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## *ITS—It's What's Happening in Florida's Transportation*

With a population of over 16 million people and a steady influx of tourists and commerce-related travel, Florida's transportation system serves a critical role in providing safe transportation for residents, visitors, and commercial vehicle operators. Our transportation system serves to enhance our economic competitiveness and provides travel choices to ensure mobility. ITS plays a key role in ensuring our mobility and providing the real-time traffic information that enables us to make informed travel decisions.

In this special edition of the *SunGuide Disseminator*, key accomplishments and special projects from Florida's ITS Program, which have been recently developed, are highlighted. Several of these are District endeavors; some are Central Office projects.

Highlighting the importance of incident management, recent national studies have estimated that roughly half of all congestion is due to non-recurring causes, primarily traffic incidents and work zones. As a result, traffic incident management is an essential part of ensuring safe travel and mobility. Florida's Statewide Incident Management Program has matured considerably in the last few years, becoming a model to many other states.

Florida's Turnpike Enterprise has created two innovative programs to deal with incidents:

- the Rapid Incident Scene Clearance (RISC) Program and
- the Traffic Management Vehicle (TMV) Pilot Program.

The RISC Program pays a cash incentive to contracted companies who clear major highway incidents in 90 minutes or less.

Their second initiative, the TMV Pilot Program, is a functional mobile transportation management center (TMC) that monitors traffic conditions in areas where equipment deployment is limited. The TMV sends live video to the Turnpike's TMC.

Also featured in this *SunGuide Disseminator* edition is an article on funding the operations and replacement costs of the FDOT ITS Program. This program provides the funding needs of TMC staffing and other related expenses to ensure their continuous operation and the replacement of field devices.

FDOT's District 6 SunGuide TMC marketing video is another program highlighted in this newsletter. The marketing video is a guide for the public that explains the TMC responsibilities.

Other programs highlighted in this newsletter include:

- the Tampa Bay Advanced Traveler Information System,
- the center-to-center network, and
- the telecommunications commercial wireless lease and operating agreement.

These are only a few of the numerous programs that Florida is very proud of! Be sure to read all about them for additional information on Florida's dynamic ITS Program.

For further information on any of the articles in this edition, or for information on the ITS Program, please contact the ITS Section at (850) 410-5600.

This editorial was provided by Elizabeth Birriel, FDOT Deputy State Traffic Engineer—ITS Program Manager.

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### *Florida's Turnpike Enterprise Takes Proactive 'RISC' In Incident Management*

In February 2004, the Florida's Turnpike Enterprise (FTE) implemented the nation's first Roadway Incident Scene Clearance (RISC) program in an effort to meet Florida's Open Roads Policy of clearing incidents from roadways in 90 minutes or less.

FTE's RISC program is incentive leveraged, providing qualified tow and clearance contractors the opportunity to earn bonuses for clearing major lane blockages within specific time limits.

The FTE has contracted with four towing organizations that presently provide coverage on 75 percent of the FTE's statewide roadway system. The contractors respond to major incidents involving tractor trailers or other large vehicles on the Florida Turnpike mainline, from milepost 30 in Miami-Dade County to milepost 309 in Wildwood, the Sawgrass Expressway (Toll 869), the Southern Connector Extension and the Seminole Expressway (Toll 417), the Bee Line Expressway West (Toll 528), and a portion of the Holland East-West Expressway (Toll 408).



RISC contractors are required to respond to major incidents with two certified 50-ton and 30-ton heavy duty wreckers, plus a support vehicle carrying clean-up and maintenance of traffic equipment. Contractors earn a \$2,500 bonus if they respond to the incident site within 60 minutes and clear the roadway to traffic within 90 minutes of the Florida Highway Patrol's (FHP) notice to proceed for clearance work. If the contractor fails to open the roadway within three hours, they are penalized \$10 for each minute over.



The FTE's RISC program has been activated 15 times in its first nine months. Each time the RISC program has been activated, the tow contractor has successfully re-opened the roadway to Turnpike customers within 90 minutes of FHP's notice to begin work. The RISC tow contractors have averaged 41 minutes to respond to the incident scene and they have averaged 55 minutes to clear the roadway. It is important to note that these incidents primarily involved large size (DOT Class 8) trucks, sometimes overturned with debris/cargo spilled

across the roadway.

“The RISC program is the single most important thing which can be done to prevent and relieve traffic backups due to crashes or other incidents,” said FHP's Troop K Commander Chief Jim Lee. “While some delays are inevitable, having a mechanism in place to rapidly respond and remove obstacles to free traffic flow yields benefits to the public which is far beyond its cost. Major incidents are being resolved quicker and reducing delays on our roads.”

Prior to the RISC program, the FTE did not have a standardized procedure for responding to major traffic incidents. Often incident responders were dispatched to an accident without the proper equipment to clear the roads in a timely manner, resulting in lengthy delays to Turnpike customers. As a result of the RISC program, major incidents are cleared more quickly, resulting in less delay to our customers.



An integral part of the RISC program is the post-incident debriefing session. Following each RISC activation, the FTE reviews, debriefs, and prepares a detailed incident report. All of the parties involved in responding to the incident are brought together to openly discuss the event. The incident report describes the incident, the actions of the involved parties, and the lessons learned from the incident.

“Through our debriefings, we continue to learn about the program's strengths and weaknesses,” Lee said. “We will build upon our strengths and work to minimize our

weaknesses. The Turnpike Enterprise is an innovator and we are constantly trying to improve our services to our customers.”

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### *Florida's Turnpike Traffic Management Vehicle Keeps "Eye" On Traffic*

The Florida's Turnpike Enterprise (FTE) ITS Operations has initiated a first-of-its-kind traffic management vehicle (TMV) pilot program.

The TMV is a vehicle that can monitor traffic conditions in areas of limited ITS camera and detection deployment. The TMV uses a pan-tilt-zoom closed-circuit television (CCTV) camera mounted on a retractable 45-foot mast from the vehicle's roof, enabling the vehicle to be dispatched to any location along the Turnpike, park in a safe location, and send, via a satellite communications system, live video to the FTE's transportation management center (TMC) for operators to monitor. The video is transmitted at a 15 to 20 frames-per-second rate, and is viewed at the TMC using an Internet IP addressable site.



This pilot project is the result of a unique public/public/private partnership. FTE Traffic Operations has contracted with the University of South Florida/Center for Urban Transportation Research (CUTR) to provide the service. CUTR has contracted with Miami-based Eye In The Sky, Inc.

Officially put into operation July 1, 2004, the TMV has proved its value and effectiveness in deployments to monitor more than 20 major crashes on the Turnpike that resulted in the roadway being closed to traffic. Because of the live video images being relayed to the TMC, the FTE was able to provide updates of the real-time changes in conditions to Turnpike customers via the FTE's overhead dynamic message signs and highway advisory radios.

“Florida’s Turnpike Enterprise is privileged to be able to pioneer the use of a traffic management tool that may well become a standard component in the inventory of devices available to most progressive transportation agencies,” said Turnpike Director of Highway Operations Bruce Seiler. “When deployed to the general locale of an incident or condition that severely impacts traffic flow, the TMV’s real-time video and one-mile range of camera coverage often allows decision makers to better assess the backups and other negative effects of the restrictions or closures.”

The TMV was also used as part of the FTE's hurricane preparedness and recovery efforts. Dispatched to several locations along the Turnpike mainline between West Palm Beach and Orlando during August, September, and October, the TMV provided the FTE and Florida Highway Patrol (FHP) management with real-time monitoring of evacuating traffic. The TMV was especially effective monitoring traffic flow through mainline toll plazas where toll collection had been suspended, and in monitoring mainline vehicle speeds near Fort Pierce in support of the FHP, who were responsible for making the potential decision to one-way the Turnpike.

Once the "all clear" had sounded, following the hurricanes' landfalls, the TMV was also one of the first Turnpike vehicles into the damaged areas to survey roadway damage and impacts. The TMV has also been used to monitor wildfires in Miami-Dade County, where smoke and fire repeatedly forced the FHP to close the Turnpike during the July 9 weekend.

The FTE's TMC also relied on the TMV to provide real-time video images of numerous special event traffic in South Florida – from sporting events at Pro Player Stadium, to concerts at the Office Depot Center along the Sawgrass Expressway and the Coral Sky Amphitheater in West Palm Beach.

#### Applications of the TMV:

- Allow the TMC to monitor traffic conditions in areas where ITS video monitoring has not been deployed;
- Provide live traffic incident video to the TMC, FHP, fire rescue, and responding agencies via a secure Web site;
  - The vehicle is staged away from the incident, but within camera view.
- Special event traffic monitoring; and
  - Sporting events, concerts, or other events that have a significant effect on Turnpike traffic conditions.
- Turnpike Traffic Engineering studies.

The TMV is based at the Eleanor Register Turnpike Operations building in Pompano, and operates daily during peak, rush hour traffic from 6:00 to 10:00 a.m. and from 4:00 to 8:00 p.m. The TMV is routinely deployed to known recurring congestion and high incident locations. It is also available for 24-hour, on-call emergency response.

The vehicle's primary coverage area during the year-long pilot program has been from milepost 20 in Miami-Dade County to milepost 109 in northern Palm Beach County. The TMC staff prepares a weekly deployment schedule; however, the TMV can be dispatched by the TMC from field locations to active incidents.

It is anticipated that the TMV will be deployed in the coming year to other roadway sections of the FTE's system, such as the Orlando area and the Veterans Expressway/Toll 589 in the Tampa area.

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## *Funding the Operations and Replacement Costs of the FDOT ITS Program*

The establishment of FDOT's *Ten-Year ITS Cost Feasible Plan (ITS CFP)* provides \$496 million for ITS deployment capital costs. However, there is no provision in the *ITS CFP* for the funding needs of transportation management center (TMC) staffing and other related expenses to ensure the continuous operation of TMCs, such as electrical and phone bills, software costs, and the replacement of field devices. Frequently, Districts relied on District-allocated funds to cover these expenses. To ensure the proper operation of ITS deployments, additional funds were needed.



In an effort to gauge the magnitude of the operational expenses needed, questionnaires were sent to all Districts asking them to identify anticipated staffing levels at TMCs, operational expenses expected at the TMCs, and software expenses. The current inventory of ITS devices already deployed and devices expected to be deployed within the next 10 years were studied in order to project the future replacement of devices according to average life cycle calculations. The information and assistance provided by the Districts was instrumental in developing preliminary operational estimates.

As expected, Districts had different concepts of operations, leading to different staffing needs and widely varying funding needs. The numbers provided by the District questionnaires became the basis for a funding category titled District Identified Needs. Standardization of these District Identified Needs provided another funding level titled Proposed Funding Levels.

The Proposed Funding Levels consist of standardized recommendations for staffing levels and associated personnel costs of TMCs operating on 24 hour/7 day and 16 hour/5 day schedules. A standardized funding level for TMC operational expenses was also calculated for 24 hour/7 day and 16 hour/5 day service. Additionally, software costs were standardized as part of the Proposed Funding Level calculations. Standard life cycles and replacement costs were calculated for devices to allow replacement projections.

The District Identified Needs and the Proposed Funding Level numbers were presented to the FDOT Executive Board on July 13, 2004. Realizing the importance of funding the operations and replacement of ITS deployments, the Executive Board approved the Proposed Funding Levels setting aside \$140 million from the FDOT Work Program to fund these areas for the next 10 years. This money accounts for funding a core level of services for operations. The Districts are free to supplement this funding level with District-allocated funds should they want levels of service above the core or baseline.

The decision to fund operations and replacement costs of ITS deployments marks a major accomplishment for the FDOT ITS Program. This long-term financial commitment will



ensure the proper operation of our major investments.

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## *FDOT District 6 SunGuide<sup>SM</sup> Transportation Management Center Marketing Video*

The FDOT District 6 SunGuide<sup>SM</sup> Transportation Management Center (TMC) was dedicated on June 25, 2004, with Governor Jeb Bush giving the keynote speech. FDOT Secretary José Abreu and Fred Dickinson, Executive Director of the Florida Department of Highway Safety and Motor Vehicles, also praised the progress and advantages the TMC's operation would provide towards improving roadway management.



The SunGuide TMC features a multi-screen wall and eight console workstations where staffs monitor and control closed-circuit television (CCTV) cameras, dynamic message signs, and vehicle detectors, and dispatch Road Rangers Service Patrols to clear accidents, remove debris, and assist stranded motorists. Collocated with the Florida Highway Patrol (FHP), they will operate 18 workstations on the second floor and the 511 traffic service will also work out of the SunGuide TMC.

Located near the interchange of the Dolphin Expressway (SR-836) and the Homestead Extension of Florida's Turnpike (HEFT) at the western end of Miami-Dade County, the TMC is a 32,000 square foot facility secured with CCTV cameras positioned to monitor the building's exterior and interior, including sensitive areas restricted through a card entry access system. ID badges provide separate restrictions for FDOT and FHP personnel for access clearance to the building and sensitive areas.

The goal of the TMC is to provide for the operation of a Freeway Traffic Management System on a "24/7" basis in order to provide early detection and accurate verification of

incidents and traffic congestion, and to formulate the appropriate response to minimize delay to the motorist. This goal will be achieved by the use of electronic message signs, CCTV cameras, detection equipment, and voice/data communications with responding agencies to restore traffic flow to normal conditions.

A marketing video was filmed as a guide to what the TMC is responsible for. The video concept is just one of the many tools used to explain to the public what we do, how we do it, and why we do it. Many tours and public information meetings are conducted at the TMC, and the video is a key element in all these events. It is used as an instructional tool for visitors, students, agencies employees, and other interested parties.



Filming started just one day after all employees reported to work at the TMC and lasted two days. The first day was in-house filming and the second day involved field filming of traffic incidents and ITS infrastructure. During filming, FHP staff and TMC operators were present to illustrate how the TMC would operate when fully occupied. All messages depicted on the dynamic message signs were in real-time. The video was first viewed publicly on June 25, 2004, the official grand opening of the TMC. It was viewed by dignitaries, elected officials, FDOT employees, and guests.

The following statement, provided by Public Information Officer, Lani Aguila, is her reaction to the video upon beginning a career working for FDOT.

“As a person that really had no idea as to what she was getting herself into, the District 6 SunGuide TMC video shed a lot of light on the type of work that I would be handling. I came here with a background in Broadcast Communication, and I have watched this video repeatedly. I am trained to respond to any and all media outlets, and I can attest that the video was the most informative out of all the training that I received to do my job. In seven minutes, this video expressed what could have taken a week for me to learn.”

The video shows all the agencies that come together to do a job that helps every single motorist on our highways. The most important people at the TMC are the operators. The video shows how they coordinate with FHP and Road Rangers Service Patrols to safely clear up accidents or stalled vehicles. This is not to minimize the importance of other staff at the TMC, but just as air traffic controllers are our eyes in the skies, the operators are our eyes in the TMC.

One can't even begin to explain the amount of technology there is at the District 6 TMC. It is because of this video that we can. Our “million-dollar wall” shows all our roadways and with a touch of a button you can zoom into any accident or disabled vehicle.

The following statement, also provided by Public Information Officer, Lani Aguila, is a reaction to the program the video presents.

“Even though I work for the Department, and I don’t need to praise SunGuide, it was because of them that I wasn’t stranded for hours on I-95. Yes, I was the victim of road debris. I blew a tire on my way to class and because operators at SunGuide saw what happened, they sent a Road Rangers Service Patrol to my rescue. It’s not that I don’t know how to change a tire, but on the side of I-95, and cars flying by me, that is very scary and I was very grateful when the Road Ranger appeared.”



All the events in the video are actual and true. The people in the video are not actors—they actually work for FDOT. All the signs on the highways were actually there. Everything you see in this video is a result of a collective effort from FDOT and partnering agencies to provide a safer commute. This video summarizes our mission and conveys it in a concise, effective, and clear way.

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## ***FDOT Uses Private Sector Data to Support Public Sector Initiative***

### **Background Information**

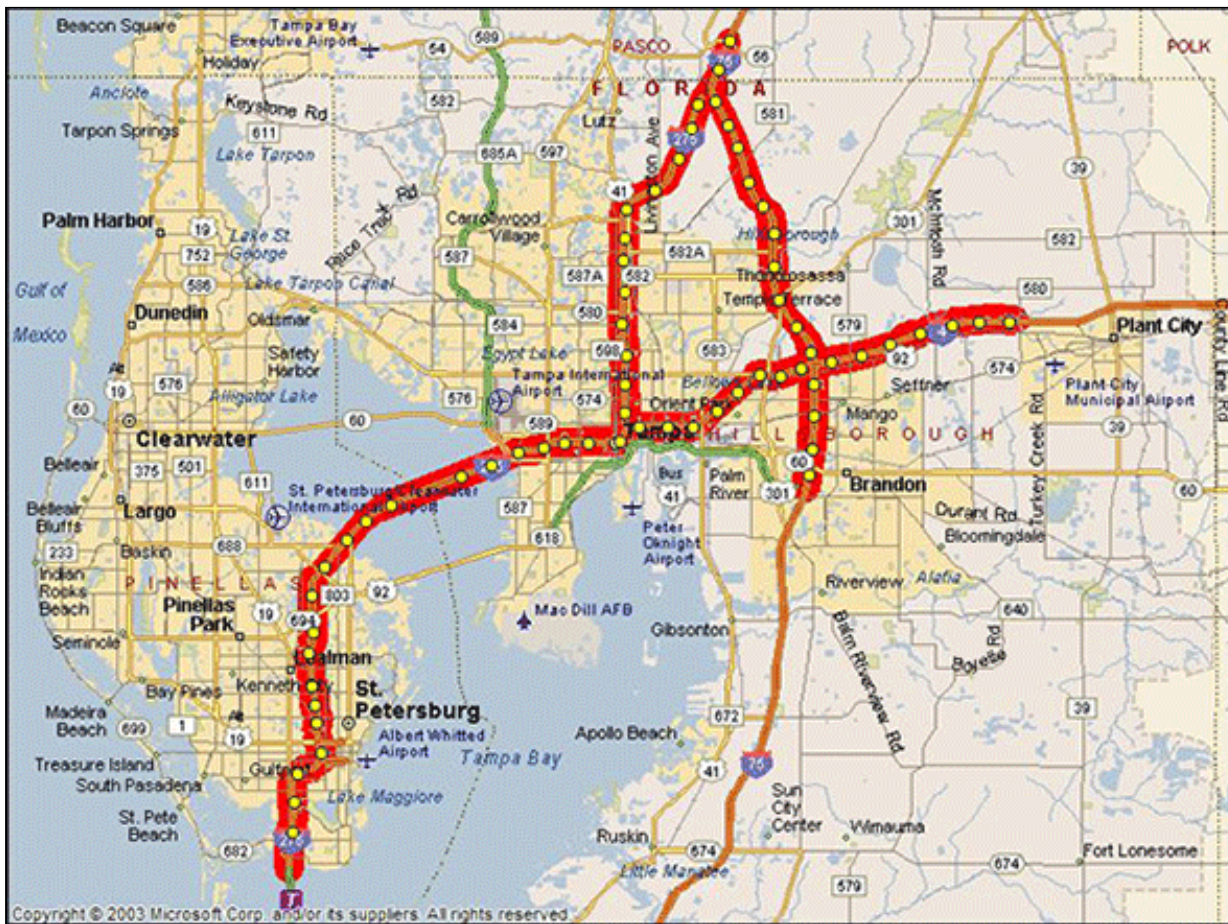
The Intelligent Transportation Infrastructure Program (ITIP) was originally provided for under section 5117 (b) (3) of TEA-21. The primary purpose of the program was to provide data to measure the operating performance of the roadway system across the nation. A secondary purpose was to provide traveler information to travelers in our urban areas. Mobility Technologies was selected through a competitive process, conducted under the U.S. DOT’s Information Technology Omnibus Procurement (ITOP) mechanism in 1998.

Funds were set aside initially to deploy infrastructure in four cities. Pittsburgh and Philadelphia were the first two cities selected and were designated by legislation. Dallas and Chicago were the other two cities and were selected through a competitive process.

Fifty million dollars was added to the program from funds designated in the 2003 Defense Appropriations Bill to continue the program. This Bill established other cities that would be eligible for funding under the ITIP. Approximately \$2 million would be available to deploy infrastructure in each city. Tampa, Orlando, and Miami were selected as Florida cities, each being eligible to receive \$2 million for participation in the ITIP. The 2003 Defense Appropriation Bill eliminated the competitive process for selection into the program, and only required cities to indicate their interest in the ITIP, to be eligible for the program.

### **Introduction**

FDOT District 7 is responsible for managing FDOT’s transportation infrastructure in the Tampa Bay area and opted to pursue negotiations with Mobility Technologies. District 7 is actively developing projects to deploy ITS in the Tampa Bay area. However, there are no public sector owned and operated ITS field elements on the ground in the Tampa Bay area at this time. The partnership with Mobility Technologies has allowed Mobility Technologies to place sensors in the rights-of-way along the heavily urbanized portions of I-275 and I-4 in the Tampa Bay area.

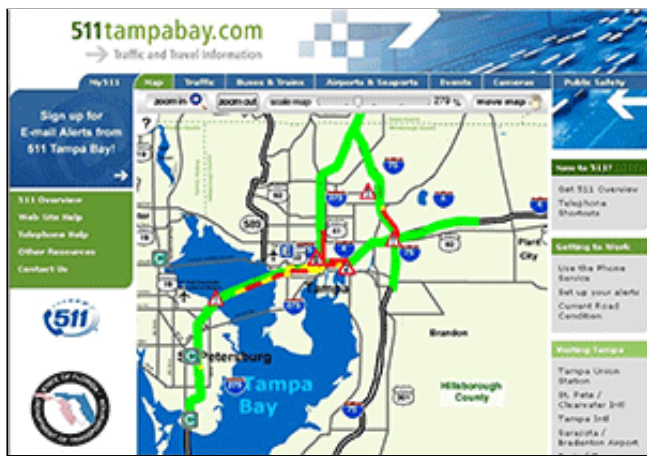


The flow information collected by these sensors can be used to help the public sector partners in carrying out system management activities including operations, planning, analysis, and maintenance. However, there is some limitation on the use of the data collected by Mobility Technologies and provided to District 7. The information is for internal use only and District 7 may not share the aggregated data with private and commercial interests. This restriction posed a problem since District 7 wanted to provide travel times and/or speeds to the public via the 511 system and Web site, which was being procured through a separate effort.

**District 7 Regional ATIS Program**

District 7 successfully leveraged use of the data provided by Mobility Technologies, through the ITIP, for use in the Regional Advanced Traveler Information System (ATIS) developed for the Tampa Bay area. Since September 2, 2004, information from the ATIS in the Tampa Bay area is disseminated to the public through the use of the 511 system and Web site that was establish as the primary dissemination methods.





Providing information to the public regarding traffic conditions, is vital to the operation of transportation systems in the state, and is particularly important in our highly congested urban areas.

Information on roadway conditions, that is available prior to a trip, allows the traveler the opportunity to select their time of departure, route or mode of travel to avoid congestion. If travelers are able to avoid congestion, the duration and severity of congestion is reduced, thus contributing to the reduction of

congestion area wide.

One of the most useful tools for gauging the consequences of recurring traffic congestion is the ability to know travel times. Estimated travel times across a route segment have proven highly desirable to travelers. The 511 Deployment Coalition recognizes the benefit of knowing travel times and indicated in it's 511 Implementation and Operational Guidelines, Version 2.0, that the provision of travel time is desirable if the deployer has the capabilities to include travel times as part of the service to the public.

## Challenges

Working out an agreement with Mobility Technologies to utilize their travel time data collected from the sensors that were installed as part of the ITIP, became more of a challenge than initially envisioned. Mobility Technologies' business model is predicated on their ability to market the data they collect. Providing the information to the public would compromise their ability to market the information. District 7 knew it would not be in a position to provide travel times for several years using publicly owned data collection, and in order to provide travel times on an interim basis, reached an agreement with Mobility Technologies. Mobility Technologies agreed to provide the information from the sensors they deployed on the FDOT rights-of-way free of charge for the first year, and District 7 agreed to offset Mobility Technologies' anticipated loss of revenue thereafter, for continued use of the data.



## Benefits

I-275 and I-4 are the primary limited-access facilities that distribute traffic throughout the Tampa Bay area. It is a tremendous asset to be able to provide travel times and speed information to the public on these heavily traveled corridors. According to Rick Schuman, PBS&J's Division Manager for Transportation Network Information, "multiple studies have shown that ATIS users value and understand travel time information, as it provides the quantitative context that many ATIS services lack."

General benefits of an ATIS are that it allows the user of the system to:

- Avoid traffic congestion and road construction,
- Reduce frustration and relieve stress,
- Change travel behavior to include altering routes and departure times, and
- Make informed decisions.



This all translates into saving time, lives, and money. The use of travel time information maximizes the benefit that can be realized from an ATIS. The agreement with Mobility Technologies allows District 7 the opportunity to enhance its service to the public that it would not have otherwise had.

### Testimonials

There is no better way to gauge the usefulness of a system than to read testimonials from people who are associated with the operation of the system or from those who have used the system. These testimonials show the need and benefit of providing travel times and speeds as part of the offering of the Tampa Bay ATIS.

The partnership with Mobility Technologies allows District 7 to provide a more robust ATIS. The following are a sampling of some of the testimonials:

“The key to the success of the 511 system is the effectiveness of the information provided to the user. Installation of the 511 sensors provides real-time speed data and travel times that have greatly enhanced the ability of the motorist to—Know Before You Go.” (Ken Hartmann, P.E., Secretary FDOT District Seven)

“The sensors associated with 511 provide motorists with real-time traffic and travel time information. This real-time information has not previously been available in the Tampa Bay area. Access to real-time information has become an invaluable tool in assisting motorists as they travel on select Bay area roadways” (Marian Scorza, Public Information Officer, FDOT District Seven)

“Thanks for your help. I have been using the service for the past couple of days and I absolutely love it. I travel main highways every day through two different counties and this helps me choose the best route to take. Great idea.” (Unknown Customer—This came into the [www.511tampabay.com](http://www.511tampabay.com) Web site as a customer feedback email.)

### Conclusion

The service is new to the Tampa Bay area, and as the system’s benefits are realized by the residents, 511 and the [511tampabay.com](http://www.511tampabay.com) Web site will become the primary means of getting traveler information. The provision of speed information and travel times provides for a more beneficial system. Since public speed and travel time information is not available in the area at this time, the use of Mobility Technologies’ data provides District 7 with the means of providing speed and travel time information on the main travel corridor from the start.

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## ***Statewide Incident Management—Clearing Our Roads As Quick As Possible***

FDOT's statewide incident management program has made great strides over the last several years. FDOT has placed major emphasis on clearance times and assisting the public by providing Road Rangers, Florida's service patrol program, on all Interstates in the major metropolitan areas and on I-75 from St. Petersburg to Naples.

FDOT's Incident Management Program stands out as one of the nation's premier programs and we look forward to sharing our successes with others.

### **FDOT's TIM Teams**

FDOT, along with local city and county governments, has implemented 16 Traffic Incident

Management (TIM) Teams that work on local incident response issues and coordinate/resolve agency-to-agency issues when responding to major incidents.

This program, which started in 2000, really kicked off in January 2002, and has grown rapidly. Since the first meeting, a little over three years, FDOT has made a commitment to incident management, along with ITS, as a cornerstone for improving congestion on Florida's Interstate system.

It is anticipated that this program will grow by two or three teams each year in the future.



The TIM Teams started several projects to determine the feasibility of implementation and effectiveness of using the statewide 800 MHz system to communicate between FDOT Road Rangers and the FHP, as well as placement of reference markers at one tenth mile intervals for better incident identification. The current 800 MHz communication system is a law enforcement system that was not included in any DOT vehicles. Since direct communication is a must in incident response, FDOT is attempting to show that a talk group can be setup on the system that would allow the FHP and Road Rangers to talk directly, eliminating the need for a completely different communications system.

The reference markers would not only identify the mile marker to the tenth of a mile, but would also give the travel direction and roadway number. Since most incidents are now reported by cell phone callers, sometimes these good Samaritans can only give an approximate location, or provide bad information due to the lack of markers. This system assists the caller since markers would be every tenth of a mile.

The TIM Team in the Ft Myers region has signed an agreement with all responders that allows first responders to direct the FHP to dispatch the appropriate type of wrecker equipment to the scene of an incident, thereby eliminating the delay of getting an FHP officer on-site and having the wrong equipment dispatched.



### Open Roads Policy

The next major accomplishment was the establishment of the statewide Open Roads Policy which creates a 90 minute goal for clearing all incidents in the state. It is recognized by all concerned that this not only improves the flow of traffic, but also reduces the threat of secondary crashes caused by such incidents. This is a major accomplishment considering that, besides Washington, Florida is the only other state that has this goal.

### Other Implementations

In the Orlando area, the Orange-Osceola County Medical Examiner has signed an agreement allowing the movement of deceased persons from the roadway or from a vehicle, off to the shoulder or off ramp, after taking appropriate digital photographs. This has proven to expedite roadway



clearance in homicide investigations and assists in the reduction of secondary crashes.

Finally, FDOT, along with the FHWA, has funded a statewide photogrammetry program for the FHP. This program provides the FHP with a total of 177 cameras, tripods, memory sticks, printers, and software to automate the crash investigation process. Once completed, this will increase the total number of FHP officers available to do photogrammetry up to 204—greatly increasing Florida’s ability to clear incidents and get the traveling public moving again.

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## ***Florida's Center-to-Center Network—The Jacksonville-Orlando Pilot Project***

Since 1959, the Daytona International Speedway, also known as the “World Center of Racing” has hosted the Daytona 500 stock car race. Held in February, this race is now the culmination of two full weeks of high speed, action packed, automobile racing and draws hundreds of thousands of tourists to



initiate the NASCAR season each year. “Speed Weeks” kicks off the first weekend in February with the 24 Hours of Daytona. Using the road course, sports cars compete around the clock in an endurance race equaled only by a similar race in Le Mans, France.

During the month of March, the speedway hosts “Bike Weeks.” This event consists of two very intense weeks of motorcycle racing and cruising the local roads and beaches.

In July, the speedway plays host to a mid-year 400 mile NASCAR race. With a seating capacity for over 165,000 fans, several annual events attract well over 250,000 people.

The six figure attendance numbers for each of these events has significant impact on the surrounding areas. For days prior to and after these events, traffic-related congestion can clearly be observed in Central Florida as far away as Orlando to the southwest and Jacksonville to the northeast.

Each of these Florida cities are home to regional transportation management centers

(RTMCs) were built to address traffic-related issues in the surrounding areas and are which have been staffed by the FDOT District Offices.

In central Florida, the Orlando network in the FDOT District 5 provides coverage for 40 miles of roadway along the I-4 corridor. A gigabit Ethernet network interconnects:

- 93 closed-circuit television cameras (CCTV),
- 30 dynamic message signs (DMSs), and
- 120 vehicle detector stations.

In northeast Florida, the Jacksonville network in FDOT District 2 provides coverage within the I-95 and I-10 corridors and intersecting arterials. A gigabit Ethernet network interconnects:

- 41 video identification and detection cameras (VIDS),
- 22 CCTV cameras,
- 1 classification/count station,
- 2 weather sensors, and
- 8 DMSs.

In an attempt to manage the traffic impacts of the events occurring at the speedway, there was, previously, limited coordination between the two RTMCs.

### **The Jacksonville-Orlando C2C Pilot Project**

FDOT is a fully decentralized agency comprised of seven geographic-based Districts, a Turnpike Enterprise and a Central Office. The Districts and Turnpike Enterprise enjoy substantial flexibility and freedom over planning, design, construction, operations, and maintenance decision-making. These Districts, while under the FDOT umbrella, are very independent from each other and from the Central Office ITS Section. They function as a network of peers.

The Orlando and Jacksonville RTMCs developed separately over time and now realize the need to manage these inter-regional traffic impacts jointly. A network connecting the centers has proven itself highly effective in providing a high level of coordination for events and traffic control as well as incorporating the ability to view video generated from the areas involved.

Toward this end, the FDOT Central Office, ITS Section, designed a Center-to-Center (C2C) network, and is deploying software that will enable various specified partners to connect to each other for the purpose of sharing traffic-related data and roadside video streams, along with camera and DMS control over the entire network.

Upon full statewide completion, the C2C communications network will enable video surveillance and monitoring, command, and control of ITS devices deployed on the network by authorized hosts from remote RTMC locations. The C2C network creates a more unified, integrated, and effective regional transportation management system.

There are challenges associated with building such a complex network in such a diverse geographical area as Florida. With over 340 miles between the RTMCs in Miami and Jacksonville, connecting them, along with centers at other locations in between, presents quite a challenge. Many of the more populated areas had built, had under construction, or have plans for, high-speed networks that will accommodate the bandwidth-demanding

application of sharing video between RTMCs.

### **However, There Was a Problem That Needed to be Addressed...**

How were these RTMCs going to be connected? A practical and economical means of connecting the centers needed to be developed.

And it was. The FDOT ITS Section maintains a statewide wireless communications data network that it constructed to support the motorist aid call box program. The microwave network, which has towers in all of the Districts, uses microwave radios to transmit and receive data between sites. Though the bandwidth is more limited than in a fiber optic system, this network would afford the opportunity to connect RTMCs throughout the state. Using the microwave network would enable a solution to one of the pieces of the C2C puzzle.

### **Will it Work?**

Districts 2 and 5 both realized the many benefits that could arise from being able to monitor and share video and traffic data from events happening in the Daytona Beach area. A pilot project to connect the centers was developed to test and evaluate the C2C connectivity for system adequacy and reliability. The project also served as proof of the operational concept.

Planning meetings between Districts 2 and 5, and the Central Office identified several major technological hurdles. Included, was the need to integrate Ethernet and time division multiplexing (TDM) data for transmission and the need to address MPEG-II video encoding over the lower bandwidth microwave network. There was also a need to do minor building modifications and fiber optic cable installations at the Jacksonville site.

FDOT upgraded the data networking equipment in Orlando and Jacksonville; reconfigured routers, switches, and firewalls; and established connectivity between the two RTMCs. Video distribution was then addressed.

MPEG-II encoded video typically requires 4-6 Mbps of available bandwidth in order to meet the quality requirements of the RTMCs. The microwave links of this particular C2C network route have a total available capacity of approximately 18 Mbps for networking purposes. Allowing for networking overhead, the available bandwidth would only accommodate 2-3 real-time video streams!!! Another way to accommodate the video sharing needs of the network was developed.

With the maturation of the MPEG-IV standard, FDOT decided to test MPEG-IV encoders and decoders to determine whether the quality was acceptable for the operators in the RTMCs. The MPEG-IV encoding algorithms allow for a higher level of compression than MPEG-II, thus allowing for broadcast quality video at a lower bandwidth. Requiring only 2-3 Mbps bandwidth, the new codecs seemed ideal for the C2C applications. FDOT decided to use the MPEG-IV codecs for video distribution over the wireless links. Shortly thereafter, at the Jacksonville RTMC, operators and staff were able to view I-4 traffic in both Orlando and Daytona Beach. In Orlando, over the same network infrastructure, Orlando operators were able to view and control video cameras with I-95 and I-10 traffic from Jacksonville. This project was deemed a success!!

As the first step in establishing statewide network connectivity, the pilot project of connecting RTMCs in Districts 2 and 5 laid the foundation and will serve as a building block for connecting RTMCs throughout the remainder of Florida. Realizing that an event

happening 100 miles away can have a significant impact to the local area, managers in the Orlando and Jacksonville centers stress the importance of having real-time information available on the network to assist in the management of traffic flows on the areas roads.

\* \* \* \*

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### ***Florida Lodestar Towers Lease and Operating Agreement For Commercial Wireless Telecommunications***

The advent of advanced wireless and fiber-optic communications technology, coupled with continued rapid growth in demand for communications capacity, has led private communications companies to seek to build new, and extend existing, wireless and fiber-optic networks. Coincident with this, government agencies at all levels are seeking to establish communications networks for ITS and other governmental functions. It is in this context that there is increased incentive and opportunity for sharing the public resource of highway right-of-way in exchange for private telecommunications expertise and capacity to further both public and private sector objectives.

Traditionally, longitudinal access to the right-of-way for non-transportation communications networks has been carefully controlled, especially in the freeways and limited-access highways. In early 1988, the U.S. Department of Transportation revised its policy on utility accommodation, allowing states with FHWA-approved utility accommodation plans to permit installation of fiber-optic cables and other utility infrastructure along interstate rights-of-way, thus setting the stage for shared resource projects.

In October 1995, the AASHTO Board of Directors directed AASHTO committees to formulate guidelines for accommodation of fiber-optic cable in roadway rights-of-way.

A shared resource project in this context has four specific features:

- Public-private partnering,
- Private longitudinal access to public roadway right-of-way,
- Installation of telecommunications hardware (wireless towers/antennas and fiber-optic lines), and
- Compensation granted to the right-of-way owner over and above administrative costs.

Compensation options include barter and cash. In barter or in-kind arrangements, private parties install the system, receiving access to the right-of-way for their own capacity in return for providing telecommunications capacity to the public agency. In cash

arrangements, private parties install the telecommunications system, receiving access to the right-of-way in return for monetary compensation to the public agency. Hybrids of the barter and cash alternatives can also be created whereby in-kind compensation (communications capacity) and monetary compensation are combined as consideration for private access to the right-of-way for private sector objectives.

Shared resource projects offer a new opportunity for public-private partnering for transportation agencies and are particularly relevant to ITS projects. Although a number of issues must be addressed, there are options for each so that individual projects can be structured to suit particular circumstances. Shared resource partnering, however, is market-driven and the window of opportunity for individual projects is limited, with the specific time frame depending on local circumstances.

### **Lease and Operating Agreement**

The Telecommunications Act of 1996, as approved by Congress, defines a national policy to facilitate the siting of wireless communications facilities on public lands. In pursuit of this policy, FDOT issued a Request for Proposal (RFP) in 1998 to qualified firms to compete for leasing of certain FDOT properties to make them available to the wireless industry. Lodestar Towers, Inc. was selected to manage and sublease FDOT property to the wireless industry. This agreement was executed March 25, 1999. Lodestar was subsequently acquired by SpectraSite Communications in 2001.

The agreement with SpectraSite is for a 30-year period with exclusive rights for the first 15 years to market and sublease FDOT property. Under the agreement, SpectraSite enters into subleases with the wireless providers and provides FDOT with a percentage of the gross receipts derived from the subleases. Aside from gaining revenue from the use of the facilities, FDOT has the option of substituting services for cash. Services obtained from SpectraSite support FDOT's ITS Program and the ITS communications infrastructure.

### **How It Works**

FDOT facilities, made available under the agreement, include all limited-access rights-of-way and existing FDOT communications facilities. In addition, high mast lighting standards, sign supports, buildings, and selected bridge structures may also be used to support the wireless industry's needs.

The public-private lease agreement was also developed in accordance with FDOT's internal Telecommunications Policy. The goal of the policy is to consolidate wireless tower use to FDOT's limited-access rights-of-way by providing equal access and opportunity to all wireless service providers. This strategy encourages wireless service providers to collocate on towers within the FDOT limited-access rights-of-way instead of developing numerous new tower sites in local communities. The resulting reduction in the number of towers and the location of the needed towers as far as possible from residential areas facilitates the intent of the lease to support the wireless service providers while minimizing wireless tower proliferation.

As of January 2005, SpectraSite has constructed 29 towers on various FDOT rights-of-way throughout the state. In total, 52 wireless collocation subleases are executed with various wireless carriers including:

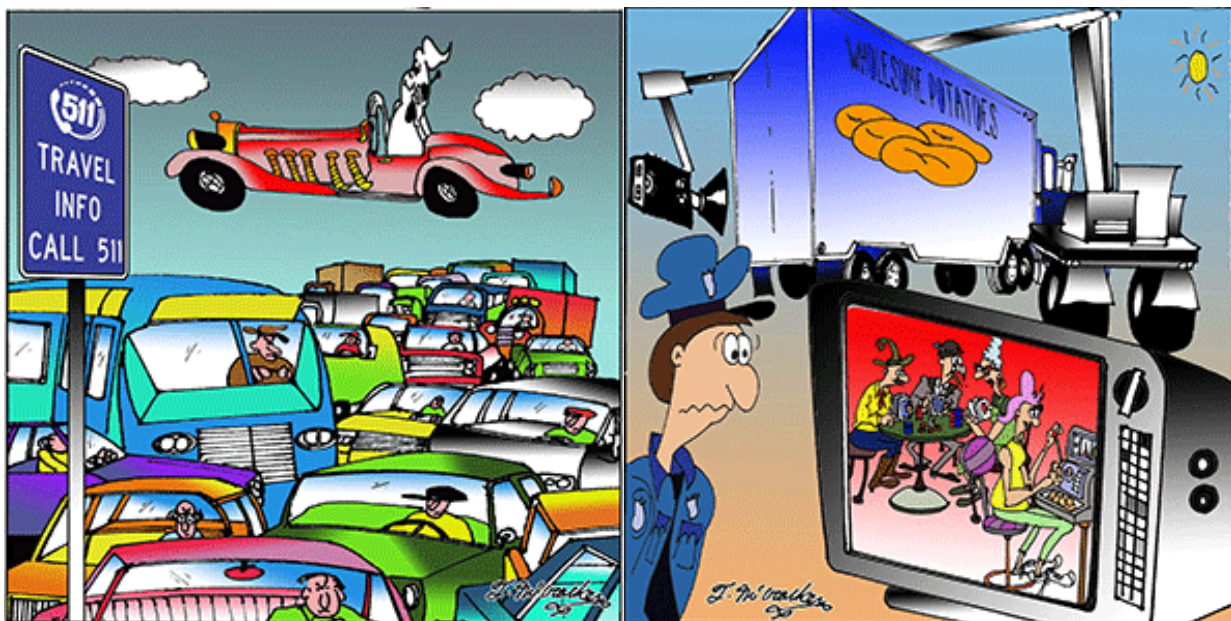
- Nextel,
- Verizon,
- Cingular,
- Metro PCS,
- Alltel,
- Sprint,
- T-Mobile,
- AT&T,
- US Cellular,
- Voicestream, and
- Skytel.

The FDOT's share in revenues, derived from current commercial wireless leases, has funded construction valued at \$1 million in communications infrastructure to support Florida's ITS.

\* \* \* \*

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# Moment of Humor!



Who you gonna call?

Gamma ra y gotcha!



SunGuide software can handle this!



Uh... does the Turnpike have a fishing license?



Hi Yo Florida! The Road Rangers ride!



FDOT's new microwave system is really cooking now!



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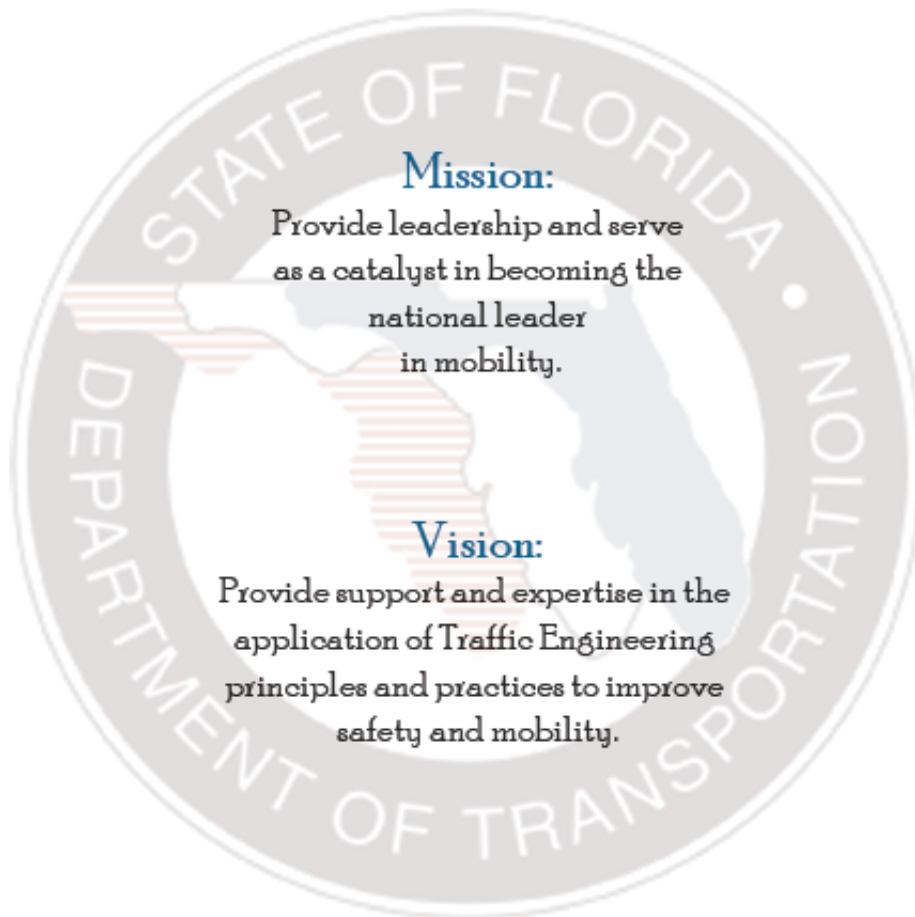
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## FDOT Traffic Engineering and Operations Mission and Vision Statements



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