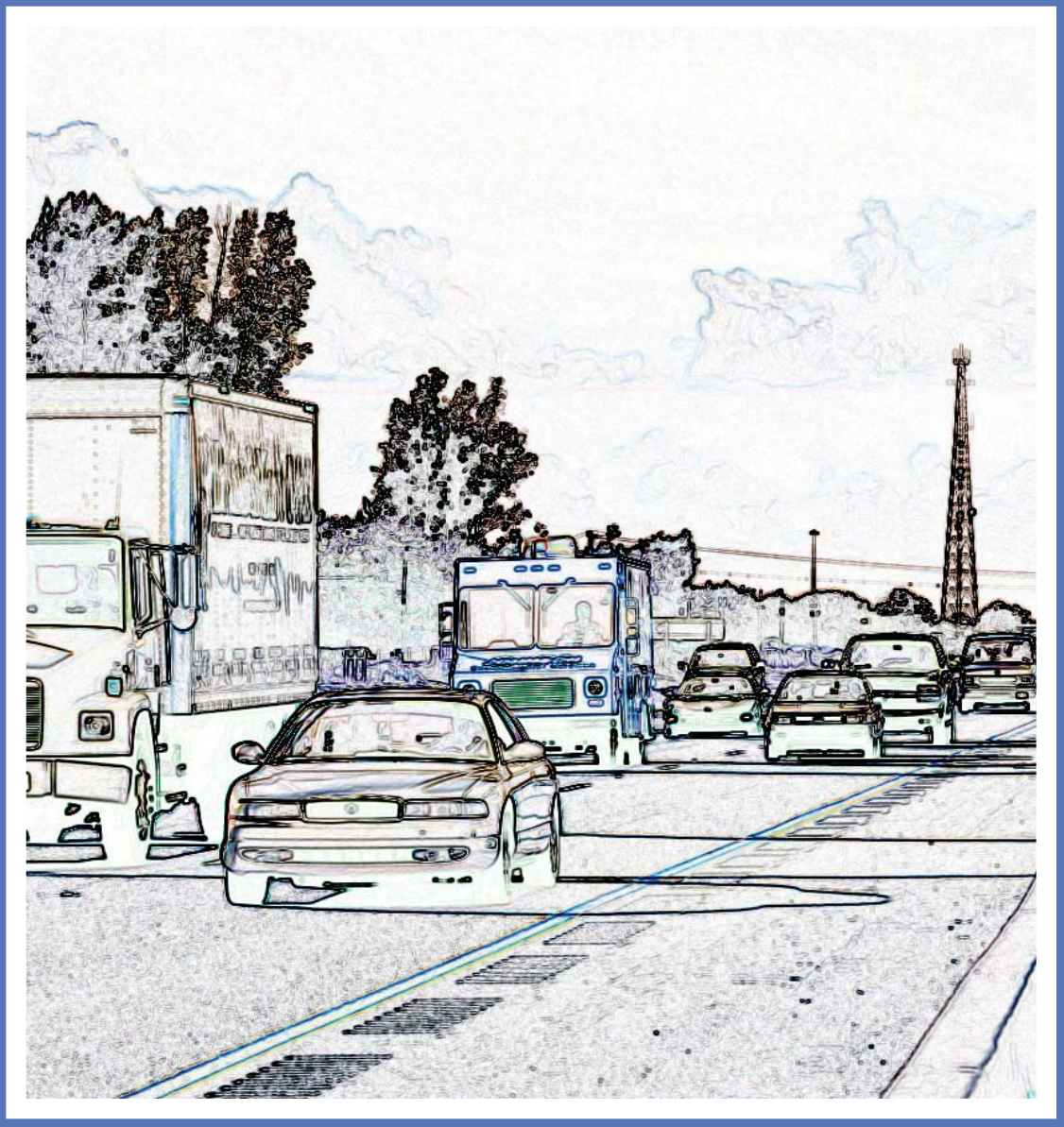
Florida Department of Transportation

Intelligent Transportation Systems Program

Annual Report

Fiscal Year 2008-2009



CONTENTS

General

ITS Program Highlights

Mission Statement

Provide leadership and serve as a catalyst in becoming the national leader in mobility.

Vision Statement

Provide support and expertise in the application of traffic engineering principles and practices to improve safety and mobility.

WELCOME

Florida Department of Transportation

CHARLIE CRIST
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

STEPHANIE KOPELOUSOS
SECRETARY

Dear Reader:

On behalf of the Florida Department of Transportation Intelligent Transportation Systems (ITS) Program, we are pleased to present this Annual Report for fiscal year 2008-2009.

It has been a year of progress—a year of continuing and extending current projects. In this report, you will find information on projects such as: the Next Generation 511 Traveler Information System, preparing to launch in the upcoming weeks; data collection; growth of the SunGuide® Software; wireless internet access; performance measures; and the ITS wide area network and facility management projects, to name a few.

We just finished producing *Florida's 511 Progress Report-Connecting the DOTs*, our annual 511 report for 2008. This is in anticipation of the launch of our new Next Generation 511 Traveler Information System and we encourage you to read about these "three magic numbers for traveler information."

We continued our work in "non-traditional" data collection systems, such as license plate readers, cell phones, and global positioning system (GPS) based data collection systems. The license plate reader data collection system will allow us to post travel times on dynamic message signs in Tallahassee. GPS-based data collection holds great promise for rural areas lacking the traditional ITS infrastructure found in urban areas. You can read all about this innovative technology and how the SunGuide Software now provides the capability to calculate travel time and/or average speeds from these systems.

Wireless internet access was extended to four welcome centers and the Florida's Turnpike Enterprise Turkey Lake Service Plaza. Work is also ongoing on a trailer-mounted mobile Wi-Fi hot spot. The ability to use this unit at different rest areas, special event locations, and events related to emergency management allows us to better meet the critical need for information.

Looking forward to the future, we hope our work continues to provide valuable information to the traveling public, enabling better travel decisions, maximizing efficient use of our roadways, and thus minimizing congestion.

Elizabeth Birriel

Elizabeth Birriel, PE
Deputy State Traffic Operations Engineer
Florida Department of Transportation
ITS Program Manager

Keeping Floridians Moving

by Elizabeth Birriel, FDOT

Intelligent transportation systems (ITS) consist of transportation technologies that enhance safety, improve mobility, support commerce, and help sustain the environment. ITS directly improves traffic flow and reduces congestion by allowing transportation agencies to operate their systems as efficiently and safety as possible. Major elements in Florida's ITS Program include: traffic management, traffic incident management, emergency management, transportation management centers, and traveler information.

Congestions management is used to improve traffic flow and decrease delays on Florida's roadways. Florida ITS technologies used to manage traffic include traffic signal optimization/retiming, surveillance and detections systems using vehicle detectors and closed-circuit television cameras; congestion pricing to manage lane volumes, ramp metering using traffic signals at on-ramps to control the rate of vehicles entering the freeway; and advanced communications using dynamic message signs, highway advisory radios, and 511 traveler information. These technologies offer improved travel times, reduced crash rates, and improved trip time reliability. The use of ITS in traffic management can increase peak period freeway speeds by 8 to 13 percent. Data also indicates that ramp metering alone can improve freeway traffic speeds by 13 to 26 percent and reduce crashes by 15 to 50 percent.[1] Through the use of these resources, ITS will also be a powerful congestion management tool during the construction projects funded by the economic stimulus package.

Traffic incident management (TIM) is a proven strategy that uses a variety of ITS technologies to quickly detect, manage, and clear incidents. Incidents account for up to 60 percent of the total congestion on limited-access facilities; for every minute that a freeway travel lane is blocked, four minutes of additional travel delay occurs until the incident is cleared.[2] Coordinated TIM helps reduce the time associated with the clearance of incidents. In addition to this time savings, improved incident clearance also enhances responder safety, reduces the likelihood of secondary accidents, reduces time lost and fuel wasted in traffic backups, and increases customer satisfaction. According to recent studies, one aspect of TIM, service patrols, has benefit-to-cost ratios ranging from 2:1 to 36:1.1[1] Service patrols are supported by an array of ITS components, enabling significant reductions in the time to respond to and clear incidents. They are one of the most effective and appreciated TIM strategies as indicated by the over 2 million assists and setup of initial traffic control for major incidents/emergency events since Florida's program inception in 2000. Service patrols are considered one of the most essential components of a successful traffic incident management program.

Emergency management through the use of reverse lanes provides a coordinated means of evacuation in times of crisis, such as during hurricanes, wildfires, or hazardous material spills. ITS technologies play an important role in emergency management by enhancing interagency coordination through effective communications, critical to successful evacuation management. ITS can improve the transportation system efficiency and effectiveness during emergencies and improve traveler safety and security. Reverse lanes, supported by dynamic message signs, closed-circuit television cameras, and 511 traveler information systems, can be used to efficiently and safely evacuate regions within the state when large-scale disasters threaten.

Traveler information, provided by the 511 traveler information systems, Florida's 511 Web site, and partnerships with the media allow motorists to avoid congestion on Florida's roadways by pre-planning or altering their routes based on information about congestion, incidents, etc. The 511 traveler information system helps to ensure the mobility of Florida's citizens and goods, while assisting with the preservation of our environment and communities through reduced emissions. Florida's 511 calls accounted for 22 percent of the 511 calls made in the U.S. through December 2007. Proven benefits from 511 include improved on-time reliability, better trip planning, and reduced early and late arrivals.

Simply stated, intelligent transportation systems save lives, time, and money by providing information to the public to make travel decisions; maximizing the use of our roadways by allowing their most effective and efficient operations; and by reducing congestion on our freeways through quicker incident detection and clearance. Transportation is the roadmap to economic recovery and ITS is the most cost-efficient way to keep Floridians moving during this recovery.

1 Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned 2008 Update, US Department of Transportation, Research and Innovative Technology Administration, September 2008
2 Benefits of Traffic Incident Management, National Traffic Incident Management Coalition, November 2008

FDOT's Overall Vision

To ensure that Florida's transportation system meets future demands, the Florida Department of Transportation (FDOT) is working to achieve the following mission:

FDOT's Mission

Provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities.

To achieve this mission, four primary goals were established—safety, systems management, economic competitiveness, and quality of life.

FDOT's ITS Program Mission

To provide effective intelligent transportation systems for Florida's travelers that enhances the safety and mobility of people and goods, economic competitiveness, and the quality of our environment and communities by serving commuters, tourists, commercial vehicles, and evacuees.

FDOT's Commitment to ITS

FDOT maintains a State Highway System of more than 12,000 centerline miles and 42,432 lane miles. According to the FDOT *Five-Year Work Program*, $6.8 billion was budgeted in this fiscal year to support Florida's transportation needs. As part of its annual program, FDOT made significant investments in ITS and is committed to investing approximately $883[1] million between 2002 and 2019.

1 Includes a $53.7 million reduction in funds to address funding shortfalls in the state.

FDOT's ITS Program Areas

The Florida Department of Transportation's (FDOT) Traffic Engineering and Operations Office coordinates and promotes the deployment of intelligent transportation systems (ITS) throughout Florida. The ITS staff are led by Elizabeth Birriel, P.E., Deputy State Traffic Engineer—ITS Program Manager.

Florida's ITS is organized into the following program areas:

- ITS Management/Deployments—*Gene Glotzbach, P.E.*
- ITS Software, Architecture, and Standards—*Arun Krishnamurthy, P.E.*
- Telecommunications Program Management—*Randy Pierce*

ITS Management/Deployments

- Promote ITS deployments on Florida's roadways, develop standards, maintain the *ITS Strategic Plan*, and implement a systems engineering process to support procurement and deployment of ITS
- Deploy advanced traveler information systems and 511
- Provide technical support and assistance to FDOT's District Offices and other partners
- Manage the *Ten-Year ITS Cost Feasible Plan* and develop the *Arterial ITS Plan*
- Continue research in the use and deployment of license plate readers, global position system devices, and other communications devices as probes for real-time traffic data and statistics for planning
- Manage the Federal ITS Discretionary Grant Program
- Support the I-95 Corridor Coalition through the co-chairmanship of the Travel Information Services Program Track
- Support the National 511 Coalition Working Group as an active member
- Support the FDOT Transit Office by providing expertise to various transit projects

ITS Software, Architecture, and Standards

- Manage the SunGuide® Software, including support of the software at transportation management centers
- Manage the FDOT Ramp Metering Software System for ramp meter control and monitoring
- Develop and maintain the *Statewide ITS Architecture* (SITSA) to promote an integrated ITS; assist in development of District, regional and corridor ITS architectures to ensure SITSA conformance
- Develop and update standards and specifications for ITS devices
- Develop and promote the use of the systems engineering management and configuration management processes to the FDOT Districts
- Coordinate ITS training to enhance the quality and quantity of the state's ITS workforce
- Coordinate the FDOT's ITS Research Program with the Districts to identify the needs, priorities, and applicability of emerging ITS concepts
- Coordinate Traffic Operations and ITS support for public-private partnerships and managed lanes projects




Telecommunications Program Management

- Guide deployment of a communications backbone to serve ITS deployments on major corridors
- Implement and manage the Statewide ITS Wide Area Network (WAN) to support ITS deployments
- Manage the operations and maintenance program for the statewide ITS telecommunications network to support ITS deployments, motorist aid call boxes, and various ITS research and development initiatives
- Manage all FDOT Federal Communications Commission radio licenses (over 600 licenses)
- Manage the Wireless General Manager Agreement, a resource-sharing public/private partnership which places commercial wireless carriers on FDOT rights-of-way with Lodestar/American Tower
- Develop operations standards and equipment specifications to support District telecommunications initiatives in their ITS, Maintenance, and Traffic Incident Management programs

Traffic Systems

- Develop, test, maintain, update, and publish minimum standards for traffic control systems and devices; and evaluate and certify these systems and devices for use in Florida
- Develop, test, maintain, and update minimum standards for ITS devices; and evaluate and certify these systems and devices for use in Florida
- Develop, implement, and maintain quality assurance and certification programs through the Approved Product List (APL)
- Provide testing, verification, and validation services for ongoing development and updates of the state's SunGuide® Software, Florida Advanced Traveler Information System, and other statewide transportation software and system applications
- Research, compile, develop, and document recommended practices and procedures for traffic control and ITS devices used in Florida
- Provide technical assistance and training relating to the design, implementation, and operation of traffic control and ITS devices used in Florida
- Conduct the Traffic Engineering Research Laboratory (TERL) testing and research programs, including traffic operations, ITS, and communications research and testing
- Represent Florida on national technical advisory groups that develop traffic control and ITS device standards
- Maintain and update traffic operations asset inventory for quality assurance and certification record

FDOT's ITS Program Accomplishments

The Florida Department of Transportation's (FDOT) Intelligent Transportation Systems (ITS) Program accomplishments are numerous. The following is a list of the Fiscal Year 2008-2009 major accomplishments.

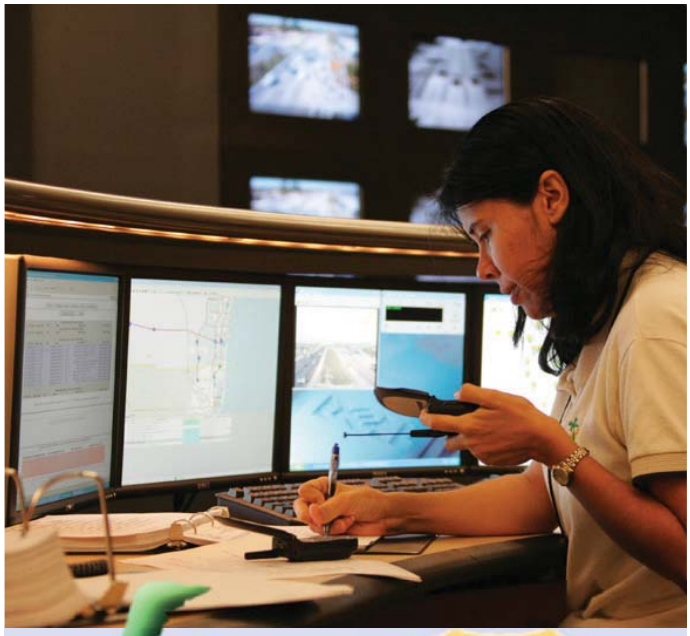
ITS Management/Deployments

- Updated the *Ten-Year ITS Cost Feasible Plan*.
- Promoted 511 traveler information in Florida with continued support to Districts 1 and 2 for the provision of data to the statewide 511 traveler information system.
- Performed various duties for the Next Generation advanced traveler information systems, including: factory acceptance testing and independent validation and verification; user acceptance testing; District database support; completed the *Style Guide for Data Entry* to provide consistency between the Districts on how data is presented; ongoing speech and grammar testing for the interactive voice recognition (IVR) phone system.
- Managed the Global-5 Communications marketing efforts for the existing 511 system as well as the Next Generation system and their research effort for the potential to generate revenue through the use of FDOT ITS assets.
- Produced *Florida's 511 Progress Report—Connecting the DOTs*, an annual report for 2008.
- Completed a pilot project involving INRIX for probe data collection using a GPS-based data collection system.
- Continued to provide support to District Traffic Operations and Work Program staffs to update the Districts' portions of the T*en-Year ITS Cost Feasible Plan*.
- Continued to provide post-award support to District 1's Traffic Operations with the I-75 ITS deployment project.
- Continued to provide post-award support to District 2's Traffic Operations Office with the Phase V I-295 projects.
- Installed a license plate reader data collection system in Tallahassee to collect travel times along I-10 and post the travel times on the two dynamic message signs deployed in the Tallahassee area.
- Continued to support and provide quality assurance to the Traffic Engineering and Research Lab (TERL) with development of an ITS lab to test ITS equipment operability using the SunGuide® Software.
- Continued to support the Change Management Board and process engineering change proposals.
- Continued to produce the *SunGuide® Disseminator* (FDOT's Traffic Engineering and Operation's monthly newsletter).
- Developed the initial phase of the *Arterial ITS Plan* with that phase concentrating on advanced traffic management systems deployment and the benefits of signal retiming.

- Continued to provide support to FDOT's Public Transportation Office for their Resource for Advanced Public Transportation System Program.
- Continued work on developing ITS performance measures.
- Continued to develop ITS specifications and maintain existing specifications based on field experience with deploying various ITS devices.

ITS Architecture, Software, and Standards

- Conducted SunGuide® Software Release 4.0 independent validation and verification (IV&V) at the FDOT Traffic Engineering Research Laboratory (TERL).
- Provided SunGuide Software Release 4.0 to the Districts; this release included additional reporting capability and information dissemination functions to support the 511 traveler information project.
- Renewed the existing five-year contract with Southwest Research Institute (SwRI) for an additional year to provide SunGuide Software support.
- Conducted SunGuide Software Release 4.0 IV&V at the District 5 regional transportation management center (RTMC).
- Delivered SunGuide Software Release 4.1 to the Districts; this release included enhancements to travel time calculation capabilities and support to license plate readers and automatic vehicle identification tags.
- Deployed the SunGuide Software at the City of Tallahassee transportation management center (TMC), and conducted SunGuide Software Release 4.1.2 license plate reader IV&V at the City of Tallahassee TMC.
- Conducted SunGuide Software Release 4.1.3 automatic vehicle location /Road Ranger integration testing at the FDOT District 7 RTMC.
- Provided SunGuide Software Release 4.1.3 to the Districts; this release included the ability to obtain traffic data in real-time from Road Rangers.



- Provided training to develop project-specific System Engineering Management Plans for District engineers and consultants to Districts 1, 2, 4, 5, and 6.
- Conducted SunGuide Software Release 4.2 IV&V at the TERL.
- Delivered SunGuide Software Release 4.2 to the Districts; this release provides the ability to obtain real-time traffic data from Florida Highway Patrol and support for Citilog software for incident detection.
- Deployed the SunGuide Software at the Fort Myers (District 1) RTMC.
- Coordinated with the University of Central Florida and the University of Florida to assist with FDOT-sponsored research projects using SunGuide Software.
- Conducted ongoing SunGuide Software Release 4.3 development to support the 95 Express Lanes and response plan enhancements in south Florida.
- Continued to support the SunGuide Reports Repository to document, validate, and efficiently share reports.
- Developed and provided SunGuide Software operator training at all Districts.
- Continued monitoring the use of completed FDOT Standard Specifications for General Requirements for ITS Devices (Section 780), Motorist Information Systems (Section 781), Video Equipment (Section 782), Fiber Optic Cable and Interconnect (Section 783), Network Devices (Section 784), and Infrastructure (Section 785).
- Performed technical reviews and provided support for project-specific requests related to specification modification.
- Continued updating the FDOT Standard Specification Section 781 to support the use of arterial dynamic message signs.
- Provided technical support to the
  - 95 Express Operations Group in the areas of ITS, signing, operational analysis, and incident management.

- I-595 Public/Private Partnership procurement team in the areas of ITS and software.
- Alligator Alley ITS Task Team in the areas of ITS, traffic operations, and incident management.

⊙ Managed the legal protection of the SunGuide logo by registering it as a registered trademark.

⊙ Managed the legal protection of the SunGuide Software source code by registering it as a federal copyright.

Telecommunications Program Management

⊙ Completed a contract for installation of the ITS wide area network (WAN) project connecting the regional transportation management centers (RTMCs) in Districts 2 and 5 to the recently completed south Florida project.

⊙ Awarded a contract for installation of the ITS WAN project to connect the Districts 1 and 7 RTMCs to the recently completed south and central Florida projects.

⊙ Implemented the ITS Facility Management System (ITS-FM) pilot project in Districts 2, 4, 5, 6, and 7, and the southern portion of the Florida's Turnpike to develop a statewide ITS-FM enabling the Districts to manage their overall telecommunications networks, field system configuration, and components.

⊙ Added 14 wireless collocations under the Lodestar/American Tower Wireless General Manager Agreement.

⊙ Completed a contract for deployment of permanent emergency generator power systems at five microwave system locations to provide continuity during power outages.

⊙ Awarded a contract for deployment of permanent emergency generator power systems at six more microwave system locations to provide continuity during power outages.

⊙ Completed $250,000 worth of emergency repairs and restoration to the statewide telecommunications network infrastructure as a result of Tropical Storm Fay.

- Completed a contract for deployment of a replacement telecommunications equipment shelter at an operational microwave system site in District 2.
- Completed a contract for repeater deployment for the 47 MHz radio system in Districts 4 and 6.
- Awarded a contract for repeater deployment for the 47 MHz radio system in Districts 1 and 7.
- Continued support of the National CLARUS Initiative reporting weather data from eight field weather stations.
- Trained over 100 trainers and staff in Districts 2, 3, 4, and 6 in the operation of the 47 MHZ radio system and its operation in the new repeater network.
- Commissioned WiFi® internet access in four welcome centers and the Turkey Lake Service Plaza.

Traffic Systems

- Maintained the statewide program to evaluate and qualify traffic control device manufacturers —qualified eight and re-qualified 15 manufacturers in 2008.
- Maintained a statewide quality assurance and certification program to evaluate and approve traffic control devices used in Florida —approved 44 products in 2008.
- Integrated the dynamic message sign (DMS) qualification list into the ITS Approved Product List (APL).
- Provided technical support and testing services for the DMS technology used on the 95 Express project.
- Provided technical support, standards verification, and testing services for variable speed limit sign technology conditionally deployed along I-4 in Orlando.
- Performed evaluations of traffic signal head attachments to improve hurricane survivability.


- Assisted in the specification development and evaluation of reflectorized traffic signal head backplates to reduce traffic crashes.
- Provided technical support, testing, and validation services for license plate reader hardware and software technology deployed along I-10 in Tallahassee.
- Oversaw the design and initial construction on additional and enhanced testing facilities, including a mast arm test intersection.
- Provided maintenance and oversight of the statewide ITS device procurement contract and monitored deployment and use of the 45 approved ITS devices.
- Performed end-to-end system testing of various SunGuide® Software components, interfaces, and field devices, including independent verification and validation testing.
- Continued work with the American Association of State Highway and Transportation Official's ITS Standards Testing Program for the evaluation of the National Transportation Communications for ITS Protocol (NTCIP) 1205 Closed-Circuit Television (CCTV) Standard.
- Participated in the NTCIP 1204 Joint Committee for development, deployment, and refinement.
- Worked with national standards development organizations to develop, refine, and promote the implementation of nationwide standards for ITS devices.
- Worked with stakeholders to begin development of Florida's CCTV NTCIP requirements.
- Developed, revised, and/or validated seven minimum functional specifications for ITS and traffic signal devices.
- Managed the following research projects:
  - Statewide central data warehouse prototype;
  - FDOT NTCIP communication requirements for actuated signal controllers, CCTV cameras, and center-to-center transportation management center communications;
  - Quality assurance monitoring and sampling method development for ITS devices;
  - Crash pattern prediction using real-time ITS data; and
  - Impact of detection and communication degradation on traffic management systems operation.

Rural Data Collection—A "Must Have" Tool

by Gene Glotzbach, FDOT

The Florida Department of Transportation (FDOT) Districts have done a good job of deploying intelligent transportation systems (ITS) devices on limited-access facilities to manage traffic flow conditions in urban areas. Districts located in rural areas have projects programmed to cover what has not yet been deployed. Within the next five years, FDOT will have all of the major and most of the intermediate-sized urban areas built out with ITS. This will enable better traffic management on these limited-access facilities. The Turnpike Mainline is one exception, and has deployed ITS along the full length of the mainline in rural as well as urban areas.

Florida's rural areas remain as a gap in the FDOT's goal to fully deploy ITS statewide, particularly in north Florida and the Panhandle. This area is void of ITS along I-75 from Tampa north to the Georgia state line; and, with the exception of small deployments in Tallahassee and Pensacola, from Jacksonville west to the Alabama state line along I-10. Due to the lack of ITS deployments in rural areas of the state, collecting information to provide to the public is very cumbersome and inconsistent. Information cannot generally be used unless it is confirmed and verified by an independent source.

The primary means of acquiring information in the rural areas is through the use of the Florida Highway Patrol's (FHP) data distribution sources, such as their computer-aided dispatch system and Web site, or from other law enforcement agency reports. Additionally, information is collected from FDOT maintenance personnel and private citizens who call in to report an incident—all good sources of data, but getting verification in a timely manner, poses a challenge.

To build out these sections of roadways with sensors and cameras in order to acquire reliable traffic data would be very costly. The cost to deploy cameras and sensors would not only include the equipment cost, but would also need to include the cost to deploy a fiber optic system to transport the information and camera images back to a transportation management center (TMC), which could be a tremendous amount. FDOT has looked at a number of potential solutions to get traffic flow data on long stretches of highways without having to sink large amounts of money to deploy infrastructure. This traffic flow data could be utilized as a primary source of data to be validated by other sources, or could be utilized to validate data derived from other sources.

One potential solution that FDOT has looked at is license plate readers and the use of toll transponders to collect traffic flow information. These systems have been tested and deployed on a limited basis. They show promise in delivering travel times to the public and provide another tool to TMC operators to manage the traffic on limited-access facilities as well as arterials. These systems have been deployed in urban areas; however, they also require the deployment of equipment.

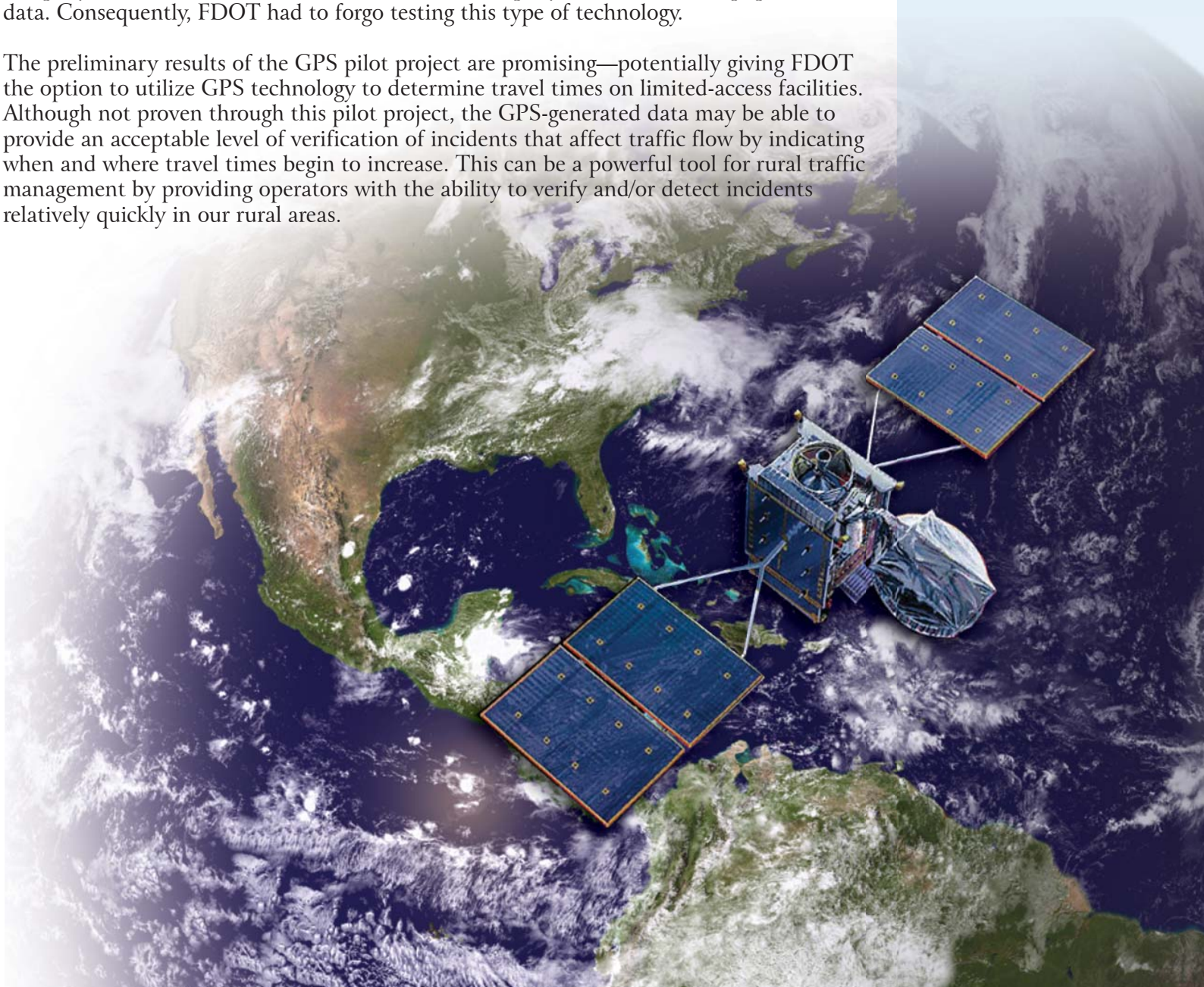
Due to their deployment cost, there may be little or no cost advantage in using these types of systems over traditional data collection systems. Other than a limited use of these types of systems in rural areas—at spot locations—license plate and toll transponder readers are not practical for lengthy deployments, such as would be needed in rural areas.

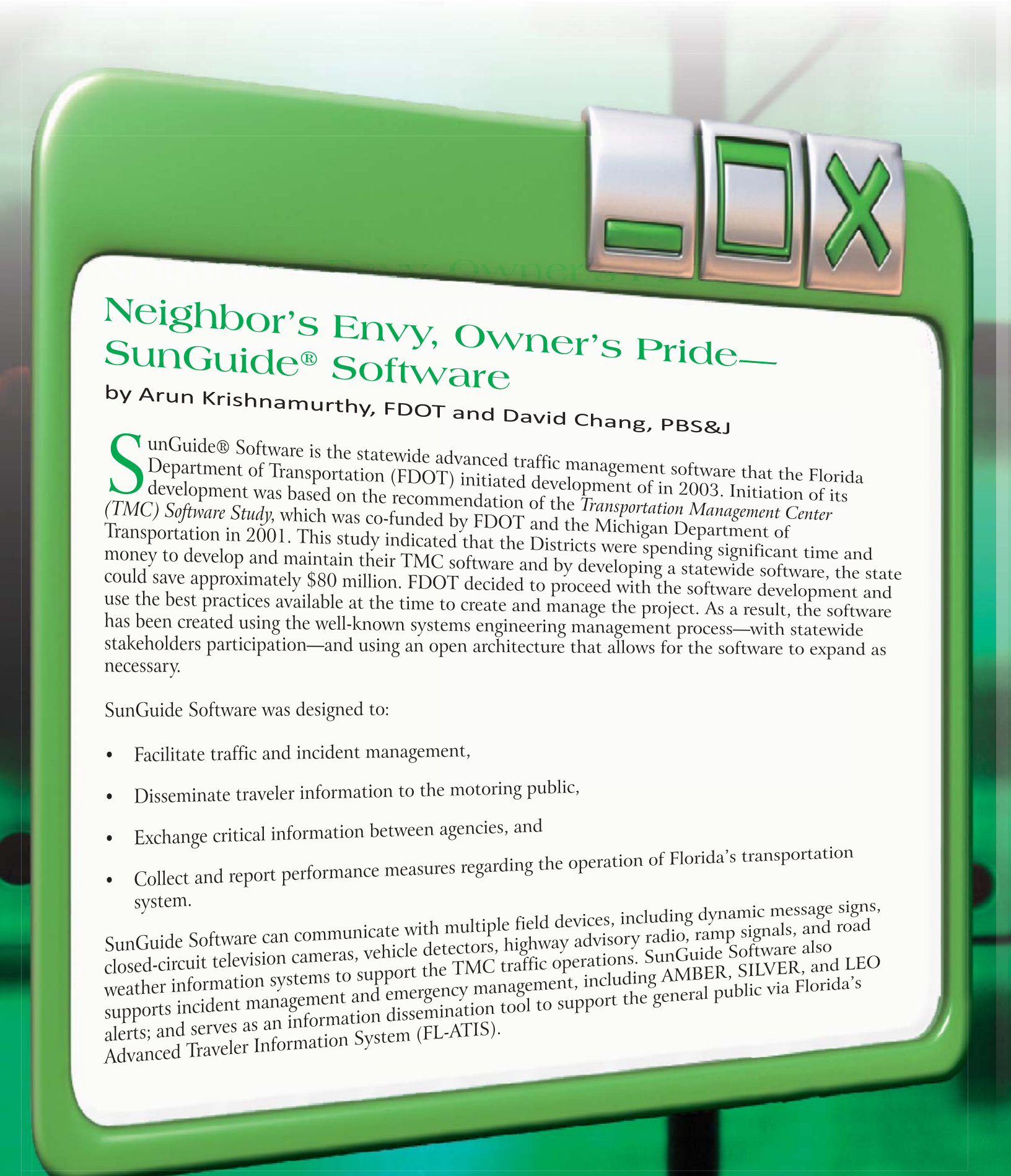
FDOT initiated and completed a pilot project to review the use of global positioning system (GPS) technology in determining travel times. The benefit of GPS-based systems is that FDOT does not need to pay for any infrastructure deployment in order to operate these systems. The infrastructure is deployed by the private sector and is needed for their business purposes. Companies can utilize the data coming from this private sector deployment to obtain traffic flow information. A combination of privately collected information and information collected by public agencies provides a more robust data flow.

The use of cell phones to generate traffic flow information was another technology that FDOT wanted to test. However, this required a contract with a cellular provider to gain access to their information. FDOT selected a company to test this technology, but this company was not able to contract with a cellular company for use of their equipment and data. Consequently, FDOT had to forgo testing this type of technology.

The preliminary results of the GPS pilot project are promising—potentially giving FDOT the option to utilize GPS technology to determine travel times on limited-access facilities. Although not proven through this pilot project, the GPS-generated data may be able to provide an acceptable level of verification of incidents that affect traffic flow by indicating when and where travel times begin to increase. This can be a powerful tool for rural traffic management by providing operators with the ability to verify and/or detect incidents relatively quickly in our rural areas.

FDOT initiated and completed a pilot project to review the use of global positioning system (GPS) technology in determining travel times.





Neighbor's Envy, Owner's Pride—SunGuide® Software

by Arun Krishnamurthy, FDOT and David Chang, PBS&J

SunGuide® Software is the statewide advanced traffic management software that the Florida Department of Transportation (FDOT) initiated development of in 2003. Initiation of its development was based on the recommendation of the *Transportation Management Center (TMC) Software Study*, which was co-funded by FDOT and the Michigan Department of Transportation in 2001. This study indicated that the Districts were spending significant time and money to develop and maintain their TMC software and by developing a statewide software, the state could save approximately $80 million. FDOT decided to proceed with the software development and use the best practices available at the time to create and manage the project. As a result, the software has been created using the well-known systems engineering management process—with statewide stakeholders participation—and using an open architecture that allows for the software to expand as necessary.

SunGuide Software was designed to:

- Facilitate traffic and incident management,
- Disseminate traveler information to the motoring public,
- Exchange critical information between agencies, and
- Collect and report performance measures regarding the operation of Florida's transportation system.

SunGuide Software can communicate with multiple field devices, including dynamic message signs, closed-circuit television cameras, vehicle detectors, highway advisory radio, ramp signals, and road weather information systems to support the TMC traffic operations. SunGuide Software also supports incident management and emergency management, including AMBER, SILVER, and LEO alerts; and serves as an information dissemination tool to support the general public via Florida's Advanced Traveler Information System (FL-ATIS).

The first release had limited support for field devices. As a result, within a few months, support for several devices was added, including highway advisory radios, road weather information systems, and traffic detector drivers. These additional features were included in the new release for the software—Release 2.1. This release also provided support for devices residing in the TMCs, including video wall and video controls. With the availability of Release 2.1, Jacksonville and Miami RTMCs switched to the SunGuide Software. By the end of 2005, the software had three RTMC users with on-going coordination with several other RTMCs underway to join the "SunGuide Community."

At that point in time, FDOT emphasized the need for the SunGuide Software to assist operators in event management, such as accidents, road closures, and construction activities. The District Intelligent Transportation Systems (ITS) Engineers agreed that the software needed an automated process to recommend response plans to operators as soon as an incident was entered in the system. Also, at the same time, FDOT was trying to gather performance measures and realized that using the extensive data collected by SunGuide Software, regarding various events, would provide more accurate information. After 12 months of development effort, Release 2.2, including these features, was deployed. Following Release 2.2, Orlando and Tampa Bay RTMCs made the switch to the SunGuide Software in 2006, with Tampa Bay also using the software in their newly constructed RTMC in December 2007.

> Created using the systems engineering process with statewide stakeholder participation and an architecture that allows the software to expand as needed.

To ensure that the software meets its obligations and requirements, FDOT needed a facility in which it could be independently validated and verified. FDOT decided to use the Traffic Engineering Research Laboratory (TERL), a traffic control device testing facility in Tallahassee, and made renovations to add more space. FDOT purchased networking equipment and computer stations to create a "mini-TMC" environment. The SunGuide Software was installed at the TERL in October 2006. TERL also has in-house consultants with extensive technical understanding of the software to provide support to the Districts with any of their operational software issues. In March 2007, the Miami-Dade Express Way Authority (MDX), collocated with District 6, deployed the SunGuide Software.

ITS has continued to grow expeditiously and dynamically in Florida. A few years back, Orlando participated in the iFlorida project, funded by the Federal Highway Administration (FHWA). SunGuide Software was used at the Orlando TMC to develop the functionality within the scope of the project. By the end of 2007, the SunGuide Software (Release 3.0) provided enhancements to include variable speed limits, a 511 subsystem, and a response plan generator. After the successful completion of the iFlorida project, FHWA praised District 5's efforts and also highlighted how the SunGuide Software helped to make the project successful.

In 2008, Florida's toll agencies and Districts were interested in enhancing SunGuide to include functionality to manage tolls, including the ability to view historical toll rates and to set current tolls. Around the same time, FDOT initiated development of FL-ATIS as a replacement of the existing 511 traveler information system. FL-ATIS is capable of providing extensive traffic-related information to travelers, including travel time, incident details, construction events, and special events. FDOT developed broad requirements for the SunGuide Software to ensure that FL-ATIS could operate at its highest potential; and the software was also enhanced to manage tolls.

The SunGuide Software also added the ability to use data from external agencies, including the Florida Highway Patrol, Road Rangers service patrol, and weather services. This data is non-traditional as data is typically collected from roadside devices, and the software does not rely on data from external sources. With the availability of this external data and the software's ability to download the data in real-time, the capability of the software is enhanced to provide richer data. Lee County and the City of Tallahassee joined the SunGuide Community in 2008, along with the Fort Myers RTMC. It is anticipated that the Fort Myers RTMC will be operational in late 2009. Florida's Turnpike Enterprise service plazas (Pompano and Turkey Lake TMCs) will join the SunGuide Community this year, for a total of 14 TMCs using the SunGuide Software. FDOT has an agreement with the Texas Department of Transportation to collaborate on the software development; the SunGuide Software uses portions of code developed in Texas and vice versa. SunGuide has grown to be more than an operational software. Universities in Florida are using the software to conduct research to understand how to improve the operator decision-

making and improve the ability of the software to handle non-recurring incidents. Florida International University and the University of Central Florida have the software and are using it for research purposes.

Six years from the SunGuide Software development commencement date, the software has grown to approximately three million lines of code, is still robust, and can perform most of the functionalities instantaneously without any perceived delay. The Districts have shown an increased desire to take ownership in the software and made SunGuide the only software required to manage and operate the freeways. The growth of the software can be measured in two ways: the increased user base within Florida since the initial deployment in 2005 and the functionalities added to the software over time. The SunGuide Software has been deployed at 12 locations throughout the state of Florida at this time with multiple releases. From the deployments at District RTMCs; at TERL for testing; at counties and cities for operations; and at universities for researching, FDOT has been successfully accomplishing its goal of making the SunGuide Software the statewide standard for TMC software. Also, SunGuide is currently managing approximately 510 dynamic message signs, 945 closed-circuit television cameras, and 1,357 vehicle detectors statewide.

Kudos to the software development firm (Southwest Research Institute), software project management firm (PBS&J), and FDOT District ITS Engineers for making SunGuide Software a reality!

5-1-1—Three Magic Numbers for Traveler Information

by Gene Glotzbach, FDOT and Vicky Mixson, Global-5 Communications, Inc.

511 plays a vital role in FDOT's vision to serve the people of Florida by delivering a transportation system that is fatality and congestion free.

As Florida continues to grow, so does the need for new and innovative congestion management tools. To meet this demand, a new resource will launch in 2009—the Statewide Florida 511 Advanced Traveler Information System—unifying all of the state's regional systems into one integrated traveler information resource. This new resource will not only connect the (District) DOTs, it will connect the traveling public with a reliable and accurate resource to avoid congestion while saving time and money.

FDOT currently operates five regional systems and a statewide system that links these five regional systems together and provides information in areas of the state not covered by the regional systems. Each regional system has its own phone system and co-branded 511 Web site. This traveler resource provides valuable real-time information to Florida's 15.5 million licensed drivers and 80 million yearly visitors.

In November 2008, Florida's 511 systems reached a significant milestone as the most trusted, one-stop traffic resource for motorists. Call volumes in the five regional and statewide services surpassed 25 million calls. In addition, Southeast Florida, Central Florida, and Tampa Bay all reached significant call volume milestones: Southeast Florida surpassed 13 million calls in August, Central Florida reached 8 million calls in September, and Tampa Bay reached 2 million calls in August.

Florida's 511 continued to prove itself as an invaluable tool during emergencies. In August 2008, as Hurricane Fay's winds and rain caused evacuations, traffic tie-ups, and even road closures, the Northeast Florida system showed a call volume spike of 87 percent. During the May 2008 wildfires in Central Florida, call volumes were up 36 percent over the 2008 average.

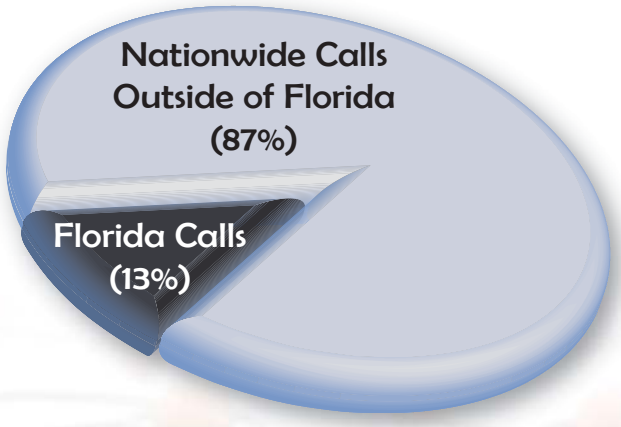
Call volumes also showed significant increases during holiday travel, as seen in previous years. After a strong statewide media push during Thanksgiving, which included four media events at FDOT's regional transportation management centers, 511 calls were up 61 percent compared to a typical week.

FDOT launched the statewide 511 marketing effort in January 2008 with an internal education campaign. Part of the success of this marketing effort is attributable to partnering with organizations, major employers, and media outlets in Florida who reached hundreds of thousands of commuters every day. By partnering with these organizations, FDOT raised awareness of 511 and its benefits to Florida's travelers.

> In Florida, we are all too familiar with natural disasters such as hurricanes and wildfires. It is important to have a number for residents to access crucial evacuation information during such emergencies. 511 has proven itself as a valuable tool for residents during these events and will continue to play a vital role in emergency management."
>
> **Craig Fugate, Former Director Florida Division of Emergency Management**

FDOT's long-term commitment to strategic 511 investments and customer service is proving to be exceptionally effective. Users of Florida's advanced traveler information system can register on the FL511.com Web site for personalized services which allows them to first hear traffic information on their customized routes. Callers can also choose to get text messages and email alerts from many regional 511 systems. Florida's 511 systems are sending daily alerts to more than 16,000 registered users.

Percentage of Nationwide Calls Made in Florida



In just a few short years, real-time traffic information provided by the FDOT through the 511 phone call, Web sites, and personalized services, along with the FDOT information provided by third party providers, has increased substantially. As technology has improved, 511 Web sites and personalized services give visual information that users are finding increasingly helpful. The role of 511 has changed from being a phone-based only service to a technologically robust phone, Web, and e-alert resource. FDOT provides hundreds of camera images, incident reports, and real-time travel times through the technology that best serves the user's needs. This approach to customer service truly sets Florida apart.

In today's economic climate, drivers are more committed to saving valuable time and fuel than ever, and Florida's suite of 511 products—phone, Web, and personalized services—are reaching more drivers than ever before. The new Statewide Florida 511 Advanced Travel Information System will make 2009 an exciting and innovative year, and is sure to please travelers with new features and a unified presentation. The fully integrated, bilingual resource offers statewide roadway coverage, the addition of more than 50 new travel partners and innovative personalized services that add up to the ultimate congestion management tool for the people of Florida. Travelers to and within the Sunshine State will now be connected to all the traffic resources they need by dialing three magic numbers—5-1-1!

WiFi® in Florida—Overcoming Challenges to Assist Travelers

by Randy Pierce, FDOT and Brian Kopp, Clifton, Weiss & Associates, Inc.

For the past year, the Florida Department of Transportation (FDOT) has been offering wireless internet services to travelers. This effort is part of a pilot project to investigate the challenges of a future statewide deployment of "WiFi® hot spots." This free service, which permits travelers to access the internet and their emails from their own laptop computers or personal data assistants (PDAs), is currently available at all four highway welcome centers as well as Florida's Turnpike Enterprise Turkey Lake Service Plaza. The FDOT contractor for this pilot project, Zoom Information Systems, is also completing construction of an additional mobile WiFi hot spot which will go live in 2009.

Implementation of this project required the FDOT and contractor to overcome some challenges, including how to best deliver broadband internet access to locations where none is available. The use of satellite services to provide broadband internet access has proven successful with one vendor in particular, WildBlue, who is providing very reliable service and useful features, at reasonable rates.

Another challenge to overcome was deciding how to monitor the operation and performance of the system—remotely and inexpensively. A custom network monitoring system was developed jointly with the contractor and FDOT, and was implemented by the contractor. This monitoring system is now providing very useful data that permits a quick review of the network status and also supports quick problem resolution. One example used by the monitoring system for quick problem resolution is to monitor the weather. When a service outage is detected, the monitoring system stores a real-time image of the National Oceanographic and Atmospheric Administration Florida weather radar so that repair personnel can review it and determine if the satellite link may have experienced a momentary "rain fade," interrupting the internet connection until the storm passed.

A third challenge was in determining how to best interact with travelers when they access the wireless internet service. An online FDOT portal, referred to as a "walled garden," provides a welcoming

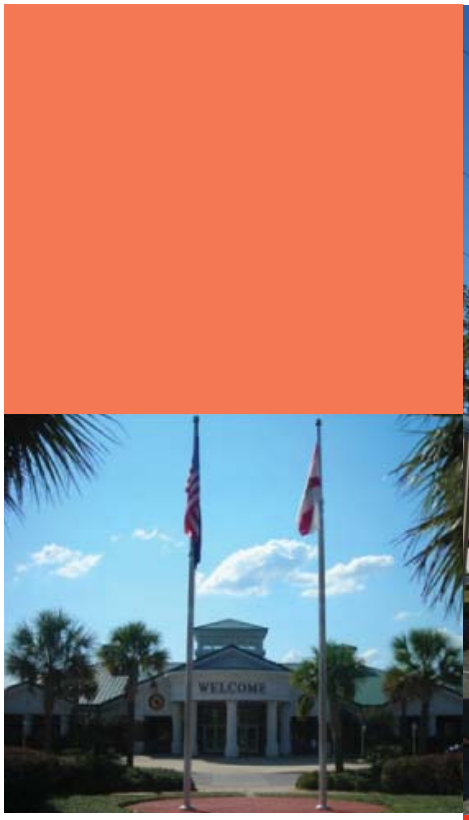
The wireless internet service provided by the FDOT has been very well received by the traveling public, and the early usage statistics are impressive.

homepage that users must view before they can proceed to the internet. This homepage also permits users to link to traveler information, including traffic and weather information. There is also a link to a voluntary user survey that has yielded interesting facts about travelers who access the internet from the FDOT sites. For instance, the leading group of travelers that use the service are commercial truck drivers, with tourists placing second. Another survey question indicated that the most common reason for using the service is to check email, with surfing the internet placing second.

The wireless internet service provided by the FDOT has been very well received by the traveling public, and the early usage statistics are impressive. Travelers are logging into the system at an increasing rate—now averaging more than 500 log-ins per week, up from 460 log-ins just a few months ago. On a per-site basis, travelers log-in approximately 16 times per day. Usage varies from site-to-site with the I-75 Welcome Center receiving the most log-ins, followed by the I-95 Welcome Center, the Turkey Lake Service Plaza, the I-10 Welcome Center, and finally the US-231 Welcome Center.

Users are currently permitted to access the internet for 90 minutes; followed by a two hour period during which they are not allowed access. This restriction is intended to prevent users from staying at the FDOT sites for too long. There is no charge for using the service and previously discussed plans to charge a fee have been discontinued due to the complicated process necessary to perform the financial transaction and the expectation of only very modest revenue. In addition, the user survey indicated that the majority of users planned to only use the internet for 15 minutes or less. The FDOT is still in discussions with the contractor regarding whether Web site advertisements, or site sponsorship, represent worthwhile revenue streams to pursue.

In addition to the five FDOT sites that now have wireless internet access, the contractor is also implementing a sophisticated mobile WiFi hot spot on an existing FDOT trailer. Deployment sites will likely include the FDOT rest areas, special event locations, or post-disaster logistical staging areas. The mobile WiFi hot spot trailer can be towed to a site that needs it and set up in about an hour. The trailer has a tower mounted on top that can be erected at the site to provide a large WiFi coverage footprint. The trailer has both solar panels and a generator for



locations that do not have electrical service. The onboard systems also run on batteries so WiFi can be provided for a short time without the other power sources.

The communications systems onboard the trailer are more complex than at the five FDOT sites. Broadband service is provided by a motorized satellite dish. After the trailer is parked, the motorized satellite dish "unfolds" and automatically searches for the signal from its assigned satellite. While the WiFi hotspot is operational, a special alarm monitors for excessive temperatures and for alarms from any of the devices. These alarms are reported remotely to the network monitoring system via the satellite broadband internet link.

During the design phase of the trailer, the FDOT recognized the potential to provide additional services with the trailer and required the contractor to provide for future growth in the implementation of the mobile WiFi hotspot. Even before its anticipated deployment in May 2009, the trailer has already been considered for one such additional service: infrastructure and traffic monitoring. To support this, the contractor was asked to install cameras on the trailer that can be remotely and securely monitored by the FDOT via the broadband satellite internet connection. This will permit the trailer to be deployed at remote highway locations, such as the I-10 / I-75 interchange, for traffic monitoring; or at infrastructure locations that require monitoring, such as the I-10 Suwannee River bridge, where recent rising river waters needed to be watched.

Overall the FDOT wireless internet access pilot project has been a success. The FDOT has gained valuable technical and contractual knowledge on how to proceed with a future statewide WiFi hotspot build-out. In addition, the service has been very well received by the traveling public. Not only do the statistics reflect this, but the Visit Florida staff who work at the welcome centers have reported that travelers seem very happy that the service is available. The FDOT has been so pleased with the project performance that a contract option to extend the service until the end of 2009 was exercised.

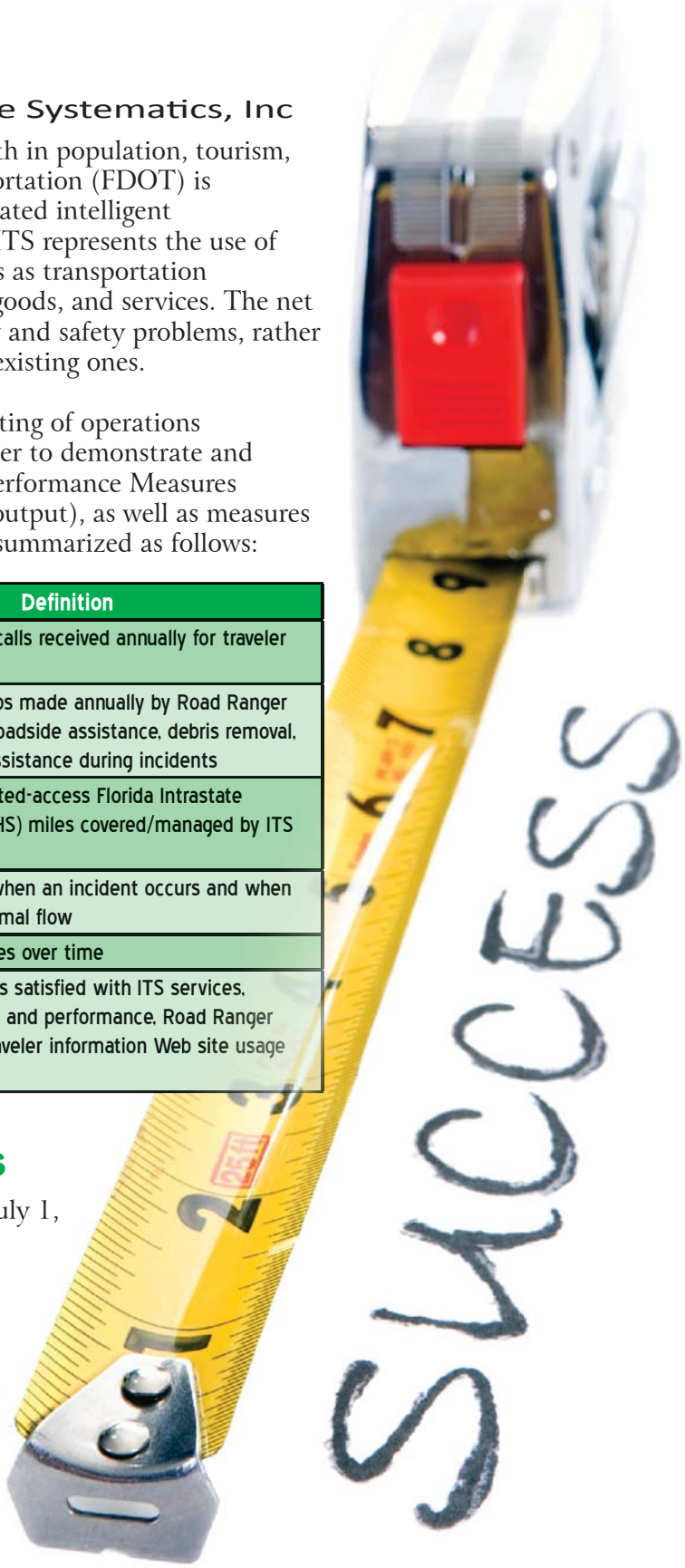
Florida's Statewide Operations Performance Measures Program—Proving ITS Benefits

by Elizabeth Birriel, FDOT and
Anita Vandervalk-Ostrander, Cambridge Systematics, Inc

To continue to accommodate the state's rapid growth in population, tourism, and commerce, the Florida Department of Transportation (FDOT) is committed to implementing statewide, fully integrated intelligent transportation systems (ITS) in a cost-efficient manner. ITS represents the use of real-time information systems and advanced technologies as transportation management tools to improve the movement of people, goods, and services. The net result is the application of technology to resolve mobility and safety problems, rather than sole reliance on building new roads and expanding existing ones.

As ITS is evolving in Florida, the development and reporting of operations performance measures is a high priority for FDOT in order to demonstrate and document the benefits of ITS. The FDOT Operations Performance Measures Program includes measures of production and usage (or output), as well as measures of performance and the resulting benefits (or outcome), summarized as follows:

Type of Measure	ITS Performance Measure	Definition
Output	Total Annual 511 Calls	Total number of 511 calls received annually for traveler information
	Total Annual Road Ranger Stops	Total number of stops made annually by Road Ranger vehicles to provide roadside assistance, debris removal, and traffic control assistance during incidents
	Miles Managed by ITS	Total number of limited-access Florida Intrastate Highway System (FIHS) miles covered/managed by ITS equipment
Outcome	Incident Duration	The time between when an incident occurs and when traffic returns to normal flow
	Travel Time Reliability	How travel time varies over time
	Customer Satisfaction	Percent of customers satisfied with ITS services, including DMS usage and performance, Road Ranger performance, and traveler information Web site usage and performance



Performance Measures Results

Following are the results for the fiscal year 2007-2008 (July 1, 2007 through June 30, 2008). The report for fiscal year 2008-2009 is currently being prepared.

Miles Managed by ITS

As of June 2008, 520.6 miles of limited-access FIHS facilities were managed by ITS. This is 25 percent of the total system mileage. Additional extensive ITS deployments will be taking place across Florida during the next year.

All of FDOT's Districts and Florida's Turnpike Enterprise are committed to ITS deployments; and each has embarked with these deployments in varying stages and pace in accordance with the FDOT *Ten-Year ITS Cost Feasible Plan*. As a percent of the limited-access FIHS mileage in each District, "miles managed by ITS" have been defined as centerline mileage that must include ***ALL*** of the following attributes:

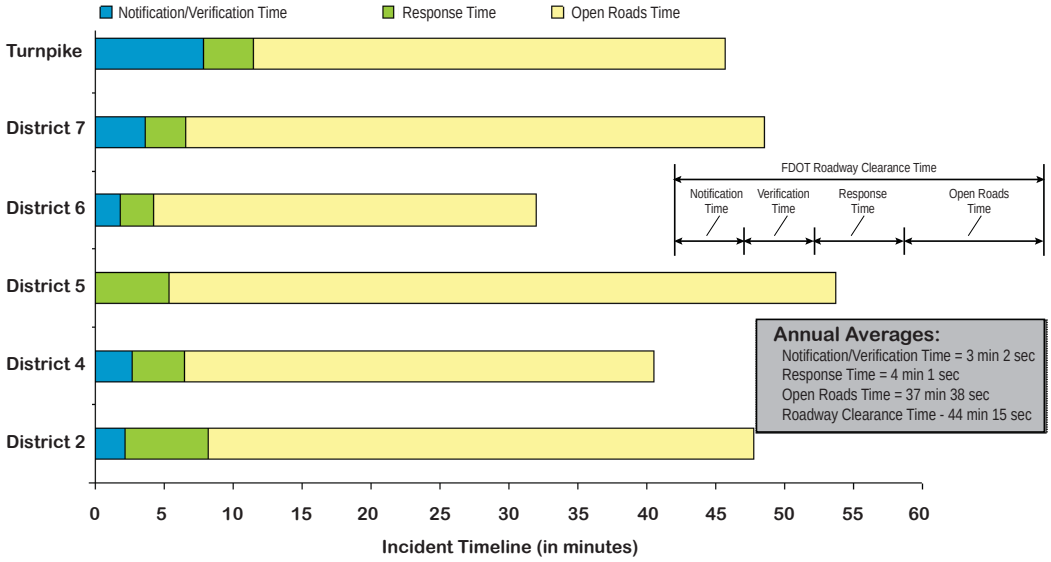
1. Traffic probes and/or sensors,
2. Real-time traffic information reporting coverage,
3. Real-time incident response capabilities, and
4. Availability of real-time traffic data to FDOT.

Additionally, all of these attributes must be continuously operated and maintained, permitting contiguous coverage of the mileage noted in order to meet the definition.

Incident Duration

One of the major activities completed for this reporting cycle was the development of an incident timeline, including incident verification, response and clearance times as well as modification of the SunGuide® Software, used statewide in the transportation management centers (TMC) to consistently record and report incident duration data.

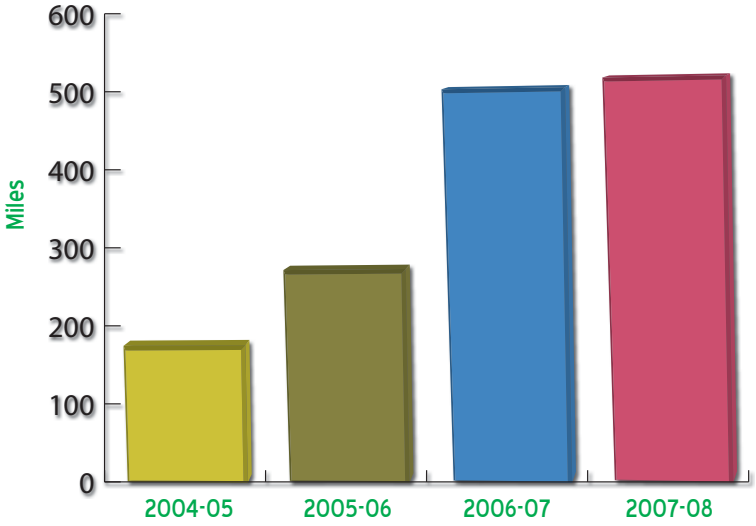
FDOT Roadway Clearance Time
FY 2007-08
Avg. Duration per Lane-blocking Incident (in minutes)



FDOT roadway clearance times varied from month-to-month, but the average time from the reporting Districts was about 44 minutes—ranging from 36 to 48 minutes for monthly averages. Graphics showing the open roads time and FDOT roadway clearance time for the five reporting Districts and Florida's Turnpike Enterprise are shown in the FDOT Roadway Clearance time figure above.

It should be noted that the roadway clearance times shown are weighted averages based on the number of incidents that occurred that month.

Total ITS Miles Managed



Travel Time Reliability

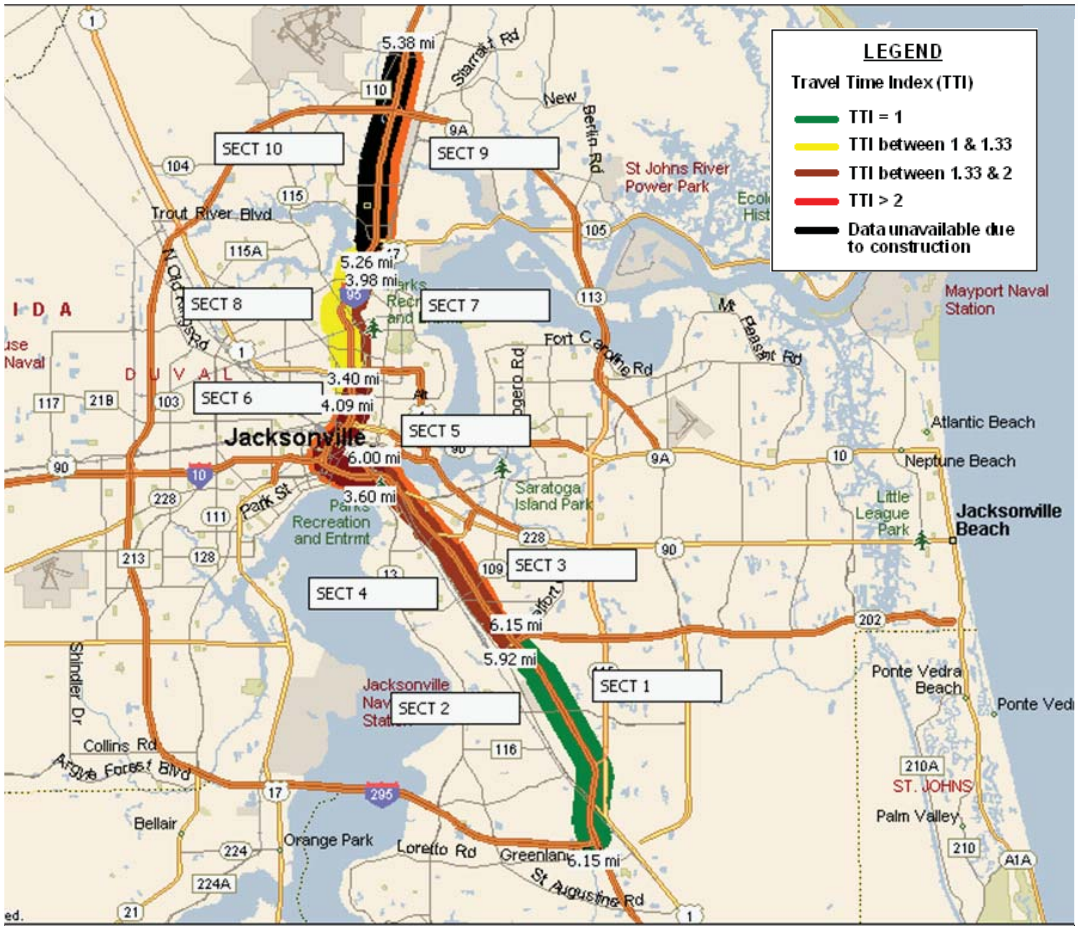
In 2005, FDOT adopted reliability as an outcome performance measure to be reported to the Florida Transportation Commission on a statewide basis. Definitions and data needs for reporting reliability were identified in fiscal year 2006. For fiscal year 2008, travel time reliability and congestion results are available for three Districts.

FDOT has identified two metrics to measure travel time reliability and congestion. The Buffer Index is a measure of the reliability of travel service. The Buffer Index is calculated as the ratio between the difference of the 95th percentile travel time and the average travel time, divided by the average travel time (i.e. [95th travel time less average travel time] divided by average travel time). For example, a value of 0.4 means that a traveler should budget an additional 8-minute buffer for a 20-minute average peak trip time to ensure 95 percent on-time arrival. A secondary metric is the Travel Time Index (TTI), which is a measure of traffic congestion. TTI is calculated as the ratio of average peak travel time to an off-peak (free-flow) standard; in this case, 60 miles per hour for freeways. For example, a value of 1.20 means that average peak travel times are 20 percent longer than off-peak travel times. Travel time, travel speed, and volume data are the basis of these measures. Travel time and speed data are obtained from either speed data from roadside detectors that communicate in real-time to TMCs or probe data from various sources that report travel time directly.

The top five most congested and most unreliable freeway sectors were reported for three reporting Districts. The most congested freeway sector reported for 2007-2008 was I-4 eastbound in the Orlando area from the Turnpike east to SR 408, with a TTI of 1.80 in the afternoon peak. The most unreliable segment was I-95 north of Jacksonville near the airport with a buffer index of 1.18.

Maps such as the following were also generated for the urban areas and peak periods.

District 2 Buffer Index - Afternoon Peak



As ITS is evolving in Florida, the development and reporting of operations performance measures is a high priority for FDOT in order to demonstrate and document the benefits of ITS.

Summary

FDOT continues to improve the data collection, analysis, and reporting related to operations performance measures. Quarterly reports are currently being generated for all six measures for fiscal year 2008-2009.

Next Generation 511—Continuing Educational Outreach

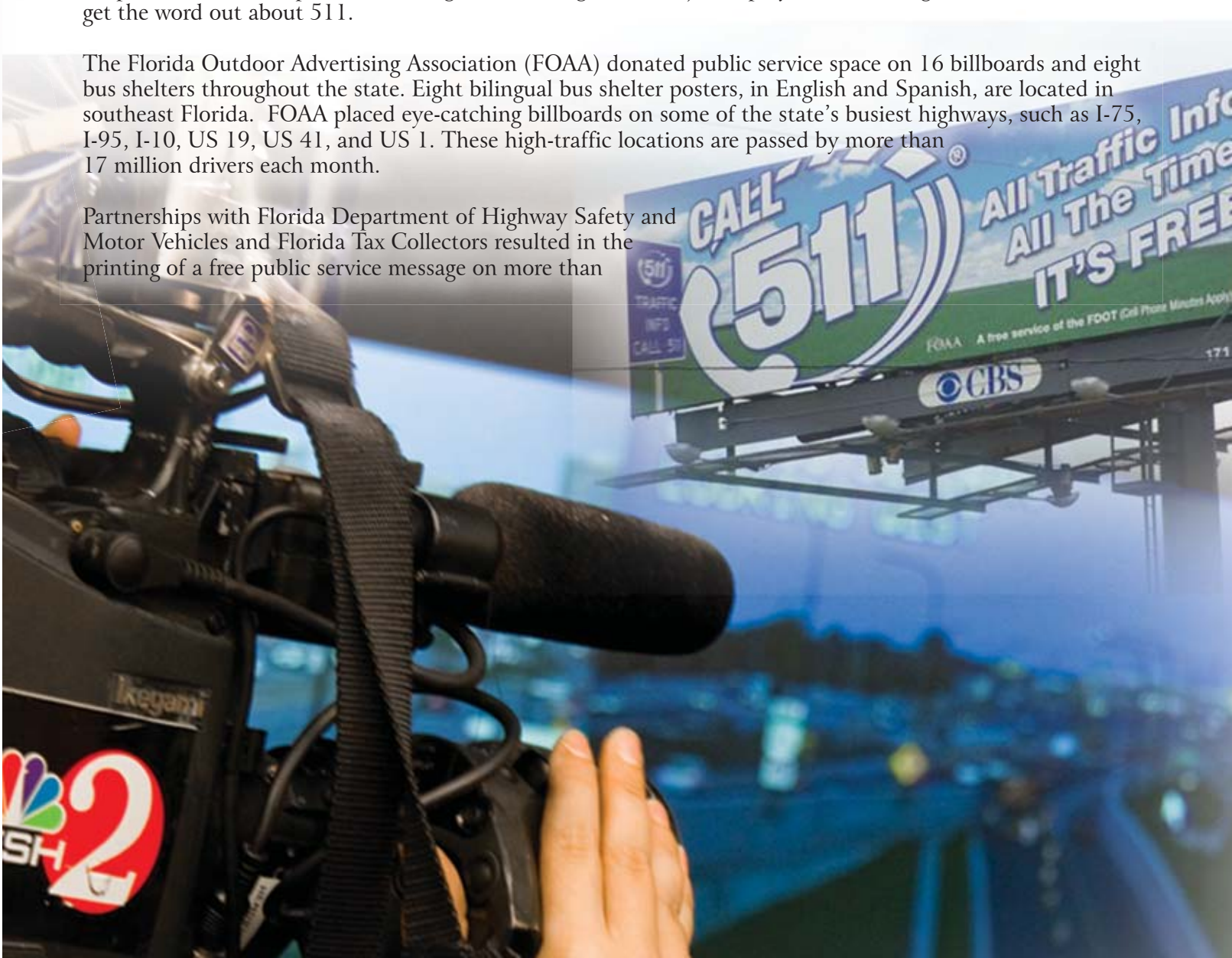
by Gene Glotzbach, FDOT and Vicky Mixson, Global-5 Communications

2008 marked a year of technical and promotional preparation, development, and integration to prepare Floridians for the Florida Department of Transportation's (FDOT) Next Generation bilingual, statewide 511 traveler information system set to launch in 2009. To educate the public about current and future 511 features and benefits, FDOT established an educational awareness campaign and rebranding plan. More than 40 million positive impressions for Florida's 511 systems were reached through broadcast and print media coverage. The 511 message reached targeted demographics of commuters, commercial vehicle operators, and visitors; and call volumes pushed past the 25 million mark.

The regionally branded 511 systems serving Florida featured unique Web addresses, taglines, and promotional materials. With the technical system integration underway, FDOT executed a brand overhaul and outreach plan. The plan included the design of a new, comprehensive statewide 511 Web site and the development of a distinctive statewide branded look for educational outreach materials. FDOT also developed Promote511.com, set to launch with the new system, to host all new statewide educational items for public use. FDOT partnered with government agencies, major employers, tourism agencies, and others to get the word out about 511.

The Florida Outdoor Advertising Association (FOAA) donated public service space on 16 billboards and eight bus shelters throughout the state. Eight bilingual bus shelter posters, in English and Spanish, are located in southeast Florida. FOAA placed eye-catching billboards on some of the state's busiest highways, such as I-75, I-95, I-10, US 19, US 41, and US 1. These high-traffic locations are passed by more than 17 million drivers each month.

Partnerships with Florida Department of Highway Safety and Motor Vehicles and Florida Tax Collectors resulted in the printing of a free public service message on more than



500,000 vehicle registration renewals in Orlando and Tampa. 511 content was provided and printed in the 2009 English and Spanish editions of Florida's driver, commercial vehicle operator, and motorcycle training handbooks. Many Division of Driver License offices throughout the state hosted 511 banner stands and literature racks that were viewed everyday by thousands of current and future motorists.

With growing reliance on the internet for disseminating information, FDOT developed customized 511 video public service announcements (PSAs) for distribution on top government agency, sports team, major event, large employer, and travel Web sites. FDOT created more than 200 customized video promos that featured 511 and the partner organization's logo. Customized 511 video promos are currently featured on dozens of Web sites, including VISIT FLORIDA, Tampa Bay and Company, Orlando Sanford International Airport, Orange County Convention Center, Daytona International Speedway, Daytona Beach's Convention and Visitors Bureau, Port Canaveral, and the Orlando Magic. Customized public service announcements were also distributed with 511 Web content. More than 40 city, county, and government organizations placed 511 information and Web links on their sites. Web outreach helped 511 sites receive 13.5 million Web page views in 2008, representing a 30 percent increase from the 10 million Web page views logged in 2007.

FDOT maintained relationships with major media outlets and generated more than 40 million impressions through print and broadcast media coverage in 2008. FDOT distributed a total of 33 news releases last year. The releases were distributed to media outlets prior to every major travel holiday and select community events. FDOT developed 511news.com to host news releases, media kits, media contacts, audio and video clips, and more. Seven major media events were hosted at FDOT's regional transportation management centers prior to the Memorial Day and Thanksgiving holiday weekends. Florida Highway Patrol, AAA Auto Club South, and transit representatives gave media

interviews alongside 511 spokespeople. Media kits, including news releases, fact and tip sheets, and video DVDs, were distributed to all media organizations and uploaded onto 511news.com. All of the major network affiliates in the state's largest media markets attended.

Through educational outreach, 511 was mentioned as a reliable resource in the event of an emergency evacuation due to severe weather or natural disasters, such as wildfires, flooding, and hurricanes. Orlando Sentinel's *2008 Hurricane Guide* gave 511 top placement in the "Important Numbers" section. The guide was also distributed with the Sun-Sentinel and the Chicago Tribune. Circulation topped more than 970,000. Florida emergency operation centers collaborated with FDOT to remind drivers to call 511. News releases and emergency flyers (in English and Spanish) were distributed. More than 50 outlets featured 511 information.

More than 130,000 brochures were placed in hotels, chambers of commerce, grocery stores, bus stations, malls, airports, marinas, military bases, tourist attractions, restaurants, rental car agencies, colleges, universities, gas stations, transit stations, and many others. Representatives spread the word about 511 at state and national conferences. 511 information was shared with thousands of people through presentations and exhibit booths at civic clubs, community groups, public safety councils, training meetings, and conferences, including Florida Transportation Builders Association Conference, Florida Public Transportation Association Conference, 2008 National Hurricane Conference in Orlando, and the 2008 Governor's Hurricane Conference.

With the launch of the Next Generation Statewide 511 system and continued educational outreach, FDOT is on its way to accomplishing the goal of making 511 a "household phone number" similar to 911—a number that people in Florida instinctively know how and when to use.

Innovative Technology—Travel Time Computation in Florida

by Arun Krishnamurthy and Gene Glotzbach, FDOT and Khue Ngo, PBS&J

Since Florida's rural areas do not typically have any intelligent transportation systems deployments, non-traditional techniques are needed to provide travel time data in these areas.

Travel time information is easily understood and used by drivers; and in 2004, the Federal Highway Administration recommended that, since dynamic message signs (DMS) on freeways were considered to be underutilized and only providing generic information while traffic conditions were deteriorating, all state departments of transportation provide travel time information on DMSs. The Florida Department of Transportation (FDOT) developed a policy in 2007 stating that the default display on a DMS will be travel time information and can be preempted by traffic incident messages, AMBER alert messages, or special event information.

FDOT generates travel times automatically using the SunGuide® Software, Florida's advanced traffic management system software, and does not need an operator to manually enter travel time information on each pre-defined roadway segment. The traditional travel time collection technique would typically utilize either inductive loop vehicle detectors or non-intrusive vehicle detectors, including microwave, radar, or acoustic detectors. However, Florida's rural areas do not typically have any intelligent transportation systems (ITS) deployments to provide the traffic data needed to generate travel times. As a result, non-traditional techniques are needed to provide travel time data in these areas. Recently, FDOT experimented with non-traditional devices, including license plate recognition/matching (LPR) and automated vehicle identification (AVI) transponders to provide reliable travel time information. AVI transponder readers are typically deployed near toll plazas to collect tolls, but have the capability to be used for travel time calculations as well.

Traditional Travel Time Determination

SunGuide Software has the capability to communicate with traditional traffic detection devices to obtain traffic data, including devices from: Canoga Microloops, EIS, Wavetronix SmartSensor,

and BiTrans. The operator pre-defines the destination of interest and the algorithm in the SunGuide Software combines various traffic detector data to calculate speed and travel time. If vehicles are traveling above the speed limit, the algorithm ensures that the broadcasted travel time is limited to the segment speed limit. The computed travel time is provided in a range of two or three minutes to account for any calculation rounding errors and variations in vehicle speeds. Also, if a segment is short and the travel time is less than five minutes, a precise range is not provided. Instead signs show "less than five minutes." Similarly, for travel times longer than 20 minutes, the signs do not provide a precise range. The travel time calculation methodology developed in the SunGuide Software ensures robustness of the data and has the ability to calculate travel times dynamically, even if some detectors fail to communicate with the software. SunGuide Software has the ability to identify detectors that are not providing data, or are providing incorrect data; the incorrect data is removed and only the functioning detectors are used to calculate the travel time.

This travel time information is typically available on DMSs and may also be listened to by callers through the 511 traveler information system. Although the software has the capability to calculate travel times on interstate segments and alternate routes if devices are available, travel times on alternate routes are typically not recommended by transportation management centers across Florida.

Non-traditional Travel Time Determination

A variety of non-traditional travel time collection devices have been deployed at various Districts and agencies in the state of Florida, such as: the Transcore AVI tags deployed in District 5, the Sirit AVI tags deployed on Orlando-Orange County Expressway Authority facilities; and Inex/Zamir LPRs deployed on I-10 in the Tallahassee area.

AVI transponders, deployed in the Orlando area, are individually encoded with a unique identification number. Detection antennas (roadside readers), located on the roadway, on overhead structures such as bridges, or as a part of the tollbooth, collect data from each transponder and assign a time/date stamp and an antenna identification number. With the time/date stamp it is possible to calculate the travel times and average speed by comparing the differences between time stamps from the various reader locations.

LPRs work in a similar way. The difference is that the unique identification information is pulled from the license plate through optical character recognition (OCR) software as opposed to the unique identification code imbedded in the AVI transponder. The OCR software converts the license plate image into an alphanumeric string and truncates the first and last characters to protect privacy. This information is matched at various points along the highway together with the time stamp from these locations. The SunGuide Software is then able to calculate the travel time and/or average speed of the traffic flow.

The SunGuide Software was recently enhanced to collect data from these non-traditional travel time collection devices and to utilize that information to calculate travel times and/or average speed. The traditional devices are required to meet or exceed 95 percent accuracy in measuring traffic data in Florida. Based on the various field tests conducted on these non-traditional devices, these devices have shown comparable accuracy. However, unlike traditional devices, non-traditional devices do not account for all vehicles on the roadway segment to compute the traffic data. Typically, LPRs use data from approximately five out of every six vehicles, while AVI uses only one out of every six vehicles to calculate the data.

Florida has progressively tried to determine new methods to calculate travel time. As travel time information is easily understood, agencies are recommended to provide this information to the traveling public. However, the agencies have to deploy significant ITS infrastructure and utilize resources at the transportation management centers to calculate this information. Travel time information is difficult to obtain in areas with no ITS deployments, but travel time data computation capabilities have been enhanced in Florida through the use of AVI transponders and LPRs.

The ITS Wide Area Network—Expanding to Serve the Need

by Randy Pierce, FDOT and Bill Lueck, Telvent Farradyne, Inc.

The Florida Department of Transportation's (FDOT) intelligent transportation systems (ITS) wide area network (WAN) continued to move forward in its planned expansion. Following last year's successful implementation of the first phase of construction, the South Florida Deployment (SFD), the ITS Program completed the Central Florida Deployment (CFD), the second phase of the ITS WAN. Additionally, FDOT is preparing to award a contract to implement the third phase—the Southwest Florida Deployment (SWFD).

The CFD connects the regional transportation management centers (RTMC) in Districts 2 and 5 in Jacksonville and Orlando, respectively, to the sites already connected by the SFD. With its completion, the combined SFD and CFD enables communications between the FDOT District ITS networks and RTMCs in Jacksonville, Fort Lauderdale, Orlando, and Miami (Districts 2, 4, 5, and 6), and Florida's Turnpike Enterprise (FTE) Pompano RTMC, as well as the FDOT Traffic Engineering Research Laboratory (TERL) in Tallahassee.

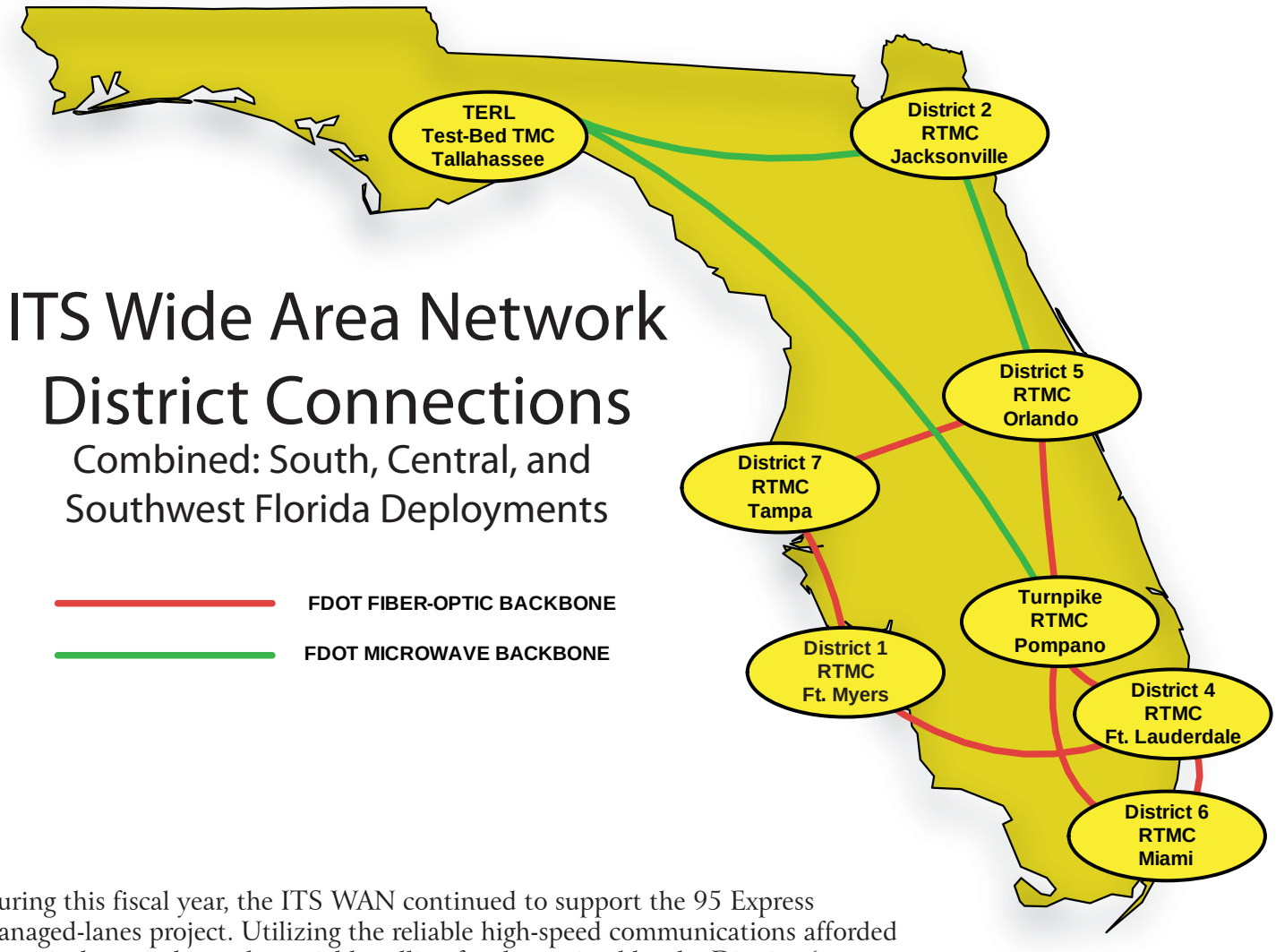
As it has from the beginning, the ITS WAN continues to use District-installed fiber-optic facilities for backbone circuits. Although other technologies are used where fiber is not available (microwave and commercial metropolitan-area network), optical networking is the technology of choice for the ITS WAN. Advantages of optical circuits over other technologies include very high speed (bandwidth), low latency, freedom from weather-related disturbances, and immunity to electrical noise and lightning damage. These and other advantages of optical networking give the ITS WAN a very high degree of reliability and "uptime."

Applying a lesson learned in the SFD to the CFD project, testing and characterization of the District fibers allocated to the ITS WAN was done early on, using the FDOT network maintenance contractor rather than the CFD contractor. Fiber testing takes significant time and effort, and often uncovers issues with fibers that may not have been in recent use. A number of such issues were found and resolved through the cooperative efforts of the Central Office ITS Program and the Districts. This procedure resulted in considerable savings in time and effort.

Award of a contract to implement the SWFD is currently in progress. This third deployment phase will bring the newly-constructed RTMCs in Fort Myers and Tampa (Districts 1 and 7) onto the network. This project will also use spare fibers in District-installed fiber-optic cables from their deployment projects. When the SWFD project is complete, SunGuide® center-to-center communications will be available between all FDOT SunGuide installations. Construction is expected to begin in late 2009. In cooperation with the Districts involved, the previously mentioned fiber testing and characterization process will be used to detect and resolve any issues that may be found.

The phased construction of the ITS WAN is outlined below:

Deployment Phase	Completion Date (FY)	District RTMCs and Networks Connected
South Florida Deployment	Complete	District 4, Ft. Lauderdale District 6, Miami FTE, Pompano Plaza TERL, Tallahassee
Central Florida Deployment	Complete	District 2, Jacksonville District 5, Orlando
Southwest Florida Deployment	2009/2010	District 1, Ft. Myers District 7, Tampa
Northwest Florida Deployment	To be determined	District 3, Pensacola District 3, Tallahassee



During this fiscal year, the ITS WAN continued to support the 95 Express managed-lanes project. Utilizing the reliable high-speed communications afforded by optical networking, the variable tolling fee determined by the District 6 SunGuide Software is communicated in milliseconds to Florida's Turnpike Enterprise Toll Data Center and the toll collection system.

Looking forward to the ITS Program's completion of the Next Generation 511 system, the ITS WAN will be coming to Tampa soon. With the 511 system data-fusion center in Tampa online and currently using commercial services to connect to the District RTMCs, major cost savings will be possible with a direct connection to the ITS WAN.

Facility Management—Expanding the System

by Randy Pierce, FDOT and Mark MacDougald, Beyers Engineering

The implementation of the intelligent transportation systems (ITS) facility management (FM) system is expanding as it becomes operational. In addition to the fiber-optic networks used for ITS deployments, the ITS-FM manages ITS devices, such as closed-circuit television (CCTV) cameras, vehicle detectors, and dynamic message signs (DMS). ITS-FM is a centralized and collaborative system designed for sharing fiber-optic network information between FDOT Districts and partner agency ITS departments, such as expressway authorities, cities, and counties. This centralized system facilitates the ability of the Districts to share common facilities and for each to see their entire network regardless of District data segmentation or geographical boundaries.

More Districts have been trained to use the ITS-FM and data has migrated from other applications into the ITS-FM. Additionally, several partner agencies have expressed an interest in using the system. Many have said that the District networks rely on their regional partners to deliver the ITS services so vital to travelers in major metropolitan areas.

The software used to operate the ITS-FM system provides the ability to analyze the fiber and ITS network statewide, including the statewide microwave system. With a centralized system and the inherent management tools of the ITS-FM, system maintenance, network outage analysis and response (fiber or electrical), interconnect design, and ITS budgeting and planning will be improved.

ITS-FM Roll Out

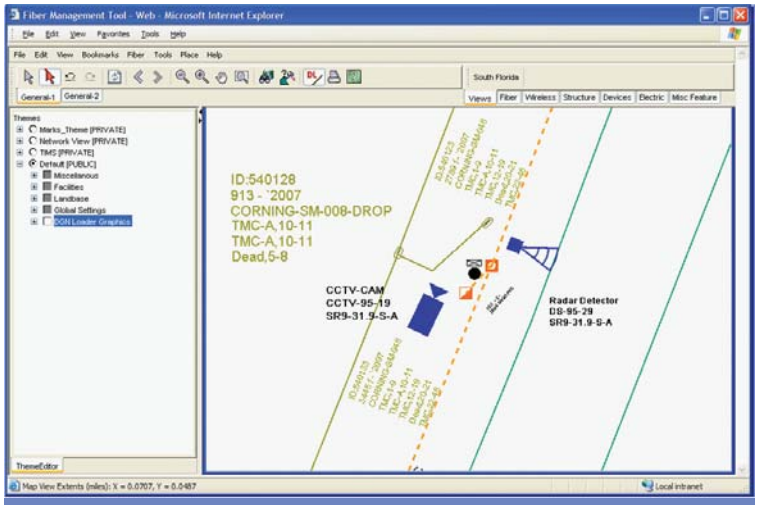
Since the last year's completion of the ITS-FM pilot project in Districts 4 and 6, and Florida's Turnpike Enterprise (FTE), three other Districts have been brought online. Training has been completed in District 2 and data encoding is underway in the system. Districts 5 and 7 have also completed training and their ITS deployment data was migrated to the ITS-FM. Updates to the ITS-FM that have occurred in the past year and lessons learned during the training point out the need for greater oversight and assistance by the FDOT Central Office ITS Program to ensure a successful statewide deployment. Toward this end, the Central Office ITS Program will provide further training in Districts 4 and 6 and the FTE to update their users on new ITS-FM system features.

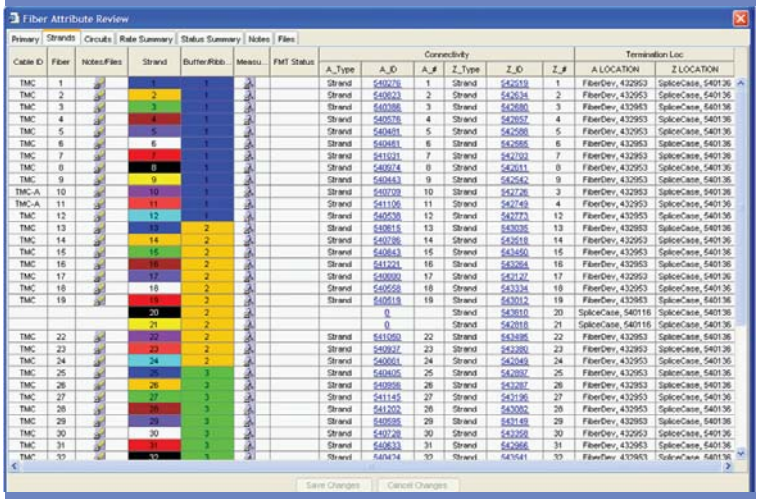
Several partner agencies have expressed interest in deploying the ITS-FM system. These agencies are working directly with the system vendor, Byers Engineering. Last fall, Pinellas County decided to include their signal system in the ITS-FM. Miami-Dade Expressway Authority (MDX) also expressed an interest in the system once the pilot project was completed in District 6. The MDX ITS projects are ready for implementation now and MDX is working towards programming the ITS-FM implementation. Martin County is also working to program an implementation project for the ITS-FM. Quite a bit of fiber sharing occurs between the Districts and between the Districts and their regional partners. The ITS-FM system will be better equipped to support this fiber sharing as more regional partners implement the system.

ITS-FM Upgrades

ITS-FM is a geographical information system (GIS) based Web application that provides for the modeling of the fiber network facilities and devices connected to the fiber as well as ITS devices and the electrical systems powering the ITS devices. The software is a Web-based application that is accessed with a secure login from any computer connected to internet. There is no software to install or maintain on the user's computer. The application provides dynamic and interactive mapping of the facility network on the user's computer. Upgrades being implemented at this time include:

- **Server Environment** – The server environment is being upgraded to provide a fourfold increase in hardware resources.
- **Extended Cabinet Attributes** – Several attributes were added to extend cabinet functionality at the Districts' requests.
- **Feature Data Import** – An interface for importing and creating features from a comma-delimited file (may be created from a global position system data capture) or Environmental Systems Research Institute, Inc. (ESRI) shape file is being provided.
- **User Audit Logging and Reporting** – An audit log of all user changes with user identification, date / time, type and description of change is being provided at the Districts' requests.
- **Google Earth Integration** – Dynamically open Google Earth and display selected features and export feature layers in Google Earth format (KML file). This will allow ITS-FM users to share facility geometries within the Google Earth application.
- **Microsoft Visio Integration** – A method for creating work order drawings in Visio from ITS-FM graphics and text. This function will open a Visio file containing the selected or visible features within the map pane of the ITS-FM system, eliminating the need for redundant entry and expediting the process for creating work print drawings depicting fiber splicing. The text loaded into Visio will be intelligent, editable text.





The core fiber management tool product was configured to support the needs of ITS network management for FDOT which included the following modifications:

- ITS devices – ITS devices, such as CCTV, DMS, video detection systems, etc., can be placed with associated attributes and linked to their serving cabinet.
- Electrical circuit features – ITS-FM was designed to allow placement of electrical facilities, such as cable and cabinets (load center, meter point, and service point), and the association of electrical circuits to serviced cabinets.
- Wireless facilities – Provided for the placement of tower, antenna, and wireless paths as well as the ability to connect optical paths through the wireless path.
- Specific ITS locates–search by:
    - Equipment cabinets by type, site number, address (name), logical fiber, or electric circuit name.
    - ITS device by type, model, year, serial number, internet protocol address, or logical fiber.
    - Electrical circuit by circuit name or meter number.

Looking Ahead

Users have now been trained in Districts 2, 5, and 7. Users will be trained in Districts 4 and 6 and FTE to familiarize them in the operation of the system and its recent enhancements. Users in Districts 1 and 3 will be identified and trained as their ITS deployments are completed. We expect to train District 1 early in the new fiscal year.

As interconnections between Districts and other agencies become more commonplace the ITS-FM software fully supports documenting the shared fiber network data within a single application database. The opportunities to streamline data sharing and mapping of statewide facilities in this centralized application are endless with ITS-FM utilization.

We also look forward to the new features and functionality that the system upgrades will bring. These upgrades will improve system performance and capabilities, keeping ITS-FM at the forefront to satisfy FDOT's needs in system operations and maintenance tools.

FDOT's Traffic Engineering Research Laboratory— Florida's Traffic Technology Lab

by Jeff Morgan and Trey Tillander, FDOT

The Traffic Engineering Research Laboratory (TERL) is the backbone of the Florida Department of Transportation (FDOT) Traffic Systems Section, which is, in turn, a key area in the FDOT Traffic Engineering and Operations Office. The TERL, the FDOT's central test lab located in Tallahassee, Florida, is a vital part of the FDOT's effort to ensure safety, efficiency, and uniformity within Florida's transportation system. The lab's core responsibility—the evaluation of traffic control signal devices and intelligent transportation systems (ITS) products—comes from a mandate set by the Florida Legislature. The need for a state law requiring the evaluation and approval of traffic control signals and devices before their sale or use in the state became apparent sometime in the 1960s (reference Florida Statute 316.0745). The law helps to ensure that only high-quality products that meet federal and state requirements are allowed in Florida.

The 2008 Florida Statutes - Title XXIII - MOTOR VEHICLES Chapter 316 STATE UNIFORM TRAFFIC CONTROL

316.0745 Uniform signals and devices.--

(4) It shall be unlawful for any public body or official to purchase, or for anyone to sell, any traffic control signal or device unless it conforms with the manual and specifications published by the Department of Transportation and is certified to be of such conformance prior to sale. Any manufacturer or vendor who sells any traffic control signal, guide, or directional sign or device without such certification shall be ineligible to bid or furnish traffic control devices to any public body or official for such period of time as may be established by the Department of Transportation; however, such period of time shall be for not less than 1 year from the date of notification of such ineligibility.

Because the state law places the requirement "anywhere the Public is invited," county and local officials charged with operating or maintaining transportation systems in Florida must also use only approved traffic control products. Consequences for selling or purchasing non-approved products include restricting public agencies from state funds for installation or replacement of traffic control devices and restricting vendors from bidding or furnishing traffic control devices for at least one year.

For decades, the FDOT Traffic Engineering and Operations Office has reviewed and approved traditional traffic control signals and devices normally used during the construction, operation, and maintenance of signalized intersections. In 1996, the FDOT entered into a relationship where Florida State University would provide electrical engineering support and help create the TERL.

In the TERL's 13 years of existence, many transportation products have passed through the doors of the lab. A few of these products made it through the doors and right back out again because they did not meet FDOT standards. Those that met the standards were approved after extensive testing and evaluation. Many stories could be told about the thousands of tests and evaluations that have occurred at the TERL throughout the years. Most every problem imaginable has been observed during the many product evaluations performed throughout the years. By finding these issues in advance, the TERL helps to ensure that a product is safe, meets set standards, and works before deployment.

All products approved by the TERL are listed on the FDOT's Approved Product List (APL). This list enables the easy identification of transportation products that have been tested, evaluated, and approved. Products listed on the APL are certified as meeting federal and state requirements which include uniformity standards, minimum quality system standards, and minimum product functional specifications. The TERL has received national recognition as significant problems with products are resolved or a manufacturer's quality system is improved. This is a benefit not only to Florida, but to the entire nation since these same products are sold throughout the country.

FDOT's centralized test lab philosophy leads to uniform standards that can be used across all types of products and all types of manufacturers of transportation devices. The centralized testing approach not only provides a screening process to allow high-quality products in the state, but also allows for more standard implementations of transportation technology to reduce support costs. By using a central lab to verify that

transportation products work independently as well as interoperate with other equipment, a reduction in the overall deployment cost is achieved. When viewed over time, the costs of developing and maintaining one central lab are dramatically lower than the costs of resolving problems in the field, redeploying inadequately tested equipment, or managing the product approval process on-the-job, independently for each project. It is simpler and less expensive to build a test set-up once for the central lab than many times for each individual project.

A summary of the advantages of having a centralized test lab are:

- Finding and resolving problems during initial testing is far less costly than resolving problems in the field.
- Requiring initial testing at a centralized testing facility can reduce test duplications.
- Conducting the same tests in the same place helps establish consistent test methodologies that produce more reliable and accepted results.
- Enabling hands-on training and post-implementation problem resolution significantly enhances maintainability.
- Providing a facility for educational presentations and demonstrations of traffic engineering functionality and technology is valuable to management and maintaining agencies.

As listed in the Program Accomplishments section of this annual report, the FDOT continues to lead the nation in the areas of standards and specifications development for transportation products, quality system standards for product manufacturers, product approval program development, and product testing for traffic control signal and ITS products. In addition, the TERL is proud to have been a small part of several novel traffic control and ITS efforts within the past year. These include initial implementations or new applications on Florida roadways of:

- Express lanes
- Ramp signaling
- Variable speed limit signs
- Pivotal adjustable hanger assembly
- Reflectorized signal head backplates
- License plate readers

Specifications development and/or testing activities were conducted at the TERL to assist in the successful deployment of these technologies within Florida.

FDOT's TERL is a central screening facility and a safe environment that closely mimics field conditions. A facility of this type allows realistic verification of safety, quality, and reliability for existing and new product technologies. The FDOT Traffic Systems mission is far from done—the TERL continually improves its own internal quality control processes as well as its testing capabilities and environment. Establishing and maintaining a safe, efficient, and uniform system of traffic control is a major goal of the FDOT; the FDOT's ***Traffic Technology Lab***, the TERL, is up to the challenge, now and in the future.

External Agency Coordination Goes Automated at Transportation Management Centers

by Arun Krishnamurthy, FDOT and Khue Ngo, PBSJ

From their very first day on the job, the operators at the Florida Department of Transportation (FDOT) transportation management centers (TMC) are trained regarding procedures to handle incidents once they are detected. The TMC operators ensure that the appropriate agencies (Florida Highway Patrol [FHP] and/or the sheriff's office) are informed and a response plan is developed including information disseminated via dynamic message signs, the 511 traveler information system, and highway advisory radios as soon as an incident is confirmed. In Florida, response effectiveness is measured by the amount of time it takes to respond to and clear incidents. As TMC operators try to improve the efficiency of their incident response, it is evident that the process has to be automated to ensure the quickest response. This article reviews the FDOT's capability to interface with external agencies, including FHP, Road Ranger service patrol, and third party vendors, such as DTN Meteorlogix, who provide the weather information needed for better response to incidents.

SunGuide® Software—Florida's advanced traffic management software—is used by the FDOT Districts to conduct their day-to-day freeway management operations. This software uses an open architecture to allow modules to be added as necessary. Intelligent transportation systems (ITS) is a dynamically growing field and the SunGuide Software has been built to allow for the needed growth opportunities.

Florida Highway Patrol Computer-Aided Dispatch

FHP works incidents on Florida's state roads covered by the TMCs. FHP uses a computer-aided dispatch (CAD) software system to collect and manage incident data given to and received from FHP Troopers in the field. Typically, once an incident occurs, the FHP dispatcher calls the TMC or the TMC operators view the incident through the FHP Web site and contact them for more details. The TMC operators receive limited information from FHP regarding the time of the incident, dispatch time, and incident clearance time. The incident performance measures maintained at the TMCs rely on this information provided by FHP; however, oftentimes, this information is not accurate. To circumvent this issue, an interface was developed to obtain real-time automated data from FHP's CAD software system. This interface between the FHP CAD and the SunGuide Software systems is anticipated to significantly reduce the incident notification time. Replacing the manual process whereby FHP notifies the operator with an automated interface will reduce the notification time from minutes to seconds.

As well as the automated interface between the FHP CAD and SunGuide Software systems, several changes and enhancements have been made in the SunGuide Software to assist TMC operators. Operators have the capability to obtain real-time data on roadways within their District regarding traffic incidents. FHP incident data is automatically provided on the TMC operator's screen when the operator creates a new event or associates with a current event. This helps to significantly reduce time and manual labor. TMC operators receive alerts from the FHP system

when there are new traffic incidents or updates of existing FHP-reported incidents. These SunGuide Software features were developed with the help of the District ITS engineers to ensure that the features effectively assist the TMC operators in performing their day-to-day operations.

SunGuide Software is built to transfer data within seconds. FDOT strives to ensure that they can receive real-time data in order to act on the information faster. With this SunGuide Software capability, the combined incident notification time (time spent by FHP notifying the TMC operator) and the verification time (time spent by the TMC operator confirming the incident with ITS devices) is reduced to less than 60 seconds on average; this is referred to as the "60 Second Rule." Typically, the time to receive notification and time spent to verify an incident would be several minutes.

Road Rangers/Automated Vehicle Location

Similar to communications with FHP, SunGuide Software has been enhanced to receive data from Road Ranger service patrols. Road Ranger is a service provided by FDOT and uses a different system to manage freeway incidents and schedule dispatch to incident locations. TMC operators work closely with Road Rangers to ensure that incidents have been cleared. However, similar to the FHP, since communications between the TMC operators and Road Rangers are verbal, delays are introduced along with the possibility of miscommunication.

FDOT has developed software modules in the SunGuide Software enabling the Road Rangers electronic field devices (Tablet PC or Toughbook) to communicate in real-time with the TMC operator. With this enhanced functionality, the TMC operators are allowed to view the Road Ranger location on the map in the TMC. This is helpful in assigning the Road Rangers to an incident. SunGuide Software allows the Road Rangers to create, update, and close incidents in the TMC from the field. Also, TMC operators can track and provide vehicle locations for Road Rangers in real-time. This electronic communication has allowed for a superior reporting mechanism that can be utilized by all of the FDOT Districts.

SunGuide Software can also incorporate data from diverse systems in a manner that is transparent to the end user by transferring data over communications networks or the internet. Along with external agency communications, SunGuide Software has the ability to obtain data using third-party vendor plug-ins, including DTN Meteorlogix who provides weather conditions. SunGuide Software subscribes to receive the weather data from DTN Meteorlogix and TMC operators automatically receive alerts of inclement weather, including wind gust and heavy rain that may affect travelers in specific counties/roadways. The operator can then associate this with existing traffic events and/or disseminate weather condition information to the traveler information system or notify travelers via dynamics message signs. With this third-party data plug-in capability, FDOT has the option to subscribe to additional vendors regarding travel time or incident information in rural areas where ITS deployments would be too expensive.

In this era of computers and electronic gadgets, FDOT is adapting to the changing information technology world. FDOT is developing processes to automate and improve the efficiency of traffic operations management within TMCs. With the automated traffic data transfer between agencies, including FHP and Road Rangers, it is anticipated that incident clearance time and delays on the freeways will be further reduced. Also, FDOT, unlike many other states, has the capability of using third-party vendor data without spending significant resources to obtain weather information using their traffic management software—SunGuide.

SunGuide® Software's Role in Florida's Advanced Traveler Information System

by Arun Krishnamurthy, FDOT and Robert Heller, Southwest Research Institute

SunGuide® Software, the Florida Department of Transportation's (FDOT) advanced traffic management system software, assists transportation management center (TMC) operators throughout Florida to monitor traffic conditions on select freeways and respond to incidents when they occur, consequently helping to maintain smooth flowing traffic and rapid response in the event of an emergency condition. The operators make use of intelligent transportation systems (ITS) devices, including closed-circuit television (CCTV) cameras, traffic detectors, and dynamic message signs (DMS), installed along the freeways to accomplish their tasks.

Recently, the FDOT started an effort to replace regional 511 traveler information services and traffic information Web sites with a single statewide service. This statewide service, known as Florida's Advanced Traveler Information System (FL-ATIS), provides motorists with statewide traffic information. The SunGuide Software acts as the backbone for the FL-ATIS by providing the traffic information. Typically, most state DOTs purchase traffic data from third party vendors for their advanced traveler information systems. These third party vendors are limited in the quality of data provided and access to the roadside devices. However, through the TMCs, the SunGuide Software manages the ITS devices on the freeways, thus providing the capability to obtain and disseminate real-time traffic data. Traffic data provided by the SunGuide Software includes freeway traffic speeds, estimated travel times on roadway segments, current messages being displayed on the DMSs, CCTV camera images, and traffic incident information.

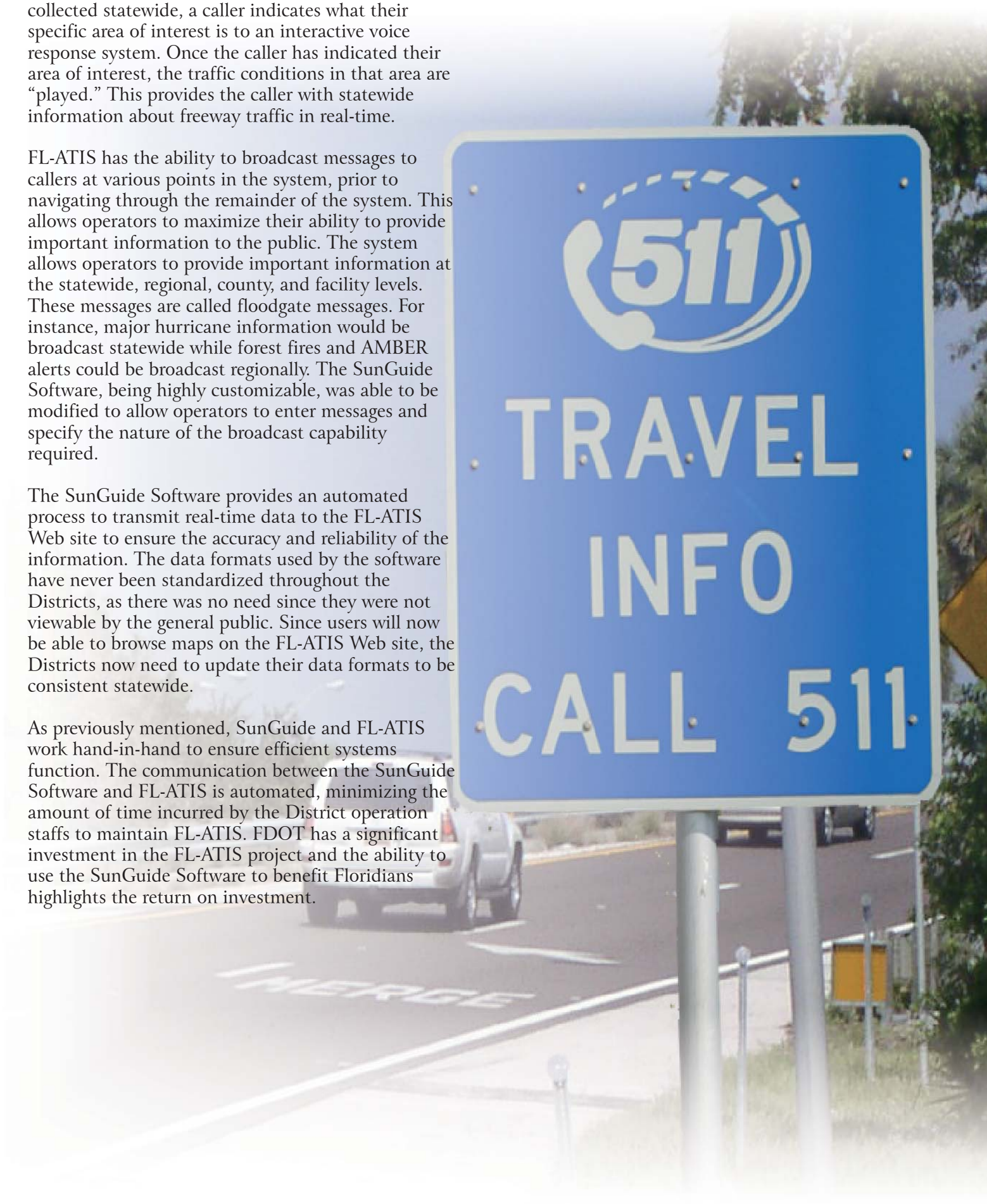
The first step in this effort was to identify a mechanism to securely transmit data provided by the SunGuide Software to the FL-ATIS. Since the SunGuide Software obtains data from ITS devices on the freeways via dedicated and secure communications networks, including fiber-optic and microwave, the data transfer from the software had to ensure that the security was not compromised. It was decided that an existing module in the software, the center-to-center module which is used to communicate between the various TMCs, would be enhanced to allow for the date transfer. The public can access the data collected by the software from any telephone within the state by dialing 511, or by accessing the FL-ATIS Web site. Because the data is

collected statewide, a caller indicates what their specific area of interest is to an interactive voice response system. Once the caller has indicated their area of interest, the traffic conditions in that area are "played." This provides the caller with statewide information about freeway traffic in real-time.

FL-ATIS has the ability to broadcast messages to callers at various points in the system, prior to navigating through the remainder of the system. This allows operators to maximize their ability to provide important information to the public. The system allows operators to provide important information at the statewide, regional, county, and facility levels. These messages are called floodgate messages. For instance, major hurricane information would be broadcast statewide while forest fires and AMBER alerts could be broadcast regionally. The SunGuide Software, being highly customizable, was able to be modified to allow operators to enter messages and specify the nature of the broadcast capability required.

The SunGuide Software provides an automated process to transmit real-time data to the FL-ATIS Web site to ensure the accuracy and reliability of the information. The data formats used by the software have never been standardized throughout the Districts, as there was no need since they were not viewable by the general public. Since users will now be able to browse maps on the FL-ATIS Web site, the Districts now need to update their data formats to be consistent statewide.

As previously mentioned, SunGuide and FL-ATIS work hand-in-hand to ensure efficient systems function. The communication between the SunGuide Software and FL-ATIS is automated, minimizing the amount of time incurred by the District operation staffs to maintain FL-ATIS. FDOT has a significant investment in the FL-ATIS project and the ability to use the SunGuide Software to benefit Floridians highlights the return on investment.



FDOT ITS Contacts

District 1
Chris Birosak
FDOT District 1 Traffic Operations
PO Box 1249
Bartow, FL 33831
(863) 519-2507

District 2
Peter Vega
FDOT District 2 Traffic Operations
2250 Irene Street, MS 2815
Jacksonville, FL 32204-5463
(904) 360-5463

District 3
Chad Williams
FDOT District 3 Traffic Operations
1074 Highway 90 East
Chipley, FL 32428-0607
(850) 415-9504

District 4
Dong Chen
FDOT District 4 Traffic Operations
2300 W. Commercial Blvd.
Ft. Lauderdale, FL 33309
(954) 847-2796

District 5
Michael Smith
FDOT District 5 Traffic Operations
719 S. Woodland Blvd., MS 3-562
DeLand, FL 32720-6834
(386) 943-5360

District 6
Rory Santana
FDOT District 6
1000 NW 111th Avenue, MS 6203
Miami, FL 33172
(305) 470-6934

District 7
Bill Wilshire
FDOT District 7 Traffic Operations
11201 N. McKinley Dr.
Tampa, FL 33612
(813) 615-8610

Florida's Turnpike Enterprise
John Easterling
Florida's Turnpike Enterprise
PO Box 9828
Ft. Lauderdale, FL 33310-9828
(954) 934-1295

Mark Wilson
State Traffic Engineer
(850) 410-5600

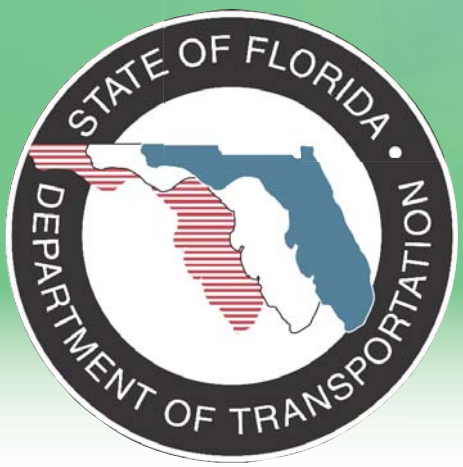
Elizabeth Birriel
Deputy State Traffic Engineer - ITS
(850) 410-5606

Gene Glotzbach
ITS Deployments
(850) 410-5616

Arun Krishnamurthy
ITS Architecture and Standards
(850) 410-5615

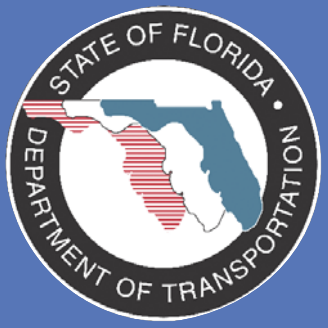
Randy Pierce
ITS Telecommunications
(850) 410-5608

Trey Tillander
Traffic Systems
(850) 410-5617



Physical Address:
Rhyne Building
2740 Centerview Drive
Suite 3-B
Tallahassee, FL 32301

Mailing Address:
Burns Building
605 Suwannee Street
MS 90
Tallahassee, FL 32399



Published by:
Florida Department of Transportation
ITS Program
605 Suwannee Street, MS 90
Tallahassee, Florida 32399