



## Technical Memorandum



## Contract Management / Special Projects

## Florida's Intelligent Transportation Systems Strategic Plan

### Version 2

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## List of Acronyms and Abbreviations

ASCT	Adaptive Signal Control Technology
C2C	Center-to-Center
CFR	Code of Federal Regulations
CO	Central Office
CVISN	Commercial Vehicle Information Systems and Networks
DSRC	Dedicated Short Range Communication
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FL511	Florida's 511 Advanced Traveler Information System
FMCSA	Federal Motor Carrier Safety Administration
ITS	Intelligent Transportation Systems
MPO	Metropolitan Planning Organization
RTMC	Regional Transportation Management Center
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SIS	Strategic Intermodal System
TMC	Transportation Management Center
TSM&O	Transportation System Management and Operations
USDOT	United States Department of Transportation
WAN	Wide Area Network

## 1 Executive Summary

*Florida's Intelligent Transportation System (ITS) Strategic Plan* defines the goals and objectives of the Florida Department of Transportation's (FDOT) ITS Program to direct future ITS deployment.

The ITS Program vision is:

***Serving the people of Florida by using ITS to deliver a transportation system that is fatality and congestion free.***

The ITS Program mission is to:

***Enhance the safety, efficiency, and reliability of Florida's transportation system through the use of best management practices and proven operational strategies.***

The *2025 Florida Transportation Plan*, the state's primary transportation system planning document, outlines five goals for the transportation system. These goals are:

- Promote a safer and more secure transportation system for residents, businesses, and visitors;
- Promote an enriched quality of life and responsible environmental stewardship;
- Promote adequate and cost-efficient maintenance and preservation of Florida's transportation assets;
- Promote a stronger economy through enhanced mobility for people and freight; and
- Promote sustainable transportation investments for Florida's future.

The priorities set by *Florida's ITS Strategic Plan* align with the goals outlined in the *2025 Florida Transportation Plan*. Each goal is supported by a corresponding group of ITS objectives and strategies that can be tracked using a common set of performance measures.

In an effort to reach these goals, FDOT will continue to enhance, operate, and maintain certain existing programs and projects. These include:

- SunGuide<sup>®</sup> Software,
- ITS Specifications,
- Florida's Advanced Traveler Information System,
- Regional Transportation Management Center (RTMC) Network,
- Transportation System Management and Operations (TSM&O),
- Central Data Warehouse,
- Commercial Vehicle Information Systems and Networks (CVISN),
- Emerging Technology Evaluation, and
- Arterial Travel Time Systems.

*Florida's ITS Strategic Plan* defines the goals, objectives, and strategies for the statewide ITS Program over the next three to five years. During this time, many initiatives and programs will begin to mature and, therefore, should be considered by FDOT. These projects and programs include:

- Supporting efforts toward zero fatality goals,
- Supporting research and deployment of rural ITS applications,
- Supporting the connected vehicles initiative,
- Supporting the development and deployment of ITS for work zone safety,
- Identifying cost offsetting strategies,
- Continuing outreach for partnership opportunities,
- Supporting ports,
- Supporting Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 1201 rulemaking,
- Supporting Smart Roadside,
- Supporting environment sustainability,
- Standardizing shared operational responsibilities with the private sector, and
- Encouraging additional public feedback.

Strategic planning guidelines will ensure that the ITS Program's policies and objectives are integrated into FDOT's procedures to guide decision makers in implementing ITS strategies, and to allocate ITS resources to problems and opportunities in the existing transportation system. These guiding principles each have their own actions and activities, and are divided into the following categories:

- Planning and Development,
- Operations and Management,
- Finance,
- Public Awareness and Involvement, and
- Research and Development.

It is FDOT's intent that *Florida's ITS Strategic Plan* provide direction for the next phases of ITS deployments, supported by program goals that reflect current conditions and anticipated future developments, and inspired by the success that FDOT's efforts have realized thus far.

## 2 Introduction

*Florida's ITS Strategic Plan* defines the goals and objectives of Florida's ITS Program to direct future ITS deployment. It outlines the issues likely to figure prominently in the ITS Program's near-term planning activities. This document includes an update of *Florida's ITS Strategic Plan*, adopted by FDOT in 2005, and identifies specific activities directed at meeting ITS Program objectives.

Since its original adoption in 1999, *Florida's ITS Strategic Plan* has been used as the guide to direct FDOT's efforts, including FDOT's Districts, Florida's metropolitan planning organizations (MPO), and local governments in the planning, programming, and implementation of integrated, multimodal ITS elements. The former FDOT Traffic Operations Office and the Systems Planning Office developed the original *Florida's ITS Strategic Plan* as part of a joint effort, with support from a statewide team that included representatives from FDOT Central Office (CO) and Districts, the Office of Motor Carrier Compliance and the MPOs. District representation included staff from the Planning, Design, Construction, and Maintenance offices. During the creation of *Florida's ITS Strategic Plan*, a comprehensive public outreach program was conducted to ensure that stakeholder needs and requirements were also addressed.

The plan was updated in 2005 to address the maturation of ITS throughout the state and nation. At that time, the new *National ITS Program Plan* defined a new vision and goals for the national ITS program.<sup>1</sup> Consequently, one of the primary purposes for the 2005 update of *Florida's ITS Strategic Plan* was to expand and redirect the efforts and resources of FDOT's ITS Program to be consistent with the evolution of national ITS program goals.

This update of *Florida's ITS Strategic Plan* includes FDOT's updated ITS vision for Florida, and the guiding principles to be used in the planning and project development process. It recommends goals and objectives that will help FDOT realize the overall ITS mission.

The updated *Florida's ITS Strategic Plan* builds on the foundation from the original documents, which provided an important statewide vision of how FDOT could employ ITS to maximize the safety and efficiency of Florida's transportation system. In addition, *Florida's ITS Strategic Plan* has had an important secondary benefit – valuable direction at the local or community level to allow for individual professional judgment and latitude in the planning and deployment of ITS services that are consistent with the statewide mission. For example, *Florida's ITS Strategic Plan* strives to incorporate both urban and rural components on both freeways and surface streets, so it is able to focus on the unique conditions and needs of each locale. This leads to an

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<sup>1</sup> Intelligent Transportation Society of America in cooperation with the United States Department of Transportation, *National Intelligent Transportation Systems Program Plan: A Ten-Year Vision* (January 2002). Available online at

integrated transportation approach wherein all users benefit, regardless of their location or type of transportation system usage.

## ***2.1 Florida's Intelligent Transportation Systems***

FDOT has pursued active management and operation of its transportation system. Since the launch of the ITS Program in July 2000, FDOT has made a concerted effort to apply new technologies and concepts to traffic operations on the Florida Intrastate Highway System and to coordinate the various deployments. The ITS Program works closely with FDOT Districts, Florida's Turnpike Enterprise, MPOs, and local governments in a collaborative approach to funding, developing, deploying, and operating an integrated statewide ITS.

While ITS is solving transportation problems, the information it produces and communications it fosters through various means are themselves important aids in cooperative planning and goal setting. The success of ITS deployments will, in turn, become an incentive to promote more collaborative relationships in which transportation professionals, researchers, institutions, and communities can address their common problems, make decisions, and pursue meaningful solutions.

It is FDOT's intent that *Florida's ITS Strategic Plan* provide direction for the next phases of ITS deployments in Florida, supported by program goals that reflect current conditions and anticipated future developments, and inspired by the success that FDOT's efforts have realized thus far.

### 3 Florida's ITS Program Vision and Mission

The ITS Program vision is adapted from FDOT's overall vision. The ITS Program vision is:

*Serving the people of Florida by using ITS to deliver a transportation system that is fatality and congestion free.*

The ITS Program mission is to:

*Enhance the safety, efficiency and reliability of Florida's transportation system through the use of best management practices and proven operational strategies.*

#### 3.1 Primary ITS Goals

The goals of *Florida's ITS Strategic Plan* align with the goals in the *2025 Florida Transportation Plan* – the state's primary transportation system planning document.<sup>2</sup> Each of the goals is supported by a corresponding group of ITS objectives that can be tracked using a common set of performance measures. These goals are:

- Promote a safer and more secure transportation system for residents, businesses, and visitors;
- Promote an enriched quality of life and responsible environmental stewardship;
- Promote adequate and cost-efficient maintenance and preservation of Florida's transportation assets;
- Promote a stronger economy through enhanced mobility for people and freight; and
- Promote sustainable transportation investments for Florida's future.

The *National ITS Program Plan* was supplemented to enhance and revise the security goal in response to the September 11, 2001 terrorist attacks.<sup>3</sup> Those events raised the consciousness of the transportation community and countless others about the need for better critical infrastructure protection and crisis management; disaster planning and prevention; and effective detection and response, particularly in the case of deliberate terrorist attacks. Additionally, Version 5.0 of the National ITS Architecture was updated to provide security coverage enhancement. This involved the inclusion of new user services and market packages for Homeland Security ITS applications designed to protect surface transportation information and infrastructure.

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<sup>2</sup> Florida Department of Transportation, *2025 Transportation Plan (2005)*. Available online at: <http://www.dot.state.fl.us/planning/FTP/>.

<sup>3</sup> Intelligent Transportation Society of America, *Homeland Security and ITS – Using Intelligent Transportation Systems to Improve and Support Homeland Security – Supplement to the National ITS Program Plan: A Ten-Year Vision* (September 2002). Available online at: [http://www.itsmidwest.org/ITSresources/PPRA\\_Security\\_Final.pdf](http://www.itsmidwest.org/ITSresources/PPRA_Security_Final.pdf).



Federal ITS policies, such as *Parts 655 and 940 of Chapter 23 of the Code of Federal Regulations (CFR)*, stress the importance of utilizing a regional ITS architecture and ITS standards to ensure interoperability among ITS services. Interoperability of ITS is crucial for improving interagency communications and data sharing among regional ITS stakeholders. Interoperability benefits for both system users and owners/operators include:

- Seamless ITS services from region to region,
- More accurate and timely travel information,
- Improved incident response times,
- More coordinated and responsive traffic management systems, and
- The ability to leverage limited resources.

Given these federal commitments to expand ITS capabilities, specifically for Homeland Security purposes, and to ensure interoperability of ITS services, the following fundamental values are basic elements of any ITS deployment:

- Deploy an integrated, effective system and
- Provide a well-prepared and secure transportation system.

## 4 Moving Forward

From its inception, FDOT's ITS Program has been characterized by a mission-focused philosophy in which critical needs are identified and projects developed to produce real solutions for the state's transportation system. The result of this approach is a program that is consistently regarded as a national model for ITS planning, deployment, and public outreach. Such success is actually the culmination of FDOT's Central Office and District efforts that originated in the *1999 Florida's ITS Strategic Plan* and continued in the pursuit of the various objectives it contained. The ITS Program's tangible results are evident in the numerous projects completed to date.

At this point, FDOT's CO and Districts have many ITS deployments completed, or near completion. Many of these deployments are long-term initiatives that must continue to be supported. The following sections identify those ongoing projects/programs that should continue to receive support and identifies short- and long-term strategies to continue the enhancement of ITS in Florida.

### 4.1 Programs and Projects to Continue

The following is a list of some of the ITS projects or programs that are underway and should be continued. In many cases these projects have been deployed, but will require continuing efforts to operate and maintain. This list does not attempt to define every significant project, but is presented to indicate the types of projects and programs that are underway throughout the state.

#### 4.1.1 SunGuide® Software

SunGuide® software has been successfully deployed at transportation management centers (TMC) throughout the state to maintain the critical interfaces between facilities, provide system interoperability, share traffic information, and respond more effectively to incidents and emergencies.<sup>4</sup> The continuous support of SunGuide software enhancements and refinements should continue to be a top priority.

#### 4.1.2 ITS Specifications

The ITS Program developed ITS device specifications to support deployment projects on Florida's roadways. The information, sample requests for proposal, and supporting documents are available online at FDOT's web site, which project managers and engineers can utilize as appropriate to expedite the planning and procurement phases of their deployments.<sup>5</sup> These

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<sup>4</sup> SunGuide is a registered trademark of the Florida Department of Transportation.

<sup>5</sup> More information about FDOT's ITS device specifications is available online at <http://www.dot.state.fl.us/specificationsoffice/>.

equipment specifications set the stage for the review and evaluation of products and the creation of the ITS Approved Products List. These ITS device specifications will continue to be refined for inclusion in FDOT's *Standard Specifications for Road & Bridge Construction*.

#### ***4.1.3 Florida's 511 Advanced Traveler Information System (FL511)***

FL511 is a phone and Internet resource that provides real-time traffic information on all Florida interstate highways, Florida's Turnpike, and major metropolitan roadways in the state. The system was previously comprised of regional 511 systems throughout the state and was completely redeployed as a single statewide resource. While much of the effort has been completed, the FL511 system should continue to be supported and upgraded as necessary to remain relevant to travelers.

#### ***4.1.4 RTMC Network***

RTMCs have been deployed in several locations throughout the state. These centers allow state and local transportation, law enforcement, and incident management professionals in a region to operate from a single center. These RTMCs are connected to a growing statewide communications network that allows them to share data and even operational control during emergencies. Additional RTMCs are under various stages of planning and construction. The operations and interconnectivity of these RTMCs will continue to be supported.

#### ***4.1.5 Transportation System Management and Operations (TSM&O)***

TSM&O is a new program within FDOT that is based on:

- Performance measurement,
- Active management of the multimodal transportation network, and
- Positive safety and mobility outcome delivery to Florida's traveling public.

Initially envisioned in 2008 and formally endorsed as a program in 2010, TSM&O offers ways to maximize the use of limited transportation funding to maximize transportation system efficiency and effectiveness. This program was recognized as an important strategic component for the ITS Program and is being actively supported. This support will remain critical as the TSM&O program matures and the FDOT CO will support the adoption and implementation of TSM&O in the Districts.

#### ***4.1.6 Central Data Warehouse***

ITS deployments are capable of collecting massive amounts of data that can be used for many applications, including developing and tracking performance measures. A prototype central data warehouse has demonstrated the feasibility of a single clearinghouse for ITS data that would support multiple users and needs throughout the state. A complete system that meets these needs would support:

- Development and tracking of performance measures,
- Reporting travel time reliability,
- Diagnostics for TMC vehicle detector operation and maintenance,
- Traffic data for District and Statistics Offices traffic count programs,
- Simulation modeling system,
- SunGuide software testing,
- Work-zone crash analysis,
- Freeway ramp breakdown analysis,
- Identification of recurring congestion,
- Connected vehicle data capture and management,
- Development of TMC operations plans,
- ITS Program benefits analysis,
- Congestion analysis and mobility performance measures, and
- Congestion modeling research.

**4.1.7 Statewide ITS Wide Area Network**

The FDOT ITS Program relies on a statewide ITS wide area network (WAN) to provide connectivity for ITS applications. The ITS WAN supports applications in every District and also connects District TMCs together. The applications that use the ITS WAN are listed below in Table 4-1.

<b>FDOT Radio System</b>	<b>Managed Lanes</b>
Road Weather Management System	SunGuide Center-to-Center (C2C) Video and Data Sharing
Radio System Interoperability	FHP Computer Aided Dispatching
Roadway Camera Video	Video Aggregation System
NOAA Bridge Wind Speed Monitoring	Florida Turnpike Enterprise Radio System
State Law Enforcement Radio System	FL511 connections RTMCs to Cyber Center

**Table 4-1. FDOT ITS WAN Applications.**

Some of these applications are used throughout the state and require multiple communication sites in each District. The FDOT radio system is a good example of this type of ubiquitous application since it uses multiple radio tower locations in every District to connect workers in the right-of-way with each other and the District headquarters. In contrast, many of the applications on the ITS WAN, such as SunGuide C2C video and data sharing use the ITS WAN for connectivity between TMCs or between TMCs and the Traffic Engineering Research Laboratory and the State Emergency Operations Center.

To support these different types of applications requires a complex network that is focused both on distributed connectivity and on point-to-point connectivity. The ITS WAN has been built with

this dual role in mind. It includes a microwave network operated and maintained by the central office ITS Program that distributes connectivity along all of the interstates and in every district. This makes it possible to support, for example, the statewide FDOT voice radio coverage. The microwave tower locations along the interstates are used as the voice repeater radio sites and the microwave radio links tie the various voice repeater radio sites in each District together so they act as one District-wide section of the statewide voice radio network.

The ITS WAN has also included the build-out of a fiber optic network, designed to support TMC-to-TMC communications in particular. Unlike the microwave network, the fiber network part of the ITS WAN uses fiber infrastructure that is operated and maintained by each individual District. The ITS WAN rides on top of this District fiber, providing connectivity between TMCs. This fiber network is largely complete in the southern half of the state. Projects in the northern half of the state are now underway and the ITS and fiber optic deployment should be complete within five years.

Despite the differences in technology between microwave and fiber, the two types of networks can both be used to carry the same types of traffic management data and video. The fiber optic networks and microwave networks are mapped out in the state along some similar and some different paths. It is highly desirable to use these paths in a redundant manner so that the two technologies can provide back-up connectivity for each other. In the southern part of the state it is now possible to utilize this redundancy and the FDOT ITS Program will continue this type of implementation. As the fiber optic networks continue to be built-out, the use of redundancy in the ITS WAN will continue to expand, increasing the reliability, maintainability, and survivability, of the overall network.

The microwave system portion of the ITS WAN has been in place for over two decades now and the age of some of the earliest-deployed equipment has started to become an issue requiring attention. The microwave network is used for many other ITS applications and to support redundancy. The FDOT ITS Program is continuing the process of upgrading network equipment and microwave radios for the ITS WAN.

The efforts to date will ensure the current and future network connections in the microwave and fiber networks of the ITS WAN are the right sizes and that they are in the right locations. District projects are driving the current improvements and rehabilitation efforts that affect the ITS WAN.

The challenges for the ITS WAN over the next 5 to 10 years are in two areas. It is anticipated that fiber optic cable build-outs in the northern part of the state will complete the needed redundancy and bandwidth upgrades that will ensure a robust ITS WAN exists statewide. In addition, the rehabilitation of the microwave and data network will provide additional bandwidth in support of the needed redundancy and also address the critical issues with aging equipment. This will enable the ITS WAN to continue to serve the existing and emerging project and program areas for many years to come.

#### 4.1.8 *Commercial Vehicle Information Systems and Networks (CVISN)*

CVISN, a key component of the Federal Motor Carrier Safety Administration (FMCSA), is a program developed to improve the safety of commercial motor vehicles. The overall program goals are to improve safety, security, efficiency, and freight mobility as well as simplifying operations. Expanded CVISN capabilities include: virtual weigh stations, license plate readers, oversize/overweight permitting, electronic portals, and driver information sharing.<sup>6</sup> CVISN should continue to receive support from this program.

#### 4.1.9 *Emerging Technology Evaluation*

In effect, ITS is the application of technology to traffic operations. As technology advances, new ideas and applications are developed. FDOT should continue to identify and evaluate emerging technologies for their effectiveness and costs. Some emerging technologies/applications include:

- **Adaptive signal control technology (ASCT)** uses real-time traffic data to automatically adjust cycle lengths to accommodate current traffic patterns. Traditional signal systems use pre-programmed signal timing plans based on time-of-day and traffic data; however, traffic conditions are not always consistent and predictable. In some situations, static signal timing can contribute to congestion and delay. ASCT is designed to adapt to the current travel conditions and change the signal timings to reduce congestion and travel time, and increase green time coordination throughout the corridor.<sup>7</sup> While some ASCT technologies are mature and in place today, new variations and approaches continue to emerge that warrant investigation.
- **Applications for the Environment: Real-Time Information Synthesis** is a Federal Highway Administration (FHWA) research program designed to work with the vehicle-to-vehicle communications in the connected vehicle effort to determine ways to mitigate the negative impacts on the environment caused by surface transportation.<sup>8</sup>
- **Active traffic management** dynamically manages congestion using real-time traffic data and new technologies to improve efficiency on a corridor by increasing throughput and safety. This technique, mainly deployed in Europe, demonstrated increases in average throughput of 3 to 7 percent, overall capacity of 3 to 22 percent, and decreases in primary incidents by 3 to 30 percent and secondary incidents by 40 to 50 percent during congested periods.<sup>9</sup> Hard shoulder running is an application of active traffic management that allows the use of roadway shoulders as traffic lanes during peak periods. This

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<sup>6</sup> <http://www.fmcsa.dot.gov/facts-research/cvisn/index.htm>

<sup>7</sup> <http://www.fhwa.dot.gov/everydaycounts/technology/adsc/>

<sup>8</sup> <http://www.its.dot.gov/aeris/index.htm>

<sup>9</sup> <http://international.fhwa.dot.gov/pubs/pl07012/index.cfm#execfind>

technique combines a number of new technologies and existing highway features to provide reliable travel times, reduced congestion, and faster response times to incidents.<sup>10</sup>

- **Variable speed limit systems**, which can be another application of active traffic management, use real-time traffic conditions and technology to determine the safest operating speed for a facility for any given time during the day. This technique can be used for congestion mitigation in urban areas or for safety and weather advisory in rural areas.<sup>11</sup> Breaking down speeds could lead to complaints from drivers that conditions do not warrant lower speeds. The travelling public needs to be educated that this is not a speed trap, but rather a project to reduce accidents and increase speed limits. The effectiveness and correct operational procedures of these systems require more research and investigation before being widely deployed.

#### ***4.1.10 Arterial Travel Time Systems***

Arterial travel time systems use various technologies to determine travel times on segments of arterial roadways. Typical systems are nonintrusive and use probe or Bluetooth<sup>®</sup> technology for detection. Applications of an arterial travel time system are origin-destination studies, signal timing optimization, and traffic demand models. Arterial travel times can be integrated into 511 information feeds and displayed on dynamic message signs. Benefits include increased throughput, improved travel times, reduced emissions and delays, and real-time traveler information to drivers. These systems should continue to be supported to provide additional data for ITS operations and analysis.

### **4.2 Emerging Program and Project Areas**

*Florida's ITS Strategic Plan* defines the goals, objectives, and strategies for the statewide ITS Program over the next three to five years. There are many projects and programs that will begin to mature in the near future. These programs should be supported by FDOT as they develop.

#### ***4.2.1 Zero Fatality Goals***

FDOT should support FHWA's efforts of *Toward Zero Deaths: A National Strategy on Highway Safety*, a strategy that was developed to be a guide and framework that assists stakeholders in decreasing the amount of fatalities that happen each year on the nation's highway system by changing the way our culture relates to highway safety. The purpose of this strategy is to "directly impact highway safety through engineering, enforcement, education, emergency medical service, policy, public health, communications, and other efforts."<sup>12</sup>

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<sup>10</sup> <http://www.highways.gov.uk/roads/projects/22995.aspx>

<sup>11</sup> <http://safety.fhwa.dot.gov/speedmgt/vslimits/>

<sup>12</sup> <http://safety.fhwa.dot.gov/tzd/>

#### **4.2.2 Rural ITS**

Rural applications of ITS are becoming increasingly important as over 75 percent of the 8.4 million lane-miles of roads in the United States are rural. According to the latest data from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System, the fatality rate for rural crashes is more than twice the fatality rate in urban crashes. FDOT should continue to investigate and support the application of ITS in rural areas which may include:

- Rural intersection collision avoidance system, a warning system for crashes resulting from gap selection errors,<sup>13</sup>
- Dynamic curve warning systems using supplemental beacons and messages to warn drivers when they are approaching curves at unsafe speeds,<sup>14</sup> and
- Variable speed limit systems to recommend safe operating speeds based on adverse weather conditions.<sup>15</sup>

#### **4.2.3 Connected Vehicle Initiatives**

FDOT should continue to support FHWA's connected vehicle initiative. This initiative uses new technology, such as wireless communications, on-board computer processing, vehicle-sensors, global position systems navigation, and smart infrastructure, to potentially alter travel on roadways. Through this infrastructure, drivers will be warned of travel conditions ahead by information distributed over the network from other vehicles.<sup>16</sup> Dedicated short-range communication (DSRC) is the communications protocol for connected vehicles. OmniAir, a non-profit trade association created to serve as a catalyst for the deployment of technologies, is assisting with the deployment of DSRC through their certification program.<sup>17</sup> FDOT should continue to support OmniAir's efforts to establish a certification program for connected vehicle technologies to promote interoperable connected vehicle deployment.

#### **4.2.4 Work Zone Safety**

The use of ITS to improve safety and efficiency in work zones is becoming more prevalent across the county. ITS technologies allow agencies to monitor traffic conditions throughout work zones and provide travel times and incident management, increasing capacity and enhancing the

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<sup>13</sup> [http://www.its.dot.gov/rural/rural\\_approach.htm#sc](http://www.its.dot.gov/rural/rural_approach.htm#sc); <http://rip.trb.org/browse/dproject.asp?n=26016>

<sup>14</sup> [http://safety.fhwa.dot.gov/roadway\\_dept/horicurves/fhwasa07002/ch4.cfm](http://safety.fhwa.dot.gov/roadway_dept/horicurves/fhwasa07002/ch4.cfm)

<sup>15</sup> <http://safety.fhwa.dot.gov/speedmgt/vslimits/>

<sup>16</sup> Federal Highway Administration web site: <http://ops.fhwa.dot.gov/travelinfo/infostructure/aboutinfo.htm>

<sup>17</sup> OmniAir web site: <http://www.omniair.org/who-we-are/>



safety of the road user and the worker.<sup>18</sup> FDOT should support the development and deployment of ITS in work zones throughout the state.

#### ***4.2.5 Cost Offsetting Strategies***

FDOT should investigate opportunities to offset the costs of its ITS Program. These opportunities are currently being investigated by other states through privatization of 511 systems, sponsoring ITS deployments, or paying for corporate logos on incident management vehicles. These and other methods should be investigated to leverage additional funds for ITS expansion, operation, and maintenance.

#### ***4.2.6 Partnership Opportunities***

As ITS continues to grow, the costs of implementing and maintaining deployments will continue to grow. FDOT should look for opportunities to partner with other (non-private) agencies to support the network of ITS deployments and their operations and maintenance. In many areas, co-locating in RTMCs may lead to the development of true partnerships in managing the system. FDOT should continue its outreach to other partners (police, fire, sheriff, public works, and transit) to assist in accomplishing mutual goals and objectives.

#### ***4.2.7 Ports***

The United States Department of Transportation's (USDOT) ITS Maritime Applications research program was created to identify ways to implement ITS technologies within the intermodal industry. The goals of this program are to determine effective ITS applications and implement these applications in the maritime transportation environment and evaluate the benefits.<sup>19</sup> FDOT should support the ITS Maritime Applications research program and its effort to increase efficiency in the maritime environment.

#### ***4.2.8 SAFETEA-LU 1201 Rulemaking – Real-Time System Management Information Program***

Section 1201 of SAFETEA-LU requires a real-time system management information program be established in all states. Target dates have been established for instrumentation of all interstate facilities (11/8/2014) and state designated metropolitan area routes of significance (11/8/2016). The intent of this program is to encourage data sharing and real-time traffic monitoring between state and local governments across state lines on major highway systems across the United States to improve traveler information to the public and congestion relief across jurisdictional lines.<sup>20</sup>

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<sup>18</sup> <http://ops.fhwa.dot.gov/wz/its/index.htm>

<sup>19</sup> [http://www.its.dot.gov/research/maritime\\_apps.htm](http://www.its.dot.gov/research/maritime_apps.htm)

<sup>20</sup> <http://ops.fhwa.dot.gov/travelinfo/about/rtsmip.htm>

FDOT should continue to support this effort and their involvement in the I-95 Corridor Coalition.

#### ***4.2.9 Smart Roadside***

Smart Roadside is a USDOT mode-specific research program. The vision of this program is to implement data sharing between modes on the transportation system, such as motor carriers and toll facilities. Through this program, the USDOT hopes “to improve motor carrier safety, security, operational efficiency, and freight mobility.” This program is supported by FHWA and FMCSA.<sup>21</sup> FDOT should maintain involvement in this research program to provide input and understand the implications on Florida's ITS.

#### ***4.2.10 Environmental Sustainability***

FDOT should identify or develop methodologies that quantify the environmental impact of the programs and projects promoted as part of the ITS deployment. These efforts should focus on how ITS fits in the broader picture of sustainable transportation.

#### ***4.2.11 Shared Operational Responsibilities with Private Sector***

As the private sector becomes more involved with ITS and traffic operations, the opportunities for “one-time” or special situations will become prevalent and lead to a situation where every public-private partnership is different from all of the others. FDOT should take a lead role in defining standardized roles, responsibilities, and levels of performance that will apply to all partnerships. This set of standardized responsibilities will clarify the confusion and misunderstandings that may occur if every partnership sets its own guidelines. FDOT should especially focus on defining what responsibilities can be provided by the private sector, and which responsibilities should always remain a public function.

#### ***4.2.12 Public Feedback***

As mobile technology and applications continue to develop, the opportunity for the public to provide real-time information will become more available. Commonly referred to as “crowd sourcing,” these applications will allow the public to identify and share information about incidents within the transportation system, or allow themselves to be anonymously tracked to provide real-time travel information. These emerging applications and opportunities should be evaluated for their effectiveness and appropriateness for inclusion into the ITS Program.

### ***4.3 Long-Term Strategic Planning Guidelines***

In addition to establishing ITS goals and objectives, strategic planning guidelines will ensure that the ITS Program's policies and objectives are integrated into FDOT's procedures to guide

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<sup>21</sup> [http://www.its.dot.gov/research/smart\\_roadside.htm](http://www.its.dot.gov/research/smart_roadside.htm)

decision makers in implementing ITS strategies and allocating ITS resources. These guiding principles describe how Florida's ITS vision will be realized as the program continues to unfold over the next 20 years. While this document itemizes some specific projects and opportunities for the ITS Program, these long-term guiding principles will allow ITS decision makers to identify new and emerging opportunities that fit the ITS vision, even if these opportunities have not been identified within this plan.

These guiding principles are divided into the following categories, each with its own actions or activities:

#### ***4.3.1 Planning and Development***

- Undertake strategic deployments.
- Provide a common framework for planning, deploying, and integrating systems through ITS architecture and standards consistency.
- Promote institutional and inter-jurisdictional cooperation and coordination in planning, deploying, operating, managing, and maintaining ITS infrastructures.
- Provide service on a regional, integrated, and interoperable basis.
- Integrate ITS planning and ITS-related operations planning with statewide, metropolitan, toll authority, and local government planning processes.
- Emphasize intermodal/multimodal orientation to enhance both passenger and freight connections and transfers at ports, airports, and via all applicable modes.
- Utilize proven cost-effective technologies to deliver new and enhanced services to travelers and system users; use a total life-cycle cost analysis to select ITS components and designs.
- Actively plan for the application of new ITS technologies that are likely to aid FDOT in meeting its transportation goals.

#### ***4.3.2 Operations and Management***

- Provide performance driven service and real-time operations and management of all transportation systems to maximize system performance, safety, and travel-time reliability.
- Adapt system operations and management strategies to changing conditions.
- Provide emergency operations support.
- Actively pursue interagency operations and management agreements.

#### ***4.3.3 Finance***

- Provide ITS funding for architecturally consistent projects.
- Leverage the value of "conventional" capital investments.
- Develop ITS funding strategies for deployment, maintenance, operations, and replacement.
- Capitalize on private sector resources.

***4.3.4 Public Awareness and Involvement***

- Include education, training, and outreach.
- Respond to special user needs.
- Identify and support ITS advocates and champions.

***4.3.5 Research and Development***

- Support continued research and operational testing.

## 5 Final Recommendations – From Strategies to Action

Florida’s ITS Strategic Plan is intended to provide high-level guidance to the ITS Program to move forward in specific program areas while remaining open to strategic opportunities. This section identifies specific action items that can be pursued in the near future.

Table 5-1 identifies many of these key actions and serves as a link between the 2025 Florida Transportation Plan and Florida’s ITS Strategic Plan. The goals and objectives were taken from the 2025 Florida Transportation Plan; however, the objectives were adapted by FDOT CO for the ITS Program. Core strategies were developed to specify how ITS will support the goals and objectives. All of the core strategies fall within the defined planning horizon, which is the next three to five years.

Each year, FDOT CO will develop an ITS Business Plan based on a subset of these strategies to focus resources and priorities.

**Table 5-1 - Core Strategies for Florida’s ITS Strategic Plan**

Goal	Objective	Core Strategy
<b>Goal 1 - A safer and more secure transportation system for residents, businesses, and visitors.</b>		
1.1	<b>Improve Safety</b> - Improve the safety of all modes of transportation comprising Florida's transportation system, for all users, including roadway intersections and locations where modes intersect.	
	1.1.1	Provide pre-trip planning information and accurate and timely traveler information regarding incidents for evacuation conditions.
	1.1.2	Provide traffic management during evacuation conditions.
	1.1.3	Improve ability to detect, verify, respond to, and clear incidents through effective communications and coordination between local governments, public safety officials, and transportation system operators.
	1.1.4	Provide route guidance information and information on traffic/travel conditions during adverse weather.
	1.1.5	Investigate, deploy, and expand connected vehicle opportunities for improving safety of travelers, including commercial vehicles.
1.2	<b>Reduce Fatalities/Injuries</b> - Reduce the rates of motor vehicle, bicycle, and pedestrian	

Goal	Objective	Core Strategy
		fatalities and serious injuries through design techniques and the application of the "4 Es" – engineering, education, enforcement, and emergency response strategies.
	1.2.1	Reduce commercial vehicle crash rates.
	1.2.2	Reduce crash rates and severities in construction work zones.
	1.2.3	Reduce weather-related traffic incidents.
	1.2.4	Reduce mainline queues at limited-access facility exit ramps.
	1.2.5	Reduce secondary crashes.
1.3	<b>Make Strategic Safety Investments</b> - Focus resources proactively where opportunities for safety improvements are greatest, as identified by best available data and trends.	
	1.3.1	Develop a Concept of Operations or procedures for evacuation coordination and management utilizing ITS.
	1.3.2	Develop diversion routes, arterial trailblazer signage, and adjustment plans for local signal system timings during an interstate diversion. Also document impacts and develop procedural guidelines.
1.4	<b>Improve Security</b> - Improve security of Florida's transportation system to deter and respond to attacks on transportation facilities or domestic targets, while ensuring mobility for all users.	
	1.4.1	Improve security for transit systems.
	1.4.2	Monitor and protect critical infrastructure.
	1.4.3	Screen and monitor commercial vehicles, cargo, and cargo handling facilities.
	1.4.4	Provide for hazardous material movement electronic identification, monitoring and tracking to be coordinated by regional traffic management and public safety agencies.
	1.4.5	Develop and implement mitigation plans to address vulnerabilities.
<b>Goal 2 - Enriched quality of life and responsible environmental stewardship.</b>		
2.1	<b>Enhance Community Livability</b> - Plan, develop, and implement ITS to enhance transportation facilities and services with communities and agencies to enhance the livability of communities. If enhancement is not possible, avoid or minimize adverse impacts to communities.	

Goal	Objective	Core Strategy
	2.1.1	Continue and expand Road Ranger service patrols.
	2.1.2	Continue and enhance the 511 System.
2.2	<b>Conserve Non-Renewable Resources</b> - Make transportation decisions that conserve and optimize non-renewable resources and promote the use of renewable resources (materials, facilities, and sources of energy) and include strategies to decrease greenhouse gases and air pollution.	
	2.2.1	Improve transportation procedures. Reduce energy consumption through signal retiming, ramp metering, and incident management.
2.3	<b>Accommodate Human Scale</b> - Plan, develop, implement, and fund ITS to accommodate the human scale, including pedestrian, bicycle, transit-oriented, and other community-enhancing features, unless inappropriate.	
	2.3.1	Continue to develop and expand information dissemination capabilities for the public.
	2.3.2	Maintain and enhance statewide infrastructure to provide center-to-center and center-to-field telecommunications.
2.4	<b>Maximize Use of Existing Infrastructure</b> - Optimize the efficiency of Florida's transportation system by implementing operational, management, access, and land use strategies that support the intended use of each element of the system identified as part of the evolving statewide, regional, or community visions.	
	2.4.1	Expand adoption and support of TSM&O.
	2.4.2	Develop and implement active traffic management.
2.5	<b>Use Effective Public Involvement</b> - Provide opportunities for early and continuing proactive customer feedback in the transportation decision making process, including easily understood and complete information, timely public notice, and full public access to key decisions.	
	2.5.1	Use the 511 system to actively inform the public and invite feedback.
	2.5.2	Continue to find additional means of promoting the benefits of ITS and educating the public on ITS and how it can help them.
2.6	<b>Preserve Natural Environment</b> - Plan, design, and construct ITS in a manner that preserves and, where feasible, restores the function and character of the natural environment and avoids or minimizes and mitigates adverse impacts.	

Goal	Objective	Core Strategy
	2.6.1	Reduce emissions from mobile sources to improve air quality.
<b>Goal 3 - Adequate and cost-efficient maintenance and preservation of Florida's transportation assets.</b>		
3.1	<b>Maintain Transportation System</b> - Maintain all elements of the transportation system to protect the public's investment for the future.	
	3.1.1	Dedicate FDOT funds, statewide-managed and District-allocated, for operations, management, maintenance, and replacement of ITS.
	3.1.2	Maintain and enhance the ITS facility management system for fiber optic system utilization and ITS device database to support maintenance and replacement purposes.
	3.1.3	Update the <i>Ten-Year ITS Cost Feasible Plan</i> each year by adding a new tenth year.
	3.1.4	Provide high reliability communications among RTMCs.
	3.1.5	Update the <i>Statewide ITS Architecture</i> and applicable standards, as needed, for consistency with 23 CFR, <i>Part 940</i> , and provide technical assistance to the Districts regarding completion of those requirements.
	3.1.6	Support, maintain, and enhance SunGuide software.
3.2	<b>Eliminate Illegal, Overweight Vehicles</b> - Eliminate the illegal operation of commercial motor vehicles that exceed weight limits on Florida's public roads and bridges.	
	3.2.1	Develop and deploy additional weigh-in-motion capabilities.
<b>Goal 4 - A stronger economy through enhanced mobility for people and freight.</b>		
4.1	<b>Improve Transfers between Modes and Facilities</b> - Provide for smooth and efficient transfers for both people and freight between transportation modes and between the Strategic Intermodal System (SIS) and other transportation facilities.	
	4.1.1	Expedite permitting and clearance of commercial vehicles at weight and agricultural inspection sites to keep commerce moving.
	4.1.2	Support efficient intermodal transfer of people and goods.
4.2	<b>Reduce Delay and Improve Reliability</b> - Reduce delay on and improve the reliability of SIS facilities and other transportation facilities.	
	4.2.1	Reduce delays at toll booths.



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Goal	Objective	Core Strategy
	4.2.2	Manage traffic at interchange entrance ramps to improve mainline throughput and traffic flow.
	4.2.3	Reduce delays caused by congestion in construction work zones.
	4.2.4	Improve travel time reliability and predictability.
	4.2.5	Reduce congestion related delays by decreasing queues and spillback from other facilities.
	4.2.6	Improve incident-related traveler information.
	4.2.7	Provide safe and efficient travel through the provision of accurate and timely traveler information.
	4.2.8	Continue to provide accurate real-time data to technology, business, and operational users and motorists for effective, responsive transportation operations.
	4.2.9	Research new technologies for travel-time data collection and traffic detection, including the evaluation of the accuracy of the data.
4.3	<b>Provide Modal Alternatives</b> - Promote the use of modal alternatives to SIS highways for travel and transport between regions, states, and nations.	
	4.3.1	Provide traveler information services with regional route and mode choice information.
	4.3.2	Support the improvement of transit travel time and reliability.
4.4	<b>Set Criteria for New Hubs and Corridors</b> - Establish statewide criteria for identifying and developing ITS on new SIS facilities where such facilities are needed to connect the economic regions of the state, especially economically distressed areas, in coordination with regional and community visions.	
	4.4.1	Support the designation of corridors as strategic intermodal corridors and funding for ITS deployments.
4.5	<b>Enhance Regional Coordination</b> - Develop regional visions and action plans that integrate transportation, land use, economic, community, and environmental systems to guide transportation decision making and investments. Focus attention on meeting regional mobility needs that transcend traditional jurisdictional boundaries, and ensure connectivity between SIS, regional, and local facilities.	
	4.5.1	Operate a statewide 511 system across regions and jurisdictions.

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<b>Goal</b>	<b>Objective</b>	<b>Core Strategy</b>
	<b>4.5.2</b>	Expand statewide 511 marketing and outreach.
	<b>4.5.3</b>	Promote cooperative operations among RTMCs.
	<b>4.5.4</b>	Develop operational guidelines that can be tailored to each District's needs and that identify procedures and minimum requirements for operating ITS.
	<b>4.5.5</b>	Promote TSM&O.
	<b>4.5.6</b>	Balance demand throughout a regional network by better coordination of freeway management with arterial signal systems.
	<b>4.5.7</b>	Promote the integration of transportation, public safety, and other transportation management agencies.
	<b>4.5.8</b>	Develop a working group to advance connected vehicle initiatives.
<b>4.6</b>	<b>Facilitate Economic Development</b> - Facilitate economic development opportunities in Florida's economically distressed areas by improving access to traveler information.	
	<b>4.6.1</b>	Ensure efficient access to major activity centers, such as tourist attractions, state parks, and other areas of interest.
<b>4.7</b>	<b>Develop Multimodal Systems</b> - Use ITS to promote multimodal systems.	
	<b>4.7.1</b>	Leverage multi-modal approaches in TSM&O projects.
<b>4.8</b>	<b>Expand Transportation Choices</b> - Expand awareness of transportation choices to enhance local mobility and to maintain the performance of the SIS and regionally significant facilities.	
	<b>4.8.1</b>	Provide traveler information services with local route and mode choice information.
<b>4.9</b>	<b>Reduce Travel by Single Occupant Vehicles</b> - Reduce per capita vehicle miles traveled by single occupant vehicles, especially during peak hours of highway use.	
	<b>4.9.1</b>	Support the development of managed lanes (e.g. high-occupancy toll lanes).
<b>4.10</b>	<b>Ensure Accessibility for All</b> - Ensure that ITS services are accessible to all users, including young, elderly, disabled, and economically disadvantaged persons.	
	<b>4.10.1</b>	Maintain Americans with Disabilities Act compliance on traveler information web resources.
	<b>4.10.2</b>	Continue to develop and implement ITS solutions that support all users.

Goal	Objective	Core Strategy
<b>Goal 5 - Sustainable transportation investments for Florida's future.</b>		
5.1	<b>Reduce Backlog and Meet Future Needs</b> - Provide sufficient resources to make decisions to reduce the identified backlog in transportation needs and meet growth needs at the state, regional, and local levels.	
	5.1.1	Provide centralized traffic data mining capabilities for all partners to support decision making.
	5.1.2	Coordinate with state and local transit agencies.
	5.1.3	Develop statewide information exchange network standards and criteria.
5.2	<b>Set Transportation Investment Priorities</b> - Establish transportation investment priorities recognizing that the SIS meets a strategic and essential state interest, and that regional and local systems must be adequately funded.	
	5.2.1	Provide research and development for technologies to support deployments.
	5.2.2	Develop and enhance existing statewide traffic incident management guidelines.
	5.2.3	Collect and report regionally accepted system performance standards and measures to drive transportation resource investment decisions.
	5.2.4	Establish a statewide managed funding program for ITS maintenance with recommendations made by the ITS Program.
	5.2.5	Continue statewide ITS communications network management system reporting to monitor network traffic and identify needs for expanded capacity.
5.3	<b>Reduce Costs</b> - Reduce the cost of providing and operating transportation facilities.	
	5.3.1	Identify in-house roles and responsibilities and recommend activities for outsourcing.
	5.3.2	Capitalize FDOT assets to create alternate funding to offset costs.
	5.3.3	Support and encourage use of the statewide <i>Systems Engineering Management Plan</i> .
	5.3.4	Continue to monitor, update, and improve ITS standards.
	5.3.5	Continue to provide an efficient, responsive, and quality ITS product approval program.

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Goal	Objective	Core Strategy
	5.3.6	Maintain statewide procurement contracts to leverage economies of scale.
	5.3.7	Conduct ITS training surveys to determine ITS training needs; deliver ITS training; and consider cost-saving training methods.
	5.3.8	Continue the use and improvement of the statewide ITS communications network for telecommunication needs in upcoming projects and inform the Districts of possible applications.
	5.3.9	Continue to support deployment of broadband telecommunications where feasible and cost-effective.
	5.3.10	Promote partnerships to leverage financial and human resources.
	5.3.11	Promote efforts to design ITS to minimize maintenance and operations costs.
	5.3.12	Monitor usage of systems and evaluate the cost-effectiveness of continuing their use.
	5.3.13	Increase the professional capacity of the public and private sectors in Florida through training, continuing education, and professional development opportunities for ITS practitioners.
5.4	<b>Identify Gap Between Funding and Needs</b> - Document the gap between funding resources (local, regional, state and federal) and needs across all levels and all modes in a consistent and compatible format.	
	5.4.1	Identify gaps between existing regional ITS that support transportation operations.
	5.4.2	Identify funding mechanisms to support deployment, operations, maintenance and replacement of ITS infrastructure and systems.