Florida Department of Transportation's Traffic Engineering and Operations Newsletter

# FDOT

### The Waze Connection

By Gene Glotzbach, FDOT Traffic Engineering and Operations

You may or may not have heard of the company called Waze. It was in the news a year ago. Waze is an Israeli company that was developed to provide traffic-related information to those who download their app in order to avoid traffic problems. Waze really made the news back on June 11, 2013, when Google acquired them for about \$1.3 billion (U.S. dollars). Before then, Waze was a small Israeli start-up company founded in 2007.

Waze supports most common mobile platforms and the app is free to download and use. Waze uses their unique crowd sourcing formula to collect data on what is happening on the road system. Waze relies on people who have downloaded their app to build their database by flagging and recording updates on accidents, bottlenecks, road closures, weather, and traffic delays as they drive. Those who utilize the system often are referred to as 'Wazers.' In addition to being able to report problems on the roadway, Wazers with their app open, contribute information on speed and the location of their car. This information is collected by Waze and then provided to the public for others to utilize when traveling the roadway network. Information is available on both limited-access as well as non-limited-access facilities.



To supplement information coming into the Waze system, Waze has been working with state departments of transportation (DOT) to get access to data collected by the DOTs. Waze recognizes the wealth of traffic-related information that public transportation agencies collect and how they can use this information to enhance their system by adding a new data source. Florida is one of the first states to sign an agreement to share information with Waze. The agreement was signed in March 2014, and allows Waze to tap into the Florida Department of

### Inside This Issue August 2014

The Waze Connection 1
Connected Vehicle Communications
District Four Focuses on Incident Responder Training5
Distric Six Transportation Management Center Celebrates Ten Years of Traffic Relief in Southeast Florida
Taking a Look at Our Weigh Stations
Weigh Stations
Weigh Stations
Weigh Stations

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However, this agreement is not a one-way street. Waze also agrees to let FDOT have access to the data that Waze collects to enhance FDOT's information dissemination capabilities. One of the requirements of the agreement is that each party must recognize the other as the source of information that is being posted, when utilizing the other's information. If FDOT uses information from Waze to post an incident on our 511 advanced traveler information system, we must attribute that information as coming from Waze.

FDOT has provided Waze with the credential to access the third-party data feed from FDOT's 511 system and Waze has already utilized the feed to post information on their application with appropriate attribution. In addition to information from the third-party data feed, FDOT is supplying Waze with information on construction, location of toll facilities, special events, speed limits, evacuation routes, emergency shelters, etc. Waze provided FDOT with access to their feed and FDOT is in the process of analyzing the data feed to develop an interface between Waze and FDOT's SunGuide® software. Once the interface is complete, FDOT will have ready access to the Waze data for use in managing traffic and assisting in the identification of events on noncovered routes.

FDOT has a robust intelligent transportation systems in place and is able to collect data on roadway conditions on about 60 percent of the state's limited-access facilities. Waze data can be a real benefit in non-covered areas to enhance our ability to know what is going on in areas that FDOT does not have instrumentation. The Waze data can also be a benefit to support the Federal Highway Administration's Real-Time System Management Information Program, included in Section 1201 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. Section 1201 requires that state DOTs make real-time information regarding traffic and travel conditions as well as weather conditions on interstate facilities accessible to the public by



Wazers providing information.

November 2014 and on routes of significance by November 2016. The small portion of interstates not currently instrumented will benefit from this data today. A great number of these routes of significance will not be instrumented and the Waze data can help fill the gap and satisfy the federal requirement for real-time traffic and roadway conditions.

There is a benefit in leveraging information collected by private information providers and FDOT is looking at how to best utilize data from providers like Waze.

For information, please contact Mr. Glotzbach at (850) 410-5616 or e-mail to Gene.Glotzbach@dot.state.fl.us.



### **Connected Vehicle Communications**

By Steve Novosad, Atkins

In the late 1990s, the United States Department of Transportation (USDOT) undertook the concept of vehicles communicating with one another. To that end, in October 1999, the United States Federal Communications Commission (FCC) allocated 75 megahertz (MHz) of spectrum in the 5.9-gigahertz (GHz) band to be used by intelligent transportation systems (ITS) vehicle safety and mobility applications. These applications were to utilize dedicated short-range communications (DSRC) over the 5.9 GHz band. DSRC is a two-way short-to-medium range wireless communications capability that permits very high data transmission—critical in communications-based active safety applications. In the early 2000s, the vehicle integration initiative kicked off research into vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications using DSRC.



Since that time, DSRC-based communications has become a major research priority of the USDOT Research and Innovative Technology Administration (RITA) ITS Joint Program Office (JPO). Important dates affecting DSRC, V2V, and V2I are:

- 1999 FCC allocated 75 MHz of spectrum in the 5.9 GHz;
- 2003 FCC issued licensing and service rules;
- July 2006 FCC issued memorandum, opinion, and order amending service rules; and
- February 2012 FCC opened a notice of proposed rule making (NPRM) to permit unlicensed national information infrastructure (U-NII) devices in the 5 GHz band.

Important milestones of the USDOT RITA JPO's research of DSRC, V2V and V2I includes:

- 1999 DSRC implementation research approved;
- 2003 Architecture and standards work approved;
- 2011 Connected vehicle safety driver clinics conducted;
- 2012 Federal Highway Administration's Safety Pilot Model deployment initiated;
- 2014 National Highway Transportation Safety Administration (NHTSA) announced intent to perform rule making for the use of DSRC in-vehicle connected vehicle devices.

In the spring of 2015, it is anticipated that the USDOT will award several regional connected vehicle pilots using DSRC and other communications medians. Original equipment manufacturers continue to ramp up their use of DRSC for V2V safety applications in response to NHTSA's announcement.

The currently allocated FCC spectrum is uniquely capable of supporting safety applications that could potentially prevent or reduce the severity of up to 80 percent of vehicle crashes involving unimpaired drivers. For example, DSRC is effective in extreme weather conditions and the need for high-speed short-range communications. In order to take advantage of DSRC's capabilities, through its research on the safety pilot model deployment project, the USDOT has developed a set of safety applications designed to prevent crashes. These applications are:

- Forward collision warning;
- Emergency electronic brake light;
- Intersection movement assist;
- Blind spot warning/lane change warning;
- Do not pass warning;



- Left turn across path/opposite direction;
- Right turn in front;
- Signal phase and timing;
- Curve speed warning;
- · Railroad crossing warning; and
- Pedestrian detection.

The explosion of personal devices, such as smartphones and tablets, has created demand on the spectrum, thus Federal policymakers have begun exploring methods to ease the looming spectrum shortage. Because of the dramatic increase in personal devices, the number of wireless Internet service providers and Wi-Fi hotspots, which operate on unlicensed bands, is also increasing.

One option to ease the spectrum shortage is to exam under-utilized spectrum that could be opened up to these unlicensed devices (e.g., Wi-Fi hotspots, laptops, tablets, cordless telephones, medical equipment, wireless headsets, remote car door openers, etc.). The FCC's *National Broadband Plan of 2010* identified the need to make 500 MHz of spectrum newly available for broadband within 10 years, of which 300 MHz should be made available for mobile use within five years. In February 2012, the FCC opened an NPRM for revision of Part 15 of the Commission's rules to permit U-NII devices in the 5 GHz band.

Following these recommendations, in February 2012, the United States (US) Congress passed the Middle Class Tax Relief and Job Creation Act. As part of this legislation, the National Telecommunications and Information Administration (NTIA) was tasked to examine the potential for spectrum sharing in the 5.4 GHz and 5.9 GHz bands. NTIA evaluated "known and proposed spectrum-sharing technologies" and identified potential risks if unlicensed devices were permitted to operate in these bands.

On January 25, 2013, the NTIA issued its initial report on the potential use of up to 195 MHz of spectrum in the 5 GHz band by U-NII devices. The report identified potential risks associated with introducing a substantial number of new, unlicensed devices into the 5.9 GHz band without proper safeguards and further analysis was needed to determine whether and how these risks could be mitigated.

In the last couple of months, both the US Senate and House of Representatives introduced bills that would authorize sharing of the 5.9 GHz spectrum. The Senate bill was coauthored by US Senators Marco Rubio and Cory Booker. The bill, known as the Wi-Fi Innovation Act, proposes to open the 5850-5925 MHz band to unlicensed devices. The bill requires NTIA to identify the actions needed to accommodate opening the band to unlicensed devices. Within three months of the bill's passage, a public notice would be issued seeking comments on interference-mitigation techniques and technologies, and potential rechannelization to accommodate incumbent licensees (including DSRC) and commercial unlicensed devices. Within six months of the bill's passage, an unlicensed device usage test plan would be published. The purpose of the test plan is to evaluate technologies that allow unlicensed devices to utilize the 5850-5925 MHz band without causing harmful interference with existing band licenses. Within 15 months of the bill's passage, the test plan would be executed and findings documented. If testing proves that there is no interference with existing licensees, then spectrum would be opened to unlicensed devices within 18 months of the bill's passage.

Members of the US House of Representatives, Darrell Issa, Anna Eshoo, Bob Latta, and Doris Matsui introduced a companion bill to the Senate's bill that calls for the FCC to study how certain bands of the nation's airwaves can be set aside for wireless devices such as tablets and laptops and other devices. The bill would require the FCC to do more to see if airwaves in the 5 GHz spectrum band could be shared with other devices.

For information, please contact Ms. Elizabeth Birriel at (850) 410-5606 or e-mail to Elizabeth.Birriel@dot.state.fl.us.



### District Four Focuses on Incident Responder Training

By Gaetano Francese, FDOT District Four

The Florida Department of Transportation (FDOT) District Four Traffic Incident Management (TIM) Team recently completed its annual training for the Road Ranger program and the Federal Highway Administration's (FHWA) National TIM Responder Course funded under the Strategic Highway Research Program (SHRP2).

In April, an 8-hour annual refresher course was presented to 80 Road Rangers from three Road Ranger contracts in Broward County (Sunshine Towing), Palm Beach County (Anchor Towing), and the Treasure Coast (Indian River, St. Lucie, and Martin Counties) (In A Flash Towing). Different from previous years training was the realization that upcoming SHRP2 training in May also applied to Road Rangers as national incident responders. Their training to national standards as set forth by the FHWA SHRP2 training seemed like the logical next step.

FDOT District Four TIM Team coordinator, Michael McGee, conducted the trainings and said the goal is to get Road Rangers to constantly think about safety as they go about their duties of incident management and motorist safety.

Following the Road Ranger trainings in April, District Four held its second annual presentation of the FHWA SHRP2
National TIM Responder Course in May.
District Four operates three TIM Teams in Broward and Palm Beach Counties, and the Treasure Coast comprised of over 600 members. TIM teams help to establish working relationships with law enforcement, fire rescue agencies, contracted towing and hazardous material containment companies, and a wide variety of private contractor companies. Last year, training was provided to 127 emergency



SHRP2 training exercise in District Four.

responder personnel; this year 112 additional personnel were trained.

The training initiative was conducted under a Memorandum of Understanding with FHWA and the American Association of State Highway and Transportation Officials (AASHTO). SHRP2 is focused on addressing the needs of the nation's highways regarding road safety, traffic congestion, and infrastructure rehabilitation. The objective of the course is to promote a shared understanding of the procedures required for quick clearance and responder safety. It outlines the common set of core competencies developed to assist participants in achieving the TIM National Unified Goal of strengthening TIM programs in the areas of responder safety; safe, quick clearance; and prompt, reliable, and interoperable communications.

District Four is always trying to recruit entire incident responder agencies to provide this valuable, free training. For any training requests within District Four, please contact the District Four Freeway Operations Manager, Gaetano Francese, at (954) 847-2797 or Gaetano.Francese@dot.state.fl.us, or the District Four Traffic Incident Management (TIM) Team Coordinator, Michael McGee, at (954) 847-2634 or Mike.McGee@smartsunguide.com.

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Distric Six Transportation Management Center Celebrates Ten Years of Traffic Relief in Southeast Florida

By Javier Rodriguez, FDOT District Six

The Florida Department of Transportation (FDOT) District Six Intelligent Transportation Systems (ITS) Program recently commemorated the ten-year anniversary of the SunGuide® Transportation Management Center (TMC). This milestone is a significant achievement for both the District and statewide ITS Program because it signals FDOT's commitment to the motoring public of our state.

The TMC opened its doors on June 25, 2004, and was inaugurated by then Governor Jeb Bush. At the time, the SunGuide TMC was heralded as a major advancement in the state's goal to provide meaningful solutions for reducing traffic congestion in southeast Florida. Today, the TMC houses a mature transportation management program and has become a must-visit destination for industry leaders from around the world.

The SunGuide TMC was designed with the goal to advance interagency communications and promote innovative ways to improve highway travel. As a result, the 32,000-square foot facility serves as the regional hub for real-time traffic management services. Traffic operators from FDOT District Six and Miami-Dade Expressway Authority manage traffic from the TMC through their respective series of highway devices that include closed-circuit television (CCTV) cameras, roadway detectors, and dynamic message signs (DMS), among others. Duty officers from Florida Highway Patrol's Troop E are also co-located in the TMC. Together, all three agencies work under their common mission of promoting safe and reliable travel conditions for the drivers of our region.

District Six has shown tremendous growth since relocating program operations from the Interim Operations Center in the District Six headquarter building to the TMC. Back in 2004, District Six had 40 CCTVs, 14 DMSs, and 153 detectors to manage traffic across its roadways from Miami-Dade to Monroe County. Today there are 258 CCTVs, 110 DMSs, 328 detectors, and 22 ramp signals. The additional ITS devices have given District Six the capability to manage traffic and operate its roadways more effectively.

The combination of enhancements made to its incident management, traveler information, and traffic management services have yielded significant travel benefits for the public. For example, the average annual roadway clearance time for an incident has been reduced from 50 minutes in 2004 to an average of 29.2 minutes today. This reduction in



Above: SunGuide TMS dedications with then Governor Jeb Bush.

Below: SunGuide TMC.

Bottom: View of 95 Express.





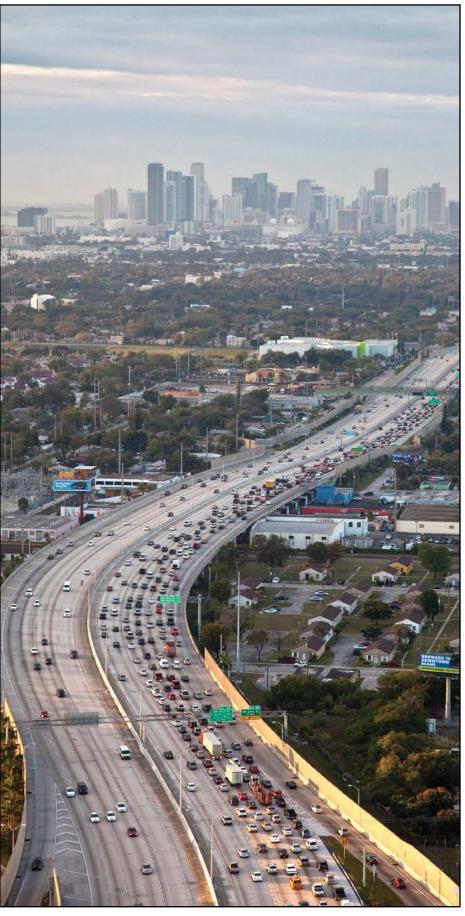
delay has helped motorists save time and money over the years. Specific enhancements made to its incident management program have included the addition of specialized vehicles and services designed to respond to a variety of incident severity levels such as the Rapid Incident Scene Clearance Program, Incident Response Vehicle Program, and others. The District also increased coordination efforts with agency partners and enhanced its responder training requirements to expedite clearance times. Additionally, the TMC worked to advance its traveler information services to provide drivers with up-to-theminute roadway information to help reduce congestion. As a result, approximately 217,300 messages were posted on DMSs and more than 47,000 events were updated on the 511 traveler information system in fiscal year 2012/2013 figures that are significantly higher compared to when the center first opened.

Lastly, District Six continues to make strides in the area of traffic management. The most notable achievement has been its role in the successful launch and operations of the state's first managed lanes and ramp signaling project – 95 Express. The 95 Express project's success has prompted expansion of more managed lanes projects across the state and has worked to raise awareness about the benefits of the ITS Program as a whole.

The combination of improvements implemented by all the District Offices throughout the years shows that FDOT's ITS Program is capable of delivering significant travel benefits to our drivers. The low impact and innovative traffic management principles of the ITS Program have shown it is capable of altering the transportation landscape of our existing system into one that is capable of meeting the everchanging travel demands of our state.

For information, please contact Mr. Rodriguez at (305) 470-5757 or e-mail to Javier. Rodriguez2@dot.state.fl.us, or visit the District Six ITS web site at www.sunguide.info.





95 Express.

### Taking a Look at Our Weigh Stations

By Paul Clark, FDOT Traffic Engineering and Operations

Florida has an extensive roadway network, which the Florida Department of Transportation (FDOT) is responsible for maintaining for the traveling public. One of the ways FDOT does this is by placing restrictions on commercial vehicles regarding their allowable size and weight. One of the tools used to monitor compliance with size and weight requirements in Florida is the state's fixed weigh station facilities that are manned and maintained by the Motor Carrier Size and Weight (MCSAW) office.

Presently the MCSAW office is staffed by approximately 170 regulatory weight inspectors that are charged with performing commercial vehicle size and weight enforcement. The primary purpose of the MCSAW weight enforcement program is to protect Florida's highway system and bridges from damage from overweight vehicles. Vehicles are weighed at 20 fixed weigh station locations and mobile enforcement with portable scales statewide. Over 20 million vehicles are weighed annually.



Weigh station facility work area.

The size of weigh station facilities varies, depending on the age and need of each facility. But one thing that is consistent is the equipment and systems required for the officers to do their jobs. Each facility has multiple computer systems that support various operations. These systems range from SmartCOP, Mettler Toledo scale systems, PrePass® electronic bypass system, FDOT computer systems, and others. There can be as many as six different computers at a workstation; this can be very cumbersome in a confined working environment.

Recently, I had the opportunity to review the Punta Gorda Weigh Station. My goal was to review the facility and determine options to reduce the clutter on work surfaces, which are currently being taken up by several computer displays and multiple sets of keyboards and mice for the six computer workstations utilized by location staff. During the review, issues were discussed with staff on duty at that time to determine information relative to their workflow, operational concerns, and to develop a plan of action which would be reasonable and accommodate their needs while meeting the project's objectives.

Several objectives were identified:

- Eliminate clutter from multiple displays;
- Eliminate clutter from multiple keyboards and mice;
- Relocate computers to get them out from "under foot" of the operational staff;
- Increase display size for certain systems; and
- Relocate an isolated computer to the primary work station.

As a result of the review two action plans have been developed. These plans range from increasing monitor size and possibly mounting monitors on the wall, to utilizing manual 4x4 universal serial bus sharing switch with associated cabling, so that a single keyboard and mouse can be shared among the four other (non-citation writing) computers or even using a wireless keyboard and mouse with a software called ShareMouse.

In the next coming weeks, we will meet with MCSAW staff and offer the solutions that we found to determine an action plan. The whole goal of the plan will be to make operations more efficient for the MCSAW regulatory weight inspectors. So next time you drive by one of FDOT's fixed weigh station facilities, remember there's a lot going on in that office and it directly supports FDOT's mission of providing a safe transportation system by performing commercial vehicle size and weight enforcement.

For information, please contact Mr. Clark at (850) 410-5607 or e-mail to Paul.Clark@dot.state.fl.us.



### ITS Florida: CFX Deploys Wrong-Way Driving Pilot Project

By Corey Quinn on behalf of ITS Florida

The Central Florida Expressway (CFX), in conjunction with the University of Central Florida (UCF), has developed plans for a pilot deployment of wrong-way driving detection technology. A recent study on wrong-way driving conducted by UCF for CFX recommended deployment of a small pilot project to further quantify the number of occurrences and test the effectiveness of local countermeasures of wrong-way driving at strategic locations on our system.

Five strategic locations were selected at the interchange areas of: State Road (SR) 408/Hiawassee Road (2 deployments), SR 408/Kirkman Road (2 deployments), and SR 520/528 (1 deployment). For the initial part of the pilot test, CFX tested a temporary deployment on the south side of the CFX Headquarters on March 3rd and 5th 2014.

Some of the performance measures that were developed for the pilot analyzed different types of vehicles traveling various speeds through detection zones. The detection system was calibrated to give drivers the greatest amount of reaction time possible by adjusting the coverage zone. CFX made a special request to add a camera that could take a snap shot of the vehicle to eliminate false alarms. Another factor to analyze was confirming that the detection zone was covering the ramp lanes and avoiding spillover to other adjacent mainline travel lanes. The detection system responded positive in all instances under clear weather conditions. The test system data recorded wrong-way detections accurately and photo archived all events.

On March 31st, 2014, a second test was conducted using dual red color rectangular rapid flash beacons mounted at both the top and bottom of the WRONG WAY sign to evaluate the need for increased driver visibility. Construction documents have been completed and this configuration will be constructed at the five locations starting August 2014 pending procurement of the contractor.

Based on the initial results of the pilot, CFX has developed a living standard operating procedure, which outlines the typical lay out of the signage and intelligent transportation systems equipment. We have four detection zones per ramp, so that UCF researchers can determine how far the car advanced after passing the flashing beacons. This detection system uses cellular technology to notify the regional transportation management center of a wrong-way driving event. We are also testing two different types of vendors' technology at each ramp location in the next phase of the pilot test.

CFX is confident the deployment will be a monumental step in furthering our goal of the value of human life, not only to our customers, but to our community.

For information, please contact Corey Quinn at 407-690-5332.

If you are interested in more information about ITS Florida or would like to submit an article on behalf of ITS Florida, please contact Sandra Beck at ITSFlorida@ITSFlorida.org.



### Editorial Corner: Updating Our ITS Architecture

By Derek Vollmer, FDOT Traffic Engineering and Operations

The last Statewide Intelligent Transportation Systems (ITS) Architecture update the Florida Department of Transportation (FDOT) performed occurred in 2006. Since then, FDOT has completed many ITS projects and has planned other projects. Additionally, the United States Department of Transportation Research and Innovative Technology Administration has updated the National ITS Architecture to version 7.0. It is time for another round of architecture updates.

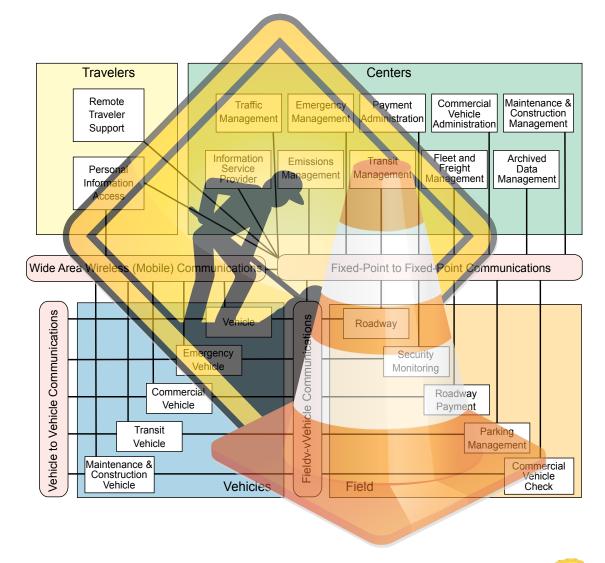
In a previous survey performed by FDOT, it was determined that a majority of the regional architecture would need to be updated in 2014. Florida is planning more managed lanes and ramp metering projects, which are new for most of FDOT's Districts. User service packages associated with these projects will need to be included in the updated regional architectures. Also, Florida now uses the University of Maryland's Regional Integrated Transportation Information System (RITIS) as an ITS data warehouse solution to store data from vehicle detection systems. This requires using the appropriate service package in the updated statewide architecture.

FDOT's Central office is working to update all of the regional architectures and the statewide architecture. For each architecture update, FDOT will reach out to and interview key stakeholders to determine the changes to that region's architecture. Afterwards, FDOT will create a draft architecture, followed by a one-day workshop to review the draft architecture. More comments will be gathered from the workshop and then a final architecture will be developed. The consultant will then update the architecture web site to complete the update process. FDOT plans to have all of the architectures updated by the end of the year.

Once the update is completed, the architectures will be compliant with the Federal Highway Administration's (FHWA) Title 23 of the Code of Federal Regulation (CFR) Part 940 for Intelligent Transportation System Architecture and Standards; it will also be compliant with FHWA's Title 23 of the CFR Part 511 for the Real-Time System Management Information Program. The timing works out great, since FHWA is reviewing FDOT's real-time system management information program and working on a stewardship and oversight agreement that will include maintaining the ITS architecture.

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

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### **Announcements**

#### Congratulations Raj!

Please join us in congratulating Raj Ponnaluri on his appointment to the position of Arterial Management System Engineer in the Traffic Engineering and Operations Office. In this new role, Raj will be working closely with District Offices, Central Office, and the Federal Highway Administration in developing and implementing arterial management strategies and initiatives on a statewide level as a part of the Florida Department of Transportation's Transportation Systems Management and Operations (TSM&O) Program. Raj previously served as the Traffic Systems Studies Engineer in the Traffic Engineering and Operations Office. Raj holds Bachelor of Science and PhD degrees from India, and obtained a Master of Science degree from Duke University and an MBA from the University of Central Florida.

#### Join us in Welcoming Steve Sciotto!

Please join us in welcoming Steven Sciotto to the staff of the Florida Department of Transportation's Intelligent Transportation Systems Telecommunications General Consultant. Steve comes to us with over 20 years of telecommunications experience in land mobile radio systems deployments for several military and commercial systems.

Steve joins the team in the areas of radio licensing, frequency coordination, and land mobile radio for the overall statewide telecommunications networks. Steve will assist in collaborating with the Districts to optimize their use of the land mobile radio system across the state. He will also manage over 600 Federal Communications Commission licenses granted to FDOT, including routine renewals and applications for new site licenses.

### 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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