

*Tennessee Department of  
Transportation*

**SmartWay Strategic Plan**

**2007 ANNUAL REPORT**



**December 2007**

This 2007 Report Was Prepared By The:

**Intelligent Transportation Systems  
Coordinating Committee**

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# 1. PREFACE

The Tennessee Department of Transportation (TDOT), recognizing a need to develop and implement an intelligent transportation systems (ITS) strategic plan, approved the organization of an ITS Coordinating Committee for the agency in January 1997. Comprised of representatives from the TDOT, the Federal Highway Administration (FHWA) and Vanderbilt University, the Committee was charged with producing a strategic plan to help guide the Department and be responsive to public and private concerns involving ITS. The initial ITS Strategic Plan was produced in June 1998. In 2004, TDOT named its intelligent transportation system "SmartWay."

This document presents an update to the ITS Strategic Plan, effective December 2007. The key plan elements are listed below:

- A definition of ITS
- ITS user services relevant to the agency
- Performance measures to identify roadway segments and corridors that may need ITS applications
- Maps indicating the location and extent of ITS technologies
- TDOT's strategic priorities involving the use of ITS
- Ongoing ITS projects within the State of Tennessee
- Issues involved in making implementation of the strategic plan practical and achievable

The intent of this document is for the reader to become aware of current activities within the TDOT that involve ITS, as well as the expected direction of future development. This will enable all interested parties to coordinate their efforts towards an integrated approach for utilizing ITS statewide to:

- Improve operating efficiency
- Improve safety and security
- Reduce congestion
- Improve reliability
- Improve access, availability and quality of planning information

## 2. WHAT IS ITS?

Intelligent transportation systems (ITS) is a term used to represent the application of advanced information technologies and management practices to improve the safety and operation of highways and other transportation modes, such as public transit. ITS applications can take on many forms, including the use of:

1. **Vehicle detection devices** to report traffic counts, speed and travel time
2. **Video surveillance** to monitor congested freeways and provide improved incident management capabilities
3. **Dynamic message signs (DMS)** to provide real-time traffic information to motorists
4. **Freeway service patrols** to reduce congestion by removing minor incidents in a timely fashion
5. **Transportation management centers** to serve as a focal point for traffic management operations and communications
6. **Incident management** to detect, verify and respond to incidents in an efficient manner and manage traffic conditions around the incident site
7. **Traffic control during construction and maintenance** to provide traffic information to motorists traveling through construction and maintenance sites
8. **Road weather monitoring systems** to monitor, predict and report information regarding weather-related road conditions to management and the traveling public
9. **Information services** to facilitate the communication of data from ITS devices to a central location and the distribution of transportation information to motorists and other interested parties before and during trip making

These system applications are typically delivered through ITS enabling technologies such as fiber optics, digital transmission, remote and central computers, the Internet, advanced video cameras, geographic information systems (GIS), and global positioning systems (GPS). This information is also delivered through many other means, including in-vehicle navigation, personal digital assistants (PDA's) and cellular telephones.

Tennessee has several of the aforementioned applications and technologies deployed and under development. A main purpose of the SmartWay Strategic Plan is to ensure these applications address Tennessee's transportation needs in an efficient, effective and integrated fashion.

## 3. ITS USER SERVICES

User services document how ITS should perform from the user's perspective. There are currently thirty-three user services that have been jointly defined by the U.S. Department of Transportation and ITS America (<http://www.itsa.org>) as being part of the National Architecture. The National Architecture provides a

common framework for planning, identifying and integrating intelligent transportation systems.<sup>1</sup> This architecture identifies ITS technologies and functions as well as the information flows that connect them into an integrated transportation system. Version 5.1 of the National Architecture was released in early 2005. ITS architectures ensure that ITS projects throughout the nation meet certain standards, and that ITS systems are somewhat compatible and may communicate with each other. Each user service has varying degrees of relevance to TDOT. To identify those user services of importance to the agency, three criteria were used:

1. *Does it apply to controlled access highways?*
2. *Does it involve integration of traffic control for freeway/surface street interfaces in urban areas?*
3. *Does it involve activities within the scope of TDOT's mission?*

Using these criteria, priority user services were identified. As the user services are broadly defined, more specific ITS functions were defined for each user service. These were then classified according to whether TDOT's role would be as the lead, support, or a combination of lead and support agency.

Table 1 provides a listing of TDOT ITS user service priorities. These priorities serve as the focal point of ensuing strategic planning activities. Under a lead role, TDOT would be expected to provide financial, technical, project management and operational control. Under the support role, TDOT would only provide financial and/or technical guidance to the project. A more detailed description of each priority user service area may be found at:

<http://itsarch.iteris.com/itsarch/html/user/userserv.htm>

ITS applications related to interstate roadways apply to the entire Tennessee system (rural and urban). In urban areas, TDOT's role includes both freeways and select partial access controlled roadways. The issue of integrating traffic control strategies between TDOT and local agencies for freeway/surface street interfaces is presently concentrated on the four major urban areas within the State: Chattanooga, Knoxville, Memphis, and Nashville. Note that the scope for integrating ITS into the agency's activities can and will cover non-freeway areas such as truck permitting, personal traveler security, ride-matching and public transportation.

1 National ITS Architecture website (<http://itsarch.iteris.com/itsarch/>). 2005

**Table 1. TDOT ITS User Service Priorities**

<b>User Service</b>	<b>TDOT Role</b>
<b>1.0 Travel and Traffic Management</b>	
1.1 Pre-trip Travel Information	
-Broadcast Information	Lead/Support
-Interactive Information	Lead/Support
1.2 En-route Driver Information	
-Highway Advisory Radio	Lead
-Welcome Centers and Rest Areas	Lead
-Private Traveler Information Providers	Lead/Support
-Dynamic Message Signs	Lead/Support
1.3 Route Guidance	Support
1.4 Ride Matching and Reservation	Support
1.5 Traveler Services Information	Lead/Support
1.6 Traffic Control -Network/Probe Detection/Surveillance	Lead
-Freeway Ramp Control	Lead
-Surface Street Control	Support
-Freeway/Surface Street Integration	Lead/Support
1.7 Incident Management	
-Freeway Service Patrols	Lead
-Hazardous Material Incident Response	Support
-Regional Incident Management Teams	Lead
1.8 Travel Demand Management	
-High Occupancy Vehicle (HOV) Lanes	Lead
-Parking Systems	Support
1.9 Emissions Testing and Mitigation	Support
1.10 Highway Rail Intersection	
-Detection and Notification	Lead/Support
<b>2.0 Public Transportation Management</b>	
2.1 Public Transportation Management	Support
2.2 En-route Transit Information	Support
2.3 Personalized Public Transit	Support
2.4 Public Travel Security	Support
<b>3.0 Electronic Payment</b>	
	N/A in TN

**Table 1. TDOT ITS User Service Priorities (Continued)**

<b>User Service</b>	<b>TDOT Role</b>
<b>4.0 Commercial Vehicle Operations</b>	
4.1 Commercial Vehicle Electronic Clearance	Support
-Automated Credentials Exchange	Lead/Support
-Weigh-In-Motion	Support
4.2 Automated Roadside Safety Inspection	N/A in TN
4.3 On-board Safety and Security Monitoring	Lead/Support
4.4 Commercial Vehicle Administrative Processes	Support
4.5 Hazardous Material Security and Incident Response	Support
4.6 Freight Mobility	Support
<b>5.0 Emergency Management</b>	
5.1 Emergency Notification and Personal Security	Support
5.2 Emergency Vehicle Management	Support
5.3 Disaster Response and Evacuation	Support
-Disaster Response	Support
-Evacuation Coordination	Support
<b>6.0 Advanced Vehicle Safety Systems</b>	
	N/A in TN
<b>7.0 Information Management</b>	
7.1 Archived Data Function	Lead
-RTMC Data Mart	Lead
-Virtual Data Warehouse	Lead
<b>8.0 Maintenance and Construction Management</b>	
8.1 Maintenance and Construction Operations	Lead
-Roadway Management	Lead
-Work Zone Management and Safety	Lead/Support
-Roadway Maintenance Conditions	Lead/Support
-Work Plan Dissemination Function	Lead/Support



## 4. PERFORMANCE MEASUREMENT

In order to gauge where each user service may be applicable in the identified transportation system, performance measures were defined. These performance measures evaluate various aspects of service quality and are represented by:

1. **Traffic volume** as a weighting factor among different corridors.
2. **Traffic volume per lane** as a uniform measure of roadway utilization and a surrogate measure of congestion.

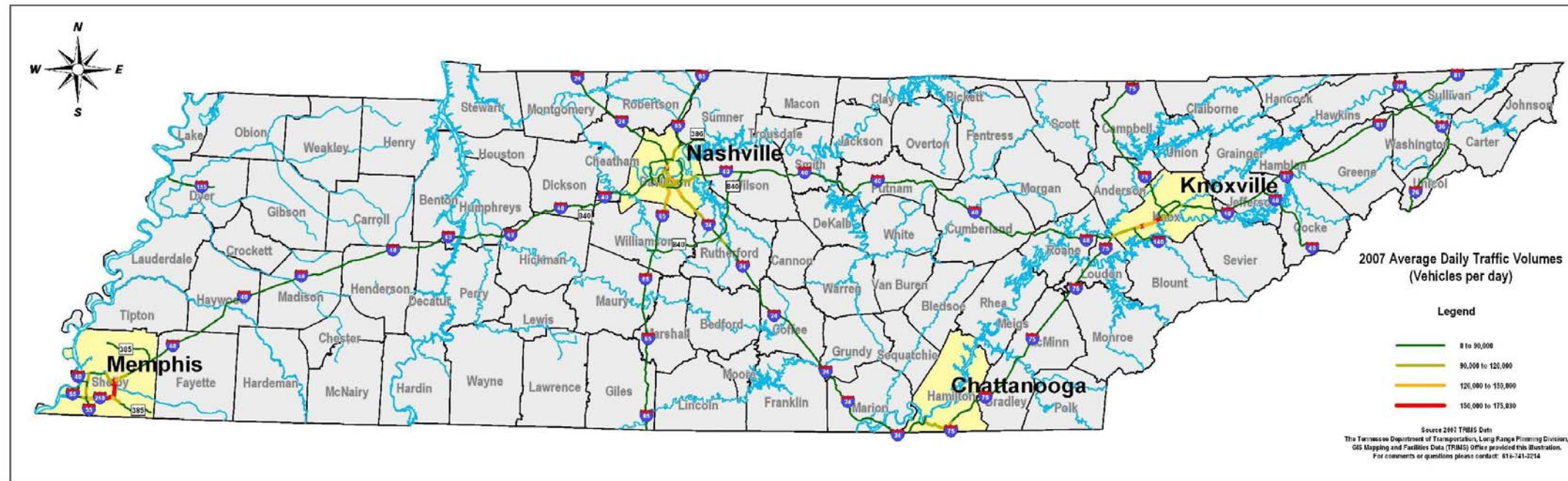
Using data resident in TDOT's databases, these measures were calculated and plotted for all controlled access segments in the State of Tennessee. Maps displaying the performance measures appear in Figures 1 and 2; both an overall system map and magnified insets for the metropolitan areas of Chattanooga, Knoxville, Memphis and Nashville are presented. As expected, the major metropolitan areas exhibit the majority of the performance problems, with certain segments and corridors showing particularly significant effects.

In past updates to the TDOT SmartWay Strategic Plan, levels of service (LOS)<sup>2</sup> were assigned to ranges of volume per lane. For 2005, the ITS Coordinating Committee adopted the volume per lane ranges and descriptions published in the Texas Transportation Institute's *Urban Mobility Report*.<sup>3</sup> These results are presented in Figure 2.

In addition to providing a "benchmark" of existing transportation service quality across the TDOT system, the performance maps are also used to identify ITS solutions for problem sites. These performance maps will continue to be updated on an annual basis, both to monitor progress and to identify emerging problem areas that warrant attention. In 2005 the annual plan added maps displaying the locations of existing TDOT ITS technologies. These ITS technologies (cameras, dynamic message signs and speed detectors) are included in Figures 3-6. As shown, the location and phasing of these deployments is coincident with the segments displaying the most acute congestion problems. This is an indication that ITS strategies are being directed at the most appropriate areas.<sup>2</sup>

Level of Service: a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F

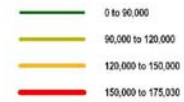
Figure 1. Average Daily Traffic Volumes





2007 Average Daily Traffic Volumes  
(Vehicles per day)

Legend



Source 2007 TRIMS Data  
The Tennessee Department of Transportation, Long Range Planning Division,  
GIS Mapping and Facilities Data (TRIMS) Office provided this illustration.  
For comments or questions please contact: 615-741-3214

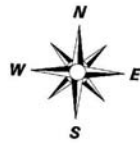


2007 Average Daily Traffic Volumes  
(Vehicles per day)

Legend

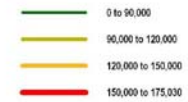


Source: 2007 TRIMS Data  
The Tennessee Department of Transportation, Long Range Planning Division,  
GIS Mapping and Facilities Data (TRIMS) Office provided this illustration.  
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**2007 Average Daily Traffic Volumes  
(Vehicles per day)**

**Legend**



Source 2007 TRIMS Data  
The Tennessee Department of Transportation, Long Range Planning Division,  
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2007 Average Daily Traffic Volumes  
(Vehicles per day)

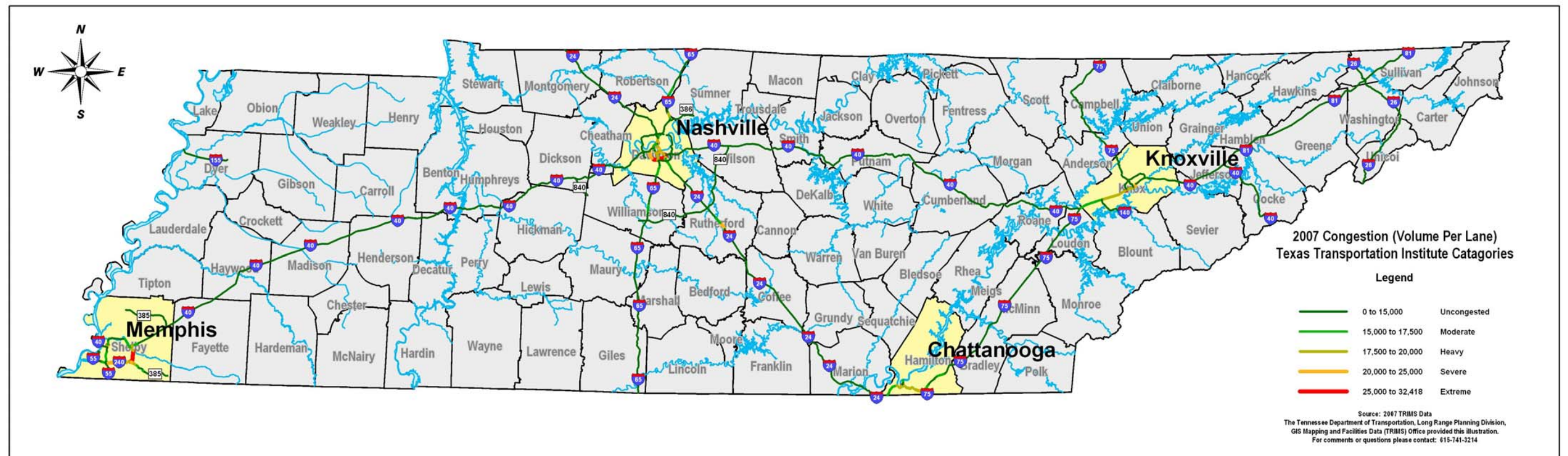
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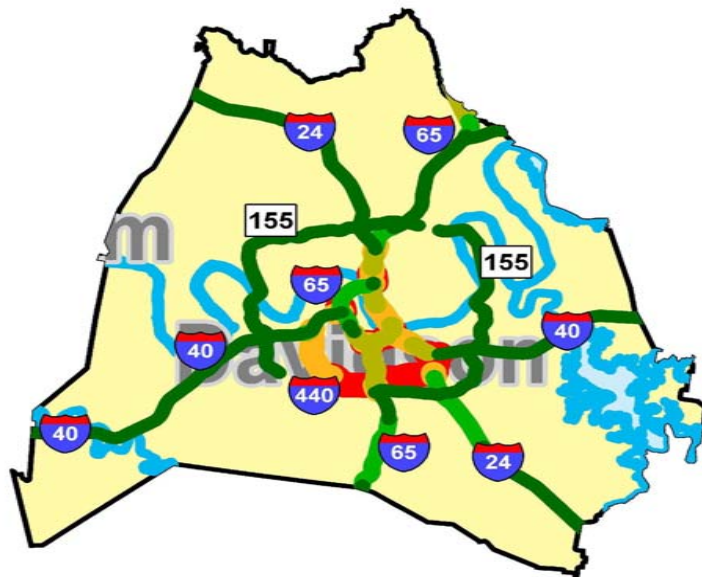
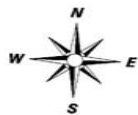


Source 2007 TRIMS Data  
The Tennessee Department of Transportation, Long Range Planning Division,  
GIS Mapping and Facilities Data (ITDS) Office provided this illustration.  
For comments or questions please contact: 615-741-3214



Figure 2. Daily Traffic Volumes Per Lane (Texas Transportation Institute Categories)





2007 Congestion (Volume Per Lane)  
Texas Transportation Institute Categories

Legend

0 to 15,000	Uncongested
15,000 to 17,500	Moderate
17,500 to 20,000	Heavy
20,000 to 25,000	Severe
25,000 to 32,418	Extreme





2007 Congestion (Volume Per Lane)  
Texas Transportation Institute Categories

Legend

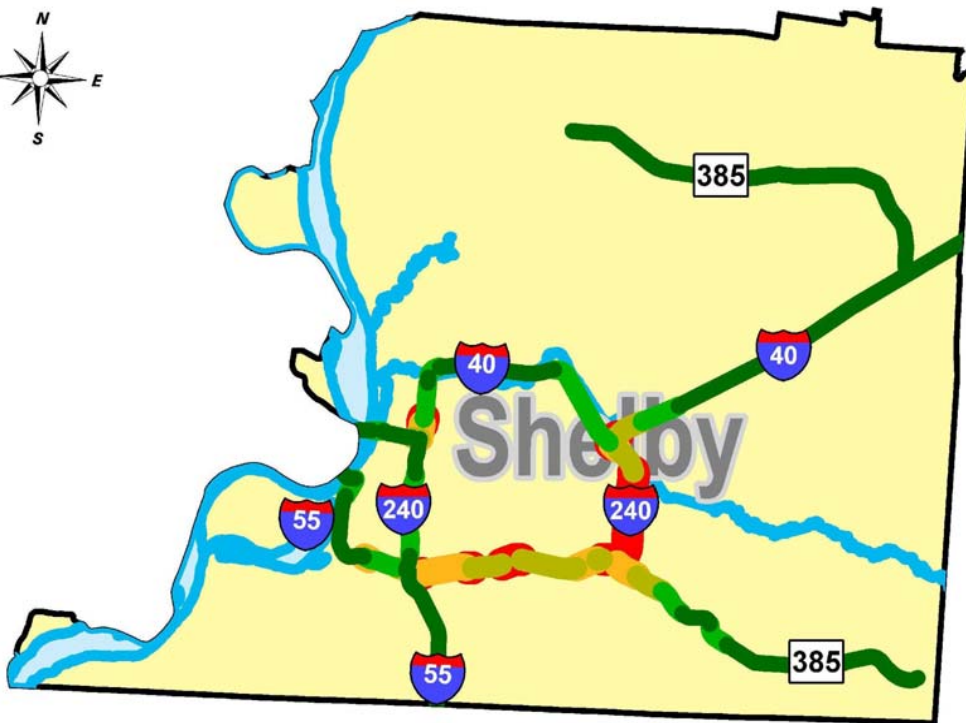
Green line	0 to 15,000	Uncongested
Yellow line	15,000 to 17,500	Moderate
Orange line	17,500 to 20,000	Heavy
Red line	20,000 to 25,000	Severe
Light green line	25,000 to 32,418	Extreme



2007 Congestion (Volume Per Lane)  
Texas Transportation Institute Categories

Legend

0 to 15,000	Uncongested
15,000 to 17,500	Moderate
17,500 to 20,000	Heavy
20,000 to 25,000	Severe
25,000 to 32,418	Extreme



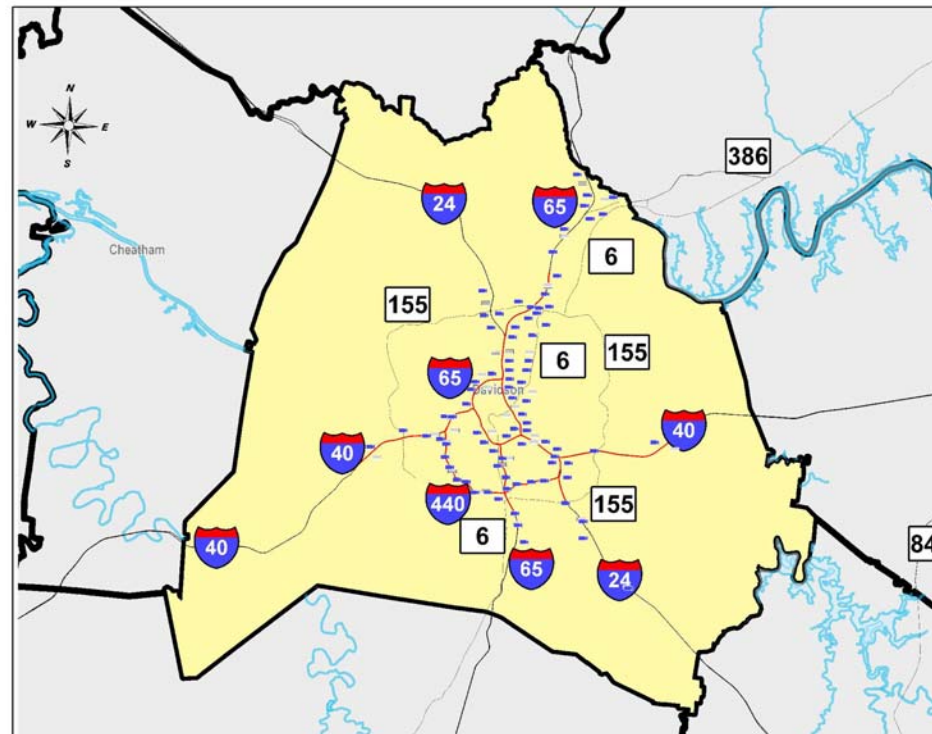
2007 Congestion (Volume Per Lane)  
Texas Transportation Institute Categories

Legend

0 to 15,000	Uncongested
15,000 to 17,500	Moderate
17,500 to 20,000	Heavy
20,000 to 25,000	Severe
25,000 to 32,418	Extreme



Figure 4. ITS Device Locations



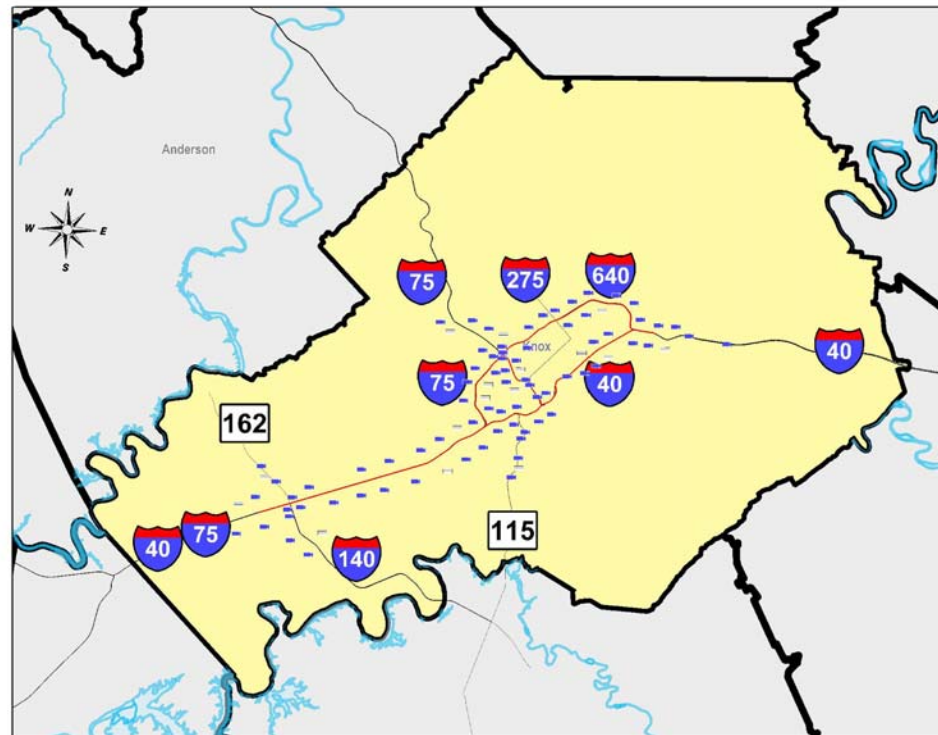
## DAVIDSON COUNTY

### Legend

- ITS CAMERAS
- ITS SIGNS
- Service Patrol



Figure 6. ITS Device Locations

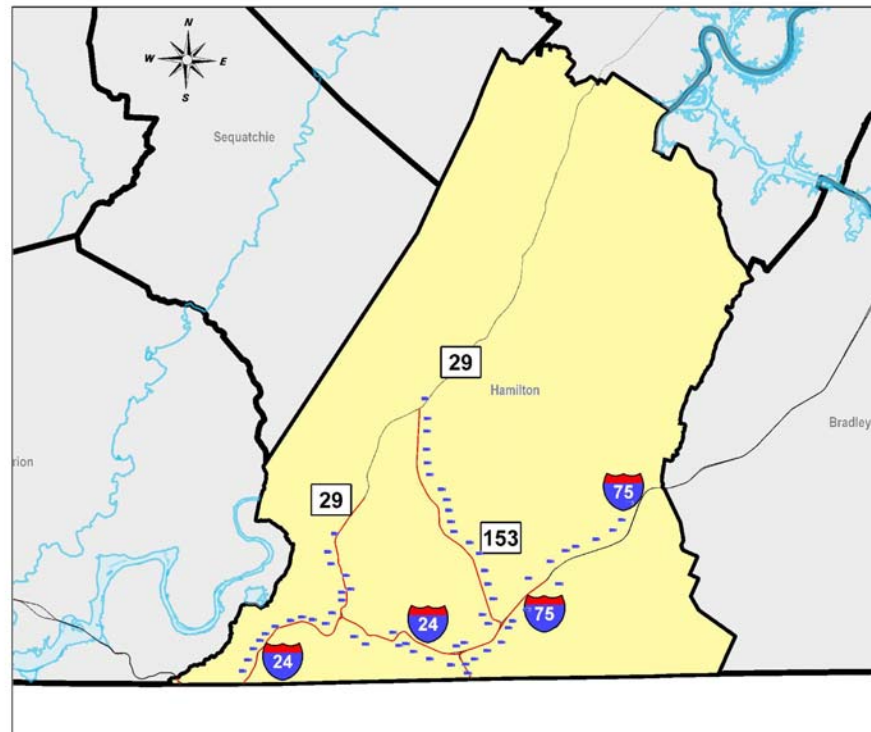


## KNOX COUNTY

### Legend

- ITS CAMERAS
- ITS SIGNS
- Service Patrol

Figure 5. ITS Device Locations

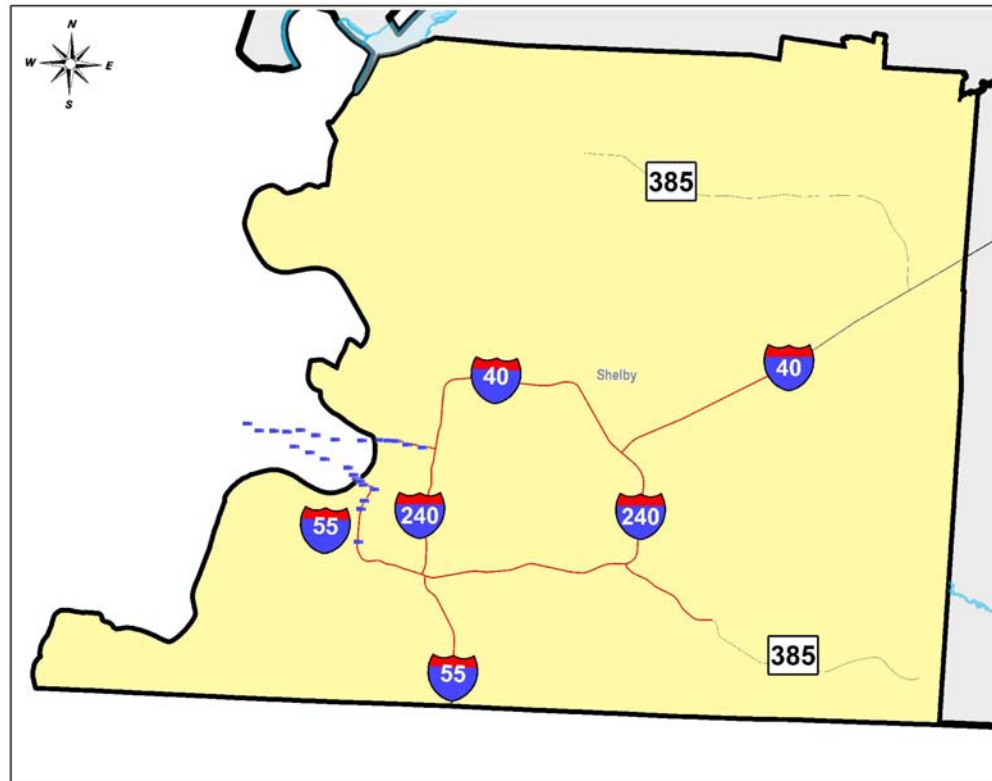


## HAMILTON COUNTY

### Legend

- - - ITS CAMERAS
- - - ITS SIGNS
- Service Patrol

Figure 3. ITS Device Locations



## SHELBY COUNTY

### Legend

- - - ITS CAMERAS
- - - ITS SIGNS
- Service Patrol



## 5. AGENCY ITS STRATEGIC PRIORITIES

A primary product of the strategic planning process is the list of strategic priorities that serves as the short-term (three-year) focus of the agency in building an ITS program. A consensus process was used to develop and update this list, based on input from multiple stakeholders. In this year's update, the basis for evaluating each priority remained:

- 1) Considerable potential for the initiative to become an ongoing ITS activity within the agency,
- 2) Successful implementation of the initiative could be accomplished in a three-year time period, and
- 3) The implementation process was feasible in terms of resource commitment and institutional cooperation.

Table 2 displays the updated list of strategic priorities. Each priority is described in terms of what can be expected to be accomplished within a three-year period. The second column in Table 2, "Past Accomplishments", presents the accomplishments from January 2007 through December 2007. The column titled "Current Year" presents planned activities for January 2008 through December 2008. The column titled "Future Direction" presents activities expected to occur in the second and third years of the plan.

As a "road map" for reaching this destination, milestones for each strategic priority are also shown. These represent the tasks that should be accomplished in order for completion of the priority to stay on schedule. The agency is using the current year milestones as the basis for assigning personnel and other resources to ITS initiatives over the coming year.

There were two changes to the list of strategic priorities for 2007. These changes are summarized below:

- "Integrating TDOT/MPO plans and programs" was removed as a priority since nearly all ITS initiatives now require close TDOT and Metropolitan Planning Organization (MPO) coordination.
- "Ongoing ITS strategic planning initiative" was eliminated since these initiatives have been incorporated into each of the other strategic priorities.

The "Collection of travel information" and "Distribution of travel information" priorities will remain very active in 2007 following two SmartWay website releases in 2005 (versions 1.0 and 2.0) and with the 511 travel information service expected to begin operations in mid-2006. Weather-related road conditions were added to TSIS before the winter of 2005. The Statewide ITS Architecture, completed at the end of 2005, will document data flows between all of these entities and insure an efficient integration of ITS deployments throughout Tennessee.

Several cities in Tennessee are in the process of developing their own ITS architectures and implementing various ITS projects. For these reasons, it is

more important than ever that TDOT coordinate with the local agencies behind these projects to ensure communication regarding upcoming projects. Maintaining close contact with local Metropolitan Planning Organizations (MPOs) is the best way to accomplish this objective. Also, data-sharing is a good way to foster these relationships. The Transportation Management Center (TMC) in Nashville has been operating for over three years now and the Knoxville TMC became operational in the spring of 2005. TMCs are planned for Memphis and Chattanooga. Chattanooga's cameras went live in December and they are in a temporary TMC until a new Regional office can be built. Data from these centers (including traffic speeds, travel times, volumes and incidents) should be beneficial to MPOs.

**Table 2. Three Year ITS Strategic Priorities Timeline**

Strategic Functions	Milestone Timeline		
	Past Year Accomplishments	Current Year Goals (Jan. '08 – Dec. '08)	Future Direction
<p><b>1. Incident management and response</b></p> <p>Priority Leader: Frank Horne</p>	<ul style="list-style-type: none"> <li>▪ Continued operation of the HELP patrols in Chattanooga, Knoxville, Memphis, and Nashville and assisted with special events</li> <li>▪ Produced the fourth HELP Program Annual Report</li> <li>▪ Completed development of plans and cost estimates for expanding the HELP service.</li> <li>▪ Completed the <i>Action Plan for Highway Incident Management</i></li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement enhancements to the HELP program and test "corridor patrols" in other areas of the state</li> <li>▪ Complete plans and cost estimates for equipment and training to facilitate TDOT's response to incidents statewide</li> <li>▪ Continue implementing the <i>Strategic Plan for Highway Incident Management in Tennessee</i> and <i>TDOT's Action Plan for Highway Incident Management</i></li> <li>▪ Negotiate interagency agreements among state, local and private organizations (including other states) to improve incident management and emergency transportation operations</li> <li>▪ Perform a statewide corridor incident management assessment and begin recommending alternate routes for all Interstate segments</li> <li>▪ Produce the fifth HELP Program Annual Report</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement staged expansion of HELP patrols; add equipment and training as needed.</li> <li>▪ Prepare an ITS Project Proposal for the integration of a web based automatic vehicle location and computer aided dispatch system especially designed for incident management</li> <li>▪ Apply to FHWA for federal assistance to implement a pilot program to improve long time parking for commercial motor vehicles along I-69 in Memphis</li> </ul>
<p><b>2. Collection of travel information</b></p> <p>Priority Leaders: John Hall, Rex Bivens and Kim McDonough</p>	<ul style="list-style-type: none"> <li>▪ Completed additional refresher and administrative TSIS training</li> <li>▪ Incorporated Department of Safety personnel (THP) input into TSIS regarding incidents</li> <li>▪ Continued development of TSIS 2.0</li> <li>▪ Implemented county wide weather advisories in SmartWay</li> </ul>	<ul style="list-style-type: none"> <li>▪ Design, develop and implement enhancements to the Tennessee SmartWay Information System (TSIS)</li> <li>▪ Implement routine TSIS training sessions (twice per year in each region)</li> <li>▪ Create a standardized central database of all ITS devices</li> <li>▪ Continue exploring field data entry into TSIS (e.g. laptops, handheld devices, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Evaluate responsiveness of system to meet customer needs.</li> <li>▪ Extend information system applications to other areas within TDOT.</li> </ul>
<p><b>3. Distribution of travel information</b></p> <p>Priority Leaders: John Hall, Rex Bivens and Kim McDonough</p>	<ul style="list-style-type: none"> <li>▪ Incorporated additional speed detection devices, cameras and message signs in Nashville</li> <li>▪ Implemented county wide weather advisories in SmartWay</li> <li>▪ Implemented GeoRSS data feed</li> <li>▪ Added Knoxville ITS devices to SmartWay Maps</li> <li>▪ Added Chattanooga cameras to SmartWay</li> <li>▪ Completed installation of travel information kiosks at all welcome centers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Design, develop and implement SmartWay website enhancements</li> <li>▪ Implement new map interface for SmartWay</li> <li>▪ Design and prototype applications for disseminating TSIS information via other media (e.g., highway advisory radio, audio/video messages at welcome centers, and on-demand cellular services)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Enhance applications based on need and as technology permits. Explore other means (text messages, emails) for delivering information to the public.</li> <li>▪ Expand state 511 operations to include multi-modal traveler information.</li> <li>▪ Work with Tourism Department.</li> </ul>

**Table 2. Three Year ITS Strategic Priorities Timeline (continued)**

Strategic Functions	Milestone Timeline		
	Past Year Accomplishments	Current Year Goals (Jan. '08 – Dec. '08)	Future Direction
<p><b>4. ITS internal and external outreach</b></p> <p>Priority Leaders: Pete Hiatt and Luanne Grandinetti</p>	<ul style="list-style-type: none"> <li>▪ Conducted several media events related to ITS events (TMC openings, early deployment projects, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continue to create ITS awareness through website, press releases, and presentations.</li> <li>▪ Maintain SmartWay website with current information regarding TN ITS projects statewide. Assist with implementation of TDOT organizational activities relating to ITS.</li> <li>▪ Act as resource to TDOT management in establishing ITS policy.</li> <li>▪ Coordinate ITS strategic planning with Department's overall strategic plan.</li> <li>▪ Produce annual update to the TDOT SmartWay Strategic Plan, including development of updated congestion maps and maps of ITS deployments statewide.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Integrate plan with TDOT Community Relations Division (CRD).</li> <li>▪ Monitor and evaluate current ITS-related projects.</li> <li>▪ Develop and recommend potential ITS projects.</li> <li>▪ Assist with implementation of TDOT organizational activities relating to ITS.</li> <li>▪ Act as resource to TDOT management in establishing ITS policy.</li> <li>▪ Coordinate ITS strategic planning with Department's overall strategic plan.</li> </ul>
<p><b>5. Targeted implementation of ITS elements in selected locations for freeway incident management and to support data collection and field test deployment strategies</b></p> <p>Priority Leader: Pete Hiatt</p>	<ul style="list-style-type: none"> <li>▪ Completed construction of Phase 2 (I-440 Parkway) SmartWay.</li> <li>▪ Completed plans and began construction on Nashville Phase 3 Smartway.</li> <li>▪ Began construction of I-75 fog detection system upgrade in Bradley and McMinn Counties.</li> <li>▪ Completed construction of rural ITS Projects in east Tennessee (expected completion date fall of 2007).</li> <li>▪ Initiated design of the major phase of the Chattanooga SmartWay Project for the urban freeways.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continue Construction on Nashville Phase 3</li> <li>▪ Complete construction of Major Phase Memphis Smartway</li> <li>▪ Complete plans for Major Phase Chattanooga Smartway</li> <li>▪ Complete the construction of the I-75 fog detection system upgrade in Bradley and McMinn Counties</li> </ul>	<ul style="list-style-type: none"> <li>▪ Expand existing and develop new Smart Way ITS System Projects using congestion levels as major criteria.</li> <li>▪ Monitor and evaluate Smart Way ITS project performance.</li> </ul>

**Table 2. Three Year ITS Strategic Priorities Timeline (continued)**

Strategic Functions	Milestone Timeline		
	Past Year Accomplishments	Current Year Goals (Jan. '08 – Dec. '08)	Future Direction
<p><b>6. ITS regional architecture development</b></p> <p>Priority Leaders: Pete Hiatt, Don Gedge and Joe Roach</p>	<ul style="list-style-type: none"> <li>▪ Initiated ITS regional architectures for Cleveland, Kingsport and Bristol.</li> <li>▪ Completed ITS Regional Architecture for Johnson City</li> <li>▪ Began Chattanooga ITS Architecture update</li> </ul>	<ul style="list-style-type: none"> <li>▪ Complete ITS regional architecture for Cleveland, Kingsport, and Bristol.</li> <li>▪ Continue to refine and include projects in statewide ITS architecture.</li> <li>▪ Monitor ITS architecture development in all Tennessee MPO and RPO areas.</li> <li>▪ Update inventory of MPO projects and planning efforts related to ITS regional architecture through review of transportation improvement program (TIP) and statewide transportation improvement program (STIP).</li> <li>▪ Coordinate the updating of ITS regional architectures with the long range transportation plan (LRTP) update process.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assist in the development of ITS regional architecture for other cities and counties.</li> <li>▪ Include a plan for statewide ITS communications in statewide ITS regional architecture.</li> <li>▪ Implement and refine programs.</li> <li>▪ Update inventory of MPO projects and planning efforts related to ITS.</li> <li>▪ Consult with MPOs and federal officials on ITS funding/technical assistance needs and resources. Identify opportunities for joint TDOT/MPO ventures.</li> </ul>
<p><b>7. Training program for ITS stakeholders</b></p> <p>Priority Leaders: Don Gedge</p>	<ul style="list-style-type: none"> <li>▪ Scheduled specific training courses, peer to peer workshops and scanning trips as requested.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Schedule specific training courses and scanning trips as needed.</li> <li>▪ Develop and implement the next ITS Service Plan (FHWA, TDOT and local stakeholders).</li> </ul>	
<p><b>8. ITS applications for other modes of transportation</b></p> <p>Priority Leader: Nellie Patton</p>	<ul style="list-style-type: none"> <li>▪ Identified transit applications warranting ITS consideration.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Identify and assess urban transit ITS strategies.</li> <li>▪ Identify current urban transit related ITS applications in Tennessee.</li> <li>▪ Design transit component of the statewide 511 system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop transit ITS Strategic Plan.</li> <li>▪ Coordinate and integrate transit related ITS strategies with other ITS strategies.</li> <li>▪ Identify ITS strategies for modes other than highway and transit.</li> </ul>
<p><b>9. Evaluate benefits and costs of ITS and incident management projects</b></p> <p>Priority Leader: Joe Roach/Ray Hallavant</p>	<ul style="list-style-type: none"> <li>▪ Completed review of ITS Deployment Analysis System (IDAS) software. Reviewed other state and local agencies' methodologies for evaluating benefits/costs of ITS and incident management projects. Developed initial ITS benefit-cost methodology.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Define potential ITS performance measures.</li> <li>▪ Develop ITS benefit-cost methodology.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement benefit-cost analyses on selected ITS applications.</li> </ul>

## 6. IMPLEMENTATION ISSUES

Several institutional issues that impact successful implementation of the activities proposed in the strategic plan were identified at the outset of the ITS program and remain important considerations today. Foremost among these concerns are:

- 1 **Legislation**, which may need to be enacted for certain ITS applications to operate smoothly.
- 2 **Partnerships and coordination** among and between federal, state and local agencies, as well as business and other private interests; this synergy enables groups to work in harmony towards meeting common objectives.
- 3 **Funding** at adequate levels to ensure that sufficient resources are available to invest in each strategic priority so that it can be successfully implemented, maintained and operated.
- 4 **TDOT staff** with dedicated responsibilities for ITS deployment **will** enable institutional viability.

Each strategic priority and milestone will require different combinations of legislative involvement, forming and coordinating partnerships, funding levels, and internal TDOT staffing. Recognizing the importance of these elements, each strategic priority has defined tasks that require consideration of varying implementation issues, as appropriate.

These issues will be critical to the ultimate success of TDOT's investment in ITS, and will need considerable attention as the Department moves forward with implementation, operation and maintenance.

## 7. CONCLUDING REMARKS

This document has provided an update to TDOT's ITS strategic planning efforts. Important observations are made concerning the role of ITS in the agency's plans to manage controlled-access highways and other modes in the State. Performance measures have been identified and applied to this network as a basis for determining those segments and corridors that are promising candidates for ITS applications. A list of strategic priorities has been developed, aimed at managing existing ITS projects in the State, implementing new ITS projects where warranted, and developing TDOT policies and programs that enable the agency to integrate ITS into daily operations. Important implementation considerations are also cited which require attention in order for each ITS strategic priority to succeed.

TDOT is currently involved with ITS technologies through the following applications:

- Highway advisory radio (HAR) in Nashville, Knoxville and Memphis.
- I-75 fog detection system in Bradley County (currently being upgraded).
- Cumberland Gap Tunnel in Claiborne County.
- Statewide truck pre-clearance program (PrePass).
- I-65 North ITS project in Nashville.
- Traffic monitoring and detection cameras monitor traffic congestion and improve incident management capabilities in Nashville, Knoxville and Memphis.
- 64 cameras are under construction in Chattanooga.
- Traffic camera and dynamic message sign (DMS) availability through TDOT's website for the public to view current traffic conditions in Nashville, Knoxville, Memphis, and Chattanooga.
- Completed ITS Regional Architectures in Chattanooga, Knoxville, Clarksville, Johnson City, Memphis, and Nashville.
- Statewide ITS Architecture completed in December 2005.
- Freeway service patrols in Chattanooga, Knoxville, Memphis and Nashville.
- Real-time weather, construction and travel information at welcome centers and rest areas. GoSmart Internet-based kiosk systems deployed at five welcome centers throughout the state.
- Providing real-time traffic information to motorists via dynamic message signs (DMS).
- Statewide training and deployment of the TDOT SmartWay Information System (TSIS).
- Installation and use of non-intrusive traffic detection equipment.
- Roadside weather information system (RWIS) stations remotely accessed to gain information on road conditions.

This strategic planning effort has also assimilated these efforts in setting the direction for future ITS activities of the Department.

Internal staffing and ITS funding are important issues that will define the ultimate success of incorporating ITS technologies into TDOT daily operations. New positions and portions of existing staff time will be required to fully complete the priorities and milestones reported in this strategic plan. The dedication of funds to develop, deploy and maintain ITS technologies will also be necessary.

Finally it should be noted that a strong organizational structure needs to be established to maintain the consistent implementation of ITS in Tennessee.

This document is anticipated to be reviewed by many different stakeholders, and its contents are intended to share TDOT's perspective on ITS, with the hope that it will promote a dialogue that can lead to the development of ITS partnerships and coordination mutually beneficial to all parties involved.

As strategic planning is an ongoing process, this document will be updated annually to keep interested parties apprised of progress made and future plans.