FLORIDA DEPARTMENT OF TRANSPORTATION



May - June 2019

District Six **Updates Software to Improve Maintenance Activities**



FLORIDA DEPARTMENT OF TRANSPORTATION'S TRAFFIC ENGINEERING AND OPERATIONS PUBLICATION





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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.

LOOKING TO BE A CONTRIBUTOR FOR THE NEXT ISSUE OF THE TSM&O DISSEMINATOR?

Email Jennifer Rich (Jennifer.Rich@dot.state.fl.us) with your story subject and title.

We would love to have your contribution be a part of the next edition.

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District Six Updates Software to Improve Maintenance Activities

By Javier Rodriguez, TSM&O Program Engineer, District Six, FDOT

The District Six Transportation Systems Management and Operations (TSM&O) Office updated its maintenance software to improve the operational availability of the program's traffic management devices during power outages.

The District's SunGuide Transportation Management Center (TMC) uses thousands of Intelligent Transportation System (ITS) devices

to support daily operations in Miami-Dade and Monroe counties. These devices collect roadway performance data, provide live traffic camera feeds, and publish traveler information 24 hours per day, seven days per week. The District depends on these devices to manage traffic and works to maintain their availability as close to 100 percent of the time as possible. However, as with all technology, service interruptions sometimes happen due to physical damage, inclement weather, or power outages. To safeguard against power disruptions, the district uses a back-up system that automatically connects failed devices to uninterruptable power supplies (UPS) to ensure operational continuity in the region.

The District recently enhanced this function by activating and configuring the notification



feature of its Advanced ITS Monitoring System (AIMS) to automatically alert staff when a device fails and goes into back-up mode. These alerts are keeping staff informed and are allowing them to take quicker action to resolve these issues before additional disruptions occur. The new feature presents a major improvement from the previous procedure which required staff to manually check for failures on a periodic basis. The updated software is providing the District with a more efficient notification system, which is saving the Department time and money in maintenance-related costs. It is reducing service disruptions to critical devices and promoting a sound transportation management system to the motoring public of southeast Florida.

For more information, please contact Javier Rodriguez at (305) 640-7307 or by email at Javier.Rodriguez2@dot.state.fl.us.

Florida Turnpike's Ramp Speed Safety Program Pays Dividends

By Mary Lou Veroline, TSM&O Technical Writer, Florida's Turnpike Enterprise



Highlighted Speed Feedback Sign on the Atlantic Avenue Exit Ramp, Turnpike Mainline Exit 81

In May of 2016, Florida's Turnpike Enterprise (FTE) traffic engineers and roadway maintenance staff embarked on a joint safety review aimed at reducing the number of "fixed object hit" crashes at some of the department's most vulnerable exit ramps. These crashes were responsible for an extensive number of single-post sign knockdowns, as well as guardrail damage, resulting in undesirable increases in both repair costs and crash-related congestion.

Selecting 13 test ramps, engineers analyzed contributing factors for crashes over the previous three years and determined that speed was a primary consideration in a majority of the subject crashes. The Department then selected four of the initial study ramps to install Highlighted Speed Feedback signs to complement existing signage and alert drivers of their speeds with enough reaction time to adjust before the curve.

Turnpike Mainline (SR 91)/Homestead Extension (SR 821)

- University Drive/Northwest (NW) 27th Avenue Southbound (SB) Exit Ramp (Mile Marker (MM) 47)
- Atlantic Avenue Northbound (NB) Exit Ramp (MM 81)
- Southern Boulevard NB Exit Ramp (MM 97)

Sawgrass Expressway (SR 869)

• US-441 NB Exit Ramp (MM 18B)

FTE Roadway Maintenance staff issued traffic service requests (TSRs) for panel installations while the Traffic Operations staff procured and tested the equipment, generated plans, and worked with the contractor to finetune radar calibration, ensuring proper operation.



Sample Plan Sheet Used During Installation of Feedback Signage at Atlantic Avenue.

After field installation on June 30, 2017, engineers monitored the rate of crashes and property damage over the next 22 months to review the signs' effectiveness in curbing speed-related crashes. The results of the before and after evaluation revealed that the number of sign knockdowns and guardrail hits was reduced by an average of 69% at the subject ramp locations (see Figure 1 below).

The results of the before and after evaluation revealed that the number of sign knockdowns and guardrail hits was reduced by an average of 69% at the subject ramp locations.

The Department is encouraged by this finding and will roll out eight additional ramp locations in Broward and Palm Beach Counties later this calendar year with plans to take a more in-depth look at not only crash occurrence but speed reduction as a result of the feedback signage. Early results, however, would indicate a favorable trend in both metrics.

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SR 821 SB Off-Ramp Exit 47 University Drive/NW 27th Avenue	Sept-15	Jun-17	2	Jul-17	Apr- 19	0	100%
SR 91 NB Off-Ramp Exit 81 Atlantic Avenue	Sept-15	Jun-17	9	Jul-17	Apr- 19	4	56%
SR 91 NB Off-Ramp Exit 97 Southern Boulevard	Sept-15	Jun-17	14	Jul-17	Apr- 19	5	64%
SR 869 NB Off-Ramp Exit 18B US-441/SR 7	Sept-15	Jun-17	7	Jul-17	Apr- 19	3	57%

Figure 1: Before and After Evaluation Results by Ramp

For more information, please contact John Easterling at (954) 934-1620 or by email John.Easterling@dot.state.fl.us.

District Three's Innovative Approach to Traffic Signal Retiming Program

By Kenny Shiver, ITS Operations Manager, District Three, FDOT; Rakesh Sharma, HNTB Corporation

The Florida Department of Transportation (FDOT) District Three (D3) Traffic Operations Office manages a \$500,000 per year signal retiming program in 16 counties with over 840 on-system traffic signals. To manage funds and make informed decisions and to manage investment allocations, D3 developed an innovative way of prioritizing the signal retiming program using ranking process and an online GIS application. This article discusses the prioritization approach and how GIS was used to visually depict the locations to select future year work along with work program elements. Additionally, the article will review D3's approach towards the next five-year signal retiming program.

Signal Prioritization Approach

D3's more than 840 on-system signals were geolocated leveraging the FDOT Central Office eTraffic effort. The following approach was used to develop a prioritized list of locations for the next five years.

- 1. Each location was identified with relevant information such as roadway name, roadway ID, upcoming capacity project, evacuation route, annual average daily traffic (AADT), and urban or rural classification.
- 2. Each location was grouped into various corridors based on historical and institutional knowledge from the signal retiming. If a signal was not found on an identified corridor it was assumed that the signal was operating "free" and was not classified as part of the corridor.
- 3. Each location was tagged with the year a corridor was last retimed. For the signals without any recorded retiming dates, a default for last retimed date was assumed to be 2005.
- 4. Each signalized intersection was loaded on ArcGIS for visual and spatial verification. After the quality assurance check was complete, four information layers were overlaid on the intersection points to develop the ranking system used for prioritization:
 - Last year retimed tag
 - D3 five-year work program overlay to identify capacity improvement projects
 - Evacuation routes from Florida Division of Emergency Management (FDEM)
 - FDOT 2016 AADT layer
 - Urban or rural classification layer from 2010 U.S. census by U.S. Department of Commerce
- 5. These five categories were established for uniformity between candidate intersections based on availability of information. Spatial joins were performed using ArcGIS to determine if a signal intersected any of these five layers, and a point system was assigned to those signals.
- 6.Signals were given points from zero to 40 based on which year they were retimed, with the most recent years getting the lower score.
 - a. 10 points if the signals were on an evacuation route.
 - b. 10 points if the signals were in the urban buffer area.
 - c. Capacity improvement projects were tagged with each signal location for point allocation. Recent (two years), current, or future capacity project at that location, received 10 points.
 - d. The signal received a point total based on the AADT and the highest AADT had a point total from 25.
- 7. Once each signal had a point total, then the corridor level analysis was performed. Each corridor is defined by the signal that has the highest point total. It was assumed that if a signal was to be retimed, the entire corridor would be retimed. This resulted in a final corridor point subtotal, that is added to the "total" points to receive a final score in the signal retiming list.

Traffic Signal Retiming Five-Year Program

The traffic signal retiming plan was based on an average retiming cost of \$10,000 per signal. Working with a budget of \$500,000 per year, this amounts to only 50 signals retimed per year for the next five years. This threshold with an average retiming cost was applied to the list and the signals were tagged based on the year they should come into the retiming plan.

The remaining signal locations are either standalone signals that require lower frequency retiming efforts, or others that can be handled, as needed and as the funds are available, through in-house consultants. The D3 retiming plan is a living document, which may change based on priority changes along the corridors and the regions. The D3 Traffic Operations Office also actively reviews each corridor to select signals which may require dual timing plans. For example, some corridors may require seasonal or day of the week multi-timing plans that will need to be included in the retiming plan.

Retime Year	Number of Signals	Price Per Year
Year 1 – 2019	50	\$ 500,000
Year 2 – 2020	51	\$ 510,000
Year 3 – 2021	49	\$ 490,000
Year 4 – 2022	48	\$ 480,000
Year 5 – 2023	52	\$ 520,000

District 3 Online GIS Map

The online GIS retiming map consists of traffic signal geo-location and other metadata information. It also breaks down each signal location into a color coded yearly retime cycle with ranking. For visual reference, the last retimed circle (in color) is placed concentrically on top of the future retiming circle, based on prioritization. The online GIS map has an ability to toggle and change the year signals to be retimed, if the priority changes. The GIS map also allows the user to view each signal location with reference to the five-year work program cycle, to better plan for the signal retiming under the project.

The GIS map is an active online interactive database that is used for tracking purposes by D3 and their retiming consultants to



add up-to-date information. The map has a live D3 work program layer to help with identifying upcoming projects in the vicinity for proactive planning. A quarter mile buffer was created around each signal to determine if there is an influence. The continuous overlapping of signals along a corridor is prioritized as one segment for retiming as coordinated signals.

District 3 Traffic Signal Retiming GIS Application Data Points

District Three's Innovative Approach to Traffic Signal Retiming Program (continued)

Summary

The five-year retiming program is based on determining which isolated signals and corridors have the highest needs. Due to a high number of signals having a last retimed year of 2005, the first program year contains many individual signals that need to be retimed that have not been touched for a long time. Following the initial year, the higher priority corridors begin to appear for the following two program years, in contrast to the individual signals in the last few years of the program. FDOT D3 has programmed the next five-year retiming locations based on this methodology and is actively using this application along with its retiming consultants.



For more information, please contact Kenny Shiver at (850) 330-1589 or by email at Kenneth.Shiver@dot.state.fl.us.

Break Time



Ζ	G	W		В	G	F	Ζ	Ε	С	S	G	L	K	F
0	T	Ν	K	W	Ν	Н	R	Х	J		S	Α	А	U
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۷	S	R	T	N	В	В	Р	R	F	Q	0	A	U	۷
С	A	М	Ε	R	А	S	М		Р	D	L	D	Q	Y
K	В	J	L	Н	S	W	۷	S	Q	L	Х	L	W	Х
E	T	S	В	U	А	۷	A	В	A	Х	Q	Q	М	
N	T	В	W	Ε		W	A	H	K	F	Q	В	L	K
W	Y	С	R	G	L	H	Ν	۷	Q	Ζ	Ε	Ζ	Ε	R
В	L	Α	R	N	Ζ	W	Х	T	K	F		T	J	D
N	0		T	С	U	R	T	S	N	0	С	М	Y	F
RETIMING			SPEED				SAFETY			ARTERIAL				
CAMERAS				SOFTWARE			SIGNAL			CONSTRUCTION				

District Four's Arterial Cameras Now Available on Florida 511

By Daniel Smith, Freeway Operations Manager, District Four, FDOT



On Thursday, May 2, 2019, in an effort to further provide real-time traffic information to the public, the District Four TSM&O Group partnered with Florida 511 to fully integrate and launch arterial cameras located in Broward County, onto the official Florida 511 website.

The newest integration allows motorists across the state to check traffic conditions by selecting snapshots of District Four's arterial cameras, with a refresh timeframe of one-three minutes. In addition, partner agencies will have the capability to view daily roadway conditions, track evacuation routes, and assist in post-hurricane assessments.

An impressive total of 149 cameras were integrated, with coverage extending across central and southern Broward County; as well as along the main corridors of University Drive, State Road 7, and Griffin Road.

With this expansive integration, District Four's Arterial Management Program continues to strive to improve arterial traffic conditions and pedestrian mobility.

For more information about District Four's TSM&O program, please contact Daniel Smith at 954-847-2633 or by email Daniel.Smith@dot.state.fl.us.

ITS Florida 2018 Outstanding Chapter of the Year

By Jonathany Tursky, ITS Florida Immediate Past President, TransCore

We are pleased to announce that ITS Florida was named Outstanding State Chapter of the year for 2018 by ITS America. This prestigious award has now been granted to ITS Florida a total of eight times since its inception in 1995.

ITS America regulates this award based on a particular chapter's outreach activity, membership activity, annual meeting participation, special projects, advocacy, transportation technology awareness, membership meetings, member growth, and other factors for consideration. All other state chapters review and vote on detailed submittals from across the country. The three specific categories for this year's competition focused on the following:

Part 1) Strong and Engaging Chapter Governance

- Part 2) Significant Impact via Networking, Outreach, and Advocacy
- Part 3) Effective Organization and Professional Development

Representative Membership and Chapter Activities

The ITS Florida Board of Directors meets monthly to review ongoing and future activities to ensure that all board members are up to date on committee activities and other relevant topics. ITS Florida has the following committees, each of which provides specific benefits to our members.

- Outreach Committee
- Events Committee
- Management Committee
- Advisory Committee
- Member Services Committee
- ITS Technical Committee

Representative Membership and Chapter Activities

ITS Florida has a large membership base and has continued to grow throughout its existence. The continued participation of multiple past presidents provides a large amount of support and knowledge to current board members. In addition, ITS Florida has an executive director who has been with the organization for over 10 years and provides all coordination activities for the various meetings, retreats, and other activities. The Strategic Plan, updated annually, identifies the organization goals, the committees responsible for each goal, and specific objectives to achieve these goals. ITS Florida's focus during 2018 included:

- Professional Development Training Lunch-and-Learn Programs, Technical Webinars
- 2018 Photo Contest
- 2018 Scholarship Awards
- 2019 ITS Florida Calendar
- Major Event Planning

Offsite Networking Events

In addition to monthly meetings, ITS Florida holds quarterly satellite meetings to various cities throughout Florida. These meetings are held in the various areas throughout Florida to garner interest and participation for local government agencies and smaller companies that may not be able to travel to other parts of the state. This interaction results in exchanges of ideas for bettering ITS Florida and sharing ideas and experiences gathered from the various ongoing ITS projects around the state. In 2018, these meetings took place in:

- ITS5C Summit in Jacksonville, Florida This meeting included participation from ITS Florida, ITS Georgia, ITS Carolinas, ITS Tennessee, and Gulf Region ITS (GRITS).
- Quarterly satellite meetings and board retreats around the state Panama City, Jacksonville, and Safety Harbor.

Willingness to Advance Unique Ideas and Practices

ITS Florida also promotes unique ideas and practices to the private, public, academic, and government sectors. The ITS Florida Calendar has been a great success. This innovative idea was established in 2009, with our first calendar printed in 2010. It creates involvement from all of its members. ITS Florida holds a photo contest each year with the winning photos incorporated into the calendars that are widely distributed to members and their clients.

ITS Florida distributed 4,000 calendars in 2018, including providing these publications to the Florida Legislature, FDOT district offices, local municipalities, and transportation planning organizations. The 2018 ITS Florida Calendar has been renamed in honor of a former ITS Florida president and the originator of the highly successful calendar. In his honor, the calendar will now be named the "ITS Florida Chester Chandler Calendar."

ITS Florida is honored to have, yet again, been named Outstanding Chapter of the Year and continues to advocate and disseminate information of the benefits of ITS in all aspects of transportation. For more information on ITS Florida visit <u>www.ITSFlorida.org</u> or contact Sandy Beck at <u>www.itsflorida@itsflorida.org</u>.

ITS Florida Awards

The awards may be bestowed to both individuals and organizations.

ITS Florida Member of the Year recognizes outstanding achievement as an organization. The primary criteria for nomination and selection are:

- 1. The work is operational or about to be operational;
- 2. The work is of major significance to improve transportation in Florida;
- 3. The work is a major innovation in any aspect of ITS; or
- 4. The work is of state or national significance.

ITS Professional of the Year recognizes an ITSFL organizational member's representative for outstanding achievement. This award is to recognize that person, who has contributed significantly to the ITS community during the past year.

ITS Florida President's Award recognizes an ITSFL organizational member who has sustained superior service to ITSFL.

ITS Champion recognizes any proponent of ITS for outstanding service in promoting ITS in the State of Florida.

Certificate of Outstanding Achievement may be awarded to an organization or individual for outstanding accomplishments worthy of recognition by ITSFL.

Recommendations for annual awards should be submitted online at:

https://fs16.formsite.com/ITSFlorida/Awards_complete/index.html

You may nominate an individual including yourself, an organization, or both. The deadline for submission is September 15, 2019.

Contact ITSFlorida@ITSFlorida.org should you require additional information.

It's time for nominations for the 2019 ITS Florida Awards.

The deadline for submission is September 15, 2019.

District Three Construction Career Days

By Amy DiRusso, TSM&O Program Engineer, District Three, FDOT

Once a year, high school students across FDOT's District Three have the opportunity to interact with Florida's leading construction experts and learn about the careers available in the industry. As part of this initiative, District Three's Traffic Operations took the opportunity to introduce students to Intelligent Transportation Systems (ITS), a program that might otherwise be unknown to them. Despite ITS elements being increasingly common throughout cities and roadways, few students are aware of how this could materialize into a viable and rewarding career.



Construction Career Days (CCD) is an educational outreach program that traces its beginnings in Florida to 1999. This April, more than 600 students from high schools in Santa Rosa and Escambia Counties attended the two-day Northwest Florida CCD event in District Three. The students participated in presentations, question and answer sessions, and hands-on activities – including operating excavators! Through these activities, students gained insight from real-world professionals about what it takes to build the skill set for a job in transportation and construction. A few of the departments present at the event included Bridge Maintenance, the Construction Office, Law Enforcement,

Commercial Vehicle Enforcement, the Department of Agriculture, and the Department of Corrections, in addition to private sector engineering and construction firms. Kenny Shiver, Greg Reynolds, and David Roark represented the District's Traffic Operations Office, not only giving an overview of ITS, but also explaining how other programs such as Rapid Incident Scene Clearance (RISC), Road Rangers Service Patrol (RRSP), and operations at the Traffic Management Center

integrate and work together.

Booth presentations, called Learning Labs, included operations at the TMC, coordination with responding agencies, the installation and maintenance of devices in the field, and the response and recovery aspect of ITS with regard to the RRSP Program. The latter was of special interest to many of the participants and a good opportunity for outreach to explain how highways are advancing and becoming more technologically integrated each year. As the question and answer sessions rolled on, students were able to speak to road rangers and tow truck operators about the types of tasks of operational staff members, backgrounds specific to their professions, and good avenues for entry level employment. Questions were mostly related to aspects of safety, tips on the job, patrol areas, required trainings, public safety and logistical experience.



Construction Career Days is more than just a day in the field, it is a hands-on encounter with the real world, exploring career paths outside of the classroom, operating

machinery, and receiving practical answers on salaries, benefits, and job advancement options. For FDOT, ensuring that the next generation understands the "big picture" of transportation infrastructure and traffic management and operations is a decisive step in the direction of progress. Exposing and inspiring these students – most of whom are high school juniors who only recently started driving – is an investment in the future of District Three. As the population in the state grows, development soars, and additional smart investment decisions are made about public infrastructure, the need for skilled professionals is constant and enduring. Recognizing this, transportation industry stakeholders have made scholarships available to students in counties with a nearby CCD event for the submission of an essay or video regarding their experience. With no slowing down in sight for the industry, creating interest and excitement about a career in ITS is nothing short of laying the groundwork for a smart, sustainable future.

For more information, please contact Amy DiRusso at (850) 330-1241 or by email at Amy.DiRusso@dot.state.fl.us.

Intelligent Transportation Society of Florida Scholarship Program

One of the goals for ITS Florida is to increase the number of professionals in the public transportation field as a career option in order to sustain growth and improvement throughout the industry. The ITS Florida Scholarship Program provides scholarships to deserving students – the future leaders of transportation in Florida.

The deadline for submission is September 13, 2019.

There are academic scholarship opportunities available to undergraduate and graduate students attending accredited colleges and universities. Principal course work shall include transportation and ITS systems, transportation engineering, planning, public policy, and public administration.

In 2013, an additional goal was to expand the scholarship program to include a separate scholarship for ITS Florida members for training and certification. The Erika Ridlehoover Birosak Training and Certification Scholarship is available to public and private sector nominees in which their respective organizations are members of ITS Florida. The scholarship assists those seeking to advance their skill set through additional training and certification courses, to better serve their organizations and the ITS industry in Florida.

ITS Florida awards cash scholarships to deserving applicants, which enables them to take advantage of the opportunities that can be achieved through education, training, and certification programs. Scholarship recipients may have an opportunity to attend an ITS Florida related event or conference.

The deadline for submission is September 13, 2019. Detailed guidelines are posted on the ITS Florida website for the 2019 scholarships and applications should be submitted to the following site:

Academic Scholarship: <u>https://fs16.formsite.com/ITSFlorida/Scholarship_Academic_com/index.html</u> Training and Certification Scholarship: https://fs16.formsite.com/ITSFlorida/Train_Cert_Scholarship/index.html

Anyone interested in information about the ITS Florida scholarship program and sponsorship opportunities may contact Sandy Beck at <u>ITSFlorida@ITSFlorida.org</u>. Sponsorships are also available at <u>http://itsflorida.org/sponsorship/</u>.



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