FLORIDA DEPARTMENT OF TRANSPORTATION

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS DISSEMINATOR September-October 2017

AASHTO SPAT CHALLENGE US 90 PILOT PROJECT

> 5.71 – Speed (Actual) Speed (Minimum)



SAFE MOBILITY FOR LIFE

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

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AASHTO SPAT CHALLENGE: US 90 PILOT PROJECT - PRE-DEPLOYMENT STATUS

By Raj Ponnaluri, P.E. PhD, PTOE, FDOT & Rakesh Sharma, P.E., PTOE, HNTB

Emerging transportation technologies for connected and automated vehicles (CAV) hold the promise to realize safety and mobility benefits. Recognizing this potential, the American Association of State Highway and Transportation Officials (AASHTO) had issued the 20/20 challenge with a goal to deploy CAV infrastructure at 20 signalized intersections in each state by the year 2020. This infrastructure includes dedicated short-range communication (DSRC) to transmit signal phase and timing (SPaT) and MAP data information. SPaT informs drivers of phase

changes such as when the signal ahead changes to red, yellow or green, thereby allowing the drivers to maintain their speed or slow down; MAP identifies in the positional situation of a vehicle, thus notifying drivers about the location and respective signal phase.

In Fall of 2016, the Florida Department of Transportation (FDOT) decided to pursue the AASHTO SPaT Challenge, and selected US 90 in the City of Tallahassee for deployment. The selected SPaT deployment corridor runs from Duval Street in downtown Tallahassee to west of I-10 as shown in Figure 1. The City of Tallahassee agreed to partner with FDOT to install the



Figure 1: SPaT Deployment Corrdior

SPaT equipment at the 22 signalized intersections and help integrate with CAV-ready traffic signal controllers. The corridor is conveniently located with the west end connecting the downtown area, the Greyhound Station, Leon High School and major shopping and dining areas to the east.

Project Purpose: This project is to deploy CV technology with SPaT and MAP data broadcasting equipment at 22 signalized intersections on US 90 and two intersections of FDOT's Traffic Engineering Research Laboratory (TERL). On-board units (OBU) will be installed in vehicles for testing and verification. The anticipated outcome of the project is that vehicles equipped with Vehicle-to-Infrastructure (V2I) technology can "listen" to the data and be aware of the signal timing in real-time as they travel through the corridor.



Procurement: In 2017, FDOT Central Office advertised a request for proposal to procure DSRC and SPaT equipment, and portable OBUs. The short-listed Vendors demonstrated their technologies at the TERL. The final selected vendor furnished the equipment for installation. In partnership with FDOT District 3 Office and the City of Tallahassee, the deployment began in November 2017.

continued on the next page

AASHTO SPAT CHALLENGE: US 90 PILOT PROJECT (continued)

Preparation: As part of this project, for all 22 US 90 signals and the two TERL signals, FDOT developed the MAP data in-house using the United States Department of Transportation's mapping tool. FDOT also obtained the Federal Communications Commission (FCC) 5.9 GHz DSRC site specific licenses for each of these locations.

TERL Demonstration: In September 2017, the Vendor successfully demonstrated the DSRC/SPaT/MAP broadcasting using RSU and OBU at the TERL. FDOT's District Traffic Operations Engineers (DTOEs) and Central Office managers viewed SPaT and the OBU in operation at the TERL. The objective of this demonstration was to test and demonstrate SPaT capabilities as a part of FDOT's CAV initiative.

Next Steps: The emerging and connected vehicle technologies are a part of FDOT's Transportation Systems Management and Operation (TSM&O) Strategic Plan that was adopted in August of 2017. FDOT is teaming with various initiatives and agencies including the SunTrax of

the Florida's Turnpike Enterprise; the Central Florida Automated Vehicles Proving Ground; the Tampa Hillsborough Expressway Authority; the Central Florida Expressway; the Cities of Gainesville, Tallahassee, Tampa, and Orlando; and Florida's University partners including the University of Florida, Florida State University-FAMU, University of Central Florida,

Center for Urban Transportation Research at the University of South Florida, University of North Florida, Florida Polytechnique Institute, Florida International University, etc., to address the safety and mobility needs of all road users.

For more information please contact Fred Heery at Fred. Heery@dot.state.fl.us or by phone at (850) 410-5606.







SAFE MOBILITY FOR LIFE

By Gail M. Holley, Safe Mobility for Life Program & Research Manager, FDOT

Florida continues to lead the nation with over 19 percent of our population over age 65 and it is projected that in the year 2040, there will be nearly 7 million individuals over age 65. There is even a good chance that many of us reading (or writing) this article will be part of that large number! The good news is that through our program and the partnerships we have developed, we will continue to improve the transportation environment to help older adults get to and from the places they enjoy, safely, whether they are driving or not.

Over the past six months we have been working with members of our Safe Mobility for Life Coalition to implement the 2017 Florida's Aging Road User Strategic Safety Plan. This strategic plan aligns and

addresses needs in both the Florida Transportation Plan and Florida's Strategic Highway Safety Plan. The purpose of our comprehensive Aging Road User Strategic Safety Plan is simple - improve the safety, access, and mobility of Florida's aging



population by addressing areas critical to the needs and concerns of our target population. To reach this goal, the strategic safety plan contains goals, objectives, and strategies in six key areas:

- Program Management, Data, and Evaluation
- Outreach and Advocacy
- Aging in Place
- Licensing and Enforcement
- Prevention and Assessment
- Transitioning from Driving.

While each area is important, the Aging in Place focus area is really the root of the Department's aging road user program that began in the 1990s. Today our team continues to build on that foundation by developing new resources designed to help us promote design

features that support lifelong communities and safe mobility for all road users. The following educational materials are available now.

How to Choose a Lifelong Community – A Transportation Checklist,

This interactive checklist helps people identify the features and services that are important to have



in their community to help them remain independent, mobile, and active. It includes simple questions to be answered "Yes", "No", or "Somewhat" to community features and services in four areas:

- Community Design
- Getting Around
- Street Safety and Security
- Neighborhood Support Services

The answers to these questions will help individuals who are thinking about retirement learn if their community will meet their personal safety and mobility needs to help them successfully age in place.

Educational Tip Cards

When we introduce new traffic control devices on our roadway system it is important to provide aging road users enough information to allow them to respond to them safely and efficiently. To ensure the

educational materials we design support aging road users, and we worked with FSU's Department of Psychology on a human factors research project. This project allowed us the opportunity to study younger, middle, and older adults on the use



of educational tip cards and to develop a research-based checklist to assist in the design of future materials. Utilizing the results and recommendations we developed tip cards for: Flashing Yellow Arrow, Roundabouts, and Right Turn on Red. To learn more about this research, please visit: http://flsams.org/Roadway.htm#tipcards

As the Safe Mobility for Life Coalition continues to implement and develop resources based on our strategic plan, we know that we cannot do it alone. To successfully achieve zero deaths, we need to work together at the state, district, and community level. Through this collaboration we will bring attention, effort, and action to reduce the crash, serious injury, and fatality rate for Florida's aging population and create a transportation environment that provides safe mobility for all road users.

For additional information or to receive any of our educational materials, please contact Gail M. Holley by email at gail.holley@dot. state.fl.us or by phone at (850) 410-5414.

FDOT & ORLANDO ATCMTD GRANT

By Jeremy Dilmore P.E., District Five Traffic Operations, FDOT

The Florida Department of Transportation, in partnership with MetroPlan Orlando, the University of Central Florida, the City of Orlando, and Orange County are pleased to announce the receipt of the Advanced Transportation and Congestion Management

Technologies Deployment (ATCMTD) grant for the Connecting the East Orlando Communities project. Connecting the East Orlando Communities represents the Central Florida Automated Vehicle Partners Smart Cities approach consisting of three program areas: PedSafe, GreenWay, and SmartCommunity. PedSafe will connect advanced traffic signal control through Connected Vehicle (CV) technologies to motorists, motorist's vehicles, and pedestrians to reduce the occurrence of pedestrian and bicycle crashes. GreenWay is an FDOT project designed to fully integrate transportation systems and management technologies to better utilize the multimodal transportation system. Over 1,000 traffic signals within the region are actively managed using real-time operation through a regional Decision Support System (DSS), allowing strategic planning for special events that considers all modes and users. SmartCommunity is an integrated program that connects people to the places they need to go and the services they need to receive. SmartCommunity's trip planning application, Transit AVL, and Transit Kiosks will provide real-time multimodal travel



information to integrate trip planning with modal choice options. SmartCommunity will allow travelers in the same area to share information and coordinate trips to destinations such as employment centers, education facilities, the grocery store, and medical treatment centers. For more information see http://www.cflsmartroads.com/.

Expanded areas

1. PedSafe is an innovative pedestrian and bicycle collision avoidance system currently being designed by FDOT. PedSafe will connect advanced signal controller capability, use of Connected Vehicle (CV) technologies, and existing communication capabilities to reduce the occurrence

of pedestrian and bicycle crashes. As a region and a state that annually tops the Dangerous by Design list of most dangerous areas for walking, development and implementation of PedSafe is an immediate priority with multiple benefits. The application will be easily transferable throughout the country.



2. GreenWay is a FDOT project to connect Advance Sensor Technology, Conditional Transit Signal Priority (TSP), Adaptive Deployment Traffic Signal Interface with Track Positive Train Control (SunRail), Smart Parking technology with Signal Performance Metrics (SPM), Expand Integrated

Corridor Management (ICM), and Signal Control Analytics and Visualization. GreenWay is designed to better utilize the multimodal transportation system by actively managing over 1,000 traffic signals within the region. Data managed in the proposed SunStore will be connected with GreenWay to support real time operation through a regional Decision Support System (DSS). This connection will allow strategic planning for special events to include consideration of all modes and users and will provide a unified approach to system operations and management.



3. SmartCommunity is an integrated program that connects people to the places they need to go and the services they need to receive. Through a Mobility on Demand (MoD) framework, SmartCommunity leverages existing ridesharing and car-sharing products to offer residents access to cars when required. SmartCommunity's trip planning application, Transit AVL, and Transit Kiosks will provide real-time multimodal travel information to integrate trip planning with modal choice options. SmartCommunity will allow travelers in the same area to share



information and coordinate trips to destinations such as employment centers, education facilities, the grocery store, and medical treatment centers. SmartCommunity will have a benefit for low income and underserved populations in the area and help to connect the community to the region.

Application

http://www.cflsmartroads.com/projects/design/ future/FD0T-2017-ATCMTD-Vol-1.pdf

For more information contact Jeremy Dilmore at Jeremy.Dilmore@dot.state.fl.us or by phone at (386) 943-5360.

By Chris Lambert, Kentucky DOT

First and foremost, I would like to thank Florida for their participation in the 2017 "Understanding and Using Real-Time Data." In August, Kentucky hosted a peer exchange to discuss issues in dealing with real-time data. The presentations focused on three key topics:

- Analyzing Real-Time Data
- Using and Relying on Real-Time Data During Operations
- New Forms of Data Being Generated from Connected and Autonomous Vehicles

Robert Taylor (PA Turnpike) started the peer exchange with a comprehensive overview of the Pennsylvania Turnpike's operations. The topics ranged from creating an innovative culture, the enormous amount of data that will be generated with connected vehicles, and the ability of their agency to deliver value to their customers. Two points of the presentation that carried great impact for those in attendance was the extraordinary response to the winter event of 2016, where the Turnpike communicated with 625 media contacts; and, the technology that enables them to push traffic alert notifications to cell phone users based on geofencing.

Ali Ragan (Wyoming DOT) then presented on WYDOT's very innovative mobile data collection solution for snow and ice. Wyoming is rolling out a two-way communication, tablet based solution, for snow plow drivers. This solution involves mounting tablets in snow plows. The operations center can push real-time weather information to the driver, such as current weather conditions or asset locations. The driver, in turn, is able to push information back to the operations center about their observations and roadway conditions. This two-way communication pieces together a comprehensive understanding of their operations. In addition, one very interesting part of this project was the fact that Wyoming uses radio vs. cellular for transmitting this information.

Tina Greenfield-Huitt (lowa DOT) then gave a remarkable presentation about lowa's snow and ice operations. Not only does lowa track 900 plows, equipped with 420 cameras, in real-time; but, they now have many years of data that allows them to accurately predict and measure the performance of operations for snow events. For more information, please visit https://iowadot.gov/performance/winter-operations.

Russell Allen (Florida DOT) presented on Florida's integration of Waze into their SunGuide® TMC software and the FL511 system as well as their upcoming Data Integration and Video Aggregation System (DIVAS). Florida pulls in incident reports from Waze users from across the state and then sends those reports to traffic management personnel. Those staff can then add more detailed information to the Waze report before publishing that information to the public-facing FL511 website. This approach is a great example of government better interacting with their citizens and private sector partners in an effort to create a more desirable outcome for both parties in real time. The other great Florida DOT advancement demonstrated by Mr. Allen was a sneak peak at DIVAS and what's to come in the future. This new system, combined with existing technologies, will provide Florida's traffic managers extremely impressive awareness of traffic and weather issues across the state.

Ali Ragan (Wyoming DOT) again wowed everyone with a presentation about Wyoming's Connected Vehicle Pilot Program. Wyoming has deployed 75 roadside units at different hotspots and equipped 400 vehicles with digital short range communications devices (DSRC). Data being generated by this project is being uploaded and stored on USDOT cloud servers, with access being granted to the public for experimentation. Current estimates place the data creation at 17TB per year. State DOTs will need the ability to aggregate and process millions, if not billions, of records in the very near future. More information can be found here: https://wydotcvp.wyoroad.info/.

Blaine Leonard (Utah DOT) ended out the state presentations by talking about connected and autonomous vehicles. Mr. Leonard went into great detail about the current state of autonomous vehicles and the enormous shift in transportation that we are witnessing today. He compared the era we are living in now to the transition between horse and buggy to the automobile. If you have the opportunity to hear Mr. Leonard speak, you won't regret it.

Jeremy Gould / Chris Lambert (Kentucky Transportation Cabinet) ended our event by talking about Kentucky's new real-time data architecture. Kentucky has spent the last two years developing a new system to handle "big data" for Intelligent Transportation Systems. By using open source products (Hadoop, Spark, Kafka, Elastic, Kibana) supported by Cloudera and Elastic, KYTC is able to aggregate and process millions of records in real-time, or near-time, data from sensors that range from Snow Plow (AVL), Waze, Weather Stations, etc. The ability to process all of this data together allows KYTC the ability to integrate into their existing GIS systems for a full understanding of roadway conditions. Newer features are generally rolled out for snow and ice season each year as proof of concepts and then make their way to other business areas in the off season. So the same set of technologies used for aggregating salt usage during the winter can then be used for work zone monitoring during construction season.

THANK YOU, FLORIDA! (continued)

BREAK TIME

Although Florida brought a lot of knowledge to the group, they walked away with a better understanding of how some of their other transportation colleagues are using data in innovative ways and hope to apply these practices in the way they do business down south. "I was really impressed with the different and innovative ways that other states are using automatic vehicle locator (AVL) data and mobile data to improve snow and ice operations, as well as leveraging these technologies to better inform the public of what's happening on the roads", says Russell Allen, Florida DOT's ITS Program Development Engineer and FL511 Program Manager. "While tracking the location of snow plows in Florida may not be at the top of our to-do list, the use of AVL data for other purposes is." Mr. Allen also said, "It is great to know that other states are also implementing solutions that take advantage of both real-time data and GIS platforms to better understand what's going on and make decisions based on the results of this real-time/near-time analysis."

Again, I want to thank Florida for participating in Kentucky's peer exchange and leading the way with integrating crowd sourced data and video.



"LOOK, HONEY. IT'S ONE OF THOSE REP LIGHT RUNNING CAMERAS."

DISTRICT THREE ANNOUNCEMENT

The Department's District Three Office has announced the promotion of Ms. Amy M. DiRusso, P.E. to the position of District TSM&O Program Manager, effective October 20, 2017. Since joining the Department over three years ago, Amy has served the District Traffic Operations Office in the role of ITS Project Manager and TSM&O Project Coordinator.

A native of Pensacola, Florida, Amy obtained her Bachelor of Science in Civil Engineering from the University of South Alabama. After working in the private sector as a consulting engineer during the early years of her career, she joined the Department's District Three Office in Chipley in May of 2014.

Amy is an officer in the Emerald Coast Branch of the Institute of Transportation Engineers (ITE)/American Public Works Association (APWA), and currently serves in the role of Vice President.

In her free time, Amy serves as team manager for the Niceville Travel Soccer Team, which allows her to spend a great deal of time with her son Louis, as well as his teammates. She has always enjoyed working with young men and women and has volunteered time to the MathCounts Program, and to other mentoring programs. Amy has actively participated in the Pensacola Opera as both a singer and active supporter over many years, and continues to be an Opera enthusiast.

Please join District Three in congratulating Amy in her new position.

I-75 EXPRESS LANES UPDATE

By Daniel Smith, District Four Traffic Operations, FDOT

Florida Department of Transportation (FDOT) District Four's plans to add express lanes along I-75 are almost complete. Extending 15 miles from I-595 in Broward County to Northwest 170th Street in Miami-Dade County, contractors for the I-75 Express Lanes have been working on minimizing the effects on motorists by completing construction in five separate segments: Segments A/B, C, D and E. Updates for these segments are as follows:

Segment E, from north of Griffin Road to I-595, completed construction on the new reversible bridge connecting the I-75 Express Lanes to the I-595 Express Lanes. Reconfiguration of the westbound I-595 Express Lanes to the northbound I-75 general purpose lanes was also completed. The reconfiguration moved the bridge just north of the existing temporary ramp. Segment E will be the first to be completed by Winter 2017.

Segment D, from south of Sheridan Street to north of Griffin Road, completed construction of the sound barrier walls that perimeter I-75. However, construction continues on the I-75 Sheridan Street interchange in order to improve traffic flow to on-coming ramps. Segment D is expected to begin ITS device installations. Completion is scheduled for Early 2018.

Segment C, from south of Miramar Parkway to south of Sheridan Street, has the most updates since the project's inception. Construction was completed on the new Pembroke Road Bridge and has been open to the public since mid-2017. Construction on the Miramar Parkway Bridge is currently being finalized. Both bridges were renovated to expand lanes and improve traffic congestion during peak hours. Final construction activities include additional lighting installations.

Segment A/B, the last portion of the I-75 Express Lanes project, from Northwest 170 Street in Miami-Dade County to south of Miramar Parkway, still has a large section under-going construction. Segment A/B continues renovations on the Snake Creek Canal Bridge, as well as the new direct-connect bridges to Florida's Turnpike. Traffic shifts are scheduled to continue.



With full completion of the project expected for winter 2017/2018, express lane tolls will be charged for each passing vehicle based on traffic density and level of service. Traffic density is measured by the average number of vehicles that occupy each mile of roadway, while level of service refers to the speed and convenience of the express lanes. Motorist should expect toll prices to vary during peak and non-peak hours.

By providing additional vehicle capacity, resulting in improved operational conditions and more reliable travel times, this project will enhance the current South Florida managed lanes network for all motorists and will improve mobility and relieve congestion throughout District Four's highways.

For additional project updates visit, www.75-express.com. For more information please contact Dan Smith at Daniel.Smith@dot.state.fl.us. or by phone at (954) 847-2785.

DISTRICT SIX TMC PREPARES FOR HURRICANE IRMA

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

The District Six SunGuide Transportation Management Center (TMC) activated its Hurricane Response Action Plan (HRAP) in preparation for Hurricane Irma. TMC management and key staff met daily, one week before the storm's arrival. They reviewed the center's contingency plan to confirm the resources needed to maintain connectivity, ensure safety, and remain operational during the critical time period during and after the storm.

The team went through a series of checklist items and identified key activities for each program department including IT, Maintenance, Operations, Facilities and Public Information. These activities included testing the TMC's network connection at the Network Access Point (NAP) of the Americas located in downtown Miami to secure our operational redundancy. Additionally, the team went over the status of

field device maintenance and post-storm repair procedures, incident management coverage in both Miami-Dade and Monroe counties as well as arterial, managed lanes and ramp signaling operations.

As the hurricane made its way closer to South Florida, local weather forecasts showed the storm directly impacting Miami as a catastrophic Category Five. The TMC's management staff devised a contingency plan that included relocating key staff to a remote location in Orlando once the storm approached. The team utilized the TMC's NAP connection to access software remotely, so that they could continue managing incidents during the storm.



The staff's preparations before the storm's arrival helped play an important part in helping keep District Six roadways safe for drivers and providing information, assistance and coordination leading up to the storm.

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

NEW FL511 MARKETING SERVICES CONTRACT AWARDED

By Bernadette Morris, Sonshine Communications



Sonshine Communications, a full-service public relations, marketing and advertising agency headquartered in Miami, was awarded the Florida's FL511 Marketing Services contract by the Florida Department of Transportation (FDOT).

"We are absolutely delighted and honored to have been selected as the agency of record to market this important tool and service provided by our state," says Bernadette Morris, CEO of @SonshinePR and the lead project manager for the campaign. "We look forward to working with FDOT to expand the brand's presence and reach, and engage more Floridians with this amazing service."

Working with Sonshine on the project is SalterMitchelIPR, a fully integrated public relations and marketing firm headquartered in Tallahassee, with offices in Orlando and Washington, DC. Combined, the Sonshine team will provide a comprehensive menu of communications programs and unique strategic marketing services to ensure the overall success of the campaign.

FDOT's free FL511 Traveler Information System provides real-time traffic information, including point-to-point commuter travel times, congestion, construction, lane closures, severe weather and emergency evacuation information on all Florida interstate highways, toll roads including Florida's Turnpike, and many other major metropolitan roadways. The resource is available 24 hours a day via phone by calling 511, on social media @FL511, and on the web at www.FL511.com.

Sonshine has worked with FDOT and developed the statewide, award-winning "Drive It Home ... Keep Our Paradise Litter-Free" roadside litter prevention education media and marketing campaign. Additionally, the firm has extensive marketing experience with numerous other transportation accounts including the National Highway Traffic Safety Administration (NHTSA), the Federal Highway Administration (FHWA),



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