

## Nashville Area 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 Nashville Area. Stakeholders in the Region developed the following guidelines to address use of the plan for project deployments and maintenance of the plan to reflect changing needs and priorities.

### ITS Architecture Use

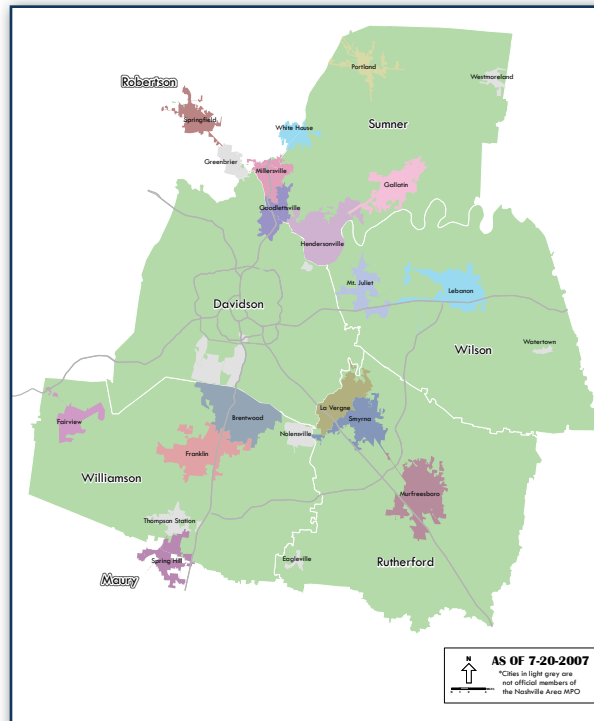
To ensure eligibility for the use of federal transportation funding of regional ITS projects, projects will be compared to the applicable ITS market packages as they are developed. Any discrepancies between a planned project and the ITS Architecture will be resolved either by modifying the project or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

### ITS Architecture Maintenance

The Nashville stakeholders will review the Regional ITS Deployment Plan on an as needed basis. Recommended projects from the ITS Deployment Plan will be reviewed to determine changes in the project status, prioritization, or the addition of new projects. Any changes will be documented by the Nashville Area MPO. 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.

### Nashville Area Geographic Boundaries

The geographic boundaries were defined for the Nashville Area Regional ITS Architecture using the boundaries of the Nashville Area MPO plus the remainder of Robertson County. The MPO boundaries include all of Davidson, Rutherford, Sumner, Williamson, and Wilson Counties as well as parts of Robertson and Maury Counties. Robertson County was not completely included within the MPO boundaries at the time the Regional ITS Architecture was developed, however the Nashville Area stakeholders decided to include all of Robertson County as part of the geographic boundaries for the ITS architecture.



Nashville Area MPO Boundaries



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# NASHVILLE AREA REGIONAL ITS ARCHITECTURE AND DEPLOYMENT PLAN

## Executive Summary

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### Introduction

Development of a regional intelligent transportation system (ITS) architecture and deployment plan is an important step in the planning and implementation of ITS in a region. The 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. In the Nashville Area, the first regional ITS architecture was developed in 2003. Since that time a number of new ITS projects have been implemented and the National ITS Architecture,

which serves as the basis for the Nashville Area Regional ITS Architecture, has been updated. In order to reflect these changes the Nashville Area Metropolitan Planning Organization (MPO), in coordination with the Tennessee Department of Transportation (TDOT), began an update of the Regional ITS Architecture in 2009. 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.

### Nashville Area Regional Stakeholders

The development of the Nashville Area Regional ITS Architecture and Deployment Plan was led by the Nashville Area MPO in coordination with TDOT. The success of the plan is due in large part to the collaboration and continuous participation of the stakeholders representing the Nashville Area Region. These stakeholders participated in a series of four workshops conducted in 2009 and 2010 to develop the Regional ITS Architecture and Deployment Plan.

#### Stakeholder agencies included:

- City of Franklin
- City of Gallatin
- City of Lebanon
- City of Mt. Juliet
- City of Murfreesboro
- City of Nashville
- Federal Highway Administration – Tennessee Division
- Franklin Transit Authority
- Metropolitan Transit Authority
- Mid-Cumberland Human Resource Agency Public Transit
- Nashville Area MPO
- TDOT – Community Relations
- TDOT – Design Division
- TDOT – Long Range Planning Division
- TDOT – Project Planning Division
- TDOT – Region 3
- Town of Smyrna
- Williamson County
- Wilson County

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## Nashville Area Project Approach

The Nashville Area 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

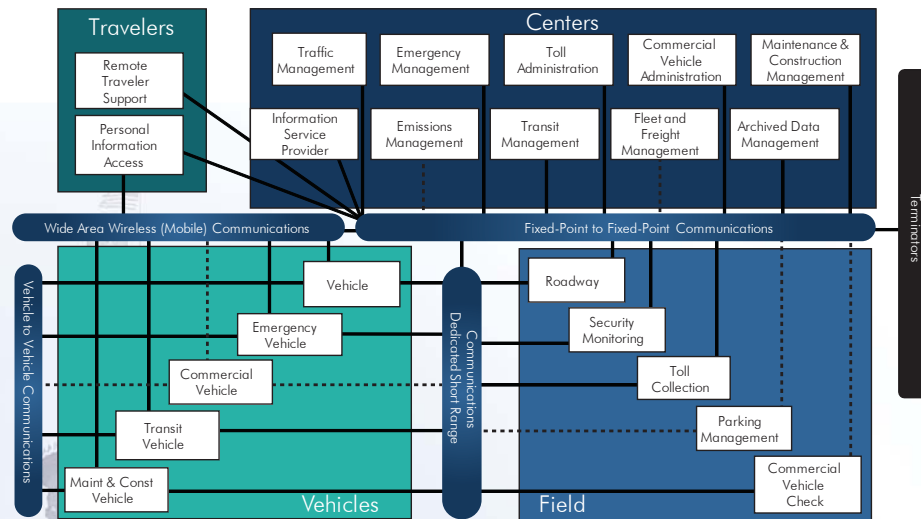
Stakeholder needs as well as existing and planned ITS elements were identified. Elements were categorized as centers, vehicles, travelers, or field devices as shown in the diagram below.

### 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 Nashville Area a total of 40 market packages were identified and prioritized as high, medium, or low. Market packages not only identify services, but also show how those services 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.

## Nashville Area 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 as high, medium, or low priority 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 Nashville Area Region are listed below.

#### Traffic Management

- Network Surveillance
- Surface Street Control
- Traffic Information Dissemination
- Regional Traffic Management
- Traffic Incident Management System

#### Emergency Management

- Emergency Call-Taking and Dispatch
- Emergency Routing
- Roadway Service Patrols

#### Maintenance and Construction Management

- Work Zone Management
- Maintenance and Construction Activity Coordination

#### Public Transportation Management

- Transit Vehicle Tracking
- Transit Fixed-Route Operations
- Demand Response Transit Operations
- Transit Security
- Transit Fleet Management
- Transit Traveler Information
- Transit Signal Priority

#### Traveler Information

- Broadcast Traveler Information
- Interactive Traveler Information

## ITS Deployment Plan

### Recommended ITS Projects

A list of recommended ITS projects for the Nashville Area was developed through input from stakeholders during the ITS architecture development process. Projects included those submitted for the Nashville Area 2035 Regional Transportation Plan as well as other projects identified through the ITS Architecture development process. Stakeholders grouped projects into time-frames for deployment based on priority, dependence on other projects, technology, and feasibility. Below is a summary of some of the key projects recommended for deployment by stakeholder agencies in the Region. A complete listing of all the projects identified is found in the Regional ITS Deployment Plan.

### Municipal/County Projects

- Traffic Operation Center (TOC) Implementation
- Traffic Signal System Implementation and Optimization
- Closed Circuit Television Camera (CCTV) Implementation
- Dynamic Message Sign (DMS) Implementation
- Road Weather Information System Implementation
- Railroad Grade Crossing Advanced Notification System
- Arterial Street Service Patrol Implementation
- Real-Time Traveler Information Website
- Emergency Vehicle Traffic Signal Preemption

### Nashville Area Metropolitan Planning Organization Projects

- Nashville Area MPO Archive Data Warehouse

### Tennessee Department of Transportation Recommended Projects

- SmartWay Freeway Management System Extension
  - SmartWay Ramp Metering
  - HELP Service Patrol Expansion
  - SmartWay Traffic Management Center (TMC)
- Coordination with:
- Municipal TOCs
  - County Emergency Management Agencies
  - Tennessee Highway Patrol
  - Tennessee Statewide Emergency Operations Center
  - Tennessee Fusion Center

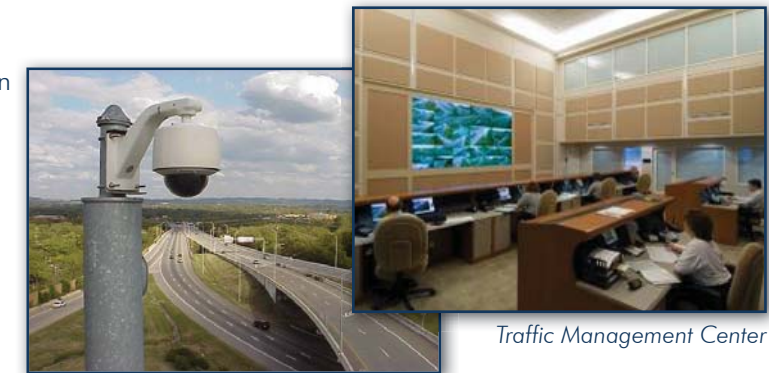
### Transit Projects

- Transit Vehicle Tracking
- On-Board Security Cameras and Alarm Systems
- Transit Vehicle Passenger Counters
- Next-bus Arrival DMS
- Real-time Traveler Information Websites
- Interactive Voice Response Systems for Reservations
- Transit Dispatch Coordination with Municipal TOCs
- Transit Signal Priority

### What is an ITS Deployment Plan?

An ITS Deployment Plan identifies the projects that need to be implemented in order to deliver the services identified in the ITS Architecture.

### ITS Deployment Examples:



Closed Circuit Television Cameras

Traffic Management Center



Traffic Signal Coordination



Transit Vehicle Tracking



Emergency Vehicle Traffic Signal Preemption



Dynamic Message Signs