

# TSM&O DISSEMINATOR

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

September - October 2018

Real-World  
**Transportation Testbed  
Opens in Gainesville**



**District Four's Innovative  
Idea for Improving the  
Precision of Incident  
Location Data**



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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?

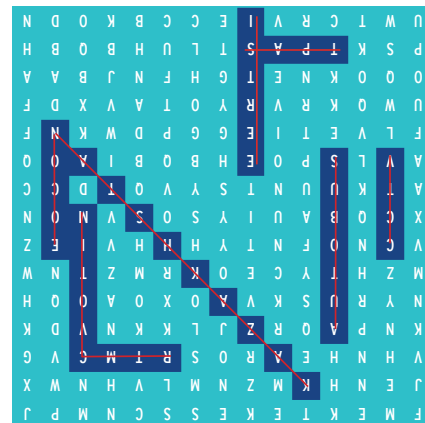
Email Jennifer Rich  
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with your story subject and title.

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

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# Real-World Transportation Testbed Opens in Gainesville

By Kevin Elliot, Marketing and Communications Coordinator, ARA

Central Florida is now home to a one-of-a-kind testing ground for deploying connected and automated vehicle (CAV) technologies.



I-STREET (Implementing Solutions from Transportation Research and Evaluation of Emerging Technologies) is a smart, multimodal roadway network weaving through parts of the University of Florida (UF) campus, the City of Gainesville (CoG), and Interstate 75. I-STREET is dedicated to advancing the state of the art in connected and automated vehicle (CAV) implementation. The project is a joint effort between the Florida Department of Transportation (FDOT), the UF Transportation Institute (UFTI), the CoG, and industry partners.

The vision for I-STREET is to provide an intelligent road system where government, industry, and academia can develop and test technologies that enhance communication between personal and mass transit vehicles, pedestrians, and traffic signalization – a true “Internet of Transportation Things.”

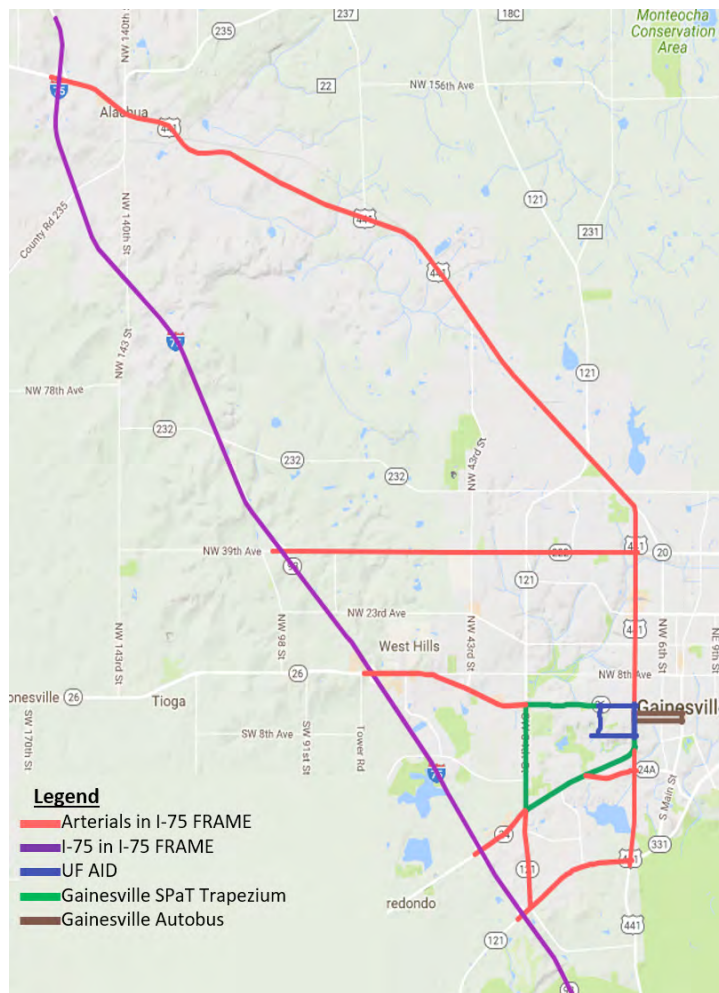
Over 30 countries are exploring CAV technologies, with many efforts underway in the U.S. I-STREET, however, is different; it is the only comprehensive testbed that is located entirely on public roads.

“Everything we do is real world,” said Dr. Lily Elefteriadou, UFTI Director and Principal Investigator for I-STREET. “Our team did a thorough literature review before proceeding with I-STREET, looking for what had not been done. We studied over 400 U.S. and international activities and testbeds. This is unique.”

The I-STREET system comprises four subsections, all part of existing roadway networks in and around Gainesville. Each is dedicated to studying a different transportation mode.

“The interstate section can be used for researching freight movement, the downtown segment is for pedestrian and bicycle mobility, another for cars, and a fourth for transit,” said Emmanuel Posadas, Traffic Operations Manager for CoG. “I-STREET captures them all at different scales.”

The goal is to facilitate the development of as many new products and control strategies as possible that can be deployed not just in Florida, but nationally.



Each of the current I-STREET sections are dedicated to studying a different transportation mode.

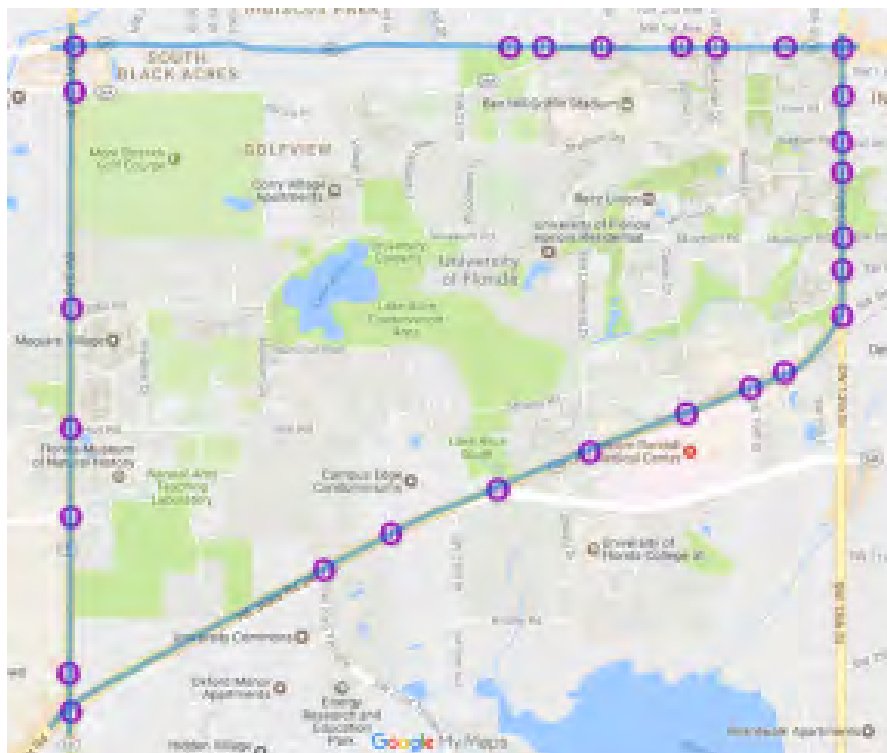
Source: UFTI

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# Real-World Transportation Testbed Opens in Gainesville *continued*

“We’re looking at much more comprehensive instrumentation and operations,” Elefteriadou said. “We’re not just exploring one aspect of testing. We have a wide variety of technologies deployed so we can evaluate each individually, as well as their interactions.”

Current I-STREET projects include several foundational efforts: The I-75 Florida’s Regional Advanced Mobility Elements (I-FRAME), which involves installing roadside monitoring units along stretches of I-75 and US 301/US 441 that will be used for CAV communication; a pedestrian/bicycle safety enhancement project on the UF campus; and the Gainesville Signal Phase and Timing (SPaT) Trapezium, dedicated to studying how connected infrastructure can improve travel time reliability, safety, throughput, and traveler information.



Each of the current I-STREET sections are dedicated to studying a different transportation mode.

Source: UFTI

These initial projects focus on installing the core monitoring and communication infrastructure needed to set the stage for future academic and industry research projects.

“We are laying the groundwork for testing so others don’t have to,” Elefteriadou said. “Then they can just come here and implement their research.”

## Safety First

But what about safety? The value of a traditional closed-course testing environment is that risk can be kept to a minimum. What about on a real-world testbed?

Dr. Clark Letter is a UFTI Researcher and the I-STREET Testbed Manager. He is responsible for its entire operation and works closely with the FDOT, the CoG, the Gainesville Regional Transit System, and the UF Police Department to maintain and implement the testbed’s safety management plan.

“The plan requires collaboration with all partners to approve projects and includes clear guidance to account for various safety-related scenarios,” Letter said. “A level of risk is applied to each scenario that itemizes specific actions to take to reduce risk. We also require applications and technologies testing on the system to include a fail-safe mode to ensure safety.”

A steering committee with representatives from each of the involved entities meets quarterly to evaluate ongoing and upcoming test activities. Each entity interested in conducting a test must submit documentation to the steering committee for review and approval. Results of the tests also have to be submitted to the committee, along with any safety concerns and incidents. Testing that is deemed unsafe is rejected, or, if in process, immediately stopped.

## All on Board

I-STREET would not be possible without significant cooperation among stakeholders. The testbed includes state arterials, CoG roads on and off the UF campus, and sections of federal highway I-75. All traffic signals are maintained by the CoG and the FDOT has provided most of the funding for projects so far. Private industry will also play an increasing role.



How was this level of collaboration achieved?

“In a word, ‘leadership,’” said Posadas. “Executives at FDOT, UF, and CoG are all behind this and pushing for it. From the top down, we all want to establish a smart city here in Gainesville and position Florida as a premier center for transportation research.”

“FDOT looks forward to leveraging technology to improve the safety and mobility of all the users of our transportation system,” said FDOT Assistant Secretary Tom Byron.

## Open for Business

A linchpin of I-STREET’s success is private industry involvement.

To that end, I-STREET issued a request for information (RFI) seeking interested industry partners. Nearly 25 companies have responded to the RFI so far, expressing serious interest in using the testbed.

“Dozens of other companies have also contacted us informally,” Letter said. “We are currently working out the details of these relationships, but we are excited to see such a response and get this momentum going.”

“We’ve also reached out to over 200 private companies and have gotten outstanding response so far,” Posadas said.

Letter said the long-term success of I-STREET depends on these public-private relationships. “The goal is to have a self-sustaining testbed. Industry partnerships will help us do that. We’re investing in the research infrastructure and equipment. Our message to industry is, ‘Come use it.’”

## I-STREET Infrastructure Projects

- FRAME - 150 Roadside Unit (RSUs) along I-75 and around the city, plus vehicle instrumentation
- Accelerated Innovation Deployment (AID) - 13 signalized intersections and seven midblock crossings
- Gainesville Trapezium (45 RSUs around the UF campus)
- Gainesville Autobus

### Related Projects:

BDV31 TWO 977-74: University of Florida Advanced Technologies Campus Testbed

BDV31-977-77: Data Management and Analytics for UF Smart Testbed

BDV31-977-79: University of Florida Testbed Initiative - Transit Components

BDV31-977-45: Development and Testing of Optimized Autonomous and Connected Vehicle Trajectories at Signalized Intersections

BDV31-TWO 977-69: Florida Driver Assistive Truck Platooning Analysis

For more information, please contact Raj Ponnaluri at (850) 410-5616 or by email [Raj.Ponnaluri@dot.state.fl.us](mailto:Raj.Ponnaluri@dot.state.fl.us).

# Florida's Turnpike Helps Lead the Way in Wrong Way Driver Detection and Prevention

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



The effects of a wrong way crash are often deadly, and with distracted driving on the rise, it is all too easy for a motorist to occasionally mistake an exit-ramp for an on-ramp. Florida's Turnpike Enterprise (FTE) has made wrong way driver detection and prevention a top priority, and along with research partners at the University of Central Florida, is working to identify hotspot locations where drivers could more easily make that error.

Currently, FTE has wrong way driver detection equipment installed on five southbound exit ramps on the Sawgrass Expressway (TOLL 869), 12 exit ramps both north and southbound on the Homestead Extension of Florida's Turnpike (TOLL 821) and systemwide north and southbound (18 locations) on TOLL 417 in both Osceola and Seminole counties.

**98%** Success rate in driver self-correction once the lights are activated

Wrong way driving statistics on the aforementioned system roadways indicate that 66 percent of occurrences have happened in the evening/overnight hours, with 26.5 percent of those incidents coming between 2 - 4 a.m. It is also found that 56 percent of instances occur on weekends. The rate of occurrence by interchange type indicates that diamond interchanges account for the highest number of incidents at 46.5 percent.

Since first deploying wrong way detection signage on system roads in 2014, Florida's Turnpike has seen a 98 percent success rate in driver self-correction once the lights are activated. Only one instance has seen the driver continue beyond the warning system, and sadly, that crash involved a fatality. This is a poignant illustration of the fact that these systems DO work.

As we enter "Phase 3" of the project, analysts at UCF have identified 14 locations on the Turnpike Mainline (TOLL 91) between mileposts 184 - 272 where predictive modeling indicated higher potential of a wrong way driver entering the system. Turnpike Traffic Engineers have reviewed the locations against current and future construction projects and confirmed that installations in that region would not face delays, allowing for an immediate impact. Thus, "Phase 3" deployment is expected to begin within the next six months.

Additionally, FTE continues to push the envelope with new and innovative approaches to tackle this national safety concern, successfully integrating infrared camera technology, at one pilot location on the system, to its video management platform, which allows immediate visual confirmation at the detection site and facilitates tracking the errant vehicle until self-correction or contact with law enforcement officials occurs.

So where do we go from here? The Turnpike eagerly awaits its implementation of SunGuide version 7.1 that will allow integration of the field assets with the advanced traffic management systems platform, further enhancing the capabilities to manage these events.

The current wrong way detection systems on the FTE system utilize microwave radar units for detection of errant vehicles. FTE is also preparing two additional pilots to identify a cost-effective, system-wide solution, the first of which utilizes a new laser sensor technology from our tolling partners and the second uses video detection algorithms to identify errant vehicles and display those video streams in the TMC in real-time.



LED "Wrong Way Driver Detection" master unit during night time testing

Given the ongoing concerns relating to the uptick in wrong way driver events, Florida's Turnpike Enterprise is proud to help the state innovate and deliver safety enhancements to reduce these devastating tragedies.

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



Correct Traffic Flow: 

BlinkLink

System: 821 SB OFF 35-US 27 Alert Time: 1/15/2018 2:59:33 AM Powered by TAPCO

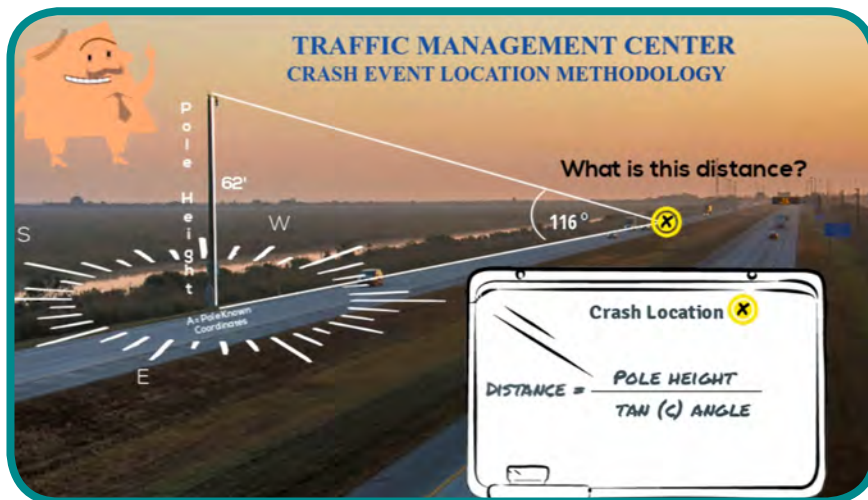
Sample photo notification of a wrong way driver on TOLL 821. The green arrow indicates the correct direction of travel for that ramp.

# District Four's Innovative Idea for Improving the Precision of Incident Location Data

By Daniel Smith, District Four ITS Operations Manager and Mark Plass, District Four Traffic Operations Engineer

Part of daily operations in District Four involve traffic incidents along a busy portion of I-95 resulting in increased congestion, and in some cases, secondary crashes. The District Four Regional Transportation Management Center (RTMC) collects the data on such incidents, including location, time, severity of event, and vehicles involved. The incident data is then primarily used to improve incident management and traffic conditions for motorists.

Further leveraging of RTMC's incident data occurs within the safety department, where it is vital to the process of identifying crash trends and countermeasures. To improve this process, District Four managers have conceptualized an innovative method to precisely calculate incident locations with a smaller margin of error.



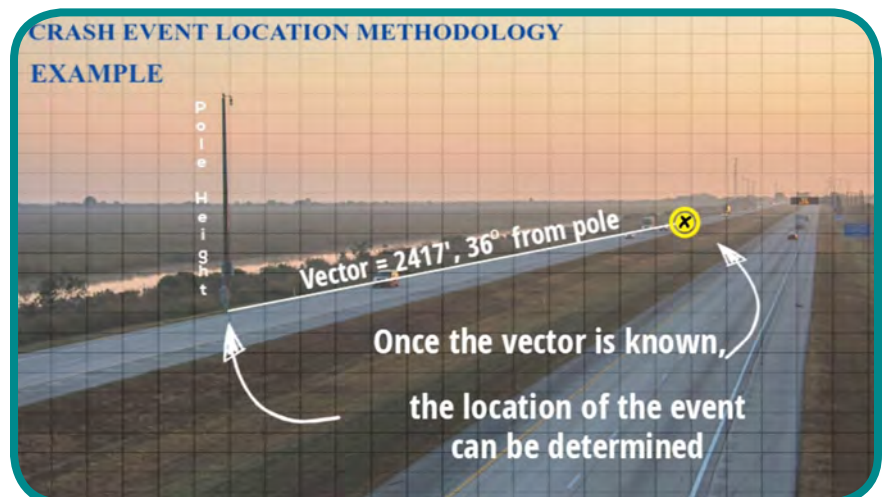
In the past, operators would use Closed Circuit Television (CCTV) cameras as their primary method in identifying an incident's location. Now, District Four is proposing to use simple trigonometry to calculate the distance from the coordinating CCTV to the incident and to determine direction using the CCTV's known height, internal inclinometer, and compass reading.

The solution is an innovative software application that can be integrated into the RTMC's current instance of SunGuide® software. The result is precise incident location data immediately available for District Four's first responders and safety studies.

This intuitive innovation will easily expedite the identification and corrective analysis conducted through the safety department for incident-prone areas.

The District Four RTMC is currently working with CCTV manufacturers and internal consultants to bring this innovative concept into their daily operations.

For more information on incident location data, please contact Daniel Smith at 954-847-2633 or by email [Daniel.Smith@dot.state.fl.us](mailto:Daniel.Smith@dot.state.fl.us).





# CVO/TIM Staff Participate in NOCoE Peer Exchange

By Marie Tucker, Commercial Vehicle Operations Manager, FDOT and Craig Toth, HNTB

On September 27-28, 2018, the Florida Department of Transportation (FDOT) Commercial Vehicles Operations and Traffic Incident Management (CVO/TIM) staff participated in a National Operations Center of Excellence (NOCoE) peer exchange focusing on Transportation Systems Management & Operations (TSM&O) and freight considerations. The meetings were held in Memphis, Tennessee.



Jeff Frost (FDOT), Marie Tucker (FDOT), and Craig Toth (HNTB) collaborated with representatives from the NOCoE (Tom Kern and Niloo Parvinashtiani), DOT staff from Arizona, Georgia, South Carolina, South Dakota, Tennessee, and Washington, as well as the Port of Long Beach, and the I-95 Corridor Coalition. The first session focused on a review of truck parking plans and deployments with Jeff Frost presenting the FDOT Truck Parking Availability System (TPAS) in Florida. The second session discussed Traffic Incident Management with relation to freight operations, with each state having varying degrees of programs in place to address heavy/commercial vehicle traffic incidents.

Roundtable discussions on freight interagency and stakeholder communications, as well as gap analysis within public agencies, yielded second-day breakout meetings focused on:

- Freight First Mile/Last Mile Issues
- Early Coordination on Land Use and Development Plans
- How to Communicate with Truckers
- Data - The Need for Granularity
- Identify and Work More Effectively with Stakeholders
- Freight Workforce/Planning - What Staffing is Needed?
- Oversize/Overweight Permitting
- Enhance interaction with FMCSA, ATA, etc.
- Seek More Funding Opportunities
- Better Incorporate Freight in TSM&O
- Weather and Freight
- Truck Parking
- TIM - Towing Large Commercial Vehicles



The breakout session participants were strategically aligned by region, with groups of approximately 10 representatives in each session. Strategies around each of the issues were captured and will be incorporated into future research areas and publications. Key take-aways from the session include expansion of:

- Freight notification of work zones and traffic incident management.
- Freight considerations in work zones (including oversize/overweight permitted vehicles).
- Planning consistency with MPO freight plans, include first/last mile.
- Collaboration and data sharing with MPOs.
- Truck parking future needs: beyond hours of service, staging for pick-up/delivery.

For more information, please contact Jeff Frost at (850) 410-5607 or by email [Jeff.Frost@dot.state.fl.us](mailto:Jeff.Frost@dot.state.fl.us) or Marie Tucker at (850) 410-5619 or by email [Marie.Tucker@dot.state.fl.us](mailto:Marie.Tucker@dot.state.fl.us).

# Transportation Delegation Visits from Kazakhstan

By Marie Tucker, Commercial Vehicle Operations Manager, FDOT



On October 1, the Florida Department of Transportation (FDOT) and the Florida Highway Patrol (FHP) hosted a delegation of government and private sector transportation specialists from Kazakhstan. The delegation was visiting the United States to review how federal, state, and local agencies partner to reduce commercial vehicle-related crashes.

The group met with representatives of FDOT's Research Office, Safety Office, Maintenance Office, Traffic Engineering and Operations Office, as well as FHP's Office of Commercial Vehicle Enforcement and the Federal Motor Carrier Safety Administration.



Prior to their visit to Tallahassee, the delegation made visits to Washington D.C., Baltimore, and Jacksonville.

For more information, please contact Marie Tucker at (850) 410-5619 or by email [Marie.Tucker@dot.state.fl.us](mailto:Marie.Tucker@dot.state.fl.us).

# FDOT's Truck Parking Availability System Highlighted at House Hearing

In a testimony to the U.S. House of Representatives Subcommittee on Highways and Transit Committee on Transportation and Infrastructure, ITS America President and CEO Shailen P. Bhatt addressed how intelligent transportation technologies are solving many of our nation's safety and mobility challenges.



Leveraging the recent Fixing America's Surface Transportation Act (FAST Act), which provides funding opportunities for deployment of transportation technologies, the future of transportation is on the cusp of transformation by implementation of technology solutions. The FDOT Truck Parking Availability System (TPAS) was presented as an Intelligent Transportation Technology Best Practice for addressing the national safety issue associated with the truck parking shortage. In addition to the safety benefits of the system, TPAS will enhance freight operations, economic vitality and reduction in emissions.



For a full report, please see: [Bhatt written testimony](#)

## Break Time



F	M	E	K	T	E	K	E	S	S	C	N	M	P	J
J	E	N	H	K	M	Z	N	M	L	V	H	N	W	X
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K	N	P	A	Q	R	Z	J	L	K	K	N	V	D	K
N	Y	R	U	S	K	V	A	O	X	O	A	O	Q	H
M	Z	H	T	Y	C	E	O	K	R	M	Z	T	N	W
V	C	N	O	F	N	T	Y	H	H	H	V	I	E	Z
X	C	O	B	A	U	I	Y	S	O	S	V	M	O	N
A	T	K	U	U	N	T	S	Y	V	Q	T	D	C	C
A	V	L	S	P	O	E	H	B	Q	B	I	A	O	Q
F	L	V	E	T	I	E	G	G	P	D	W	K	N	F
U	W	O	K	R	V	R	Y	O	T	A	V	X	D	F
O	Q	O	K	N	E	T	G	H	F	N	J	B	A	A
P	S	K	T	P	A	S	T	L	U	H	B	Q	B	H
U	W	T	C	R	V	I	E	C	C	B	K	O	D	N
TPAS				CVO/TIM				RTMC				CCTV		
AUTOBUS				I-STREET				NOCoe				KAZAKHSTAN		

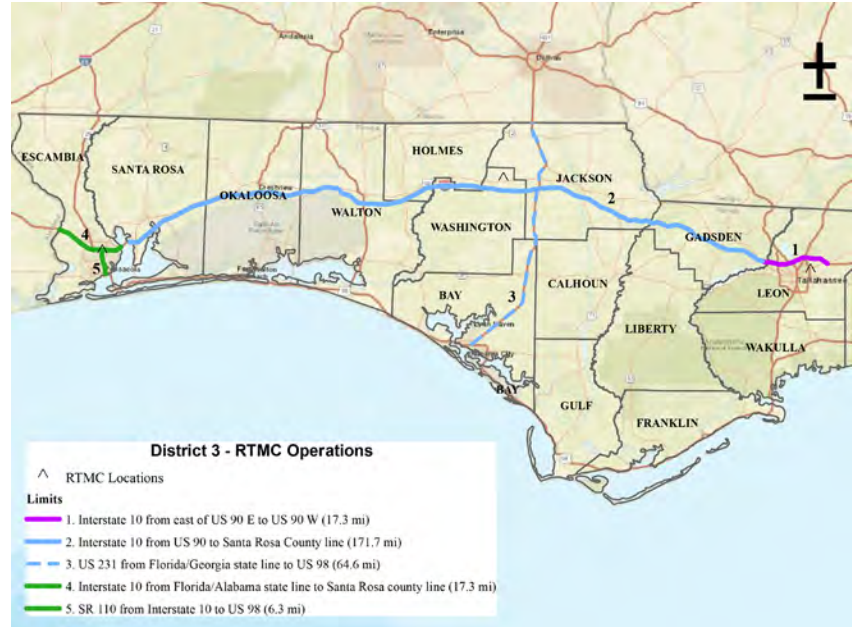
# Traffic Management Keeps Advancing in District Three

By Greg Reynolds, District Three Traffic Operations Office; Mark Nallick, District Three Traffic Operations Office; Jill Capelli, Kimley-Horn

Over 10 years ago, District Three opened its first Regional Transportation Management Center (RTMC) using a unique design, build, operate and maintain project delivery method. The Pensacola RTMC monitors a 40-mile Freeway Management System (FMS) along I-10 and I-110 around Pensacola, Florida. Within the deployment the FMS has 12 dynamic message signs (DMS), 40 closed-circuit television (CCTV) cameras, 88 microwave vehicle detection system (MVDS) sensors, and one road weather information system (RWIS) station.

Since opening the RTMC in Pensacola, which manages operations occurring in both Escambia and Santa Rosa County, two more RTMCs have begun operations to support District Three. The Tallahassee RTMC performs management and operations within its own city limits, as well as a 19-mile portion of I-10 in Leon and Gadsden Counties. The most recent addition to District Three operations is the RTMC located in Chipley, which manages the remaining portions of I-10 throughout District Three and US-231. The disparate operations, contract methods, and contrasting urban to rural locations are unique to District Three and creates unique challenges.

As you can imagine, much has changed in 10 years! In 2008 Google Chrome was introduced, Apple released its second iPhone with 3G, and the Olympics were held in Beijing, China. Now in 2018, District Three hosts two additional RTMCs and is completing the final stages of the districtwide FMS. Due to the level of resources currently available to the district, the latest challenge is to integrate the oldest RTMC in Pensacola with the newest RTMC in Chipley.



This migration merges the 10-year-old Pensacola system into the newest Chipley system; creating a challenge for District Three ITS LAN Administrator, Mark Nallick. As part of the migration, Mark is maintaining both systems, operating in parallel. Operations in Pensacola are maintained 16 hours a day, five days a week, but are transitioned to Chipley for night and weekend coverage. To maintain this interoperability, Mark and his team have overcome challenges that include:

- Replicating databases at two disparate facilities with corresponding updates to SQL
- Resolving network configuration issues
- Merging topologies between a 1-year and 10-year old system
- Merging SunGuide application servers
- Upgrading to SunGuide version 7.0
- Updating failover methodology

These challenges are being overcome through a key SunGuide partnership between Mark's team and the Southwest Research Institute (SwRI). One of the benefits already realized by the district from this migration is the opportunity to leverage a remote enterprise database cluster, resulting in increased network speeds and available bandwidth. The plan for full, 24/7 migration to the Chipley RTMC is anticipated in 2020.

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

# Emergency Stopping Sites Improve Operations on 95 Express



## 95 EXPRESS

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

The Florida Department of Transportation (FDOT) District Six Office has completed a series of safety improvements on 95 Express during the past few years. The improvements are part of the Department's commitment to provide drivers with the most reliable and safe travel choices when traveling on Interstate 95.

The safety improvements have addressed multiple issues including improving highway signage, deterring illegal lane changing, and reducing travel time delays associated with incident clearance efforts. The first phase of safety improvements was the installation of new express lane markers (ELMs). The new ELMs were completed at the end of 2016, resulting in a reduction of crashes. The second phase of safety improvements was the construction of five Emergency Stopping Sites (ESS) along the median of 95 Express. The sites were added to provide a temporary refuge for disabled vehicles before they are relocated by a Road Ranger and to give first responders the space needed to manage incidents and enforce traffic laws in a more efficient manner.

The ESS construction was completed as part of the I-95 Pavement Rehabilitation construction project and opened for use in May of this year. They are located between NW 29 Street and NW 131 Street in Miami-Dade County. Three sites were built in the northbound direction and two sites were built for southbound lanes. They consist of 13-foot shoulders and measure between 1,200 feet and 1,900 feet in length. The sites are helping to reduce the department's need to close the adjacent travel lanes during active traffic scenes. As a result, the ESS additions are not only working to improve driver and responder safety, but they are helping to increase the availability and vehicle throughput of the express lanes as well. This has been a key benefit of the ESS, because recurring lane closures

negatively impact capacity and degrade highway operations.



The ESSs combined with the rest of the safety strategies have improved 95 Express operations. Latest reports show that crashes have reduced by 38 percent while traffic volume has increased by 0.4 percent in the express lanes since prior to the express lane marker installation in 2016. The department remains committed to managing 95 Express and identifying additional strategies that improve the safety and mobility of the facility. For more information about 95 Express, please visit [www.95express.com](http://www.95express.com).

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

# ITS5C Summit Achieves New Heights in Learning Opportunities



By Jay Calhoun, Vibe Engineering

More than 750 transportation professionals from across the U.S. came together in early October in Jacksonville, Florida, for the ITS5C Summit. The Summit was jointly sponsored by the five southeastern ITS Chapters, representing eight states – Gulf Region ITS, ITS Carolinas, ITS Florida, ITS Georgia, and ITS Tennessee.

“The ITS5C Summit is one of the largest gatherings of transportation professionals focused on Smart Cities, connected vehicle and intelligent transportation solutions,” said Jay Calhoun, chairman of the ITS5C Summit organizing committee. “Our theme, ‘Coming Together to Address the Challenge of Connecting Cars, Communities and Citizens,’ captures both the issues and solutions for creating a safer, smarter and more efficient surface transportation system for our citizens.”

The opening Keynote address was given by ITS America CEO and President Shailen Bhatt who challenged the local leaders to keep innovating and keep the U.S. in the forefront of developing and implementing intelligent transportation solutions.

“(ITS) technology is there for us to help achieve our vision of a better world transformed by intelligent mobility – one that is safer, greener, and smarter,” Bhatt said. “You need local ITS Chapters, the people locally who know the markets, to be able to deploy.”

The ITS community provided tremendous support for the event with 81 exhibits of the latest ITS technologies and topics covered during the conference included: autonomous vehicles, connected vehicles, transportation technology and cyber security, and artificial intelligence in transportation.

## Awards

ITE TSM&O Council Award presented to Mr. Fred Heery on behalf of FDOT's TSM&O Program.



ITS World Congress Hall of Fame: ITS World Congress Hall of Fame, Local Government Award presented to Florida Transportation Commissioner Beth Kigel in Copenhagen, Denmark.

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