

TSM&O DISSEMINATOR

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

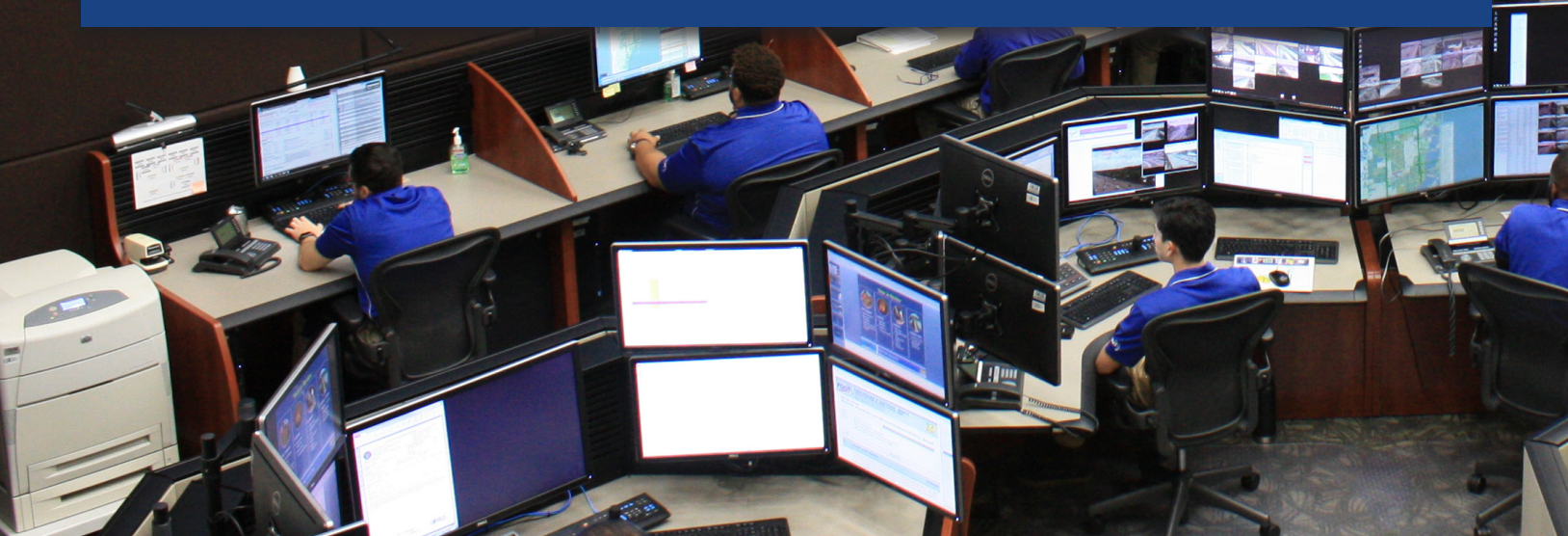
August - December 2023



FDOT District Four Damage Assessment Application

The TIM Coordinator Multi-State Scanning Tour

**FDOT Hosts Summer Holiday Travel Media
Event in District Six**





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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: teodisseminator@dot.state.fl.us with your story subject and title.

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

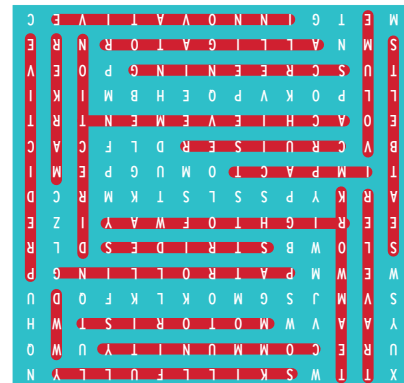
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FDOT Hosts Summer Holiday Travel Media Event in District Six

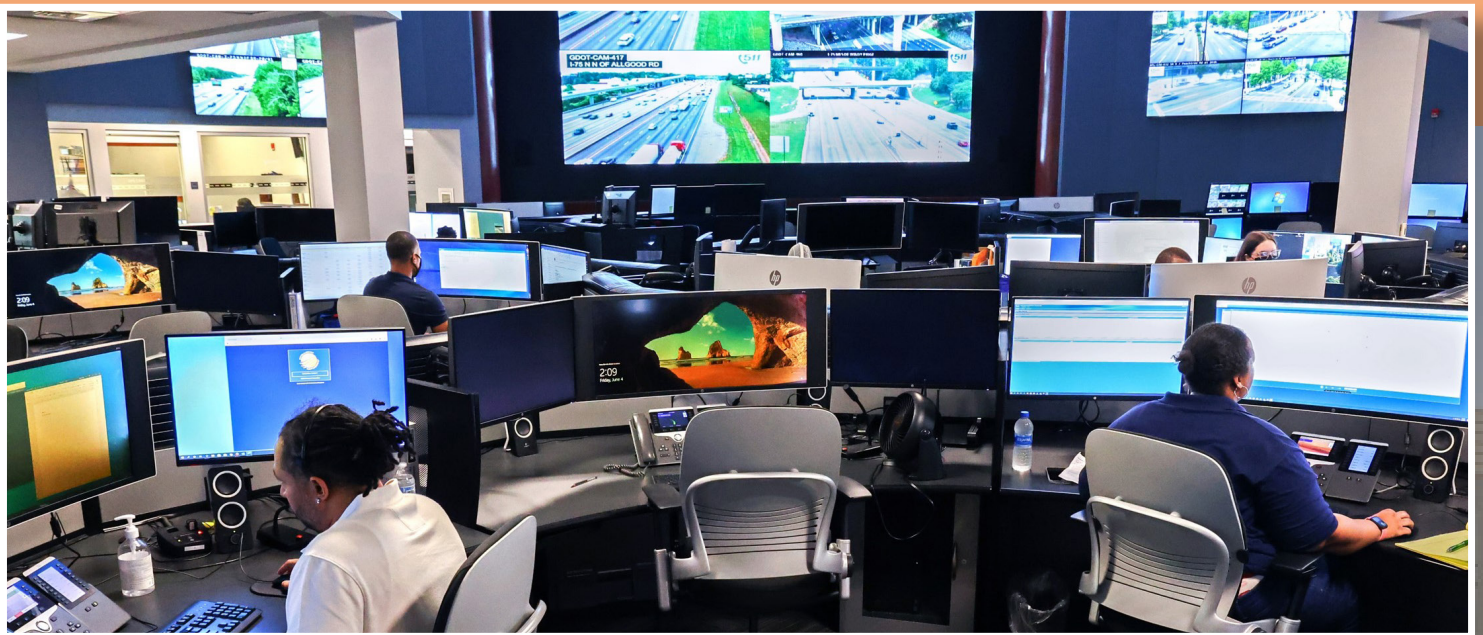
The Florida Department of Transportation (FDOT) hosted a press conference in District Six to share important safety tips for the summer travel season that kicked off with the Fourth of July holiday.

The media event was held in conjunction with transportation partners such as the Florida Highway Patrol (FHP), Bike305, and others. It highlighted the collaborative approach the agencies take to provide drivers with the resources needed to arrive safely at their destinations. Representatives from FDOT's Florida's Advanced Traveler Information Service (FLATIS), James Landini, P.E., and Savannah Sams, traveled to the District Office to speak at the conference. They talked about the tools available on FL511.com and the importance of planning ahead for a safe traveling experience on the road. FDOT District Six Secretary, Stacy Miller, P.E., urged drivers to wear their seatbelts, stay sober, avoid distractions when driving, and to call *347 if their vehicle becomes stranded. FHP Troop E Major, Roger Reyes, focused on security measures by reminding drivers to lock their vehicle doors and remain vigilant when traveling. The event was hosted at the SunGuide Transportation Management Center to give media agencies a first-hand look at the traffic operations services provided to the public 24 hours per day, 7 days per week. They recorded footage of the video wall and the traffic operators at work to show viewers the effort that goes on behind the scenes. The event was followed by a vehicle demonstration of the District's Road Ranger and Incident Response Vehicle trucks that are available for roadway clearance and motorist assistance.

The press conference was covered by all the major print and broadcast media stations in southeast Florida. The story was transmitted in English, Spanish, and Creole. The event allowed FDOT and its partners to engage with the media and share this important information to the community. Educational events are vital to FDOT's mission of providing a safe transportation system that ensures the mobility of people and goods in our state.

The TIM Coordinator Multi-State Scanning Tour

By Christopher Ison, TIM Coordinator, FDOT District Four



In the ever-evolving landscape of Traffic Incident Management (TIM), the pursuit of continuous learning and collaboration remains pivotal for driving progress. The TIM Coordinator Multi-State Scanning Tour emerged as a visionary undertaking. This initiative is dedicated to nurturing connections and facilitating the exchange of knowledge among seasoned incident management experts hailing from various states. During the period of July 17th to July 21st, 2023, our very own FDOT District Four, Christopher Ison, Traffic Incident Management Coordinator, actively participated in this program. This involvement signifies our commitment to staying at the forefront of incident management practices, fostering meaningful relationships, and contributing to the enhancement of incident response strategies on a broader scale.

Key Objectives of the Tour

The primary objective of the TIM Coordinator Multi-State Scanning Tour is to observe operations in various states and glean insights from experienced subject matter experts in each locale. By doing so, participants aspire to amass valuable knowledge and best practices that can be applied within their respective regions. The tour is equally dedicated to fostering strong professional relationships and nurturing collaboration among Incident Management professionals nationwide.

Highlights and Impact of the Tour

Over the course of the tour, several pivotal moments left an indelible mark on the participants. A notable highlight was the initial visit to the Atlanta Traffic Management Center (TMC), where discussions centered around severe weather management, including Georgia's Hurricane Evacuation Plan. The Senior Transportation Operations Engineer, an orchestrator of TIM meetings in Georgia, imparted invaluable insights, including the art of initiating meetings with thought-provoking questions, leveraging county emergency management leaders to drive stakeholder engagement, and utilizing the responder safety website for real-time information updates. Participants also received templates for meeting agendas and guidance on conducting TIM self-assessments.

On the third day, the participants actively took part in the Georgia iteration of the National Traffic Incident Management Train-the-Trainer Course, skillfully led by the Senior Transportation Operations Engineer. This immersive training brought real-world case studies to the forefront and emphasized the imperative of stakeholder collaboration for the secure and efficient resolution of incidents.

The fourth day, the tour led to Norfolk, VA, where the participants were introduced to the VDOT's Hampton Roads Transportation Operations Center (TOC). The Regional Safety Service Patrol (SSP) Manager provided a comprehensive overview of the Incident Management Coordinator position within VDOT. This role, significantly distinct from Florida's FDOT D4 TIM Coordinator position, involves acting as a vital link between the TOC and all stakeholders, necessitating on-site presence during various incidents. An enlightening ride-along with SSP operators showcased effective management of a five-car accident scene within the bridge and tunnel operations.

The tour's culmination on the final day occurred in Richmond, VA, featuring a facility tour, a thorough exploration of Virginia's districts, insights into safety protocols during civil unrest scenarios, and a comprehensive briefing on TIM training requisites and the integration of novel technologies.

Looking Ahead

The TIM Coordinator Multi-State Scanning Tour has laid the foundation for long-term benefits. The relationships cultivated with industry peers across the nation hold immeasurable potential for the exchange of ideas, experiences, and expertise. Participants have gained access to Incident Management training programs, meeting records, and certification as Traffic Incident Management Responders. This certification empowers District Four to deliver comprehensive training to stakeholders, thus elevating overall incident response effectiveness and safety measures.

The TIM Coordinator Multi-State Scanning Tour stands as a triumphant endeavor for Incident Management professionals striving to broaden their horizons and disseminate best practices. Through observations, immersive training, and networking opportunities, the tour has solidified connections spanning states and nurtured a collaborative ethos. As participants rejoin their respective regions, they carry forth a treasury of invaluable insights and experiences that will continue to mold and elevate Incident Management practices on a nationwide scale.

For more information on FDOT District Four's TIM Coordinator Multi-State Scanning Tour, please contact Alexandra Lopez, at Alexandra.Lopez@dot.state.fl.us or by phone at (954) 777-4376.

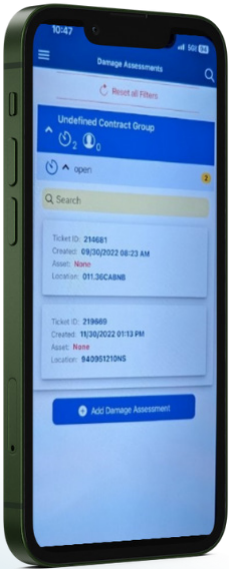
FDOT District Four Damage Assessment Application

By Nicole Forest, TSM&O Resource Manager, FDOT District Four

The Florida Department of Transportation's District Four Transportation Systems and Operations (TSM&O) Maintenance program serves the region of Broward, Palm Beach, Martin, St. Lucie, and Indian River counties. One of the responsibilities of the TSM&O Maintenance program is to perform assessments post storm during hurricane season (June 1 - November 30) or as emergencies arise. As part of those assessments, each device and site are assessed for any damage and recorded, and before and after photos are compared to document damage. This allows the department to properly assess damage caused by Hurricanes and to ensure repairs are properly documented and completed in a timely manner. It also ensures that all costs associated with repairs are auditable and tracked.

The Challenge: Traditional Manual Assessment

In the past, this process was very tedious and labor intensive; all relevant information was manually accumulated and subject to human error. Each year the Department would assign maintenance staff to go to the field and take pictures of all ITS sites. In preparation for a hurricane, the District's maintenance team would print out multiple packages with recent ITS pictures and plan for a post-storm assessment. Once a storm had passed, the District's maintenance team would take the printed packages, and visit each ITS site to manually document any damage caused by the storm.



The Innovative Proposal

Nicole Forest, the Florida Department of Transportation's District Four TSM&O Resource Manager currently in charge of the TSM&O Maintenance Program, proposed an enhancement to the District's Maintenance and Inventory Management System (MIMS) software, that would allow the maintenance team to use a smart phone app to track and assess the damage of relevant assets, identify their location, the severity of the damage, and remediation actions and costs.

Empowering MIMS Software

The MIMS software was specifically designed to facilitate and streamline ITS asset maintenance and inventory management. It provides users with the ability to manage and track the complete lifecycle of each asset and associated scheduled and/or unscheduled maintenance activities. MIMS also allows for the creation of work orders and invoices that include system and user generated maintenance activities, preconfigured cost items, and labor rates. The system also includes planning tools that can be used to forecast replacement and maintenance costs for future fiscal years and capital programs. The Damage Assessment functionality was built to be accessed in the field via the MIMS mobile application using a modern smartphone, and to capitalize on the effort already expended by the district on managing, maintaining, and tracking existing ITS inventory.

Efficacy and Benefits

This innovation benefits the District Four Regional Transportation Management Center (RTMC) Operations and Maintenance team, which consists of 100+ staff members. The enhanced application saves time and labor costs by accelerating the process of visiting and documenting each site, by cataloging the damage and assessing the cost to repair and by allowing the information to be easily tracked and shared.

For more information, contact Nicole Forest, District Four TSM&O Resource Manager at Nicole.Forest@dot.state.fl.us or (954) 847-2631.



Brave Actions of One of Our District One Road Rangers!

By Tom Arsenault, District One

On Tuesday June 27 at 11:48 pm, Road Ranger Yosvanys Hernandez Garcia was patrolling his zone on Alligator Alley Northbound around the 80 Mile Marker when he noticed headlights coming at him the wrong way. The vehicle was Southbound in the left Northbound lanes. RR Garcia immediately activated his emergency overhead lights to notify the traffic behind him. He was able to get the traffic to stop and intercept the WWD, between the off ramp and on ramp for Exit 80. He spoke with them quickly and was able to get them to pull off to the shoulder. It was a young driver with her parents in the backseat. After talking to the driver, he was assessed that no drugs or alcohol were involved. They informed him they were headed to Ave Maria from Miami and had just missed the exit. (Exit 80). He was able to safely get them turned around and headed to Naples in the correct direction. RR Garcia also advised them that it was highly dangerous and illegal to turn around anywhere while on the interstate.

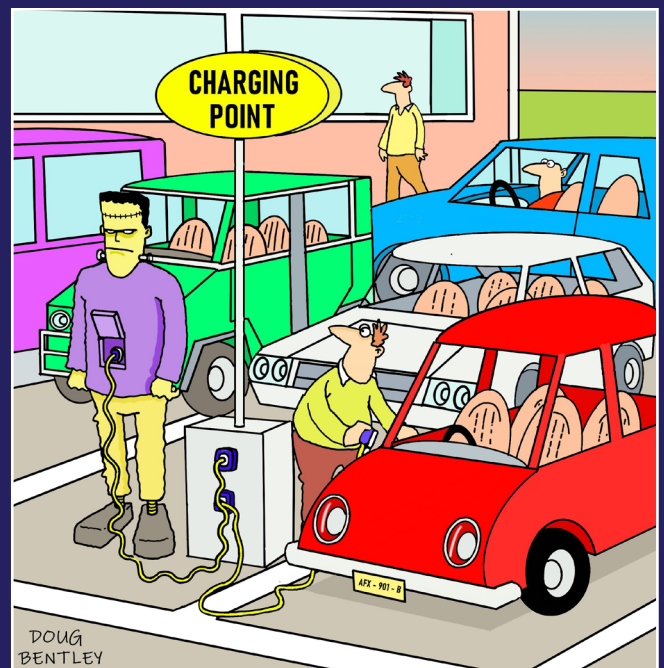
For more information, please contact Tom Arsenault at Tom.Arsenault@dot.state.fl.us or (239) 225-1915.

Break Time



Cruiser
Community
Teamwork
Patrol
Motorist
Impact
Traveler
Seatbelts
Patrolling
WWD

Alligator
Marker
Achievement
Strides
Right of Way
Skillfully
Innovative
Volume
Predictive
Screening



FHP chomps the competition and wins first place in the 2023 AAST Best Looking Cruiser Competition!



Florida Department of Highway Safety and Motor Vehicles (FLHSMV) and FHP used a variety of strategies to engage the community in this year's competition which ultimately led to an increase in votes and a surge of teamwork felt throughout the state

as different law enforcement, state agencies, media organizations, businesses, and public figures came together to raise awareness of the competition and share in the state effort to win first place.

The competition, which began on July 17, 2023, was fierce and, for those following, consisted of many ups and downs, with no clear winner holding the top spot for a significant length of time. Without a clear forerunner, states resorted to playful yet competitive banter and went head-to-head like never before, in fact there were over 1 million votes cast in this competition.

"I am incredibly proud that the Florida Highway Patrol won first place in this year's competition," **said FLHSMV Executive Director Dave Kerner**. "I know that the effort displayed by those pushing us toward this victory came from a deep love and respect for the patrol and its history as Florida's finest."

"FHP was proud to have participated in this year's American Association of State Troopers Best Looking Cruiser Contest," **said Colonel Gary Howze, Director of the Florida Highway Patrol**. "It's gratifying to see the inclusion and enthusiasm for supporting Florida by citizens, other partners, and our FHP members."

"FHP certainly deserves to be the winner of the Best-Looking Cruiser contest! They went all out with their media platforms, law enforcement partners and engaged the citizens of Florida to all get involved," **said John Bagnardi, Executive Director American Association of State Troopers**. "We are very proud to have the Black and Tan on our cover!"

The FHP picture submission was taken by retired FHP Lieutenant Jeff Frost and featured a 2019 Dodge Charger at Gatorland in Orlando and featured a 15-year-old, 8.5 ft long, 180-lb female American alligator named Tamale.

The 2024 AAST calendar will feature FHP on its cover and will be available on their website.

For more information, contact HSMV-Media@FLHSMV.GOV

FDOT FOR THE STRIDES 2 ZERO INITIATIVE



The Florida Department of Transportation (FDOT) has received a 2023 Transportation Achievement Award in the Safety Category for their STRIDES 2 ZERO initiative. The Transportation Achievement Awards recognize excellence in the advancement of transportation to meet human needs, by entities concerned with transportation, such as governmental agencies, Tribes, legislative bodies, consulting firms, industry partners, and other organizations. Awards are presented in five categories: Complete Streets, TSMO, Safety, Planning, and Traffic Engineering.

STRIDES (State Traffic Roadway and Intersection Data Evaluation System) 2 Zero (S2Z) is a statewide initiative to work toward the vision of eliminating traffic fatalities and serious injuries by implementing technological advances in highway safety engineering. The objectives of the initiative are to enhance highway safety management practices in Florida through a data-driven process and provide engineering- based safety solutions for different transportation facilities and modes.

S2Z program employs the most advanced tools and resources of the highway safety management process to improve safety on the State Highway System (SHS) in Florida. This program entails the following strategies: (i) Leverage various data sources and create a repository of roadway segments, intersections, geometry, land use, and traffic volume data, which is updated regularly with latest information; (ii) Apply state-of-the-art predictive analysis methods (e.g., Florida-specific Safety Performance Functions (SPFs)) and network screening performance measures to identify sites with the highest potential for safety improvement; (iii) Develop customized tools to facilitate diagnosis, countermeasure selection, economic appraisal, and project prioritization for safety improvements; (iv) Make sound business decisions based on the reliable estimate of expected benefits from proposed safety improvements; and (v) Monitor safety and operational performance of roadway facilities and evaluate benefits from the dollars FDOT invested. The strategies lead to implementing safety countermeasures at signalized intersections on the SHS. In addition, platforms for the screening of roadway segments and systemic safety improvements are developed for implementation.

Congratulations to the FDOT team, including the State Traffic Services and Studies Section and the State Traffic Engineering and Operations Office for this achievement! Read more about Strides 2 Zero [here](#).

FLORIDA DEPARTMENT OF TRANSPORTATION - DISTRICT FOUR



Congratulations to the Florida Department of Transportation (FDOT) District Four for being selected to receive a 2023 Council Impact Award - Transportation Systems Management and Operations (TSMO) Organization Award.

The ITE Council Impact Awards seek to recognize individuals and organizations for outstanding contributions to the transportation industry and the communities they serve. ITE Councils work to advance the knowledge and practice in their disciplines, and the Council Impact Awards seek to recognize those professionals and/or organizations who have demonstrated excellence in the following core focus areas:

- Innovative activities and contributions in the practice of transportation engineering and planning
- Advancement and implementation of TSMO and ITS technologies
- Leadership and innovation in advancing traffic safety programs, initiatives, or technologies
- Unique and successful educational programming and resources for student engagement
- Dedication and commitment to transportation in the community
- Demonstrated commitment to incorporating diversity, equity, and inclusion into all aspects of transportation

FDOT District Four is being recognized for its notable strides in advancing transportation safety and efficiency through innovative TSMO programs. This recognition is a testament to District Four’s commitment to excellence and its vision to enhance the lives of both residents and visitors in Florida.

SMART WORK ZONES

What are Smart Work Zones (SWZs)?
 SWZs are the deployment of ITS technologies and TSM&O strategies to enhance mobility and safety in and around work zones. These technologies typically produce data and camera images that are processed to become actionable information. Typical use cases include queue detection, speeding notifications, construction equipment alerts, travel time messaging, incident detection, and over-height warnings. FDOT District Four defines SWZs as a combination of **ITS + People + Relationships + a Plan**.

Why do we need them?
 Work Zones play a key role in maintaining and upgrading our roadways. Unfortunately, daily changes in traffic patterns, narrow right-of-way, and other construction activities often result in crashes, injuries, and fatalities. According to 2017-2021 statewide crash data, Florida experienced more than 53,000 work zone-related crashes, including 156 fatalities and 1,916 severe injuries. SWZ systems improve safety for motorists approaching and driving through work zones, construction workers within work zones, as well as improves travel reliability.

COMPLETED

- SR 84 Bridge Impact**
 - Summer 2021 - Spring 2022
 - Right and left closures
 - Re-open I-95 Express Lanes
 - Phase II construction
- Glades Road Diverging Diamond Interchange (DDI)**
 - Early 2023
 - Final DDI in District Four
 - Close SWZ support for opening DDI

ON-GOING

- Henry E. Kinney Tunnel Reconstruction**
 - Summer 2021 - Fall 2023
 - Full tunnel closure
 - Closing SWZ support

UPCOMING

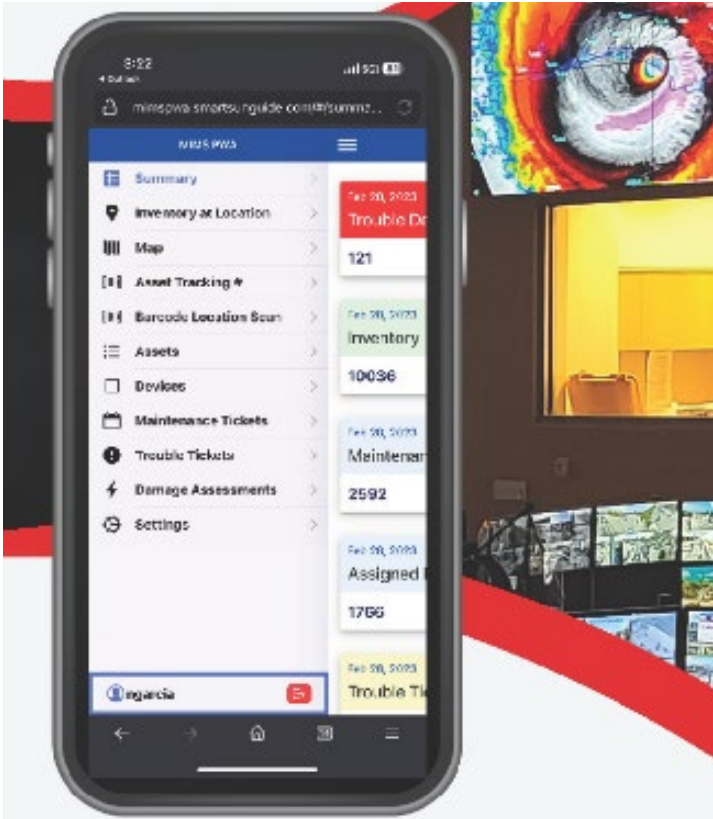
- Jupiter Bridge (US 1) Replacement Project**
 - October 2021 - early 2026
 - Planned full bridge closure early 2023
 - Close SWZ support through closure
- SR 108A Street**
 - Late 2024 - 2026
 - Key regional connector
 - Vertical lift connector
 - Interchange I-95 on-ramp in place ahead of construction

Kinney Tunnel Project Sparks Transformation.

Among FDOT District Four’s recent accomplishments is the groundbreaking Kinney Tunnel Project, an example of their innovative approach in redefining traffic safety. This ambitious endeavor, initiated in the summer of 2021 and completed in winter of 2023, has already showcased remarkable success. Throughout its construction, the department skillfully managed three complex detour scenarios—Northbound closure, Southbound closure, and Full Closure—ensuring the uninterrupted flow of traffic while safeguarding both motorists and construction workers. A key facet of the Kinney Tunnel Project was the Smart Work Zone (SWZ) program that has revolutionized construction zone

Council Impact Award - Transportation Systems Management and Operations Organization Award - FDOT District Four

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management. The real-time monitoring of the Kinney Tunnel SWZ guaranteed prompt responses to changing conditions. By collaborating closely with signal timing engineers, the Department optimized signal timing on the fly, effectively mitigating traffic congestion and enhancing traffic flow. This success culminated in the establishment of the **District Four SWZ program**, the pioneering initiative of its kind in Florida. Designed to guide all district departments in SWZ implementation, this program promises to significantly elevate safety, mobility, and infrastructure efficiency within construction zones.

Hurricane App for ITS Devices and Infrastructure Damage. District Four has also harnessed the power of technology to overhaul damage assessment processes with the Maintenance and Inventory Management System (MIMS). This TSMO-enhancing software marks a pivotal step towards revolutionizing emergency response and disaster recovery efforts. Previously, damage assessments were laborious and error-prone, involving time-consuming site visits, manual documentation, and the potential for inaccuracies.

Nicole Forest, District Four's TSM&O Resource Manager, introduced a game-changing solution—leveraging a smartphone app to comprehensively track and assess damage to critical assets. By integrating this innovation into

the MIMS software, the assessment process has been streamlined, leading to time and cost savings. The app's capabilities include pinpointing asset locations, gauging damage severity, and outlining remediation actions and associated costs. This innovative approach has demonstrated strong scalability and applicability to the TSM&O industry, with the potential to be implemented statewide and throughout the TSM&O industry, offering substantial cost reductions and significantly improved accuracy in reporting damage assessments.

District Four's pioneering work in TSMO, exemplified by the Kinney Tunnel Project and the MIMS-enhanced damage assessment process, showcases their dedication to driving impactful change in transportation. These initiatives not only elevate safety and efficiency but also resonate with FDOT District Four's overarching vision to enhance the quality of life for Florida's populace and visitors.

See FDOT District Four's 2022 Annual Report for details on their many initiatives [here](#). Check out District Four's website [here](#).

Congratulations to the FDOT District Four team on a well-deserved achievement and on your many innovative initiatives that are advancing TSMO, ITS, and making the travelling public safer in District Four: Alexandra Lopez, P.E., PTOE, TSM&O Program Engineer; Nicole Forest, TSM&O Resource Manager; and Daniel Smith, TSM&O Arterial Program Manager.

JAVIER RODRIGUEZ



Congratulations to Javier Rodriguez, P.E., for being selected to receive a 2023 Council Impact Award - Transportation Systems Management and Operations (TSMO) Individual Award in recognition of his exceptional contributions and pioneering leadership within the transportation industry of southeast Florida.

The ITE Council Impact Awards seek to recognize individuals and organizations for outstanding contributions to the transportation industry and the communities they serve. ITE Councils work to advance the knowledge and practice in their disciplines, and the Council Impact Awards seek to recognize those professionals and/or organizations who have demonstrated excellence in the following core focus areas:

- Innovative activities and contributions in the practice of transportation engineering and planning
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Council Impact Award - Transportation Systems Management and Operations Individual Award - Javier Rodriguez

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Javier Rodriguez, P.E., is TSM&O Program Engineer for District Six of the Florida Department of Transportation (FDOT). For nearly two decades, he has spearheaded transformative transportation solutions, establishing himself as an able and effective leader. His journey commenced as a young engineer overseeing operations and maintenance, and he ascended to the role of Program Engineer, where his purview encompasses all facets of highway and arterial operations. This includes incident management, express lanes, ramp metering, and Intelligent Transportation Systems (ITS) maintenance for Miami-Dade and Monroe Counties.

At the helm of the District's TSM&O Office, Javier adeptly manages contracts totaling \$30 million annually and orchestrates the activities of over 100 employees and consultants. Beyond his FDOT responsibilities, he has also imparted his expertise as a professor at local universities, nurturing and guiding the next generation of transportation professionals, both locally and across the nation.

The landscape of southeast Florida, marked by increasing population levels and constrained right-of-way space, demands innovative strategies. Javier's visionary leadership has responded adeptly, crafting strategies that propel our roadways toward future readiness and capability to handle the region's burgeoning demand.

Javier's engineering expertise, coupled with his strategic acumen, positions him as an effective driving force behind pivotal projects, notably Florida's groundbreaking multi-modal congestion-management program, 95 Express. His instrumental role in devising the operational framework underpinning the project's monumental success and subsequent statewide expansion underscores his dedication to innovation. He also spearheaded the creation of the project's congestion pricing software, a tailored incident management plan, and steadfast operational guidelines that have garnered national recognition as a "best practice" for managed lanes—a distinction largely attributed to Mr. Rodriguez's foresight and expertise.

A Legacy of Advancement. His influence extends well beyond 95 Express, touching numerous initiatives that have shaped the transportation industry. District Six's growth under his stewardship includes groundbreaking projects such as the I-75/Palmetto Express Lanes, Florida's inaugural system-to-system express lanes endeavor. Additionally, his oversight encompasses adaptive signal control traffic initiatives, rapid incident clearance services, comprehensive traffic signal operations and maintenance in Monroe County, and the imminent launch of the pioneering Connected Automated Vehicle Pilot Project in 2023.

A Visionary Leader. Driven by his visionary spirit, Javier transforms concepts into tangible progress, often behind the scenes, consistently infusing innovation into the TSM&O sector. His tireless commitment to roadway safety and the integration of principles yielding sustainable, cost-effective outcomes exemplify his dedication. He consistently puts FDOT's agency-wide mission at the forefront when creating projects within the district and builds them for future adaptability and growth.

Upon receiving this distinguished award, Mr. Rodriguez humbly shared, "I am deeply honored by ITE's recognition, and I extend my gratitude to the ITE community for their unwavering support throughout my professional journey."

Congratulations, Javier, on this achievement and for your successful leadership of FDOT District Six's TSMO initiatives. Thank you to Javier's District Six colleagues for your nomination.

Institute of Transportation Engineers | www.ite.org

District Seven Enhancing Pedestrian Detection Safety for Moveable Bridges with LiDAR and FLIR Sensors

By Bruce Wolny II, P.E., ITS Operations Manager, District Seven, Megan Arasteh, TSM&O Program Engineer, and Luke Wolf, TSM&O Intern

The Florida Department of Transportation (FDOT) District Seven has recently accelerated the integration of Light Detection and Ranging (LiDAR) and Forward Looking Infrared (FLIR) sensors into their moveable bridge infrastructure. These sensors act as a supporting system to aid bridgetenders for identifying and monitoring crossing pedestrians prior to bridge lifting. Although FLIR sensors have been the traditional solution for this application, District 7 has found that a LiDAR solution that has recently become available is an alternative that provides advantages over FLIR systems with respect to cost, procurement time (LiDAR's procurement time was not affected by the supply chain delay), and maintenance. Recognizing Hillsborough River Bridge as the most challenging deployment and thus an ideal pilot project for vetting an alternative solution, the LiDAR sensors are critical as key aspect for boosting pedestrian safety which has guided District 7 with sensor integration on other moveable bridges.

On February 7, 2022, a biker in West Palm Beach was walking across a moveable bridge. Unnoticed by the bridgetender, who activated the bridge movement operation, the biker was on the rising portion of the bridge which ultimately resulted in the biker falling 50ft. District Seven identified this fatality as a catalyst to accelerate implementing countermeasures to help mitigate potential hazards to pedestrians and other vulnerable road users.

Prior to the above-mentioned tragedy, District Seven Installed FLIR detection sensors on John's Pass and Welch Causeway to assist bridge tender visibility for the walkways remote from the tender house. Following the unfortunate event in West Palm Beach, the rollout phases of pedestrian sensor detection systems throughout bridges in District Seven were accelerated. Since 2020, the price and lead-times of FLIR systems have compounded and Light Detection and Ranging (LiDAR) was discovered as a viable alternative. While there were initial uncertainties regarding LiDAR technology and its functionality, the pilot project conducted on the Hillsborough River Bridge demonstrated that LiDAR is a more feasible solution. Ultimately, District Seven has acknowledged two potential monitoring advantages with LiDAR and FLIR accomplishing the ultimate objective of increasing pedestrian safety and reducing human operating error. The objective is to support operators decision-making awareness, not full reliance on the monitoring system.

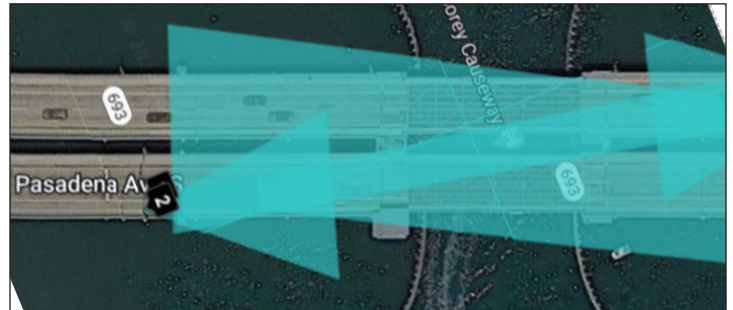


Figure 1: Corey Causeway FLIR Coverage Map

The first sensor type that was installed on the bridges in District Seven, FLIR, can detect heat signatures and can fully operate in any condition and lighting. FLIR thermal sensors require both a short range and a long-range sensor to cover a single walkway. Short Range FLIR are designed for close proximity applications with a wider field of view, whereas long-range FLIR is optimized for higher resolution optics. This is represented in Figure 1, with a coverage map of the Corey Causeway bascule bridge portraying the overlapping short-range and long-range FLIR cameras. Although the FLIR sensors are effective, there were multiple reasons why other alternatives were explored for the accelerated implementation of detection systems. It can be pinpointed due to the high cost per unit (CPU), extended lead times, and designated location (i.e. the units are not interchangeable).

Identified as the most viable alternative option, LiDAR sensors can provide full coverage of a pedestrian walkway with no blind spots (360° view) with a singular sensor. The positioning of the sensor is set in a vertical mounting position to develop a full-range field of view optimized for the linear detection zone. Due to this unorthodox positioning, testing of setup was essential; this led to the pilot project that was conducted at Hillsborough River Bridge. This view is illustrated in Figure 2, where there is full coverage of the 2 walkways



Figure 2: Corey Causeway LiDAR Coverage

District Seven Enhancing Pedestrian Detection Safety for Moveable Bridges with LiDAR and FLIR Sensors

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Figure 3: Hillsborough River Bridge LiDAR Sensor

on the Corey Causeway bridge with 2 LiDAR sensors. The LiDAR will effectively provide a complete 3-D digital twin representation of the bridge infrastructure itself and allows for real time continuous tracking. Shorter lead times,

along with decreased CPU and interchangeability guided the interest and implementation of these sensors beginning with the pilot project.

As the pilot project for LiDAR sensors, Hillsborough River Bridge paved the path for subsequent LiDAR projects by implementing and installing 3 LiDAR sensors, orientated over the pedestrian walkways - example shown in Figure 3. The LiDAR sensors were recognized as the optimal solution over the FLIR cameras due to the cost differential which required two cameras for each walkway, including both a short-range and a long-range camera. The overall estimated price difference was \$86,478 for LiDAR vs \$139,131 for FLIR installations for this particular project. Hillsborough Avenue has two moveable bridges, the north-side is a bascule bridge including the new tender house with a single walkway. Whereas the south-side has a vertical-lift bridge and includes 2 walkways on both sides of the bridge. Each walkway requires a single vertically mounted LiDAR sensor, to monitor the entire length of the walkway; therefore, requiring two sensors on the south-side bridge. To eliminate a wired connection of the two sensors on the south side bridge to the north-side tender house (which would have increased both the cost and complexity of construction), a point-to-point radio system was utilized. This includes a wireless transmitter mounted on the old/abandoned south side tender house and a corresponding receiver mounted on the new/active north side tender house. The third sensor is strategically mounted on the north side bridge tender house, facilitating a direct wired connection. This allows the bridgetender to identify any moving objects on all 3 walkways simultaneously as a color-code shape in the point cloud output. District Seven ensured the tender house was prepared with a new monitor (Figure 4) and a laminated reference sheet, as well as additional training for the operators.

During the preliminary deployment phase of LiDAR sensors, a testing period was performed. District Seven reproduced common pedestrian and bridge movements such as walking, cycling, and bridge operations. A noteworthy challenge was encountered during the bridge lift portion of the testing.



Figure 4: Hillsborough River Bridge Tender House LiDAR Monitor

Specifically, although the sensors correctly identified the bridge lifting (the vertical lift span), when the bridge was lowered, the sensors continued to show the bridge as lifted, which interfered with pedestrian

detection in this area. However, this error subsided after about 10 minutes. This detection error was ultimately resolved by adjusting the set-object timer parameter that eliminates the moving object after a set time of non-movement.

Due to preexisting FLIR sensors installed remote from the tender houses on both the Boca Ciega Bay Bridge, also known as “John’s Pass” and the Welch Causeway bridge,



Figure 5: Welch Causeway FLIR

there was no intention of adding additional LiDAR sensors when outfitting the walkways adjacent to the tender houses, as this would have increased the complexity of these

operating systems by having 2 different systems on the same bridge. The FLIR sensors covering the walkway remote from the tender house at Welch Causeway are shown in Figure 5. The sensors covering the near walkways on these 2 bridges are currently being installed as part of the final phase of outfitting all of District Seven’s moveable bridges with pedestrian detection equipment.

Since the initial project of LiDAR sensor on Hillsborough Avenue, LiDAR detection systems have been installed on 3 other moveable bridges: Corey Causeway, Indian Rocks, and Kennedy Blvd. The integration of the pedestrian detection sensors supplements the bridge tender’s situational awareness and thus increases the safety of pedestrians and other vulnerable road users.

For more information, please contact:

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ITS Florida Awards

DEADLINE DECEMBER 31TH, 2023

The ITS Florida awards program is now accepting nominations for deserving individuals, projects and organizations for 2023 in the following categories.

The **Front Line Of The Year Award** recognizes the top front line staff in their respective field. These individuals are role models within the industry. They contribute to the transportation network operating in a safe and efficient manner for the traveling public. The three awards categories include:

Road Ranger* of the Year

ITS Field Technician* of the Year

TMC Operator/Supervisor* of the Year

Public and private sector candidates are eligible for nomination.

The ITSFL Board will select and award a winner in each category.

For the requirements, and documentation needed, visit: https://fs16.formsite.com/ITSFlorida/Front_Line/index

** Excludes managers*

ITS FL Member of the Year Award recognizes an ITS program, project, or other accomplishments that is of significant benefit to the transportation industry and to the traveling public during this calendar year. The award can be for any public or private sector member of ITS Florida. The primary criteria for award consideration are that the work provides (is providing) improved transportation for Floridians.

The criteria for the nomination and selection are: 1) the work is completed or about to be operational by 12/31/2023; 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 Award recognizes that person, or persons (although generally one person per year), who has contributed significantly to the ITS community during the calendar year. The person nominated should be noted for contributing to the ITS mission/ goals of ITS FL.

The criteria for this award include: 1) the person has contributed to ITS mission; 2) person has been instrumental in project management, project completion, project planning, development of planning, financial, or other strategies; and 3) person has had a key role in some significant program or project, which may include activities of ITS Florida itself.

ITS Florida President's Award recognizes superior career achievements in ITS and extraordinary service to ITS Florida. It may not be awarded annually. This is ITS Florida's highest award and should be given only for truly superlative performance and accomplishment.

ITS Champion Award may be given to an individual (ITSFL member or not), who has made significant contributions to advance the cause of ITS in Florida. This award should be given only for rare and conspicuous service.

Certificate of Outstanding Achievement is an "open-ended" class of awards that may be given by ITS Florida for outstanding service by individuals or organizational units. Past awards have been given for individuals who have performed superior service as, for example, chairs of ITS FL conferences, to FDOT districts for deploying new, integrated RTMC's, and for individuals who have provided outstanding service, such as volunteers serving ITS conferences.

Honor Roll—ITS Florida occasionally identifies a person in the transportation business who has greatly contributed to ITS during their career. Persons who have retired or who are about to retire are considered candidates. Any member may nominate a candidate for the ITS Florida Honor Roll with a letter describing their accomplishments and contributions.

To nominate someone for an award, please visit: https://fs16.formsite.com/ITSFlorida/Awards_complete/index

Anyone interested in information about the ITS Florida Award program and sponsorship opportunities may contact Sandy Beck at ITSFlorida@ITSFlorida.org.

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