



2011 SMART SunGuide ITS Annual Report

Florida Department of Transportation District Four
Fort Lauderdale, Florida



**District Four
SMART SunGuide Regional
Transportation Management Center**

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A Message to Our Readers...

Now that we have 100% ITS coverage in the district, our responsibility to motorists is greater than ever.

The number of ITS devices used to monitor highway traffic increased by 60% with the ITS deployments in Palm Beach and the Treasure Coast during the past year. Such a sizeable increase brought growing pains, but certainly nothing that our seasoned ITS Unit could not handle. It was the first year of roadway management in the Treasure Coast and the first time that Palm Beach operations was done remotely from the Broward Regional Transportation Management Center.

Along with the expanded operations, the components of our annually calculated benefit-cost ratio changed. This is the first year the Treasure Coast will be figured into the calculation. We also incorporated the benefit and cost of arterial dynamic message signs and video-feed sharing with the Florida Highway Patrol.

More ITS coverage meant more work, further increasing the need for efficiency. In re-evaluating the tools and resources available to us, we found it highly useful to rearrange how data is displayed in the control room. This led us to modify operators' work stations and add projectors to the control room to display speed data, nearly doubling the size of the video wall at a fraction of the price.

It's no question that "Expanding Our Operations" is a suitable theme for the year. Please join us in reviewing the highlights of the last 12 months and how we plan to continue moving forward.



Dong Chen

*FDOT District Four
ITS Program Manager*

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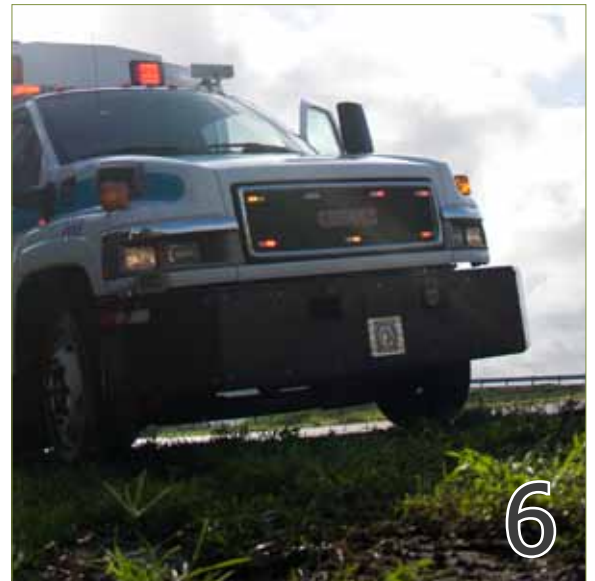
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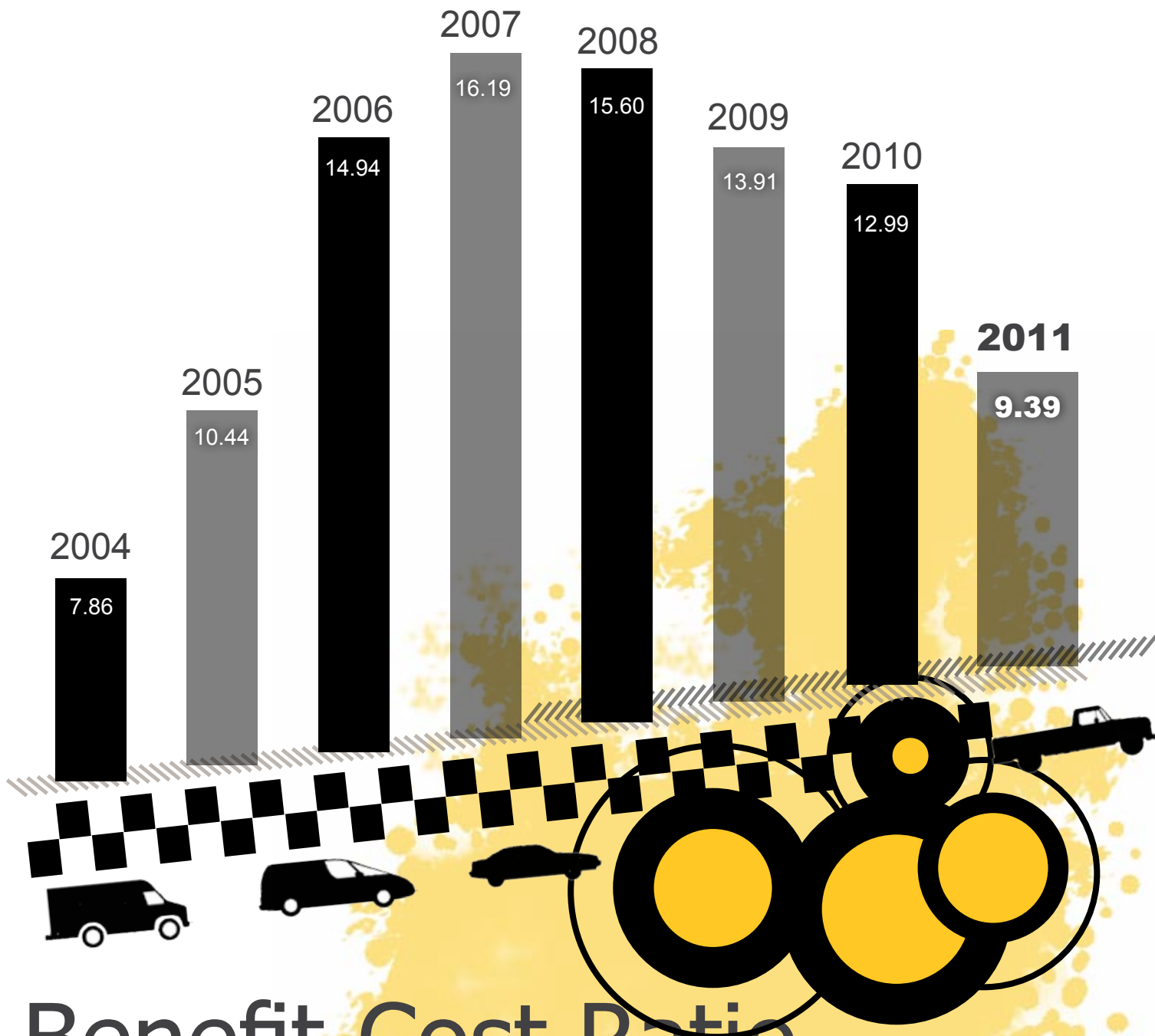
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What's Inside:

The Florida Department of Transportation (FDOT) SMART SunGuide 2011 ITS Annual Report is a consolidation of the past year's highlights. The District's ITS inventory increased, deployments were completed, new programs were launched and the motoring public and our peers learned more about the ITS program. Look inside to see what achievements made this year special.





Benefit-Cost Ratio

Each year, the District Four ITS Unit highlights its Benefit-Cost (B-C) ratio. It is a performance measure calculated to give a numerical representation of the annual return on investment that ITS provides to motorists for each dollar invested. The 2011 benefit is \$250,429,900 (4.5% greater than 2010) and the total annual cost is \$26,670,700 (44.5% greater than 2010). Using these two numbers, the benefit-cost ratio for 2011 is 9.39.

Several changes were made to the list of elements that make up the annual benefit-cost ratio. The cost of the Road Ranger Service Patrol has always been a part of the B-C ratio calculation, but was updated for the first time in five years. The value of the arterial dynamic message signs was recently calculated for the first time. Based on reduction of travel delay, the value of the

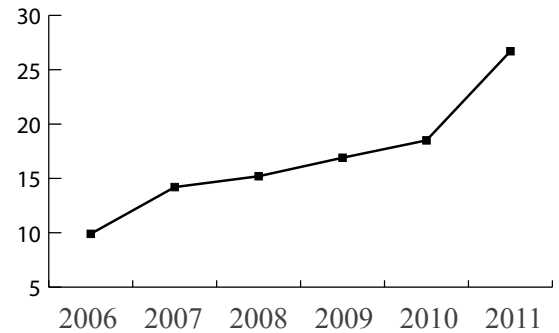
arterial DMS totaled \$9,810,300. Finally, the value of the live video feed provided to the Florida Highway Patrol, Troop L, which allows FHP to more quickly activate the Rapid Incident Scene Clearance (RISC) program, was \$410,000. Clearing and reopening lanes faster results in fewer travel delays, less wasted fuel, and lower emissions. These two new project benefits will continue from year to year while the cost is absorbed into the program.

The ITS Unit experienced its fifth consecutive year of a downward trend in its B-C ratio. The high increase in annual cost is directly attributed to 2011 being the first year the unit managed and operated all five counties within the district. The 2011 B-C ratio of 9.39 will be set as the new baseline

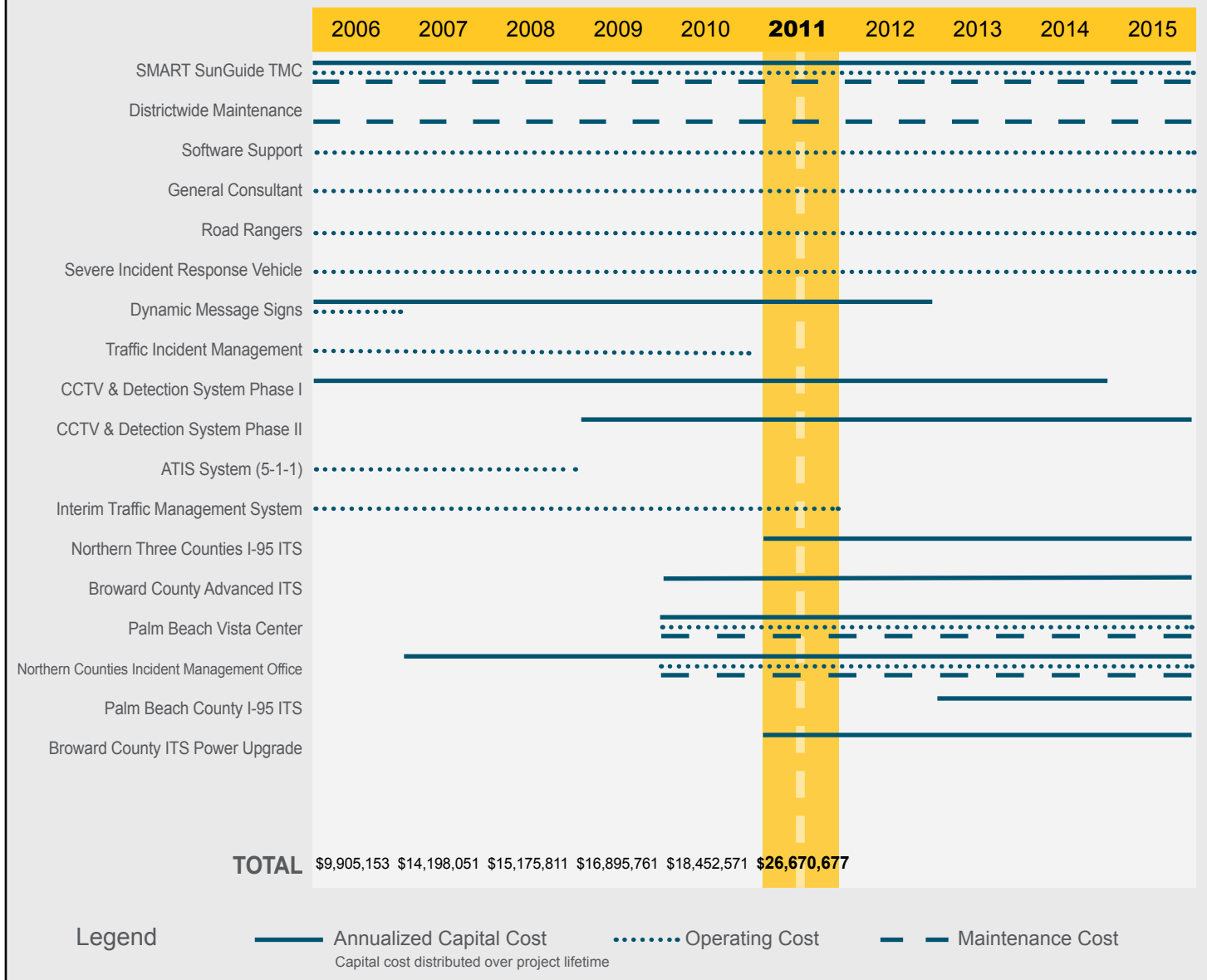
for this important performance measure. Even with this B-C result, the unit maintained its consistent net present value (NPV) of \$2 billion for the fifth consecutive year. NPV is a measure of long-term profitability of a project. In this case, the NPV is based on a 15-year time span and a 7 percent interest rate.

The ITS Unit has used the chart below as a graphical representation of program costs since 2007. Unit managers created the 10-year snapshot for the three types of spending they manage: capital cost, operating cost, and maintenance. The ITS Unit annualizes the capital cost over the life expectancy of the project using a 20-year life expectancy for TMCs and a 10-year life expectancy for ITS field device deployments (at 6% amortization). This methodology provides a more even distribution of total costs and eliminates large fluctuations in the benefit-cost ratio.

Costs in Millions



District Four ITS Program Costs

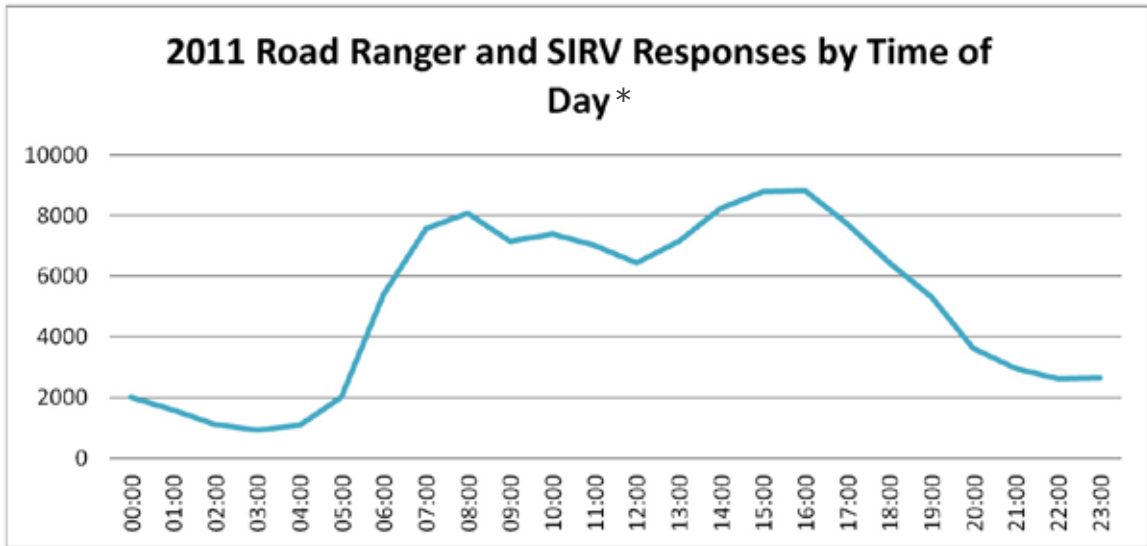


Freeway Operations

FACT:

Since its start in 2005, SIRV operators have saved emergency response crews in Broward County more than 1,620 hours at severe crashes and other lane-blocking incidents. The program will expand to Palm Beach County in 2012.





* Covers all five counties in FDOT District Four

SIRV

The Severe Incident Response Vehicle (SIRV) program is a key component of the Traffic Incident Management (TIM) program. SIRV has a successful track record since its inception in Broward County in 2005, and is expanding its services to Palm Beach County. The past year was spent preparing for the expansion, which is set to begin in February 2012. As part of the program's expansion, four additional SIRV operators will be hired to operate four new trucks.

Palm Beach SIRV operators will provide an immediate FDOT incident command presence on the scene of severe traffic incidents affecting I-95 within Palm Beach County. The SIRV team will be dispatched from the Palm Beach SMART SunGuide Transportation Management Center (TMC) and will respond to full highway closures, fatalities, overturned commercial vehicles, and any other incident that may last longer than two hours. SIRV will also respond to any incident that blocks a travel lane on weekdays, from 6 a.m. – 7 p.m., when two SIRV trucks will be on patrol during rush hours. During off-peak hours, SIRV operators will be on call.

The decision to expand was the result of a successful pilot program that was conducted in Palm Beach County between July 2010 and January 2011. During this six-month period, the SIRV Operators responded to 120 incidents and saved emergency response crews over 15 hours of work, freeing them to respond faster to other emergencies. They also helped relieve congestion by reducing the number of lanes closed, saving over 30 hours of individual lane closure time.

Palm Beach Road Ranger Program - State Farm Sponsorship

A new contract with State Farm Insurance was executed providing sponsorship funds for the Road Ranger Program. The sponsorship adds another roaming supervisor for 24/7 patrol to the existing Palm Beach fleet. In turn, Road Ranger vehicles will be "wrapped" with incident responder markings and State Farm logos. The contract started in February 2011 and continues through January 2013.

124,809

Road Ranger Stops

557

SIRV Responses

26

Minutes Saved Per SIRV Response

In order to keep up with the ITS infrastructure deployed on the highway, technology at the RTMC must stay current. In 2011, the technology in the server room was modernized providing better, faster service and more storage space at a significant cost savings.

A key step in modernization was installation of a blade enclosure consisting of 12 blade servers. This enclosure is designed to use far less rack space than the same number of non-blade servers but offer greater storage capacity and substantially faster speed while reducing power requirements. These servers are mainly being used to consolidate functions from older, slower, more power-hungry servers that are increasingly expensive to maintain. Most of the 12 servers have been fully deployed. Those remaining are designated for parts of the project occurring in 2012. Furthermore, the server enclosure has four unused bays to allow for future expansion should the project's growth require the need for more server blades.

Also in 2011, ten new servers were purchased to support consolidation of our main operations software. The new servers support a six-way failover cluster, which allows for the remaining five servers to absorb the load and keep operations running should a server failure occur. The functionalities assigned to these servers include database, application, data, web hosting and backup.

The purchase of additional Storage Area Network (SAN) increased disk space needed for the servers to host the files, databases and applications necessary to perform their functions. The Storage Area Network is connected to the servers with fiber-channel, allowing superior data transfer speeds.



An IT manager works on technology upgrades in the server room

Information Technology

Infrastructure

The ITS deployment program has achieved a number of accomplishments for the year 2011. The major deployment projects for the year include:

Palm Beach ITS

ITS deployment along I-95 is divided into two phases: Phase A for the segment south of PGA Boulevard, and Phase B for the segment north of PGA Boulevard. The permanent ITS includes highway and arterial dynamic message signs, a roadway weather information system, Highway Advisory Radio, closed-circuit television cameras and vehicle detectors. Phase A is complete and is now in the maintenance period. Phase B design is complete and construction will begin in 2012.

I-75 Safety Project

The Alligator Alley/I-75 ITS Safety Project uses sensors to detect a motorist's speed. If the speed is excessive, a message is posted on a nearby DMS advising the motorist to slow down. Special weather sensors are also utilized to detect and monitor smoke/fog, rain and wet pavement conditions along the I-75 corridor. Construction began in December 2010 and has been completed. The project has gone through system testing and is expected to be accepted in early 2012.

Variable Speed Limit Signs Project

A Variable Speed Limit System (VSLS) along SR25/US27/Okeechobee Road near the South Broward High School in Broward County is in the process of being deployed. The purpose of this system is to inform motorists of changes to the existing SR 25/US27 speed limits on school days, when the flashing school beacons will be in operation, and during school activities (e.g. sporting events). At other times, the VSLS will display the normal speed limit of 65 mph. By using ITS technology, an active "smart" system can provide the flexibility to control speeds as the situation dictates, thereby optimizing traffic flow rather than imposing the same fixed speed for all conditions. This project is scheduled to be complete in spring of 2012.

ITS Device Availability

In 2011, ITS device availability increased from 87.1% to 96.0%. This is directly attributed to permanent ITS devices being deployed in both Palm Beach and the Treasure Coast counties (Martin, St. Lucie and Indian River). Previously, Palm Beach solely utilized mobile devices and the Treasure Coast had none. The dependability of the permanent devices in these counties should be as consistent as the ITS devices in Broward have been throughout the years.

96.0%

**ITS Device
Availability**

191.5

**ITS Freeway Miles
Managed**

Permanent cameras were installed along I-95 during the first phase of ITS deployment in Palm Beach County



Real time speed data charts are displayed on unused wall space in the control room to give operators another tool to monitor traffic.

TMC Operations

For eight years the ITS Unit managed I-95 in Palm Beach County using portable devices, which could be relocated as needed during the long-term roadway construction. Phase A of the construction was completed in July 2011, clearing the way for the deployment of permanent ITS (see the Infrastructure section for details). Following the turnover of the permanent ITS devices in Palm Beach County, the existing operations contract was expanded

districtwide. In addition to managing Broward and the Treasure Coast 24/7, the SMART SunGuide TMC now manages the ITS in Palm Beach County during overnight (6 p.m. – 6 a.m.) and weekend hours. The result was more efficient operations throughout the district with fewer staff.

The expansion to districtwide operations more than doubled the

HIGHLIGHT:

Five new monitors were added to each workstation to display more cameras simultaneously, allowing operators to more quickly detect traffic delays.

number of closed circuit television cameras monitored in the TMC, bringing about more change. Previously, cameras in the most active areas were continuously displayed on the video wall to assist in detecting traffic incidents. Operators were still responsible for viewing every camera, one-by-one, on a desktop monitor. This method worked while the TMC was managing 100 cameras, but following the deployment of the Treasure Coast and Palm Beach cameras operations staff needed to develop a new method.

The increased capacity was accomplished by modifying operators' consoles rather than the video wall. The cost was substantially less and did not require any changes to the control room size or layout. Five new monitors were installed at each console, four to display 64 cameras simultaneously, plus an additional monitor to customize based on the incident or zone of responsibility. The upgrade gives operators the ability to spot disruptions to traffic faster instead of viewing one camera at a time.

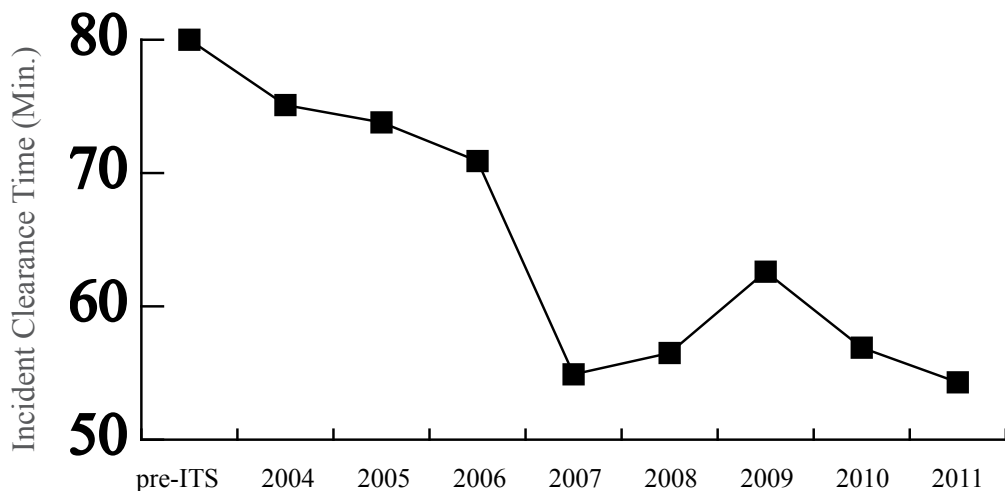
To further assist operators, the Data Analysis and Reporting Tool (DART) was created. It is a web-based application providing operations with the ability to view and analyze ITS data. The application provides a fleet status display to view both current and historical locations of fleet vehicles based on GPS data, a real-time detector data chart display with customizable parameters, a historical detector data analysis/chart tool, and an interface to view roadway incidents that are of specific interest in terms of safety. The DART application provides the ability to monitor and explore the vast collection of ITS data collected, leveraging the investment made in ITS infrastructure and adding value to operational procedures.

Ten projectors were installed in the control room to display real time speed data charts from DART on otherwise unused wall space. This data gives operators a snapshot view of traffic speeds throughout the district and is another tool for detecting disruptions to traffic flow which are generally indicative of an incident.

The biggest beneficiaries of these improvements are the TMC operators. At a glance, they are able to spot changes in traffic flow, possibly saving minutes in making their camera checks. The longer term benefit of implementing console-based mini-video walls and projected detector data is that the main video wall is now available for other operational uses, such as displaying speed data and device status profiles.

36.5
Minutes
**Roadway
Clearance Time**

54.3
Minutes
**Incident
Clearance Time**



Traffic Information

In a continual effort to reach the motoring public with information about the ITS program, the unit repeated some successful tactics and took advantage of new opportunities. This year's highlights included:

- Thanksgiving media event – FDOT hosted a media event together with 511 to promote the new 511 app and safe traveling over the Thanksgiving weekend. The event, held at the Palm Beach TMC, attracted all of the major networks. Media correspondents gave live reports during the morning news from the control room.
- 95 Express Public Information – While 95 Express Phase 2 only started to get underway in 2011, the effort to educate the public started much sooner. The construction and design/build public information teams received support from the ITS Unit during presentations and public meetings. Media interviews at the Broward TMC gave the most exposure to the ITS elements of 95 Express.
- Transportation Management Academy – Educating the public is important to the success of the ITS program, but so is educating ITS staff. Through the Transportation

Management Academy, an in-house training program, staff is able to learn about the history and impact of ITS. They also get a closer look at some of its elements, including incident management, engineering, advanced traffic management, and software development. The preliminary session provided valuable lessons to both the participants and the organizer. Further work on the program will be done in 2012.

The ITS Unit was able to actively participate in the ITS World Congress this year because it was held nearby in Orlando. Several staff members were able to attend and learn from an international group of peers. The Severe Incident Response Vehicle was on display during Incident Management Day. Following World Congress, a group of about 50 international participants visited the Broward RTMC and viewed a presentation on the freeway management programs. In addition to bringing an international audience to the TMC, one of our staff members was invited to attend and present at the 11th International Conference of Chinese Transportation Professionals. The presentation covered the entire District Four ITS program, providing an understanding of the way South Florida uses ITS to an audience on the other side of the world.



Daniel Smith, ITS Unit Operations Manager, is interviewed by a local TV station in the control room.

***517,649**

**511 Calls in
District Four**
*28.6% of all calls
statewide

Report Card

The report card below depicts the ITS Unit's performance in a "letter-grade" format. The "overall" grade increased from 3.6 in 2010 to 3.7 in 2011 (out of 4.0 possible). The main reason was the high increase in system reliability. This was based on permanent devices being deployed in Palm Beach and the Treasure Coast counties. The resulting two-grade increase helped the ITS Unit's overall "grade" even though Benefit-Cost ratio performance measure dropped from a "B" to a "C".

Performance Measure (Metric)	2010 Score	2011 Score	A	B	C	D	F
ITS Systems							
% Completion of Systems Build-Out (Actual # Miles Built Per Year / Planned # Miles Built Per Year)	A 100	A 100	≥90%	80-89%	70-79%	60-69%	<60%
ITS Operations							
Annual Benefit / Cost Ratio (BCR - from Annual Report)	B 12.99	C 9.36	>15	11-15	6-10	1-5	<1
ITS Maintenance							
System Reliability - Field Devices (% Time Operational)	D 87.1	B 96.0	>97%	95-97%	91-94%	85-90%	<85%
Road Rangers							
Customer Satisfaction (% of Respondents Satisfied with Service)	A 95	A 95	≥95%	90-94%	80-89%	70-79%	<70%
Traffic Incident Management							
Incident Clearance Time (Overall Time to Clear Travel Lanes after Road Ranger Arrival)	A 56.9	A 54.3	<60 min.	60-75 min.	76-90 min.	91-120 min.	>120 min.
ITS Systems							
System Reliability - TMCs (% Time TMC Systems are Operational)	A 99.01	A 99.12	>99%	98-99%	95-97%	92-94%	<92%
Partnering							
Number of Private and/or Public Partners (# Partners Collaborating with on a Daily Basis)	A 8	A 8	≥7	6	5	4	≤3
Traveler Information							
Regional Travel Time Index (Peak Period Travel Times vs. Free Flow)	A 1.00	A 1.00	1.00-1.09	1.10-1.24	1.25-1.44	1.45-1.69	≥1.70
Public Outreach							
Satisfaction with ITS Program (Customer Survey - Scale of 1 to 10)	A 9.0	A 9.0	>9	8-9	7-8	6-7	<6
New ITS Initiatives							
Number of New Initiatives (# of New Initiatives)	A 5	A 4	≥4	3	2	1	0

Activities

Throughout the year 2011, we had a number of achievements -- some were readily visible to the public and others were apparent only to those working behind the scenes. In 2012, the focus will be on the following projects:

- I-95 Managed Lanes Project Design-Build Phase 2: This project extends in both directions of I-95 from north of the Golden Glades Interchange in Miami-Dade County to just north of SR 838 (Sunrise Boulevard) in Broward County. This project began November 2011. Detailed information on this project is available at www.95express.com.
- SR 25/US 27 ITS Design-Build Project in Broward County and Palm Beach County: The 45-mile project limits begin within Broward County just north of Griffin Road within the right-of-way of SR 25/US 27 to the project's end just north of SR 80 in Palm Beach County. This project was advertised in December 2011.
- DMS replacement project in Broward County: The District will be replacing the existing fiber/flip disk DMS in Broward County. These signs are approaching the end of their useful life and replacement components are difficult to obtain. The procurement for this project is expected to start in January 2012.
- I-75 managed lanes: The proposed I-75 Managed Lanes Project will provide "HOT Lanes," similar to the managed lanes now in operation along I-95. The I-75 project differs from I-95 in that the managed lanes portion will be completely separated from the general purpose lanes by a 28-foot grass median in both directions. Detailed information on this project is available at www.I-75Vision.com.



Achievements



National Awards

Intelligent Transportation Society of America

- Best of ITS Awards in the category of Best New Innovative Product, Service or Application for the Maintenance Inventory Management System

Statewide Awards

Intelligent Transportation Society of Florida (ITS Florida)

- ITS Florida Outstanding Achievement Award in recognition of outstanding service in development and implementation of the Transportation Management Academy.
- ITS Florida Certificate of Recognition for outstanding performance and lasting contributions to the motoring public of Florida and the industry of ITS.

The 2011 Prudential Financial - Davis Productivity Awards

- ITS Maintenance PC Tablet Team - "Saved Time in Field with Tablet PCs" recognized with a plaque
- ITS Deployment Team - "Saved Costs by Eliminating Unnecessary Power" recognized with a plaque
- ITS Maintenance Software Team - "Developed Time Saving Maintenance Inventory Software" recognized with a plaque
- ITS Cost Savings Team - "Completed Deployment at Reduced Cost" recognized with a plaque

- ITS Furniture Recycling Team - "Recycled Furniture to Save Expenses" recognized with a certificate of commendation
- ITS Power Upgrade Team - "Reduced Project Scope to Save Costs" recognized with a plaque
- ITS Device Recycling Team - "Saved Costs by Recycling ITS Devices" recognized with a certificate of commendation
- ITS Office Lease Cost Reduction Team - "Saved Costs by Early Termination of Office Lease" recognized with a certificate of commendation
- ITS Outreach Team - "Saved Money by Coordinating Free Advertising Space" recognized with a certificate of commendation
- ITS National Weather Service Training Team - "Coordinated Storm Spotter Certification for Employees" recognized as an honorable mention

