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

# West Memphis Region

# Regional ITS Deployment Plan

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# TABLE OF CONTENTS

REGIONAL ITS DEPLOYMENT PLAN


**1. INTRODUCTION ..... 1**

**1.1 Project Overview ..... 1**
**1.2 Document Overview ..... 1**
**1.3 The West Memphis Region ..... 2**
*1.3.1 Region Overview ..... 2*
*1.3.2 Stakeholders ..... 2*

**2. REGIONAL ITS ARCHITECTURE MARKET PACKAGE IMPLEMENTATION ..... 4**

**2.1 Market Package Prioritization ..... 4**
**2.2 Market Packages and Supporting Projects ..... 5**
*2.2.1 Traffic Management Service Area ..... 6*
*2.2.2 Emergency Management Service Area ..... 9*
*2.2.3 Maintenance and Construction Management Service Area ..... 11*
*2.2.4 Public Transportation Management Service Area ..... 13*
*2.2.5 Commercial Vehicle Operations Service Area ..... 14*
*2.2.6 Traveler Information Service Area ..... 15*
*2.2.7 Archived Data Management Service Area ..... 16*

**3. PROJECT RECOMMENDATIONS ..... 17**

**3.1 Regional Projects ..... 17**
**3.2 Projects of Statewide Significance ..... 28**

**4. MAINTAINING THE REGIONAL ITS DEPLOYMENT PLAN ..... 30**

# TABLE OF CONTENTS

REGIONAL ITS DEPLOYMENT PLAN

## LIST OF TABLES

Table 1 – West Memphis Market Package Prioritization by Functional Area ..... 4
Table 2 – Traffic Management Market Packages and Projects ..... 6
Table 3 – Emergency Management Market Packages and Projects ..... 9
Table 4 – Maintenance and Construction Management Market Packages and Projects ..... 11
Table 5 – Public Transportation Management Market Packages and Projects ..... 13
Table 6 – Commercial Vehicle Operations Market Packages and Projects ..... 14
Table 7 – Traveler Information Market Packages and Projects ..... 15
Table 8 – Archived Data Management Market Packages and Projects ..... 16
Table 9 – Travel and Traffic Management Project Recommendations ..... 18
Table 10 – Emergency Management Project Recommendations ..... 23
Table 11 – Maintenance and Construction Management Project Recommendations ..... 25
Table 12 – Public Transportation Management Project Recommendations ..... 26
Table 13 – Archived Data Management Project Recommendations ..... 27
Table 14 – Projects of Statewide Significance ..... 29

# LIST OF ACRONYMS

| | |
|---|---|
| AD | Archived Data |
| AHTD | Arkansas State Highway and Transportation Department |
| AMBER | America's Missing: Broadcast Emergency Response |
| APTS | Advanced Public Transportation Systems |
| ATIS | Advanced Travel Information System |
| ATMS | Advanced Traffic Management System |
| CCTV | Closed-Circuit Television |
| CVISN | Commercial Vehicle Information Systems and Networks |
| CVO | Commercial Vehicle Operations |
| DMS | Dynamic Message Sign |
| EM | Emergency Management |
| EMS | Emergency Medical Services |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| HAR | Highway Advisory Radio |
| HAZMAT | Hazardous Materials |
| HCRS | Highway Closure and Restriction System |
| HRI | Highway Rail Intersections |
| ITS | Intelligent Transportation System |
| MAP | Motorist Assist Patrol |
| MATA | Memphis Area Transit Authority |
| MC | Maintenance and Construction |
| MPO | Metropolitan Planning Organization |
| TDOT | Tennessee Department of Transportation |
| TMC | Transportation Management Center |
| TOC | Traffic Operations Center |

# 1. INTRODUCTION

## 1.1 Project Overview

The West Memphis Region has developed a Regional Intelligent Transportation System (ITS) Architecture under the direction of the Arkansas State Highway and Transportation Department (AHTD) with support from the West Memphis MPO, the Metropolitan Planning Organization (MPO) for the 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 Regional ITS Architecture focuses on the functionality that ITS could provide in the Region as well as how those functions would be operated by agencies in and around the West Memphis Region. The Regional ITS Architecture also satisfies an important requirement from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) regarding transportation and funding. A FHWA Final Rule and a FTA Final Policy issued in 2001 requires that regions develop an ITS architecture and show how ITS projects conform to that regional ITS architecture in order to receive federal funding.

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

The ITS Deployment Plan also ties each project back to the architecture by identifying the market packages that correspond to each project. If projects are identified that do not correspond to market packages, the ITS architecture can be revised easily while still in draft format. The resulting ITS deployment projects from this effort should be clearly supported by the ITS architecture.

The West Memphis Regional ITS Architecture and the 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, this plan should be periodically reviewed and updated.

## 1.2 Document Overview

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

**Section 1 – Introduction**

This section provides an overview of the National ITS Architecture requirements, the West Memphis Regional ITS Deployment Plan, and the key features and stakeholders in the West Memphis Region.

**Section 2 – Application of Regional ITS Architecture Market Packages**

A summary of the market packages selected and prioritized for the Region is provided in this section. Each market package is described and a listing of projects that support implementation of the services contained in the market package is provided.

**Section 3 – Project Recommendations**

This section contains project recommendations to address stakeholder needs and goals for ITS implementation in the Region. Each project includes a description of the project, responsible agency, an opinion of probable cost, whether or not funding has been identified, and a listing of market packages that are associated with the project.

**Section 4 – Maintaining the Regional ITS Deployment Plan**

A brief description of the maintenance procedure for the Regional ITS Deployment Plan is provided in this section.

## 1.3 The West Memphis Region

### *1.3.1 Region Overview*

The West Memphis Region is defined by the boundaries of the West Memphis – Marion Transportation Study with extensions of the MPO's boundaries northward along I-55 and westward along I-40. These extensions were included to accommodate the possibility of future ITS equipment coverage along the two interstate highways. The Region encompasses approximately 500 square miles in eastern Arkansas and includes the majority of Crittenden County, Arkansas. The Crittenden County population was 51,488 in 2004. The largest city in the area is West Memphis.

The West Memphis Region is served by numerous State and Federal highways. The primary roadway facilities include I-40, I-55, US 64, US 70 (East Broadway Boulevard), and SR 77 (Missouri Street).

I-40 and I-55 merge in West Memphis and follow the same alignment for about two miles. These interstate routes diverge just east of West Memphis and cross the Mississippi River into Memphis, Tennessee on two separate bridges. These bridges are key infrastructure for both the West Memphis and Memphis Regions as well as in the entire Mississippi River corridor. This merge/diverge area in combination with the large number of commercial vehicles on both roadways and traffic commuting to and from Memphis provides operational challenges for the freeway system in the West Memphis area.

### *1.3.2 Stakeholders*

Due to the fact that 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 a region.

The following stakeholder agencies have participated in the West Memphis Region project workshops or provided input to the study team:

- AHTD District 1;
- AHTD Highway Police;
- AHTD Planning and Research Division;
- City of Marion;
- City of Marion Police Department;
- City of West Memphis;
- City of West Memphis Fire Department;
- Crittenden County;
- Crittenden County Sheriff's Department;
- FHWA Arkansas Division;
- Shelby County Department of Regional Services;
- Tennessee Department of Transportation Region 4; and
- West Memphis MPO.

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

# 2. REGIONAL ITS ARCHITECTURE MARKET PACKAGE IMPLEMENTATION

Of the 85 market packages available in Version 5.1 of the National ITS Architecture, 33 were selected and customized for deployment in the West Memphis Region. The market packages outline the functions that stakeholders envision ITS to perform in coming years. The Deployment Plan builds on those market packages through the development of project concepts to implement in the Region.

## 2.1 Market Package Prioritization

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**. More detail on the ITS Market Packages is provided in the ITS Architecture report.

**Table 1 – West Memphis 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<br>ATMS06 Traffic Information Dissemination<br>ATMS07 Regional Traffic Control<br>ATMS08 Traffic Incident Management System<br>ATMS13 Standard Railroad Grade Crossing<br>ATMS15 Railroad Operations Coordination | ATMS03 Surface Street Control | |
| ***Emergency Management*** | | |
| EM01 Emergency Call-Taking and Dispatch<br>EM04 Roadway Service Patrols<br>EM05 Transportation Infrastructure Protection<br>EM06 Wide-Area Alert<br>EM07 Early Warning System<br>EM08 Disaster Response and Recovery<br>EM10 Disaster Traveler Information | EM02 Emergency Routing | EM09 Evacuation and Reentry Management |

**Table 1 – West Memphis Market Package Prioritization by Functional Area (continued)**

| High Priority Market Packages | Medium Priority Market Packages | Low Priority Market Packages |
|---|---|---|
| ***Maintenance and Construction Management*** | | |
| MC07 Roadway Maintenance and Construction<br>MC08 Work Zone Management<br>MC10 Maintenance and Construction Activity Coordination | MC03 Road Weather Data Collection<br>MC04 Weather Information Processing and Distribution | MC06 Winter Maintenance<br>MC09 Work Zone Safety Monitoring |
| ***Public Transportation Management*** | | |
| | APTS1 Transit Vehicle Tracking<br>APTS2 Transit Fixed Route Operations<br>APTS3 Demand Response Transit Operations | APTS5 Transit Security |
| ***Commercial Vehicle Operations*** | | |
| CVO10 HAZMAT Management<br>CVO11 Roadside HAZMAT Security Detection and Mitigation | | |
| ***Traveler Information*** | | |
| ATIS1 Broadcast Traveler Information | ATIS2 Interactive Traveler Information | |
| ***Archived Data Management*** | | |
| AD1 ITS Data Mart | AD2 ITS Data Warehouse | |

The market package prioritization was a primary factor in developing recommendations for ITS deployment and integration in the West Memphis Region. These priorities identified the key ITS services that are desired by stakeholders in the Region, as well as the interfaces that need to be established to provide integrated functionality. It is important to note that the high, medium, and low prioritization does not necessarily correspond to any specific time frame (such as five, ten, or twenty year deployment horizon). For example, a market package can be a high priority, but because of funding or prerequisite project requirements, it might not be feasible for deployment for several years. Maturity and availability of technology were also considered in prioritizing the market packages. Another consideration included whether or not the market package was better suited for private deployment and operations rather than public sector deployment.

## 2.2 Market Packages and Supporting Projects

In order to implement the ITS market package services in the West Memphis Region, each market package was reviewed to determine what projects should be deployed in order to provide the desired services of that market package. Stakeholders provided a great deal of feedback on these projects at an ITS Deployment Plan Workshop. Although the timeframe of the Deployment Plan extended out to twenty years, stakeholders generally identified and focused on shorter term projects that were more likely to be funded.

It should be noted that not every market package has an associated ITS project. Several market packages were identified as being important to the Region; however, at this time there are no

projects that stakeholders felt were feasible enough to document in the ITS Deployment Plan. In the future, it is likely that additional projects will be added to the ITS Deployment Plan to implement these market packages.

The market packages in the following subsections are organized by service areas in the order they appear in the National ITS Architecture. Each market package includes:

- A brief definition of the market package (which have been modified from the National ITS Architecture definitions);
- Stakeholder priority for the market package; and
- Recommended projects that will address some or all of the services that are contained in the market package.

### *2.2.1 Traffic Management Service Area*

The following market packages and related projects implement the traffic management service area functions. These traffic management service areas represent some of the most commonly deployed projects, such as closed-circuit television (CCTV) cameras, dynamic message signs (DMS), transportation management centers (TMCs), and traffic operations centers (TOCs), and traffic signal systems. It is expected that many of the market packages in this area will be deployed prior to market packages in other areas.

**Table 2 – Traffic Management Market Packages and Projects**

| **Network Surveillance (ATMS01)** | **High Priority** |
|---|---|
| Includes traffic detectors, CCTV cameras, other surveillance equipment, supporting field equipment, and fixed point to point communications to transmit the collected data back to a traffic management center. | |
| **Recommended Projects**<br>▪ AHTD CCTV Cameras and DMS Expansion<br>▪ AHTD CCTV Cameras and DMS on I-40 and I-55<br>▪ AHTD District 1 TMC<br>▪ AHTD Infrastructure Security Monitoring Phase 1<br>▪ AHTD Infrastructure Security Monitoring Phase 2<br>▪ AHTD Speed Detection on I-40 and I-55<br>▪ AHTD Statewide TMC<br>▪ AHTD/City of West Memphis Road Weather Data Collection<br>▪ AHTD-Crittenden County TOC<br>▪ AHTD/TDOT Communications Connection<br>▪ TDOT ITS Equipment on I-40 and I-55 | |

**Table 2 – Traffic Management Market Packages and Projects (continued)**

| **Surface Street Control (ATMS03)** | **Medium Priority** |
|---|---|
| Provides the central control and monitoring equipment, communication links, and signal control equipment that support local street and/or arterial traffic management. This market package is consistent with typical urban traffic signal control systems. | |
| **Recommended Projects**<br>▪ AHTD Standard Railroad Grade Crossing Coordination<br>▪ AHTD/City of West Memphis Signal Study<br>▪ AHTD/City of West Memphis Signal System Coordination and Upgrades<br>▪ City of West Memphis Fire/EMS Signal Preemption | |

| **Traffic Information Dissemination (ATMS06)** | **High Priority** |
|---|---|
| Provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. Information can include traffic and road conditions, closure and detour information, incident information, emergency alerts and driver advisories. | |
| **Recommended Projects**<br>▪ AHTD AMBER Alert DMS on I-40<br>▪ AHTD CCTV Cameras and DMS Expansion<br>▪ AHTD CCTV Cameras and DMS on I-40 and I-55<br>▪ AHTD District 1 TMC<br>▪ AHTD DMS on Arterials<br>▪ AHTD HAR on I-40<br>▪ AHTD Portable DMS<br>▪ AHTD Speed Detection on I-40 and I-55<br>▪ AHTD Statewide TMC<br>▪ AHTD-Crittenden County TOC<br>▪ TDOT ITS Equipment on I-40 and I-55 | |

| **Regional Traffic Control (ATMS07)** | **High Priority** |
|---|---|
| Facilitates the sharing of traffic information and control among traffic management centers to support a regional control strategy. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. | |
| **Recommended Projects**<br>▪ AHTD District 1 TMC<br>▪ AHTD Statewide TMC<br>▪ AHTD/TDOT Communications Connection | |

**Table 2 – Traffic Management Market Packages and Projects (continued)**

| **Traffic Incident Management System (ATMS08)** | **High Priority** |
|---|---|
| Manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. This market package includes incident detection capabilities and coordination with other agencies. It supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel. | |
| **Recommended Projects**<br>▪ AHTD CCTV Cameras and DMS on I-40 and I-55<br>▪ AHTD District 1 TMC<br>▪ AHTD Motorist Assist Patrol (MAP) Dispatch<br>▪ AHTD Statewide TMC<br>▪ AHTD-Crittenden County TOC<br>▪ AHTD/TDOT Communications Connection<br>▪ West Memphis Regional Mutual Aid Agreements | |

| **Standard Railroad Grade Crossing (ATMS13)** | **High Priority** |
|---|---|
| Manages highway traffic at highway-rail intersections (HRIs) where rail operations speeds are less than 80 mph. | |
| **Recommended Projects**<br>▪ AHTD Standard Railroad Grade Crossing Coordination | |

| **Railroad Operations Coordination (ATMS15)** | **High Priority** |
|---|---|
| Provides an additional level of strategic coordination between freight rail operations and traffic management centers. Could include train schedules, maintenance schedules or any other anticipated HRI closures. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

### *2.2.2 Emergency Management Service Area*

The following market packages and related projects implement ITS functions that support emergency management activities. These market packages are important for incident response, coordination of the emergency management and transportation systems, traveler information during disasters, and protection of the transportation infrastructure.

**Table 3 – Emergency Management Market Packages and Projects**

| **Emergency Call-Taking and Dispatch (EM01)** | **High Priority** |
|---|---|
| Provides basic public safety call-taking and dispatch services. Includes emergency vehicle equipment, equipment used to receive and route emergency calls, wireless communications, and coordination between emergency management agencies. | |
| **Recommended Projects** | |
| ▪ West Memphis Regional Mutual Aid Agreements | |

| **Emergency Routing (EM02)** | **Medium Priority** |
|---|---|
| Supports automated vehicle location and dynamic routing of emergency vehicles. Traffic information, road conditions and suggested routing information are provided to enhance emergency vehicle routing. Includes signal preemption and priority applications. | |
| **Recommended Projects** | |
| ▪ City of West Memphis Fire/EMS Signal Preemption | |

| **Roadway Service Patrols (EM04)** | **High Priority** |
|---|---|
| Supports roadway service patrol vehicles that monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). | |
| **Recommended Projects** | |
| ▪ AHTD Motorist Assist Patrol (MAP) Dispatch | |

| **Transportation Infrastructure Protection (EM05)** | **High Priority** |
|---|---|
| Includes the monitoring of transportation infrastructure (e.g. bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment as well as barriers and safeguard systems to preclude an incident, control access during and after an incident, or to mitigate the impact of an incident. Threats can be acts of nature, terrorist attacks, or other incidents causing damage to the infrastructure. | |
| **Recommended Projects** | |
| ▪ AHTD Infrastructure Security Monitoring Phase 1 | |

**Table 3 – Emergency Management Market Packages and Projects (continued)**

| Wide Area Alert (EM06) | High Priority |
|---|---|
| Uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather, civil emergencies, or other situations that pose a threat to life and property. | |
| **Recommended Projects**<br>▪ AHTD AMBER Alert DMS on I-40<br>▪ AHTD Infrastructure Security Monitoring Phase 2<br>▪ West Memphis AMBER Alert Dissemination<br>▪ DMS AMBER Alert Message Dissemination System | |

| Early Warning System (EM07) | High Priority |
|---|---|
| Monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| Disaster Response and Recovery (EM08) | High Priority |
|---|---|
| Enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| Evacuation and Reentry Management (EM09) | Low Priority |
|---|---|
| Supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. This market package supports both anticipated, well-planned, and orderly evacuations such as for a hurricane, as well as sudden evacuations with little or no time for preparation or public warning such as a terrorist act. Employs a number of strategies to maximize capacity along an evacuation route including coordination with transit. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

**Table 3 – Emergency Management Market Packages and Projects (continued)**

| **Disaster Traveler Information (EM10)** | **High Priority** |
|---|---|
| Uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. | |
| **Recommended Projects**<br>▪ AHTD AMBER Alert DMS on I-40<br>▪ AHTD CCTV Cameras and DMS Expansion<br>▪ AHTD CCTV Cameras and DMS on I-40 and I-55<br>▪ AHTD HAR on I-40<br>▪ Media Liaison and Coordination<br>▪ TDOT ITS Equipment on I-40 and I-55 | |

### *2.2.3 Maintenance and Construction Management Service Area*

The following market packages and related projects implement maintenance and construction management ITS functions. Maintenance and construction activity coordination, portable DMS for road closures and detour information, and road weather data collection primarily for flooding were identified as priorities for the Region.

**Table 4 – Maintenance and Construction Management Market Packages and Projects**

| **Road Weather Data Collection (MC03)** | **Medium Priority** |
|---|---|
| Collects current road weather conditions using data collected from environmental sensors deployed on and about the roadway. | |
| **Recommended Projects**<br>▪ AHTD/City of West Memphis Road Weather Data Collection | |

| **Weather Information Processing and Distribution (MC04)** | **Medium Priority** |
|---|---|
| Processes and distributes the environmental information collected from the Road Weather Data Collection market package. This market package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so system operators can make decisions on corrective actions to take. | |
| **Recommended Projects**<br>▪ AHTD/City of West Memphis Road Weather Data Collection | |

**Table 4 – Maintenance and Construction Management Market Packages and Projects (continued)**

| Winter Maintenance (MC06) | Low Priority |
|---|---|
| Supports winter road maintenance. Monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| Roadway Maintenance and Construction (MC07) | High Priority |
|---|---|
| Supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities. | |
| **Recommended Projects**<br>▪ Maintenance and Construction Activity Coordination | |

| Work Zone Management (MC08) | High Priority |
|---|---|
| Directs activity in work zones, controlling traffic through portable dynamic message signs and informing other groups of activity for better coordination management. Also provides speed and delay information to motorists prior to the work zone. | |
| **Recommended Projects**<br>▪ AHTD Portable DMS | |

| Work Zone Safety Monitoring (MC09) | Low Priority |
|---|---|
| Includes systems that improve work crew safety and reduce collisions between the motoring public and maintenance and construction vehicles. Detects vehicle intrusions in work zones and warns workers and drivers of safety hazards when encroachment occurs. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| Maintenance and Construction Activity Coordination (MC10) | High Priority |
|---|---|
| Supports the dissemination of maintenance and construction activity information to centers that can utilize it as part of their operations. (i.e., traffic management, transit, emergency management) | |
| **Recommended Projects**<br>▪ Maintenance and Construction Activity Coordination | |

### *2.2.4 Public Transportation Management Service Area*

The following market packages and related projects implement public transportation management ITS functions. Public transportation in the West Memphis Region is provided by the Memphis Area Transit Authority (MATA). Market packages and projects for MATA services are covered in the Memphis Area Regional ITS Architecture, a separate study effort completed by the Tennessee Department of Transportation in 2002. In the West Memphis Regional ITS Architecture and Deployment Plan, transit market packages that would apply specifically to West Memphis were noted. One project, Transit Information for 511, was identified that relates to transit. The purpose of this project was to provide transit information into a 511 traveler information number in West Memphis should 511 be implemented in Arkansas. This project is shown as part of the Interactive Traveler Information (ATIS2) market package.

**Table 5 – Public Transportation Management Market Packages and Projects**

| **Transit Vehicle Tracking (APTS1)** | **Medium Priority** |
|---|---|
| Monitors current transit vehicle location using an automated vehicle location system. Location data may be used to determine real time schedule adherence and update the transit system's schedule in real time. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| **Transit Fixed-Route Operations (APTS2)** | **Medium Priority** |
|---|---|
| Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for fixed-route and flexible-route transit services. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| **Demand Response Transit Operations (APTS3)** | **Medium Priority** |
|---|---|
| Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for demand responsive transit services. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| **Transit Security (APTS5)** | **Low Priority** |
|---|---|
| Provides for the physical security of transit passengers and transit vehicle operators. Includes on-board security cameras and panic buttons. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

### *2.2.5 Commercial Vehicle Operations Service Area*

There were two market packages that were identified that related to commercial vehicle operations in the Region. Planning for commercial vehicle operations is also being done on a statewide level as part of the Commercial Vehicle Information Systems and Networks (CVISN) program. As part of this program, projects are being developed on a statewide basis rather then a regional basis. Although several market packages were identified by stakeholders for local deployment, no projects were currently identified for implementation of these market packages.

**Table 6 – Commercial Vehicle Operations Market Packages and Projects**

| **HAZMAT Management (CVO10)** | **High Priority** |
|---|---|
| Integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| **Roadside HAZMAT Security Detection and Mitigation (CVO11)** | **High Priority** |
|---|---|
| Provides the capability to detect and classify security sensitive HAZMAT on commercial vehicles using roadside sensing and imaging technology. Credentials information can be accessed to verify if the commercial driver, vehicle, and carrier are permitted to transport the identified HAZMAT. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

### *2.2.6 Traveler Information Service Area*

The following market packages and related projects implement traveler information ITS functions. Traveler information service area projects address market packages that broadcast traveler information over a wide area. A possible future 511 traveler information phone number as well as improved media liaison and coordination were identified as projects to facilitate broadcast traveler information. Traveler information provided at specific location on the roadway, such as DMS, is addressed in the ATMS06 – Traffic Information Dissemination market package in Section 2.2.1.

**Table 7 – Traveler Information Market Packages and Projects**

| **Broadcast Traveler Information (ATIS1)** | **High Priority** |
|---|---|
| Collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures (radio, cell phones, etc.). | |
| **Recommended Projects**<br>▪ AHTD West Memphis Regional Traveler Information Web Site<br>▪ Media Liaison and Coordination | |

| **Interactive Traveler Information (ATIS2)** | **Medium Priority** |
|---|---|
| Provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information. | |
| **Recommended Projects**<br>▪ AHTD/TDOT Communications Connection<br>▪ Arkansas 511 Implementation<br>▪ Transit Information for 511 | |

### *2.2.7 Archived Data Management Service Area*

The following market packages and related projects implement archived data management ITS functions. Data collected through ITS deployments can be housed in several different formats. The market packages selected by stakeholders will allow data for a specific agency to be housed by that agency, or all data from throughout the region can be sent to a site to be housed together. Data housed by an agency as part of an ITS data mart would likely be part of another project deployment and are not called out separately in this section. For example, DMS implementation might include software to archive all of the messages placed on the DMS over a period of time.

**Table 8 – Archived Data Management Market Packages and Projects**

| **ITS Data Mart (AD1)** | **High Priority** |
|---|---|
| Provides a focused archive that houses data collected and owned by a single agency or other organization. Focused archive typically covers a single transportation mode and one jurisdiction. | |
| **Recommended Projects**<br>No projects have been identified at this time | |

| **ITS Data Warehouse (AD2)** | **Medium Priority** |
|---|---|
| Includes all the data collection and management capabilities of the ITS Data Mart. Adds the functionality to allow collection of data from multiple agencies and data sources across modal and jurisdictional boundaries. | |
| **Recommended Projects**<br>▪ AHTD West Memphis Regional Data Warehouse | |

# 3. PROJECT RECOMMENDATIONS

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

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

In order to achieve input from stakeholders, a workshop was held in the West Memphis Region on December 7, 2005 to discuss potential projects. Each project recommended for the Regional ITS Deployment Plan was discussed, and consensus was reached by the stakeholders on the project description and the timeframe for implementation.

In the following sections, projects are categorized into functional areas: Travel and Traffic Management, Emergency Management, Maintenance and Construction Management, Public Transportation Management, Archived Data Management and Projects of Statewide Significance. 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 categorized as short-term (5-year deployment timeframe), mid-term (10-year deployment timeframe), and long-term projects (20-year deployment timeframe). Actual deployment timeframes for the projects will be dependent on inclusion in the TIP and identification of funding sources.

For each project, the tables include a project description, responsible agency, opinion of probable cost, an indication as to whether funding has been identified, and the applicable market packages in the West Memphis Regional ITS Architecture. In addition to the regional and statewide projects identified in Section 3.1 and 3.2, the communications needs are discussed in Section 3.3.

## 3.1 Regional Projects

Regional projects are identified in **Table 9** through **Table 13**. The tables are broken out as follows:

- **Table 9** – Travel and Traffic Management Project Recommendations;
- **Table 10** – Emergency Management Project Recommendations;
- **Table 11** – Maintenance and Construction Management Project Recommendations;
- **Table 12** – Public Transportation Recommendations; and
- **Table 13** – Archived Data Management Project Recommendations.

**Table 9 – Travel and Traffic Management Project Recommendations**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Short-Term Travel and Traffic Management Projects*** | | | | | |
| AHTD District 1 TMC | Establish a Traffic Management Center (TMC) for AHTD District 1 in Wynne. Project to include closed-circuit television (CCTV) camera monitoring and control and dynamic message sign (DMS) control. Initial deployment will focus on freeway operations and AHTD maintenance and construction vehicle dispatch. This center would also act as a secondary center to the AHTD-Crittenden County Traffic Operations Center (TOC). Cost for this project represents an approximate amount for a small TMC with a single workstation and single monitor and includes potential costs for hardware, software, and upgrades to an existing facility. Existing space in an AHTD facility will be used for the TMC. | AHTD | $100,000 | No | ATMS01<br>ATMS06<br>ATMS07<br>ATMS08 |
| AHTD-Crittenden County TOC | Establish a TOC in Crittenden County. Project to include CCTV camera monitoring and control and DMS control. Initial deployment will focus on freeway operations and Motorist Assist Patrol (MAP) dispatch. Cost for this project represents an approximate amount for a medium size TMC with two workstations and a small video wall and includes potential costs for hardware, software, and upgrades to an existing facility. Cost assumes existing space in an AHTD or City facility will be used, or vacant space will be leased for the TOC. This project should be coordinated with the Regional Communications Master Plan project. | AHTD, City of West Memphis | $300,000 - $500,000 | No | ATMS01<br>ATMS06<br>ATMS08 |
| AHTD CCTV Cameras and DMS on I-40 and I-55 | Implement additional CCTV cameras and DMS on key sections of I-40 and I-55 for incident management, traveler information, and traffic monitoring. Cost for this project represents an average cost per DMS and per CCTV camera including camera, sign, pole or structure, and communications. | AHTD | $150,000/sign<br>$30,000/camera | No | ATMS01<br>ATMS06<br>ATMS08<br>EM10 |

**Table 9 – Travel and Traffic Management Project Recommendations (continued)**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Short-Term Travel and Traffic Management Projects (continued)*** | | | | | |
| AHTD AMBER Alert DMS on I-40 | Implement two DMS on I-40. Signs will be implemented through America's Missing: Broadcast Emergency Response (AMBER) Alert funding. Cost represents two signs at an average cost of $150,000 per sign. | AHTD | $300,000 | Yes | ATMS06<br>EM06<br>EM10 |
| AHTD Speed Detection on I-40 and I-55 | Implement speed detection along I-40 and I-55 for use in traffic monitoring and for input to traveler information web site and 511. | AHTD | $20,000/ detection site | No | ATMS01 |
| AHTD HAR on I-40 | Implement highway advisory radio (HAR) on I-40. Project will include flashing beacon signs to alert motorists when high priority messages are being broadcast. Cost represents a HAR transmitter and approximately four flashing beacon signs. | AHTD | $75,000 | No | ATMS06<br>EM10 |
| TDOT ITS Equipment on I-40 and I-55 | Implement additional CCTV cameras and dynamic message signs DMS on I-40 and I-55 for traffic information dissemination and incident management. Project will include a minimum of four DMS and six CCTV cameras as well as 60 speed detection devices and a highway advisory radio system. Cost for this project represents an average cost per DMS and per CCTV camera including camera, sign, pole or structure, and communications. | TDOT | $150,000/sign<br>$30,000/camera<br>$5,500/detector<br>plus $120,000 for HAR system | Yes | ATMS01<br>ATMS06<br>EM10 |
| AHTD West Memphis Regional Traveler Information Web Site | Install a traveler information web site to provide travelers with up to date roadway condition information as well as information on local transit options. Web site will include links to AHTD Statewide 511 and Tennessee Department of Transportation (TDOT) Memphis web sites. | AHTD | To Be Determined | No | ATIS1 |
| AHTD/City of West Memphis Signal Study | Study and evaluate the need for signal coordination, signal upgrades, and additional signals in the City of West Memphis. | AHTD, City of West Memphis | $50,000 - $100,000 | No | ATMS03 |

**Table 9 – Travel and Traffic Management Project Recommendations (continued)**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Short-Term Travel and Traffic Management Projects (continued)*** | | | | | |
| AHTD/City of West Memphis Signal System Coordination and Upgrades | Implement signal improvements to allow for signal coordination and re-timing on all major arterials in the City of West Memphis to optimize flow of traffic. In some cases, additional signals will need to be constructed. Cost for this project represents a range that includes an average cost per intersection for upgrading an existing signalized intersection at $20,000 per intersection up to a cost as high as $100,000 per intersection for installation of a new signal. This project should also include training for City staff on signal timing and coordination. | AHTD, City of West Memphis | $20,000 - $100,000/ intersection | No | ATMS03 |
| Regional Communications Master Plan | Develop a Regional Communications Master Plan for the West Memphis Region. The project will examine current and future regional communications needs to support traffic management, incident management, emergency management, transit management, and maintenance and construction coordination implementation. The Regional Communications Master Plan and the communications implementation projects that will implement the plan will be the foundation for ITS in the Region. To achieve the connections for coordination and data sharing that are outlined in the architecture, an effective communications system is essential. This project should be coordinated with the AHTD-Crittenden County TOC project. | AHTD, Arkansas State Police, City of West Memphis, City of Marion, Crittenden County, TDOT | $100,000 - $200,000 | No | All market packages[3] |
| Regional Communications Implementation Phase 1 | Phase 1 communications infrastructure implementation as recommended by the Regional Communications Master Plan to support ITS deployment. Cost for this project will be determined by the Regional Communications Master Plan. | AHTD, City of West Memphis, City of Marion, Crittenden County, TDOT | To Be Determined | No | All market packages[3] |

**Table 9 – Travel and Traffic Management Project Recommendations (continued)**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Mid-Term Travel and Traffic Management Projects*** | | | | | |
| AHTD CCTV Cameras and DMS Expansion | Implement additional CCTV cameras and DMS on interstates and state routes as needed throughout the Region. Video feeds could be shared with emergency management agencies to facilitate emergency response. | AHTD | $150,000/sign<br>$30,000/camera | No | ATMS01<br>ATMS06<br>EM10 |
| AHTD DMS on Arterials | Implement DMS on major arterials in advance of freeway entrances. Cost for this project represents an average cost per small size DMS including sign, structure, and communications. | AHTD | $75,000/sign | No | ATMS06 |
| AHTD Standard Railroad Grade Crossing Coordination | Implement communications to railroad wayside equipment to monitor intersection status for train blockages. Agreements with railroad operations must be established and coordination with traffic signal systems will be needed. This project should be coordinated with the Railroad Overpass Study for Marion and West Memphis. | AHTD, Railroad Operators | To Be Determined | No | ATMS03<br>ATMS13 |
| Regional Communications Implementation Phase 2 | Phase 2 communications infrastructure implementation to support ITS deployment. Cost for this project will be determined by the Regional Communications Master Plan and Phase 1 of the Regional Communications Implementation project. | AHTD, City of West Memphis, City of Marion, Crittenden County, TDOT | To Be Determined | No | All market packages[3] |
| Media Liaison and Coordination | Develop agreements and enhanced coordination with local media to improve information sharing and dissemination. There is no cost associated with this project beyond staff time. Should the media desire to gather data, such as camera feeds, from transportation agencies in the Region, it is expected that the media would be responsible for any costs. | AHTD, City of West Memphis, City of Marion, City of Memphis, TDOT, Local Radio/Television Stations | N/A | N/A | ATIS1<br>EM10 |

**Table 9 – Travel and Traffic Management Project Recommendations (continued)**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Long-Term Travel and Traffic Management Projects*** | | | | | |
| Regional Communications Implementation Phase 3 | Phase 3 communications infrastructure implementation to support ITS deployment. Cost for this project will be determined by the Regional Communications Master Plan and Phase 1 and 2 of the Regional Communications Implementation. | AHTD, City of West Memphis, City of Marion, Crittenden County, TDOT | To Be Determined | No | All market packages[3] |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

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

[3]Supports all market packages, but is not specifically represented in any market package.

**Table 10 – Emergency Management Project Recommendations**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Short-Term Emergency Management Projects*** | | | | | |
| AHTD Motorist Assist Patrol (MAP) Dispatch | Implement MAP dispatch in AHTD District 1 TMC and AHTD-Crittenden County TOC. Co-location will facilitate coordination and incident management. | AHTD | $50,000 | No | ATMS08<br>EM04 |
| AHTD Infrastructure Security Monitoring Phase 1 | Implement bridge security CCTV camera monitoring in the AHTD District 1 TMC and AHTD-Crittenden County TOC. Existing cameras on I-40 and I-55 bridges over the Mississippi River will be incorporated. Any additional security cameras installed in the future will also be incorporated. Connections to cameras exist on AHTD's local area network and therefore there is no cost associated with this project. | AHTD | N/A | No | ATMS01<br>EM05 |
| West Memphis Regional Mutual Aid Agreements | Develop agreements and enhanced coordination for emergency management agencies to improve information sharing and dissemination. Common radio frequencies among agencies should be a goal. | AHTD, City of West Memphis, City of Marion, Crittenden County, City of Memphis, TDOT, ASP, AHP, AR State EOC, AR Game and Fish, MATA, School Districts, Private Tow/Wrecker, Private Ambulance | N/A | N/A | ATMS08<br>EM01 |
| West Memphis AMBER Alert Dissemination | Implement a process for disseminating AMBER Alerts on West Memphis DMS and HAR in coordination with the Arkansas State Emergency Operations Center and Arkansas State Police. Coordination with Tennessee agencies is also needed. | AHTD, Arkansas State Emergency Operations Center, Arkansas State Police, TDOT, Tennessee Department of Safety | N/A | N/A | EM06 |

**Table 10 – Emergency Management Project Recommendations (continued)**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Mid-Term Emergency Management Projects*** | | | | | |
| AHTD Infrastructure Security Monitoring Phase 2 | Implement bridge security CCTV cameras at additional monitoring locations in the Region. | AHTD | To Be Determined | No | ATMS01<br>EM05 |
| City of West Memphis Fire/EMS Signal Preemption | Implement emergency vehicle signal preemption on City of West Memphis traffic signals for preemption by fire department and emergency medical services (EMS) vehicles. Signal preemption can reduce travel time for emergency responders to reach an incident and also increases safety for response personnel and motorists. It is recommended that preemption be considered during the traffic signal upgrades because a cost savings can be recognized by completing the projects concurrently or at least ensuring that preemption can easily be added at a later time. | AHTD, City of West Memphis | $6,000/ intersection<br>$1,500/vehicle | No | ATMS03<br>EM02 |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

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

**Table 11 – Maintenance and Construction Management Project Recommendations**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Short-Term Maintenance and Construction Management Projects*** | | | | | |
| Maintenance and Construction Activity Coordination | Establish maintenance and construction activity coordination processes between the AHTD District 1 TMC, AHTD - Crittenden County TOC, AHTD maintenance facilities, AHTD Highway Closure and Restriction System (HCRS), local maintenance/construction agencies, and TDOT. No cost is expected except for staff time from the respective agencies. | AHTD, TDOT | N/A | N/A | MC07<br>MC10 |
| AHTD Portable DMS | Procure additional portable DMS for use during maintenance activities or for incident management. Cost represents an approximate cost per portable DMS | AHTD | $30,000/sign | No | ATMS06<br>MC08 |
| ***Mid-Term Maintenance and Construction Management Projects*** | | | | | |
| AHTD/City of West Memphis Road Weather Data Collection | Add permanent road weather data collection stations for collecting weather and road condition information in areas prone to flooding, icing, or other severe conditions. Real time data will be made available at the AHTD-Crittenden County TOC and the AHTD District 1 TMC. | AHTD | $20,000 | No | ATMS01<br>MC03<br>MC04 |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

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

**Table 12 – Public Transportation Management Project Recommendations**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Mid-Term Public Transportation Management Projects*** | | | | | |
| Transit Information for 511 | This project will provide transit traveler information for transit operations to AHTD 511 and web site. | City of West Memphis, AHTD | To Be Determined | No | ATIS2 |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

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

**Table 13 – Archived Data Management Project Recommendations**

| Program Area/Project | Description | Responsible Agency[1] | Opinion of Probable Cost[2] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|---|
| ***Mid-Term Archived Data Management Projects*** | | | | | |
| AHTD West Memphis Regional Data Warehouse | Establish a data warehouse to archive data from AHTD and local agencies in the West Memphis Region and store if in one location. Costs could vary widely depending on the level of detail and functionality of the system, but an average for a basic warehouse system has been included. | AHTD, West Memphis MPO | $100,000 | No | AD2 |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

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

## 3.2 Projects of Statewide Significance

Projects of statewide significance are projects that the West Memphis 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.

**Table 14** on the following page identifies the projects of statewide significance.

**Table 14 – Projects of Statewide Significance**

| Program Area/Project | Description | Responsible Agency[1] | Funding Identified | Applicable Market Packages |
|---|---|---|---|---|
| AHTD/TDOT Communications Connection | Establish a communications connection between the potential AHTD Statewide TMC in Little Rock and the TDOT TMC in Memphis to share traveler information and CCTV camera feeds as well as coordinate 511 operations. | AHTD Central Office Headquarters/TDOT | No | ATMS01<br>ATMS07<br>ATMS08<br>ATIS2 |
| AHTD Statewide TMC | Establish an AHTD Statewide TMC and communications with the AHTD District 1 TMC and the AHTD-Crittenden County TOC. | AHTD Central Office Headquarters | No | ATMS01<br>ATMS06<br>ATMS07<br>ATMS08 |
| Arkansas 511 Implementation | Implement 511 telephone system and web site in the State of Arkansas. The AHTD District 1 TMC, AHTD-Crittenden County TOC, and TDOT Memphis TMC will provide regional traveler information to the statewide 511 system. | AHTD Central Office Headquarters | No | ATIS2 |
| DMS AMBER Alert Message Dissemination System | Develop a system to facilitate the dissemination of AMBER Alert messages on DMS throughout the State of Arkansas. This system could be controlled from a Statewide TMC and would allow for AMBER Alert messages to be placed on DMS throughout the State quickly and consistently. | AHTD Central Office Headquarters, Arkansas State Police | No | EM06 |
| CVISN Implementation | Implement the Commercial Vehicle Information Systems and Networks (CVISN) projects according to the statewide CVISN plan. Operational improvements implemented as part of CVISN will benefit the Region since they have a high percentage of commercial vehicle traffic. | AHTD Central Office Headquarters | No | CVO04[2] |

[1]Agency listed is responsible for implementation, operations, and maintenance unless otherwise noted.

[2]The market package for Commercial Vehicle Administration (CVO04) has not been included in the West Memphis Regional ITS Architecture since there are no automated permitting systems existing or planned for local agencies. This market package would need to be implemented statewide.

# 4. MAINTAINING THE REGIONAL ITS DEPLOYMENT PLAN

Just as the ITS Architecture developed for the West Memphis Region addresses the Region's vision for ITS implementation at the time the plan was developed, the ITS Deployment Plan addresses the projects that stakeholders agreed were necessary to implement in order to reach their ITS vision. 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 on local streets or signal coordination was not a major concern in the Region; therefore, local traffic management did not play a large role in this version of the Regional ITS Architecture and Deployment Plan. Instead, a much greater focus was given to providing traveler information to travelers on I-40 and I-55 due to the high volumes and large number of commercial vehicles. As more development occurs in the Region, traffic congestion on arterial streets could become a larger concern and may require a more significant focus in the ITS Deployment Plan. Shifts in regional focus, as well as changes in the National ITS Architecture, will necessitate that the West Memphis Regional ITS Architecture be updated to remain a useful resource for the Region. These same changes will create new project opportunities or perhaps make projects listed in this ITS Deployment Plan obsolete.

Stakeholders discussed the procedure for updating the Regional ITS Architecture and Deployment Plan at the December 7, 2005 ITS Deployment Plan Workshop. The procedure is documented in the West Memphis Regional ITS Architecture. It outlines a procedure for documenting architecture changes and a schedule to hold a formal review every two years and a major revision every four years corresponding with the Long Range Plan Update. The project listings in the ITS Deployment Plan should be examined during these scheduled reviews and updated as appropriate to maintain consistency with the regional ITS vision. The West Memphis MPO will take the lead in maintaining the Regional ITS Architecture and Deployment Plan.