

Florida's ITS Evolution



ALL TRUCKS
MUST ENTER
WEIGH
STATION
3/8 MILE

WHEN
FLASHING



**Florida Department of Transportation
ITS Office**

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www.dot.state.fl.us/trafficengineering/its.htm

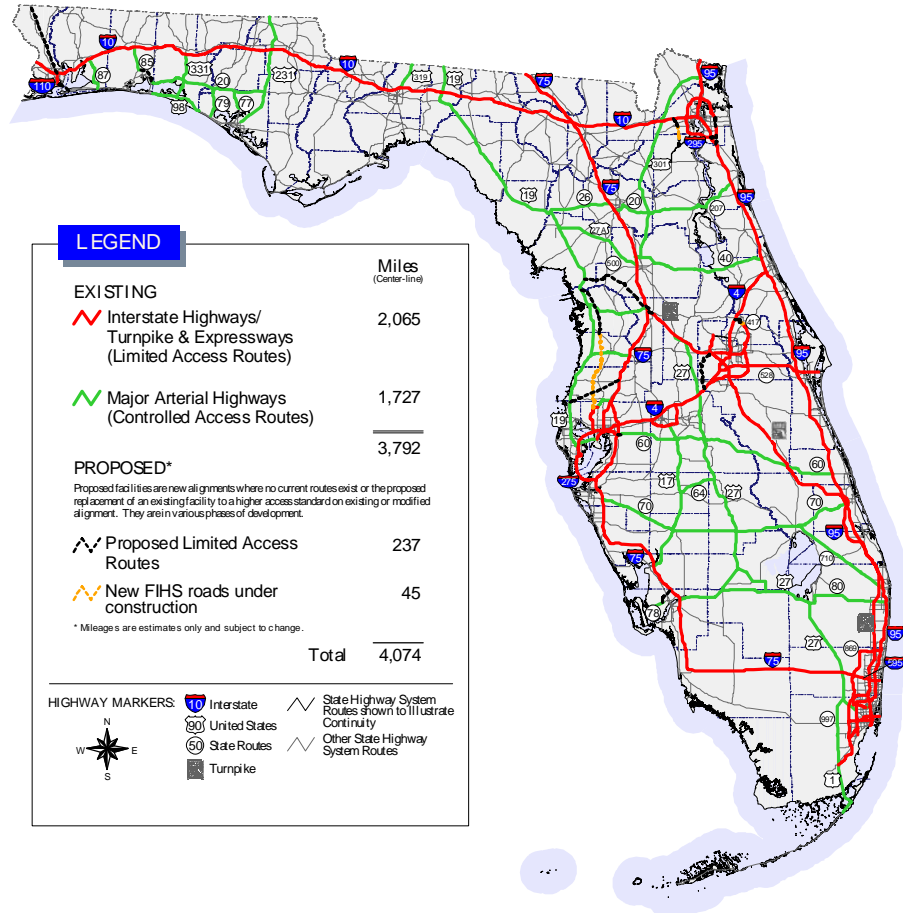
FLORIDA'S ITS EVOLUTION



Florida's beaches, major tourist attractions, and gateway status for the Americas attract nearly 60 million visitors each year. The demand for transportation services resulting from these visitors and the 16 million residents of Florida, one of the fastest growing populations in the US, is outpacing the ability of the state and local governments to build new highways to meet this demand.



Florida Intrastate Highway System (FIHS) Existing and Proposed Routes January 2001



FLORIDA'S TRANSPORTATION MISSION

Florida will provide and manage a safe transportation system that ensures the mobility of people and goods, while enhancing economic competitiveness and the quality of our environment and communities.

On Florida's Intrastate Highway System (FIHS), a priority system of about 3,792 miles of freeways, toll roads, and intercity arterials, travel demand (measured in vehicle-miles of travel) increased 43 percent and the percent of travel that is congested operating during peak conditions (5:00^{PM} to 6:00^{PM}) increased 40 percent from 1990 to 1999. During the same period, FDOT invested more than \$3.1 billion in construction (only) on the FIHS which resulted in a 10.3 percent increase in the number of lane-miles. Florida's growth is not expected to abate and by the year 2020, the system must accommodate more than a projected 21 million residents and 80 million visitors. The 2020 system must also respond to an

anticipated three-fold increase in Florida's imports and exports. Vehicle-miles of travel are expected to increase by about 60 percent, transit trips by about 40 percent, and air travel will more than double. Historical roadway expansion and infrastructure management trends will be insufficient to keep pace with this demand.

In order to respond to these increases in demand and congestion, FDOT has focused its mission on serving four goals: safety, systems management, economic competitiveness, and quality of life. ITS will be an important operational and management tool in achieving these goals.



FDOT's ITS OFFICE

THE MISSION OF THE ITS OFFICE IS TO COORDINATE AND PROMOTE THE DEPLOYMENT OF ITS AND INCIDENT MANAGEMENT ACTIVITIES CONDUCTED BY FDOT.

To support the coordinated deployment of ITS on a statewide basis, FDOT recently established an ITS Office. The mission of the ITS Office is to coordinate and promote the deployment of ITS and incident management activities conducted by FDOT. The Office was established as a result of a strategic planning process adopted by FDOT.

Mr. Chester Chandler, PE was named the ITS Program Manager in July 2000 and a team was assembled.

Four major program areas were developed in the Office:

- Telecommunications Program Management led by **Robert Gottschalk, PE**;
- ITS Architectures and Standards led by **Liang Hsia, PE**;
- ITS Program Management led by **Gene Glotzbach, PE**; and
- Commercial Vehicle Operations/ Electronic Toll Collection led by **Michael Akridge**.

General consultant services for the ITS Office have been secured, with PBS&J providing ITS general consulting services and PB Farradyne, Inc. providing telecommunications-related support.

The major initiatives being undertaken by this office are:

- Guide the deployment of a communication backbone to serve ITS on major transportation corridors throughout the state. Florida's five principal transportation corridors are: I-75, I-95, I-4, I-10, and Florida's Turnpike. FDOT is developing plans to update its microwave system to provide statewide capacity. In addition to the statewide microwave system, FDOT is seeking a public/private partnership to install a fiber optic backbone along Florida's five principal transportation corridors. In exchange for this use of right-of-way, FDOT is seeking a private partner that will provide fiber exclusively for ITS use.
- Adopt a corridor-wide approach to the implementation of ITS along Florida's five principal transportation corridors that

mirror the communication backbone and develop conceptual systems engineering solutions for these corridors that will lead to procurement and deployment of ITS services.

- Establish statewide standards and specifications for ITS which include the resolution of disparate traffic management center softwares.
- Support the deployment of a statewide data warehouse to support advanced traveler information services (ATIS).

The ITS Office provides statewide program management and leadership that will be used to leverage FDOT's resources and implement a fully integrated statewide ITS system in a cost-effective manner. Florida has been at the forefront of implementing ITS in the US since 1990 when the TravTek operational field test was implemented in the Orlando metropolitan area. This program will build on Florida's history of success in ITS deployment.



SUNGUIDE

FLORIDA'S STATEWIDE INTELLIGENT TRANSPORTATION SYSTEM

In the fall of 2000, FDOT Management agreed to "brand" ITS services and traveler information on a statewide basis as "SunGuide" using the logo shown at left.

This decision provides for a common interface and identification of ITS services throughout the state to provide seamless services to travelers in Florida.

FLORIDA'S STATEWIDE ITS DEPLOYMENT

ITS CONCEPT PLANS AND ITS PROGRAM PLAN

FDOT is in the process of developing ITS Corridor Concept Plans for the five principal FHHS limited access transportation corridors -- I-75, I-95, I-4, I-10, and Florida's Turnpike. The ITS Corridor Concept Plans will build on existing and planned deployments developed by each District to integrate ITS on a corridor-wide and statewide basis. It will identify anticipated ITS needs, funding, and projects recommended for programming along each corridor.



At the same time, a statewide *ITS Program Plan* will be developed to summarize and document the needs, issues, problems, and objectives for statewide deployment of ITS. This plan will guide the dedication of resources and provide a roadmap for the successful deployment of ITS. The basis of the *ITS Program Plan* will be the completion of the conceptual engineering, ITS architecture, system engineering, and standards and specifications analysis along the corridors.

STATEWIDE ITS ARCHITECTURE

In order to provide a coordinated approach to statewide ITS deployment, FDOT developed a Statewide ITS Architecture based on the National ITS Architecture prepared by the US DOT.

This statewide architecture provides a common framework for planning, defining, and integrating intelligent transportation systems. It reflects the contributions of a broad cross-section of the ITS community and other stakeholders in Florida.

The Statewide Architecture identifies the structured framework for ITS deployments in Florida and is the basis for our regional architectures required in Rule 940 - Intelligent Transportation Systems Architectures and Standards, issued by the FHWA on April 8, 2001.

ATIS FEASIBILITY STUDY

ATIS presents information to travelers to assist them in moving from one point to another. A feasibility study is being performed to assess the potential success of ATIS services in the Jacksonville area, along the I-4 Corridor, and the Gulf Coast area including Charlotte, Lee, and Collier counties.

Conclusions and recommendations will be arrived at after careful consideration of the scale of the market, consumer segmentation, market segmentation, the ATIS marketplace, and basis for estimates, among other factors.

TRAFFIC MANAGEMENT CENTER SOFTWARE SYSTEMS

The Departments of Transportation in Florida and Michigan, and the Federal Highway Administration, have initiated a study to determine the best solution for an integrated statewide traffic management center (TMC) software system. FDOT currently employs four different software systems in its TMCs. The price tag of individual software system development, operation, training, maintenance, and update is currently in excess of \$1 million and will increase substantially with the scheduled deployment of each new TMC.



An integrated TMC software system will reduce these redundant, high costs and provide a unifying platform to ensure that technologies work together smoothly and effectively. The evaluation and selection of a TMC software system should allow transportation management centers, toll collector freeway incident management, travel information, vehicle information wireless microwave, and fiber optic communication to function seamlessly.

UNMANNED AERIAL VEHICLE (UAV)



FDOT is currently assessing the feasibility of using unmanned aerial vehicles (UAV) as aerial platforms for roadway management in Florida. The UAV has many potential applications including:

- rural and urban traffic monitoring
- forensic measurements at accident locations
- traffic flow management during evacuation
- situational assessments during natural or man-made disasters
- travel characteristic studies
- incident response



SUNPASS - ELECTRONIC TOLL COLLECTION



By the end of this year, nearly all of Florida's toll roads and toll bridges will be equipped with an integrated electronic toll collection system -- SunPass™. SunPass™ has been implemented statewide on Florida's

Turnpike, Department of Transportation toll roads and toll bridges, Miami Dade Expressway Authority (MDX), Tampa Hillsborough County Expressway Authority (THCEA), and toll bridge authorities facilities. Statewide interoperability has

been provided with toll roads operated by the Orlando-Orange County Expressway Authority and Osceola County Expressway.

"To date, SunPass™ has sold more than 330,000 transponders in less than two years of operation, and we expect the numbers to steadily grow" says Deborah Stemle, FDOT Director of Toll Operations." OOCEA has more than 250,000 transponders in use, resulting in more than 580,000 interoperable transponders in use statewide.

SunPass™ customers are provided with several account replenishment options including: automatic replenishment with a credit card when the balance reaches a minimum amount; in person; by mail; by phone; or online at <http://www.sunpass.com>.

COMMERCIAL VEHICLE INFORMATION SYSTEMS AND NETWORKS (CVISN)

Commercial vehicles form the backbone of Florida's freight transportation network. All aspects of the economy rely on commercial vehicles to meet their transportation needs. The trucking industry is an active participant in all of Florida's major industries. Motor carriers haul 77 percent (by weight) of all shipments originating in Florida. These shipments have a combined value of \$154 billion. Commercial vehicles also provide the integral landside link to the state's intermodal facilities.

The Florida CVISN program currently has automated bypass in place at 12 weigh station facilities on three interstates as well as providing its mobile enforcement officers with ASPEN-loaded laptop computers to conduct safety inspections. In the future, the program will also include automated credentials application and issuance as well as the ability to apply for certain oversize/overweight permits electronically over the Internet.



Commercial vehicles form the backbone of Florida's freight transportation network.

SOUTH FLORIDA'S ITS

SUNGUIDE PROGRAM



SUNGUIDE ATIS

Through a cooperative effort of transportation agencies throughout the Tri-County area incorporating Miami-Dade, Broward, and Palm Beach counties, FDOT has entered into an agreement with SmartRoute Systems, a Westwood One Company, to provide Advanced Traveler Information Services (ATIS). The major initiatives of SunGuide in South Florida include implementation of ATIS and a Consumer Information Network (multimodal data warehouse) in partnership with the Regional Transit Organization that includes transit services for Miami-Dade, Broward, and Palm Beach counties and Tri-Rail, a commuter rail-line operating in the I-95 corridor.

Once in place, the SunGuide Traveler Information Service will supply real-time information that can inform a traveler about levels of congestion on roadways or if there are any incidents tying up traffic. It may even inform a traveler where to exit as a detour and if buses and trains are running

on schedule. This information may be provided through websites, telephone, and cable television, among other means.

Informed motorists can help cut down delays by taking alternate routes, changing travel plans, or shifting their means of travel from car to bus or train, for instance

SUNGUIDE ROAD RANGERS

US DOT statistics indicate that service patrols can reduce congestion delays by as much as 45 percent. FDOT and the Miami-Dade Expressway Authority (MDX) have implemented a free service in the Tri-County area of South Florida providing specialized tow trucks that help stranded motorists, remove roadway debris, and assist the Florida Highway Patrol during incidents on area highways. The roadways with this service available include: I-95, I-595, I-75, SR-836, SR-826, SR-112, SR-874, SR-878, SR-924, and Florida's Turnpike.

The SunGuide Road Rangers presently operate 24 hours a day, 7 days a week in

Miami-Dade County and Palm Beach County. Broward County operation hours are Monday through Friday from 6:00^{AM} to 7:00^{PM}. Road Rangers operate year round during peak traffic hours of Florida's Turnpike.

SOUTH FLORIDA INTELLIGENT CORRIDOR SYSTEM PROGRAM

The ICS program provides a regional multimodal ITS system along freeway and toll road corridors in Miami-Dade, Broward, and Palm Beach counties. This system includes video surveillance, incident management and evacuation coordination for the backbone of the transportation system in the Tri-County area.

A new regional traffic management center at the Miami District Headquarters is near construction and ramp metering is planned for limited deployment in the near future along I-95. This system also provides travel data in support of the SunGuide ATIS

NORTHEAST FLORIDA'S ITS

JACKSONVILLE FREEWAY MANAGEMENT SYSTEM



A freeway management system is in place in the Jacksonville area that provides video surveillance and incident management. Nearly 60 closed-circuit television cameras are located on I-10, I-95, and I-295 in Jacksonville. These services provide valuable traffic and incident management during peak periods and special events.

FDOT also operates a state-of-the-art regional traffic management center in the Jacksonville Urban Office.



CENTRAL FLORIDA'S ITS

I-4 SURVEILLANCE MOTORIST INFORMATION SYSTEM (SMIS)

The SMIS is currently provided along I-4 in the Orlando area from US 192 to Lake Mary Boulevard. This 39-mile freeway management system includes roadway surveillance using inductive loop detectors and closed-circuit television. Surveillance is provided at about 70 locations. Surveillance information is linked to a regional traffic management center (RTMC) located along Semoran Boulevard (SR-436) near the East-West Expressway (SR-408). This RTMC includes joint-dispatch services for the Florida Highway Patrol, Motor Carrier Compliance Office, and Florida Department of Law Enforcement. This system is complemented with Road Rangers service patrol and incident management response services. Real-



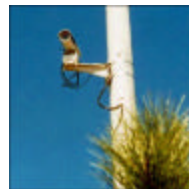
time traveler information is provided through the Traveler Information Radio Network (TIRN) and dynamic message signs at key locations along the corridor.

The system is currently being expanded in conjunction with a bridge widening project to provide smart work zone management and maintenance of traffic for the section from Lake Mary Boulevard to the St. Johns River Bridge.



I-4 ITS CORRIDOR PLAN

Consistent with the corridor-wide approach for implementing ITS, a regional ITS architecture study was recently completed for the I-4 corridor to provide seamless ITS services to the users along this important corridor for Florida's trade and tourism markets. Major recommendations of the study included: development of regional ATIS, major incident management services, central data warehousing, and evacuation coordination services. These corridor-wide approaches are supplemented with recommendations for proof-of-concept/pilot projects that include: virtual weigh-in-motion stations, smart work zone management, and E911 services. Approximately \$50 million of ITS needs were identified. The ITS corridor plan ties together the existing ITS services, such as the I-4 Surveillance Motorist Information System in the Orlando area, with other ITS architectures and planning projects along the corridor. The result will be seamless ITS services with consistent interfaces to travelers.



These recommendations were developed using a cooperative planning process that involved local governments, expressway authorities, and other state agencies involved in the corridor. This cooperative approach resulted in a robust requirements analysis that identified the needs, issues, problems, and objectives for transportation services throughout the corridor. More than \$4 billion of traditional infrastructure improvements are programmed along this corridor over the next ten years and the integration of ITS into these construction projects is a major theme.

Innovative solutions developed during this project included the development of Evacuation Coordination, a new ITS user service for Florida to address evacuation management, coordination, and response associated with natural disasters such as hurricanes, fires, and other major incidents.

SOUTHWEST FLORIDA'S ITS

COORDINATED ITS AND INCIDENT MANAGEMENT PLANS

ITS deployment in the Tampa Bay region is currently limited to a system of variable message signs on I-275 near Tropicana Field in St. Petersburg and traffic management and surveillance for the Skyway Bridge and other major bay crossings. In addition, portable ITS was recently tested for special event management during the Super Bowl using closed-circuit cameras and variable message signs to manage traffic.

FDOT is currently developing ITS Plans for deployment of freeway and incident management on the Interstate and toll roads. This Plan includes a regional architecture that was developed in cooperation with many of the transportation partners in the area including: fire, emergency, and police personnel. A new regional traffic management center is being planned that will include a dispatch center for the Florida Highway Patrol and state-of-the-art traffic management.

Along I-75, FDOT is also considering incident management services in Collier, Lee, Manatee, and Sarasota counties. This plan will include emergency service patrols, incident detection, surveillance, and traveler information using dynamic message signs and highway advisory radio. Other major diversion routes or commuter routes in Lee County are also being planned for study.

FLORIDA'S PANHANDLE ITS

BAY COUNTY (PANAMA CITY) ITS ARCHITECTURE PROJECT/SCHOOL BOARD COLLABORATION



Utilizing a federal demonstration grant, FDOT, Bay County Traffic Engineering, and Bay County School Districts are entering into a public-public partnership to provide an arterial management system using a fiber optic network for communications that will also link major educational facilities in the county. This innovative public-public partnership is currently in the architecture/system engineering phase.

ITS elements that will be involved include traffic management systems and traveler information provided using dynamic message signs.



PLEASE JOIN US FOR OUR ITS OPEN HOUSE

WHERE: FDOT ITS Office
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WHEN: Afternoon
September 18, 2001

FOR MORE DETAILS CALL: (850) 414-4980



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