



Tennessee Department of Transportation  
Regional ITS Architectures and Deployment Plans

## Jackson Region

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# Regional ITS Deployment Plan

*Prepared by:*



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115004071

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## LIST OF ACRONYMS

AD	Archived Data
APTS	Advanced Public Transportation Systems
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
EM	Emergency Management
EMA	Emergency Management Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GPS	Global Positioning System
HAR	Highway Advisory Radio
HRA	Human Resource Agency
HRI	Highway-Rail Intersection
ITS	Intelligent Transportation System
MC	Maintenance and Construction
MPO	Metropolitan Planning Organization
TDOT	Tennessee Department of Transportation
TMC	Traffic Management Center
TOC	Traffic Operations Center

## 1. INTRODUCTION

### 1.1 Project Overview

The Jackson Region has developed a Regional Intelligent Transportation System (ITS) Architecture under the direction of the Tennessee Department of Transportation (TDOT) with support from the Jackson Area Metropolitan Planning Organization (MPO). 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 provides in the Region as well as how those functions can operate for agencies in and around the Jackson Region. The Regional ITS Architecture also satisfies an important requirement from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) regarding transportation funding. An FHWA Final Rule and an FTA Final Policy issued in 2001 require 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 are able to 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 shows the correlation between each project and the architecture by identifying the market packages that correspond with each project. If projects are identified that do not correspond to a market package, the ITS architecture can be revised while in draft format; therefore, the resulting ITS deployment projects from this effort should be clearly supported by the ITS architecture.

The Jackson Regional ITS Architecture and 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 available to all stakeholders. 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 Jackson 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 Jackson Regional ITS Deployment Plan, and the key features and stakeholders in the Jackson 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 defined, accompanied by a listing of projects that support implementation of the market package services.

### **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, the responsible agency, an opinion of probable cost, the decision of whether or not funding was identified, and a listing of market packages 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 Jackson Region**

### *1.3.1 Region Overview*

The Jackson Region is defined by the boundaries of the Jackson Area MPO study area. The Region encompasses all of Madison County in southwestern Tennessee.

The primary roadway facilities include I-40 and US 45. I-40 is a divided interstate highway that stretches between the coast in Wilmington, North Carolina and I-15 in California. I-40 connects Memphis and Jackson and provides the Region with access to Nashville and Knoxville as well. US 45 runs north-south through the Region, connecting Jackson to several of the smaller cities in the Region as well as Mississippi.

### *1.3.2 Stakeholders*

ITS often transcends traditional transportation infrastructure; therefore, the involvement of non-traditional stakeholders is important in the architecture development and visioning process. Input from these stakeholders, both public and private, is a crucial part of defining the interfaces, integration needs, and overall vision for ITS in a region.

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

- City of Jackson;
- Federal Highway Administration – Tennessee Division;
- Jackson Area MPO;
- Jackson Transit Authority;
- Jackson/Madison County Emergency Management Agency;
- Madison County;
- Southwest Tennessee Human Resource Agency (HRA) Transportation;
- Tennessee Department of Transportation – Design Division, Signals and Signing.
- Tennessee Department of Transportation – Long Range Planning Division; and
- Tennessee Department of Transportation – Region 4.

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 Jackson 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 – Jackson Market Package Prioritization by Functional Area**

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
<b><i>Travel and Traffic Management</i></b>		
ATMS01 Network Surveillance	ATMS07 Regional Traffic Control	
ATMS03 Surface Street Control	ATMS13 Standard Railroad Grade Crossing	
ATMS06 Traffic Information Dissemination	ATMS15 Railroad Operations Coordination	
ATMS08 Traffic Incident Management System	ATMS19 Speed Monitoring	
<b><i>Emergency Management</i></b>		
EM01 Emergency Call-Taking and Dispatch	EM04 Roadway Service Patrols	
EM02 Emergency Routing	EM08 Disaster Response and Recovery	
EM06 Wide-Area Alert	EM09 Evacuation and Reentry Management	
EM10 Disaster Traveler Information		
<b><i>Maintenance and Construction Management</i></b>		
MC03 Road Weather Data Collection	MC01 Maintenance and Construction Vehicle and Equipment Tracking	
MC04 Weather Information Processing and Distribution	MC07 Roadway Maintenance and Construction	
MC08 Work Zone Management		
MC10 Maintenance and Construction Activity Coordination		

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

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
<b>Public Transportation Management</b>		
APTS1 Transit Vehicle Tracking APTS2 Transit Fixed-Route Operations APTS3 Demand Response Transit Operations APTS5 Transit Security	APTS4 Transit Passenger and Fare Management APTS7 Multi-modal Coordination APTS8 Transit Traveler Information	APTS6 Transit Maintenance
<b>Traveler Information</b>		
ATIS1 Broadcast Traveler Information ATIS2 Interactive Traveler Information		
<b>Archived Data Management</b>		
	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 Jackson Region. These priorities identified the key ITS services desired by stakeholders in the Jackson Region, as well as the interfaces that need to be established to provide integrated functionality and establish communication between elements. 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 due to funding needs or prerequisite project requirements, deployment might not be feasible for several years. Maturity and availability of technology were also considered in prioritizing the market packages along with determining if the market package was more suitable for private deployment and operations or public sector deployment.

## 2.2 Market Packages and Supporting Projects

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

Not every market package has an associated ITS project. Several market packages were identified as being important to the Region; however, at this time stakeholders decided there were no projects feasible enough to document in the ITS Deployment Plan. In the future, additional projects will likely 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 were 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), traffic operations centers (TOCs), and traffic signal systems. Many of the market packages in this service area are expected to be deployed prior to market packages in other service areas.

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

<b>Network Surveillance (ATMS01)</b>	<b>High Priority</b>
Includes traffic detectors, CCTV cameras, other surveillance equipment, supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to a traffic management center.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson CCTV Cameras</li> <li>▪ City of Jackson TOC Phases 1 and 2</li> <li>▪ City of Jackson Vehicle Detection Phases 1 and 2</li> <li>▪ TDOT SmartWay Deployment on I-40 – Vehicle Detection</li> <li>▪ TDOT SmartWay Deployment on I-40 – CCTV Cameras</li> </ul>	
<b>Surface Street Control (ATMS03)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Signal System Fiber Interconnect</li> <li>▪ City of Jackson Signal System Upgrades Phases 1, 2, and 3</li> <li>▪ City of Jackson TOC Phase 1</li> <li>▪ City of Jackson Vehicle Detection Phases 1 and 2</li> </ul>	
<b>Traffic Information Dissemination (ATMS06)</b>	<b>High Priority</b>
Provides information to drivers using roadway equipment such as DMS or highway advisory radio (HAR). Information can include traffic and road conditions, closure and detour information, incident information, emergency alerts and driver advisories.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson TOC Phase 2</li> <li>▪ Regional Media Liaison and Coordination</li> <li>▪ TDOT Madison County HAR</li> <li>▪ TDOT SmartWay Deployment on I-40 – DMS</li> </ul>	

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

<b>Regional Traffic Control (ATMS07)</b>	<b>Medium Priority</b>
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.	
<b>Recommended Projects</b> <ul style="list-style-type: none"> <li>▪ City of Jackson TOC Coordination with TDOT SmartWay Center</li> <li>▪ City of Jackson TOC Phase 1</li> </ul>	

<b>Traffic Incident Management System (ATMS08)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b> <ul style="list-style-type: none"> <li>▪ City of Jackson CCTV Cameras</li> <li>▪ City of Jackson Consolidated AVL System</li> <li>▪ City of Jackson TOC Coordination with Jackson/Madison County EMA</li> <li>▪ City of Jackson TOC Coordination with TDOT SmartWay Center</li> <li>▪ City of Jackson Vehicle Detection Phases 1 and 2</li> <li>▪ Madison County E911 CCTV Camera Image Sharing</li> <li>▪ TDOT Madison County HAR</li> <li>▪ TDOT SmartWay Deployment on I-40 – DMS</li> <li>▪ TDOT SmartWay Deployment on I-40 – Vehicle Detection</li> <li>▪ TDOT SmartWay Deployment on I-40 – CCTV Cameras</li> </ul>	

<b>Standard Railroad Grade Crossing (ATMS13)</b>	<b>Medium Priority</b>
Manages highway traffic at highway-rail intersections (HRIs) where rail operations speeds are less than 80 mph.	
<b>Recommended Projects</b> <p>No projects have been identified at this time</p>	



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

<b>Railroad Operations Coordination (ATMS15)</b>	<b>Medium Priority</b>
Provides an additional level of strategic coordination between freight rail operations and traffic management centers. Rail operations provide train schedules, maintenance schedules, and any other forecast events that will result in HRI closures. This information is used to develop forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.	
<b>Recommended Projects</b>	
No projects have been identified at this time	

<b>Speed Monitoring (ATMS19)</b>	<b>Medium Priority</b>
Monitors the speed of vehicles traveling through a roadway system.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Police Department Automated Enforcement</li> <li>▪ City of Jackson Portable Speed Detection</li> </ul>	

### 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**

<b>Emergency Call-Taking and Dispatch (EM01)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Consolidated AVL System</li> <li>▪ City of Jackson Police Department Helicopter Surveillance Real-Time Upgrades</li> <li>▪ TDOT HELP Vehicle AVL</li> </ul>	
<b>Emergency Routing (EM02)</b>	<b>High Priority</b>
Supports automated vehicle location (AVL) 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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Emergency Vehicle Signal Preemption Expansion</li> </ul>	
<b>Roadway Service Patrols (EM04)</b>	<b>Medium Priority</b>
Supports the roadway service patrol vehicles that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. This market package monitors service patrol vehicle locations and supports vehicle dispatch.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ TDOT HELP Vehicle AVL</li> <li>▪ TDOT HELP Vehicle Service Area Expansion</li> </ul>	
<b>Wide-Area Alert (EM06)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ TDOT Madison County HAR</li> </ul>	



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

<b>Disaster Response and Recovery (EM08)</b>	<b>Medium Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson TOC Coordination with Jackson/Madison County EMA</li> <li>▪ Madison County E911 CCTV Camera Image Sharing</li> </ul>	
<b>Evacuation and Reentry Management (EM09)</b>	<b>Medium Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson TOC Coordination with Jackson/Madison County EMA</li> <li>▪ Madison County E911 CCTV Camera Image Sharing</li> </ul>	
<b>Disaster Traveler Information (EM10)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ TDOT Madison County HAR</li> </ul>	

### 2.2.3 Maintenance and Construction Management Service Area

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

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

<b>Maintenance and Construction Vehicle and Equipment Tracking (MC01)</b>	<b>Medium Priority</b>
Tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Consolidated AVL System</li> <li>▪ City of Jackson Street Department Vehicle AVL Expansion</li> </ul>	
<b>Road Weather Data Collection (MC03)</b>	<b>High Priority</b>
Collects current road weather conditions using data collected from environmental sensors deployed on and about the roadway.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Ice Detection</li> </ul>	
<b>Weather Information Processing and Distribution (MC04)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Ice Detection</li> </ul>	

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

<b>Roadway Maintenance and Construction (MC07)</b>	<b>Medium Priority</b>
Supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal, routine maintenance activities, and repair and maintenance of both ITS and non-ITS equipment on the roadway. Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Street Department Maintenance Tracking System</li> </ul>	
<b>Work Zone Management (MC08)</b>	<b>High Priority</b>
Directs activity in work zones, controlling traffic through portable DMS and informing other groups of activity for better coordination management. Also provides speed and delay information to motorists prior to the work zone.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ City of Jackson Additional Portable DMS</li> <li>▪ City of Jackson Portable DMS</li> <li>▪ TDOT Portable DMS Upgrade to Support Remote Communications</li> </ul>	
<b>Maintenance and Construction Activity Coordination (MC10)</b>	<b>High Priority</b>
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).	
<b>Recommended Projects</b>	
No projects have been identified at this time	

### 2.2.4 Public Transportation Management Service Area

The following market packages and related projects implement public transportation management ITS functions. Public transportation projects for the Jackson Transit Authority were identified for a number of market packages. Many of these market packages were considered high priority and will likely be implemented in the near future.

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

<b>Transit Vehicle Tracking (APTS1)</b>	<b>High Priority</b>
Monitors current transit vehicle location using an AVL system. Location data may be used to determine real time schedule adherence and update the transit system's schedule in real time.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Transit Authority AVL</li> <li>▪ Jackson Transit Authority Real Time Arrival Information</li> </ul>	
<b>Transit Fixed-Route Operations (APTS2)</b>	<b>High Priority</b>
Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for fixed-route and flexible-route transit services.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Transit Authority Real Time Arrival Information</li> </ul>	
<b>Demand Response Transit Operations (APTS3)</b>	<b>High Priority</b>
Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for demand responsive transit services.	
<b>Recommended Projects</b>	
No projects have been identified at this time	
<b>Transit Passenger and Fare Management (APTS4)</b>	<b>Medium Priority</b>
Manages passenger loading and fare payments on transit vehicles using electronic means.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Transit Authority Electronic Fare Collection System</li> <li>▪ Southwest HRA Transportation Electronic Fare Collection System</li> </ul>	

**Table 5 – Public Transportation Management Market Packages and Projects  
(continued)**

<b>Transit Security (APTS5)</b>	<b>High Priority</b>
Provides for the physical security of transit passengers and transit vehicle operators. Includes on-board security cameras and panic buttons.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Transit Authority Bus Stop Security Monitoring</li> <li>▪ Jackson Transit Authority Transit Vehicle Security Cameras</li> <li>▪ Southwest HRA Transportation Transit Vehicle Security Cameras</li> </ul>	
<b>Transit Maintenance (APTS6)</b>	<b>Low Priority</b>
Supports automatic transit maintenance scheduling and monitoring for both routine and corrective maintenance.	
<b>Recommended Projects</b>	
No projects have been identified at this time	
<b>Multi-Modal Coordination (APTS7)</b>	<b>Medium Priority</b>
Establishes two way communications between multiple transit and traffic agencies to improve service coordination.	
<b>Recommended Projects</b>	
No projects have been identified at this time	
<b>Transit Traveler Information (APTS8)</b>	<b>Medium Priority</b>
Provides transit users at transit stops and on board transit vehicles with ready access to transit information. Services include stop annunciation, imminent arrival signs, and real-time transit schedule displays. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this market package.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Transit Authority Real Time Bus Arrival Information</li> <li>▪ Jackson Transit Authority SmartBus</li> </ul>	

### 2.2.5 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 such as the 511 traveler information phone number. Traveler information provided at a specific location on the roadway, such as DMS, is addressed in the ATMS06 – Traffic Information Dissemination market package in Section 2.2.1.

**Table 6 – Traveler Information Market Packages and Projects**

<b>Broadcast Traveler Information (ATIS1)</b>	<b>High Priority</b>
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.).	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Regional Media Liaison and Coordination</li> </ul>	
<b>Interactive Traveler Information (ATIS2)</b>	<b>High Priority</b>
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.	
<b>Recommended Projects</b>	
No projects have been identified at this time	

### 2.2.6 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 from a specific agency to be housed by that agency, or 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 selected 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 7 – Archived Data Management Market Packages and Projects**

<b>ITS Data Mart (AD1)</b>	<b>Medium Priority</b>
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.	
<b>Recommended Projects</b>	
No projects have been identified at this time	
<b>ITS Data Warehouse (AD2)</b>	<b>Low Priority</b>
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.	
<b>Recommended Projects</b>	
<ul style="list-style-type: none"> <li>▪ Jackson Area MPO Archive Data Warehouse</li> </ul>	

### 3. PROJECT RECOMMENDATIONS

In order to achieve the ITS deployment levels outlined in 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 the Region's ITS goals 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 ensure 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, full motion cameras may be 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. The costs shown in this document represent an opinion of probable cost for implementation (equipment and installation). Design costs typically average 15 percent of the construction cost.

In order to achieve input from stakeholders, a workshop was held in the Jackson Region on October 18, 2006 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, and Archived Data Management. For each functional area, stakeholders grouped projects into timeframes for deployment based on priority, dependence on other projects, technology, and feasibility. The timeframes were categorized as short-term (5-year deployment timeframe), mid-term (10-year deployment timeframe), and long-term (20-year deployment timeframe). Actual deployment timeframes for the projects will depend on inclusion in the Transportation Improvement Program and identification of funding sources.

For each project, the tables include a project description, the responsible agency, an opinion of probable cost, and the applicable market packages in the Jackson Regional ITS Architecture.

#### 3.1 Regional Projects

Regional projects are identified in **Table 8** through **Table 12**. The tables are divided as follows:

- **Table 8** – Travel and Traffic Management Project Recommendations;
- **Table 9** – Emergency Management Project Recommendations;
- **Table 10** – Maintenance and Construction Management Project Recommendations;
- **Table 11** – Public Transportation Project Recommendations; and
- **Table 12** – Archived Data Management Project Recommendations.

**Table 8 – Travel and Traffic Management Project Recommendations**

<b>Program Area/Project</b>	<b>Description</b>	<b>Responsible Agency<sup>1</sup></b>	<b>Opinion of Probable Cost<sup>2</sup></b>	<b>Applicable Market Packages</b>
<b>Short-Term Travel and Traffic Management Projects</b>				
City of Jackson TOC Phase 1	Establish a Traffic Operations Center (TOC) for the City of Jackson. Phase 1 of the TOC will support the management of the closed loop traffic signal system. Cost will vary based on the location chosen and modifications required.	City of Jackson	To De Determined	ATMS01 ATMS03 ATMS07
City of Jackson Signal System Fiber Interconnect	Install fiber interconnect to create a closed loop signal system for the City of Jackson. The closed loop signal system will allow the remote adjustment of signal timing and signal troubleshooting.	City of Jackson	To Be Determined	ATMS03
City of Jackson Signal System Upgrades Phase 1	Upgrade and expand the City of Jackson traffic signal system. Cost represents an average cost per intersection for upgrading and adding to the closed loop signal system. Cost will vary based on the level of upgrade required to integrate the signals.	City of Jackson	\$20,000 per intersection	ATMS03
City of Jackson Vehicle Detection Phase 1	Implement vehicle detection technologies on roadways in the City of Jackson so that traffic management staff can monitor speeds and volumes. The information can be used to detect incidents and improve the management of the transportation system. The costs and capabilities will depend on the technology chosen. Cost range represents a variety of technologies from in-pavement loop detectors to non-intrusive detectors that would be mounted on an existing or new pole.	City of Jackson	\$10,000 to \$15,000 per site	ATMS01 ATMS03 ATMS08
City of Jackson TOC Coordination with TDOT SmartWay Center	Establish a communications connection between the City of Jackson TOC and Memphis SmartWay Center for the coordination of traffic information. This sharing will facilitate the inclusion of regional information in the Tennessee 511 System as well the sharing of weather information and video feeds.	City of Jackson, TDOT	To Be Determined	ATMS07 ATMS08

**Table 8 – Travel and Traffic Management Project Recommendations (continued)**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b>Short-Term Travel and Traffic Management Projects (continued)</b>				
City of Jackson Police Department Automated Enforcement	Expand the existing red-light running automated enforcement system and add automated speed enforcement capabilities. It is anticipated that a vendor will continue to provide these services at no cost to the City.	City of Jackson	Not Applicable	ATMS19
City of Jackson Portable Speed Detection	Procure portable speed detection trailers with capabilities to store speed data so that they can be used for driver awareness as well as determining the need for enforcement.	City of Jackson	\$5,000 per trailer	ATMS19
TDOT Madison County HAR	Procure highway advisory radio (HAR) transmitters to disseminate traveler information along I-40 in Madison County.	TDOT	To Be Determined	ATMS06 ATMS08 EM06 EM10
<b>Mid-Term Travel and Traffic Management Projects</b>				
City of Jackson TOC Phase 2	Expand the capabilities of the TOC to include the ability to monitor closed-circuit television (CCTV) cameras and vehicle detection equipment. The added capabilities could also include the ability to control dynamic message signs (DMS). Cost represents equipment costs for the added capabilities.	City of Jackson	\$75,000	ATMS01 ATMS06
City of Jackson Signal System Upgrades Phase 2	Continue to upgrade and expand the City of Jackson traffic signal system. Cost represents an average cost per intersection for upgrading and adding to the closed loop signal system. Cost will vary based on the level of upgrade required to integrate the signals.	City of Jackson	\$20,000 per intersection	ATMS03
City of Jackson Vehicle Detection Phase 2	Implement additional vehicle detection in the City of Jackson so that traffic management staff can monitor speeds and volumes. The information can be used in the management of the transportation system or to detect incidents. The costs and capabilities will depend on the technology chosen. Cost range represents a variety of technologies from in-pavement loop detectors to non-intrusive detectors that would be mounted on an existing or new pole.	City of Jackson	\$10,000 to \$15,000 per site	ATMS01 ATMS03 ATMS08

**Table 8 – Travel and Traffic Management Project Recommendations (continued)**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b>Mid-Term Travel and Traffic Management Projects (continued)</b>				
City of Jackson CCTV Cameras	Implement CCTV cameras on key sections of roadway within the City of Jackson. CCTV cameras can be used to monitor traffic conditions and to aid in incident management. Video feeds can be shared with emergency management agencies to facilitate emergency response. Cost shown includes the pole and camera. The cost will be lower if the camera is installed on a signal mast arm or other existing roadside structure.	City of Jackson	\$30,000 per site	ATMS01 ATMS08
TDOT SmartWay Deployment on I-40 – DMS	Implement DMS for traffic information dissemination. The estimated cost per sign will depend greatly on the size of the sign and type of mounting structure chosen. Cost shown is for a medium sized DMS on a butterfly mount.	TDOT	\$150,000 per sign	ATMS06 ATMS08
TDOT SmartWay Deployment on I-40 – Vehicle Detection	Implement vehicle detection technologies on I-40 to monitor speeds and volumes. The cost and capabilities will depend on the technology chosen. Cost range represents a variety of technologies from in-pavement loop detectors to non-intrusive detectors mounted on an existing or new pole. Communications costs in new locations without existing communications vary greatly. (Note: TDOT typically implements lower cost radar technologies for speed and volume detection and occasionally video detection for classification.) Spacing between detection sites in rural areas will typically be greater than spacing in urban areas.	TDOT	\$10,000 - \$15,000 per site	ATMS01 ATMS08
TDOT SmartWay Deployment on I-40 - CCTV Cameras	Implement CCTV cameras on I-40 in the Jackson Region. CCTV cameras can be used to monitor traffic conditions and to aid in incident management. Video feeds can be shared with emergency management agencies to facilitate emergency response. Communications costs are not included and can vary widely depending on available options.	TDOT	\$30,000 per site	ATMS01 ATMS08

**Table 8 – Travel and Traffic Management Project Recommendations (continued)**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b><i>Long-Term Travel and Traffic Management Projects (continued)</i></b>				
Regional 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. If the media desires to gather data, such as camera feeds, from the transportation agencies in the Region, then it is expected that the media would be responsible for any costs.	City of Jackson TDOT	Not Applicable	ATMS06 ATIS1
City of Jackson Signal System Upgrades Phase 3	Continue to upgrade and expand the City of Jackson traffic signal system. Cost represents an average cost per intersection for upgrading and adding to the closed loop signal system. Cost will vary based on the level of upgrade required to integrate the signals.	City of Jackson	\$20,000 per intersection	ATMS03

<sup>1</sup>Agency listed is responsible for implementation, operations, and maintenance.

<sup>2</sup>The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

**Table 9 – Emergency Management Project Recommendations**

<b>Program Area/Project</b>	<b>Description</b>	<b>Responsible Agency<sup>1</sup></b>	<b>Opinion of Probable Cost<sup>2</sup></b>	<b>Applicable Market Packages</b>
<b>Short-Term Emergency Management Projects</b>				
City of Jackson Police Department Helicopter Surveillance Real-Time Upgrades	Implement technology to transmit video images from the City of Jackson Police Department helicopters to the Police Department for real-time monitoring capabilities.	City of Jackson	\$15,000 to \$20,000 per helicopter	EM01
City of Jackson Emergency Vehicle Signal Preemption Expansion	Implement emergency vehicle signal preemption at additional traffic signals in the City of Jackson to improve incident response times and emergency responder safety.	City of Jackson	\$6,000/ per intersection \$2,000 per vehicle	EM02
City of Jackson TOC Coordination with Jackson/Madison County EMA	Establish a connection to share TDOT and City of Jackson CCTV camera images with the Jackson/Madison County Emergency Management Agency (EMA). Connecting to the City of Jackson TOC would allow the Jackson/Madison County EMA access to TDOT video once the Jackson TOC was connected to TDOT.	City of Jackson, Jackson/Madison County EMA	To Be Determined	ATMS08 EM08 EM09
<b>Mid-Term Emergency Management Projects</b>				
City of Jackson Consolidated AVL System	Consolidate all City of Jackson automated vehicle location (AVL) into a single tracking system. For example, this would enable Jackson Transit to see where police vehicles were or the Police Department to see where Street Department vehicles were located. Having this information readily accessible can facilitate dispatch and coordination by all City departments.	City of Jackson	To Be Determined	ATMS08 EM01 MC01
Madison County E911 CCTV Camera Image Sharing	Establish a connection to share TDOT and City of Jackson CCTV camera images with the Madison County E911 Center. Connecting to the City of Jackson TOC would allow the Madison County E911 access to TDOT video once the TOC was connected to TDOT.	City of Jackson, TDOT	To Be Determined	ATMS08 EM08 EM09

**Table 9 – Emergency Management Project Recommendations (continued)**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b>Long-Term Emergency Management Projects</b>				
TDOT HELP Vehicle Service Area Expansion	Expand the TDOT Region 4 HELP service area to include the Jackson Region. HELP vehicles stationed in the area would facilitate incident management as well as special event management.	TDOT	To Be Determined	EM04
TDOT HELP Vehicle AVL	Implement AVL on TDOT HELP vehicles. AVL will facilitate vehicle dispatch. Cost represents in-vehicle equipment as well as supporting software.	TDOT	\$3,000 per vehicle	EM01 EM04

<sup>1</sup>Agency listed is responsible for implementation, operations, and maintenance.

<sup>2</sup>The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

**Table 10 – Maintenance and Construction Management Project Recommendations**

<b>Program Area/Project</b>	<b>Description</b>	<b>Responsible Agency<sup>1</sup></b>	<b>Opinion of Probable Cost<sup>2</sup></b>	<b>Applicable Market Packages</b>
<b><i>Short-Term Maintenance and Construction Management Projects</i></b>				
City of Jackson Portable DMS	Procure portable DMS for use in the City of Jackson during maintenance activities or for incident management.	City of Jackson	\$25,000 per sign	MC08
City of Jackson Street Department Vehicle AVL Expansion	Implement AVL on City of Jackson Street Department vehicles. Cost represents in-vehicle equipment as well as supporting software.	City of Jackson	\$3,000 per vehicle	MC01
City of Jackson Street Department Maintenance Tracking System	Implement a global positioning system (GPS) based tracking system to log locations needing maintenance service. For example, street sweepers can document an issue needing the Street Department's attention, such as a large pothole, and capture the location for later repair.	City of Jackson	To Be Determined	MC07
TDOT Portable DMS Upgrade to Support Remote Communications	Retrofit TDOT portable DMS to add remote communications capabilities.	TDOT	\$1,000 per sign	MC08
<b><i>Mid-Term Maintenance and Construction Management Projects</i></b>				
City of Jackson Additional Portable DMS	Procure additional portable DMS for use in the City of Jackson during maintenance activities or for incident management.	City of Jackson	\$25,000 per sign	MC08
City of Jackson Ice Detection	Implement roadway ice detection stations along corridors prone to ice formation. This information will facilitate the effective dispatch of maintenance personnel to apply anti-icing chemicals.	City of Jackson	\$20,000 per site	MC03 MC04

<sup>1</sup>Agency listed is responsible for implementation, operations, and maintenance.

<sup>2</sup>The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

**Table 11 – Public Transportation Management Project Recommendations**

<b>Program Area/Project</b>	<b>Description</b>	<b>Responsible Agency<sup>1</sup></b>	<b>Opinion of Probable Cost<sup>2</sup></b>	<b>Applicable Market Packages</b>
<b>Short-Term Public Transportation Management Projects</b>				
Jackson Transit Authority AVL	Install AVL for real-time vehicle location of the Jackson Transit Authority fleet. The system will include GPS and a communication link between vehicle and dispatcher.	Jackson Transit Authority	\$150,000 to \$175,000	APTS1
Jackson Transit Authority SmartBus	Retrofit existing Jackson Transit Authority buses with stop annunciation technology to improve traveler information and accessibility by the sight impaired. Stop annunciation uses GPS to determine what the next stop is and makes an announcement to travelers. This information is also frequently displayed on a dynamic sign within the vehicle so that hearing impaired patrons can also benefit from the information.	Jackson Transit Authority	To Be Determined	APTS8
Jackson Transit Authority Transit Vehicle Security Cameras	Implement video surveillance on Jackson Transit Authority vehicles to improve patron and driver safety. Cameras would be for on-board recording only.	Jackson Transit Authority	\$3,000 per vehicle	APTS5
Southwest HRA Transportation Transit Vehicle Security Cameras	Implement video surveillance on Southwest Human Resource Agency (HRA) Transportation vehicles to improve patron and driver safety. Cameras would be for on-board recording only.	Southwest Tennessee Human Resource Agency	\$3,000 per vehicle	APTS5
<b>Mid-Term Public Transportation Management Projects</b>				
Jackson Transit Authority Real Time Bus Arrival Information	Install technology to provide real-time vehicle location information at transit transfer stations and permanent covered stops.	Jackson Transit Authority	\$50,000 to \$75,000	APTS1 APTS2 APTS8
Jackson Transit Authority Electronic Fare Collection System	Outfit Jackson Transit Authority vehicles with electronic fare collection capabilities.	Jackson Transit Authority	To Be Determined	APTS4
Jackson Transit Authority Bus Stop Security Monitoring	Implement video surveillance at transit transfer stations and permanent covered stops to improve patron and driver safety. Cameras would be monitored by the City of Jackson Police Department. Cost can vary greatly depending on communications. The cost shown includes the camera and basic communication equipment.	Jackson Transit Authority	\$5,000 per camera	APTS5

**Table 11 – Public Transportation Management Project Recommendations (continued)**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b><i>Mid-Term Public Transportation Management Projects (continued)</i></b>				
Southwest HRA Transportation Electronic Fare Collection System	Outfit Southwest HRA Transportation vehicles with electronic fare collection capabilities.	Southwest Tennessee Human Resource Agency	To Be Determined	APTS4

<sup>1</sup>Agency listed is responsible for implementation, operations, and maintenance.

<sup>2</sup>The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

**Table 12 – Archived Data Management Project Recommendations**

Program Area/Project	Description	Responsible Agency <sup>1</sup>	Opinion of Probable Cost <sup>2</sup>	Applicable Market Packages
<b><i>Long-Term Archived Data Management Projects</i></b>				
Jackson Area MPO Archive Data Warehouse	Establish a data warehouse to archive data from cities and transit agencies in the Metropolitan Planning Organization (MPO) service area for use in regional planning. Cost for this project represents an average range for developing a data warehouse system. Cost could vary widely depending on the level of detail and functionality of the system as well as the amount of development that is done in-house by the Jackson Area MPO.	Jackson Area MPO	\$50,000 to \$100,000	AD2

<sup>1</sup>Agency listed is responsible for implementation, operations, and maintenance.

<sup>2</sup>The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

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

Just as the ITS Architecture developed for the Jackson Region documents the Region's goals for ITS implementation at the time it was developed, the ITS Deployment Plan addresses the projects that stakeholders agreed were necessary to implement at the time the plan was developed in order to reach their ITS deployment goals. As the Region grows, needs will change and as technology progresses new ITS opportunities will arise. Shifts in regional focus as well as changes in the National ITS Architecture will necessitate that the Jackson Regional ITS Architecture be updated to remain a useful resource for the Region. These same changes will create new project opportunities and revisions to the projects in this ITS Deployment Plan.

Stakeholders discussed the procedure for updating the Regional ITS Architecture and Deployment Plan at the October 18, 2006 ITS Deployment Plan Workshop. The procedure, documented in the Jackson Regional ITS Architecture, outlines how to document architecture changes for inclusion in the next plan update. Stakeholders agreed that meeting once a year to discuss the projects identified in the ITS Deployment Plan would be beneficial. The purpose of the discussion would be to update the project status, remove projects that were completed, add project detail when available, and add new projects. Any corresponding architecture changes would be documented for the next update. A major revision would be completed every four years corresponding with the Transportation Improvement Plan. The Jackson Area MPO will take the lead in collecting details on the changes that need to be made to the architecture and deployment plan and coordinate with the TDOT Long Range Planning Office to schedule the update.