SUNGUIDE® DISSEMINATOR

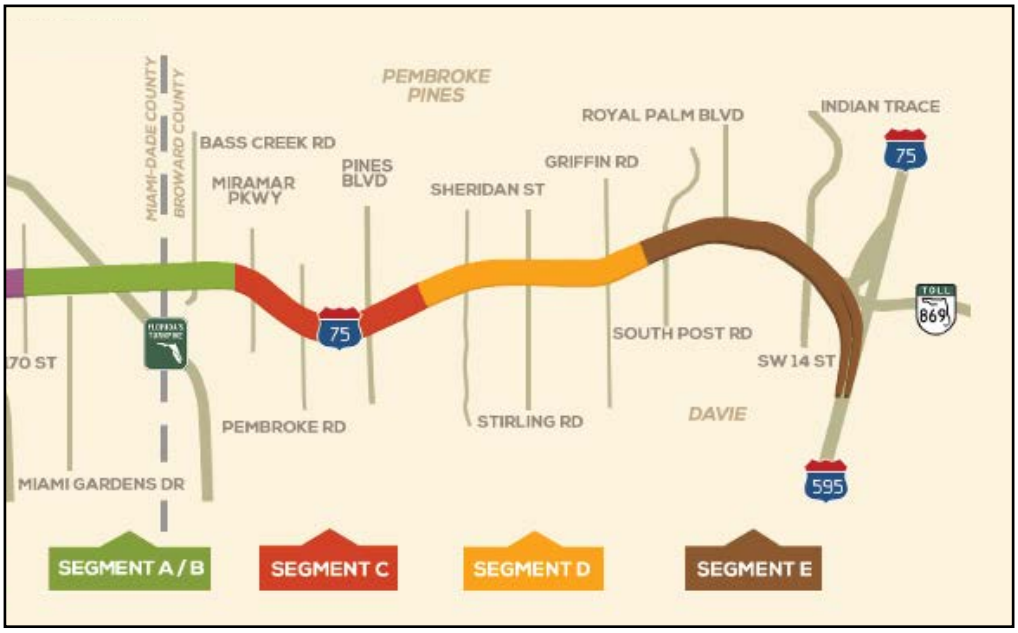
Florida Department of Transportation's Traffic Engineering and Operations Newsletter

Centennial FDOT 1915 ★ 2015

District Four: I-75 Express Lanes Project Update

By Natalie Cortes, FDOT District Four

The Florida Department of Transportation (FDOT) District Four's plans to add express lanes to another interstate are underway. District Four is implementing express lanes along 15 miles of I-75 from I-595 in Broward County to Northwest 170th Street in Miami-Dade County, connecting to an adjacent District Six I-75 Express Lanes project from Northwest 170th Street to SR-826 (Palmetto Expressway) in Miami-Dade County. The project includes the addition of two express lanes within the I-75 median, physically separated from the existing general purpose lanes by a 28-foot grass median. The total project is estimated to cost $567 million and is scheduled for completion by early 2018. To minimize affects to motorists, work is being completed in five segments: Segment E, Segment D, Segment C, and Segment A/B, starting from Northern Broward County and working down to the south. Updates for these segments are covered in this article.



I-75 Express Lanes Project outlines future construction segments.

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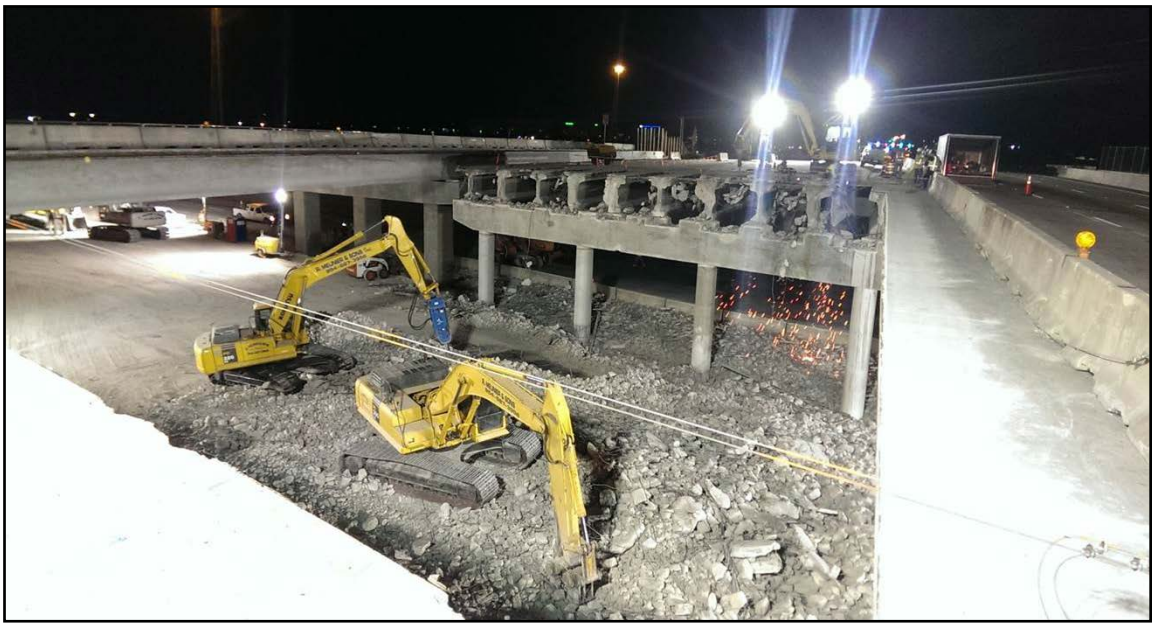
Segment E runs from north of Griffin Road to I-595. Excavating ponds for future drainage has begun. Construction on several bridge projects in Segment E is also underway. The first is the new reversible bridge connecting I-75 Express Lanes to I-595 Express Lanes. This will be followed by the reconfiguration of the westbound I-595 Express Lanes to the northbound I-75 general purpose lanes. The reconfiguration will move the bridge just north of the existing temporary ramp; message boards will be placed to direct motorists to the bridge's final location. Segment E will be completed by summer 2017.

Segment D runs from south of Sheridan Street to north of Griffin Road. Construction began on the sound barrier walls that will provide a perimeter for I-75. Segment D also includes major improvements to the I-75 Sheridan Street interchange in order to improve traffic flow to on-coming ramps. Segment D is expected to be complete by summer 2018.

Segment C, from south of Miramar Parkway to south of Sheridan Street, has the most updates since the project's inception. Construction began on the new Pembroke Road Bridge as well as the existing Miramar Parkway Bridge. Both bridges are being renovated to expand lanes and improve traffic congestion during peak hours. Swale areas on the outside of I-75 are being constructed to manage storm water runoff to nearby residential and commercial areas. Segment C is expected to be completed by summer 2018.



Construction at Miramar Parkway.

The last of the I-75 Express Lanes project, Segment A/B is expected to be completed by spring 2019. Segment A/B, from Northwest 170 Street in Miami-Dade County to south of Miramar Parkway, began construction on the Snake Creek Canal Bridge as well as clearing vegetation along several communities for the remaining sound barrier walls. The ground-mounted walls provide traffic and construction sound relief for the 26 communities that run parallel to the project's five segments.

Once complete, express lane tolls will be charged for each passing vehicle based on traffic density and level of service. Traffic density is a measure of the average number of vehicles that occupy each mile of roadway, while level of service refers to the speed and convenience of the express lanes. Toll prices will vary during peak and non-peak hours.

With the completion of the I-75 Express Lanes, FDOT District Four will provide additional vehicle capacity, resulting in improved operational conditions, more reliable travel times, and reduced user delay. This project will complete another section of the South Florida managed lanes network for all motorists and will improve mobility and relieve congestion.

Additional project updates can be viewed online at www.75-express.com. For information, please contact Mr. Dong Chen at (954) 847-2785 or email to Dong.Chen@dot.state.fl.us.

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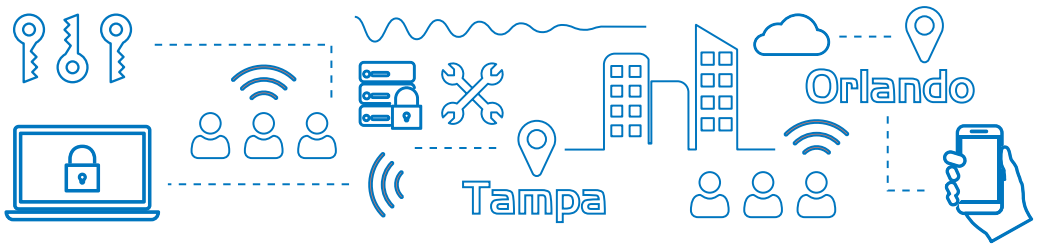
Testing and Certifying Connected and Autonomous Vehicles

By Suzanne Murtha, Atkins



Deployment Testing

On September 14, the United States Department of Transportation (USDOT) announced its awards for connected vehicle pilot deployment programs. New York City, NY, Wyoming, and Tampa, FL will receive up to $42 million to pilot next-gen technology in infrastructure and vehicles. These programs are one of the many forms of testing that need to occur to ensure the connected vehicle system is highly functional in large-scale deployment environments. Real world testing is key to understanding how to improve connected vehicle functionality. Pilot programs provide the opportunity to test applications in less than ideal situations. Testing is not always about working within a clean, ideal environment. Most test cases involve challenging environments for applications to conquer.

The USDOT is planning not only to support connected vehicle deployment in these three announced places, but is also planning to support deployments in other cities and regions throughout the country. These deployments will lead to even more successful, larger scale deployments. We'll be able to see how connected and autonomous vehicles (CAV) function and interact in a multi-modal environment at many different speeds, surrounded by pedestrians, bicyclists, and non-connected vehicles.

Closed Track Testing

Closed track testing is valuable for testing in an ideal, clean environment. Simultaneous to pilot testing, many organizations are developing closed track testing facilities for CAVs. Re-purposed airports, military bases, and even greenfield facilities across the country are being developed into facilities for closed track testing in places like New Jersey, Texas, Florida, California, and Michigan. These facilities are especially important to understand how to improve autonomous (or driverless) vehicles. For example, poorly striped/signed roads are a particular challenge for driverless cars. Closed tracks across the US also provide testing in different weather environments, while other tracks are capable of simulating their own varied weather situations. Most importantly, the closed track environment allows near-real world testing for safety-critical applications without risking impact to other road users.

With closed track environments popping up across the country, a unifying force is needed in terms of standards. The Society of Automotive Engineers is taking the lead and currently developing testing standards for autonomous vehicles. The Florida Department of Transportation is looking forward to the release of these standards, which will help unite various testing efforts and minimize risk for all of us.

Certification Testing

Certification testing measures and evaluates a particular aspect of a system performance using standardized metrics. A certification program may include several aspects of performance or just one. For example, current dedicated short-range communication (DSRC) certification plans are focused on testing interoperability. But in the future, it may also include WiFi® and Federal Communications Commission testing as part of the interoperability certification.

These testing mechanisms have at least one thing in common—they all require input and cooperation of many involved parties. Pilot deployment testing involves input from dozens of stakeholders. Closed track testing involves engagement with users and standards developers. Finally, certification testing involves engagement with equipment users, manufacturers, and test labs. This makes cross-industry cooperation and collaborative partnerships perhaps the most critical component of improving and successfully deploying CAVs.

For information, please contact Mr. Fred Heery at (850) 410-5606 or email to Fred.Heery@dot.state.fl.us.

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Florida's Turnpike Kicks-off its South Florida DMS Replacement and Installation Projects

By Ryan Brown, Florida's Turnpike Traffic Operations

Florida's Turnpike Enterprise (FTE) held a September preconstruction meeting for the installation of arterial dynamic message signs (ADMS) in Broward and Palm Beach Counties, as part of FTE's continued expansion of intelligent transportation systems in the heavily congested South Florida region. This project, one of two major dynamic message sign (DMS) projects in South Florida, will install eight full matrix, full color, front access ADMSs along approach roadways to the Turnpike's Mainline to promote and provide traveler information at east and westbound area interchanges, including:

- Sunrise Boulevard
- Commercial Boulevard
- Sample Road
- Atlantic Avenue

In addition to this new deployment, FTE opened bids for replacement of six mainline DMSs along the Sawgrass Expressway (Toll 869). These new DMSs will replace older, monochrome amber technology with full color, full matrix high-resolution (20mm) signs. For this replacement project, the existing half-span structures will be retrofitted to utilize the existing structures to economize the overall construction cost. This project will replace older signs that are no longer supported from the manufacturer and will provide the ability to utilize logos for destinations along the corridor and beyond.

This deployment continues to exemplify FTE's emphasis on utilizing its funding to maximize information available to motorists. These projects, with a combined cost of approximately $3 million, and total deployment/upgrade of 14 DMSs will provide much greater ability to disseminate local travel information along the Sawgrass Expressway and the arterial feeder roads to the mainline in Broward and Palm Beach Counties.

For information, please contact Mr. Eric Gordin at (407) 264-3316 or e-mail to Eric.Gordin@dot.state.fl.us.

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Older ADMS to be replaced.

Full Color Dynamic Message Sign Network Simulation

By Clay Packard and Philip Blaiklock, Atkins

Testing and demonstrating SunGuide® software is made possible by using software simulators. Field devices can be and are used in software testing, but cannot be used for all testing scenarios. Conducting validation testing of the entire system at the Traffic Engineering Research Laboratory (TERL) would require purchasing many expensive dynamic message signs (DMS) and other intelligent transportation systems (ITS) devices. The latest addition to the TERL arsenal of device simulators is the full color, full matrix DMS simulator supporting National Transportation Communications for Intelligent Transportation System Protocol (NTCIP) 1203 version 3.04.

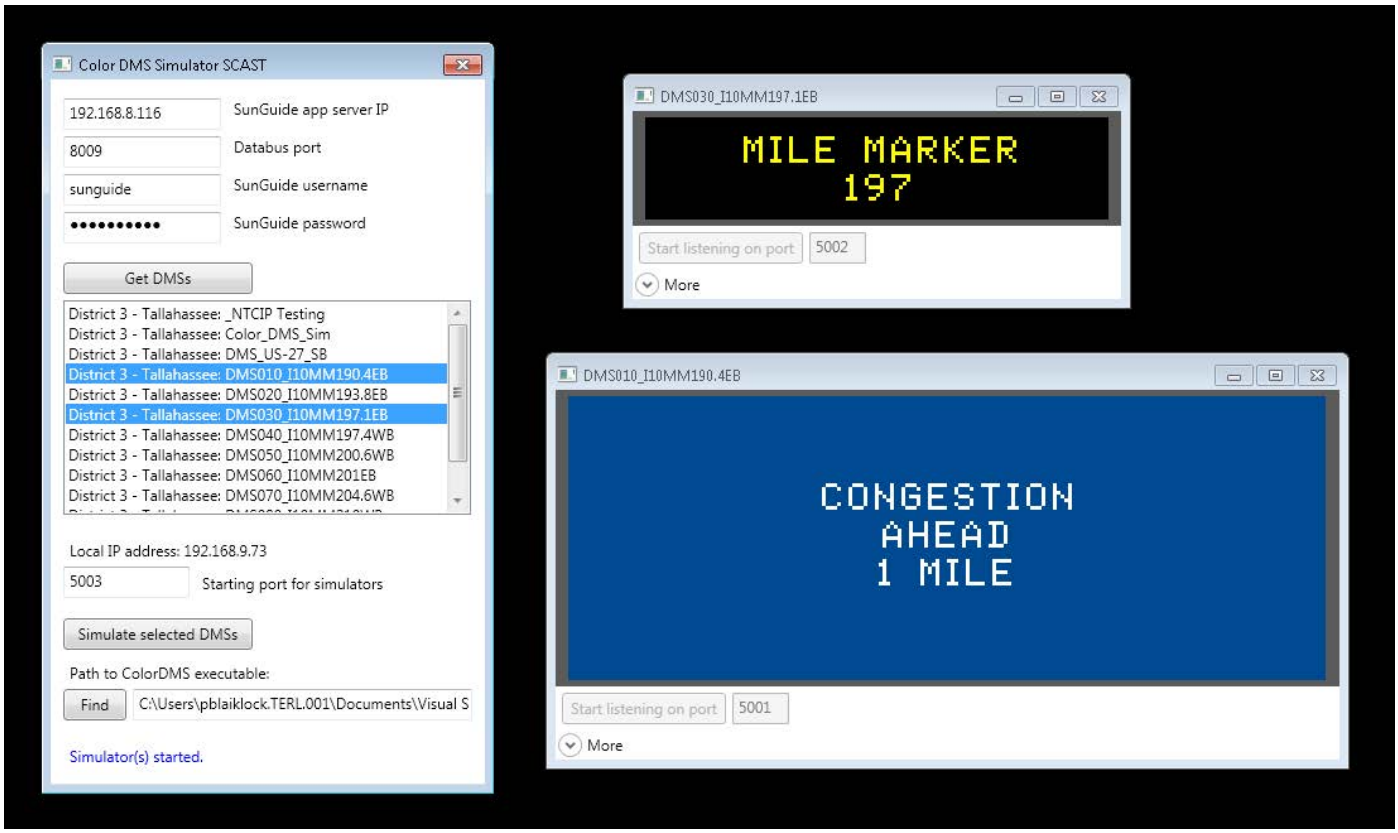
The color DMS simulator application presents itself on the network as a DMS controller. SunGuide software connects to it and communicates with it just as it would a physical DMS controller in the field. The simulator implements the NTCIP commands that are most commonly used by SunGuide software to display messages and graphics. It also supports storage of 24-bit images and will also store fonts in the future. SunGuide software does not send fonts to signs currently, but vendor master software can send fonts to DMSs, and the signs then use these fonts to render the text on the display. Once this feature is supported in SunGuide software, the simulator will be enhanced to support receiving fonts to render the text display. The simulator also stores images sent to it by SunGuide software to render as well.

The full color, full matrix DMS simulator allows SunGuide software systems to be used for testing, validation, training, and demonstration.

The simulator shows the same display, pixel-by-pixel, on its graphical user interface as would be displayed on a DMS. The simulator has controls for additional functions that help with real-world challenges. It can introduce a delay in the network communications responses to test SunGuide software's ability to overcome delays. SunGuide software must keep up with the status and control of many signs at once without letting one sign's delay impact the responsiveness in communicating and controlling other signs. In addition to delay, the simulator can also simulate a dropped connection and restore that connection without terminating the application.

SunGuide software testing is more valuable when it is done on a system that is as realistic as possible. Some of these details include having multiple devices that are configured just like they are in a District deployment. Using a copy of a District's software database is the best and fastest way of deploying the test system. This copy already has the device configuration in place for multiple DMSs and other intelligent transportation systems field devices. However, the configuration for each device includes an Internet protocol (IP) address and port that is used in the District, so in order to be successfully used as a test system, the sign configuration has to be changed to use the local communications address of the simulator. Additionally, multiple instances of the simulator need to be launched to simulate the entire network of DMSs in the District.

Individually configuring DMSs in a test system with the simulator's IP address and a set of unique port numbers, and individually launching multiple simulators for each of these signs can be very time consuming. Automating this process would save hours of work each time a District test system is deployed. The SunGuide Configuration And Simulation Tool (SCAST) is an application built at TERL to automate this process. The SCAST application first retrieves the DMS configuration from SunGuide software. The user then selects all or a specific subset of DMSs to simulate and invokes the SCAST function. The SCAST application modifies the IP address and port numbers of the DMS configuration in SunGuide software to point back to the computer hosting the simulator. The application can even re-configure non-NTCIP signs or older character-matrix signs. Finally, the SCAST application launches multiple instances of the simulator at each of the port numbers used, and the SunGuide software configuration and simulation deployment is complete. The process takes just seconds.



SCAST automates the process of configuring a test system and launching multiple simulators, reducing this burden from hours to seconds.

This SCAST concept was also applied to the microwave radar detectors as well.

Device simulation is a very important part of the SunGuide software testing program. It is used in software testing, training, and for demonstration to other potential users and agencies. More information about the SunGuide software device simulation and SunGuide software in general is available at sunguidesoftware.com. A direct link to SunGuide software device simulation information is available at sunguidesoftware.com/about-hub/device-simulation.

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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FDOT District Six Enhances SunGuide® Transportation Management Center

By Javier Rodriguez, FDOT District Six

The Florida Department of Transportation (FDOT) redesigned and updated the SunGuide® Transportation Management Center (TMC) to improve operational efficiency with daily traffic services in south Florida, and plan for future growth.

The goal of the $1.9 million redesign was to enhance the center's ability to handle current and future traffic operations challenges. The retrofit project transformed the control room floor by maximizing and reorganizing the existing workspace capacity to improve efficiency. The previous workspace was changed from a simple linear model with a total of eight traffic operator workstations into a pod-based model featuring 18 traffic operator workstations and six manager support desks. Three to five more computer monitors were added to each workstation and the size of the center's video wall was increased.

The new layout is promoting a more collaborative approach to traffic management. The workstations are sectioned into four pods that group operators by major highways and functions. The additional computer monitors are increasing operator workflow by enabling them to multitask more efficiently. The larger video wall expanded the center's overall highway monitoring capabilities.

Redesigned and updated District Six TMC.

These improvements are set to increase the TMC's efficiency and enhance the benefits of traffic services that drivers depend on daily. This also equips the center to handle additional transportation projects, such as ramp signaling, arterial management, 95 Express Phase 2, and Palmetto Express, among others.

The TMC serves as the regional hub for traffic operations. It houses traffic operations for FDOT District Six and Miami-Dade Expressway Authority, dispatch operations for the Florida Highway Patrol Troop "E," and the Florida Fish and Wildlife Conservation Commission. Together, these agencies manage highway operations, clear roadway incidents, and keep drivers informed of real-time traffic conditions 24-hours per day, 7-days per week. In fiscal year 2014/2015 traffic operators managed 49,500 traffic events, 19,000 lane-blocking events, and posted 427,000 messages on the District's dynamic messaging signs.

The retrofit was completed in August and shows FDOT's continued commitment in addressing traffic congestion issues in our community. It was completed within the 60-day contract period and remained on budget. The retrofit was initiated because most of the TMC's infrastructure and equipment were reaching end-of-life. District Six drew on this opportunity to not only replace the equipment, but to redesign it to the conditions that would accommodate planned growth in the region.

A project video and fact sheet are available online (under News Flash) at www.sunguide.info/sunguide/index.php.

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

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ITS Florida: Webinar/Board Meeting/Tours

By Sandy Beck, ITS Florida

Florida International University (FIU) hosted the Intelligent Transportation Society of Florida (ITS Florida) Webinar, Board Meeting, and tours of the Lehman Center for Transportation Research (LCTR) at FIU on September 22, 2015.

Webinar presentation was well attended.

Peter Vega, Florida Department of Transportation (FDOT) District Two, presented the methods taken to create the Jacksonville transportation management center (TMC). The TMC design incorporated lessons learned from the past, best practices, and new technology. District Two's move in date is approaching fast.

Following the Board Meeting, Dr. Mohammed Hadi (with FIU) provided tours of the LCTR facility. This included presentations by the current doctorate candidates, and tours of the driving simulation lab and wall of wind.

The driving simulation lab is a collaboration between FIU's Colleges of Engineering and Computing, Nursing and Health Sciences, and the LCTR to provide a center dedicated to driver safety, human factors, and related engineering projects. The driving simulator is a full-size car set up on the third floor of the facility. A video was previewed, which illustrated how the car made it to the third floor of the building using the elevator shaft. This was an engineering feat in itself.

The tour included the wall of wind, a facility on campus that can create hurricane force category 5 winds. The photo illustrates the size of the equipment used to generate hurricane force winds.

FIU Wall of Wind.

In addition to the FIU tour, we also toured the newly refurbished FDOT District Six TMC. The new operator pods are a great upgrade to normal workstations. It illuminates how to make the most out of a workstation by providing the tools necessary and keeping ergonomics in the forefront.

For more information on ITS Florida, please check the ITS Florida web site at www.itsflorida.org or contact Ms. Sandy Beck, Chapter Administrator, at itsflorida@itsflorida.org. If you wish to contribute an article to the *SunGuide® Disseminator* on behalf of ITS Florida, please email Ms. Stephanie Hoback at Stephanie.Hoback@Wavetronix.com or Sandy Beck.

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Editorial Corner: TSM&O – Transitioning from Strategy to Implementation

By Raj Ponnaluri, FDOT Traffic Engineering and Operations

The professionalism and enterprise of the Florida Department of Transportation (FDOT) is remarkably visible in all aspects of its transportation initiatives, which are aimed at providing mobility to all road users. FDOT's Transportation System Management and Operations (TSM&O) Program's mission is thus consistent with the Federal Highway Administration's (FHWA) definition, i.e., develop "an integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system."

FDOT's leadership has provided outstanding support to the TSM&O Program throughout the years, as is evident from the Executive Board's endorsement of the TSM&O Business Plan and the outline of a Strategic Plan in 2010. FDOT's State Traffic Engineering and Operations Office (TEOO) had initiated various activities including a dialogue with the District Offices as part of its Intelligent Transportation Systems (ITS) Program. Since the freeway component of FDOT's ITS initiatives have matured, it was felt that the arterial network needs to be prioritized; therefore, the Statewide Arterial Management Program (STAMP) was created in 2014. With quick successes of the STAMP initiative, including the deployment of advanced signal control technology pilot projects in Phase I and more corridors set for Phase II implementation, the expansion of the STAMP efforts is recognized as being central to FDOT's TSM&O Program. The need of the hour is to quickly transition from strategy to implementation.

The next priority of the TSM&O Program is to make it truly multimodal. To meet this objective, the TEOO is working closely with FDOT's Transit Office and partnering to deliver four transit signal priority workshops at the District Offices. Furthermore, the TEOO has reached out to the Planning and Transit Offices regarding the STAMP initiative, while working closely with other divisions. The TSM&O Task team lead by TEOO includes the Planning, Statistics, and other offices with the objective to continually collaborate for efficiencies and effectiveness in delivering transportation services to all road users. Such efforts are not only cross-functional, but also promote dialogue among FDOT staff and with stakeholder agencies. A key note in this regard is that all of the elements presented in the TSM&O image to the right, which includes freeways, arterials, transit, incident management, etc., are individually distinct components yet, when brought together create a unique TSM&O Program. Towards achieving this synergy, FDOT worked with FHWA and, with their support, conducted a joint workshop on ramp metering in May 2015. As the TSM&O Program begins to discuss the development of guidance on ramp metering, FDOT will continue its dialogue with FHWA.

The TSM&O Program is keen to demonstrate leadership in working closely with each District, as one of its important roles of TEOO is to provide guidance and policy frameworks for the implementation and deployment efforts. Toward this goal, the TSM&O Program will work closely with the District Offices through frequent visits to field offices, detailed interaction with Traffic Operations staff and their counterparts in the District Offices, and with local agencies.

With many activities set for planning and development in the TSM&O Program, the TEOO will seek guidance from FDOT's leadership on the future course of action (top-down approach), while working closely with the Districts (bottom-up) to facilitate the development and deployment of a realistic and time-bound TSM&O Program. This blend is essential to brand and develop a sustainable program and a national leader in TSM&O.

For information, please contact Dr. Ponnaluri at (850) 410-5616 or e-mail to Raj.Ponnaluri@dot.state.fl.us.

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Announcements

Mark Your Calendar

The American Association of State Highway and Transportation Organization (AASHTO) is holding the AASHTO Special Committee on Wireless Communication Technology 2015 Strategic Planning Meeting on October 27-29 at the Florida Department of Transportation, District Seven Office located at 11201 N. McKinley Drive, Tampa, Florida.

More information on this meeting is available online at www.cvent.com/events/aashto-special-committee-on-wireless-communication-technology-2015-strategic-planning-meeting/event-summary-65ef7b7d9f834e948bd9598480e4c285.aspx

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Good Luck Paul Clark!

Please join us in congratulating Paul Clark on his new position at FDOT's Office of Maintenance. Paul will be the Statewide Manager for Scale Operations in the Motor Carrier Size and Weight Unit.

Good luck Paul!

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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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