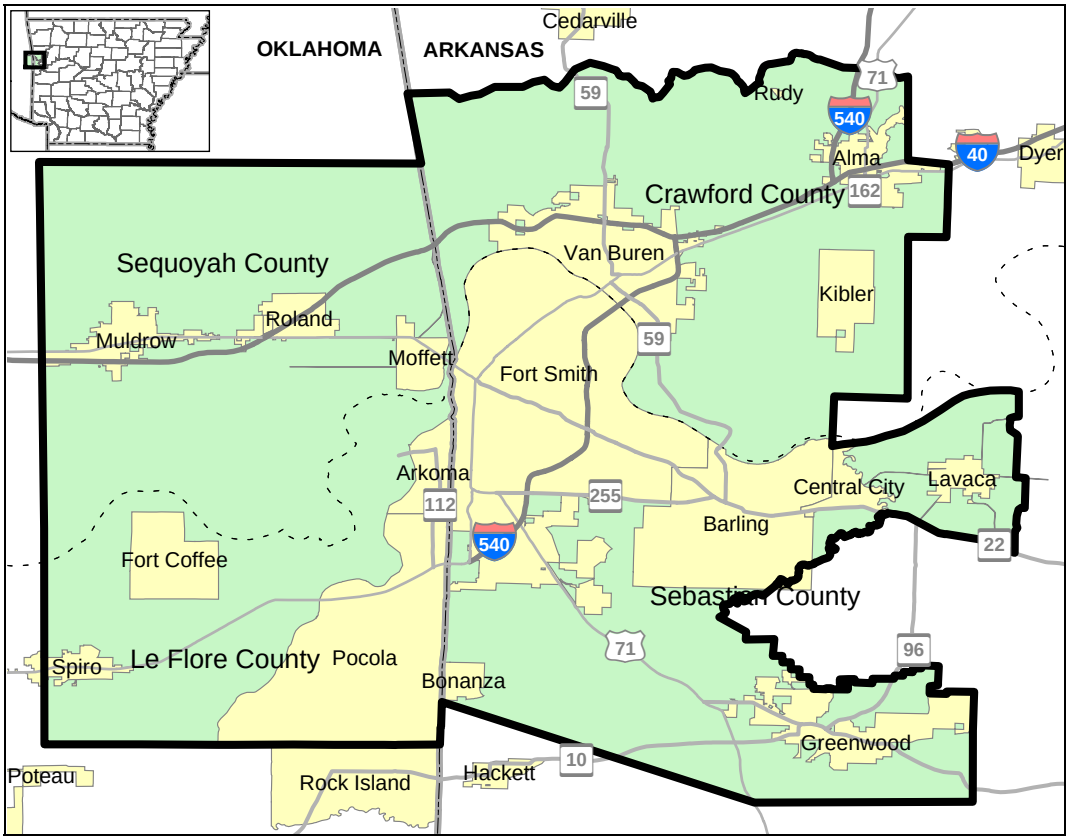


Figure 2 – Bi-State Regional Boundaries

The Bi-State Region is served by numerous State and Federal highways. Primary roadway facilities include I-40, I-540, US 59, US 64, US 71, and US 271. I-40 and I-540 are divided interstate highways in the Region; I-40 runs east-west and I-540 runs north-south. Their effective operation is critical to the movement of goods and people throughout the States of Arkansas and Oklahoma, as well the United States.

REGIONAL STAKEHOLDERS

Due to the fact that ITS often transcends traditional transportation infrastructure, it is important to involve non-traditional stakeholders in the Regional ITS Architecture and Deployment Plan development. Input from these stakeholders, both public and private, is a critical part of developing and documenting the overall vision for ITS in a region.

The following stakeholder agencies have participated in the Bi-State Region project workshops or provided input to the study team:

- AHTD Central Office;
- AHTD District Four;
- AHTD Highway Police;
- Arkansas State Police;
- Bi-State MPO;
- City of Fort Smith;
- City of Greenwood;
- City of Van Buren;
- Crawford County;
- FHWA Arkansas Division;
- Fort Smith Advertising and Promotion Commission;
- Fort Smith Airport;
- Fort Smith Transit;
- KIBOIS Community Action Foundation;
- Oklahoma Department of Transportation (ODOT);
- Sebastian County;
- Van Buren Advertising and Promotion Commission; and
- Western Arkansas Planning and Development District.

A detailed list of stakeholders, including the individuals representing each agency, is provided in the Regional ITS Architecture report.

BI-STATE REGIONAL ITS ARCHITECTURE

The process for developing the Regional ITS Architecture for the Bi-State Region included several key steps:

- Preparing an inventory of planned and existing systems in the Region;
- Identifying needs in the Region that could be addressed by ITS deployment or integration;
- Customizing and prioritizing market packages to address the specific needs and services identified by stakeholders;
- Developing interconnects and interfaces for system elements to map out data flows and agency links;
- Preparing an operational concept to illustrate how the systems, components, and agencies will be integrated and function as a result of the architecture framework;
- Identifying high-level functional requirements;
- Identifying standards that could be applicable to the Region; and
- Outlining potential agreements that would be needed to facilitate information or resource sharing as a result of ITS implementation.

Inventory and Needs in the Region

The Bi-State Regional ITS Architecture began with a Kick-off Workshop in July 2005. At that workshop, stakeholders provided information about existing and planned ITS elements in the Region. A diverse range of needs were identified by stakeholders who attended. The inventory of planned and existing ITS infrastructure provided the basis for the architecture development. Needs that could be addressed by ITS technologies guided the selection of market packages, data flows, and integration requirements.

Market Packages

An ITS Architecture Workshop was held in Fort Smith in August 2005. At this workshop, stakeholders were provided with architecture training that included background information about the National ITS Architecture and the process that would be used to develop the Bi-State Regional ITS Architecture.

The next step in developing the Bi-State Regional ITS Architecture was to identify the services that would be needed to address the stakeholder needs. In the National ITS Architecture, services are referred to as market packages. Market packages can include several stakeholders and elements that work together to provide a service in the Region. There are a total of 85 market packages identified in Version 5.1 of the National ITS Architecture.

At the ITS Architecture Workshop, stakeholders selected the market packages that corresponded to the desired services and functions identified for the Region, and then customized these market packages. They included services and functions such as Network Surveillance, Traffic Information Dissemination, and Emergency Response as well as market packages to address coordination needs, including Traffic Incident Management and Regional Traffic Control and Coordination. Because market packages are groups of services and functions, they can be deployed incrementally and over time. Of the 85 market packages in the National ITS Architecture Version 5.1, 38 were selected and customized for deployment in the Bi-State

Region. The market packages outline the functions that stakeholders envision ITS to perform in coming years.

AHTD is leading a separate effort to develop and implement the Commercial Vehicle Information Systems and Networks (CVISN) program. CVISN addresses commercial vehicle operations, including ITS, on a statewide level and includes such applications as electronic clearance, safety enforcement, and registration. Unless a specific need was identified in the Bi-State Region that could be addressed locally, the commercial vehicle operations market packages were not selected and instead will be covered in the CVISN effort to ensure consistency.

Stakeholders were asked to prioritize the market packages into high, medium, and low priorities based on regional needs, feasibility, likelihood of deployment, and overall contribution of the market package to the goals and vision for ITS functionality in the Region. A summary of these prioritized market packages is shown in **Table 1**. Definitions for the ITS market packages are provided in Appendix A of the Regional ITS Architecture report.

Table 1 – Bi-State Market Package Prioritization by Functional Area

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
Travel and Traffic Management		
ATMS01 Network Surveillance ATMS03 Surface Street Control ATMS06 Traffic Information Dissemination ATMS08 Traffic Incident Management System	ATMS07 Regional Traffic Control ATMS13 Standard Railroad Grade Crossing	ATMS04 Freeway Control ATMS15 Railroad Operations Coordination
Emergency Management		
EM01 Emergency Call Taking and Dispatch EM02 Emergency Routing EM05 Transportation Infrastructure Protection EM06 Wide Area Alert		EM09 Evacuation and Reentry Management EM10 Disaster Traveler Information
Maintenance and Construction Management		
MC03 Road Weather Data Collection MC04 Weather Information Processing and Distribution MC08 Work Zone Management MC10 Maintenance and Construction Activity Coordination	MC07 Roadway Maintenance and Construction	MC01 Maintenance and Construction Vehicle and Equipment Tracking MC02 Maintenance and Construction Vehicle Maintenance MC06 Winter Maintenance MC09 Work Zone Safety Monitoring

Table 1 – Bi-State Market Package Prioritization by Functional Area (continued)

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
Public Transportation Management		
APTS2 Transit Fixed Route Operations APTS3 Demand Response Transit Operations APTS4 Transit Passenger and Fare Management APTS7 Multi-modal Coordination APTS8 Transit Traveler Information	APTS1 Transit Vehicle Tracking APTS5 Transit Security	APTS6 Transit Maintenance
Commercial Vehicle Operations		
	CVO10 HAZMAT Management	CVO04 CV Administrative Processes CVO06 Weigh-in-Motion
Traveler Information		
ATIS1 Broadcast Traveler Information ATIS2 Interactive Traveler Information	ATIS5 ISP Based Route Coordination	
Archived Data Management		
	AD1 ITS Data Mart AD2 ITS Data Warehouse	

Interconnects, Interfaces and Data Flows

While customizing the Regional ITS architecture market packages, stakeholders mapped existing and planned ITS elements in the Bi-State Region to the subsystems in the National ITS Architecture. These elements included agencies, systems, and all of the ITS components in the Region. Subsystems are the highest level building blocks of the physical architecture, and the National ITS Architecture groups them into four major classes: Centers, Field, Vehicles, and Travelers. This mapping resulted in an interconnect diagram for the Region that is shown in **Figure 3**. This architecture diagram, also referred to as the "sausage diagram", shows the relationship of existing and planned systems in the Bi-State Region.

Interfaces have been identified for each element in the Bi-State Regional ITS Architecture, and each element has been mapped to those other elements with which it must interface. Architecture flows between the elements define the specific data that is exchanged. These data flows could be requests for information, alerts and messages, status requests, broadcast advisories, video images, or other information.

LEGEND

National ITS Architecture Entity	No Regional Architecture Elements Map To National ITS Architecture
National ITS Architecture Entity	Regional Architecture Elements Map To National ITS Architecture
———	Existing Connection
- - -	Future Connection
— — —	No Connection Planned

Transit Vehicle Subsystem
Fort Smith Demand Response Transit Vehicles
Fort Smith Fixed Route Transit Vehicles
Independent School District Buses
KIBOIS Area Transit Vehicles
Local Demand Response Transit Vehicles

Vehicle Subsystem
Commercial Vehicles
Fort Smith Fixed Route Transit Vehicles
Private Vehicles
Rail Operators Rail Cars

Commercial Vehicle Subsystem
Commercial Vehicles
Rail Operators Rail Cars

Maintenance and Const Vehicle Subsystem
AHTD Maintenance and Construction Vehicles
County Maintenance and Construction Vehicles
Municipal Maintenance and Construction Vehicles
ODOT Maintenance and Construction Vehicles

Emergency Vehicle Subsystem
Arkansas Highway Police Vehicles
Arkansas State Police Vehicles
County EMS Vehicles
County Sheriff Vehicles
Fort Smith EMS Vehicles
Fort Smith Fire Vehicles
Fort Smith Police Vehicles
Municipal Public Safety Vehicles
Oklahoma Public Safety Vehicles
Private Tow/Wrecker Vehicles
Public/Private Ambulance Vehicles
Van Buren EMS Vehicles
Van Buren Fire Vehicles
Van Buren Police Vehicles

* Elements are *planned*, not *existing*.

Remote Traveler Support Subsystem
AHTD Security Monitoring Field Equipment*
Fort Smith Airport Kiosks*
Fort Smith Transit Kiosks*
KIBOIS Area Transit Kiosks*
Rest Area/Truck Stop/Visitor Kiosks*

Personal Information Access Subsystem
Private Travelers Personal Computing Devices

Maintenance & Construction Management
AHTD Headquarters
AHTD Highway Conditions Reporting System
AHTD Resident Engineers Office
AHTD Statewide TMC*
AHTD Website
County Maintenance Operations
Fort Smith Maintenance Operations
Greenwood Maintenance Operations
Municipal Maintenance Operations*
ODOT Highway Conditions Reporting System
ODOT Maintenance Operations
ODOT Website
Other AHTD Area Maintenance Headquarters
Van Buren Maintenance Operations

Emergency Management Subsystem
AHTD District 4 TMC*
Arkansas Game and Fish
Arkansas Highway Police Dispatch
Arkansas State EOC
Arkansas State Police Headquarters
Arkansas State Police Dispatch Troop H
Army Corps of Engineers
Concierge Service Provider
County EMS Dispatch
County EOC*
County Sheriff Dispatch
Fort Smith EMS Dispatch
Fort Smith Police Communications Center
Fort Smith Transit Dispatch
Local Federal Offices
Municipal Public Safety Dispatch
ODOT Traffic Operations Center
Oklahoma Game and Fish
Oklahoma State Police Dispatch
Private Tow/Wrecker Dispatch
Public/Private Ambulance Dispatch
U.S. Coast Guard
Van Buren EMS Dispatch

Emergency Management Subsystem (Cont.)
Van Buren Police/Fire Dispatch

Information Service Provider Subsystem
AHTD Highway Conditions Reporting System
AHTD Public Information Office
AHTD Website
Arkansas 511 System*
Bi-State MPO Website
Fort Smith Advertising and Promotion Commission and Website
Fort Smith Transit Website
Fort Smith Website*
Greenwood Website*
KIBOIS Area Transit Website
Municipal Website*
ODOT Highway Conditions Reporting System
ODOT Public Information Office
ODOT Website
Oklahoma 511 System
Private Sector Traveler Information Services
Public Tourism Websites
Van Buren Advertising and Promotion Commission and Website
Van Buren Website*

Fleet and Freight Management Subsystem
Private Fleet Operations
Rail Operations Centers

Transit Management Subsystem
Fort Smith Transit Dispatch
Independent School District Dispatch
KIBOIS Area Transit Operations
Private Long Distance Bus Company Operations
River Valley Transportation Providers

Traffic Management Subsystem
AHTD Highway Conditions Reporting System
AHTD Statewide TMC*
AHTD District 4 TMC*
Fort Smith Traffic Operations Center
Greenwood Traffic Operations Center*
Municipal Traffic Operations Center*
ODOT Highway Conditions Reporting System
ODOT Traffic Operations Center
Van Buren Traffic Operations Center*

Commercial Vehicle Admin Subsystem
Municipal or County Permitting System

Commercial Vehicle Check Subsystem
Weigh in Motion Sites

Archived Data Management Subsystem
AHTD Maintenance Archive
Arkansas Regional Transportation Data Archive
ASP Statewide Crash Records Information System
Bi-State MPO Data Archive*
Fort Smith Transit Archive
KIBOIS Transit Archive
ODOT Statewide Crash Records Information System
Oklahoma Regional Transportation Data Archive

Archived Data User Systems
Archive Data Users

Asset Management
AHTD Asset Management System
County Asset Management System
Municipal Asset Management System
ODOT Asset Management System

Care Facility
Regional Medical Centers

Equipment Repair Facility
AHTD Equipment Repair Facility
County Equipment Repair Facility
Municipal Equipment Repair Facility
ODOT Equipment Repair Facility

Event Promoters
Fort Smith Advertising and Promotion Commission and Website
Municipal Advertising and Promotion Commission and Website*
Van Buren Advertising and Promotion Commission and Website

Financial Institution
Financial Institution
Service Agency

Maintenance and Const Admin Systems
AHTD Resident Engineers Office

Media
Local Print and Broadcast Media

Multimodal Transportation Service Provider
Fort Smith Regional Airport

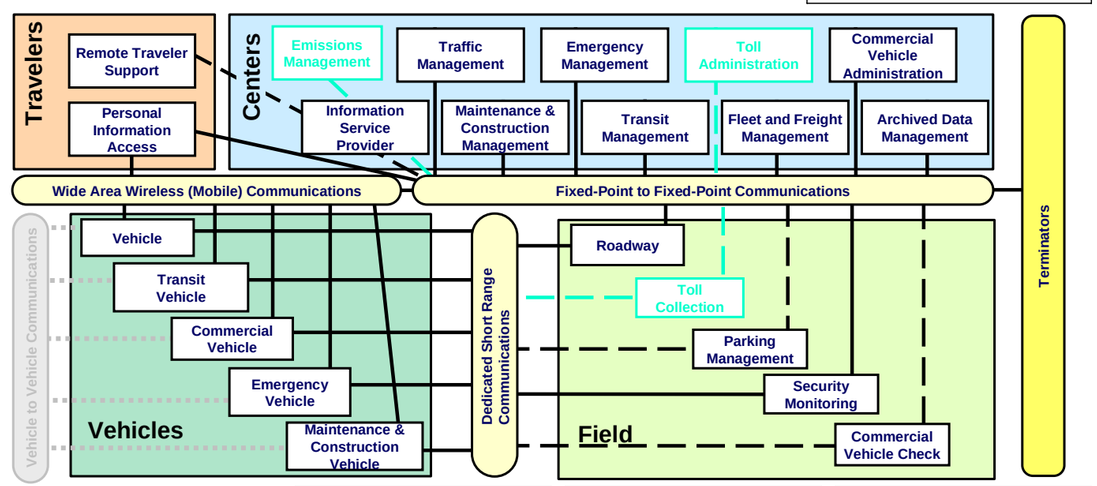
Other Emergency Management
Fort Smith Regional Mutual Aid Network

Other Traffic Management
Other AHTD District TMCs*

Rail Operations
Rail Operations Centers

Storage Facility
AHTD Storage Facilities
ODOT Storage Facilities

Transit Vehicle Operator
Fort Smith Transit Vehicle Operator
Independent School Bus Operator
KIBOIS Area Transit Vehicle Operator
Local Transit Vehicle Operator



Roadway Subsystem
AHTD CCTV Cameras*
AHTD Field Equipment*
AHTD Field Sensors*
County ITS Field Equipment
Fort Smith Field Equipment
Fort Smith School Zone Pager System
Greenwood Field Equipment*
Greenwood School Zone Pager System
Municipal ITS Field Equipment*
Municipal School Zone Pager System

Roadway Subsystem
ODOT Field Equipment
Van Buren Field Equipment
Van Buren Maintenance Field Devices
Van Buren School Zone Pager System

Security Monitoring Subsystem
AHTD Security Monitoring Field Equipment*
Fort Smith Security Monitoring Field Equipment*
ODOT Field Equipment

Parking Management
Fort Smith Intermodal Terminal

Traveler Card
Regional Smart Card*

Wayside Equipment
Rail Operators Wayside Equipment

Weather Service
National Weather Service
Private Weather Services

Figure 3 – Bi-State Regional System Interconnect Diagram

Standards

With the required interfaces and interconnections identified, standards that could potentially be applied to the Bi-State Region were identified. Standards are an important tool that will allow efficient implementation of the elements in the Bi-State Regional ITS Architecture over time. They facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances, vendors change, and as new approaches evolve.

Operational Concept

An Operational Concept documents each stakeholder's current and future roles and responsibilities in the operation of the regional ITS. The operational concept included in the Bi-State Regional ITS Architecture documents these roles and responsibilities across a range of transportation services. The services covered are:

- Traffic Signal Control;
- Highway Management;
- Incident Management;
- Transit Management;
- Traveler Information;
- Emergency Management;
- Maintenance and Construction Management;
- Archive Data Management; and
- Electronic Payment.

Agreements

The Regional ITS Architecture for the Bi-State 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 Bi-State 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.

With the implementation of ITS technologies, the integration of systems from one or more agencies, and the anticipated level of information exchange identified in the architecture, it is likely that formal agreements between agencies will be needed in the future. 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 will also outline specific funding responsibilities, where appropriate and applicable.

The following is a list of potential agreements for the Bi-State Region based on the interfaces identified in the Regional ITS Architecture and recommended ITS projects in the Deployment Plan:

- Joint operations/shared control agreements among public agencies;
- Joint operations/shared control agreement between public agencies and private media and information service providers;
- Data sharing and usage agreements among public agencies;
- Data sharing and usage agreements among public agencies and private media and information service providers; and
- Mutual aid agreements among public agencies.

It is important to note that as ITS services and systems are implemented in the Region, part of the planning and review process for those projects should include a review of potential agreements that would be needed for implementation or operations.

ITS Architecture Documentation

The Regional ITS Architecture for the Bi-State Region is documented in a final report. Stakeholders were brought together to review the Regional ITS Architecture and provide feedback. The final architecture report was not prepared until after completion of the Bi-State Regional ITS Deployment Plan to allow for modifications based on information and input received for the Regional ITS Deployment Plan recommendations.

A website with the Regional ITS Architectures was also maintained. The website allowed stakeholders to review the architecture and provide comments directly to the project team through the website. At the time this report was published, the Bi-State Regional ITS Architecture website was being hosted at www.consystec.com. The site can be accessed by selecting the link to Arkansas, and then the link to the Bi-State Region. The Bi-State MPO plans to host this information on their site in the future.

BI-STATE REGIONAL ITS DEPLOYMENT PLAN

Although development of an ITS deployment plan was not required by the FHWA Final Rule for the architecture, the Final Rule does request a sequence of projects required for implementation. Capitalizing on the momentum and interagency dialogue established during the development of the Regional ITS Architecture, AHTD chose to expand on the project sequence requirement to develop a formal ITS deployment plan for the Region.

The Bi-State Regional ITS Architecture provided the framework and prioritized the key functions and services desired by stakeholders in the Region. The Bi-State Regional ITS Deployment Plan builds on the architecture by outlining specific ITS project recommendations and strategies for the Region and identifying deployment timeframes so that the recommended projects and strategies can be implemented over time. Agency responsibilities for implementing and operating the systems are also a key component of the Regional ITS Deployment Plan.

ITS Project Recommendations for the Bi-State Region

Using the needs, market package priorities, and any planned projects identified by the stakeholders during the architecture process, a list of recommended ITS projects for the Bi-State Region was developed. These projects were refined and additions and deletions were made by the Regional stakeholders at the ITS Deployment Plan Workshop in September 2005.

For each functional area, stakeholders grouped projects into timeframes for deployment based on priority, dependence on other projects, technology, and feasibility. The timeframes have been loosely defined as 0-5 years, 5-10 years, and 10-20 years for short-term, mid-term, and long-term, respectively. Actual deployment timeframes will be dependent on inclusion in the Transportation Improvement Program (TIP) and identification of funding sources. Most projects for the Region are infrastructure based; however, there are some recommendations that focus more on institutional practices and interconnectivity to enhance coordination and communications.

Each recommended project for the Bi-State Region was included in a table of projects grouped by functional area and separated into priorities by approximate implementation timeframe. These tables provided the name of the project, a project description, primary responsible agency, a planning level estimate of probable cost, an indication of whether or not funding had been identified for that specific project, and a listing of applicable market packages.

Table 2 summarizes the ITS projects recommended for the Bi-State Region. This summary is divided into the major program areas and subdivided by timeframe.

Table 2 – Recommended ITS Projects for the Bi-State Region

Project Time Frame	Project Name (Responsible Agency)
Travel and Traffic Management	
Short Term Projects 5-year Horizon	▪ AHTD Dynamic Message Signs (DMS) on I-40 and I-540 (AHTD) ▪ City of Fort Smith Transportation Management Center Phase 1 (City of Fort Smith, Fort Smith Transit) ▪ City of Fort Smith Signal Coordination and Upgrades (City of Fort Smith) ▪ City of Van Buren Traffic Operations Center (TOC) (City of Van Buren) ▪ City of Van Buren Traffic Signal System Optimization and Staff Training (City of Van Buren) ▪ City of Greenwood TOC (City of Greenwood) ▪ City of Greenwood Signal Coordination and Upgrades (City of Greenwood) ▪ Regional Communications Master Plan (AHTD, City of Fort Smith, City of Van Buren, City of Greenwood) ▪ Regional Communications Implementation Phase 1 (AHTD, City of Fort Smith, City of Van Buren, City of Greenwood)
Mid Term Projects 10-year Horizon	▪ AHTD Closed-Circuit Television (CCTV) Cameras on I-40 and I-540 (AHTD) ▪ City of Fort Smith Transportation Management Center Phase 2 (City of Fort Smith, Fort Smith Transit) ▪ City of Van Buren School Zone Flasher Pager Control System (City of Van Buren) ▪ City of Greenwood School Zone Flasher Pager Control System (City of Greenwood) ▪ Fort Smith Airport Highway Advisory Radio (HAR) (Fort Smith Airport) ▪ Fort Smith Airport Traveler Information Kiosk (Fort Smith Airport) ▪ Regional Communications Implementation Phase 2 (AHTD, City of Fort Smith, City of Van Buren, City of Greenwood) ▪ Media Liaison and Coordination (AHTD, City of Fort Smith, City of Van Buren, City of Greenwood, Municipalities)
Long Term Projects 20-year Horizon	▪ Regional Traffic Management Center (TMC) (City of Fort Smith, City of Van Buren, City of Greenwood, Municipalities)
Emergency Management	
Short Term Projects 5-year Horizon	▪ City of Van Buren Emergency Services Computer Aided Dispatch (CAD) Upgrade (City of Van Buren)
Mid Term Projects 10-year Horizon	▪ City of Van Buren Fire and Police Department Automated Vehicle Location (AVL) and Mobile Data Terminals (MDTs) (City of Van Buren) ▪ City of Fort Smith Fire and Police Department AVL and MDTs (City of Fort Smith) ▪ City of Greenwood Emergency Vehicle Signal Preemption (City of Greenwood) ▪ City of Van Buren Emergency Vehicle Signal Preemption (City of Van Buren)

Table 2 – Recommended ITS Projects for the Bi-State Region (continued)

Project Time Frame	Project Name (Responsible Agency)
Maintenance and Construction Management	
Short Term Projects 5-year Horizon	▪ City of Greenwood Flood Detection Stations (City of Greenwood) ▪ City of Fort Smith Portable DMS (City of Fort Smith)
Mid Term Projects 10-year Horizon	▪ City of Van Buren Maintenance Geographic Information System (GIS) Database (City of Van Buren) ▪ Regional Portable DMS Fleet (Bi-State MPO)
Public Transportation Management	
Short Term Projects 5-year Horizon	▪ Fort Smith Transit Intermodal Terminal Video Surveillance (Fort Smith Transit) ▪ Regional Transit Coordination System (Fort Smith Transit, River Valley Transit Providers)
Mid Term Projects 10-year Horizon	▪ Fort Smith Transit Vehicle Video Surveillance (Fort Smith Transit) ▪ Fort Smith Transit Traveler Information Kiosks (Fort Smith Transit) ▪ Greenwood Public Schools AVL on Buses (Greenwood Public Schools)
Long Term Projects 20-year Horizon	▪ Fort Smith Transit AVL (Fort Smith Transit) ▪ Fort Smith Transit Audible Bus Stop Information (Fort Smith Transit)
Archived Data Management	
Mid Term Projects 10-year Horizon	▪ Bi-State MPO Data Warehouse (Bi-State MPO)
Long Term Projects 20-year Horizon	▪ Fort Smith Transit Data Mart (Fort Smith Transit)

Projects of Statewide Significance

Projects of statewide significance are projects that the Bi-State Region felt were important to the Region, but that would most likely be implemented on a statewide level rather than a regional level. The stakeholders recommended that these projects be considered for deployment statewide and expressed a willingness to support the projects as needed. Because the implementation schedule for these projects will be driven at the state level and not the regional level, a timeframe for implementation has not been included. Costs have also not been included as further study will be needed to determine the costs on a statewide level and the costs should not have an impact on funding for the Region. These projects include:

- AHTD/ODOT Communications Connection;
- Arkansas 511 Implementation; and
- Statewide Transit Coordination System.

Communications

One of the primary purposes of an ITS architecture is to identify the data that needs to flow between agencies. Much of this data, such as video from CCTV cameras and real time traffic information, can require high bandwidth communication; therefore, no ITS deployment is complete without addressing the communications needed for deployment.

In the Regional ITS Deployment Plan, a project to develop a Regional Communications Master Plan is recommended. This master plan should provide the Bi-State Region with guidance on the most feasible communication system to deploy. Communication needs should be considered not just of transportation agencies but also of other government agencies to allow for increased potential for resource sharing. Resource sharing between agencies can often be a very cost effective way to deploy or maintain communications systems. Reliability and maintenance of the communication system must also be carefully considered. Although it will likely not be possible to implement a complete communication system that serves the region's ITS needs through a single project, having a master plan available will allow agencies to incrementally deploy pieces of the communication system when implementing other projects while ultimately working towards deployment of the full master planned system.

MAINTAINING THE REGIONAL ITS ARCHITECTURE AND ITS DEPLOYMENT PLAN

The Regional ITS Architecture and ITS Deployment Plan developed for the Bi-State Region addresses the Region's vision for ITS implementation at the time the plan was developed. As the Region grows, needs will change and as technology progresses new ITS opportunities will arise. As an example, at the time this architecture was developed traffic congestion was not a major concern in the Region and therefore traffic management did not play a large role in this version. As more development occurs in the Region, traffic congestion could become a larger concern and need to be a more significant focus. Shifts in regional focus as well as changes in the National ITS Architecture will necessitate that the Bi-State Regional ITS Architecture be updated to remain a useful resource for the Region.

At the September 2005 project workshop stakeholders outlined a procedure for documenting changes to the Regional ITS Architecture. Stakeholders also decided to hold a formal review of the Regional ITS Architecture and Deployment Plan every two years in coordination with the TIP update cycle and a major revision every five years to correspond with the Long Range Plan Update. As part of the reviews, the project listings in the Regional ITS Deployment Plan should be examined and updated as appropriate to reflect projects that have been implemented, changes in project priorities, and new projects that need to be added to the plan. A procedure has also been established to address the changes identified between updates. A copy of the change documentation form has been included as **Figure 4**.

Bi-State Regional ITS Architecture

Architecture Maintenance Documentation Form

Please complete the following questionnaire to document changes for the Bi-State Regional ITS Architecture. Modifications will be made during the next architecture update.

Agency	
Agency Contact Person	
Street Address	
City	
State, Zip Code	
Telephone	
Fax	
E-Mail	

Change Information

Please indicate the type of change:
____ new market package (please attach sketch if possible)
____ existing market package modification (please attach marked up market package)
____ other: _____

Please indicate the reason for the change:
____ new stakeholder
____ new project/element(s)

Market Package(s) Impacted	
Describe requested change	
Have you coordinated with any other stakeholders on this change? If so, who?	
Are there any additional stakeholders that could be affected by this change?	

Please submit change forms to:

Ken O'Donnell
Bi-State MPO
PO Box 2067
Fort Smith, AR 72902
479-785-2651

Date Request Filed: _____

Figure 4 – Architecture Maintenance Documentation Form