

**FDOT District Six
2005 Intelligent Transportation System Annual Report**

SHARPENING OUR FOCUS...



**Florida Department of Transportation
District Six**



...FOR SMART GROWTH IN MIAMI-DADE AND MONROE COUNTIES

"Our mission is to provide an effective Intelligent Transportation System for Florida's travelers that enhances the safety and mobility of people and goods, economic competitiveness, and the quality of our environment and communities by serving commuters, tourists, commercial vehicles, and evacuees."



A MESSAGE FROM THE DISTRICT SECRETARY

As one of the most populous regions in the state of Florida, Southeast Florida has a transportation system that serves a variety of modes (air, highway, rail, and sea) carrying large numbers of people and high volumes of goods daily. The region often experiences heavy congestion due to recurring demand and incidents. As in most of Florida, constructing new surface transportation facilities or widening existing ones is environmentally unacceptable, and the cost is prohibitive. In operating the highway system, the Florida Department of Transportation (FDOT) District Six (which includes Miami-Dade and Monroe Counties) is increasingly turning to Intelligent Transportation System (ITS) to satisfy routine daily travel demands, and to manage incidents. ITS technologies offer FDOT cost-effective means to get the most out of the existing infrastructure.

It is a pleasure to present our first annual report on the ITS program in FDOT District Six. This report highlights our efforts during 2005 to meet the Department's ITS mission and goals. As we move forward with our ITS program, it is important that the benefits of the program outweigh the costs. In 2005, the ITS program has yielded \$15 of benefits for every \$1 spent on the program.

It has been a hectic year in South Florida. Hurricanes Katrina and Wilma tested the ability of the regional ITS programs to keep key roadways operational for evacuation and recovery efforts. And growing congestion remains a key concern of Southeast Florida residents, industry, and elected officials alike. With its high return on investment and relatively short deployment time, our ITS program is ideally suited to address these problems.

*We need to think beyond
the pavement but within it.*

The District Six ITS program grew rapidly in 2005. Projects on the Palmetto Expressway and in the Florida Keys now allow for video monitoring of traffic. The complex Upper Keys project was completed, and we marked our first full year in the new SunGuide Transportation Management Center (TMC). Many ongoing ITS projects will be completed in 2006-including Florida's first deployment of ramp metering.

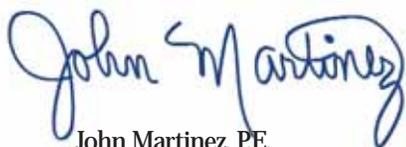
The statewide TMC software project known as SunGuide was installed in 2005, providing control and command capabilities to all ITS equipment. In 2006, this software will be enhanced to support the calculation and posting of travel-time information.

TMC operators used an array of specialized software and systems to monitor traffic along the limited-access freeways in District Six. Dispatching Road Rangers to help clear traffic incidents as quickly as possible-while reducing the probability of secondary crashes is the responsibility of the TMC operators. In 2005 District Six Road Rangers performed more than 80,000 assists, and a pilot program is evaluating the expansion of these emergency services to arterial roadways. The Road Ranger program continues to be the most popular and recognizable service the District offers.

The Advanced Traveler Information System (known as ATIS, or the "511 project") enjoys heavy usage, with almost 7 million calls received to date. The revamped traveler information Web site (www.511southflorida.com) is widely used as well. The Consumer Information Network project was recently completed, adding regional transit information to its trip-planning capabilities. The project received an Outstanding Achievement Award from ITS Florida.

Regional coordination and public outreach efforts expanded in 2005, with the South Florida Regional ITS Coalition helping to pave the way for ITS deployments. The pending deployment of ramp metering in particular has required a major outreach effort.

We look forward to an even busier 2006. I hope you find this inaugural report informative; please do not hesitate to provide any suggestions for improving future editions.



John Martinez, P.E.
District Secretary



STATE TROOPER



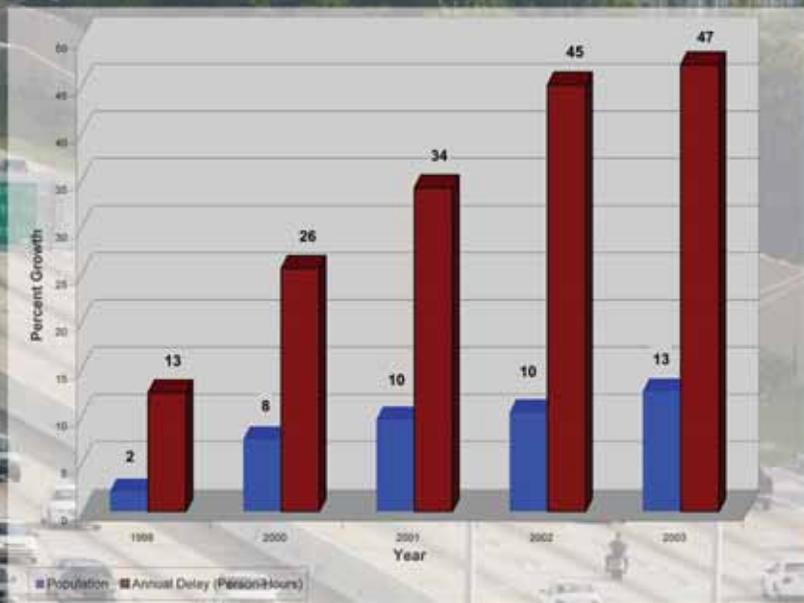
ROAD RANGER

TABLE OF CONTENTS

INTRODUCTION	3
BUSINESS PLAN	5
INTELLIGENT TRANSPORTATION SYSTEM (ITS) PROGRAMS	7
ITS DEPLOYMENTS	9
ITS MAINTENANCE	11
TRANSPORTATION MANAGEMENT CENTER (TMC) OPERATIONS	13
ROAD RANGERS	17
ADVANCED TRAVELER INFORMATION SYSTEM (ATIS)	21
TRAFFIC INCIDENT MANAGEMENT (TIM) TEAM	23
PUBLIC OUTREACH	27
PERFORMANCE MEASURES	29
LESSONS LEARNED	33
A LOOK AHEAD TO 2006	34



SOUTHEAST FLORIDA'S ANNUAL DELAY



Source: Texas Transportation Institute 2005 Urban Mobility Report

INTRODUCTION

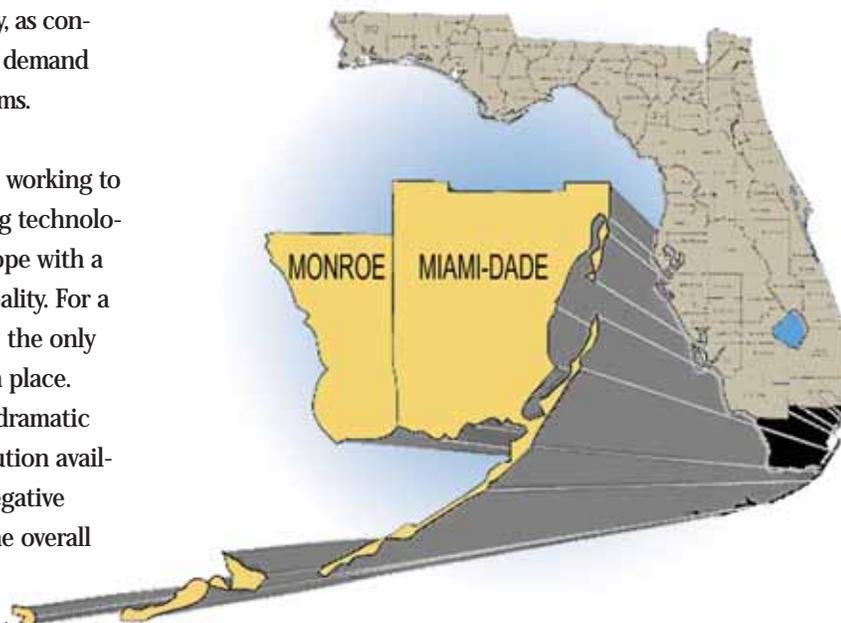
FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) DISTRICT SIX encompasses Miami-Dade and Monroe counties, a total of more than 3,000 square miles at the southern tip of Florida. Major cities in the District are Coral Gables, Hialeah, Key West, and Miami. The District is home to some 2.4 million people; and Southeast Florida has over 5 million residents. Its roads are traveled more than 36.7 million miles daily. Southeast Florida is the sixth most congested area in the nation. While population has grown 12.7 percent from 1998 to 2003, annual delay has grown 47.3 percent during the same time period. In 2003, congestion cost the public over \$2.4 billion.*

Initially, FDOT District Six Intelligent Transportation Systems (ITS) Programs have focused on the limited access facilities (I-95, I-75, SR 826, I-195 and I-395), which make up 53.5 centerline miles. In addition, FDOT District Six supports Miami-Dade Expressway Authority's (MDX) ITS program by managing the Road Rangers on MDX facilities. With a traffic volume of nearly 300,000 vehicles a day, I-95 in Miami-Dade County is operating well over capacity, as congestion costs continue to mount. And the growing demand cannot be met by just expanding the freeway systems.

Against this harsh backdrop, FDOT District Six is working to substitute smart growth for physical growth, using technology and innovation instead of new lane miles to cope with a challenge posed by a compelling demographic reality. For a roadway system that is at its limit in terms of size, the only solution is optimize the efficiency of the assets in place. Controlling the flow of traffic may not offset the dramatic increases in sheer numbers, but it is the best solution available for minimizing the crush of traffic and its negative effects on the economy, social interaction, and the overall quality of life in Southeast Florida.

The State of Florida operates a statewide program, known as SunGuide, for planning, implementing, maintaining and operating ITS. FDOT District Six is working with the state, local jurisdictions, regional authorities, and multiple interested stakeholders to implement ITS within the District. This program comprises an array of measures that work in tandem to smooth traffic flow, minimize the effect of traffic incidents, expedite recovery from such incidents, and provide the traveling public with up-to-date information that helps them plan their trips and minimize their encounters with time-consuming delays that inevitably arise on busy highways.

There are no quick-fix solutions. However, there are several highway improvements and programs to manage traffic better, such as ramp metering on I-95, incident detection systems, dynamic messaging signs (DMS), and freeway service patrols. FDOT District Six also leads a regional effort to provide a 511 traveler information system that supplies real-time traffic reports and transit trip planning. Progress made in these and related ITS initiatives during 2005 are documented throughout this report.



*Source: Texas Transportation Institute 2005 Urban Mobility Report

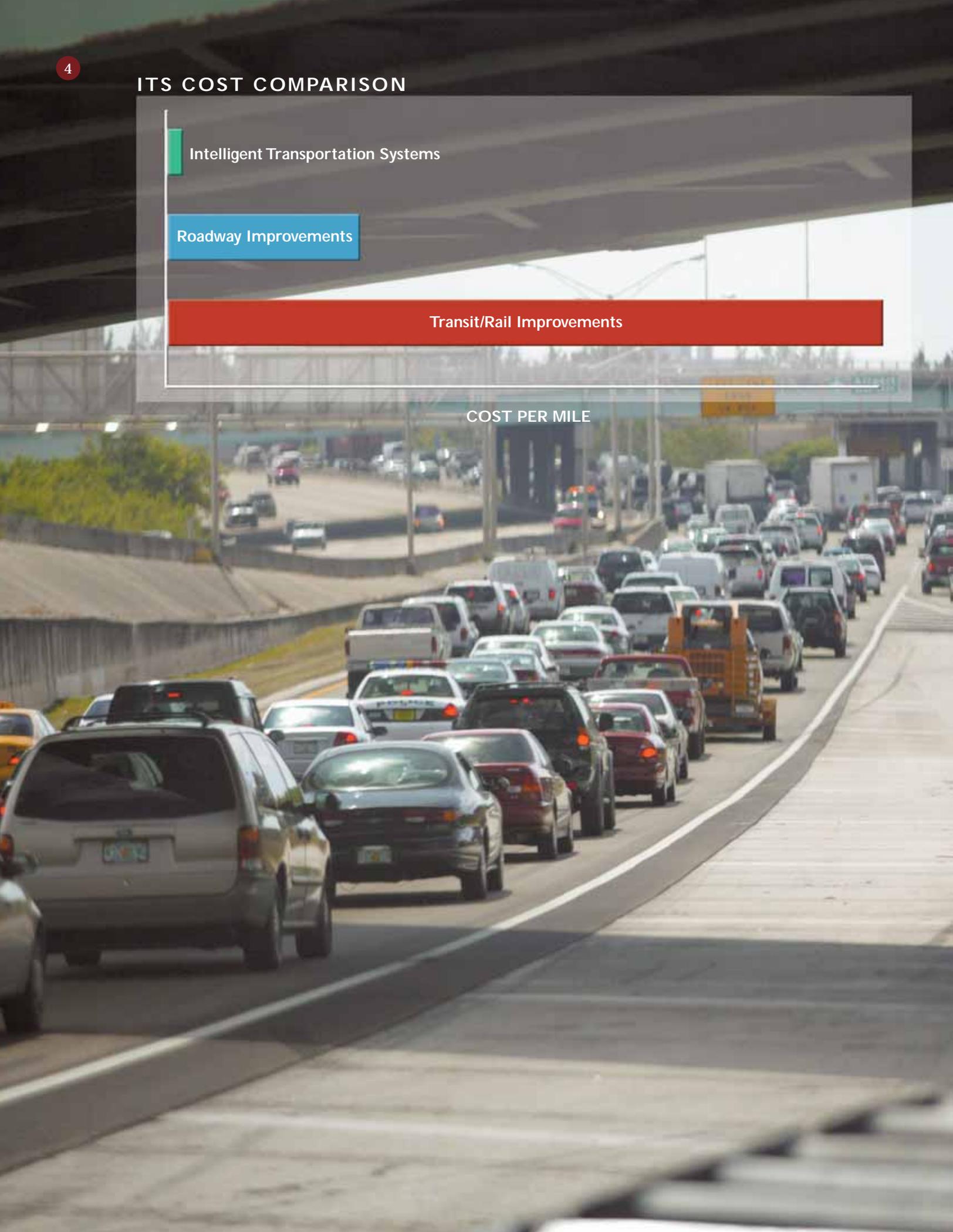
ITS COST COMPARISON

Intelligent Transportation Systems

Roadway Improvements

Transit/Rail Improvements

COST PER MILE



BUSINESS PLAN

THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) DISTRICT SIX Intelligent Transportation System (ITS) program is designed to offset the growing crush of traffic by implementing, maintaining and operating the technology that controls our roadways, and improving the interactions that take place between that technology and roadway users. Since additional roadway construction is expensive, and roadway widening is actually prohibited in the case of many primary roadways such as I-95, state-of-the-art ITS systems offer the best return for each dollar invested in traffic improvements.

FDOT District Six has an organizational unit that is specifically charged with implementation of SunGuide ITS initiatives within the District. That organizational unit is shown below. The unit uses a combination of in-house staff and contract personnel to ensure that the required skills are available to plan, deploy, operate, and maintain District Six ITS program.

The District Six ITS program budgets for 2005 include both capital improvement costs and operating and maintenance costs. As indicated below, the total costs shown are considerably less than the normal capital costs associated with expanding highways and facilities.

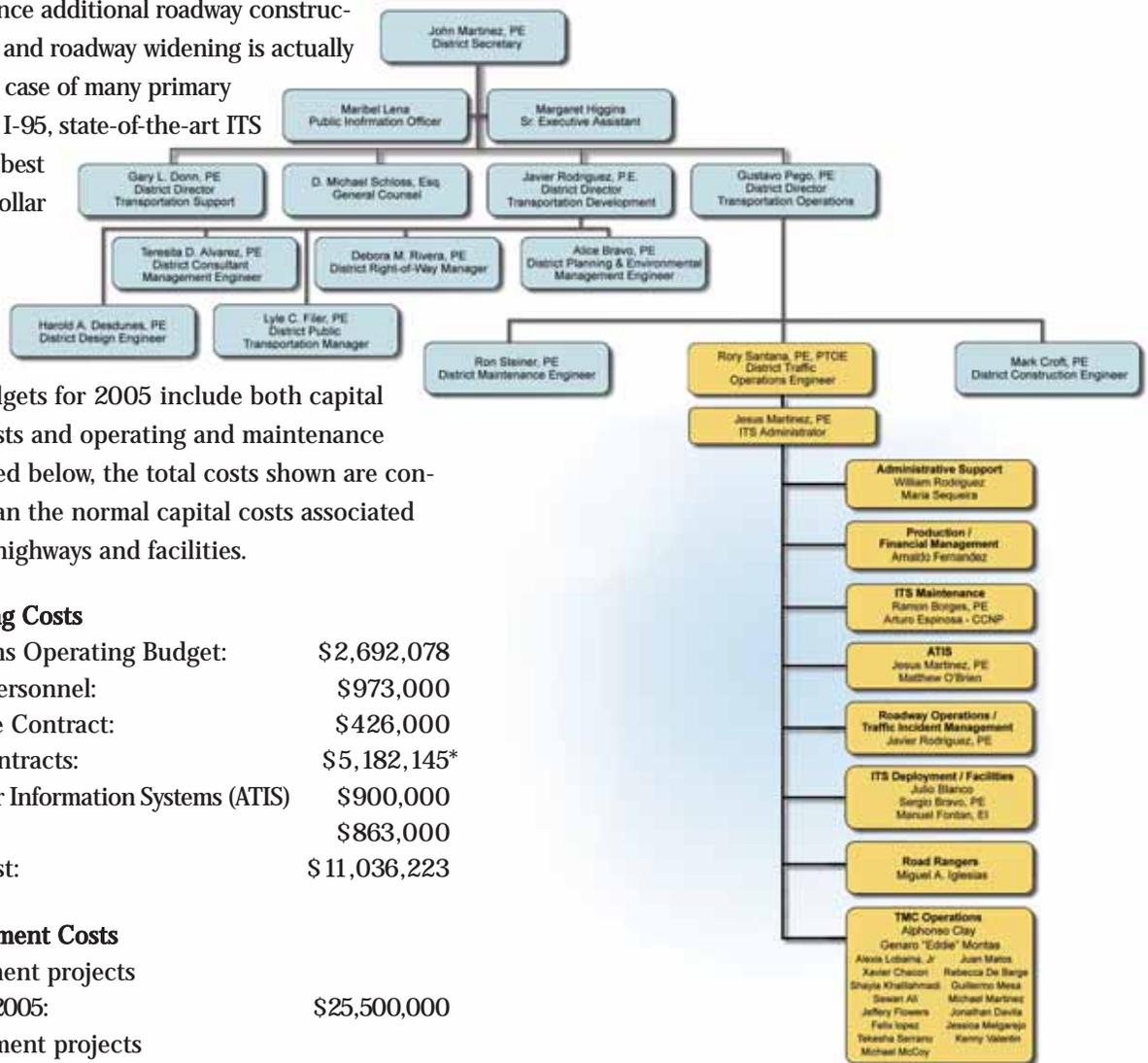
Annual Operating Costs

Traffic Operations Operating Budget:	\$2,692,078
TMC Contract Personnel:	\$973,000
ITS Maintenance Contract:	\$426,000
Road Ranger Contracts:	\$5,182,145*
Advanced Traveler Information Systems (ATIS)	\$900,000
ITS Consultants	\$863,000
Total Annual Cost:	\$11,036,223

Capital Improvement Costs

ITS field deployment projects completed before 2005:	\$25,500,000
ITS field deployment projects completed in 2005:	\$7,100,000
Projects under construction:	\$24,600,000
Upcoming Projects (through 2009):	\$14,000,000

*Includes Miami-Dade Expressway Authority Roadways





SunGuide Transportation Management Center

TRAVELER INFORMATION



MEDIA



INTERNET

FDOT DISTRICT VI SUNGUIDE TMC



**FDOT / FLORIDA HIGHWAY PATROL
TRAVELER INFORMATION**



**VEHICLE
DETECTION**



**RAMP
METERING**



**TRAFFIC INCIDENT
MANAGEMENT TEAMS**



**DYNAMIC
MESSAGE SIGNS**



**TRAILBLAZER
SIGNS**



CCTV CAMERAS



ROAD RANGERS

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INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAMS

FLORIDA'S ITS reduces crashes, incident response times, and travel times. ITS services promote increased travel speeds, reduced emissions, and enhanced safety. The main functions of ITS are: incident management (primarily avoiding secondary crashes), traveler information (511) dissemination, and traffic management/operations.

Proper planning is the first step in defining Florida Department of Transportation (FDOT) District Six ITS programs. FDOT District Six ITS staff actively participated in the development of regional and statewide ITS Architectures. These architectures laid the foundation for building a truly regional and integrated ITS system. As more specific transportation needs are identified, the District conducts feasibility studies to develop conceptual solutions. FDOT District Six ITS staff coordinates their planning activities internally with other FDOT Departments and with the Miami-Dade Metropolitan Planning Organization (MPO). Some of the planning activities include:

- Host and participate in Traffic Incident Management Team Meetings (Miami-Dade, regional and statewide)
- Update - Regional ITS Architecture
- Participate in Miami-Dade MPO ITS Standing Committee Meetings
- Developed Memorandum of Understanding (MOU) for sharing communications network infrastructure and right-of-way with Miami-Dade Transit and Miami-Dade Enterprise Technology Services Department (ETSD)
- Evaluating/planning video sharing opportunities with the City of Miami, Miami-Dade Traffic Signals and Signs Division, Miami-Dade Transit, Port of Miami and Monroe County Sheriff's Office
- Contributed to the development of the Miami-Dade County Long-Range Transportation Plan

In addition, FDOT District Six established a South Florida Regional ITS Coalition to serve as a resource sharing forum; the numerous agency partners within South Florida provide coordinated planning, deployment, operation, maintenance, and evaluation of ITS within the region (for more information go to the project website www.sunguide.org/itsregionalcoalition.asp).

In addition to ITS planning, FDOT District Six manages a number of ITS programs. The primary programs include:

- ITS Deployments - Managing the design and construction of ITS field equipment to improve operations, such as dynamic message signs (DMS), Closed Circuit Television (CCTV) cameras, ramp metering, roadway detectors, and fiber optic communications infrastructure
- ITS Maintenance - Managing the maintenance of ITS field and Transportation Management Center (TMC) equipment to ensure system availability
- TMC Operations - Providing a central location for data collection and dissemination, and for dispatching Road Rangers—the essence of traffic management
- Road Rangers - Florida's version of a freeway service patrol, assisting motorists in need and supporting agencies responding to incidents
- Advance Traveler Information System (ATIS) - Providing real-time traveler information services through various media, such as the telephone and the Internet
- Traffic Incident Management (TIM) Team - Coordinating multi-agency meetings to identify issues and develop solutions to improve incident management
- Public Outreach - Educating the public on the ITS services provided by the FDOT District Six and how these tools will benefit the public



"FDOT District Six has expedited the delivery—with less claims and litigation—of capital improvement ITS projects through design-build project delivery methods."

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Intelligent Transportation Systems (ITS) Deployment

Florida Department of Transportation (FDOT) District Six Traffic Operations Office has been proactive in finding ways to expedite the delivery of ITS capital improvement projects. They have expedited recent projects by switching project delivery systems from the traditional design-bid-build to design-build. By procuring projects via design-build, ITS projects are completed faster, with fewer claims and less litigation, while benefiting from the latest technologies available in the market.

In 2005, FDOT District Six made one of South Florida's most congested expressways—SR 826/Palmetto Expressway—a little smarter. The first ITS deployment for the Upper Keys was also completed in 2005. Overall, FDOT District Six completed \$7.1 million of ITS deployments during the year, and has another \$24.6 million under construction.

Every deployment of ITS requires a robust communications network. FDOT District Six primarily installs fiber optic communications as the backbone, but in 2005, the District has taken advantage of advancements in wireless communications technology where fiber optic deployment is not feasible.

ITS applications within work zones (aka “Smart Work Zones”) can provide benefits in terms of both mobility and safety, as demonstrated by agencies across the country. FDOT District Six recognizes the value of these potential benefits, and is taking proactive steps to coordinate with construction project managers in the deployment of ITS Smart Work Zones. FDOT District Six already has one active deployment under way at a construction project (Biscayne Boulevard at NE 110 Street), and plans are in place to coordinate Smart Work Zones in five upcoming roadway improvement construction projects. Implementing ITS in work zones has resulted in better communications and coordination between stakeholder agencies.

FDOT DISTRICT SIX ITS PROGRAM

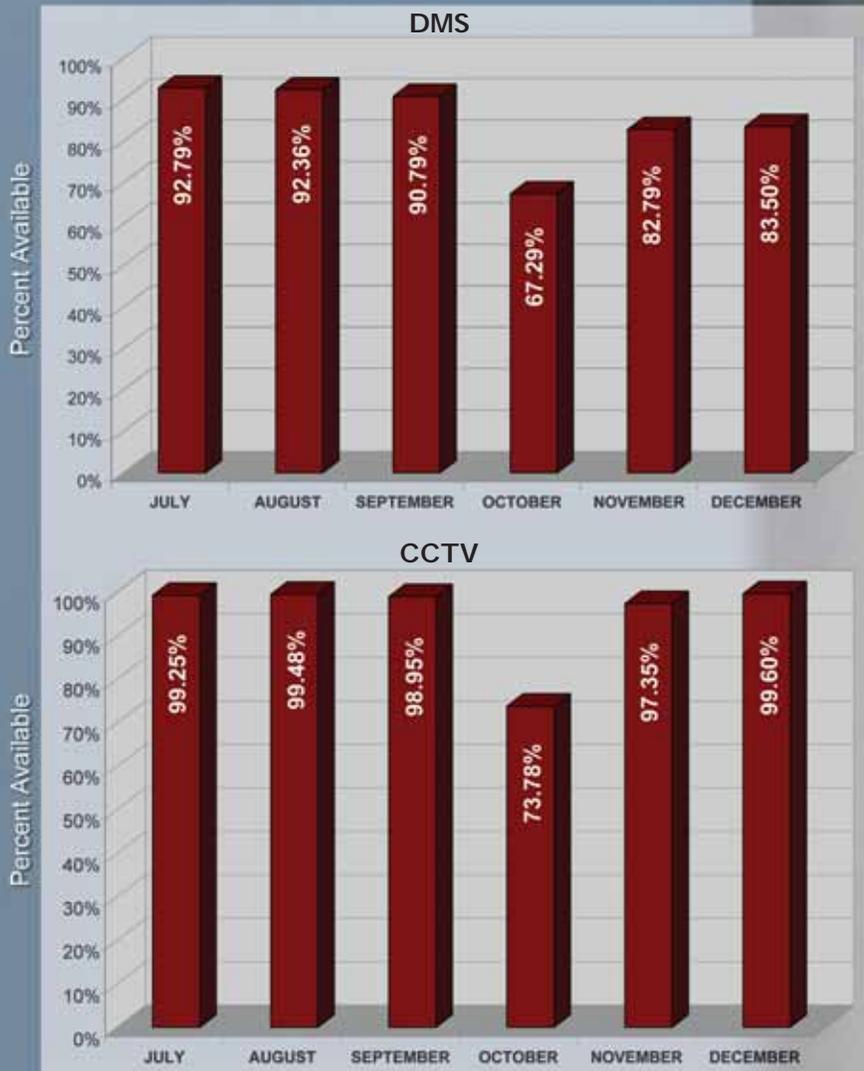
ITS Project	Date	Cost	DMSs	CCTVs	Detectors	Ramp Meters	Trail Blazers	
Golden Glades Interchange (GGI)	2001	\$2.4M	10	6	86	---	---	
GGI CCTV Design / Build	2001	\$0.7M	---	7	---	---	---	
SunGuide Package A	2001	\$13.3M	4	27	67	---	---	
SunGuide Package C	2004	\$9.1M	Construction of SunGuide TMC					
SR 826 East / West	2005	\$4.3M	4	10	50	---	---	
SR 826 North / South	2005	\$0.8M	---	11	---	---	---	
Monroe Co. - Upper Keys	2005	\$2.0M	4	8	2	---	---	
SunGuide Package B	2006	\$10.0M	15	---	331	22	27	
Monroe Co. - Lower Keys	2006	\$9.4M	7	41	---	---	---	
I-75	2006	\$2.4M	4	7	30	---	---	
I-195	2006	\$2.8M	4	6	22	---	---	
I-95/SR 7 Diversion Route	2008	\$1.3M	1	---	---	---	27	
I-395	2008	\$3.6M	1	9	10	---	---	
US 1	2008	\$4.2M	4	17	6	---	---	
SR 826 North of SR 836	2009	\$4.9M	Feasibility Study*					
Totals	---	\$71.2M	58	149	604	22	54	

*Note: Feasibility Study will determine device quantities and Locations

Status:
 Completed
 Under Construction
 Planned



FDOT DISTRICT SIX ITS SYSTEM AVAILABILITY (July-December 2005)



System availability declined in October 2005 due to power outages caused by Hurricane Wilma.

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Intelligent Transportation Systems (ITS) Maintenance

The District Six Intelligent Transportation System (ITS) system is highly interactive, and dependent on state-of-the-art technology that is used to monitor and report roadway status systemwide. The entire network of equipment—the roadway detectors and Closed-Circuit Television (CCTV) cameras that track vehicle flow, the communications infrastructure, SunGuide Software, and computer servers that assess and respond to traffic congestion, dynamic message signs (DMS) and the 511 traveler information service that warn motorists of problems in real time—must remain in operation 24/7. This in turn calls for an aggressive maintenance program that ensures ITS equipment is in shape to detect, report, and redirect the flow of traffic throughout the region.

Since tracking system reliability in July 2005, Florida Department of Transportation (FDOT) District Six has been able to maintain CCTV cameras and DMS at an availability of 92.19 percent. This includes significant power outages during an active hurricane season.

To help with this effort, FDOT District Six implemented a robust work order system that is hosted by the contractor and accessible by FDOT via the internet. Currently, FDOT maintenance managers use the work order system as a backup for their invoices, and they plan to expand its function to develop and monitor more detailed budgets for maintenance activities. For example, FDOT District Six will be able to determine the annual maintenance cost for a CCTV camera.

Routine Maintenance

To comply with the terms of a new contract with FDOT District Six, the maintenance contractor worked throughout the instrumented ITS corridors to keep the District Six ITS system up and running smoothly. This required both preventive and corrective maintenance on CCTV units, DMS, and the supporting communications infrastructure. It also

entailed emergency repairs to facilities damaged by Hurricane Wilma.

Technicians are dispatched to perform routine maintenance whenever a unit fails, and all CCTV units undergo preventive maintenance (PM) visits four times a year. Two PM visits a year are required for all DMS units. PM is also conducted four times a year on all three communications hub buildings and their generator units.

Equipment Upgrades

In addition to keeping the existing facilities up and running, maintenance personnel also upgraded a number of installations during 2005. The key upgrades were as follows:

- Original CCTV cameras on I-95, at the Golden Glades Interchange (GGL), and on the adjacent arterials were replaced with new, National Transportation Communications for ITS Protocol (NTCIP)-compatible CCTV units.
- All devices were migrated to an IP-based network.
- Lowering devices were installed in 90 percent of the camera sites along I-95 and GGL.
- Three Vultron DMS were upgraded to Amber Light Emitting Diode (LED) and NTCIP Ethernet controllers, using IP addressing with diagnostics capability.
- Four Vultron DMS were upgraded with new driver boards and NTCIP Ethernet controllers, using IP addressing with diagnostics capability.
- A 3-terabyte storage area network was installed to support the deployment of the SunGuide software.
- A multichannel encoding and streaming video server was deployed and tested; it will support future posting of live traffic video over the Internet.



"Since its opening in the summer of 2004, the District Six TMC has been gearing up to accommodate its full complement of tenants and perform a host of ITS functions."

SHARPENING OUR FOCUS... Transportation Management Center (TMC) Operations

The Regional Transportation Management Centers (RTMCs) are the nerve centers of Florida's Intelligent Transportation System (ITS). The SunGuide Transportation Management Center (TMC) in Miami-Dade County is the RTMC for Florida Department of Transportation (FDOT) District Six. This facility serves as the regional command and control center for the ITS program within Miami-Dade and Monroe Counties. The two-story, 32,000-square foot facility is located at 1001 NW 111th Avenue in Miami, within the FDOT District Six Headquarters complex.

Inside the TMC

Since its opening in the summer of 2004, the District Six TMC has been gearing up to accommodate its full complement of tenants and perform a host of ITS functions.

The TMC houses FDOT operations staff who monitor traffic, disseminate information, and dispatch Road Rangers. 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 attend to the incident in order to provide the emergency and rescue services needed, while clearing the

incident as fast as possible to reduce the probability of a secondary crash. This coordination will be enhanced once the Florida Highway Patrol (FHP) and other law enforcement agencies are stationed within the TMC building as well. The TMC also provides space for SmartRoute Systems (SRS); the 511 service provider that disseminates travel information to the public throughout the Southeast Florida region. SRS is expected to move into the TMC in 2006.

Regional Coordination

The SunGuide TMC in District Six works closely with other control centers within the region, sharing video images, data, and other real-time information to provide a seamless approach to traffic management. The regional coordination is facilitated through a committee of TMC managers known as the Southeast Florida Regional TMC Operations Committee (SEFRTOC). SEFRTOC membership includes representatives from Broward and Palm Beach Counties, Florida's Turnpike Enterprise (FTE) and Miami-Dade Expressway Authority (MDX). SEFRTOC facilitated regional TMC coordination before and after each hurricane, proving to be a vital part of the TMC operations for natural disasters.





"By the end of 2005, FDOT District Six had tested, accepted, and is now using the SunGuide Software components that control the DMS and CCTV cameras."

TMC Operations (continued)

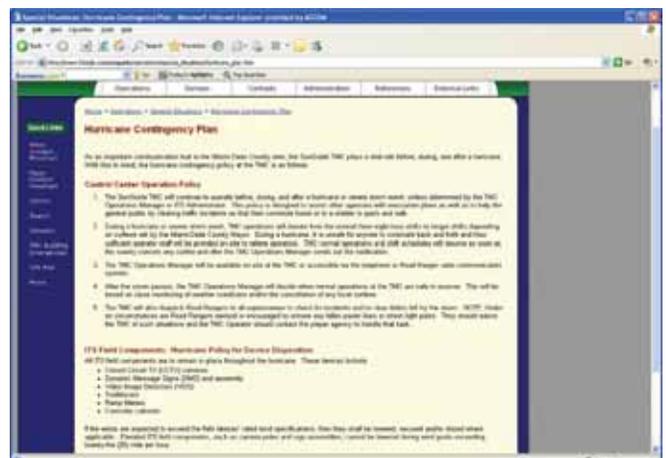
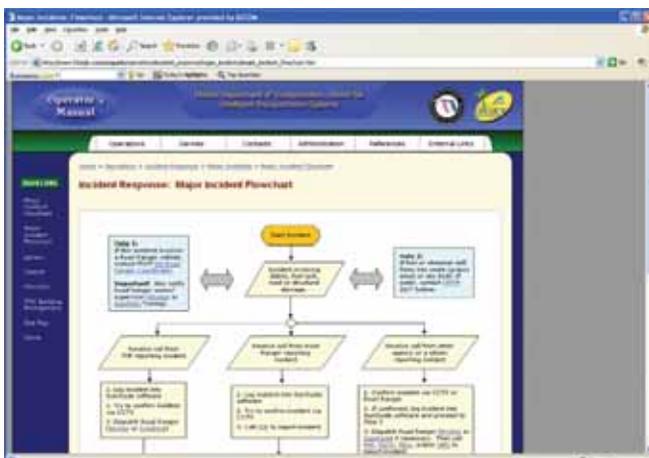
Operational Enhancements

Transportation Management Center (TMC) operations were enhanced by several projects in 2005.

Electronic Operators Manual - In 2005, District Six published an electronic version of its TMC operator's manual (see the sample screen shots below). This gives operators instant access to the information they need to operate the TMC effectively. It also serves as a training tool for new personnel. Flowcharts depict the steps needed to detect, respond to, and document incidents affecting District Six roadways. An electronic library houses an extensive list of organizational contacts. There is also a wealth of procedural and regulatory information, from specific guidance like the Florida Department of Transportation (FDOT) District Six procedures manual to communications aids (such as listings of the phonetic alphabet and the "10 codes" that are used for radio communications). Basic ITS devices are documented as well, with descriptions, photographs, and deployment strategies explained in detail. Maps show the Road Ranger patrol zones, Amber Alert coverage areas, and the overall region. The TMC electronic operators manual documents everything from correct radio check procedures to how to clear your voice-mail box. For TMC operators, the references they need are all just a click away.

SunGuideSM Software - In November 2005, District Six began the initial deployment of the SunGuideSM Software. SunGuideSM Software is a statewide effort to develop an integrated RTMC software application that can be used by all FDOT Districts. By having one common software platform, the FDOT Districts will be able to share data and control of ITS devices-providing true center-to-center communications and redundant operations on a regional basis. SunGuide software integrates control of field devices into one application, making it much easier for the operator to manage traffic. The software has been deployed in phases, with each phase adding capability to control new components. By the end of 2005, FDOT District Six had tested, accepted, and is now using the components that control the dynamic message signs (DMS) and closed-circuit television (CCTV) cameras. The incident management component is not being used because FDOT District Six is using SunGuide Incident Management System (SIMS)—an application used by the TMC operators to automate Road Ranger data collection. FDOT District Six ultimately intends to integrate the two applications.

TMC Building Upgrades/Maintenance - After the District Six TMC began operating, several improvements were needed to enhance the operational environment. Improvements were made to the A/C system and the electrical power distribution system.





- *Total Road Ranger Assists for 2005: 80,055*
- *Motorists assisted: 6,700 average per month*
- *Assists per hour: 9*
- *Fleet size: 24 daytime/15 nighttime and weekends*
- *Coverage: 99 centerline miles*
- *Radio dispatch coverage: 24/7*

SHARPENING OUR FOCUS...

Road Rangers

The Road Ranger service patrol is a free service of the Florida Department of Transportation (FDOT). Road Rangers in District Six currently patrol I-95, I-395, I-75, I-195, SR 826 and Miami-Dade Expressway Authority (MDX) roads (SR 836, SR 874, SR 924, SR 878 and SR 112). In September 2005, FDOT District Six expanded Road Ranger coverage to the arterials (SR 5/US 1 from SW 112th Street to SW 17th Avenue) as part of a two-year pilot project. Road Rangers help stranded motorists, remove roadway debris, and assist the Florida Highway Patrol (FHP) during traffic incidents. Road Rangers in District Six alone helped as many as 9,000 Florida motorists in the month of July.

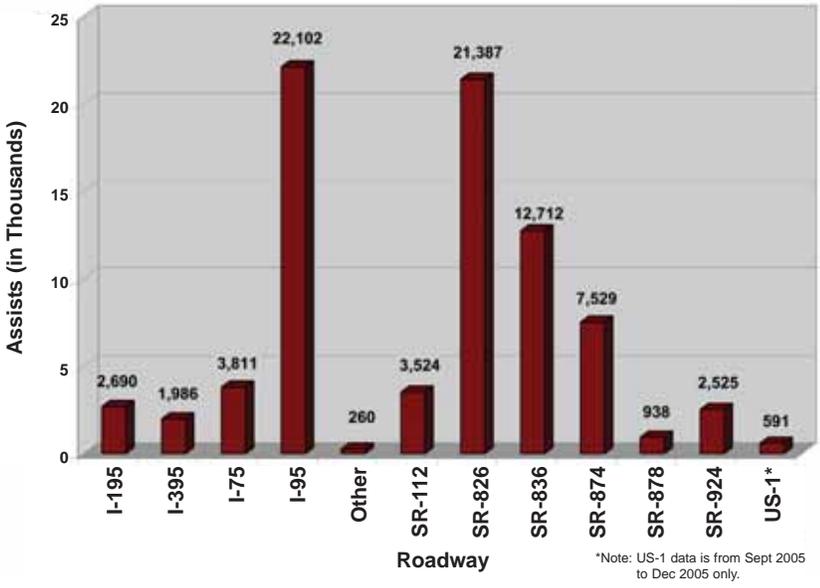
As one might expect, three major roadways—I-95, SR-826, and SR-836—consume the lion’s share of Road Ranger time and attention. However, other roadways account for nearly 30 percent of the assists rendered in 2005 (some 23,854 events). As traffic congestion spreads throughout the region, so too does the need for Road Rangers who can expedite traffic flow. The duration by each service is shown in the chart to the right. As expected, crashes take the longest to clear at 89 minutes on average. Other types of assists take less time, bringing the average time a Road Ranger is assisting a motorist to 46 minutes.

Road Rangers do more than just change flat tires (21 percent of the assistance events) or provide stranded motorists with enough fuel to get to the nearest gas station if they run out of gas. In fact, they perform all of the following services free of charge:

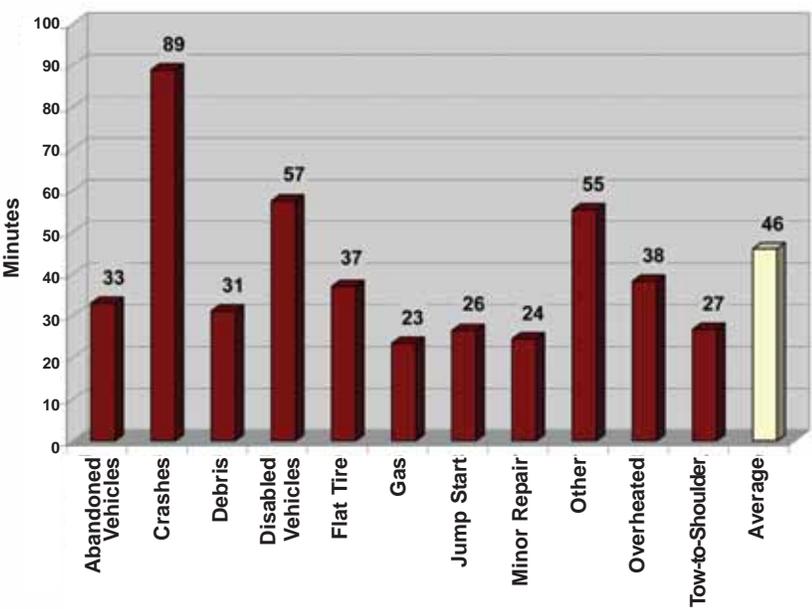
- Tow stranded cars to the nearest safe location
- Detect and report road conditions and incidents

- Spend up to 30 minutes to try to fix a stranded vehicle
- Secure the scene of an accident and set up a safe zone for emergency vehicles

2005 ASSISTS BY ROAD IN DISTRICT SIX



2005 AVERAGE DURATION BY ASSIST TYPE IN DISTRICT SIX



"...regional traffic congestion can be reduced by extending Road Ranger services to the roadways that feed the freeways."

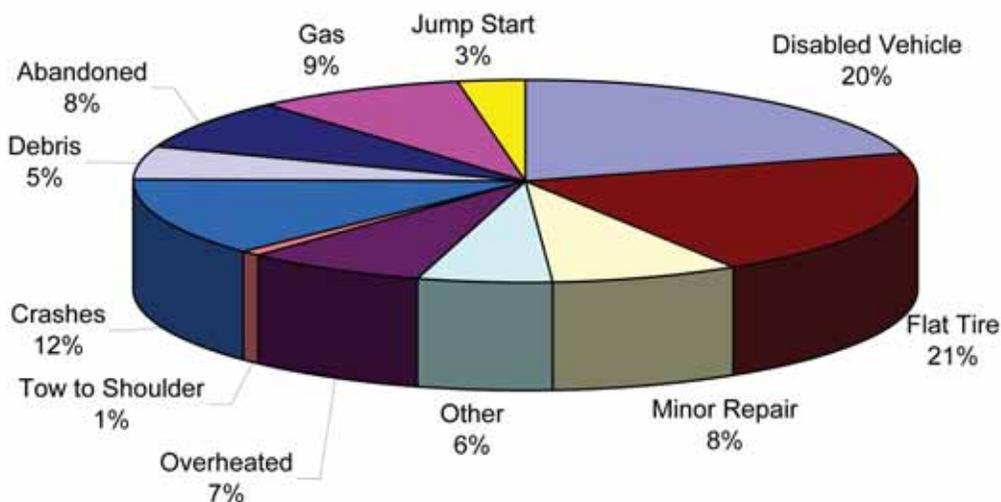


Road Rangers (continued)

- Set up maintenance-of-traffic measures so commuters know how to avoid an incident
- Pick up road debris
- Patrol during hurricane evacuation to assist stranded motorists
- Detect and report suspicious vehicles

Crashes, road debris, and disabled vehicles are the three major impediments to the flow of traffic. As the pie chart below shows, the Road Ranger patrols perform a variety of services to manage roadway incidents, prevent secondary crashes, and keep traffic moving.

2005 ASSISTS BY TYPE



Improved Data Collection

In 2005, District Six distributed robust, roadworthy personal digital assistants (PDAs) to all of its Road Ranger units. Used primarily to simplify and expedite the capture of incident data, these PDAs are part of a Web-based incident management system; they enable Road Rangers to gather incident data at the scene and upload the information at the end of each shift. The PDAs help standardize the type and amount of information being gathered, and they simpli-

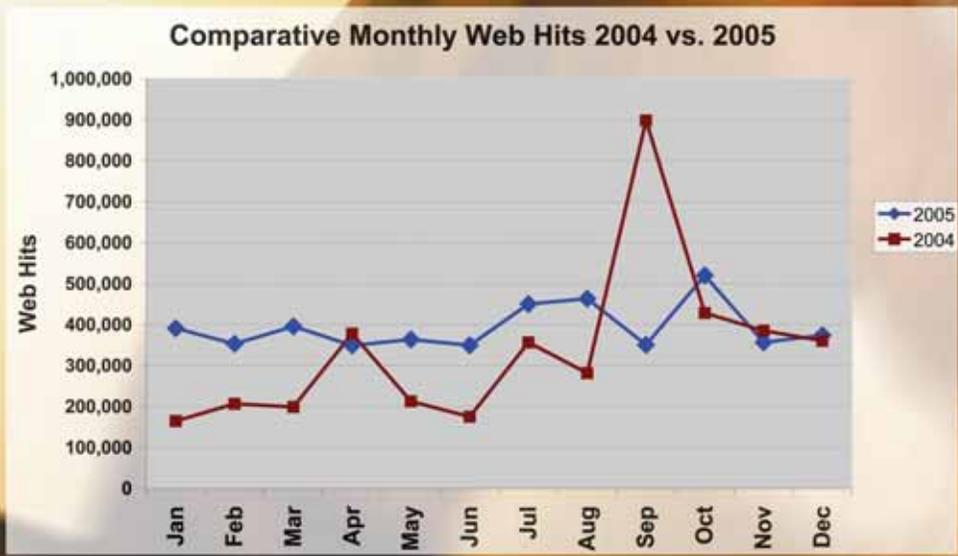
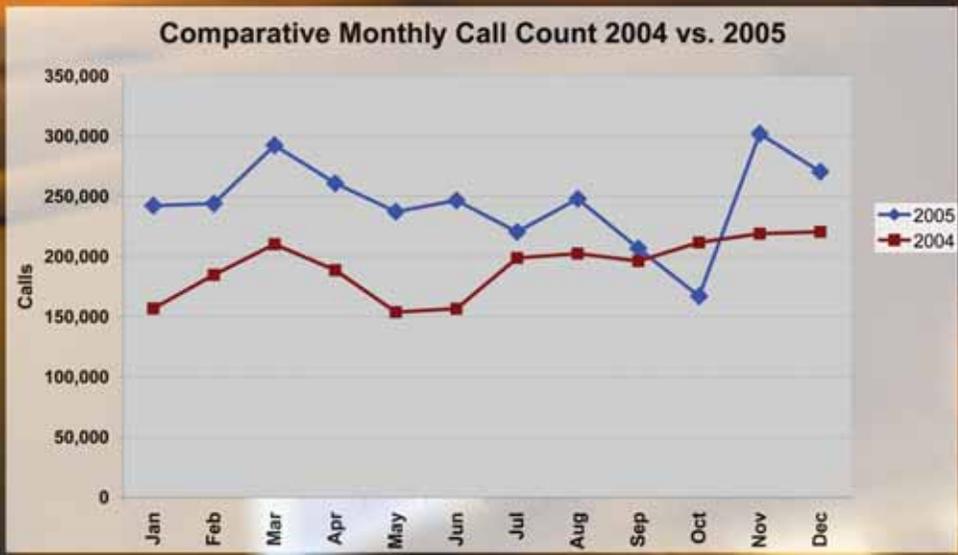
fy the task for Road Rangers, whose focus can better remain on managing the incident—instead of scribbling down data for use after the fact. Full deployment began in January 2005 and has gradually been adopted by the Road Rangers and TMC Operators after various enhancements and training.



Arterial Coverage

Florida Department of Transportation (FDOT) District Six is conducting a pilot program to assess the value of using Road Ranger patrols on arterial roads as well as freeways. Currently under way on SR 5/US 1 from SW 112th Street to SW 17th Avenue, this two-year pilot program will determine whether regional traffic congestion can be reduced by extending Road Ranger services to the roadways that feed the freeways. Delays on surface streets—whether triggered by crashes, breakdowns, or other traffic obstructions such as debris or construction—can impede the flow of traffic onto and off of the freeways, which has a cascading effect on motorists throughout the region. If the test is successful, extended Road Ranger patrols will become another weapon in District Six’s arsenal of traffic congestion-fighting tools.

Because of complex jurisdictional issues, District Six coordinated with local police agencies before launching the pilot program. That close relationship will continue for the duration of the test. Although it is early in the program, results to date have been encouraging, and the initial feedback has been very positive.



SHARPENING OUR FOCUS...

Advanced Traveler Information Systems (ATIS)

The Advanced Traveler Information System (ATIS) project provides uniform, multimodal, real-time traveler and traffic information in South Florida under the SunGuide program. Florida Department of Transportation (FDOT) District Six leads this regional project with support from FDOT District Four, Florida's Turnpike Enterprise, and the Miami-Dade Expressway Authority. The services are provided by SmartRoute Systems, a private ATIS partner that currently works from its own facility near the Golden Glades Interchange. In addition to disseminating real-traffic information via the Web, SmartRoute Systems hosts a 511 telephone service that was upgraded to include voice recognition in January 2006.

The consumer information network (CIN) project was launched in October 2005. The CIN software provides seamless regional transit trip planning in Miami-Dade, Broward, and Palm Beach Counties for four transit partners. The CIN project was awarded the *2005 Outstanding Achievement Award by the Intelligent Transportation Society of Florida*.



511 Traveler Information Service

System Workload - Focused marketing efforts, high system reliability, and word of mouth have combined to boost regional usage of the popular 511 Traveler Information Service to its highest levels ever. In 2005, the 511 service received a total of 2,937,862 incoming calls. This represents a 27 percent increase over the volume recorded in 2004. Call volume spiked past 300,000 in November 2005, and the average number of calls per month has climbed to almost 245,000. Periods of heaviest use have seen daily call volumes reach as high as 20,000. The chart to the left compares the 2005 trend line and call volume data to 2004 results. *Since its launch, the regional 511 system has*

received a total of 6,994,120 calls. The system ranks second nationally out of 26 deployed 511 system for its call volume.



System Performance - Throughout most of 2005 the 511 call system was remarkably dependable, with system availability generally exceeding 99 percent in most months. However, the entire system underwent outages beginning at 3:00 a.m. on Monday, October 24, 2005, after Hurricane Wilma made landfall. Power was not restored to the ATIS operations center until October 31, 2005, and necessary activities to restore hardware and software delayed full resumption of 511 telephone service until November 2, 2005. However, the ATIS operations center is expected to move into the FDOT District Six TMC prior to the 2006 hurricane season. Since that facility has full backup power, the 511 system will be much less vulnerable to damage from hurricanes, other weather anomalies, or incidental damage to power stations or utility lines serving the TMC.

SunGuide Traveler Information on the Web

Motorists in the South Florida region are well served by a dedicated Web site that offers a wealth of travel information. Route planning tools, incident alerts, live traffic camera views of major roadways, and even information on public transit services can be readily found at www.511southflorida.com. As depicted in the chart to the left, current usage rates show an average of some 392,000 hits per month—more than 4 million hits a year. This represents an increase of more than 16 percent over 2004 levels, even taking into account a September 2004 usage spike that was driven by intense hurricane activity. For 2005, usage peaked in October (the month when Hurricane Wilma struck), reaching almost 520,000 hits. Since its launch, the Web site has amassed more than 10 million hits.

"The primary mission of the TIM Team is to develop recommendations that will provide a safe, efficient, and appropriate multi-agency response to traffic incidents through timely and accurate detection, verification and clearance."



SHARPENING OUR FOCUS...

Traffic Incident Management (TIM) Team

The Traffic Incident Management (TIM) Team is one of several successful proactive programs designed to assist our regional Transportation Management Centers (TMCs) with incident management and surface transportation-related activities throughout Florida. The primary mission of the TIM Team is to develop recommendations that will provide a safe, efficient, and appropriate multi-agency response to traffic incidents through timely and accurate detection, verification and clearance.

Regularly scheduled TIM meetings bring together various agencies responsible for responding to incidents. They address issues that arise as a result of the diverse institutional functions and individual agency goals that are at play.

The TIM Team has become a showcase of collaboration in South Florida. Florida Department of Transportation (FDOT)'s District Six SunGuide leads the Miami-Dade TIM Team. The TIM stakeholders are many, including transportation and emergency management professionals from Miami-Dade County and various municipalities. They provide a diverse perspective on the common goal of detecting, responding to, and clearing incidents efficiently and safely, with minimum disruption of traffic. During 2005 there was a focused effort to capitalize on recent Intelligent Transportation System (ITS) infrastructure investments along the Interstate 95 corridor, and to take full advantage of the Road Ranger service patrol program.

I-95 Diversion Routes

The Miami-Dade TIM Team in 2005, completed the update process for the I-95 diversion route plans developed in the 1980s. These diversion route plans identify alternate routes that could be activated in response to major incidents that block the travel lanes on I-95. The

update of these plans involved numerous technical working sessions, bimonthly TIM meetings, individual meetings with stakeholders, and special information workshops through-

out 2005. The evolving plans are an initial but vital step to guide the development of an overall implementation plan, one that would require clear direction and commitments from the TIM stakeholders. Such a plan would also go a long way toward implementing the approved "Open Roads Policy" which is a memorandum of understanding between Florida Highway Patrol (FHP) and FDOT to open all travel lanes of traffic within 90 minutes of the arrival of the first FHP Officer at an incident. The TIM Team recognized that the Miami-Dade TIM is the appropriate forum to facilitate the development of this important initiative and bring it to fruition. The deployment of these plans would require a pre-planned, coordinated, and unified multi-agency approach from the responding agencies, all of which are represented on the Miami-Dade TIM team. The team has formulated a task force that includes FDOT District Six, FHP, City of Miami Police and Fire Rescue, Miami-Dade Public Works, Miami-Dade Police and Fire Rescue, and the consultant team, and has invited others to help guide the development of the implementation plan and protocol.

Multi-Agency TIM Training

FDOT District Six hosted a multi-agency TIM training workshop in December 2005 that covered responder safety, incident site management, and incident clearance. The workshop included exercises and videos highlighting best practices for these areas on a national level.



"...District Six outperformed the national average in terms of both the initial FHWA-mandated baseline self-assessment and the 2005 update."

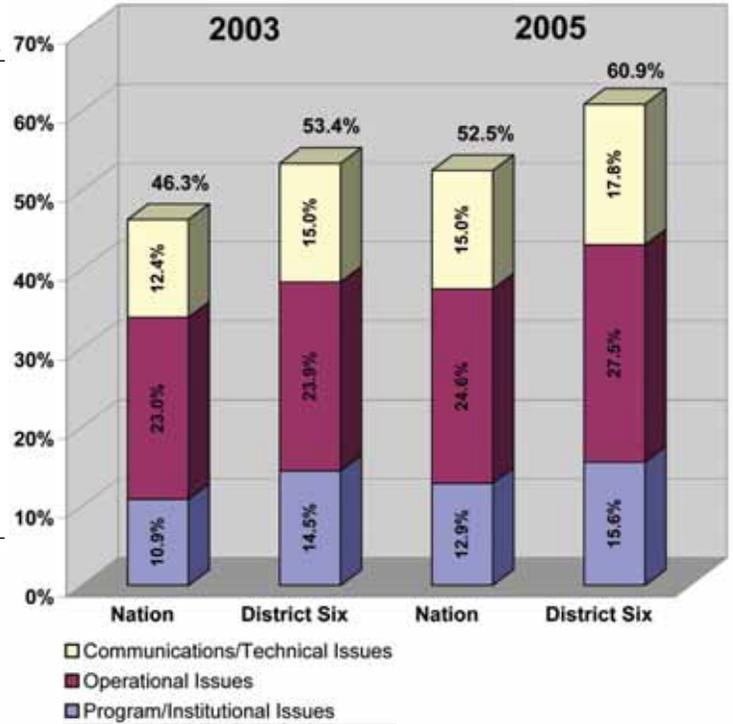


TIM Team (continued)

FHWA TIM Self-Assessment

As prescribed by the Federal Highway Administration (FHWA), the Miami-Dade TIM conducted a biannual self-assessment in 2005. The self-assessment is categorized into program and institutional issues, operational issues, and communication and technology issues. As demonstrated by the chart to the right, District Six outperformed the national average in terms of both the initial FHWA-mandated baseline self-assessment and the 2005 update. Although overall scores are still low—both nationally and within the District—progress is evident across the board on the issues that define effective TIM approaches. Echoing results for the country as a whole, District Six has focused its greatest attention on operational issues, since at the tactical level, this is where traffic incident clearance rates are most directly affected. For 2006, The Miami-Dade TIM has developed a list of action items that focus on performance measurement, responder and motorist safety, and integrated inter-agency communications.

FHWA TIM SELF ASSESSMENT RESULTS





"The District Six Traffic Management Center represents a giant step toward the transportation system of tomorrow for all Floridians. We know that we can't build our way out of the traffic and transportation challenges our state faces. There is a finite capacity to build or expand our roads. But we can use technology to help us make the most of our roads and highways. And I applaud our DOT for harnessing that power to serve Floridians."

— Governor Jeb Bush



SHARPENING OUR FOCUS...

Public Outreach

The SunGuide public outreach program is designed to maximize public participation in the design, development, and implementation of the District Six Intelligent Transportation System (ITS) Program. A deliberate effort is also made to ensure that the public is fully aware of the services available to them, and of the goals and accomplishments of the program. The outreach effort takes advantage of media opportunities, branding techniques, and regular public information releases to sustain public interest and awareness. Florida Department of Transportation (FDOT) District Six actively assists national, trade, local, and community media by providing accurate, unambiguous data, and open access to ITS facilities (over 50 TMC tours and over 40 Ramp Metering Outreach presentations were given in 2005).

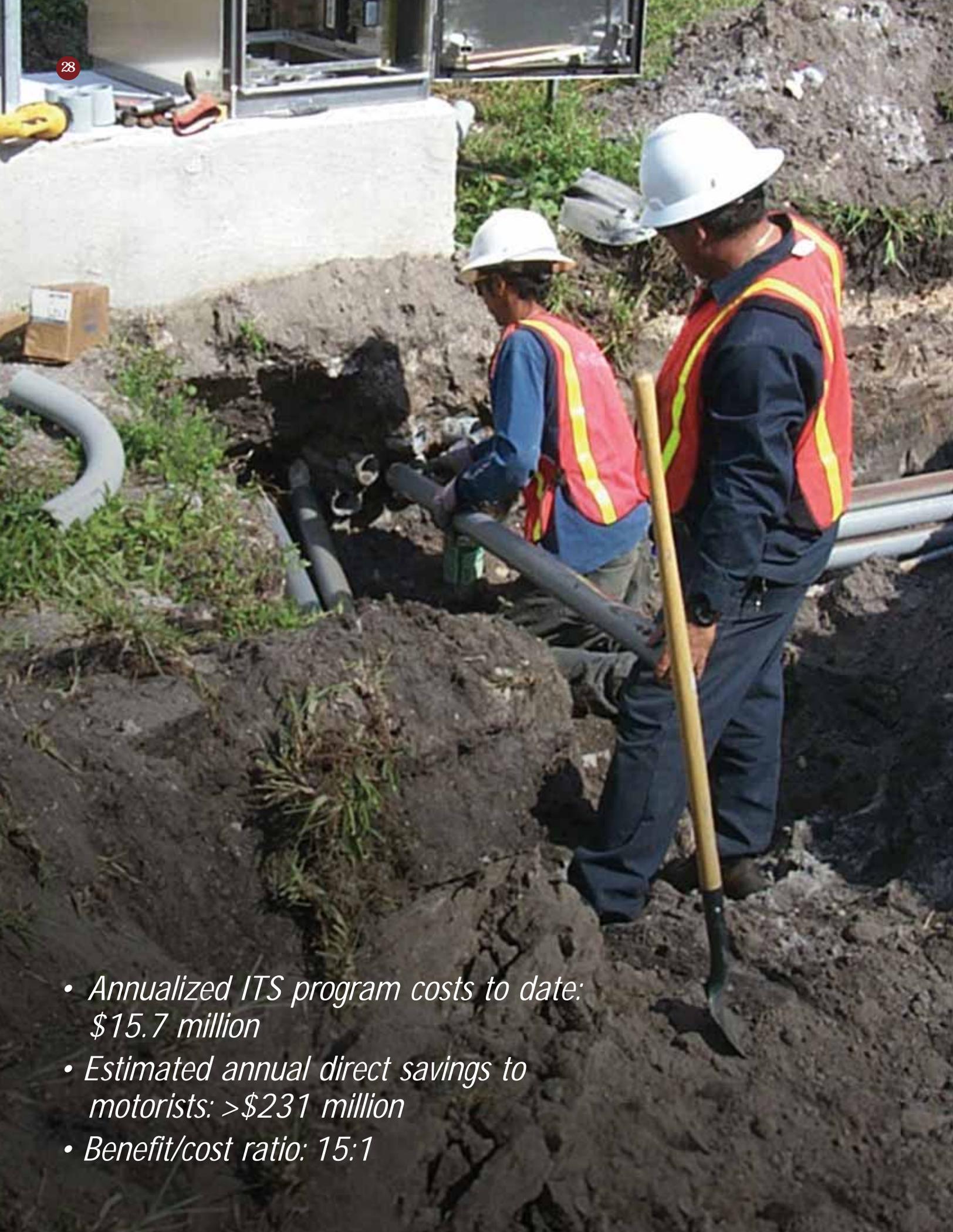


The SunGuide Web site is a primary tool for conveying information to the traveling public. Designed to be both comprehensive and user-friendly, the Web site (www.sunguide.org) addresses all aspects of the ITS program. It provides access to

real-time 511 travel information; route and trip planning tools; live traffic cameras and reports; direct e-mail alerts; and even information on public transportation alternatives in the event that the traveler's normal routes are blocked by traffic congestion or roadway incidents.

In addition to publicizing the ITS program through the Web site, FDOT and a regional coalition of public and corporate ITS participants have conducted several individual events to heighten public awareness of ongoing improvements in Southeast Florida's complex transportation system. Several examples are listed to the right.

- City of Coral Gables
 - Highlighted the 511 SunGuide program at their "1 Millionth Ride" event
 - Continually promote 511 program to residents and city employees
- Douglas Road Metro Rail Station Radio Remote
 - Radio remote for transportation promotions
 - Distribution of 511 program to all public transit users commuting into station
- Miami Herald Health Fair
 - Promotional event with the SunGuide FDOT District Six Transportation Management Center (TMC)
 - Information on 511, ramp metering, Road Rangers, TMC services, and other FDOT projects available to community
- Miami-Dade Public Defenders Office
 - Information distributed to all file operatives
 - Presentation of the www.511southflorida.com Web site and benefits of registering to create personal e-mail profiles to receive customized traffic information
- Palm Beach Office Depot Corporate Center
 - Event for all employees at the corporate park
 - Promotions of Web site and on-line services available to employees
- Development of Collateral Materials and Giveaways
 - Coordination with regional marketing and outreach coalition to consider new collateral materials and giveaways
 - Identify marketing opportunities through partner events and promotions (e.g., Miami-Dade Expressway Authority (MDX) highway signs highlighting 511)
- Monthly News Releases
 - Highlighting any new services implemented
 - Dissemination of season information (such as hurricane season, upcoming holiday season)
 - Travel tips for commuting and special events
- American Airlines Benefits Fair
 - Promotion of the various transportation services available to approximately 2,500 airport employees
- Promotional Outreach Campaign, Broward County
 - Working in cooperation with South Florida Vanpool outreach coordinator



- *Annualized ITS program costs to date: \$15.7 million*
- *Estimated annual direct savings to motorists: >\$231 million*
- *Benefit/cost ratio: 15:1*

PERFORMANCE MEASURES

PERFORMANCE MEASURES IN USE FOR 2005

Florida Department of Transportation (FDOT) has established a mobility performance measure program to link strategic planning to resource allocations, and to ensure accountability. On a statewide basis, FDOT's Central Office has adopted six key performance measures for Intelligent Transportation System (ITS) programs. They fall into two categories: output and outcome.

Output measures quantify the physical results of a range of program activities; in effect, they measure program efficiency. Key items that District Six tracked in 2005 are shown here:

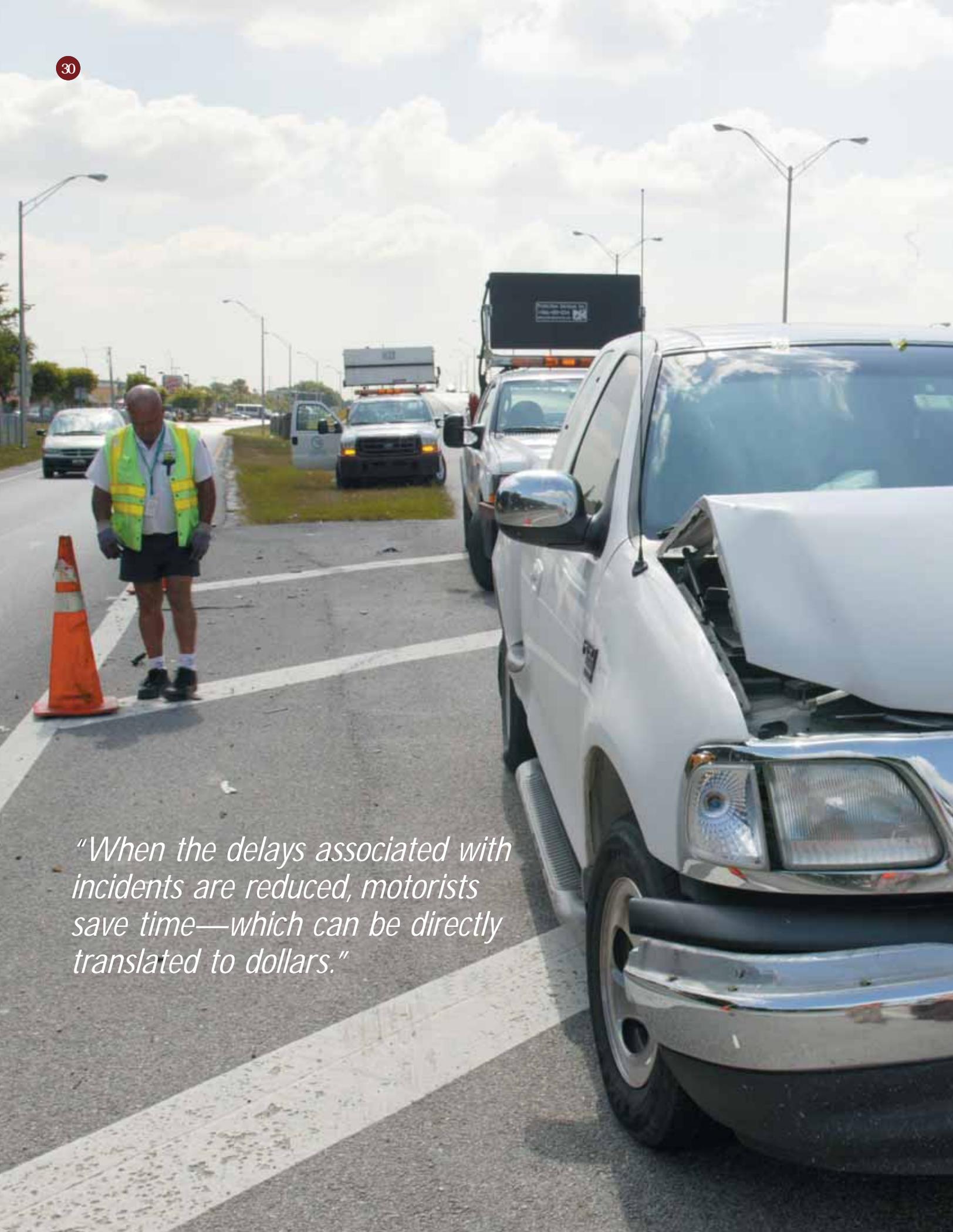
- Number of 511 calls – 2,937,862
- Number of Road Ranger assists – 80,055
- Extent of limited access facilities managed by ITS – 27.7 miles (out of a total of 53.5 miles of limited-access roadways in District Six)

Output measures relate to how well the business or agency is meeting its broader mission and stated goals. In effect, they document the benefits of the program activities. The measures currently in use are these:

- Travel time reliability
- Incident duration - reduced by an average of 8 minutes (Note: Currently, FDOT District Six measures incident duration as the time the Road Rangers arrive on scene to the time they depart for incidents that block travel lanes. There is a statewide effort to standardize how incident duration will be measured in the future.)
- Customer satisfaction

FDOT District Six is currently equipped to report on four of the six measures listed. District Six will be able to report on the other two—travel time reliability and customer satisfaction—in 2006. Travel time reliability will be measured as ITS deployments are completed along roadways with comprehensive roadway detector capabilities. And customer satisfaction surveys are currently being developed and distributed on a statewide basis by FDOT's Central Office. Both Central Office and District Six expect additional performance measures to be put in place as ITS becomes fully deployed.





“When the delays associated with incidents are reduced, motorists save time—which can be directly translated to dollars.”

PERFORMANCE MEASURES (continued)

RESULTS FOR 2005

The charts below depicts year-over-year comparison between incident durations for 2004 and 2005. The incidents are grouped by severity and include incidents that had a travel lane blockage. The severity of incidents are grouped into three levels based on incident duration (see charts below). Lane blockage events have the most impact to motorist delays and safety, which is the focus of the Intelligent Transportation System (ITS) Programs.

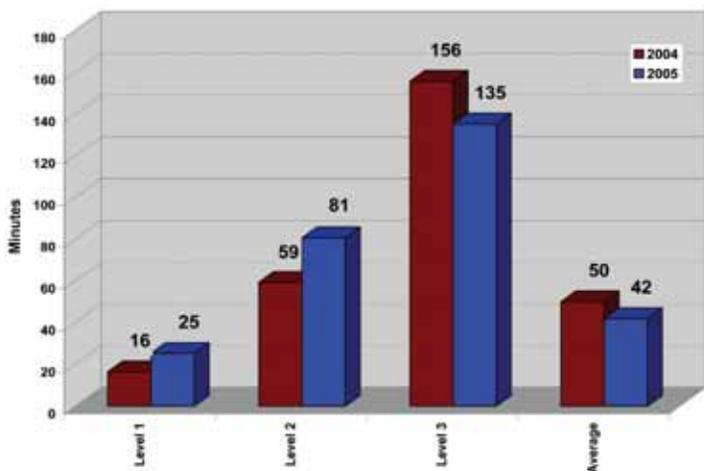
Substantial improvements were made in reducing incident duration. The Florida Department of Transportation (FDOT) District Six ITS program helped reduced the average duration of the most severe incidents (Level 3) from 156 minutes to 135 minutes; or 14 percent. The incident duration for moderate (Level 2) and least (Level 1) severe incidents have increased.

At the other end of the severity spectrum, the percentage of incidents that were cleared in less than 30 minutes increased from 35 percent to 73 percent. By clearing the travel lanes more quickly following minor incidents, District Six ensured that Miami-Dade drivers experienced shorter delays.

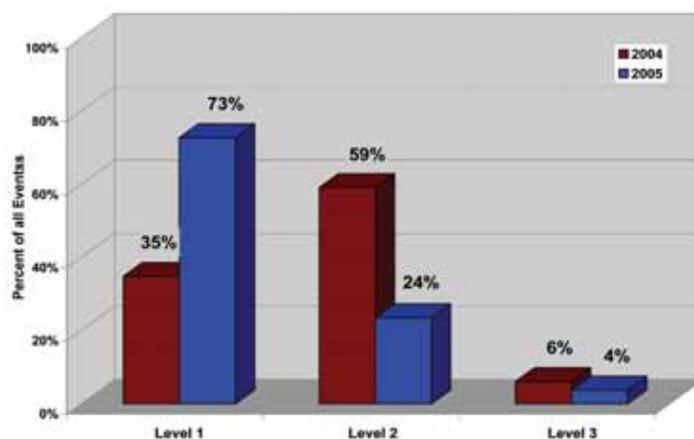
ACCRUED BENEFITS FOR 2005

Reducing incident duration has a direct and beneficial financial effect on South Florida motorists as well, 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. As an example, the average duration of incidents that blocked travel lanes was reduced from 50 minutes to 42 minutes. Using published, widely accepted statistical methods for estimating the cost implications of traffic delays, this translates into savings of over \$231 million. (That estimate only includes motorists' time saved; it does not address fuel expenses and other associated costs.) When this estimate is weighed against the total capital investments (annualized over 10 years at 7 percent) and annual operating expenses, the ITS program is shown to be yielding a benefit cost ratio of 15. For every dollar invested, about \$15 is the economic benefit for the motoring public.

2004 VS. 2005 COMPARISON OF AVERAGE DURATION BY INCIDENT SEVERITY



2004 VS. 2005 COMPARISON OF INCIDENT SEVERITY



Note:

- Level 1** - Incident Duration is less than 30 minutes
- Level 2** - Incident Duration is greater than 30 minutes and less than 120 minutes
- Level 3** - Incident Duration is greater than 120 minutes

"The robust fiber optic system helped sustain communications between Districts and ITS 'partners' during storm outages."



LESSONS LEARNED

THE EVENTS OF 2005 — both planned Intelligent Transportation System (ITS) initiatives and the unique, unplanned challenges imposed by nature—made it a very exciting year for the Florida Department of Transportation (FDOT) District Six ITS program. Experience accumulated during 2005 gave District Six a better understanding of how valuable ITS can be, both to the public and to other departments within FDOT.

Natural Disasters

FDOT District Six learned that ITS infrastructure supports more functions than just managing traffic. During this busy hurricane season, and particularly with Hurricane Wilma, FDOT District Six capitalized on the fiber optic communications that connect the Broward and Miami-Dade Transportation Management Centers (TMCs). Quickly mobilizing on-site resources, FDOT District Six was able to provide basic communication services to the FDOT District Four headquarters.

The Road Rangers also proved to be a valuable tool for addressing a multitude of hurricane-induced needs. In particular, the FDOT added some patrols to help clear the roadways during evacuations. The feedback from the FDOT Emergency Operations Center was very positive; in fact, they want to develop emergency Road Ranger contracts for the 2006 hurricane season. A key aspect to hurricane preparedness is having redundancy built into designs. Backup generator provided a valuable redundant power system that kept the TMC running after Hurricane Wilma made landfall. Also, the redundant radio system (which is essential to Road Ranger operations) was particularly useful for keeping traffic flowing during the emergency. The District is working on redundant power for priority field components [closed-circuit television (CCTV) and dynamic message signs (DMS)] to assure availability of equipment during the storm arrival and recovery.

Regional Coordination

Coordinating with regional partners has always been an important element of the ITS program. This year the benefits were made particularly evident when the Southeast Florida Regional traffic Operations Committee (SEFRTOC) played a vital part in resource sharing between TMCs. SEFRTOC held frequent teleconferences leading up to and immediately after hurricane Wilma. During these teleconferences, the TMCs were able to update each other on available resources. FDOT District Six was able to dedicate a channel on the radio system for FDOT District Four, which helped them keep their Road Rangers operational.

Public Outreach

With ramp metering coming on board in 2006, public outreach efforts helped mitigate concerns of the public, elected officials, and community groups. Having learned the value of allocating adequate resources to public outreach, FDOT District Six took a more aggressive approach with the public outreach effort for ramp metering. The District went beyond the usual effort that is mounted for traditional roadway projects, retaining an experienced public relations/marketing firm to help package and deliver a clear message on the benefits of ramp metering. A key aspect of the public outreach program was to bring in ramp metering experts and other state officials who have ramp metering experience to discuss the benefits and help manage expectations.

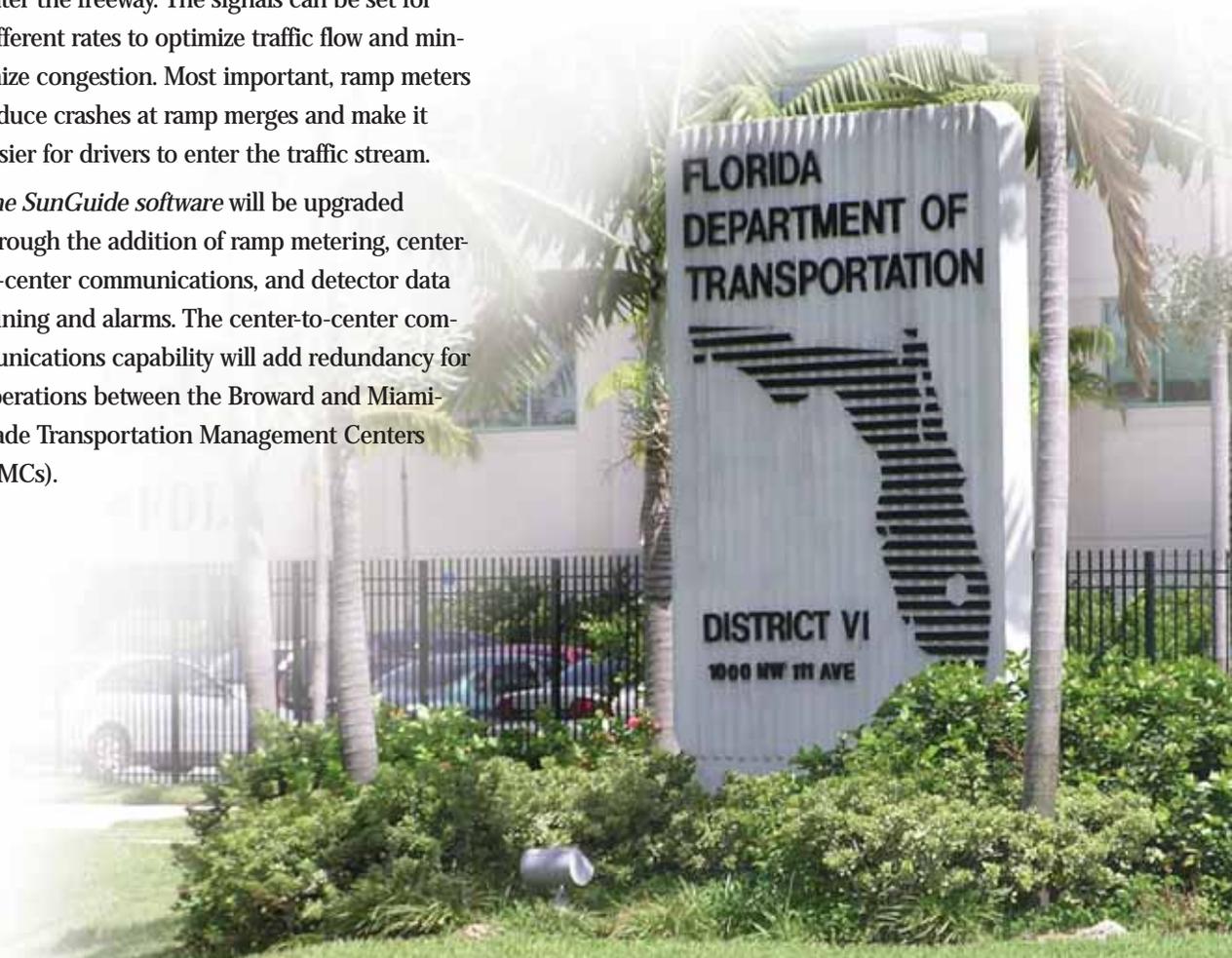


A LOOK AHEAD TO 2006

THE INTELLIGENT TRANSPORTATION SYSTEM (ITS)

Program in Florida Department of Transportation's (FDOT's) District Six will be very active in 2006. With the completion of some \$24.6 million in ITS deployments, FDOT District Six will now be able to focus on corridor management. Corridor management considers the network of arterial roadways that parallel the freeway, with the goal being to manage the balance between demand and capacity. Several other initiatives will start up in 2006 as well:

- *Ramp metering along I-95 is coming to Southeast Florida in 2006.* Ramp meters are red-green traffic signals placed at freeway on-ramps; they control the rate at which vehicles enter the freeway. The signals can be set for different rates to optimize traffic flow and minimize congestion. Most important, ramp meters reduce crashes at ramp merges and make it easier for drivers to enter the traffic stream.
- *The SunGuide software will be upgraded through the addition of ramp metering, center-to-center communications, and detector data mining and alarms.* The center-to-center communications capability will add redundancy for operations between the Broward and Miami-Dade Transportation Management Centers (TMCs).
- FDOT District Six will complete their *ITS Strategic Plan* in 2006. This document will guide future planning, deployment, and operations/maintenance activities for the District Six ITS program.
- Development of a *hurricane response plan.* Hurricane Wilma forcefully reminded everyone of the devastation that hurricanes can cause. While the ITS program responded well to Hurricane Wilma largely due to the dedication, know-how, and active coordination efforts of the partnering agencies—it was recognized that these successful practices need to be documented, and less successful techniques need to be reevaluated and redesigned.







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