# **SUNGUDE INSEMINATOR**

#### Florida Department of Transportation's Traffic Engineering and Operations Newsletter

## Wrong-Way Pilot Projects in Florida Update

By Raj Ponnaluri, FDOT Traffic Engineering and Operations

The Florida Department of Transportation (FDOT) has initiated pilot projects along the Homestead Extension of Florida's Turnpike (HEFT) and at three I-10 interchanges in the Tallahassee area. This report provides status updates on both projects.

### Florida's Turnpike Enterprise's Pilot Project on the HEFT

During the spring of 2013, Florida's Turnpike Enterprise (FTE) initiated a wrong-way driving (WWD) study that included crash reports from FDOT's Crash Analysis Reporting (CAR) system; phone calls captured in the 911 system, SunGuide® software event data (collected by FTE's transportation management center [TMC]), and Florida Highway Patrol citation data. As a result of the preliminary study, FTE decided to conduct a pilot project on the



DO NOT ENTER sign.

northern section of the HEFT from Exit 29, NW 41st Street, through Exit 47, University Dr. This is an 18-mile section along the HEFT corridor that includes ten exit ramps (excluding ramps to/from I-75). The FTE pilot project will be developed in a four-phased approach:

- Phase 1: Signing and Pavement Marking;
- Phase 2: Mainline Detection;
- Phase 3: Ramp Detection; and
- Phase 4: SunGuide Software Enhancements.

As part of Phase 1, all of the DO NOT ENTER, WRONG WAY, ONE WAY, No Left/U Turns, and Keep Right signs were replaced with their respective oversized signs. Additional wrong-way arrows were also added to the pavement along the exit ramps.

FTE is finalizing Phase 2, which will install new vehicle-alert technology and replace 12 mainline detection devices located on the section of the HEFT that will be monitored as part of this WWD project. The mainline detection devices will trigger an alert and the vendor software will produce alarms sent directly to the TMC.



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Blinking WRONG WAY sign.

For Phase 3, FTE is considering installation of wrong-way light-emitting diode (LED) blinker signs with vehicle detection at 10 exit ramps located along the FTE's pilot project on the HEFT. The ramp technology will also generate an email sent directly to the TMC in the event a wrong-way vehicle is detected. Additionally, FTE and FDOT's Central Office may evaluate the possibility of enhancing the SunGuide software for this project as part of Phase 4.

#### District 3 Initiative in Tallahassee

Office, identified four locations (interchanges) along I-10 in Tallahassee for design and implementation of WWD countermeasures.

The locations identified for this pilot project include the I-10 off ramps at SR 363 (Capital Circle NW), SR 63 (US 27/North Monroe Street), SR 61 (Thomasville Road), and the westbound off ramp at SR 261 (Capital Circle NE).

The initial phase for this pilot project will implement countermeasures in the form of additional signage, better sign locations, pavement markings, and vehicle activated LED blinker signs. The objective is to provide positive guidance to motorists to prevent WWD and to provide significant warning if a wrong-way movement is attempted. The existing signing and pavement markings are consistent with what is required per the Federal Highway Administration's Federal Highway Administration's *Manual on Uniform Traffic Control Devices* and FDOT's Standards and Specifications. Roadway lighting is present at all four interchange locations.



Blinking WRONG WAY sign.

The countermeasures being implemented vary by location, but include the following:

- WRONG WAY, vehicle-activated, fully lit LED signs with corner blinkers added to both sides of exit ramps at existing WRONG WAY sign locations or further up ramp where appropriate.
- Additional set of wrong-way pavement arrows with raised reflective pavement markers added further up exit ramps at proposed LED sign locations.
- Large overhead WRONG WAY sign panels added to back side of existing guide sign trusses.
- Additional set of larger WRONG WAY signs added to both sides of ramps closer to ramp terminal.
- Existing DO NOT ENTER signs replaced with larger signs and WRONG WAY panels added below DO NOT ENTER signs at ramp termination.
- Pavement through arrows with ONLY markings added to through lanes to discourage turns into exit ramps.
- I-10 pavement marking shields added at start of left turn lanes to ramps that start prior to exit ramps with through arrows.
- Larger No Right Turn and No Left Turn signs added along the arterial roadway at exit ramp intersections.
- Additional turn movement pavement marking channelization in median openings along cross roads at exit ramps to make it more difficult to make wrong-way movements.

The existing overhead guide sign trusses provide a unique opportunity to add an additional large WRONG WAY sign panel on the back side of the truss structures. DO NOT ENTER and WRONG WAY signs mounted on the same post and at a lower height than usual are being added at ramp terminations. The I-10 pavement shields with through arrows were added where turn lanes started prior to the exit ramp, which could have been interpreted as a turn lane for the ramp. The solar-powered vehicle-activated WRONG WAY LED blinking signs will be located where the ramps are one- to two-lanes wide to enhance the warning effectiveness by proximity to the vehicle traveling the wrong way. The WRONG WAY signs employ microwave Doppler radar to detect wrong-way movements up the ramp. The signs will remain dark for the majority of the time and the display will illuminate when a wrong-way movement is detected. Construction plans were completed in January 2014, and construction was scheduled to begin in February 2014.

For information, please contact Mr. Ponnaluri at (850) 410-5418 or e-mail to Raj.Ponnaluri@dot.state.fl.us.

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## SunGuide® Software Uses Real-Time Information to Operate Roads

By Clay Packard, Atkins

The Florida Department of Transportation (FDOT) uses real-time traffic conditions information to operate roadways in Florida. In addition to general monitoring of conditions on a map, there are automated processes as well: congestion alerts are presented to operators, variable speed limit changes are recommended, travel time messages are posted on dynamic message signs, and express lane price changes are recommended. This data is also provided to the public via Florida's Advanced Traveler Information System. Obtaining this data is done via deployment of non-intrusive traffic detection devices for most of Florida's limited-access facilities. However, there are segments on limited-access facilities that are not instrumented; thus, finding a way to fill in the gap quickly and cost-effectively is important to be able to respond to traffic conditions. Furthermore, as traffic systems management and operations includes arterial management, having traffic conditions information for these arterials as well is important; however, instrumentation of all of these arterials at once is not feasible.

Obtaining traffic condition data coverage from a third-party data feed is a cost-effective way to fill in the gaps on limitedaccess roadways and to obtain coverage for arterial roadways. FDOT subscribed to a third-party data feed starting with SunGuide® software version 5.0.4 released in February 2011. This initial release included subscriptions to a few limitedaccess roadways including I-10 and most of I-75 from north of Tampa all the way to the Florida/Georgia state line.

With the release of SunGuide software version 6.0, another stand-alone installer for integrating an additional vendor's data was provide, which now includes all of Florida limitedaccess roadways and most arterial roadways.

The data comes into the system as an XML string with codes that identify roadway segments. These codes are called traffic message channel codes. These codes allow SunGuide software to identify the segment of roadway that the speed data represents and display the speed data onto the software's operator map. Speed thresholds can be defined within SunGuide software to change the roadway segment color to yellow or red if the traffic is moving too slowly relative to the free flow speed of the segment. This allows operators to quickly identify abnormal traffic flows on roadways they manage.

There were a few challenges getting the HERE data incorporated into SunGuide software. Originally, FDOT thought the data could be incorporated the same way as the



SunGuide software displays third-party data feed for more limited-access roadways and now also includes arterial roadways.

previous vendor's data was incorporated. However, during initial integration, there were several differences identified between the new and previous vendor's data feed. First there were a lot of roadway coverage gaps being displayed on the operator map. FDOT determined that the segments of roadway coverage being provided were both roadway segments between interchanges and between an off and on ramp at an interchange, included as a single segment. This was different from the way the previous vendor reported their data.

Another difference in the new vendor's data feed was that the SunGuide software operator map responsiveness was sluggish when presenting the data feed to the operator. Since the additional roadways included arterials, there were significantly more roadway segments, which caused the sluggishness. After filtering out unneeded roadway segments, responsiveness was restored. This was accomplished by editing the traffic message channel codes configuration file SunGuide software references. Thus, each SunGuide software deployment will edit this file to include only the roadways needed by the TMC or that the District wants to manage.

Finally, there were arterial roadway segments that were always red, indicating congestion, even when actual traffic conditions were free flow. The thresholds defined in SunGuide software and used to indicate congestion are percentages of the speed limit for that road. The map data used for SunGuide software provides the speed limit for most roadways; however, when the speed limit is missing the software assumes a speed limit of 55 miles per hour. This was part of the reason the roadway segments were red. Data for arterials from the data feed also includes delays encountered by signalized intersections. So the speeds reported for some of the roadways can be lower than from other technologies or vendors. Also within the data feed data is a value that indicates the free-flow, or expected speed for that roadway based on historical data. When this value was used to determine the thresholds, the map data more accurately reflected traffic conditions.

So now the new vendor's data feed can be incorporated into SunGuide software to provide Districts with information on roadways that are not instrumented with intelligent transportation systems equipment. This will provide some insight into traffic conditions on those roadways.

For information, please contact Mr. Derek Vollmer at (850) 410-5615 or e-mail to Derek.Vollmer@dot.state.fl.us.

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## **US** Transportation Secretary Anthony Foxx Visits District Four

By Dong Chen, FDOT District Four

United States (US) Secretary of Transportation Anthony Foxx visited the Florida Department of Transportation's (FDOT) District Four I-95 Express Lanes, which is under construction, as well as toured FDOT's District Four SMART SunGuide® Regional Transportation Management Center on January 31, 2014. Secretary Foxx was in south Florida along with US Representatives Alcee Hastings, Debbie Wasserman Schultz, and Lois Frankel, together with other state and local officials, to highlight public transportation's role in strengthening access to jobs and opportunities.

The I-95 Express Lanes is a project that reflects how transportation can help create the type of economic opportunities President Obama discussed in his State of the Union Address in January 2014. The \$112 million project used \$105 million in American Recovery and Reinvestment Act funds from the US Department of Transportation.



US Secretary of Transportation Anthony Foxx visited FDOT District Four's I-95 Express Lanes.

Funding from the Recovery Act allowed FDOT to begin this project five years earlier than planned, and the innovative use of design-build contracting, which accelerates project delivery, is helping deliver it even more quickly.

"The road to opportunity can take many forms, and these new express lanes will help people traveling between Miami and Fort Lauderdale get to work and home safer and more quickly," said Secretary Foxx. "As the President said, 'first-class jobs gravitate to first-class infrastructure,' and this project is a great example of how transportation will help businesses and residents in South Florida."

For information, please contact Dong Chen at (954) 847-2785 or email to Dong.Chen@dot.state.fl.us.

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## FDOT Prepares for Phase 2 Incident Management

By Javier Rodriguez, FDOT District Six

The Florida Department of Transportation (FDOT) District Six and District Four Traffic Incident Management (TIM) Teams recently hosted a joint meeting to kick off development plans for 95 Express Phase 2 Incident Management Operations.

The session, held January 22, at the SMART SunGuide® Regional Transportation Management Center in Broward County, was attended by representatives from Florida's Turnpike Enterprise, Miami-Dade County Fire Rescue, Broward Sheriff's Office, Road Rangers, rapid incident scene clearance vendors, and maintenance contractors among others. The purpose of the meeting was to review the incident management plan for 95 Express Phase 1 and move toward expanding the plan to support Phase 2, which is slated to open in mid-2015. District Six detailed the procedures that support current operations for the seven-mile segment in Miami-Dade County. They reviewed the guidelines for the facility's closure procedures and the event severity associated with each closure type. They also discussed maintenance of traffic efforts, resource management, enforcement, and lessons learned.

District representatives also conducted several table-top exercises to illustrate various scenarios that occur along the highway on a daily basis. This gave attendees an opportunity to learn about the plan in a more interactive way. They were able to ask questions and give the team feedback about possible enhancements.

This kick-off session served as the first of several that will be scheduled throughout the year. The District Six and District Four TIM Teams are committed to hosting these meetings to build upon the success of Phase 1 and give drivers a seamless commute as 95 Express expands into Broward County.



FDOT District Six TIM Team presents the 95 Express Incident Management Plan for Phase 1



Attendees watch the table-top exercises conducted by the TIM Team.

For information, please contact Mr. Rodriguez at (305) 470-5757 or e-mail to Javier.Rodriguez2@dot.state.fl.us.





## ITS Florida: The Importance of ITS in Florida

By Jay Calhoun on behalf of ITS Florida

In September 2014, the Intelligent Transportation Societies of Florida and Georgia, along with the Gulf Region Intelligent Transportation Society will meet in Mobile, Alabama at the largest regional intelligent transportation systems (ITS) meeting ever held – the ITS 3C Summit. In preparation



for that meeting, each organization has been looking back at how ITS got its start in their region. This article describes the beginning of ITS in Florida and indicates the importance the Florida Department of Transportation (FDOT) placed on this then-emerging industry.

The implementation of ITS in Florida has been a well-planned, long-term, and very successful process. Florida's urban areas have grown rapidly over the last 30 years and are expected to continue growing at comparable growth rates, further congesting existing highway networks and other transportation systems. FDOT enacted a policy that limits the number of lanes on the State Highway System to be supported by federal and state transportation funding. This maximum lane policy, in conjunction with current congestion levels, projected growth, environmental impacts, and other considerations, created a strong need for FDOT to consider alternatives to highway construction for expanding system capacity. When combined, these factors support the implementation of ITS for purposes of increasing capacity and improving safety – without new construction. In August 1999, FDOT published Florida's *Intelligent Transportation System Strategic Plan*, and ITS in Florida was born. The purpose of this *Strategic Plan* was to guide FDOT, Florida's metropolitan planning organizations, and local governments in the planning, programming, and implementation of integrated multi-modal ITS elements at the statewide, regional, and local levels.

This document recommended that:

- FDOT should add a fifth goal or expand an existing goal in the *Florida Transportation Plan* that stresses the importance of the management and operation of the state's transportation system by providing a statewide, integrated transportation system that is managed and operated in real time;
- FDOT should establish an ITS Program office under the Assistant Secretary for Transportation Policy to be responsible for all FDOT ITS activities;
- FDOT should establish a position of statewide ITS Program Manager with a responsibility to manage the ITS budget and staff, and coordinate all ITS and incident management activities;

- Each District should create a District ITS Program and designate a District ITS Program Manager responsible for ITS and incident management activities, and will seek full integration with the urban regions within that District;
- Each District should develop an ITS infrastructure and initiate development or enhancement of a transportation management center focusing on the interstate highways; and
- Each District should develop ITS staff requirements and staff training programs that will enable them to meet the ITS services they plan to deliver over the next five years.

An important element of that *Strategic Plan* was an analysis of the economic impacts of ITS. FDOT understood the relationship between moving vehicles and freight efficiently and the impact on the state's economy, and used that relationship as a justification to build one of the largest ITS infrastructures in the nation. The objectives of this economic analysis were:

- To examine the relationship between Florida's transportation system and its economy;
- To identify how ITS benefits the transportation system and its economy;
- To examine the benefits documented thus far from ITS deployment in Florida and nationwide;
- To examine the potential of an expanded ITS deployment on Florida's economy; and
- To examine the potential of aggressive ITS deployment on Florida's economy.

Among the many findings of this analysis was that Florida's fast-growing economy was out pacing the national rate of growth and was heavily tied to tourism and global trade – both equally dependent on Florida's transportation network connectivity. Representing only a piece of the total economic effects of trade, exports alone were identified as generating \$24 billion in 1996. Tourism was found to generate \$41 billion in 1997. ITS applications supporting these industries are likely to have the greatest impacts to the economy as a whole. The two most relevant categories of ITS strategies for FDOT, therefore, are commercial vehicle operations (CVO) and tourism ITS. CVO will benefit from electronic credentialing and clearance (weigh-in-motion), safety assurance, fleet management (private-sector based), and any freeway management systems benefitting freight shipment corridors. Florida tourism will gain from an advanced traveler information system. Lastly, ancillary benefits from ITS deployment may include attracting high-tech industry.

Using this planning and economic justification, FDOT was able to create and fund its *Ten-Year ITS Cost Feasible Plan*. This plan was introduced in October 2002 and featured a total planned budget of over \$700 million that would implement ITS throughout the state of Florida. FDOT developed ITS corridor master plans and an ITS Plan for the Florida Intrastate Highway System (FIHS) limited-access corridors for deployment of an integrated, interoperable ITS. The basis of the plan was the completion of the conceptual engineering, ITS architecture, and system engineering analyses for:

- I-95
- I-75
- I-10
- I-4
- Florida's Turnpike

FDOT is a decentralized organization, so while the Central Office was organizing this effort on the FIHS and getting it implemented through the District ITS offices, the Districts were also busy planning, designing, and implementing advanced traffic management systems projects with the local governments. This wide-spread effort has put interconnected signal systems, closed-circuit television cameras, and dynamic message signs on local arterials from Miami to Pensacola. Almost every urbanized area in the state enjoys the benefits of centralized signal control.

To maintain your knowledge of ITS, network with ITS professionals, and see the latest technologies, plan to attend the ITS 3C Summit in Mobile, Alabama, September 14 – 17, 2014. For more information, please check out the ITS 3C Summit web site at http://www.its3csummit.com/.

Please contact Sandy Beck at ITSFlorida@ITSFlorida.org for additional information or if you would like to contribute an article.





## Editorial Corner: Join us in September for the 21st World Congress on ITS

By Thomas E. Kern, ITS America

The Intelligent Transportation Society of America (ITS America), in partnership with ITS Asia-Pacific, and ERTICO-ITS Europe, are proud to host the 2014 World



Congress on Intelligent Transport Systems (World Congress),

September 7-11, 2014, in Detroit, Michigan—America's original Motor City. As you're probably aware, the World Congress was last in the United States in 2011 when Orlando, Florida hosted a very successful event. The World Congress only comes to North America every third year so this will be our most important ITS

gathering until 2017.



This September at Detroit's newly refurbished Cobo Hall, more than 10,000 of the world's leading transportation policymakers, researchers, high-tech innovators, and business professionals from more than 65 countries will gather to share the latest intelligent transportation systems (ITS) applications from around the globe.

Few places in the world have the concentration of transportation companies, research institutions, and deploying agencies as Detroit, but the Motor City is about more than cars. Detroit and its Canadian neighbor Windsor, Ontario, is also an integrated hub for the highway, commercial vehicle, and transit industries. The Ambassador Bridge that connects these two cities is the biggest international crossing in North America in terms of trade volume, and more than 25 percent of all merchandise trade between the U.S. and Canada crosses the bridge. This is the first time that a World Congress will take place at an international border crossing; allowing us to showcase how ITS are critical for the safe and efficient movement of people and goods across international boundaries.

Detroit has always been an innovation-led city, driven by its people and home-grown businesses that provide goods and services to the world. Today's Detroit retains that legacy, growing into a high-tech business hub where partnerships are being forged between companies new and old, and large and small. Groundbreaking research in automotive safety and improved mobility is taking place and advancements in manufacturing are being deployed.

In fact, Michigan is home to 375 automotive research and development centers. Detroit is made of both grit and silicon. The rich heritage of America's automotive industry is blending with the burgeoning, innovative technologies of our future, and it's clear that Detroit is uniquely positioned on the cusp of that coupling.

This year's World Congress will showcase the most recent innovations in intelligent transportation and share the developing story of our industry. We live in an increasingly connected world, with technology changing not only the way we live, work, and travel, but also how businesses and our nation compete in the global economy. From connected and autonomous vehicles, to advanced traffic management systems and real-time traffic, transit, and parking apps, the World Congress will showcase technologies that are changing transportation today as well as next generation innovations that are reinventing mobility for future generations.

The automakers are excited to showcase their city as well as the latest technological developments in the transportation industry. Chief executive officers from the auto world and major high-tech corporations will lead programs and the event will display more demonstrations than ever before. We will transform all of Michigan's Belle Isle—a 983-acre island located just a few miles from the Cobo Center—into a live demonstration showcase for ITS technologies including connected and autonomous vehicles, electric vehicles, robotics, sensor technology, real-time weather and road conditions data analysis, and many others. Southeast Michigan's emergency responders will also demonstrate the region's hazardous response capability in a realistic and dramatic visual simulation during Emergency Responder Day, happening Tuesday, September 9<sup>th</sup>.

Another exciting element of this year's World Congress program is our Youth Connection Showcase. ITS America is partnering with Square One Network, Michigan Department of Transportation, Mobile Technology Association of Michigan, and many others to develop and coordinate interactive experiences for more than 1,000 high school and college level students, and spotlight the next generation of ITS talent developing in Michigan and career opportunities in the intelligent transportation arena. With our special interest sessions, all-star keynotes, technology showcase, youth-focused programs and competitions, investor matching, and extensive exhibition hall, we are sure to impress and inspire at every turn.

ITS America's Annual Meeting & Exposition will take place in conjunction with the World Congress. While focusing on topics of the World Congress theme "Reinventing Transportation in our Connected World," ITS America's Annual Meeting will provide a distinct series of events for the Society's members that focus on exploring solutions for easing traffic congestion, financing and improving the nation's transportation system, advancing life-saving vehicle technologies, and much more through exhibits, panel discussions, technology demonstrations, technical tours, training sessions, and networking events.

This year ITS America Annual Meeting will feature a Plenary Session, Leadership Circle meeting, a host of committee forum meetings, and the Best of ITS Awards, State Chapter Awards, and Student Essay Competition winners.

This year's program and registration for the World Congress will formally open April 1, 2014, but you can sign up to reserve your spot today on our web site and on April 1, we'll reach out to you directly to complete the full registration form.

More than any ITS meeting we've ever held, the World Congress in Detroit will connect our past with our future. I promise you do not want to miss out on the 2014 World Congress on ITS. This event will be a unique opportunity to see and experience the future of technology and transportation as well as what's in store for the great city of Detroit—America's Motor City.

Learn more about this year's World Congress on ITS by visiting the web site at www.itsworldcongress.org.

Thomas E. Kern is the Executive Vice President of ITS America. In this role, he provides oversight and support for all technical programs, business development activities, legislative initiatives, meeting planning, member sales and service, and communications. He is responsible for the effective operations of ITS America by providing day-to-day guidance to senior staff; including program development, execution and resource allocation; and managing the implementation of ITS America's strategic plan.

For information, please contact Mr. Kern at (202) 721-4211 or e-mail to TKern@itsa.org.

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## Announcements Upcoming Conferences



#### World Congress

Detroit is the scene for the 21st World Congress on September 7-11, 2014. Don't miss this event that only occurs in the US once every three years!

Information on registering and/or participating is available at http:// itsworldcongress.org/.

## ITS 3C SUMMIT [1] [2014] Mobile, AL

#### **3C Summit**

Registration is now open for the the 2014 ITS 3C Summit, a joint annual meeting between the Gulf Region Intelligent Transportation Society, the Intelligent Transportation Society of Florida, and the Intelligent Transportation Society of Georgia. The meeting will be held September 14 - 17, 2014 at the Arthur R. Outlaw Convention Center in Mobile, Alabama. More information is available at http://www.its3csummit.com.

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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.

# FDOT Contacts

#### District 1

L.K. Nandam, DTOE Chris Birosak, ITS FDOT District 1 Traffic Operations PO Box 1249 Bartow, FL 33831 (863) 519-2490

#### District 2

Jerry Ausher, DTOE Peter Vega, ITS FDOT District 2 Traffic Operations 2198 Edison Avenue Jacksonville, FL 32204 (904) 360-5630

#### District 3

Jared Perdue, DTOE Lee Smith, ITS FDOT District 3 Traffic Operations 1074 Highway 90 East Chipley, FL 32428-0607 (850) 638-0250

#### District 4

Mark Plass, DTOE Dong Chen, ITS FDOT District 4 Traffic Operations 2300 W. Commercial Blvd. Ft. Lauderdale, FL 33309 (954) 777-4350

#### District 5

Richard Morrow, DTOE Jeremy Dilmore ITS FDOT District 5 Traffic Operations 719 S. Woodland Blvd., MS 3-562 DeLand, FL 32720-6834 (386) 943-5310

#### District 6

Omar Meitin, DTOE Rory Santana, ITS FDOT District 6 1000 NW 111th Avenue, MS 6203 Miami, FL 33172 (305) 470-5312

#### District 7

Gary Thompson, DTOE Chester Chandler, ITS FDOT District 7 Traffic Operations 11201 N. McKinley Dr. Tampa, FL 33612 (813) 615-8600

#### Florida's Turnpike Enterprise

John Easterling, DTOE Eric Gordin, ADTOE Florida's Turnpike Enterprise PO Box 9828 Ft. Lauderdale, FL 33310-9828 (954) 975-4855 Mark Wilson State Traffic Engineer (850) 410-5600

#### Elizabeth Birriel

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

#### Paul Clark

Incident Management and Commercial Vehicle Operations (850) 410-5607

Fred Heery

Deputy State Traffic Engineer - Operations (850) 410-5419

#### Alan El-Urfali

Deputy State Traffic Engineer - 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 36 Tallahassee, FL 32399