



# SUNGUIDE® DISSEMINATOR

Florida Department of Transportation's Traffic Engineering and Operations Newsletter



## Next Steps in the Real-Time System Management Information Program – Identification of Routes of Significance

*By Jo Ann Oerter, Atkins, and Russell Allen, FDOT State Traffic Engineering and Operations Office*

In November 2014, the Florida Department of Transportation (FDOT) delivered a response to the Federal Highway Administration (FHWA) regarding its plan to meet requirements outlined in Section 1201 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users under Title 23 of the Code of Federal Regulations, Part 511- Real-Time System Management Information Program (RTSMIP). The program is intended to provide a foundation of basic traffic and travel conditions information that may be built upon and used by public agencies, other public and private parties who may deliver value-added information products, and the traveling public.

The next milestone FDOT will be required to meet is identifying the provisions and parameters to code routes of significance (RoS). The RoS identified by the states and local agencies are due by November 8, 2016.

Since this will be a joint venture between FDOT and municipal partners, FDOT will be relying on District staff to take the lead and work with their local partner agencies to define these RoS. In an effort to keep some consistency between how the routes are determined, FDOT is using the mandatory requirements identified in the RTSMIP as well as establishing FDOT-defined criteria to rank each route. Mandatory requirements of the RTSMIP are:

1. Store the information in a database in an XML format;
2. Electronically share the information with FDOT within five minutes or less from the time of a closure or the reopening of a roadway;
3. Provide a process on how they anticipate monitoring and maintaining an 85 percent, or higher, level of accuracy; and
4. Operate their intelligent transportation systems (ITS) devices/infrastructure at a level of 90 percent, or higher, availability.

During February 2016, FDOT Central Office will be reaching out to each District and discussing the criteria to determine which routes should be included

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as RoS and how FDOT will measure to ensure the routes meet that criteria. Some of the possible criteria for discussion with the Districts will include, but not be limited to:

- Existing ITS infrastructure (devices and communications; FDOT or third party);
- Connectivity with interstates/major routes (e.g., alternate routes, parallel routes);
- Regional connectivity;
- Severity and frequency of congestion;
- Major evacuation routes;
- Economic activity (e.g., routes to/from ports, major venues, etc.);
- Travel time reliability;
- Roadway volumes (annual average daily traffic > 50,000); and
- Crash rates.

Once the criteria and metrics have been defined, the Districts will begin to determine which routes should be included as RoS. The foundation for the RoS will be the existing routes that are already covered and reported to Florida's advanced traveler information system, FL511, since these routes already meet the RoS criteria. Building off these routes, FDOT District staff will then reach out to their respective municipal partners and determine if there are additional routes, which can meet FHWA's RTSMIP requirements as well as FDOT's criteria, that they would like included as a RoS.

This process of coordinating with the various municipal partners to determine the RoS should take about two months and be completed by May 2016. Final RoS lists from each District will be due to FDOT Central Office in June 2016. This data will then be incorporated into FDOT's final report identifying which routes FDOT will include as their designated RoS, which is due to FHWA by November 8th, 2016.

One thing to note is that the RTSMIP process and documentation to determine which routes will be covered is a living process. As new routes become instrumented with ITS infrastructure, and both Districts and municipal partners determine that they also meet the RTSMIP requirements and FDOT criteria, they can be added to FDOT's list of covered routes.

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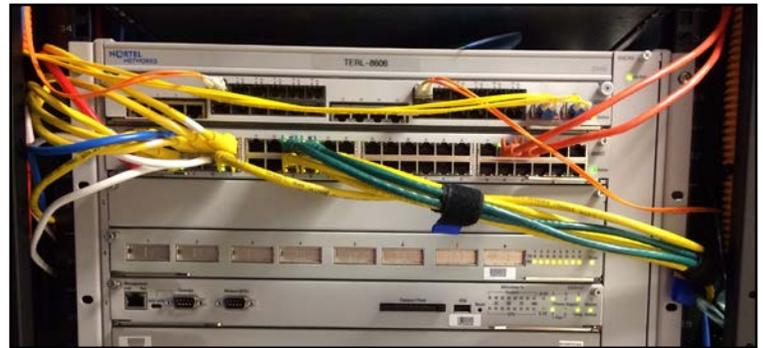
# Tallahassee Fiber Ring Extends the Statewide ITS Network

By David Heupel, Schneider Electric Mobility

In the summer of 2015, the Florida Department of Transportation (FDOT) brought an extension to the statewide ITS network, known as the Tallahassee Fiber Ring, online. Through a partnership with the City of Tallahassee, the network spans five key locations throughout the capitol city. This strategic partnership benefits not only FDOT, but also the Cities of Pensacola and Panama City, and the City of Tallahassee's new traffic management center (TMC), known as the Public Safety Complex, as they are all linked into the statewide intelligent transportation systems (ITS) network.

The City of Tallahassee allocated fiber strands from its ITS network for use by FDOT's State Traffic Engineering and Operations Office (TEOO). Beginning at the Traffic Engineering Research Laboratory (TERL), the fiber network goes east to an FDOT microwave tower site at the Florida Highway Patrol's Troop H headquarters (Tallahassee FHP). It then goes to the Public Safety Complex, turns south to the State TEOO, including the Central Office ITS Section, thence to the State Emergency Operations Center (SEOC), and back around west to the TERL. Since the network travels around the city in a circular, or ring topology, it inherently provides redundancy in the event that fiber is cut due to construction or some other event.

Extending the statewide ITS network into these five strategic locations provides many benefits to FDOT and the State of Florida. Due to the Tallahassee FHP site participating in the fiber ring, there is an "interchange" for ITS data to travel on the FDOT microwave system, which is also located at this site. The FDOT microwave system carries ITS data statewide, and is the primary transport for statewide ITS data in areas of Florida where fiber optics do not yet exist or are not yet lit up. A similar data interchange exists in south Florida, so the Tallahassee FHP location offers geographic diversity and redundancy for passing ITS traffic between FDOT's fiber and microwave networks. Further, the FDOT microwave system is always available as a secondary transport for ITS data statewide, as well as primary transport for other applications, such as the road weather information system and the land mobile radio system for road maintenance crews.



*Creating network connectivity.*

Following the implementation of the Tallahassee Fiber Ring, a dedicated data circuit linking the TERL and Tallahassee FHP sites was decommissioned, realizing an annual savings of over \$30,000.

The Public Safety Complex is an important location in the Tallahassee Fiber Ring, as they can now easily share ITS data with the Pensacola and Chipley regional transportation management centers. This is also partly due to 210 miles of new fiber optics recently installed along the I-10 corridor between Tallahassee and the Alabama state line by FDOT District Three. This connectivity provides for an efficient take-over or backup of each other's operations.

The fiber ring also leverages the Tallahassee FHP site as a remote backup location for the State TEOO's data, providing off-site backup and disaster recovery capabilities.

A crucial benefit is that the fiber ring establishes a means for all multicast traffic flow video camera streams, statewide, to be viewable at the SEOC. The FDOT SunGuide® software development team is creating an application where a user at the SEOC can look at a map of the state, and click icons to view any multicast-enabled traffic video camera. This is critical in times of emergency and/or natural disasters when emergency operations officials need to keep tabs on road conditions and the efficiency of traffic flows during evacuation scenarios.

By connecting the State TEOO to the ring, FDOT employees and contractors can gain faster and more efficient access to the statewide ITS network for application development and testing, network management, and troubleshooting problems.

Built on next generation networking technologies, and through the strategic partnership with the City of Tallahassee, FDOT's new fiber optic ring in the capitol delivers new and useful features to the statewide ITS network by bringing the State TEOO, TERL, SEOC, and District Three sites together.

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## FDOT District Six Releases SunGuide® TMC's Ten-Year Anniversary Annual Report

By *Javier Rodriguez, FDOT District Six*

The Florida Department of Transportation (FDOT) District Six Intelligent Transportation Systems (ITS) Unit published its annual report for fiscal year 2014-2015. The report commemorates the SunGuide® Transportation Management Center's (TMC) ten-year anniversary highlighting the beginnings of the District's ITS Program, the opening of the TMC, and the progress that has been made since.

The annual report offers insights in how the region's growth prompted the District to expand the program into what it is today. The District knew it could not build itself out of congestion and that integrating technology and traffic management strategies into its transportation system would become increasingly necessary to meet South Florida's growing needs. The report also details the steps taken to expand ITS efforts and create the regional hub that would eventually become the SunGuide TMC, which also houses Miami-Dade Expressway Authority, Florida Highway Patrol, and others.



*FDOT District Six celebrates ten-year anniversary.*

The annual report is categorized by the program's five primary functions: ITS Deployments, TMC Operations, Incident Management, Information Technology/ITS Maintenance, and Traveler Information. It gives a brief history on the origins and the needs of each function, how they have developed through the years, and the projects that will take the TMC into the future.

Additionally, it provides valuable data that gives readers the context around the improvements made and challenges the ITS program has overcome this past year. Specifically, it highlights the ever-increasing traffic volumes on District Six roadways as well as the progress programs, such as ramp signaling and incident management, have made. The report also details the benefits of 95 Express, the inception of the TMC's control room retrofit, and the upcoming improvements to its software and operational strategies.

The program's incident management efforts have improved over the last fiscal year. Average lane clearance times have decreased to 27.5 minutes from 28 minutes last fiscal year. Overall, the incident management team handled 49,500 incidents this fiscal year, an increase of 6,500 incidents from the previous fiscal year. The TMC also posted 426,500 dynamic message sign messages to the public, a 70 percent increase from the previous year.

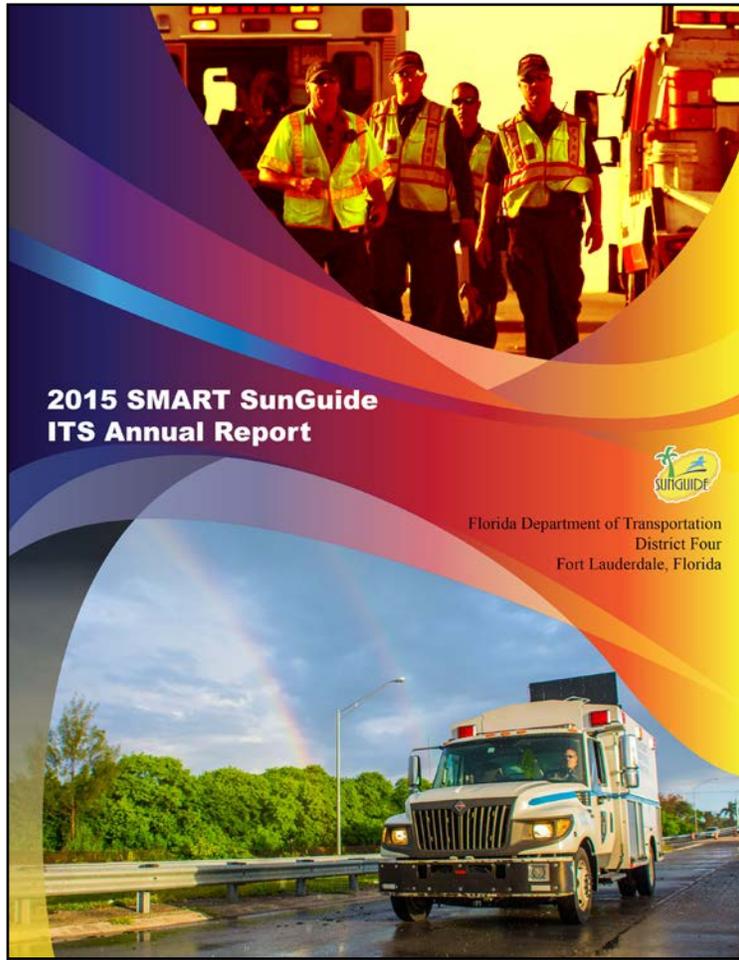
Overall, the efforts by the TMC and the ITS Unit have had a positive impact on the regional community. With more than \$2 billion in savings to the local economy achieved by reducing delays and improving the way people and goods move throughout this region, it is important to see how critical this program is to the lives of so many people.

For information, please contact Mr. Rodriguez at (305) 470-5757 or email to [Javier.Rodriguez2@dot.state.fl.us](mailto:Javier.Rodriguez2@dot.state.fl.us).

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# District Four: 2015 SMART SunGuide® ITS Annual Report Highlights

By Natalie Cortes, FDOT District Four



*The 2015 SMART SunGuide ITS Annual Report cover represents the 24 hour customer service delivered to motorists across District Four.*

2015 was another impressive year for the Florida Department of Transportation (FDOT) District Four Intelligent Transportation Systems (ITS) program. With great pride, the regional transportation management center continued to build solid and consistent programs, similar to the ITS Unit, which were driven by the commitment to customer service. A few of District Four's ITS Unit highlights found in the 2015 SMART SunGuide® ITS Annual Report are mentioned in this article.

As in past years, one of the most important features of this annual report is the benefit-cost ratio, a figure-value that represents the advantages to motorists based on improvements to FDOT District Four's highways. This year, the benefit-cost ratio was identified as 9.40. This signifies that every dollar spent on ITS improvements generated \$9.40 worth of motorist benefits in travel times and fuel savings. Also reflective of these improvements is District Four's incident clearance time, a key performance measure of any ITS program. Once again, District Four continued its record of advancement with an average clearance time of 57.4 minutes—two minutes under the Federal Highway Administration's industry standard of 60 minutes.

In order to keep up with upcoming ITS infrastructure deployments for District Four's future managed lanes systems, the ITS Unit designed and developed a robust, configurable, and scalable 'next generation' dynamic pricing software platform, known as the Express Lanes System (ELS) Software v2.0 – a software foundation for the deployment of express lanes across the state. The ELS Software v2.0 is truly

dynamic in recalculating express lanes segments and trip toll amounts at configurable intervals based on real-time traffic data received from field detectors and other data sources.

In addition, Florida International University developed a traffic data simulator to generate real-time traffic sensor data in conjunction with the ELS Software v2.0. The new data simulator allows users, through adjusting traffic speeds or volume for a single sensor, to simulate the impact of a traffic incident, causing the software to realistically transmit that impact to all upstream sensors. For this development, the District Four ITS Unit received an honorary plaque for outstanding innovation from the Intelligent Transportation Society of Florida.

The District Four ITS Unit's "no challenge is too great" attitude continues to set trends within the state and region. These and other accomplishments are highlighted in the 2015 SMART SunGuide ITS Annual Report. The full report is available online at the SMART SunGuide web site at [www.smartsunguide.com/SmartDocs.aspx](http://www.smartsunguide.com/SmartDocs.aspx).

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## ITS Florida: President's Message and Scholarship Winners

*By Sara Calhoun, President of ITS Florida, and Sandra Beck, ITS Florida*

### President's Message

I am honored to be elected as President of the Intelligent Transportation Society of Florida (ITS Florida) this year. This organization has been an important advocate for getting the word out on the value of intelligent transportation systems (ITS). When I started attending ITS Florida events many years ago, I was impressed by the leadership of the organization and it is an honor for me to uphold these traditions. ITS started under several different names and evolved to today's program; the implementation of the program has migrated as well. Like many other things these days, there is a movement to mainstream ITS. I think, as an organization, it is our responsibility to advocate caution to this approach and to educate people on the details that sometimes get lost in mainstreaming. It is important for us to excel in what we do and to get the word out of how important this work is to the future of our transportation network. I hope to spend this year engaging friends and colleagues in this industry to assist in these pursuits.

As I reviewed documents developed for us by previous leaders of this organization, I see the importance that ITS Florida needs to be an organization that gives back to its members and makes a difference. These are the guiding principles of this organization that is now thriving in its third decade. The Board of Directors will meet in a few weeks with the objective of addressing all of the previously established goals and charting the path to have a more substantial impact this year than in years past. Over the past two decades, there have been individuals that have pushed this organization above others with their passion. One of these people was my dear friend Erika Birosak, who we lost far too soon, but who will always be remembered for her passion to make this organization great. I will do my best to reenergize the passion and follow her vision to invoke that passion in others.

We hope to accomplish this in the coming year by finding opportunities to advocate ITS and promote the development, expansion, and benefits of ITS. This will be accomplished with a strong program to educate and solicit involvement through meetings, training, and publications. Significant steps have been taken to establish the ITS Technical Forum and make it an interactive resource through the ITS Florida web site; this will be launched this year. Training opportunities will be offered to engage new and more experienced professionals and to keep them current on ITS markets and opportunities. Industry events will be planned to facilitate information exchange, and publications will be distributed to solicit interest and increase participation. We will work to provide relevant information and assistance to new professionals as well as those with more experience. Through the scholarship program, we will reach out to students who have not yet entered the job force to be sure they also see the need and the vision to help ensure a successful organization for decades into the future. With members that cover all of the aspects of ITS, we have the knowledge to influence the steps forward we can make as a group.

I am excited about the possibilities of what we can accomplish this year and I look forward to the meetings, trainings, and events planned for the year, including TRANSPO2016, which will be held in the fall. I am grateful for your assistance and advice on how we can increase our effectiveness and benefit our members, and I look forward to hearing from you. Please feel free to reach out with ideas and suggestions and I will do my best to follow the vision to exceed our goals.

## Anne Brewer Scholarship Program

It was truly a difficult task in selecting this year's recipients of the ITS Florida Anne Brewer Scholarship Program. There were many excellent applications to select from. The following are the 2015 candidates that were awarded this prestigious scholarship.

### Third Place - Trang Luong

According to Ms. Luong's professors at the University of South Florida (USF), she is an outstanding student with strong analytical skills, exemplary work ethic, high levels of energy and enthusiasm, and a laser focus on advancing her professional career. She has taken every opportunity to either intern or volunteer on different research projects, both at the USF as well as outside the university, including an internship in Germany (for which she learned German prior to going).

Her resume includes an impressive set of awards she has received, including winner of the 2014 American Society of Civil Engineers New Faces of Civil Engineering and the USF "Most Outstanding Student for the Class of 2015."

### Second Place - Md. Shahadat Iqbal (tie for second)

Prior to coming to the United States (US), Mr. Iqbal was a research engineer at the Bangladesh University of Engineering and Technology. His main project was "Development of a Microscopic Traffic Simulator with Mixed Traffic Simulation Capability for Evaluation of Alternative Transport Options for Dhaka City." Currently, he serves as a research assistant and teaching assistant at Florida International University (FIU), working on his doctorate.

His current body of work includes projects such as, "Decision Support Systems for Transportation System Management and Operations (TSM&O)" and "Framework to Support Transportation Agency ITS Infrastructure and ITS Legacy Decisions with Consideration of Connected Vehicle Deployment and Autonomous Vehicle and Automated Vehicle Initiatives."

### Second Place - Mohsen Parsafard (tie for second)

Mr. Parsafard is a graduate research assistant at the University of South Florida working on his dissertation for his doctorate. In addition to the dissertation, he is working on a few different projects funded by the National Science Foundation and local-level agencies (e.g., state departments of transportation), such as: "The Mobility and Safety of Walk-and-Ride Systems," "Interdependent Facility Location Design with Probabilistic Disruptions," and "Time-Geography-Based Mobility Measures for Geo-tagged Twitter Data." One of his most recent projects is a paper published in Transportation Research Part B, entitled "Stop-and-Go Traffic Analysis: Theoretical Properties, Environmental Impacts, and Oscillation Mitigation."

Both of the second level award winners have stellar academic records and high praise and recommendations from their professors.

### First Place - Homa Fartash

Highly recommended by her professors and maintaining a distinguished academic performance, Homa Fartash is our First Place Scholarship Winner.

Ms. Fartash is in the US to study for her doctorate at FIU and is currently a graduate assistant. To illustrate the broad base of her experience, prior to coming to the US while still working on her Masters, she was employed at Rahbord Taraddod Consulting Engineering Co, Tehran, Iran. One of her interesting and informative projects was the "Reduction of Traffic Air and Noise Pollution in Tehran Using Innovative Technologies and Intelligent Transportation Systems."

Since beginning her studies at FIU, she has authored several high-level studies, including one entitled, "Utilization of the HCM Urban Facility Procedures for the Estimation and Real-Time Prediction of Travel Time with Consideration of Rain Impacts," which was presented to the Transportation Research Board.

## Erika Birozak Training Scholarship

### Lisa Yttri – Manatee County, TMC Systems Administrator

Ms. Yttri has progressively enhanced her level of knowledge with the network administration for the regional transportation management center (TMC) in Manatee County. Using good problem solving skills, Ms. Yttri performs technical, professional, and analytical project work in the administration of the regional TMC computer application environment. Recently, she helped in the implementation of a complete functional backup TMC added to the existing regional TMC network.

Ms. Yttri is currently assisting in the implementation of the proposed University Parkway fiber optic connectivity and adaptive traffic control system projects; she is also assisting Manatee County with the installation and configuration of the BlueTOAD™.

This award will help Lisa attain her certification as a, "Microsoft Certified Solutions Associate," in Windows Server 2012.

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For more information on ITS Florida, please check the ITS Florida web site at [www.itsflorida.org](http://www.itsflorida.org) or contact Sandy Beck, Chapter Administrator, at [itsflorida@itsflorida.org](mailto:itsflorida@itsflorida.org).

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# Editorial Corner: Statewide ITS Architecture Updates

By Derek Vollmer, FDOT State Traffic Engineering and Operations

The intelligent transportation systems (ITS) architecture is a means by which state and local agencies can plan, define, or integrate ITS. Florida created an ITS architecture in 2001 and did a major update to the architecture in 2005. Since then only minor changes have occurred. Starting in the fall of 2014, the Florida Department of Transportation (FDOT) embarked on another major update of the statewide and regional ITS architectures. The process included holding an initial kickoff meeting with FDOT stakeholders to discuss the process, then performing interviews with all of the key regional stakeholders. This included FDOT, local agencies, transit agencies, law enforcement, planning organizations, and other entities involved with ITS. It was interesting to be a part of these interviews, to see what individual entities, or even groups within an entity, were doing and planning within the ITS realm. After all of the interviews were conducted, FDOT held a face-to-face meeting to review changes with key stakeholders and to hear input from smaller stakeholders. This provided a venue to share information on how the architecture was being shaped with everyone in the region. After the face-to-face meeting, the updated web site was reviewed by the stakeholders, and a final online meeting was held to finalize the architecture.



*Face-to-face meeting to review changes with key stakeholders*



Florida Statewide ITS Architecture (Final)



This process was performed multiple times. Districts One and Seven were updated first, followed by District Five and Florida's Turnpike Enterprise, then Districts Two and Three, and the statewide architectures were updated, and finally Districts Four and Six completed the entire statewide and regional architectures. The whole process ended on December 28th, 2015. For the Central Office staff involved in the process, it was an eye opening experience. Being new to FDOT, the ITS architecture process really opened my eyes to projects happening around the state, and how much coordination is needed between all of the entities involved in a region.

So now, Florida's statewide and regional ITS architectures are compliant with version 7.0 of the national ITS architecture. The updated ITS architectures also help Florida meet requirements in Title 23 of the Code of Federal Regulations (CFR), Part 511- Real-Time System Management Information Program, and for future projects to be compliant with Title 23 CFR Part 940 – ITS Architecture and Standards. I would like to thank everyone who participated in the update process for your time, effort, and comments. It is because of your participation that Florida has a quality ITS architecture. I look forward to participating in the next update!

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## FDOT Traffic Engineering and Operations Mission and Vision Statements

### Mission:

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

### Vision:

Provide support and expertise in the application of Traffic Engineering principles and practices to improve safety and mobility.

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