Tennessee Department of Transportation
Regional ITS Architectures and Deployment Plans

Lakeway Region

Regional ITS Deployment Plan

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AD	Archived Data
APTS	Advanced Public Transportation System
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CAD	Computer Aided Dispatch
CCTV	Closed Circuit Television
CGTA	Cumberland Gap Tunnel Authority
CVISN	Commercial Vehicle Information Systems and Networks
CVO	Commercial Vehicle Operations
DMS	Dynamic Message Sign
EM	Emergency Management
EMA	Emergency Management Agency
EMS	Emergency Medical Services
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HRI	Highway-Rail Intersection
ITS	Intelligent Transportation System
MC	Maintenance and Construction
MDT	Mobile Data Terminal
MTPO	Metropolitan Transportation Planning Organization
TDOT	Tennessee Department of Transportation
TOC	Traffic Operations Center

1. INTRODUCTION

1.1 Project Overview

The Lakeway Region has developed a Regional Intelligent Transportation System (ITS) Architecture under the direction of the Tennessee Department of Transportation (TDOT) with support from the Lakeway Metropolitan Transportation Planning Organization (MTPO). 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 Lakeway 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 Lakeway 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 their ITS Architecture. The ITS Deployment Plan builds on the ITS 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 ITS 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 Lakeway Regional ITS Architecture and ITS Deployment Plan were both developed with significant input from local, state, and federal officials. A series of four workshops was held to solicit input from stakeholders and ensure that the plan reflected the unique needs of the Region. Copies of the draft reports were made available to all stakeholders. The Regional ITS Architecture and Deployment Plan developed reflects an accurate snapshot of existing ITS deployments 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 Lakeway Regional ITS Deployment Plan is organized into four key sections:

Section 1 – Introduction

This section provides an overview of the Lakeway Regional ITS Deployment Plan and the key features and stakeholders in the Lakeway Region.

Section 2 –Regional ITS Architecture Market Package Implementation

A summary of the market packages selected and prioritized for the Region is provided in this section. Each market package is defined and is 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 or agencies, an opinion of probable cost and whether or not funding was identified, deployment timeframe, 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 Lakeway Region

1.3.1 Region Overview

The Lakeway Region is comprised of Hamblen and Jefferson Counties in east Tennessee. Municipalities include Morristown, Jefferson City, and White Pine. The regional boundaries encompass all of the Lakeway MTPO service area as well as the remaining portions of Hamblen and Jefferson Counties not included in the MTPO boundaries.

1.3.2 Stakeholders

ITS often extends beyond traditional transportation infrastructure; therefore, the involvement of non-traditional stakeholders, such as police and fire, 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 Lakeway Region project workshops or provided input to the study team:

- City of Jefferson City Public Works Department;
- City of Morristown Engineering Department;
- City of Morristown Fire Department;
- City of Morristown Information Technology Department;
- City of Morristown Police Department;
- City of Morristown Public Works Department;
- Cumberland Gap Tunnel Authority;
- Federal Highway Administration – Tennessee Division;
- Hamblen County E911;
- Jefferson County E911;
- Jefferson County Sheriff's Office;
- Lakeway MTPO;
- Norfolk Southern Corporation;
- Tennessee Department of Transportation – Long-Range Planning Division;
- Tennessee Department of Transportation – Region 1 SmartWay Center;

- Tennessee Highway Patrol;
- Town of White Pine; and
- Walters State Community College.

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

2. REGIONAL ITS ARCHITECTURE MARKET PACKAGE IMPLEMENTATION

Of the 91 market packages available in Version 6.0 of the National ITS Architecture, 40 were selected by stakeholders and customized for deployment in the Lakeway Region as part of the Regional ITS Architecture development process. The market packages outline the functions that stakeholders envision ITS to perform in coming years. The Regional ITS 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 market packages is provided in the Lakeway Regional ITS Architecture report.

Table 1 – Lakeway Region Market Package Prioritization by Functional Area

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
Travel and Traffic Management		
ATMS01 Network Surveillance ATMS03 Surface Street Control ATMS06 Traffic Information Dissemination ATMS08 Traffic Incident Management System ATMS13 Standard Railroad Grade Crossing	ATMS07 Regional Traffic Management ATMS19 Speed Monitoring	ATMS15 Railroad Operations Coordination
Emergency Management		
EM01 Emergency Call-Taking and Dispatch EM02 Emergency Routing EM06 Wide-Area Alert	EM08 Disaster Response and Recovery EM09 Evacuation and Reentry Management EM10 Disaster Traveler Information	EM04 Roadway Service Patrols
Maintenance and Construction Management		
MC03 Road Weather Data Collection MC04 Weather Information Processing and Distribution MC08 Work Zone Management MC10 Maintenance and Construction Activity Coordination	MC01 Maintenance and Construction Vehicle and Equipment Tracking MC07 Roadway Maintenance and Construction MC09 Work Zone Safety Monitoring	MC02 Maintenance and Construction Vehicle Maintenance MC06 Winter Maintenance

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

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
Public Transportation Management		
	APTS01 Transit Vehicle Tracking APTS02 Transit Fixed-Route Operations APTS03 Demand Response Transit Operations APTS05 Transit Security APTS08 Transit Traveler Information	APTS04 Transit Fare Collection Management APTS06 Transit Fleet Management APTS07 Multi-modal Coordination APTS10 Transit Passenger Counting
Traveler Information		
ATIS01 Broadcast Traveler Information ATIS02 Interactive Traveler Information		
Commercial Vehicle Operations		
	CVO06 Weigh-in-Motion CVO10 HAZMAT Management CVO11 Roadside HAZMAT Security Detection and Mitigation	
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 Lakeway Region. These priorities identified the key ITS services desired by stakeholders in the Lakeway 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 a 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 public or private sector deployment and operations.

2.2 Market Packages and Supporting Projects

In order to implement the ITS market package services in the Lakeway 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 Regional ITS 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;
- Recommended projects that will address some or all of the services that are contained in the market package; and
- Additional projects that support the services that are contained in the market package (if applicable).

The projects listed in the Recommended Projects section of the market package tables are those that can be directly tied back to a particular market package and will help support the implementation of that market package. The projects listed in the Additional Supporting Projects section lists projects that will support the market package but are not a specific part of the actual implementation of the market package. For example, the City of Morristown Closed Circuit Television (CCTV) Camera project will support operations of the City of Lakeway traffic signal system captured in the ATMS03 – Surface Street Control market package by allowing traffic operations personnel to visually monitor traffic signal operations at an intersection within range of a CCTV camera. However, the ATMS03 – Surface Street Control market package does not include any CCTV camera elements or data flows for traffic images and therefore the City of Morristown CCTV Camera project supports its operations but does not contribute to its implementation.

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 traffic signal systems, CCTV cameras, dynamic message signs (DMS), and traffic operations centers (TOCs). 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

Network Surveillance (ATMS01)	**High Priority**
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.	
Recommended Projects ▪ City of Jefferson City TOC ▪ City of Morristown TOC ▪ City of Morristown CCTV Cameras ▪ TDOT SmartWay Deployment – CCTV Cameras	
Additional Supporting Projects ▪ City of Jefferson City Railroad Grade Crossing Advanced Notification System ▪ City of Morristown Railroad Grade Crossing Advanced Notification System ▪ City of Morristown Traffic Signal System Upgrades ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC	

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

Surface Street Control (ATMS03)	**High 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 ▪ City of Jefferson City Fire Department Traffic Signal Preemption ▪ City of Jefferson City TOC ▪ City of Jefferson City Traffic Signal System Upgrades ▪ City of Morristown TOC ▪ City of Morristown Traffic Signal System Upgrades ▪ Jefferson County EMS Traffic Signal Preemption ▪ Morristown-Hamblen County EMS Traffic Signal Preemption ▪ Town of White Pine Fire and Police Department Traffic Signal Preemption	
Additional Supporting Projects ▪ City of Morristown CCTV Cameras ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC	

Traffic Information Dissemination (ATMS06)	**High Priority**
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.	
Recommended Projects ▪ City of Jefferson City TOC ▪ City of Morristown DMS ▪ City of Morristown Portable DMS ▪ City of Morristown TOC	
Additional Supporting Projects ▪ City of Jefferson City Railroad Grade Crossing Advanced Notification System ▪ City of Morristown Railroad Grade Crossing Advanced Notification System ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC	

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

Regional Traffic Management (ATMS07)	**Medium 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 ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown TOC Coordination with TDOT SmartWay Center	
Additional Supporting Projects ▪ City of Jefferson City TOC ▪ City of Morristown TOC	

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 ▪ City of Jefferson City TOC ▪ City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown TOC ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch ▪ City of Morristown TOC Coordination with TDOT SmartWay Center ▪ Hamblen County 911 Dispatch CCTV Camera Image Sharing ▪ Jefferson County 911 Dispatch CCTV Camera Image Sharing	
Additional Supporting Projects ▪ City of Morristown CCTV Cameras ▪ City of Morristown DMS ▪ City of Morristown Portable DMS ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC ▪ TDOT Smart-Way Deployment – CCTV Cameras	

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

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 ▪ City of Jefferson City Railroad Grade Crossing Advanced Notification System ▪ City of Morristown Railroad Grade Crossing Advanced Notification System	
Additional Supporting Projects ▪ City of Jefferson City Traffic Signal System Upgrades ▪ City of Morristown Traffic Signal System Upgrades	

Railroad Operations Coordination (ATMS15)	**Low Priority**
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.	
Recommended Projects No projects have been identified at this time. The Railroad Operations Coordination market package was customized and included in the ITS Architecture to reflect the desire for future coordination with railroad operations.	

Speed Monitoring (ATMS19)	**Medium Priority**
Monitors the speed of vehicles traveling through a roadway system.	
Recommended Projects No projects have been identified at this time. Several local municipalities are currently using portable speed trailers for speed monitoring and at this time do not see a significant benefit to permanent installations, therefore no new projects were added to the ITS Deployment Plan for speed monitoring.	

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 ▪ City of Jefferson City Fire Department AVL and MDTs ▪ City of Morristown Fire Department AVL and MDTs ▪ Jefferson County EMS AVL and MDTs ▪ Morristown-Hamblen County EMS AVL and MDTs	
Additional Supporting Projects ▪ City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch	

Emergency Routing (EM02)	**High Priority**
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.	
Recommended Projects ▪ City of Jefferson City Fire Department AVL and MDTs ▪ City of Jefferson City Fire Department Traffic Signal Preemption ▪ City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch ▪ City of Morristown Fire Department AVL and MDTs ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch ▪ Jefferson County EMS AVL and MDTs ▪ Jefferson County EMS Traffic Signal Preemption ▪ Morristown-Hamblen County EMS AVL and MDTs ▪ Morristown-Hamblen County EMS Traffic Signal Preemption ▪ Town of White Pine Fire and Police Department Traffic Signal Preemption	
Additional Supporting Projects ▪ City of Jefferson City Railroad Grade Crossing Advanced Notification System ▪ City of Morristown Railroad Grade Crossing Advanced Notification System	

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

Roadway Service Patrols (EM04)	**Low Priority**
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.	
Recommended Projects No projects have been identified at this time.	

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 No projects have been identified at this time specifically for wide area alerts. Disseminating this information is a high priority for the Region and is supported by several deployments that, although primarily implemented for traffic management purposes, could also be used for the dissemination of wide area alert information.	

Disaster Response and Recovery (EM08)	**Medium 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 ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC	
Additional Supporting Projects ▪ Hamblen County 911 Dispatch CCTV Camera Image Sharing ▪ Jefferson County 911 Dispatch CCTV Camera Image Sharing	

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

Evacuation and Reentry Management (EM09)	**Medium 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 ▪ Hamblen County EMA Back-up Operations for City of Morristown TOC ▪ Jefferson County EMA Back-up Operations for City of Jefferson City TOC	
Additional Supporting Projects ▪ City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown CCTV Cameras ▪ City of Morristown DMS ▪ City of Morristown Portable DMS ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch ▪ City of Morristown TOC Coordination with TDOT SmartWay Center ▪ Hamblen County 911 Dispatch CCTV Camera Image Sharing ▪ Jefferson County 911 Dispatch CCTV Camera Image Sharing ▪ TDOT Smart-Way Deployment – CCTV Cameras	

Disaster Traveler Information (EM10)	**Medium 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 No projects have been identified at this time specifically for disaster traveler information. Traveler information during an emergency is a high priority for the Region and is supported by several deployments that, although primarily implemented for traffic management purposes, would also provide a disaster traveler information benefit during an emergency.	

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 included road weather data collection using weather detection stations primarily for snow and ice, maintenance and construction activity coordination, and maintenance and construction vehicle tracking for public works vehicles.

Table 4 – Maintenance and Construction Management Market Packages and Projects

Maintenance and Construction Vehicle and Equipment Tracking (MC01)	**Medium Priority**
Tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities.	
Recommended Projects ▪ City of Jefferson City Public Works Department Vehicle AVL ▪ City of Morristown Public Works Department Vehicle AVL	

Maintenance and Construction Vehicle Maintenance (MC02)	**Low Priority**
Performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities. Includes on-board sensors capable of automatically performing diagnostics.	
Recommended Projects No projects have been identified at this time for implementation in the Region.	

Road Weather Data Collection (MC03)	**High Priority**
Collects current road weather conditions using data collected from environmental sensors deployed on and about the roadway.	
Recommended Projects ▪ City of Morristown Weather Detection ▪ Hamblen County Public Works Department Weather Detection	

Weather Information Processing and Distribution (MC04)	**High 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 No projects have been identified at this time for implementation in the Region.	
Additional Supporting Projects ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch ▪ City of Morristown TOC Coordination with TDOT SmartWay Center	

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 No projects have been identified at this time for implementation in the Region.	
Additional Supporting Projects ▪ City of Morristown Weather Detection ▪ Hamblen County Public Works Department Weather Detection	

Roadway Maintenance and Construction (MC07)	**Medium 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 No projects have been identified at this time for implementation in the Region.	
Additional Supporting Projects ▪ City of Morristown Weather Detection ▪ Hamblen County Public Works Department Weather Detection	

Work Zone Management (MC08)	**High Priority**
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.	
Recommended Projects ▪ City of Morristown Portable DMS	
Additional Supporting Projects ▪ City of Morristown DMS	

Work Zone Safety Monitoring (MC09)	**Medium 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 No projects have been identified for the Region at this time. Although this market package is important to stakeholders the technology is not yet at a point to support the portable solution that is desired.	

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

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 ▪ City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch ▪ City of Morristown TOC Coordination with Hamblen County 911 Dispatch	
Additional Supporting Projects ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown TOC Coordination with TDOT SmartWay Center	

2.2.4 Public Transportation Management Service Area

The following market packages implement public transportation management ITS functions. Planning for a transit system in Morristown is currently underway, but there is not currently an operational system. Market packages were developed to facilitate planning for the system, but no specific projects have been identified at this time.

Table 5 – Public Transportation Management Market Packages and Projects

Transit Vehicle Tracking (APTS01)	**Medium Priority**
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.	
Recommended Projects No projects have been identified at this time.	

Transit Fixed-Route Operations (APTS02)	**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 No projects have been identified at this time.	

Demand Response Transit Operations (APTS03)	**Medium Priority**
Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for demand responsive transit services.	
Recommended Projects No projects have been identified at this time.	

Transit Fare Collection Management (APTS04)	**Low Priority**
Manages transit fare collection on-board transit vehicles and at transit stops using electronic means. Allows the use of a traveler card or other electronic payment device.	
Recommended Projects No projects have been identified at this time.	

Transit Security (APTS05)	**Medium Priority**
Provides for the physical security of transit passengers and transit vehicle operators. Includes on-board security cameras and panic buttons.	
Recommended Projects No projects have been identified at this time.	

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

Transit Fleet Management (APTS06)	**Low Priority**
Supports automatic transit maintenance scheduling and monitoring for both routine and corrective maintenance.	
Recommended Projects No projects have been identified at this time.	

Multi-modal Coordination (APTS07)	**Low Priority**
Establishes two way communications between multiple transit and traffic agencies to improve service coordination.	
Recommended Projects No projects have been identified at this time.	

Transit Traveler Information (APTS08)	**Medium Priority**
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.	
Recommended Projects No projects have been identified at this time.	

Transit Passenger Counting (APTS10)	**Low Priority**
Counts the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicates the collected passenger data back to the management center.	
Recommended Projects No projects have been identified at this time.	

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 make traveler information available to the public over a wide area such as the 511 traveler information phone number. Traveler information provided at specific locations 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

Broadcast Traveler Information (ATIS01)	**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 ▪ City of Morristown Real-Time Traveler Information Website ▪ Regional Media Liaison and Coordination	

Interactive Traveler Information (ATIS02)	**High 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 No projects were specifically identified for local implementation. 511 traveler information phone and web-based services are being provided on a statewide level in Tennessee.	
Additional Supporting Projects ▪ City of Jefferson City TOC Coordination with TDOT SmartWay Center ▪ City of Morristown TOC Coordination with TDOT SmartWay Center	

2.2.6 Commercial Vehicle Operations

The following market packages and related projects implement commercial vehicle operations ITS functions. Planning for commercial vehicle operations is being performed 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 than a regional basis.

Table 7 – Commercial Vehicle Operations Market Packages and Projects

Weigh-in-Motion (CVO06)	**Medium Priority**
Provides for high speed weigh-in-motion with or without automated vehicle identification capabilities.	
Recommended Projects No projects have been identified at this time. There is an existing weigh-in-motion location within the Region, but no additional locations are needed at this time.	

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

Roadside HAZMAT Security Detection and Mitigation (CVO11)	**Medium 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 No projects have been identified at this time.	

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 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 8 – Archived Data Management Market Packages and Projects

ITS Data Mart (AD1)	**Medium 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 No projects have been identified at this time, as ITS deployments come on line and the quantity of available data increases it is likely that stakeholder agencies might develop data mart projects.	

ITS Data Warehouse (AD2)	**Low 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 ▪ Lakeway MTPO Archive Data Warehouse	

3. PROJECT RECOMMENDATIONS

In order to achieve the ITS deployment levels outlined in their regional ITS architecture, a region must deploy carefully developed projects that provide the functionality and interoperability identified in their ITS architecture. A key step toward achieving the Lakeway 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 for stakeholders to have ownership of the ITS Deployment Plan and to ensure that the plan has realistically identified projects and timeframes for deployment. 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.

To achieve input from stakeholders, a workshop was held in the Lakeway Region on October 1, 2008 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 deployment.

In the following sections all of the projects that were recommended for deployment by stakeholders are discussed. In Section 3.1 maps that identify locations of field elements for many of the priority projects in the Lakeway Region are presented. In Section 3.2 tables are provided with the ITS projects that have been identified for the stakeholder agencies in the Region.

3.1 ITS Infrastructure Deployment Maps

Existing, planned and future ITS infrastructure in the Lakeway Region is shown on the ITS infrastructure deployment maps included in this section. **Figure 1** depicts field element deployments for state agencies and **Figures 2 and 3** cover local agency deployments. Some of the field element deployments on the maps are already fully implemented and are not shown in the project tables in Section 3.2.

The ITS infrastructure deployment maps do not represent a design of the system. Prior to the deployment of any of the ITS field elements, the location of each of the field elements should be reviewed. The maps were developed with significant stakeholder input to assist the Region in developing an initial concept of how ITS can be deployed throughout the Region.

ITS field elements are typically shown as existing or future. Existing elements have either been fully deployed or were in the process of being deployed at the time this report was developed. Future elements are those elements that are not part of a funded project but have been identified as important to the Region. Each of the future elements shown in **Figures 1 through 3** are part of the projects described in the project tables in Section 3.2.

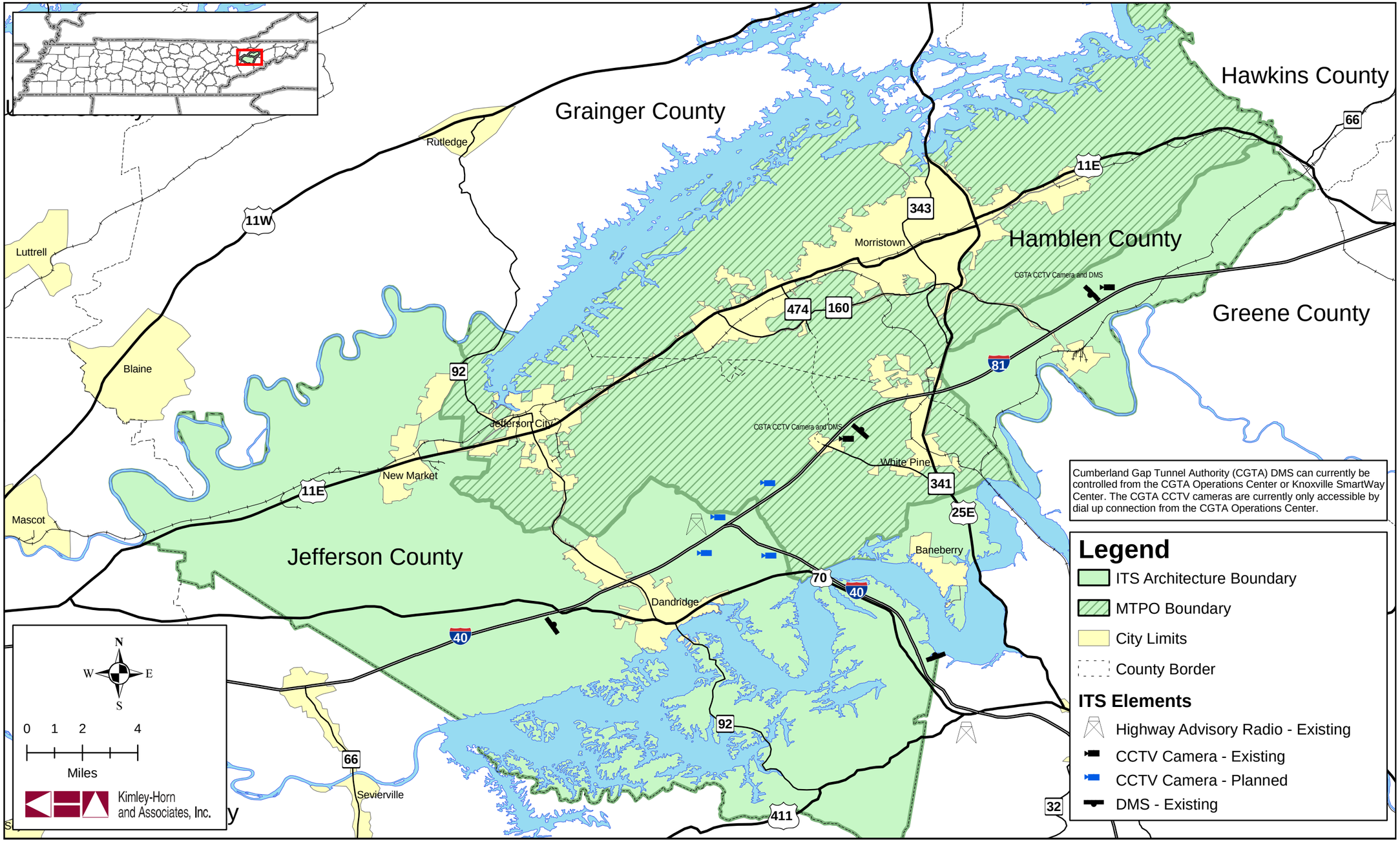

Figure 1 – TDOT ITS Field Element Deployments

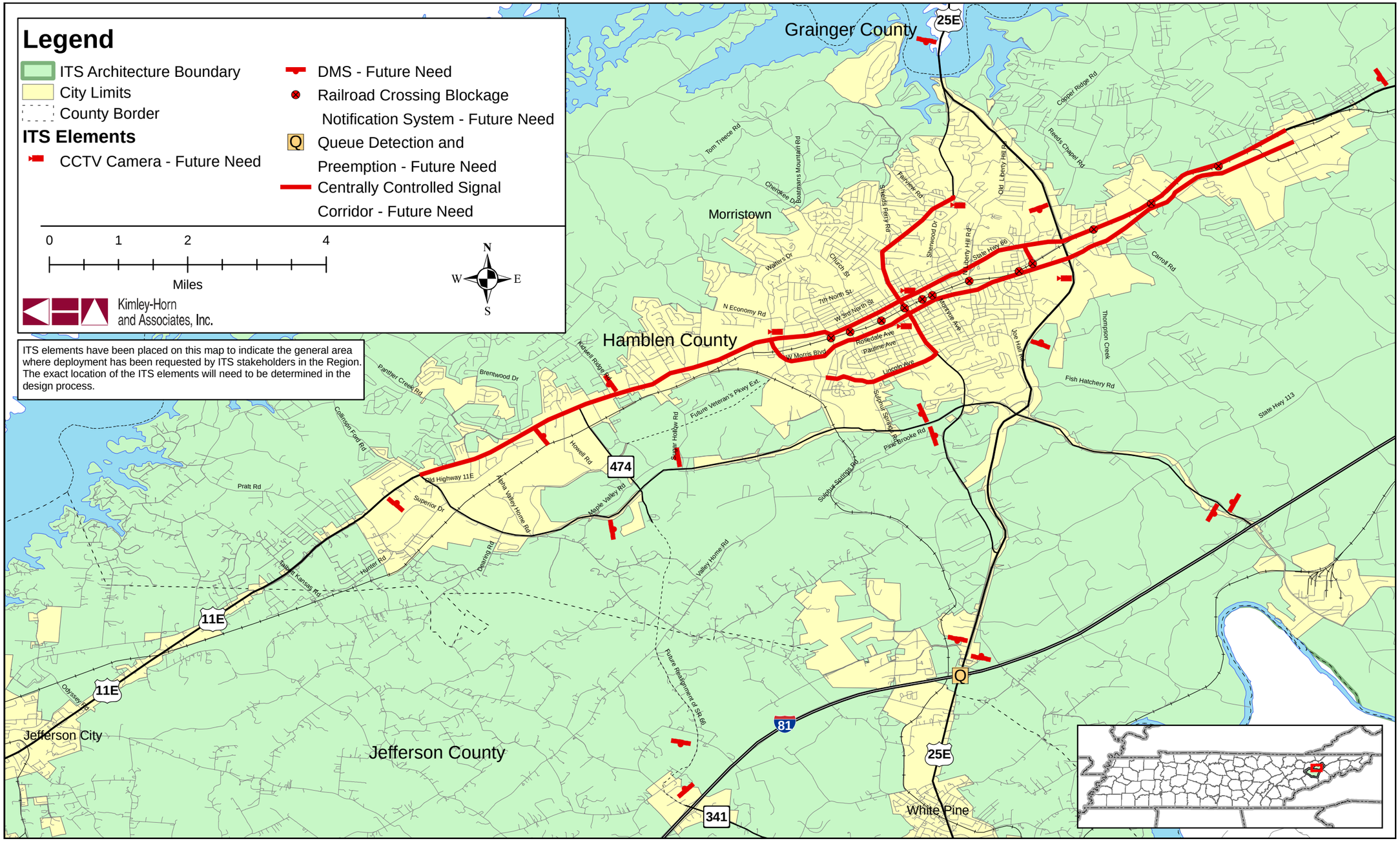

Figure 2 – Morristown ITS Field Element Deployments

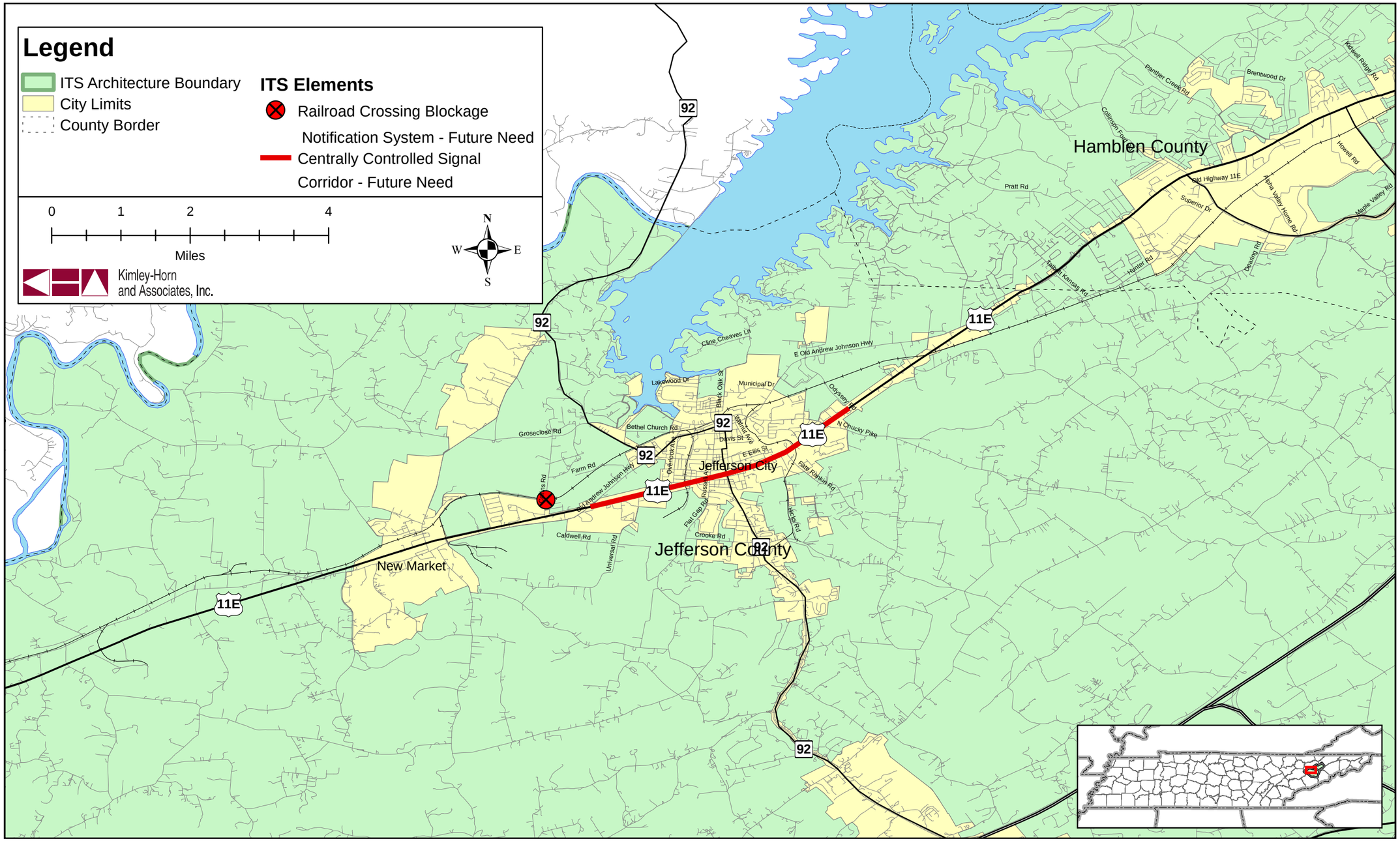

Figure 3 – Jefferson City ITS Field Element Deployments

3.2 Regional Projects

Regional projects are identified in **Table 9** through **Table 16**. The tables are divided by primary responsible agency as follows:

- **Table 9** – City of Jefferson City;
- **Table 10** – City of Morristown;
- **Table 11** – Hamblen County;
- **Table 12** – Jefferson County;
- **Table 13** – Lakeway MTPO;
- **Table 14** – Other Municipalities;
- **Table 15** – Tennessee Department of Transportation; and
- **Table 16** – Lakeway Region.

The projects identified in the tables represent priority projects for each agency that are needed in order to implement the ITS services that were identified as part of the Regional ITS Architecture development. A majority of the projects identified are not funded and identification of a funding source will likely be the most significant challenge in getting the projects implemented.

For each project, the following categories are discussed:

- **Project** – Identifies the project name including the agency responsible for implementation.
- **Description** – Provides a description of the project including notes on deployment locations and costs. The level of detail in the project descriptions varies depending on the implementing agency and how much detail they wanted to include regarding a project. In some cases projects had not been discussed beyond a very high conceptual level while in other cases an agency had begun detailed planning for a project implementation and more detail is provided in the description. **Figures 1 through 3** support the project descriptions by showing the location of many of the existing, planned, and future field components.
- **Opinion of Probable Cost and Funding Status** – Provides an opinion of probable cost of each project. Because design has not been undertaken for any projects, the opinion of probable cost should not be considered an estimate and should only be used for planning purposes. Costs are presented either as a total project cost when the project has been defined in more detail or as a unit cost per element when a project is at a higher conceptual level and has not been defined to the point where a total project cost opinion can be provided. For each project it is also noted whether funding has been identified or is still needed.
- **Deployment Timeframe** – Provides a recommended timeframe for deployment for each project. Timeframes have been identified as short-term (deployment recommended in 0-5 years), mid-term (deployment recommended in 5-10 years), and long-term (deployment recommended beyond 10 years). Recommendations for deployment timeframes were based on input from each agency and considered the project priority, possibility of funding, and dependency on other project deployments.
- **Applicable Market Packages** – Identifies the ITS market packages from the Regional ITS Architecture that each project will assist in implementing. Knowing which market packages each project identifies is an important part of an ITS architecture conformance review.

3.2.1 City of Jefferson City

Table 9 – City of Jefferson City Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Jefferson City TOC	Establish a Traffic Operations Center (TOC) for the City of Jefferson City to manage the traffic signal system. Cost represents equipment costs and those costs associated with modifying space in an existing facility for use as a TOC.	$100,000 – $200,000 Funding Identified: No	Short-term	ATMS01 ATMS03 ATMS06 ATMS08
City of Jefferson City Traffic Signal System Upgrades	Upgrade and expand the City of Jefferson City closed loop traffic signal system, including improved traffic signal coordination and communications to allow real time monitoring of traffic signals. 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 upgrades required and the communication infrastructure needed. A corridor was identified on US 11E from West Old Andrew Johnson Highway to Odyssey Road as a high priority need for traffic signal system upgrades.	$20,000 - $40,000/ intersection Funding Identified: No	Short-term	ATMS03
City of Jefferson City Railroad Grade Crossing Advanced Notification System	Implement advanced warning signs at railroad crossings to alert motorists of road blockages due to stopped trains. The information can also be shared with emergency dispatchers. A location for implementation was identified on Collins Road just north of US 11E. Information about crossing blockages is passed along to 911 Dispatch as part of the City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch project.	$10,000 - $20,000/site Funding Identified: No	Mid-term	ATMS13
City of Jefferson City TOC Coordination with TDOT SmartWay Center	Establish a communications connection between the City of Jefferson City TOC and the TDOT SmartWay Center in Knoxville for the coordination of traffic information. This sharing will facilitate the inclusion of regional information in the Tennessee 511 System as well as the sharing of video feeds and weather information as additional TDOT deployments are made in the Region.	To Be Determined Funding Identified: No	Long-term	ATMS07 ATMS08

Table 9 – City of Jefferson City Project Recommendations (continued)

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Jefferson City TOC Coordination with Jefferson County 911 Dispatch	Establish a connection to allow the City of Jefferson City TOC to share traffic information, railroad crossing closure status, and other information with the Jefferson County 911 Dispatch. This project could also include the integration of the 911 Dispatch Computer Aided Dispatch (CAD) system and the TOC to allow the TOC to receive automated notification about incidents that might affect the roadway network. Integration of the 911 Dispatch CAD system could also allow the TOC to provide 911 Dispatch with real-time traffic and road conditions for use in emergency vehicle dispatch.	To Be Determined Funding Identified: No	Mid-Term	ATMS08 EM02 MC10
City of Jefferson City Public Works Department Vehicle AVL	Implement automated vehicle location (AVL) on the City of Jefferson City Public Works Department vehicles. Cost represents in-vehicle equipment as well as supporting software.	$3,000/vehicle Funding Identified: No	Mid-Term	MC01
City of Jefferson City Fire Department AVL and MDTs	Implement AVL and mobile data terminals (MDTs) on City of Jefferson City Fire Department vehicles. Cost represents in-vehicle equipment as well as supporting software.	$5,000/vehicle Funding Identified: No	Short-Term	EM01 EM02
City of Jefferson City Fire Department Traffic Signal Preemption	Implement emergency vehicle signal preemption for the City of Jefferson City Fire Department to improve incident response times and emergency responder safety.	$6,000/intersection $1,500/vehicle Funding Identified: No	Short Term	ATMS03 EM02

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.2 City of Morristown

Table 10 – City of Morristown Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Morristown TOC	Establish a Traffic Operations Center (TOC) for the City of Morristown. The TOC will manage the traffic signal system, monitor closed circuit television (CCTV) cameras and vehicle detection, and control dynamic message signs (DMS). Cost represents equipment costs and those costs associated with modifying space in an existing facility for use as a TOC. It is envisioned that functionality of the TOC will be implemented in phases in coordination with improvements of communications to existing traffic signal system equipment and deployments of new signal system and ITS equipment in the field.	$100,000 – $200,000 Funding Identified: No	Short-term	ATMS01 ATMS03 ATMS06 ATMS08
City of Morristown Traffic Signal System Upgrades	Upgrade and expand the City of Morristown closed loop traffic signal system, including improved traffic signal coordination and communications to allow real time monitoring of traffic signals. Cost represents an average cost per intersection for upgrading and connecting to the fiber communications network. Cost will vary based on the level of upgrades required. Project implementation will be phased and done by corridor. Corridors identified for improvements in priority order include: – Cumberland Street from US 11E to West 1st North Street – US 11E from West Andrew Johnson Highway to Cumberland Street – US 11E from SR 160 to West Andrew Johnson Highway – West Andrew Johnson Highway/West 1st North Street from US 11E to Cumberland Street – US 11E from Cumberland Street to US 25E – East Andrew Johnson Highway from Cumberland Street to US 25E – US 11E from US 25E to Shelby Williams Drive – Morris Boulevard from US 25E to Industrial Avenue/Shelby Williams Lane – Haun Drive from US 11E to E Andrew Johnson Highway – North Cumberland Street from West 1st North Street to North Liberty Hill Road – Lincoln Avenue from Jarnigan Avenue to South Cumberland Street	$20,000 - $40,000/intersection Funding Identified: No	Short-term	ATMS03

Table 10 – City of Morristown Project Recommendations (continued)

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Morristown CCTV Cameras	Implement CCTV cameras on key sections of roadway within the City of Morristown including US 25E. 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 cost for a pole and camera. The cost will be lower if the camera is installed on a signal mast arm or other existing roadside structure. Priority locations include the following intersections: – US 11E / West Andrew Johnson Highway – North Cumberland Street / West 1st North Street – South Cumberland Street / US 11E – US 25E south of Exit 2 (Near the retail development) – North Cumberland Street / North Liberty Hill Road	$30,000/site Funding Identified: No	Short-term	ATMS01

Table 10 – City of Morristown Project Recommendations (continued)

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Morristown DMS	Deploy DMS in the City of Morristown to provide traveler information, incident management, and special event management capabilities. The following locations have been identified for DMS deployment: – US 11E eastbound west of SR 160 – SR 160 eastbound and westbound west of SR 343 – US 25E southbound north of Buffalo Trail* – US 25E northbound and southbound north of I-81 – US 25E southbound north of East Andrew Johnson Hwy – US 25E northbound south of East Andrew Johnson Hwy – SR 160 northbound and southbound north of I-81 – US 11E westbound east of East Morris Blvd The following locations have been identified for DMS deployment in coordination or after the completion of the 2012 planned upgrade of SR 66 to a four lane connector with limited access: – US 11E eastbound west of SR 66 – US 11E westbound east of SR 66 – SR 160 eastbound west of SR 66 – SR 160 westbound east of SR 66 – SR 66 northbound and southbound north of I-81 *Note: The DMS on US 25E southbound north of Buffalo Trail may need to be located in Grainger County to provide adequate time for drivers to read messages on the DMS and decide which route to take prior to the decision point at US 25E and Buffalo Trail (SR 343)	$90,000/sign Funding Identified: No	Mid-term	ATMS06
City of Morristown Portable DMS	Procure four additional portable DMS with the capability to change the messages remotely for use during maintenance activities, special events, and long-term incidents.	$25,000/sign Funding Identified: No	Short-term	ATMS06 MC08

Table 10 – City of Morristown Project Recommendations (continued)

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Morristown Railroad Grade Crossing Advanced Notification System	Implement advanced warning signs at railroad crossings to alert motorists of road blockages due to stopped trains. Priority locations include: – Fairmont Avenue – South High Street – South Jackson Street – South Cumberland Street – James Street – Montvue Avenue – North Liberty Hill Road – Senter Way – Haum Drive – Pope Road – Jaybird Road – Bethesda Road Information about crossing blockages is passed along to 911 Dispatch as part of the City of Morristown TOC Coordination with Hamblen County 911 Dispatch project. This information will allow 911 dispatchers to route emergency responders around blocked railroad crossings.	$10,000 - $20,000/site Funding Identified: No	Short-term	ATMS13
City of Morristown Weather Detection	Implement weather detection sensors at various locations in the City of Morristown to monitor roadway temperatures to aid in determining the correct abatement process (salt, brine, etc.) and prioritize locations for treatment.	$10,000 - $40,000/site Funding Identified: No	Mid-term	MC03
City of Morristown Real-Time Traveler Information Website	Add real-time traveler information, such as incident locations, speed, and CCTV camera images to the City of Morristown Public Works Department website.	$50,000 - $100,000 Funding Identified: No	Mid-term	ATIS01

Table 10 – City of Morristown Project Recommendations (continued)

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
City of Morristown TOC Coordination with TDOT SmartWay Center	Establish a communications connection between the City of Morristown TOC and the TDOT SmartWay Center in Knoxville for the coordination of traffic information. This sharing will facilitate the inclusion of regional information in the Tennessee 511 System as well as the sharing of video feeds and weather information as additional TDOT and City of Morristown deployments are made in the Region.	To Be Determined Funding Identified: No	Mid-term	ATMS07 ATMS08
City of Morristown TOC Coordination with Hamblen County 911 Dispatch	Establish a connection to allow the City of Morristown TOC to share CCTV camera images, railroad crossing closure status, and other information with the Hamblen County 911 Dispatch to aid in incident management. This project could also include the integration of the 911 Dispatch computer aided dispatch (CAD) system and the TOC to allow the TOC to receive automated notification about incidents that might affect the roadway network. Integration of the 911 Dispatch CAD system could also allow the TOC to provide 911 Dispatch with real-time traffic and road conditions for use in emergency vehicle dispatch.	To Be Determined Funding Identified: No	Short-term	ATMS08 EM02 MC10
City of Morristown Fire Department AVL and MDTs	Implement automated vehicle location (AVL) and mobile data terminals (MDTs) on City of Morristown Fire Department vehicles. Cost represents in-vehicle equipment as well as supporting software. This project should be coordinated with the Public Works Department AVL project as well as the existing Police Department AVL Deployment so that if at all possible a standardized deployment can be made for all City vehicles.	$5,000/vehicle Funding Identified: No	Short-term	EM01 EM02
City of Morristown Public Works Department Vehicle AVL	Implement AVL on City of Morristown Public Works Department vehicles. Cost represents in-vehicle equipment as well as supporting software. This project should be coordinated with the City of Morristown Fire Department AVL project as well as the existing Police Department AVL Deployment so that if at all possible a standardized deployment can be made for all City vehicles.	$3,000/vehicle Funding Identified: No	Mid-term	MC01

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.3 Hamblen County

Table 11 – Hamblen County Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
Morristown-Hamblen County EMS AVL and MDTs	Implement automated vehicle location (AVL) and mobile data terminals (MDTs) on Morristown-Hamblen County Emergency Medical Services (EMS) vehicles. Cost represents in-vehicle equipment as well as supporting software.	$5,000/vehicle	Short-term	EM01 EM02
Morristown-Hamblen County EMS Traffic Signal Preemption	Implement emergency vehicle signal preemption for Morristown-Hamblen County EMS to improve incident response times and emergency responder safety. Preemption capability is currently exists for the City of Morristown Fire Department but not for the Morristown-Hamblen County EMS and therefore much of the intersection infrastructure is already in place. In areas of Hamblen County outside the City of Morristown it may be necessary to install intersection equipment.	$6,000/intersection $1,500/vehicle Funding Identified: No	Short-term	ATMS03 EM02
Hamblen County 911 Dispatch CCTV Camera Image Sharing	Establish a connection to share TDOT and City of Morristown closed circuit television (CCTV) camera images with the Hamblen County 911 Dispatch. Connecting to the City of Morristown TOC will allow the Hamblen County 911 Dispatch access to TDOT video once the Traffic Operations Center (TOC) is connected to TDOT.	To Be Determined Funding Identified: No	Mid-term	ATMS08
Hamblen County EMA Back-up Operations for City of Morristown TOC	Implement a workstation and appropriate software at the Hamblen County Emergency Management Agency (EMA) to allow City of Morristown staff at the EMA during an emergency situation to have the ability to monitor and control all of the TOC capabilities.	To Be Determined Funding Identified: No	Mid-term	EM08 EM09
Hamblen County Public Works Department Weather Detection	Implement weather detection systems for snow, ice, flooding, and other severe weather conditions at various locations in Hamblen County including SR 160.	$10,000 - $40,000/site Funding Identified: No	Mid-term	MC03

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.4 Jefferson County

Table 12 – Jefferson County Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
Jefferson County EMS AVL and MDTs	Implement automated vehicle location (AVL) and mobile data terminals (MDTs) on Jefferson County Emergency Medical Services (EMS) vehicles. Cost represents in-vehicle equipment as well as supporting software.	$5,000/vehicle Funding Identified: No	Short-term	EM01 EM02
Jefferson County EMS Traffic Signal Preemption	Implement emergency vehicle signal preemption for Jefferson County EMS to improve incident response times and emergency responder safety.	$6,000/intersection $1,500/vehicle Funding Identified: No	Short-term	ATMS03 EM02
Jefferson County 911 Dispatch CCTV Camera Image Sharing	Establish a connection to share TDOT closed circuit television (CCTV) camera images with the Jefferson County 911 Dispatch.	To Be Determined Funding Identified: No	Short-term	ATMS08
Jefferson County EMA Back-up Operations for City of Jefferson City TOC	Implement a workstation and appropriate software at the Jefferson County Emergency Management Agency (EMA) to allow City of Jefferson City staff at the EMA during an emergency situation to have the ability to monitor and control all of the Traffic Operations Center (TOC) capabilities.	To Be Determined Funding Identified: No	Mid-term	EM08 EM09

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.5 Lakeway Metropolitan Transportation Planning Organization

Table 13 – Lakeway MTPO Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
Lakeway MTPO Archive Data Warehouse	Establish a data warehouse to archive data from cities and future transit agencies in the Metropolitan Transportation Planning Organization (MTPO) 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 Lakeway MTPO.	$200,0000 Funding Identified: No	Long-term	AD2

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.6 Other Municipalities

Table 14 – Other Municipalities Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
Town of White Pine Fire and Police Department Traffic Signal Preemption	Implement emergency vehicle signal preemption for the Town of White Pine Fire Department and Police Department to improve incident response times and emergency responder safety. The Town of White Pine has identified the traffic signal at Maple Street and Main Street as the highest priority for traffic signal preemption. The traffic signal at US 25E and Main Street has a growing need for traffic signal preemption. A traffic signal will be added in the future at the freeway ramps of I-81 and SR 341 (Exit 4); however, a need for traffic signal preemption is not anticipated at this intersection.	$6,000/intersection $1,500/vehicle Funding Identified: No	Short-term	ATMS03 EM02

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.7 Tennessee Department of Transportation

Table 15 – TDOT Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
TDOT SmartWay Deployment – CCTV Cameras	Implement closed circuit television (CCTV) cameras at the I-40/I-81 interchange in the Lakeway Region. CCTV cameras can be used to monitor traffic conditions and to aid in incident management. The cameras will be monitored by the TDOT SmartWay Center in Knoxville and the camera feeds could be shared with traffic and emergency management agencies in the Region. Communications costs are not included and can vary widely depending on available options for communication and the quality of video that is required.	$30,000/camera Funding Identified: Yes	Short-term	ATMS01

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

3.2.8 Lakeway Region

Table 16 – Regional Project Recommendations

Project	Description	Opinion of Probable Cost[1] and Funding Status	Deployment Timeframe[2]	Applicable Market Packages
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 closed circuit television (CCTV) camera video feeds, from the transportation agencies in the Region then it is expected that the media will be responsible for any costs. Responsible Agencies: City of Morristown, City of Jefferson City, TDOT.	No Associated Cost Note: Funding not applicable	Mid-term	ATIS01

[1]The design has not been undertaken and thus this is only an opinion of probable cost for implementation to be used for planning purposes.

[2]Deployment timeframes include short-term (0-5 years), mid-term (5-10 years), and long-term (10+ years).

4. MAINTAINING THE REGIONAL ITS DEPLOYMENT PLAN

Just as the ITS Architecture developed for the Lakeway 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 Lakeway 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 the ITS Deployment Plan.

Stakeholders agreed upon a procedure for updating the Regional ITS Architecture and Deployment Plan. The procedure, documented in detail in the Lakeway Regional ITS Architecture, outlines how to document ITS Architecture changes that may be needed for inclusion in the next plan update. While complete plan updates are scheduled to occur approximately every four years prior to the Long Range Transportation Plan update, stakeholders agreed that it would be beneficial to review the projects identified in the ITS Deployment Plan once a year. The Lakeway MTPO will lead the annual project reviews. The purpose of the reviews will be to update project status, remove projects that are completed, add project detail when available, and add any new projects into the ITS Deployment Plan. Any corresponding changes to the Lakeway Regional ITS Architecture will be documented and retained by the Lakeway MTPO for inclusion during the next complete update as outlined in the Lakeway Regional ITS Architecture document.