Lakeway Regional ITS Architecture and Deployment Plan

Executive Summary

February 2009

Introduction

The purpose of the Lakeway Regional Intelligent Transportation System (ITS) Architecture and Deployment Plan is to develop a framework for the implementation and operation of ITS in the Lakeway Region. An ITS architecture and deployment plan allows stakeholders to plan for what they want their system to look like in the long term and then break the system into smaller pieces that can be implemented over time as funding permits. Development of an ITS architecture and deployment plan encourages interoperability and resource sharing among agencies and allows for cohesive long-range planning among regional stakeholders.

Stakeholders in the Lakeway Region identified several key management areas where ITS applications could address local needs. These areas included traffic management, emergency management, and maintenance and construction management. Some of the highest priority ITS projects that were identified included projects to improve traffic signal timing on corridors, deploy closed circuit television cameras and dynamic message signs, and provide advanced notification of trains blocking railroad crossings to emergency dispatchers and the general public.

In addition to the planning benefits of developing a regional ITS architecture, project conformance to the regional ITS architecture is also a requirement for any agency in the Region to be eligible for federal funding of an ITS project.

What is ITS?

Intelligent Transportation Systems (ITS) are the application of electronic technologies and communications to improve the operation of roadway and transit systems.

Lakeway Regional Stakeholders

The development of the Lakeway Regional ITS Architecture and Deployment Plan was led by the Tennessee Department of Transportation (TDOT) and the Lakeway Metropolitan Transportation Planning Organization (MTPO). The success of the plan is due in large part to the collaboration and continuous participation of the stakeholders representing the Lakeway Region. These stakeholders participated in a series of four workshops conducted in 2008 to develop the Regional ITS Architecture and Deployment Plan. Stakeholder agencies included:

- City of Jefferson City
- City of Morristown
- Cumberland Gap Tunnel Authority
- Federal Highway Administration – Tennessee Division
- Hamblen County E911
- Jefferson County E911
- Jefferson County Sheriff's Office
- Lakeway MTPO
- Morristown Utility Systems
- Norfolk Southern Corporation
- TDOT – Long Range Planning Division
- TDOT – Region 1 SmartWay Center
- Tennessee Highway Patrol
- Town of White Pine
- Walters State Community College

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Lakeway Use and Maintenance Plan

Use and maintenance of the Regional ITS Architecture and Deployment Plan will be important to preserve the plan's role as a guide for the implementation of ITS in the Lakeway Region. Stakeholders in the Region developed the following guidelines to address use of the plan for project deployment and maintenance of the plan to reflect changing needs and priorities.
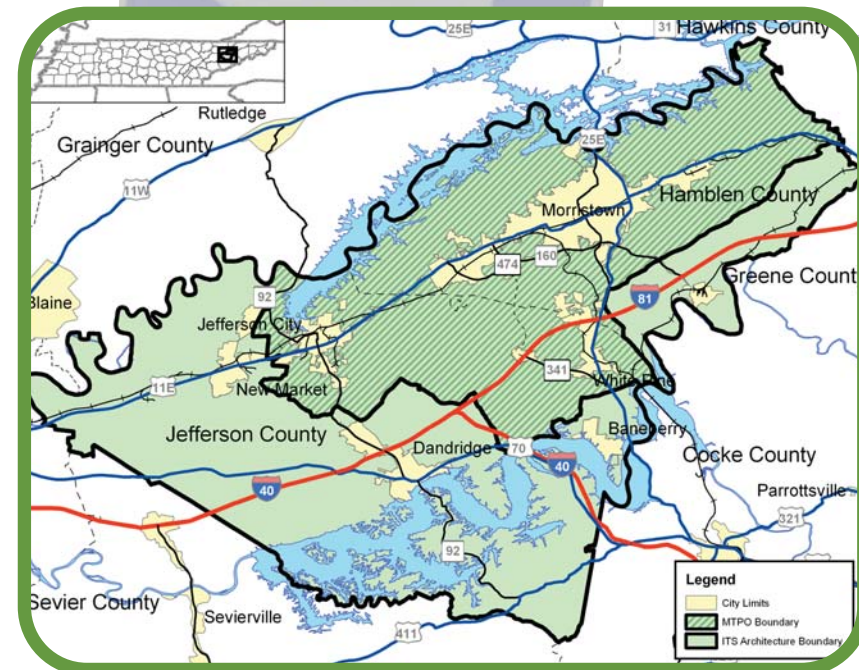
ITS Architecture Use

To ensure eligibility for the use of federal transportation funding of regional ITS projects, as projects are developed they will be compared to the applicable ITS market packages. Any discrepancies between the planned project and the ITS Architecture will be resolved either by modifying the project or the market package(s). Changes to the market packages will be documented on an Architecture Maintenance Documentation Form. All change forms will be retained by the Lakeway MTPO until the next plan update.

ITS Architecture Maintenance

The stakeholder group will review the recommended projects in the ITS Deployment Plan annually to determine changes in the project status, prioritization, or the addition of new projects. Any changes will be documented by the Lakeway MTPO. Prior to the Long Range Transportation Plan update the Regional ITS Architecture and Deployment Plan will undergo a complete update. During the complete update, Architecture Maintenance Documentation Forms and changes to the ITS Deployment Plan projects will be incorporated. In addition, any new stakeholders or elements in the Region will be included and any changes made to the National ITS Architecture will be evaluated for their impact on the Regional ITS Architecture.

Lakeway Region Geographic Boundaries

The geographic boundaries that were used in the development of the Regional ITS Architecture and Deployment Plan include all of Hamblen and Jefferson Counties. The Lakeway MTPO area falls within the boundaries selected for the Lakeway Regional ITS Architecture and Deployment Plan and is represented by the diagonal lines in the map below.

Legend
- City Limits
- MTPO Boundary
- ITS Architecture Boundary

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Lakeway Project Approach

The Lakeway Regional ITS Architecture was developed using a consensus approach with input from stakeholder agencies throughout the Region. Three key steps were used to develop the plan.

Step 1 – Identify Needs and ITS Inventory
Stakeholder needs as well as existing and planned ITS elements were identified. Elements were categorized as centers, vehicles, travelers, or field devices as shown in the diagram to the right.

### Step 2 – Develop ITS Market Packages (Services)
ITS market packages represent the services that ITS can provide to address one or more needs in the Region. In the Lakeway Region a total of 40 market packages were identified and prioritized as high, medium, or low. Market packages not only identify a service, but also show how that service will be operated and the data flows that will occur between agencies.

Step 3 – Identify Sequence of ITS Projects to Deploy in the Region
The ITS Deployment Plan identifies the projects that stakeholders recommended for deployment in order to implement the ITS services identified in the market packages.

> ### What is an ITS architecture?
> An ITS architecture is a framework for the deployment and operation of ITS in a region.
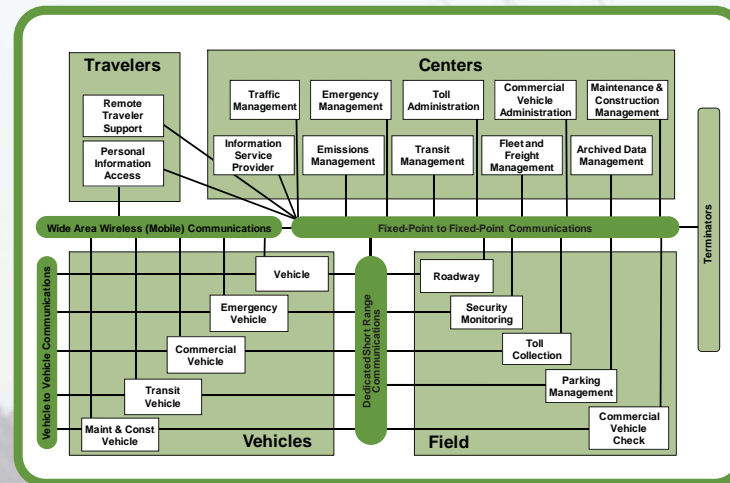
Lakeway ITS Market Packages

ITS market packages outline the functions and services that stakeholders envision ITS to perform now and in the future. Stakeholders selected and prioritized market packages into high, medium, and low priorities based on regional needs, feasibility, likelihood of deployment, and overall contribution of the market package to meeting the goals and vision for ITS functionality in the Region. The high priority ITS market packages identified by stakeholders in the Lakeway Region included:

Traffic Management
- Network Surveillance
- Surface Street Control
- Traffic Information Dissemination
- Traffic Incident Management System
- Standard Railroad Grade Crossing

Emergency Management
- Emergency Call-Taking and Dispatch
- Emergency Routing
- Wide-Area Alert

Traveler Information
- Broadcast Traveler Information
- Interactive Traveler Information

Maintenance and Construction Management
- Road Weather Data Collection
- Weather Information Processing and Distribution
- Work Zone Management
- Maintenance and Construction Activity Coordination

Lakeway ITS Projects

A list of recommended ITS projects for the Lakeway Region was developed through input from stakeholders during the ITS architecture development process. Stakeholders grouped projects into timeframes for deployment based on priority, dependence on other projects, technology, and feasibility. Locations for deployment of ITS elements in the field were also identified for many of the projects and documented on maps included in the ITS Deployment Plan. Below is a summary of some of the key projects recommended for deployment in the short-term (next five years) by stakeholder agencies in the Region. A complete listing of all the projects identified is found in the Regional ITS Deployment Plan.

> ### What is an ITS deployment plan?
> An ITS deployment plan identifies the projects that need to be implemented in order to meet ITS needs and deliver the ITS services identified in the ITS architecture.

City of Jefferson City
- Traffic Operations Center
- Traffic Signal System Upgrades
- Fire Department Automated Vehicle Location (AVL) and Mobil Data Terminals (MDTs)
- Fire Department Traffic Signal Preemption

City of Morristown
- Traffic Operations Center
- Traffic Signal System Upgrades
- Closed Circuit Television (CCTV) Cameras
- Portable Dynamic Message Signs (DMS)
- Railroad Grade Crossing Advanced Notification System
- Traffic Operations Center Coordination with Hamblen County 911 Dispatch
- Fire Department AVL and MDTs

Hamblen County
- Morristown-Hamblen County EMS AVL and MDTs
- Morristown-Hamblen County EMS Traffic Signal Preemption

Jefferson County
- EMS AVL and MDTs
- EMS Traffic Signal Preemption
- 911 Dispatch CCTV Camera Image Sharing

Tennessee Department of Transportation
- SmartWay Deployment - CCTV Cameras

Town of White Pine
- Fire and Police Department Traffic Signal Preemption

ITS Deployment Examples

Closed Circuit Television Cameras

Traffic Management/Operations Center

Dynamic Message Signs

Railroad Crossing Advance Notification

Traffic Signal Coordination System

Emergency Vehicle Signal Preemption