



# Leading the Way



# A MESSAGE FROM THE DISTRICT SECRETARY



**S**trong leadership becomes evident in times when action is needed. Fiscal Year 2008/2009 was a year in which every challenge presented became an opportunity for our District to excel. Becoming the

first in the State of Florida to implement such innovative transportation management systems as the 95 Express and Ramp Signaling Projects this fiscal year, District Six rose to each challenge by delivering programs that exceeded industry-standard goals and surpassed community expectations...establishing a mark that will help guide others achieve the same success.

During Fiscal Year 2008/2009, the Florida Department of Transportation (FDOT) District Six Transportation Management Center (TMC) significantly expanded its operations to support program enhancements and new initiatives. With a strong unit of FDOT leadership, coupled with the services of an experienced Intelligent Transportation Systems (ITS) Team, the TMC played a critical part in the successes achieved during this fiscal year. Whether developing software applications to maximize daily operations of new initiatives or overcoming budget cuts to maintain services to acceptable standards, the TMC enhanced system operations to ensure successful deployments and overall public acceptance of its services.

The ITS Team launched operations of Phase 1A of the 95 Express Lanes, leading the state in its first-ever dynamic pricing tolling facility. Soon after, the District introduced the first Ramp Signaling System, which served to enhance the benefits derived from the already successful 95 Express Project. The combination of these two initiatives increased average travel speeds along the general purpose lanes from 18 mph to 43 mph during the northbound PM Peak Period. The District reached another milestone by completing the first arterial ITS project along US 1 that will allow other agencies (e.g., transit, traffic signals) to benefit from ITS devices on arterials in the field.

The ITS Team also led the Incident Management Program in a new direction to increase overall effectiveness to support expanded operations. Developing a grass roots approach in agency outreach to increase multi-agency coordination during highway events has led to significant improvement in incident clearance times. Lane blockage events have been cleared by an average of 32 minutes, which is equivalent to an 11% reduction in comparison to last fiscal year. Also, our presence at the Network Access Point (NAP) of the Americas provides all Miami-Dade County agencies an opportunity to view video from our closed circuit TV cameras (CCTVs). Our Road Rangers underwent significant contract modifications to overcome budget cuts and maintain the levels of service the public was accustomed to.

The ITS Team supported the launch of a new statewide 511 system that provides the public with more direct access to the data collected by the TMC. As the previous 511 system was retired on June 17, 2009, it received more than 142,000 calls on average per month while the e-mail alert service averaged more than 75,000 alerts sent per month.

Due to improvements in our ITS Maintenance Program, our system availability averaged 97% last fiscal year. This level of system availability was critical in leveraging investments made in the District Six ITS program.

During the past year, the FDOT District Six ITS Program yielded \$21.53 of benefits for every dollar invested in the program.

Please join me as we review the achievements made in Fiscal Year 2008/2009, and look ahead as we move to build from our accomplishments in hopes of providing our community with even greater benefits in Fiscal Year 2009/2010.

A handwritten signature in blue ink, appearing to read "Gus Pego". The signature is fluid and cursive, written in a professional style.

**Gus Pego, P.E.**  
District Secretary

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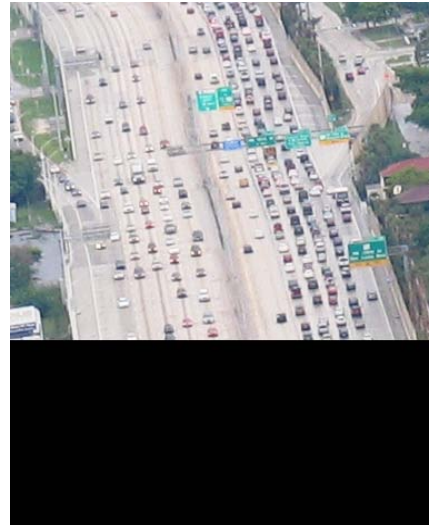
The background of the page is a faded, high-angle photograph of a multi-lane highway. The road is filled with cars, mostly in a single direction, creating a traffic jam. In the upper center, a large green overhead highway sign is visible, displaying some text that is partially obscured by the image's opacity. The overall scene is brightly lit, suggesting a clear day.

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# INTRODUCTION

**F**iscal Year 2008/2009 proved to be a period of significant progress and growth for the FDOT District Six ITS Program. The program, which serves to support and manage the transportation infrastructure through the application of integrated technologies, continues to be a viable alternative and a complement to traditional roadway enhancement projects. District Six, in its commitment to maximize system capacity and improve regional mobility, successfully led the charge in introducing a series of innovative transportation management initiatives that benefited our commuters and served to mark a new chapter for the ITS Program in the State of Florida. The ITS Program, while integrated to maximize overall system benefits, is comprised of five areas as described below:

- **ITS Deployments** - Providing planning, design, and procurement of ITS equipment, such as closed circuit TV cameras (CCTVs), Dynamic Message Signs (DMS), Detectors and communications.
- **TMC Operations** - Providing a central location for data collection and dissemination, and a command center for managing traffic and incidents.
- **Traffic Incident Management (TIM)** - Providing the Road Rangers - Florida's version of a safety service patrol - and additional resources. Coordinating multi-agency meetings to identify issues and develop solutions to improve incident management.
- **Advanced Traveler Information System (ATIS)** - Providing real-time traveler information services through various media, such as the telephone and the Internet.
- **IT/ITS Maintenance** - Managing the maintenance of ITS field and TMC equipment to ensure system availability, as well as software support.



*95 Express customers save time along the typically congested I-95 northbound during PM Peak Period*

Fiscal Year 2008/2009 marks the fourth edition of District Six's ITS Annual Report. This year we focus on the milestones achieved based on the foundation built from years past. Inside these pages, we recognize the benefits derived from such projects as the 95 Express Lanes and Ramp Signaling System. We highlight the enhancements made to our existing systems and their role in helping us achieve the goals we set forth during this fiscal year. We hope you find our annual report informative, and welcome you to join District Six as we continue to provide our community with a safer and more efficient transportation system.

## 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

Initially, Florida Department of Transportation (FDOT) District Six's ITS Program focused on deploying Advanced Traffic Management Systems (ATMS) on limited access facilities such as I-95, I-75, I-195, I-395 and State Road (SR) 826. These deployments have resulted in approximately 54 centerline miles of District Six roadways in Miami-Dade County that contain ITS infrastructure. Once most of the limited access facilities were instrumented with ITS technologies, the Department began implementing ATMS on controlled access roadways, such as SR 5 (US 1) in both Miami-Dade (approximately 17 centerline miles) and Monroe Counties (approximately 127 centerline miles), and SR A1A/MacArthur Causeway (approximately three center-line miles). Additionally, a limited number of ITS devices, such as Dynamic Message Signs (DMS) have been deployed on arterial roadways leading onto I-95.

Key planning and design achievements during Fiscal Year 2008/2009 included:

- **DMS Replacement** - In June 2009, the District's first ITS replacement project was awarded. It was a design-build procurement for the replacement of 13 DMS on existing structures along I-95, SR 826, SR 9, US 441, and the Florida's Turnpike Spur. This project includes the removal of the existing DMS, various upgrades to the equipment (cabinets), maintenance repairs to the structures, and installation/integration of the new DMS.
- **ITS Planning and Design Guidelines** - In June 2009, District Six developed guidelines to facilitate the streamlining of ITS deployments into the planning and design of more traditional roadway projects. The guidelines were developed primarily from the ITS Program's lessons learned on recent ITS deployment projects. This development work also included a training class for FDOT in-house planners, designers and construction personnel on the guidelines, as well as the application of the

federally mandated Systems Engineering and Management Plan (SEMP) process.

A summary of FDOT District Six ITS projects deployed during this fiscal year is presented below:

- **SR-5/US-1 ITS Design-Build Deployment** - This completed project was the District's first arterial ITS deployment tying into the FDOT TMC was along US 1 between SW 17th Avenue and SW 112th Avenue (approximately 17 miles), and it includes the following components: 17 Closed Circuit Television (CCTV) cameras and four DMS; six detectors; 96 strand fiber-optic cable (installed 36 strand fiber optic cable for Miami-Dade Transit); and two communications hub buildings. US 1 within the project limits is a multi-modal, six-lane, divided facility with heavy commercial land use. The Miami-Dade Transit Metro-Rail and Busway runs parallel and along the west side of US 1. A roadway with a direct link to several highways, the implementation of ITS infrastructure on US 1 aims to integrate the freeway management and state arterial systems to improve efficiency in the region's general transportation management plan. Deploying ITS along this multi-modal corridor will lay the groundwork for future integrated corridor management operations.



*CCTV along US 1 provides a shared resource for multiple agencies*

## ITS DFPI OYMENTS (cont.)

- SR 826 ITS Design-Build Deployment** - The SR 826 ITS design-build deployment, between NW 25th Street and NW 122nd Street, includes the following components: six new CCTV cameras and the integration of four existing CCTV cameras; three DMS; 37 detectors; and 72 strand fiber optic cable. This project is a key link in the District's overall ITS communications network and will enhance the traveler information disseminated along an important corridor (SR 826). The project was in the construction phase during this fiscal year.
- I-395 ITS Design-Build Deployment** -The I-395 ITS design-build deployment has construction limits along I-395 between I-95 and Alton Road; along Biscayne Boulevard between I-395 and Port Boulevard; and along Port Boulevard between Biscayne Boulevard and the Port of Miami Administration Building. The system includes the following components: 10 CCTV cameras; 10 detectors; one DMS; and 72 strand fiber optic cable. As this project area serves the Port of Miami, so will these devices and future integration among the TMC and the Port of Miami operations is envisioned. The project was in the construction phase during this fiscal year.
- I-95 Express** - The first of its kind in the state, this managed lanes project is part of an overall long-term strategy of initiatives designed to help improve the safety, throughput and reliability of mobility along the roadways within southeast Florida. Roadway construction impacts were kept to a minimum, and the corridor itself was not widened. Instead, the entire facility was

reconfigured and restriped to allow room for an additional lane to fit inside the existing right-of-way. In addition to roadway improvements, the I-95 Express Project includes ITS infrastructure and an electronic toll collection system. The ITS infrastructure includes the following additional components for Phase 1A: 12 CCTV cameras, four detectors, and 18 DMS (which include toll rate and lane status DMS). The construction began in February 2008 and tolling operations began on December 5th, 2008. The Phase 1B ITS infrastructure includes: 49 CCTV cameras, nine detectors, and 22 DMS (which include toll rate and lane status DMS). For project updates, please visit [www.95express.com](http://www.95express.com).

Other ITS deployments include roadway and bridge projects that have ITS components within the project (e.g., Jewfish Creek Bridge, SR 826 Widening at Coral Way, Miller Drive, SR 874 and Bird Road). The table below summarizes the status of ITS deployment projects within FDOT District Six as of the end of Fiscal Year 2008/2009.

FDOT District Six ITS Deployment								
Roadway/Corridor	CCTV*		DMS		Detectors**		Ramp Signals	
	C	UC	C	UC	C	UC	C	UC
I-95	30		10		94		22	
I-95 Express	12	49	18	22	4	9		
SR 826	24	6	7	3	50	37		
I-75	7		3		30			
I-195	6		6		21			
I-395		10	1	1		10		
US 1 (SW 17 to 112 Ave)	22		5		6			
US 1 (south of Florida City)	44		11		2			
Card Sound Road	5							
SR 9	1		1					
US 441	2		2					
Florida's Turnpike Spur	1		1					
Other Arterials			11					
<b>Total</b>	<b>154</b>	<b>65</b>	<b>76</b>	<b>26</b>	<b>207</b>	<b>56</b>	<b>22</b>	

C = Complete

UC = Under Construction

\*Includes static CCTV for DMS verification

\*\*I-95 Loop Detectors are reported as a detector station and not by loop

# TMC OPERATIONS

The Department's SunGuide Transportation Management Center (TMC) houses the FDOT Operations staff who monitor and manage traffic, disseminate information and dispatch incident management resources 24 hours per day, 7 days per week (24/7). In the event of a traffic incident, such as a crash or a hazardous materials spill, the operators coordinate with emergency responders and the Road Rangers to provide the necessary emergency and rescue services to clear the incident as quickly and safely as possible. This coordination is enhanced by the co-location of the Miami-Dade Expressway Authority TMC Operations staff and the Florida Highway Patrol (FHP) Troop "E" dispatch in the TMC. The TMC also provided control room space for the 511 service provider that disseminated travel information to the public throughout the Southeast Florida region this fiscal year.

The SunGuide TMC in District Six works closely with other control centers within the region sharing video images, Road Rangers, data, and other real-time information to provide a seamless approach to regional traffic management. The regional coordination is facilitated through a committee of TMC managers known as the Southeast Florida Regional TMC Operations Committee (SEFRTOC). The SEFRTOC membership includes representatives from FDOT District Four (Broward and Palm Beach Counties), Florida's Turnpike Enterprise (FTE), 511 service provider, and Miami-Dade Expressway Authority (MDX). Two new members joined the SEFRTOC in Fiscal Year 2008/2009, FDOT District One (to facilitate coordination for disseminating wild fire information along I-75/Alligator Alley) and the I-595 Concessionaire (to coordinate future operations of the I-595 operations in Broward County). The SEFRTOC key activities included the coordination of disseminating construction information (DMS and HAR) for 95 Express, Seven Mile Bridge

Closure, Dolphin Stadium related closures for I-95 at the Golden Glades Interchange, and preparations for the new 511 system (FLATIS). The most notable TMC Operations achievements during Fiscal Year 2008/2009 are the following:

**Exceeding Performance Measures** - In December 2007, District Six set targets for key operational performance measures that have the greatest impact to the public. Through a structured management approach and quality control procedures, District Six was able to exceed the targets (see table below). One measure that is not listed, but has contributed to improve the performance measure "Time to Confirm an Event" is the percentage of events detected by TMC Operators via CCTV cameras, which has increased from 12% to 35%. Early detection and confirmation of events also contributes to the reduction in overall delays to motorists.

Performance Measure	Annual Average	Target
DMS Efficiency	100%	>95%
TMC Operator Error Rate	0.30%	<0.69%
Time to Dispatch Road Rangers	0.79 min	<2.00 min
Time to Confirm an Event*	0.44 min	<2.00 min
Time to Post DMS	3.43 min	<5.00 min
Time to Notify Other Agencies	1.51 min	<7.00 min

*\*Does not include events detected by Road Rangers*

## TMC OPERATIONS (cont.)

**Express Lanes Operations** - Extending northbound between State Road 112 and the Golden Glades Interchange, Phase 1A converted the previous HOV lane into two express lanes. The express lanes are separated from the general purpose lanes with flexible plastic poles spaced 10 feet apart along the 6.2 mile stretch of the project. Congestion pricing along the 95 Express is managed and operated by the TMC. The TMC played a critical role in the successful implementation of the 95 Express. Some of the key activities included:

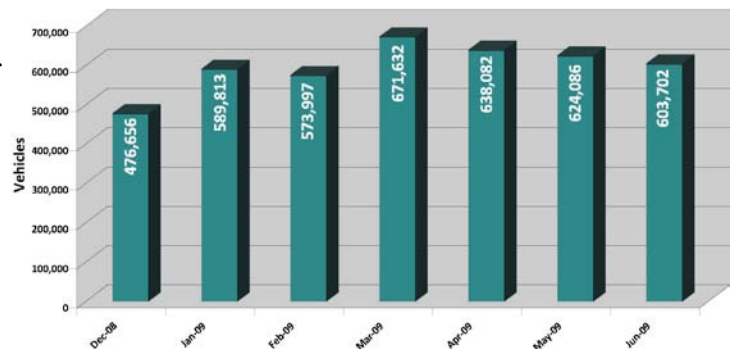
- **Operational Testing** - The TMC developed and documented specific operational test plans for the newly deployed ITS equipment related to the 95 Express project.
- **Operating Procedures** - Since the 95 Express is the first of its kind in Florida, District Six had to develop operating procedures, develop training materials and train TMC Staff and other agencies participating in the daily operations of the express lanes (i.e., FHP).
- **Dynamic Pricing** - The TMC developed a software application (Express Lanes Watcher) that advanced the Department's goal of dynamic pricing by 1 ½ years. This tool is a critical part of the Express Lanes Operations and not only serves to facilitate daily operations, but also provides historical information for future analysis and in responding to customer inquiries.
- **Incident Management** - The TMC led a multi-agency effort to develop and implement successful incident management strategies to facilitate the clearance of incidents in and adjacent to the express lanes. With 130 incidents occurring in the express lanes from opening to June 30, 2009, the express lanes were only closed for 0.75% of the time.



*Express Lanes Operator monitors and manages 95 Express with CCTV and Express Lane Watcher application.*

Overall, 95 Express has been a great success for the Department. It has received positive feedback from the press and the public. The benefits are experienced daily with the average travel speeds increasing from 18 mph to 43 mph for the general purpose lanes and the express lanes operating at 57 mph during the PM Peak period. The express lanes operate at 45 mph or greater 99.5% of the time. Demand for the express lanes grew in the first few months of operation to more than 600,000 vehicle trips per month, but has since begun to level off.

**Monthly 95 Express Traffic**

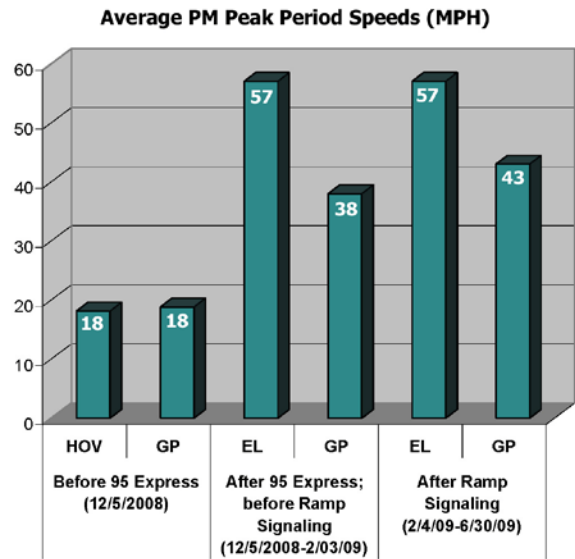


**Ramp Signaling** – The first system of its kind to be implemented in Florida, Ramp Signals were activated on February 4th, 2009. The ramp signals follow the project limits of the 95 Express Lanes and help control the rate at which vehicles enter the highway along eight northbound entrance ramps of I-95, from NW 62nd Street, north to NW 167th Street, near the Golden Glades Interchange. The signals are positioned along each entrance ramp; and serve as traffic control devices that alternate from red to green lights to ensure vehicles enter in a spaced, but steady manner. They operate based on traffic demand and allow one or two cars to enter the interstate in response to real-time traffic conditions along the highway. District Six led the charge in a multi-agency coordination effort to properly inform the public on how to use the signals and a series of planned educational efforts were executed in the weeks before launch. District Six worked with Florida Highway Patrol (FHP) to ensure that safety and mobility goals were maintained. In combination with the Florida International University, District Six staff observed and adjusted the system parameters based on real-time traffic conditions on the mainline and various on-ramps to optimize operations and minimize impacts to surrounding arterials. During the start-up of the ramp signals, the TMC met with Miami-Dade Traffic Signals and Signs Division to establish protocols for the new ramp signaling operations. The protocols addressed how to handle impacts to the adjacent arterials, as well as the TMC sending



ITS field personnel played a critical role in the successful start-up of ramp signal operations.

weekly operational reports to Miami-Dade Traffic Signals and Signs Division to keep them informed of any issues. As a result of the Ramp Signaling, the general purpose lanes average PM Peak Period speed increased from 38 mph to 43 mph.



**Posting Travel Times on DMS** - In August 2008, motorists traveling along I-75; I-195 and SR 826 (Palmetto Expressway) from I-75 to the Golden Glades Interchange in both directions began receiving real-time information regarding travel times along their particular corridor on DMS. Travel times on the DMS alert motorists to upcoming delays, so they can make informed travel decisions.



"This is a great achievement for FDOT in South Florida. I want to commend the District to take this challenge and successfully achieve a public benefit that will be shared with our customers traveling our freeways in South Florida," said Michael M. Loyselle, Traffic Operations & ITS Engineer for the Federal Highway Administration.

## TMC OPERATIONS (cont.)

**Construction Support** – Construction activities along major highways increased significantly in Fiscal Year 2008/2009 as a result of the implementation of Phase 1A and the upcoming deployment of Phase 1B of the 95 Express Project. The TMC played a critical role in helping the Department disseminate construction updates for these activities by coordinating signage plans with the District Six Construction Office and posting them using existing ITS devices, such as the DMS, 511 Traveler Information System and the Highway Advisory Radio (HAR). The number of construction related messages increased throughout the year to nearly 2,500 in June 2009.

Also, in support of the construction the HAR was utilized for supporting diversion routes due to highway closures. HAR proved to be a very useful tool for use in these scenarios because it expanded capabilities for message content. In addition, HAR played an important role in providing the public with information during the launching of the 95 Express and Ramp Signaling Systems.



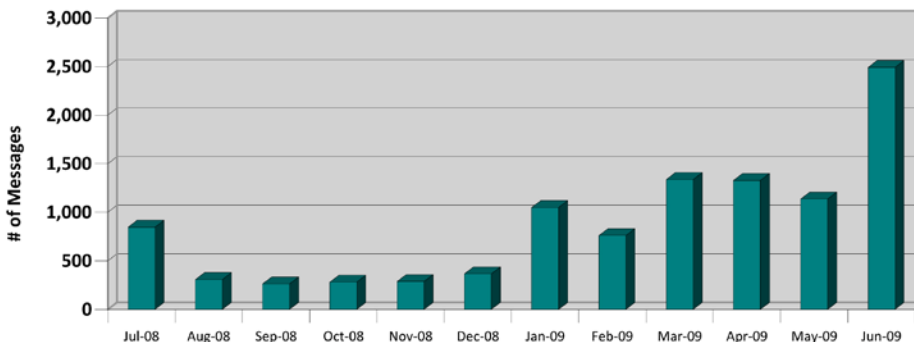
*HAR sign along I-95 in Miami-Dade County*



*DMS posted pre-event messages alerting the public to 95 Express Phase 1B lane closures.*

**Back-up Control Center** – The ITS Office recently outfitted a redundant area in the Adam Leigh Cann Building (District Six Headquarters) to serve as a back-up center to the TMC. The “back-up” center will be activated in the event an emergency situation affects regular operations at the TMC. The site is equipped with a communications and traffic management control system capable of operating, at a reduced capacity, the various components of the TMC. With the region considered as one of the most congested areas in the nation, and factoring in the recent additions of the 95 Express and Ramp Signaling devices to its transportation infrastructure, implementing this level of redundancy was especially important to District Six. Support staff can perform regular operational and incident management procedures through the redundant software and communications system collocated within the remote site. The back-up facility has two workstations, radio communication devices and a landline telephone system that enables operators to communicate with field staff and partner agencies at all times. The combination of these resources allows operators to manage the most critical aspects of the District’s ITS operations, including the 95 Express and Ramp Signaling remotely from this site. The remote capabilities of this facility are supported by the recent addition of the ITS network equipment in the Network Access Point (NAP) of the Americas.

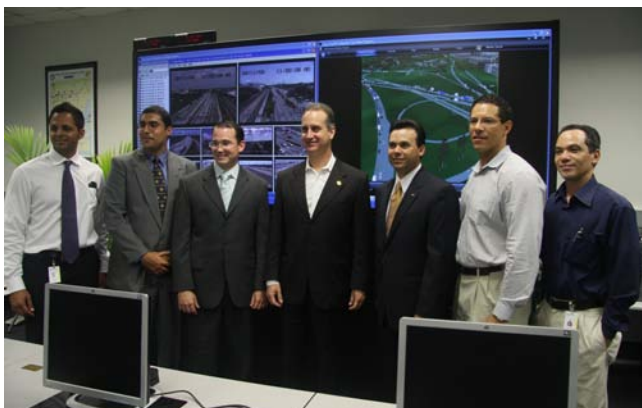
**Construction Related DMS Messages**



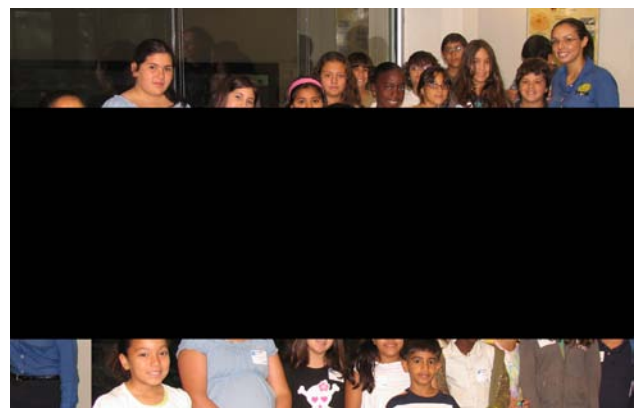
**Florida International University Lab** - Florida International University's (FIU) College of Engineering and Computing, in partnership with the FDOT District Six, officially unveiled its Integrated Intelligent Transportation Systems (IITS) Laboratory on May 11, 2009. The first of its kind in South Florida, the laboratory will serve as an educational research facility that allows engineering students to analyze traffic data gathered through the District's ITS Program. Through their continuing partnership, the District aims to promote the overall advancement of the transportation industry by enabling students to conduct traffic management related studies, while providing them with hands-on experience in their field. The unveiling of the \$150,000 research facility is an example of the longstanding collaborative efforts between our two organizations, and will serve to take future research activities to a new level. With ITS solutions continuing to become a viable alternative or complement to traditional roadway enhancement projects, the information shared by the TMC with this facility allows students to explore innovative ways to mitigate congestion and improve overall system operations. The state-of-the-art laboratory is equipped with a multi-screen video wall, central software, servers and operator workstations that replicate, on a smaller scale, those of the SunGuide TMC's control room center. The laboratory is also equipped to serve as an

additional, future "back-up" center to the SunGuide TMC in the event an emergency situation affects regular operations. The District is working on an agreement with FIU that will allow the TMC to manage the most critical aspects of the District's ITS operations, remotely from this site. The agreement should be finalized in Fiscal Year 2009/2010.

**Public Outreach** - The SunGuide TMC enlisted the services of an on-site Public Information Officer to support the Center's expanded operations in Fiscal Year 2008/2009. The continuing additions of ITS technologies implemented along our District roadways increased the Center's need to inform the public about its role in daily traffic management. Establishing an ITS contact to serve as a liaison between the community, industry professionals and members of the media served to enhance the success of such critical deployments like the 95 Express, Ramp Signals and the statewide transition of the 511 Traveler Information Systems. The Public Information Officer facilitated 20 tours (for public officials, academia, and consultants from across the nation) and assisted the District PIO Office with 6 media events (for travel times, ramp signaling, 95 Express, etc.) at the TMC. Other activities included development of an ITS Program Public Outreach Plan, outreach to other groups (i.e., the Community Traffic Safety Team) and hosting of Take Your Child to Work Day.



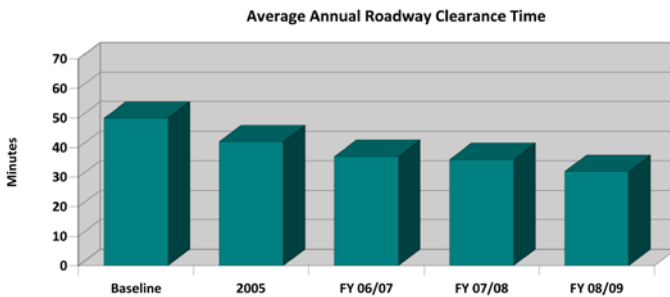
*FDOT District Six Staff, MDX, and FIU students join Congressman Mario Diaz-Balart in the grand opening of the FIU ITS Lab.*



*Future motorists are educated on the services provided by the TMC during a "Take Your Child to Work" day.*

# INCIDENT MANAGEMENT

The FDOT District Six ITS Program continues to lead the coordination among the various local, regional and state agency members of the Miami-Dade Traffic Incident Management (TIM) Team. The TIM Team’s goal is to expedite incident clearance to provide a safe and reliable transportation network. This requires coordination, cooperation and communication among responders. The TIM Team not only develops policies to meet this goal, but also implements them as well. A key measure of performance is how long it takes to open travel lanes closed due to incidents (commonly known as roadway clearance). As indicated in the chart below, the TIM Team has had continued success by reducing the average roadway clearance time by 11% from last year and by 36% from the baseline of 50 minutes.



The following are key achievements contributing to these benefits for Fiscal Year 2008/2009:

**TIM Team** - In the first half of this fiscal year, the District held bi-monthly TIM Team meetings that were a valuable asset in facilitating an open discussion to identify areas of improvement, as well as success stories. In early 2009, District Six decided to expand on this success and take a more grassroots approach to TIM by targeting specific issues and conducting agency outreach to quickly identify solutions to incident management. In order to ensure success with the new approach, the District developed a TIM procedural plan that outlined key activities, which included:

- **TIM Newsletter** - The District’s first-ever TIM newsletter was released this fiscal year to raise awareness about the Team’s ongoing initiatives and activities. The *District Six TIM Quarterly Review* is published every three months and serves as the ongoing information exchange forum to enhance overall communication between the department and its partner agencies.
- **TIM Activity Database** - The TIM Activity Database was created to facilitate the records storage, tracking and reporting of the TIM Team’s public outreach and interagency coordination efforts. The database serves to track and report on agency meetings, action items, lessons learned and performance measures based on the guidelines defined within the TIM Procedural Plan.

**95 Express Incident Management Plan** - District Six led a multi-agency workshop that brought together representatives from local police and fire rescue, FHP, transit, and other traffic incident management team members. Following up from the workshop, the TMC developed an incident management plan that included additional resources, specific multi-agency protocols and quick clearance policies. The additional resources included FHP troopers for 95 Express, a specially equipped incident response vehicle, and a flat-bed tow truck. The TMC also developed and conducted training for FHP troopers on quick clearance policies as well as specific maintenance of traffic strategies for events that impacted both the express lanes and general purpose lanes. These incident management strategies proved to be successful by reducing the travel lane blockage duration in the express lanes by 45% and response times by 15% (based on before and after data from November 2008 through March 2009).

**Road Rangers** - The District Six TMC is the focal point of incident management and serves as the command and control center for dispatching and coordinating field operations. A large part of the field operations are the Road Rangers who are the most visible incident management service the Department provides. Unfortunately, the Road Ranger program suffered a nearly 50% reduction in funding at the onset of Fiscal Year 2008/2009, leaving many Districts searching for answers on how to maintain traffic flow and respond to incidents occurring along their highways. Road Ranger Service Patrol reductions became effective in District Six on August 1, 2008. Since this date, Road Rangers have been staged at designated locations along I-95 and SR 826, ready to be dispatched to incidents. As a result, District Six TMC operators are relying more on CCTV cameras, roadside detectors and other partners (FHP) for incident detection. District Six's realignment of the Road Ranger service included:

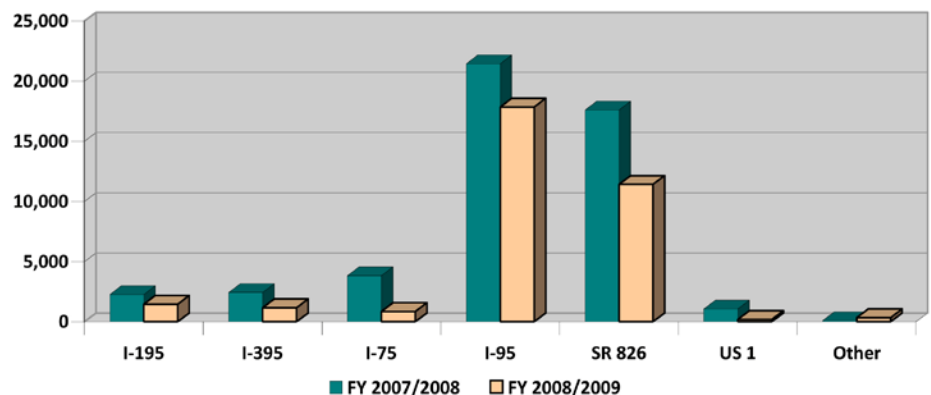
- **SR 826** - daytime Road Ranger fleet size reduced from 7 to 4 trucks, and overnight coverage was reduced from 4 to 3 trucks.
- **SR 826** - weekend service patrol hours were reduced from 24 to 12 hours (8am - 8pm).
- **I-75 and US 1** are no longer patrolled by Road Rangers. Instead, Road Rangers respond to traffic incidents only when requested by law enforcement or motorists.



*Road Rangers play an important role with safety during incidents by providing extra maintenance of traffic for responders.*

This reduction in services impacted the number of Road Ranger response as well as Road Ranger assists. The Road Rangers responded 33,292 times to incidents in Fiscal Year 2008/2009, which was a 32% decrease from last fiscal year. Similarly, Road Ranger assists were reduced during this fiscal year to 72,103 from 96,983 or 26%. As indicated in the chart, the roadways with the largest decrease are those in which the Road Ranger service was significantly reduced (I-75, SR 826, US 1).

**Incidents Involving Road Ranger Response by Roadway**



## INCIDENT MANAGEMENT (cont.)

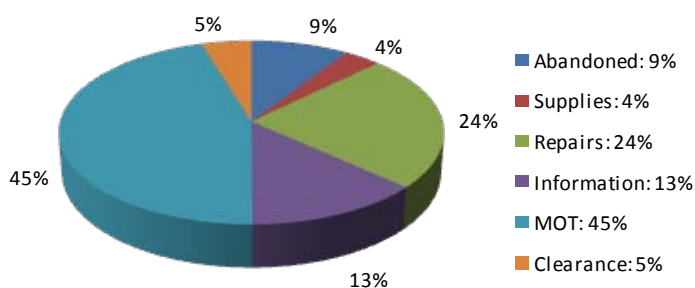
In the summer of 2008, substantially higher fuel prices, increased insurance premiums, and reduced budgets prompted one of the two Road Ranger Contractors to request to terminate their contract due to financial hardship. As a result, the District was faced with the elimination of Road Ranger service along I-95, I-195, I-395, and US 1. With the assistance of District One, District Six was able to replace the Road Ranger Contractor and have no lapse in coverage.

Recognizing the downturn in the economic landscape, the TMC decided to evaluate the existing Road Ranger Program to identify areas of improvement, such as:

- Program Management and Staffing
- Operation Modifications: Routes, Hours of Operations and Patrolling
- Contracts: Procurement and Payment Methods
- Alternate Sources of Funding

Based on the evaluation and a review of the assist type data shown below, the TMC developed a Request for Proposal for Road Ranger services that will be advertised in Fiscal Year 2009/2010. As indicated in the chart, only 5% of the assists require a tow truck, while the current fleet of vehicles has more than 50% tow trucks. Therefore, the scope of services realigned resources (vehicle types) to match the distribution of services to maximize efficiency of the program.

FY 08/09 Road Ranger Assists by Type



### Rapid Incident Scene Clearance (RISC)

**Implementation** – RISC is an incentive based program for the rapid removal of large incidents requiring heavy-duty wreckers to clear travel lanes. The RISC Contractors are required to respond (within 60 minutes) and clear the travel lanes with specific time limits (90 minutes) to receive the incentive. District Six completed the Vendor Selection and Contract Award Process and issued a Notice to Proceed for a July 1, 2009 start date. The TMC played a vital role in developing protocols, providing training, and the inspection of the vendor’s equipment. With an incentive based contract, it is critical to accurately re-create the event timeline to avoid conflicts and expedite the invoicing process. The TMC developed a software application (RISC Watcher) to do just that. The RISC Watcher provides an easy to use interface for the TMC to track rotation lists, official requests for RISC activation, RISC Contractor notification and resource activation, RISC Contractor/resource arrival and official travel lane clearance times. It also provides a quality control and audit function that ensures the data is accurately stored and reported. This will provide efficiency in the District’s invoicing process.

**FHWA Self Assessment** - The advancements of the TIM Team’s efforts are also documented in the FHWA TIM Self-Assessment. The FHWA TIM self assessment for the Miami-Dade TIM Program has been conducted annually since 2005 and has shown continuous improvements in the program. The overall TIM Program score for Fiscal Year 2008/2009 was calculated at 83.2%, which is an improvement over the last fiscal year score of 80.8%

## TRAVELER INFORMATION

**T**raveler information is an important tool in congestion management. Disseminating real-time traffic information that is accurate and reliable empowers motorists to make informed decisions along their routes of travel; helping them avoid delays that contribute to roadway congestion. The Advanced Traveler Information System (ATIS) project provides uniform, multimodal, real-time traveler and traffic information in South Florida under the ITS Program. The FDOT District Six led this regional project with support from the FDOT District Four, Florida's Turnpike Enterprise and the MDX. The services were provided by a private ATIS Contractor that operated from the FDOT District Six SunGuide TMC. In addition to disseminating real-time traffic information via the Web, they hosted a 511 telephone service including voice recognition. In Fiscal Year 2008/2009, the 511 service received a total of 1,635,892 calls (from July 2008 through June 17, 2009) or an average of 142,252 per month (20% reduction as compared to the previous year). The 511 service also sent 834,243 e-mail alerts (from July 2008 through May 2009) or an average of 75,840 per month (2% reduction as compared to the previous year). These reductions may be related to the decrease in economic activity. The coordination among the partners and ATIS Contractor was excellent as the ATIS Contractor was able to disseminate 97% of the traffic data collected by the partners. The most notable events regarding traveler information during this fiscal year include the following:

**Marketing** - The ATIS project also provided marketing services to enhance public awareness of the 511 system. This was accomplished by taking advantage of opportunities to promote 511 to other groups. In this fiscal year, 511 participated as a sponsor in the 2009 Miami Heart Walk and worked closely with the Florida Marlins to have a 511 traffic report delivered by the stadium announcer at the end of each Florida Marlins home game and had a 511

endorsement by a Marlins player displayed on the stadium's Jumbo-Tron Screen.



*511 increasing community awareness at the 2009 Mercedes-Benz Corporate Run.*

**FLATIS Launch** - The 511 Traveler Information System has been committed to providing South Florida residents with regional traffic information since 2002, and during Fiscal Year 2008/2009 FDOT replaced its regional 511 service with a statewide 511 traffic information system with greater options and more capabilities than before. The new system still provides users with local traffic reports on a regional level, but has been enhanced to provide information, such as roadway conditions, commuter travel times, construction lane closures and severe weather affecting traffic, along the major metropolitan roadways throughout the state as well. Visit [www.fl511.com](http://www.fl511.com) for more information.

**511 Watcher** - Responsible for generating the traffic information disseminated onto the new statewide 511 System for Miami-Dade and Monroe Counties, the TMC created the 511 Watcher software to ensure accuracy and timeliness of this information. The 511 Watcher automates the tracking of information posted on to the FLATIS, such as lane blocking events, congestion events, floodgate messages, travel times, and CCTV images. The 511 Watcher serves as the operator's guide in the process of confirming accuracy of data to be published, documents their findings, and

generates performance measure reports.

# IT/ITS MAINTENANCE

The FDOT District Six ITS Program is highly interactive and dependent on state-of-the-art technology that is used to efficiently manage roadway operations. The IT/ITS Maintenance staff manage/maintain the equipment in the TMC and out in the field. The entire network of equipment – the roadway detectors, CCTV cameras, DMS, communications infrastructure, servers/computers, video wall and software applications – must remain in operation 24/7. These systems, in turn, call for an aggressive maintenance program that ensures ITS equipment is operating adequately to support the goals of the District.

District Six has deployed a database application that assists with tracking the early detection, reporting, troubleshooting and ultimately the repair of IT and ITS field equipment. The TMC Operations staff, as they utilize the equipment and subsequently perform regular system checks, perform simple troubleshooting procedures to assist with the nature of the failure. Once the failure is confirmed, it is reported in the maintenance database application and an e-mail is automatically sent to the IT staff for further troubleshooting before ITS maintenance resources are deployed into the field. In Fiscal Year 2008/2009, the IT staff responded to 3,560 reported maintenance tickets, of which 843 were related to the 95 Express project. District Six takes an integrated approach regarding TMC Operations, IT Staff and ITS

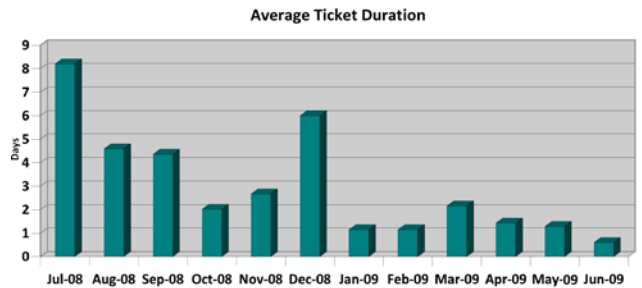
Subsystem	Annual Average System Availability
TMC Systems (critical)	99.97%
Video Wall	99.99%
SunGuide™ Software	98.88%
CCTV	96.79%
DMS	89.46%
Detectors	92.80%
Workstations (non-critical)	98.91%

\*Critical is defined as SunGuide™ Software related servers, operator workstations, fax machines, network servers, Cisco switches, SAN, firewall, and VPN.

\*\*Non critical is defined as laptops, staff workstations, network printers, and other ancillary computing equipment.

Maintenance Staff that results in high system availability, as shown in the table below left.

The key achievements for Fiscal Year 2008/2009 include:



## Expanded IT Support and ITS Maintenance Resources

- Starting in October 2008, the IT Department hired additional staff to expand on site TMC coverage to five days per week/24 hours per day in support of Express Lanes operation. The “Average Ticket Duration” graph above presents the average ITS field device outage in days per maintenance ticket. Similar to expanding the IT Staff, District Six expanded the ITS Maintenance resources to support the increasing number of field devices. The additional resources included on-site personnel, assigning a permanent bucket truck to D6, increased ITS spares to 10% (includes copper, fiber and composite cable), and spare generators to support commercial power outages. With the exception of December 2008 (the launch of the 95 Express and extended DMS power outage in the Keys), the expanded hours of on-site TMC coverage assisted in reducing the overall outage duration reported for maintenance tickets.

**Vandalism/Theft of ITS Field Device** – In Fiscal Year 2008/2009, the District had to overcome the challenge of vandalism/theft and did so by taking the following actions:

- Developed a database to track incidents of vandalism and accidents to facilitate the cost recovery efforts.
- Hardened new infrastructure – locking inserts, concrete encasement of exposed conduits and concrete encasement of heavily vandalized access points.
- Installed security fencing and extended ID card access readers to two critical hubs to increase hub security.
- Coordinated with the Florida Department of Law Enforcement and installed infrastructure surveillance cameras that led to the apprehension and subsequent conviction of vandals.
- Aggressively coordinated with law enforcement and State District Attorney’s office to successfully convict the felons.

As a result, there was a reduction in the number of acts of vandalism/theft of copper electrical cable (from 19 to seven) from the previous fiscal year. Subsequently, this saved the District a total of approximately \$180,000 in repair costs.

**SunGuide Software Support** - The SunGuide software was upgraded several times during Fiscal Year 2008/2009 (from version 3.1 to version 4.1.3) to address many footprint issues (bugs) in preparation for the 95 Express, Ramp Signaling and FLATIS launches. Each upgrade has an impact on TMC Operations. In order to minimize downtime and impacts to TMC Operations, as well as demand on IT Staff, District Six developed a process to ensure a successful installation of each new release of SunGuide Software. Each new release goes through a stringent testing process before it is installed on the production system. This includes combining multiple documents into a single checklist, testing the installation procedures on back up servers, and conducting operational testing. Subsequently, issues

identified during this process are then addressed and a rollback procedure is verified. Finally, the production upgrade is scheduled, based on the estimated time to install and, if necessary, roll back before reaching another critical time for Operations.

**Contract Management** – The District improved its efficiency in managing the ITS Maintenance efforts by collocating the ITS Maintenance Project Manager, Contractor Project Manager and associated administrative support to the TMC. Other management tools included the deployment of an asset inventory system, conducting daily failure report reviews and specific task driven Letters of Authorization for more efficient tracking of project funds.

**Infrastructure Improvements** – The District took significant steps to improving the reliability of the ITS infrastructure by: converting five leased communication links (T1) to wireless links to increase communications bandwidth and reduce recurring costs; completing the communications link between District Six and District Four along I-75; and installing generators for three key communication hubs and field equipment in the Florida Keys to provide redundant power sources.

**95 Express/Ramp Signaling Support** – The IT/ITS Maintenance staff were instrumental in preparing for the successful launch of the Ramp Signaling and 95 Express projects. Key activities included:

- Completed the integration of several Ramp Signaling field components.
- Installed CCTVs to monitor northbound ramp signaling sites.
- Completed fiber optics communication redundant paths and middleware connections between District Six and Florida’s Turnpike Enterprise for 95 Express tolling operations.
- Installed a new HAR site.
- Began I-95 southbound infrastructure repairs in preparation for 95 Express Phase 1B.

# BENEFITS TO THE PUBLIC

The FDOT District Six ITS Program budgets for this fiscal year included capital improvement, operating and maintenance costs. The total costs shown are considerably less than the normal capital costs associated with expanding highways and facilities.

Reducing incident duration has both a direct and financial benefit for South Florida motorists by substantially trimming the costs they must absorb. When the delays associated with incidents are reduced, motorists save time – which can be directly translated to dollars. In 2005, FDOT established a baseline average duration of incidents that blocked travel lanes of 50 minutes. During this fiscal year, the average duration was reduced to 32 minutes. In addition to the reduced delays due to incidents, the 95 Express and Ramp Signaling projects have also contributed to reduced delays

during the PM Peak Period. The Road Ranger program not only contributes to reducing delays due to incidents, it also provides a direct benefit to the public by saving them the cost of services they provide free of charge. Using published, widely accepted statistical methods for estimating the cost implications of traffic delays, this translates into savings of more than \$600 million. This estimate only includes motorists' time saved; it does not address road user cost savings.

When this estimate is weighed against the total capital investments (annualized over 10 years at seven percent) and annual operating expenses, the ITS program is shown to be yielding a benefit cost ratio of 21.53. For every dollar invested, about \$21.53 in economic benefit is valued for the motoring public.

Fiscal Year 2008/2009 Benefits	
Incident Management	\$570,537,187
Express Lanes / Ramp Signals	\$8,731,453
Road Ranger Services	\$25,544,867
<b>Total Benefits</b>	<b>\$604,813,506</b>

Fiscal Year 2008/2009 Costs	
ITS Operations Contracts	\$4,605,508
ITS Maintenance Contract	\$1,358,640
Road Ranger Contracts	\$2,781,816
ATIS Contract	\$483,605
FDOT Cost Center Operating Budget	\$2,364,417
Other (Consultants and FIU)	\$1,106,098
<b>Total Annual Operating Costs</b>	<b>\$12,700,084</b>
ITS Field Deployment Projects Completed Through Fiscal Year 2007/2008*	\$108,058,668
Total Annualized Capital Costs	\$15,385,123
<b>Total Annual Costs:</b>	<b>\$28,085,207</b>

\*Includes \$44.7 million for 95 Express Project



A stranded motorist observes a Road Ranger changing her tire.

# A LOOK AHEAD TO FISCAL YEAR 2009/2010

The District Six ITS Program has identified milestones for Fiscal Year 2009/2010 that will continue to lead the way in providing innovative solutions to address future transportation needs. Key activities include:

**Phase 1B - 95 Express/Ramp Signaling** - Phase 1B is tentatively set to begin operations in late 2009 and will establish express lanes along southbound I-95 from the Golden Glades area to just north of SR 836, as well as activate Ramp Signals along that footprint. With the ITS Team already taking an active role in supporting all construction-related activities this fiscal year, a shift in gears will soon take place once Electronic Toll Collection begins. As in Phase 1A, the ITS Team will take a leadership role in all matters of operation, incident management and process improvements to ensure the facility and system components operate at maximum levels of efficiency.



*95 Express Phase 1B construction at I-95/SR 112 interchange.*

**SR 826/SR 836 Interchange Reconstruction** – Section 5 of the Palmetto Improvement Program project is set to begin during the next fiscal year, and will involve the reconstruction of a system-to-system interchange between State Road 826/Palmetto Expressway and State Road 836/Dolphin Expressway. Capacity improvements include the reconstruction and widening of approximately one mile of both SR 826 and SR 836, and the construction of 34 bridges. The project will provide new direct ramps for major

movements and collector-distributor (CD) ramps to eliminate existing geometric and operational deficiencies. The District Six TMC will play a critical role during the construction phase – which is set to last about six years, by enhancing its incident management resources along the interchange. The TMC will manage these resources, as well as the temporary and permanent ITS field devices deployed as part of the reconstruction. The TMC will utilize the new TIM Team approach to facilitate the development of new protocols with the responding agencies to ensure incidents are managed as efficiently as possible throughout the construction work zone.



*Proposed configuration of the new SR 826 / SR 836 Interchange.*

**Software Tools** – The District has had great success with the development of software tools to meet the challenges of new initiatives (95 Express, Ramp Signaling, FLATIS, RISC). This trend will continue in Fiscal Year 2009/2010 as the ITS Team will enhance the Express Lane Watcher software to handle the Phase 1B launch. These enhancements include improving system availability, automating the existing manual processes, and improving data integrity for tolling operations. Also, additional improvements in the existing ITS Maintenance database and TMC Operator quality control databases are planned that will result in process improvements and will assist the District in continuing to provide the highest possible level of service to the public.



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