

## Kingsport 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 Kingsport 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

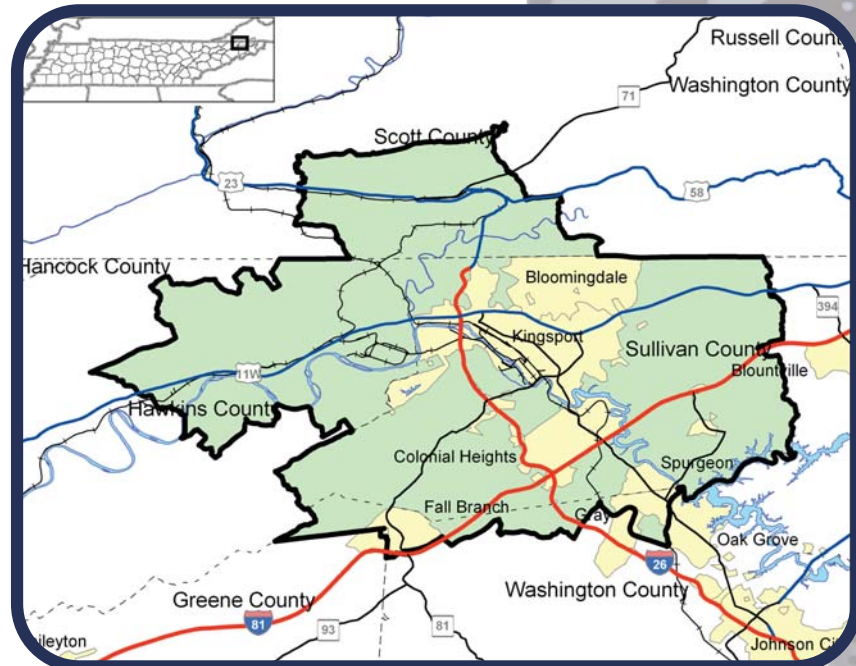
To ensure eligibility for the use of federal transportation funding of regional ITS projects, as projects are developed they will be compared to the applicable ITS market packages. Any discrepancies between the planned project and the ITS architecture will be resolved either by modifying the project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

### ITS Architecture Maintenance

The stakeholder group will review the Regional ITS Deployment Plan annually. The 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 Kingsport 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.

## Kingsport Region Geographic Boundaries

The Kingsport Region is defined by the boundaries of the Kingsport MPO and includes portions of Sullivan, Hawkins, and Washington Counties in Tennessee and Scott County in Virginia.



## Project Contacts



**Joe Roach**  
Joseph.Roach@state.tn.us



**Amy Lewis**  
amy.lewis@kimley-horn.com

**Tom Fowler**  
thomas.fowler@kimley-horn.com

# Kingsport Regional ITS Architecture and Deployment Plan

Executive Summary

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## Introduction

The purpose of the Kingsport Regional Intelligent Transportation System (ITS) Architecture and Deployment plan is to develop a framework for the implementation and operation of ITS in the Kingsport 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 Kingsport Region identified several key management areas where ITS applications could address local needs.

These areas included traffic management, emergency management, and public transit management. Some of the highest priority ITS projects that were identified included projects to improve traffic signal timing on corridors, detect queues on freeway off-ramps that might block freeway through lanes, provide traffic signal preemption capabilities to emergency vehicles, and deploy closed circuit television cameras and dynamic message signs to manage incidents and special events.

In addition to the planning benefits of developing a regional ITS

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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.

## Kingsport Regional Stakeholders

The development of the Kingsport Regional ITS Architecture and Deployment Plan was led by the Tennessee Department of Transportation (TDOT) in coordination with the Kingsport

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

Metropolitan Planning Organization (MPO) and the Virginia Department of Transportation (VDOT). The plan was developed concurrently with the development of the Bristol Regional ITS Architecture and Deployment Plan and many of

the workshops were conducted jointly with stakeholders from both regions. The success of the plan is due in large part to the collaboration and continuous participation of the stakeholders representing the Kingsport Region. These stakeholders participated in a series of four workshops conducted in 2007 and 2008 to develop the Kingsport Regional ITS Architecture and Deployment Plan.

Stakeholder agencies included:

- City of Kingsport
- City of Mount Carmel
- Kingsport MPO
- Federal Highway Administration – Tennessee Division
- Johnson City MPO
- Mountain Empire Older Citizens, Inc.
- Sullivan County
- TDOT Long Range Planning Division
- TDOT Region 1
- Tennessee Highway Patrol
- VDOT Bristol District

## Kingsport Project Approach

The Kingsport 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)

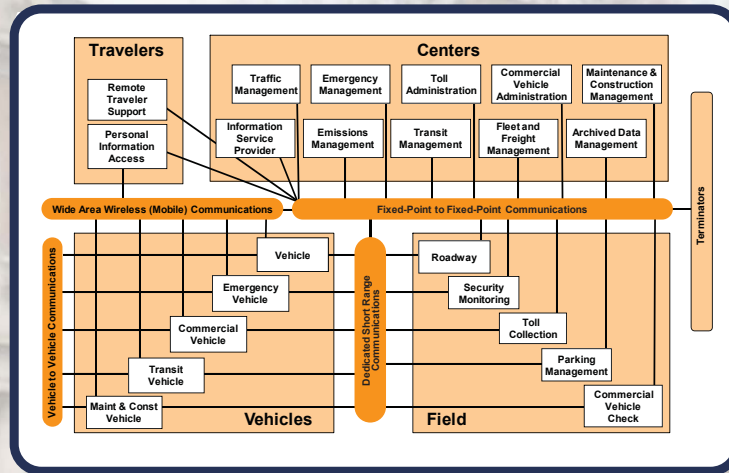
ITS market packages represent the services that ITS can provide to address one or more needs in the Region. In Kingsport a total of 36 market packages were identified and prioritized as high, medium, or low. Market packages not only identify a service, but also show how that service will be operated 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.



## Kingsport 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 Kingsport Region include:

### Traffic Management

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

### Emergency Management

- Emergency Call-Taking and Dispatch
- Emergency Routing
- Wide-Area Alert
- Disaster Traveler Information

### 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

### Public Transportation Management

- Transit Vehicle Tracking
- Transit Fixed-Route Operations
- Demand Response Transit Operations
- Transit Security

## Kingsport ITS Projects

A list of recommended ITS projects for the Kingsport 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 by stakeholder agencies in the Region. A complete listing of all the projects identified is found in the Regional ITS Deployment Plan.

### Kingsport MPO

- Archive Data Warehouse

### City of Kingsport

- Traffic Operations Center (TOC)
- Centrally Controlled Signal Corridors and Fiber Optic Communication System
- Closed Circuit Television (CCTV) Cameras
- Dynamic Message Sign (DMS)
- Speed Monitoring System
- Freeway Off-Ramp Queue Detection
- Railroad Grade Crossing Improvements
- TOC Coordination with TDOT Region 1 and Kingsport 911
- Fire and Emergency Medical Services Automated Vehicle Location (AVL) and Mobile Data Terminals (MDTs)
- Emergency Vehicle Signal Preemption
- Public Works AVL

### Mountain Empire Older Citizens, Inc. Transit

- Transit Bus AVL and MDTs
- On-Board Bus Security Monitoring

### Sullivan County

- 911 Dispatch and Emergency Operations Center
- CCTV Camera Image Sharing

### City of Mount Carmel

- Speed Monitoring System

## 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.

### Kingsport Area Transit Service

- Transit Bus AVL
- Real-time Bus Arrival Information
- Electronic Fare Collection
- Automatic Passenger Counters
- On-Board Bus Security Monitoring
- Central Station and Bus Stop Security Monitoring
- Traffic Signal Priority

### Tennessee Department of Transportation

- SmartWay Deployment at the I-26/I-81 Interchange – CCTV Cameras
- SmartWay Deployment on I-26 – CCTV Cameras
- SmartWay Deployment on I-26 – DMS
- SmartWay Deployment on I-26 – Vehicle Detection
- TDOT Weather Detection
- TDOT HELP Vehicle Service Area Expansion

### Virginia Department of Transportation

- CCTV Cameras
- DMS on US 23 and SR 224
- Vehicle Detection Deployment on I-81
- Highway Advisory Radio

## ITS Deployment Examples



Closed Circuit Television Cameras



Traffic Management Center



Dynamic Message Signs



Highway Incident Response Units



Traffic Signal Coordination System



Emergency Vehicle Signal Preemption