FDOT District Six ITS ANNUAL REPORT

SunGuide Transportation Management Center 10 Year Anniversary

FISCAL YEAR 2014–2015

A MESSAGE FROM THE DISTRICT SECRETARY

A lot can happen in ten years. New presidents are elected. Technology continues to change at a rapid pace. Significant weather events take place. However, one constant has been the increase in traffic volumes and congestion in the South Florida region. There have been significant transportation improvement projects designed and constructed to improve traffic conditions including the construction of the Miami Intermodal Center, Port of Miami Tunnel, expansions along the Palmetto Expressway, and major improvements to the Palmetto Expressway / Dolphin Expressway Interchange. However, Intelligent Transportation Systems (ITS) continue to play an important role with optimizing our infrastructure and managing congestion. Ten years ago, the SunGuide Transportation Management Center (STMC) was constructed to manage the expanding ITS network. This edition of the ITS Annual Report celebrates the tenth anniversary of the STMC.

First, a brief history leading to the need for the STMC. During the early 1990s, it was clear that we could not build our way out of traffic congestion. Our existing roadway infrastructure needed to be managed more efficiently. At the time, the Federal Highway Administration had begun to develop the Intelligent Vehicle Highway System (IVHS) program. IVHS was a product of the landmark Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). One of the tenets of IVHS was to "provide for the accelerated use of advanced technology to improve safety on all roads and to reduce traffic congestion along heavily populated and traveled corridors."

The Florida Department of Transportation (FDOT) began dipping its toe in the intelligent highway pool. In District Six, there were a few pilot projects including the first closed circuit television (CCTV) camera project and the dynamic message sign (DMS) technology demonstration project—both within the Golden Glades Interchange. The first major project was the Intelligent Corridor System (ICS) along the entire 17 mile portion of I-95 in Miami-Dade County which started in 1997. This project included installation of the fiber optic cable communications backbone, CCTV cameras, freeway dynamic message signs, and a combination of inductive loop and video detectors. This was the catalyst for the system deployment of what would become known as the ITS along the main freeways in District Six including I-95, I-195, I-395, I-75, the Palmetto Expressway, and US-1 (the major arterial from Miami-Dade County to Key West).

The master plan of the ICS included a central control center which would allow staff to monitor the data being transmitted by the field devices and transmit messages to motorists about traffic conditions. The first ICS project established an Interim Operations Center (IOC) at the District Six headquarters building. The IOC remained in operation while the STMC was constructed. The STMC opened its doors on June 25, 2004.

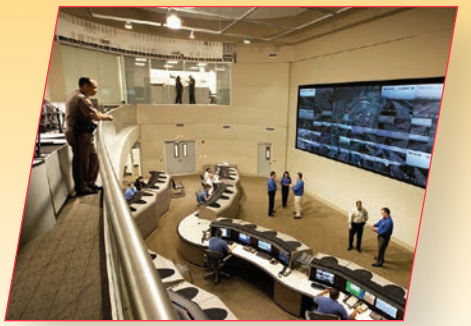
The building was constructed with growth in mind and houses the TMC for our sister agency, the Miami-Dade Expressway Authority (MDX) and the regional dispatch center for Florida Highway Patrol (FHP) Troop E. Through the years, the STMC has helped to facilitate the implementation of several important projects including our freeway service patrol or Road Rangers, the installation of the first express lanes system in Florida, the installation of the first ramp signal system in Florida, the implementation of the Rapid Incident Scene Clearance (RISC) program, and several other innovative projects.

The STMC will continue to support future projects and initiatives. We have the potential for improving the reliability of our transportation system through efficient operations. Based on the six-year operational success of the 95 Express, District Six has been planning the development of a regional network of express lanes to improve mobility within Southeast Florida. District Six is working closely with its partners in expanding the express lanes program to other strategic corridors including SR 826, I-75 as well as continuation of the 95 Express through Broward and Palm Beach Counties. The STMC is expanding to support these new initiatives by increasing the amount of operator work stations from eight to eighteen.

I would like to thank our ITS Leadership team, consultants, contractors, and all the past contributors for the sustained success of our program. These incredibly dedicated people work constantly to make the District Six ITS program, including the 95 Express, an international success.

As District Six Secretary, I am proud of our accomplishments this past year and am fortunate to witness the evolution of the STMC over the last ten years. I look forward to the next ten years and making our multimodal transportation system the best in the nation of which the SunGuide TMC is a key component of achieving that goal.

Gus Pego, P.E.
District Six Secretary of the Florida Department of Transportation



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INTRODUCTION

The theme for this year's annual report is the ten year anniversary of the SunGuide Transportation Management Center (STMC) and what it means to South Florida. The ITS program has seen many changes over the past ten years and the STMC has been the cornerstone for these changes.

The ITS program had its genesis in the mid 1990s with the installation of the first dynamic messages sign (DMS) project within the Golden Glades Interchange (the intersection of I-95, the Florida's Turnpike, the Palmetto Expressway, and SR 7). This was followed by the first closed circuit television (CCTV) camera project also within the Golden Glades Interchange. These projects were the launching point for the current vibrant ITS program that is in place today. The STMC was constructed as part of the I-95 Intelligent Corridor System. The STMC replaced the interim operation center that was housed in the FDOT District Six headquarters building.

The STMC was designed to be the focal point and command center for ITS operations in District Six. This 32,000 square foot building also houses operations and dispatching for the Miami-Dade Expressway Authority, Florida Highway Patrol Troop E, Florida Fish and Wildlife Conservation Commission, and the Florida Department of Law Enforcement.

Interim Operations Center, 2000

Groundbreaking at the STMC site, 2001

The STMC and its staff have managed the expansion of ITS equipment along the major freeways in Miami-Dade County including US-1 through Monroe County to Key West. Innovations such as the 95 Express have been managed successfully from the center. The need to continually optimize our operations coupled with the expected growth in ITS deployment and expansion of the regional express lanes network has necessitated a retrofit of the control room. The STMC embarked on a project to increase the number of operator workstations from eight to eighteen.

This FDOT District Six ITS Annual Report covers the timeframe from July 1, 2014 to June 30, 2015 (FY 2014–2015). This ITS Annual Report aligns with the program's five primary functional areas listed below:

ITS DEPLOYMENTS. providing planning, design and procurement of ITS equipment, including CCTV cameras, DMS, vehicle detectors, and communications supporting ITS operations.

TMC OPERATIONS. providing a central location for data collection and dissemination. The STMC is the command center for managing traffic incidents as well as providing proactive operations through express lanes, ramp signaling, and other active traffic management strategies.

INCIDENT MANAGEMENT. providing and dispatching Road Rangers, and other incident management resources, to safely and quickly clear lane-blocking events as well as provide motorist assistance. An important part of the program is coordination with first responders to identify, develop and implement solutions to improve incident management.

IT/ITS MAINTENANCE. managing the maintenance of ITS field and STMC equipment to ensure system availability and stability, as well as provide software support.

TRAVELER INFORMATION. providing real-time traveler information services through various media, such as the telephone, Internet, Smartphone applications, and social media.

This marks the tenth edition of District Six's ITS Annual Report. In this report, we highlight some of the history and how the District Six ITS office focused its efforts on enhancing its operational strategies, software, and coordination efforts. We hope you find the report informative and welcome you to join District Six as we continue to improve the reliability of the multi-modal transportation systems within South Florida.

Future Control Room, 2015

FLORIDA DEPARTMENT OF TRANSPORTATION

ITS MISSION:

Enhance the safety, security and efficiency of Florida's transportation system through the implementation of interoperable ITS technology in support of local, regional and statewide mobility.

ITS VISION:

Be the national leader in ITS by promoting multi-jurisdictional coordination for the provision of an efficient, secure, reliable, and safe transportation system.

ITS DEPLOYMENTS

The first ITS projects concentrated on installing the outdoor plant fiber optic cable infrastructure and expansion of CCTV cameras, traffic detectors, and dynamic message signs in Miami-Dade and Monroe Counties. As ITS was embraced as a traffic improvement option, FDOT road and bridge projects continued the deployment by including ITS elements in these construction projects. ITS became an important consideration in planning and feasibility studies for new roadway projects. One of the challenges with ITS is the ever-changing technology. Over the past 10 years there have been improvements to CCTV cameras with high definition video, DMS are being installed with the capability of full color text and graphics, and communications have improved to using both hard-wired and reliable wireless systems. District Six has worked hard to stay ahead of the technology curve and continues to improve the ITS infrastructure to achieve its transportation goals in improving traffic safety, incident management, mobility, and reliability.

Some of the significant historic ITS projects include:

I-95 INTELLIGENT CORRIDOR SYSTEM (PACKAGES A, B, AND C). This was the first major deployment of ITS in Miami-Dade County covering the entire 17 mile portion of I-95. Packages A & B established the fiber optic cable backbone; installed CCTV cameras, DMS, and detectors; installed the ramp signal infrastructure; and laid the foundation for the I-95 express lane projects. Package C was the project that constructed the STMC. These projects began in 1997 and were completed in 2007.

Freeway DMS along I-95

95 EXPRESS PHASE 1. This project was the beginning of FDOT's involvement with express lanes. The project converted the High Occupancy Vehicle (HOV) lane and adjusted overall lane widths to install two express lanes in each direction over a seven mile segment of I-95. The northbound segment became operational in 2008 and the southbound segment in 2010.

I-95 RAMP SIGNALS. District Six deployed the first ramp signals in Florida at 22 on-ramps along I-95. The first phase along northbound I-95 from NW 62nd Street to Ives Dairy Road became operational in 2008. The second phase along southbound I-95 became operational in 2009. This system has proven successful in smoothing friction points between freeway and merging traffic.

A summary of District Six ITS projects completed during FY 2014–2015 and ongoing into FY 2015–2016 includes:

DMS AND ARTERIAL DMS REPLACEMENTS. These design-build projects replaced five amber freeway DMSs and three amber arterial DMSs with color LED full-matrix DMSs. The DMS project was completed in July 2014 and the arterial DMS project was completed in April 2015.

SR 826 AND I-75 EXPRESS LANES MIAMI-DADE DEPLOYMENTS. These express lane projects began construction during 2014. ITS devices such as CCTV cameras, DMS, vehicle detectors, and other infrastructure support equipment will be installed to support these express lanes. These projects are scheduled for completion in 2017.

PALMETTO EXPRESSWAY (SR 826)/DOLPHIN EXPRESSWAY (SR 836) INTERCHANGE RECONSTRUCTION SECTION 5. This major multilevel interchange reconstruction project includes additional ITS elements such as five new CCTV cameras, DMSs along SR 826, arterial DMSs, microwave vehicle detectors, and fiber optic cables. The addition of these devices will provide District Six with full coverage of the SR 826/SR 836 Interchange and completes the final fiber optic cable link for SR 826. Construction has been ongoing since 2009 and is expected to be complete in 2016.

95 EXPRESS PHASE 2. This project, which began construction in November 2011, will extend the existing express lanes from the Golden Glades Interchange in Miami-Dade County to Broward Boulevard in Broward County. ITS devices such as CCTV cameras, DMSs, vehicle detectors, and other infrastructure support equipment will be installed to support 95 Express Phase 2. This project is scheduled for completion in 2016.

I-95 EXPRESS DMS AND TOLL SIGN PANEL REPLACEMENT PROJECT. This project beginning in FY 2015–2016 will retrofit existing toll signs, DMS, and confirmation cameras for the express lanes expansion. The project will upgrade the equipment to high definition (HD) cameras and full matrix color DMS. This will enhance the existing express lanes and allow for the expansion under the 95 Express Phase 2 project.

This table illustrates the increase in deployed ITS devices from 2005 to 2015.

ITS Device	2005	2015
CCTV	69	299
DMS	22	131
Detectors	205	321
Ramp Signals	0	22

TMC OPERATIONS

The origin of the ITS program was a result of the transition from development of advanced traffic signal systems to freeway management. During the planning stage, it became apparent that a command center needed to be established to handle the amount of data being received and the information being sent out. The ICS Package A Project established the interim operations center (IOC) in the District Six headquarters building. This was a temporary base of operations until the STMC building could be constructed. The ICS Package C project constructed the STMC building which was followed by another project to install the networking, computer, and video wall equipment. The fully functional STMC became operational on June 25, 2004 and the District Six ITS program has not looked back.

The STMC serves as the command and control center for proactive traffic management (e.g., express lanes, ramp signaling) as well as its core functions of incident, work zone, emergency, and special event management. The STMC operates 24 hours a day, seven days a week.

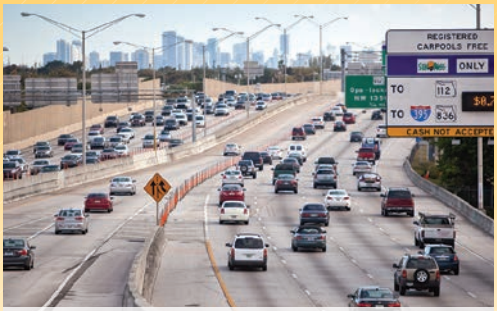
The STMC has also accommodated advancements in software. The first ITS software system used in District Six was based on proprietary software. As each district started installing ITS equipment, the FDOT Central Office embarked on developing standard software that would be used by all districts. Hence, the SunGuide system software was born. Today all FDOT districts, including the Florida's Turnpike, use the SunGuide software.

District Six had additional requirements and needs that went beyond what the SunGuide software could provide. The decision was made to develop software tools to help with the day-to-day operations. District Six developed Operations Task Manager (OTM) and Operator Quality Control (OpQC) to assist with functions such as express lanes operation, tracking ITS device maintenance tickets, measuring operations staff performance, and other daily activities. This software helps District Six operate more efficiently.

TMC operators coordinate with emergency responders, Road Rangers, and other incident management resources to clear incidents as quickly and safely as possible from South Florida's roadways. This coordination is enhanced by the co-location of the Miami-Dade Expressway Authority (MDX) TMC operations staff and the Florida Highway Patrol (FHP) Troop E dispatch within the STMC.

The SunGuide software was upgraded to Version 6.0 which includes new features to accommodate Wrong Way Detection systems, enhancement to WAZE operations, and transition to a Windows platform to enable TMC Operators to make more informed decisions in activating incident response plans.

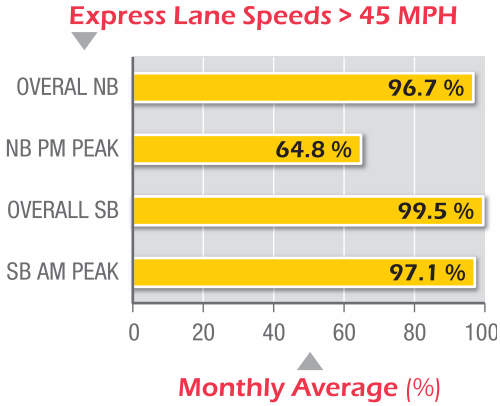
95 EXPRESS OPERATIONS



95 Express Lanes

One of the most significant projects to impact ITS operations during the past ten years is the Express Lanes Phase 1 project. The project launched in December 2008 and has seen a steady increase in popularity in South Florida leading it to be considered one of the most successful and highly used express lanes facilities in the United States. During FY 2014–2015, the 95 Express reached 120 million vehicle trips since inception and serviced over 21 million vehicle trips during the past year.

Toll-exempt trips using the 95 Express (i.e., carpools of three or more and transit) experienced a significant increase from 560,000 to over 680,000 trips, a 21% increase. Of all toll-exempt trips, 30% are composed of HOV3+. Express Lanes Bus Rapid Transit service also experienced increased usage during FY 2014–2015 rising from 2,810 to 3,537 boardings per day, a 25% increase.



This graph highlights the reliability of the 95 Express. Reliability is a key performance measure for the Express Lanes and is defined as the percentage of time during the peak period when speeds remain above 45 miles per hour. The federal goal for this performance measure is 90%. The northbound afternoon peak period has several factors affecting reliability including: more concentrated traffic volumes for homebound commuters, conflict point at the Golden Glades Interchange, and freeway geometry issues north of the I-195 interchange.

As a result of the decrease in reliability, District Six experimented with a hard closure procedure for the northbound PM peak period. Any traffic event within the express lanes during the PM peak period would result in physically shutting down the entrances to the express lanes. This was implemented to control access to the facility, manage motorists ignoring a posted "closed"

message under a "soft closure", prevent "lane divers" from weaving between the express lane markers, and improve safety for responders. This procedure is currently being evaluated.

As the District continues to operate the existing phase of the 95 Express, it is also working with its partners District Four and Florida's Turnpike preparing for the next phase of the facility. 95 Express Phase 2, which is currently under construction and is scheduled to begin operations during FY 2015–2016, is a 14-mile extension from the current phase into Broward County. Upon completion, this new phase will introduce two new tolling segments in each direction. Drivers who wish to use 95 Express for long trips will benefit from "Trip Building" based operations. Trip building allows drivers to see a toll (or tolls) for longer distances rather than one exit ahead and locks them at the price shown (or lower) based on the time their toll transponder is read at the first tolling point passed. As part of the effort to make this transition seamless for drivers, District Six worked with its partners to develop business rules which were translated into software design requirements to accommodate the new type of operations.

SR 826/I-75 EXPRESS OPERATIONS

District Six is expanding its express lanes network in alignment with a regional plan established for South Florida. After 95 Express Phase 2, the next express lanes project to become operational for District Six is the SR 826/I-75 Express Lanes. The project limits are SR 826 from West Flagler Street to NW 154th Street continuing along I-75 from SR 826 to I-595 in Broward County. The project length is approximately 28 miles and spans FDOT Districts Four and Six.

The SR 826/I-75 Express Lanes will include a two-lane direct connect reversible flyover ramp to/from the I-595 Express Reversible Lanes System in the northern end of the project in Broward County. There will also be a single-lane flyover ramp that connects the southbound I-75 Express Lanes to the southbound Homestead Extension of the Florida's Turnpike (HEFT), and a single-lane flyover that connects northbound HEFT to the northbound I-75 Express Lanes. There will be a flyover ramp (one lane in both the northbound and southbound directions) that directly connects I-75 and SR 826. In addition to the physical geometric improvements, the SR 826/I-75 Express Lanes will also include the following additional system components:

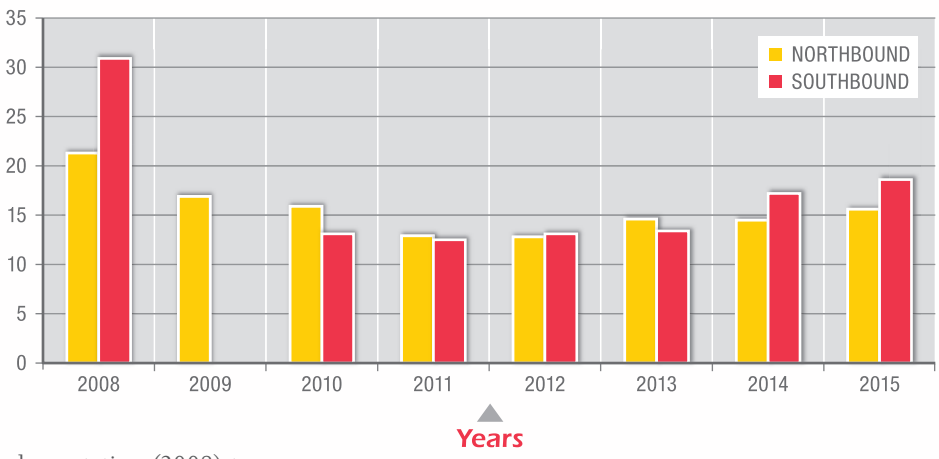
- Dynamic Message Signs System
- Vehicle Detection System
- CCTV Cameras System
- Ramp Signal System (SR 826 only)
- FDOT Toll Setting Software
- Electronic Toll Collection System
- Reversible Lane Control System
- Incident Management Services

Operation of the SR 826/I-75 Express Lanes will be a joint effort between the TMCs in Districts Four and Six. Both TMCs will use the statewide SunGuide Software to monitor and control the ITS field devices. The toll operations functionality will be controlled through separate software that will interface with the SunGuide Software and the Florida's Turnpike back office software. In addition, Florida Highway Patrol (FHP) and local police/fire rescue agencies will provide emergency response. The FHP will also be responsible for enforcement.

RAMP SIGNALING OPERATIONS

Another component of the 95 Express is the ramp signaling system, which entered its fifth full year of operation during FY 2014–2015. Consisting of 22 total ramp signals, the system improves operations along I-95 by regulating the flow of vehicles entering the roadway during peak periods of travel. TMC operators can also activate the ramp signaling system in the case of congestion during non-peak periods or to assist during an incident or special event. As demand along the freeway increases in the future, ramp signaling will continue to be one of the tools to help District Six continue to be proactive in managing congestion. This graph indicates the decrease in average travel times along I-95 from before the ramp signaling system's implementation (2008) to after its implementation (northbound in 2009 and southbound in 2010).

Average Travel Time on I-95 *(minutes)*



CONSTRUCTION AND SPECIAL EVENT COORDINATION

A crucial component of TMC operations is coordinating with multiple agencies to ensure all planned and unplanned lane blockage events are dealt with in the most efficient manner possible. During FY 2014–2015, coordination between the TMC operations staff and these various agencies increased as several construction projects continued to affect District Six roadways.

CONSTRUCTION COORDINATION. One of the most significant challenges is the impact of ongoing roadway construction. TMC operations staff coordinated with the project leads of several construction projects to create pre-event information plans that would advise the motoring public of upcoming construction-related closures. The following is a list of projects that TMC operations staff developed these plans for: SR 826/836 Section 5, NW 25th Street Viaduct Phase 2, I-95 Pavement Rehabilitation, Long Key Bridge Pier Replacement, I-75 and SR 826 Express Lanes, and 95 Express Phase 2.

SPECIAL EVENT COORDINATION. Aside from construction projects, several special events occur in South Florida that cause unusual traffic congestion along District Six roadways. TMC operations staff coordinates with representatives of these events to help ensure traffic can move as safely and efficiently as possible. Events such as the annual holiday Toys in the Sun Run in Broward County, professional basketball games in downtown Miami, a major tennis tournament in Key Biscayne, all college and professional football-related events including the college bowl game at the stadium in North Miami, and downtown Miami entertainment events (e.g., weekend long music festivals) are just a few examples of events TMC operations staff handled.

SOFTWARE ENHANCEMENTS

During FY 2014–2015, TMC operations software was enhanced to streamline procedures, increase operational efficiency, and provide optimized quality assurance and quality control of TMC operator data entry.

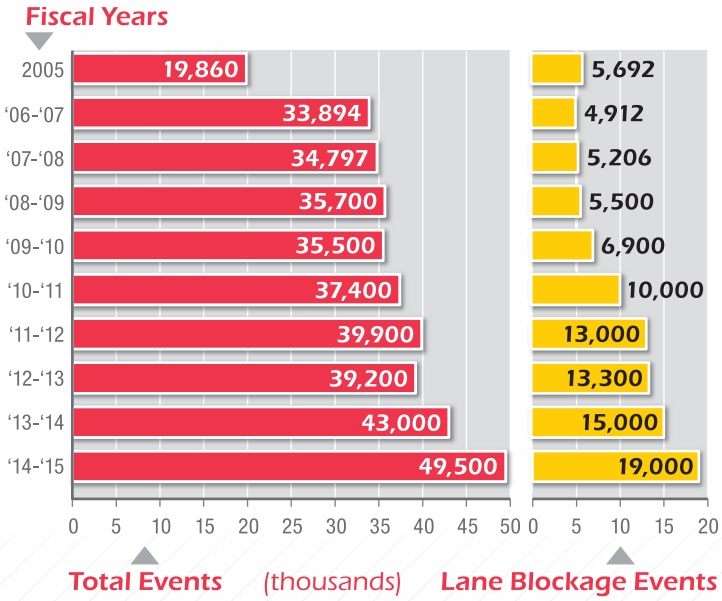
OPERATIONS TASK MANAGER (OTM). OTM is a single piece of software that incorporates several separate software modules which serve as extensions of the statewide SunGuide Software. OTM includes ten modules handling functions such as express lanes, ramp signaling, ITS device maintenance tracking, rapid incident scene clearance, and reporting functions. During FY 2014–2015, OTM was improved to accommodate the upgrade to the new SunGuide version 6.0 and enhance the express lanes module.

OPERATOR PERFORMANCE QUALITY CONTROL (OPQC). The TMC's operational services are provided through a performance-based contract, in which operator performance is evaluated on 34 possible errors for each lane blocking event managed. This requires a detailed quality review of all travel lane blocking events. OpQC was developed to help automate most of the data evaluation efforts for both lane blockage and non-lane blockage events. In FY 2014–2015, staff incorporated OpQC as a module in OTM.

PERFORMANCE MEASURES

In December 2007, District Six set targets for key operational performance measures that have the greatest impact to the public. During FY 2014–2015, TMC operations staff once again exceeded those targets, thanks to quality control procedures that include daily reviews of all travel lane blocking events.

The table on the opposite page shows the performance measures' average results and targets. These goals continue to be exceeded as operators managed 49,500 total events and 19,000 lane blocking events during FY 2014–2015. The adjacent graph shows the number of events compared to previous years.



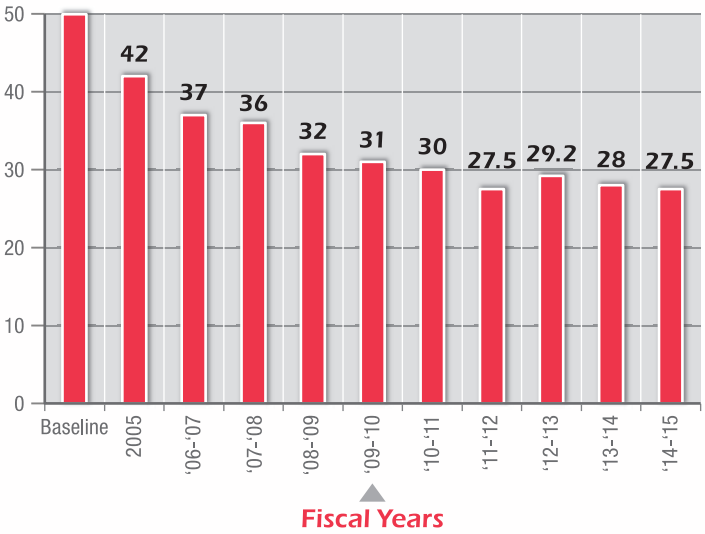
Performance Measures	FY 07-08 Average	FY 08-09 Average	FY 09-10 Average	FY 10-11 Average	FY 11-12 Average	FY 12-13 Average	FY 13-14 Average	FY 14-15 Average	Target
DMS Efficiency	99.00%	100.00%	99.72%	99.82%	99.77%	99.87%	99.78%	99.74%	>95.00%
TMC Operator Error Rate	0.19%	0.30%	0.43%	0.32%	0.30%	0.36%	0.38%	0.44%	<0.59%
Time to Dispatch Road Rangers	0:00:51	0:00:47	0:01:05	0:00:56	0:00:44	00:00:44	00:00:44	00:00:45	<00:02:00
Time to Confirm an Event	0:00:59	0:00:26	0:00:23	00:01:31	0:01:42	00:01:40	00:01:48	00:01:11	<00:02:00
Time to Post DMS	0:02:15	0:03:26	0:03:17	00:02:47	0:02:27	00:02:16	00:02:28	00:02:16	<00:05:00
Time to Notify Other Agencies	0:02:04	0:01:31	0:01:19	00:01:15	0:01:11	00:01:30	00:01:42	00:02:18	<00:07:00

INCIDENT MANAGEMENT

District Six's incident management service helps maintain roadways free and clear of road blocking incidents. The multi-agency Traffic Incident Management (TIM) Team plays a significant role in helping FDOT to reach its goal: to reduce traffic congestion, as well as decrease the chances of secondary events, caused by prolonged exposure to traffic incidents.

With the help of all its partners in the TIM Team, District Six's average annual roadway clearance time was 27.5 minutes during FY 2014–2015. The following graph shows the historic trend of roadway clearance times.

Average Annual Roadway Clearance Duration *(minutes)*



TIM

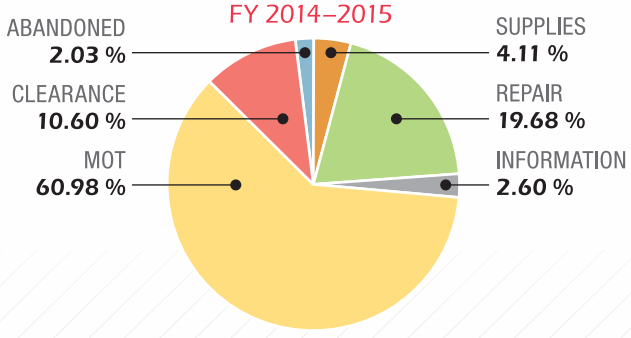
Special event coordination was a major component of incident management efforts during FY 2014–2015. Interagency coordination within the TIM Team made that possible.

Thanks to the relationships built within the TIM Team, the TMC's TIM representatives were able to continue coordination efforts and outreach with partnering agencies. Meetings were arranged with several agencies within the TIM Team such as FHP, Road Ranger contractors, roadway maintenance contractors and fire rescue representatives. The group discusses upcoming FDOT projects as well as conducts post incident analyses of recent large scale events to apply lessons learned. FHP Troop E and TMC operations staff continue to share information and resources to help detect and manage incidents along District Six roadways more efficiently. The relationships built in the TIM Team help District Six by creating more efficient interagency coordination during future incidents along general purpose lanes as well as express lanes.

ROAD RANGERS

The TMC serves as the control center for dispatching and coordinating field operations. One of the largest parts of District Six's field operations is the Road Ranger program, which began in 1999 and has evolved into an incident management arm for the STMC. As the most visible component of District Six's incident management service, Road Rangers provide incident response and motorist assistance along I-95, I-75, SR 826, I-195, I-395 and the MacArthur Causeway. The initial vehicles included tow trucks and pickup trucks. In 2009, flatbed wreckers were added and in 2013 a heavy duty wrecker was implemented. As seen on the pie chart below, more than 90% of Road Ranger assists are for Maintenance of Traffic (MOT), repair or clearance services.

Road Ranger Assists by Type
FY 2014–2015

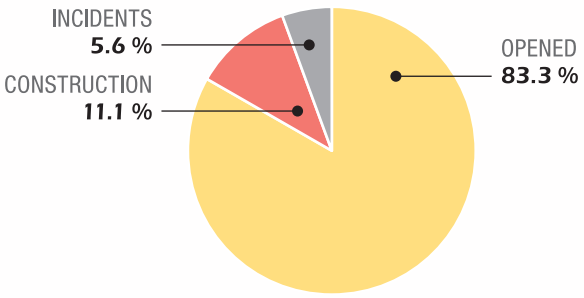


INCIDENT RESPONSE VEHICLES (IRV)

IRV Support Truck

District Six's IRV Program responded to 1,713 events during FY 2014–2015. IRV operators, along with the FHP, Road Rangers and other responders were instrumental in keeping the 95 Express lanes open and available for use 83.3% of the time during the fiscal year with the facility remaining closed due to incidents 5.6% of the time. The average travel lane blockage duration in the express lanes was 20.0 minutes in the northbound direction and 17.7 minutes southbound. Even though IRV operators focus mostly on the 95 Express lanes, they also assist motorists in the general purpose lanes along I-95 on an as-needed basis. An additional truck was implemented in FY 2014–2015 to assist with the hard closures of the express lanes. This pickup truck (or "IRV Light") carries traffic cones and barricades to assist maintenance of traffic operations.

Express Lanes Facility Availability
FY 2014–2015



SAFETY AND SIRV COORDINATION

District Six continued coordination between its IRV operations staff and the District Four TMC's Severe Incident Response Vehicle (SIRV) Team. This coordination is needed due to the overlapping construction limits for the 95 Express Phase 2 project. The two teams meet and discuss IRV/SIRV procedures and lessons learned. Coordination will continue through the opening of 95 Express Phase 2.

RISC Event

RAPID INCIDENT SCENE CLEARANCE (RISC) UPDATES

The RISC program supports Florida's Open Roads Policy by providing incentives for the rapid removal of the more complex incidents that occur along District Six roadways and normally require additional time for clearance. RISC contractors need to respond with all required vehicles within 60 minutes and clear the travel lanes within 90 minutes to receive the incentive. TMC operations staff use the RISC module in Operations Task Manager to track RISC activation, resources arrival and clearance times. During FY 2014–2015, the average RISC response time was 43 minutes while the average RISC travel lane clearance time was 57 minutes. In total, TMC operations staff summoned RISC resources 18 times during FY 2014–2015. The RISC program has responded to 75 events since its inception in 2009. This RISC program continues to improve on its clearance times as shown in the table below.

The RISC arterial pilot program continued during FY 2014–2015 covering Krome Avenue (from Kendall Drive to US 27), US 27 (from SR 826 to the Miami-Dade/Broward County line), and the MacArthur Causeway. This program was launched in 2011 to address the problem of major incidents along these roadways that experience high commercial vehicle traffic volumes.

RISC Performance	2009–2010	2010–2011	2011–2012	2012 – 2013	2013–2014	2014–2015	Target
Average Activation Time	n/a	21 m	10 m	28 m	23 m	28 m	--
Average Response Time	50 m	37 m	39 m	46 m	45 m	43 m	60 m
Average Travel Lane Clearance Time	76 m	60 m	88 m	85 m	68 m	57 m	90 m
Average Total Incident Clearance Time	n/a	128 m	161 m	225 m	161 m	141 m	--
Total RISC Events	10	12	9	7	19	18	--

IT/ITS MAINTENANCE

District Six's ITS Program is highly dependent on technology to be able to process the tremendous amount of data throughout the TMC's computer network. There have been many technological changes and advancements during the past ten years that have required the TMC's IT/ITS maintenance staff to adapt and remain flexible. Staff has seen video compression/decompression equipment change from the size of a board game box to a box of matches. The main servers that process data reduced from the size of a tank to the size of a shoe box. The transition was made from a third party leased communication service to an Ethernet based fiber optic cable network. Now the ITS Program has a presence at the Network Access Point (NAP) of the Americas in downtown Miami. The SunGuide system and OTM software can essentially be operated from anywhere with a network connection. This gives the STMC a secure backup option in the event of a major event that could cause it to evacuate or shut down.

The table below shows the availability of key system components during FY 2014–2015 as compared to the previous fiscal years.

Subsystem	Annual Average System Availability		
	FY 2012–2013	FY 2013–2014	FY 2014–2015
CCTV	95.47%	97.56%	94.73%
DMS	93.85%	96.66%	96.15%
Detectors	94.90%	96.13%	95.05%
Video Wall	97.49%	97.43%	98.86%
SunGuide	97.97%	99.86%	98.97%
OTM	99.85%	99.97%	99.68%

ITS UTILITY INFRASTRUCTURE LOCATES

One important function of the STMC is to prevent outside entities from damaging the ITS infrastructure. The ITS Program has installed a large amount of underground fiber optic and electrical cables throughout Miami-Dade and Monroe Counties over the past ten years. Notifications (or locate tickets) are received from Sunshine 811 regarding activity that may interfere with underground utilities. The ITS Program sorts through these tickets and when necessary will physically mark the ground showing the location of the ITS underground infrastructure. During FY 2014–2015, 15,912 sunshine tickets were received and 1,791 sunshine tickets were located. The graph at the right shows the amount of locates since FY 2009–2010.

Some of the current accomplishments by the IT/ITS Maintenance staff include the following.

VIDEO WALL UPGRADE

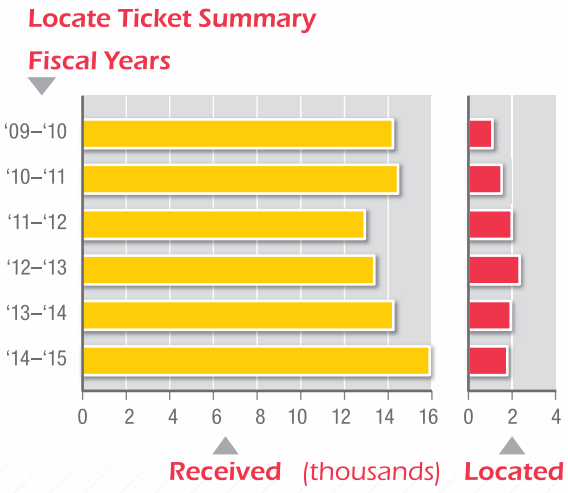
In 2013, the ITS program upgraded the video wall cubes to an LED engine system. In 2014, the ITS program upgraded the computer system that controls the video wall. The new system operates on off-the-shelf servers and video control system software. The new system supports high definition video images and allows operators more flexibility with controlling how the video is presented.

PORT OF MIAMI TUNNEL NETWORK CIRCUIT

The opening of the Port of Miami Tunnel was a major event in 2014. The STMC serves as a backup facility for the Port of Miami Tunnel operations center. IT/ITS staff assisted with the installation of the networking equipment that allows connectivity between the two systems.

SYSTEM SOFTWARE UPGRADES

The IT/ITS staff guided the installation of major upgrades to the SunGuide system software and the Operations Task Manager software. Both upgrades offer the STMC more capabilities and improve operator workflow. The IT/ITS staff ensured that the required hardware was configured and ready to go for these important upgrades.



TRAVELER INFORMATION

Traffic information through the statewide Florida Advanced Traveler Information System (FL-ATIS), commonly referred to as 511, started in Florida when FDOT received a Federal Highway Administration (FHWA) 511 deployment grant which initiated the statewide implementation plan. The plan began with the deployment of regional 511 telephone-based traveler information services in Central and Southeast Florida regions. In 2000, FDOT Districts Four and Six, and the Florida Turnpike Enterprise initiated a program to design, build, operate, and maintain a multi-modal traveler information service.

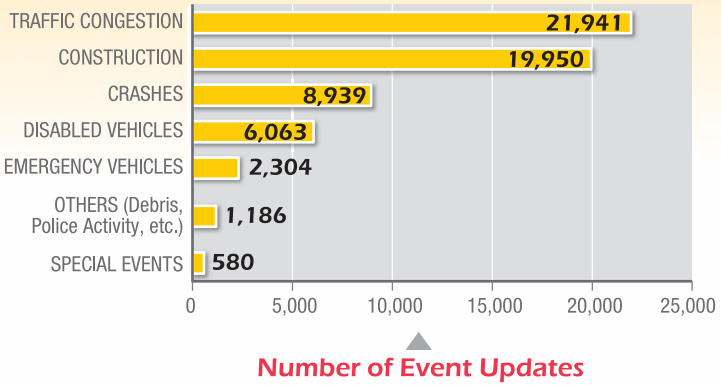
The service for Southeast Florida launched on July 16, 2002. With this regional system, Southeast Florida had traffic information available on all major interstates and many state highways throughout Miami-Dade, Broward, and Palm Beach Counties. Callers from within these counties, as well as Monroe County through the Florida Keys, had access to live operators by dialing 511 on their phones. The Southeast Florida phone service was touchtone activated and provided information in both English and Spanish. The service also provided traffic information through the www.511southflorida.com website. Regional 511 services were later launched in Tampa Bay, Jacksonville, and the Southwest region. In December 2003, a statewide FDOT 511 Working Group was formed to facilitate coordination between the Districts in deploying and operating 511 services. The Working Group developed strategies to converge all regional 511 services towards a single statewide service by the end of the decade, hence FL-ATIS was born.

FL-ATIS was launched on June 17, 2009, serving the motoring public statewide with real time traffic information, travel times (TvT), reproduction of posted DMS messages, and CCTV still images. The statewide service was first launched in two platforms, the phone based Interactive Voice Recognition System (IVR) and the 511 website www.fl511.com. FL-ATIS later evolved to incorporate Twitter accounts and smart phone apps. The 511 iPhone app was launched June 2011 and the app for Android phones was launched August 2013.

In March 2014, FDOT signed an agreement to share information with a crowd source traffic app called Waze. The agreement allows Waze to tap into FDOT's databases to enhance their product to the public. In turn, Waze grants access to FDOT to their collected data to enable enhancement of FDOT's information disseminating capabilities.

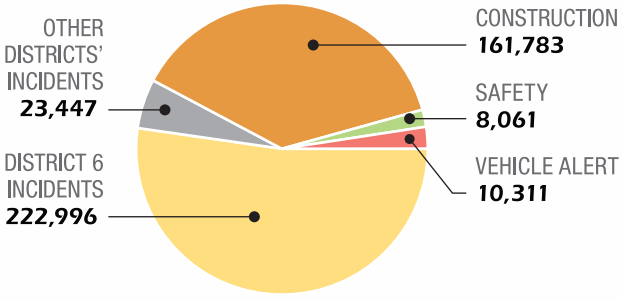
During FY 2014–2015, the 511 service continued to receive a significant amount of calls statewide with users in Miami-Dade and Broward Counties making up a considerable portion of those calls. District Six TMC operators published over 60,000 event updates from lane blockage and congestion events on roadways managed by the District Six TMC; a 27% increase over last fiscal year. The below graph shows the different types of published events.

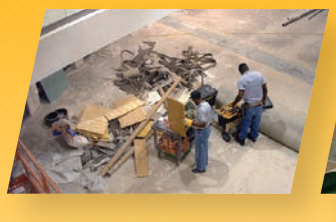
FL-ATIS Published Traffic Information by Event Type (60,963 Published Event Updates)



During FY 2014–2015, more than 426,500 messages were deployed on District Six DMSs, with the majority of messages being for incidents and construction. This is a 73% increase compared to the previous fiscal year.

Posted DMS Messages by Type
(426,598 Messages) FY 2014–2015





PUBLIC OUTREACH

FDOT District Six recognized early on for the need to have a public information (PI) staff for the ITS Program. The PI staff has been a tremendous help over the past ten years providing information to motorists, the media, and other political and municipal agencies. This dedicated staff initially educated the public on the ITS program. Their efforts evolved into more of a customer service effort as inquiries and feedback regarding the 95 Express Lanes became more prevalent.

The ITS PI staff completed several efforts this year to raise awareness of the program's services in the local community and also participated in various events that worked to increase its national profile. PI staff also focused on supporting 95 Express operations, customer service, and working with partner agencies such as South Florida Commuter Services, Broward County Transit, and Miami-Dade Transit to streamline customer service procedures. Opportunities were taken to interact with the media to increase the program's exposure. STMC staff hosted tours, published numerous articles, and participated in industry conferences throughout the year.

TOURS. The District Six ITS program conducts tours of the STMC. Tours typically include a presentation of the ITS program, viewing of the control room operations, and in some instances a walkthrough of the STMC. Staff facilitated tours during FY 2014–2015 for:

- FDOT employees
- FIU Institute of Transportation Engineers/Women in Transportation
- University of Miami School of Engineering
- Bring Your Daughters and Sons to Work Day
- Miami-Dade Aviation
- FDOT District 4 Transportation Management Academy
- Hitsotsubashi University (Japan)
- FIU Electrical Engineering Department
- FDOT District 6 Construction
- FDOT District 7
- Georgia Tech University
- FIU Summer Prep Program
- Gwinnett County Chamber of Commerce
- Palm Beach MPO

INTERVIEWS. District Six ITS PI staff conducted interviews with media to help increase awareness of the ITS program. Some of the interviews conducted during FY 2014–2015 include:

- WFTV Orlando Interview and Tour
- CBS media interview and tour
- Sun Sentinel
- WLRN/Miami Herald

COMMUNITY INVOLVEMENT. District Six ITS staff participated in various campaigns and functions in the community to support important issues and increase awareness of the ITS program. Some of the community involvement efforts over the past fiscal year include:

- Tour for the FDOT Chief of Staff
- Hosting United States Senate candidates
- Hosting Miami-Dade Metropolitan Planning Organization Citizens Transportation Advisory Committee

CUSTOMER SERVICE. Customer service efforts continued to be a high priority as 95 Express experienced several changes during this fiscal year. As a result, staff processed more than 300 comments from a variety of topics that included tolling, transit and data requests for academic and professional institutions from around the world.

Gwinnett County Tour

Daughters and Sons to Work Day

BENEFITS TO THE PUBLIC

One of the most important benefits of the ITS Program to South Florida motorists is the reduction in incident duration. The average travel lane blocking incident duration during this fiscal year was 27.5 minutes. This represents a 45% reduction from the 2005 FDOT District Six established baseline average duration of 50 minutes.

The FDOT District Six ITS Program's budget for FY 2014–2015 included operating, maintenance and capital improvement costs. The costs displayed in the table to the right are considerably less than the normal capital costs associated with expanding highways and facilities.

When the delays associated with incidents are reduced, motorists save time. This time savings can be directly translated to dollars. As shown in the benefits table, the Incident Management Program's contribution to the reduction in delay due to incidents translates into savings of $2.6 billion. The time savings due to clearing incidents quicker had more of an impact during FY 2014–2015. The number of events that had blocked travel lanes increased from last fiscal year by over 2,000 events—a 23% increase. An increase in events coupled with lower clearance time results in significant time savings compared to the 2005 benchmark.

Additionally, 95 Express and the Ramp Signaling System also contributed to the reduction of delay during peak hours translating into savings of $36 million. This estimate was calculated using widely accepted statistical methods for estimating the cost implications of traffic delays. The estimate only includes time saved by motorists; it does not address road user cost savings.

When comparing the total estimated benefits of the ITS Program during FY 2014–2015 to the total annual operating expenses and capital investments (annualized over ten years at seven percent), the ITS Program is shown to be yielding $53.15 in economic benefit for every dollar spent (Benefit Cost Ratio of 53.15:1).

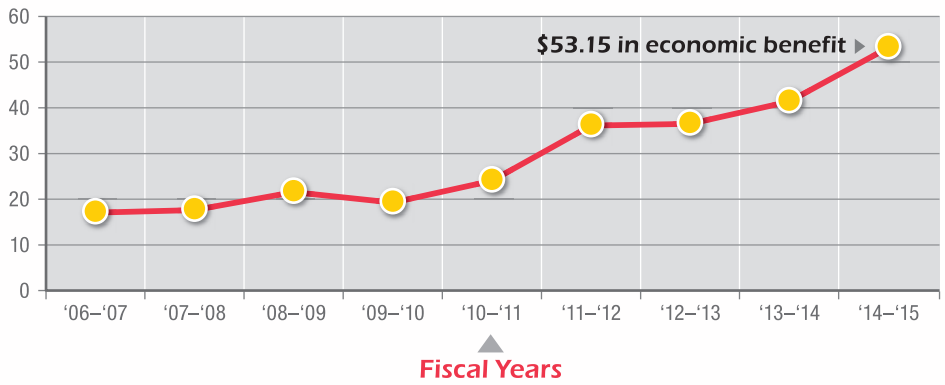
Fiscal Year 2014–2015 Costs	
ITS Operations	$6,245,828
ITS Maintenance *	$3,987,682
Road Rangers	$4,036,225
RISC	$57,500
FDOT Cost Center Operating Budget **	$2,371,657
Other (Consultants, FTE, FHP, FIU)	$3,323,311
Total Annual Operating Costs	$20,022,203
Total Annualized Capital Costs	$30,325,262
Total Annual Costs	$50,347,465

Fiscal Year 2014–2015 Benefits	
Incident Management	$2,640,226,691
Express Lanes / Ramp Signals	$35,716,654
Total Benefits	$2,675,943,345

* Includes Express Lanes ITS Maintenance and Express Lane Marker Repair

** Includes Utilities for Express Lanes

Benefit Cost Ratio



A comparison of the Benefit Cost Ratio for FY 2014–2015 versus the previous eight years is presented in the graph to the left. The continuous increase in benefit is indicative of the continual improvement in the program as well as the increased value of travel time and less capital expenditures since the critical ITS infrastructure is mostly in place.

A LOOK AHEAD

The next ten years for the STMC and ITS Program will be important and exciting ones. The South Florida regional express lane network will continue to expand with several ongoing and future projects. This will require upgrades to the ITS infrastructure in the field as well as improvements to the software systems and layout of the control room within the STMC. These and other operational improvements are summarized below.

STMC CONTROL ROOM RECONFIGURATION

At the end of 2015, District Six will be completing the construction of improvements within the STMC control room to accommodate future operational needs. The number of workstations is increasing from the existing eight, which is configured in a linear arrangement, to 18 workstations configured in a pod arrangement. The pods will be organized to facilitate more efficient communications among operators conducting like functions. For example, one pod will be dedicated to I-95 operations and include two workstations for express lanes, one for ramp signaling, one for incident management/ coordination with Road Rangers, and one for a supervisor. An identical pod will be configured for SR 826 to accommodate future growth for similar functions. In addition, six individual workstations are being installed in front of the video wall for TMC support functions (Road Ranger and IRV Supervision, TIM and Construction Coordination, and traffic engineering).

95 EXPRESS PHASE 2 AND PHASE 3

Construction will continue into FY 2015–2016 on 95 Express Phase 2. District Six will continue to support the project by preparing all necessary documents to ensure 95 Express operations continue to be a success. These documents will update software requirements, policies, procedures, training, and incident management resources to handle the project's 14-mile expansion into Broward County. Phase 3 is currently in the development stage and will extend 95 Express into Palm Beach County. District Six will be working closely with its partners to ensure all stakeholders' needs and concerns are adequately addressed to maintain a regional approach across jurisdictional boundaries.

INCIDENT RESPONSE VEHICLE (IRV) OPERATIONS

IRV operations will be expanded from five days to seven days each week to address incidents occurring in the express and general purpose lanes during weekends as well as the weekdays.

OTHER EXPRESS LANES PROJECTS

Building on the success of 95 Express, FDOT is currently planning to extend express lanes to other facilities in South Florida. To fully realize and maximize the benefits provided by express lanes, each individual express lanes facility will be developed as part of an overall network of express lanes facilities, meaning all express lanes would be linked to function and operate as a seamless, region-wide network. Roadways included as part of this expansion within South Florida are SR 826, I-75, I-595, Florida's Turnpike as well as portions of the Golden Glades Interchange and the SR 826/ SR 836 Interchange.

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS (TSM&O) PROGRAM

TSM&O provides a higher level of operational integration among the freeway, arterial and transit systems aligned with performance measures to improve the efficiency of our multi-modal transportation network in real-time. The TSM&O Program was initially envisioned in 2008 and formally endorsed as a program in 2010. One of the planned projects of this program for FY 2015–2016 is the Adaptive Signal Control Technology (ASCT) Pilot Project. The goal is to improve traffic conditions along SW 8th Street between SW 142nd Avenue to SW 67th Avenue utilizing traffic adaptive technology at 29 signalized intersections. Traffic adaptive technology optimizes individual signalized intersections based on real time data while improving the traffic flow through a corridor of intersections.

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