

Technical Memorandum No. 3.6

**Florida's 2003 Intelligent Transportation Systems
Strategic Plan Update**

**Recommended Initiatives for Mainstreaming
Advanced Public Transportation Systems
into the Intelligent Transportation Systems
Program**

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Version 3**



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List of Acronyms

APC.....	Automatic Passenger Counter
APTA.....	American Public Transportation Association
APTS.....	Advanced Public Transportation System
ATIS.....	Advanced Traveler Information System
AVL.....	Automatic Vehicle Location
BRT.....	Bus Rapid Transit
CAD.....	Computer-Aided Dispatch
CUTR.....	Center for Urban Transportation Research
FDOT.....	Florida Department of Transportation
FTPN.....	Florida Transit Planning Network
FTC.....	Florida Transportation Commission
ITS.....	Intelligent Transportation System
ITSA.....	Intelligent Transportation Society of America
NCTR.....	National Center for Transit Research (University of South Florida)
PT.....	Public Transportation (Forum)
PTO.....	Public Transit Office
RAPTS.....	Resource for Advanced Public Transportation Systems
RFP.....	Request for Proposals
RITSA.....	Regional ITS Architecture
RTO.....	Regional Transportation Organization
SIG.....	Special Interest Group
SIS.....	Strategic Intermodal System
SPO.....	Systems Planning Office
TDM.....	Travel Demand Management
TEOO.....	Traffic Engineering and Operations Office
TIVL.....	Transit Intelligent Vehicle Initiative
TSP.....	Transit Signal Priority
USF.....	University of South Florida

1. Purpose

This *Technical Memorandum* contains information and recommendations that can be used to establish and promote a coordinated and comprehensive effort regarding the use of intelligent transportation systems (ITS) in transit operations. This paper describes a more active role for the ITS Section of the Florida Department of Transportation's (FDOT) Traffic Engineering and Operations Office (TEOO) in supporting the development and deployment of advanced public transportation systems (APTS) in Florida, including a process for integrating the FDOT Public Transit Office (PTO) APTS efforts with the ITS Section efforts.

2. Background

There are a number of factors that necessitate the application of ITS to transit operations in Florida. The 25 urban transit systems in the state annually provide 195 million trips. These systems are constantly under pressure to increase ridership and reduce costs. Efficient management of limited resources, effective deployment of services, and safety and security of these systems are inherent goals of all transit properties. Therefore, a number of APTS technologies become very appropriate for consideration and application:

- Electronic payment systems;
- Fleet management systems;
- Advanced traveler information systems (ATIS);
- Transportation demand management (TDM) systems; and
- Transit safety and security systems.

Based on the current statewide APTS survey of 31 transit systems, which consisted of 25 urban and 6 rural systems, 6 systems have fully operational automatic vehicle location (AVL) systems, 10 have electronic fare payment systems, and 2 have fully operational automatic passenger counter (APC) systems.

One of the most comprehensive APTS projects in Florida involves a joint county and state partnership between Broward and Palm Beach counties, their transit agencies, the metropolitan planning organizations (MPOs), and FDOT District 4. The *Broward County/Palm Beach County APTS Master Plan Final Report*¹ identifies projects that will improve transit operations by integrating existing components and priorities with future needs. The *Master Plan* also addresses the existing and proposed communication system for future APTS compatibility. A password-protected Web site² has been established as a means of continuous communication among all project partners.

¹ Gray-Calhoun & Associates, Inc., *Broward County/Palm Beach County APTS Master Plan Final Report* (February 2004).

² More information regarding the development of the *Broward County/Palm Beach County APTS Master Plan* is available online at <http://www.floridaapts.org/>. The project scope is described in www.floridaapts.org/scope.pdf.

3. The Florida Transit Planning Network and the Resource for Advanced Public Transportation Systems

Established in October 2002 by the FDOT and the University of South Florida's (USF) Center for Urban Transportation Research (CUTR), the Florida Transit Planning Network (FTPN) is a cooperative association of Florida public transit planning professionals. To date, FTPN members include 13 individuals from FDOT, 9 from CUTR, 5 from the MPOs, 36 from various transit properties, 6 from consulting firms, and 40 others with various affiliations. The FTPN publishes bimonthly electronic newsletters that include transit planning news; updates on FDOT rules and regulations; professional development opportunities; APTS applications; and special interest topics. The FTPN serves as a forum for transit planners and as an advisor to CUTR's Resource for Advanced Public Transportation Systems (RAPTS) program.³

The RAPTS program was established by CUTR while under contract to the FDOT's PTO. The primary objectives for the RAPTS program are:

- To coordinate and facilitate APTS activities with the FDOT ITS Program;
- To support APTS standards, guidelines, and deployment; and
- To foster the joint procurement of APTS "to maximize the cost competition and support statewide system compatibility, integration and maintenance requirements," according to the RAPTS Annual Work Program.

Additionally, the RAPTS program offers a multitude of information and services including:

- A statewide electronic APTS inventory and database;
- An APTS technical dictionary;
- Case studies in APTS deployments;
- Technical scanning missions (e.g., Los Angeles Metro Rapid Transit Program in March 2003);
- An APTS Electronic Library;
- Links to Florida transit property Web sites;

³ More information regarding CUTR's RAPTS program is available online at <http://www.rapts.cutr.usf.edu/>.

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- Links to national resource Web sites;
- Help desk (i.e., online questions to CUTR); and
- Technical assistance to Florida transit agencies (e.g., provide assistance with developing an APTS master plan; performing needs assessment, procurement, data collection, and analysis; and conducting performance evaluations).

The combination of the FTPN and RAPTS efforts, although not yet even two years in existence, represents a very comprehensive and well-coordinated APTS community in Florida that should be formally aligned with the FDOT TEOO's ITS Section, its statewide activities, and efforts.

4. What Do Florida's Transit Experts Want?

As part of this issue assessment, a number of Florida's transit experts were interviewed to identify the ITS Section's responsibilities in assuming a more active role in APTS development and deployment in Florida. Those interviewed include the FDOT PTO, a RPTS project manager, and several FTPN representatives. The following items represent feedback and highlights from these interviews.

- Transportation professionals must recognize that APTS is a component of ITS and that it must be considered in all transportation system analyses.
- The update of *Florida's Intelligent Transportation System Strategic Plan*⁴ should explore how the FDOT ITS Program can be made truly multimodal. We should investigate the ITS applications that can reduce cost and delay of intermodal connections, minimize shipping and delivery delays, and improve the efficiency of fleet operations. The ITS Section should be more directly involved with Strategic Intermodal System (SIS) planning.⁵
- The design and operations of the proposed high-speed rail and existing commuter rail corridors should be integrated with regional traffic management system operations such as highway-rail crossing systems for the South Florida Rail Corridor.
- The established regional ITS architectures (RITSAs) should be extended to place meaning and relevance on APTS components. Additionally, there should be emphasis on communications interoperability between APTS and regional ITS communications.
- The assessment of ITS traffic management improvements for compatibility and coordination with public transit plans and programs should be supported. For example, a corridor designated for future bus rapid transit (BRT) development should be assessed when evaluating improved traffic operations.
- The potential uses of APTS data to improve the performance of the overall transportation system, such as the use of a transit fleet as system probes for improved traffic management, should be evaluated.

⁴ Florida Department of Transportation, *Florida's Intelligent Transportation System Strategic Plan* (August 1999). Available online at <http://www.dot.state.fl.us/trafficoperations/>.

⁵ More information regarding Florida's SIS is available online at <http://www.dot.state.fl.us/planning/SIS/>.

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- A federal funding “pipeline” that promotes a balanced ITS funding program that includes APTS projects should be endorsed. Funding for APTS programs should be an integral part of the FDOT’s ITS funding program.
- The ITS research project evaluation and selection process should directly encourage more response in the APTS research and development areas.
- Engineering technical support should be provided to compliment the planning and project management support offered by the RPTS program (e.g., the review of local requests for proposals [RFPs]; design and specifications; and participation in contractor selection). Information on emerging technologies should be shared through high-level presentations to local governing boards.
- A full-time PTO staff addition to the TEOO should be considered to improve and coordinate ITS and APTS efforts.
- Advanced APTS training should be supported comparable to other ITS training.
- Assistance should be provided to District PTOs to improve APTS outreach efforts at the local level and APTS representation should be included at the ITS Working Group Meetings.
- The APTS stakeholders in emerging regional ITS coalitions should be included. For example, the South Florida Regional ITS Coalition is building its stakeholder foundation with Broward County Transit, Miami-Dade Transit, and Palm Tran.

5. National Perspective

The Public Transportation (PT) Forum is the second largest of all the ITS America (ITSA) forums, and is cosponsored by ITSA and the American Public Transportation Association (APTA).⁶ The PT Forum meets quarterly and includes two Special Interest Groups (SIGs): the Transit Intelligent Vehicle Initiative (TIVI) and the Rail ITS SIG, which is chaired by the Tri-County Commuter Rail Authority's Executive Director, Joseph Giulietti. The TIVI is focusing on mainstreaming collision avoidance, precision docking, and lane keeping technologies. The Rail ITS SIG is trying to transfer modern bus technologies to rail.

The PT Forum has been directly involved with advancing a number of strategic national ITS initiatives, and these can also provide additional and/or reinforced focus for APTS in Florida. These focus areas include:

- Transit signal priority (TSP);
- Multimodal 511 traveler information;
- Electronic payment systems;
- Homeland security; and
- Integrated network of transportation information.

⁶ More information regarding the PT Forum is available online at <http://www.itsa.org/new.nsf/vLookupForumIntro/Public+Transit!OpenDocument>.

6. District Advanced Public Transportation Systems

With the exception of Districts 4 and 5, formalized APTS planning, design, and implementation activities have not been incorporated in Florida's ITS Program. District 4 in coordination with Broward and Palm Beach counties developed an APTS Master Plan, and has a multiagency demonstration project underway that will improve bus-to-rail transfers near downtown Fort Lauderdale. District 5 will be including various APTS enhancements in the *iFlorida* federal grant initiative. The proposed enhancements include LYNX computer-aided dispatching (CAD) and AVL technologies to improve schedule adherence, and wireless video systems to improve security. All *iFlorida* deployments are to be operational by May 2005.

Orlando's long-standing District 5 ITS subcommittee, METROPLAN ORLANDO, has formally incorporated local public transit stakeholder input in ITS planning efforts for the entire region.⁷ The only other significant APTS activity is a transit-based consumer information network in South Florida. Districts 4 and 6 sponsor the network, with District 6 taking the lead. The network operates through the regional transportation organization (RTO) that is integrating all transit operations in the region and providing 511 callers with multimodal traveler information.

One very apparent and logical convergence of APTS and the ITS Program can be in the area of TSP. Signalization priority (i.e., the extension of green lights and/or the interruption of signal phasing) exists in many areas for emergency vehicles, but the application is relatively new to public transit vehicle movement, where it is still being evaluated and debated. It will, however, provide an excellent opportunity for transit operators and traffic engineers to work together to improve the overall movement of people with ITS.

Through the Statewide ITS Performance Measures Initiative funded by the Florida Transportation Commission (FTC) and the ITS Section, the FDOT PTO is working with each District PTO manager to identify eligible intersections for TSP. A priority for TSP is the signalization of intersections that serve primary transit routes and are located in a moderately congested corridor. When this effort is completed, the ITS engineer in each District will have the opportunity to review and refine the project in a collaborative manner. This will define the official mainstreaming of APTS into the statewide ITS Program, and provide the foundation for further and continuing integration of APTS throughout Florida.

⁷ More information on METROPLAN ORLANDO is available online at <http://www.metroplanorlando.com/>.

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Additionally, to establish an unbiased perspective for TSP, required reading for District PTO managers and ITS engineers should include the *Effectiveness of Bus Signal Priority*⁸ and ITSA's *An Overview of Transit Signal Priority*.⁹

⁸ Chada, Shireen, and Robert Newland, National Center for Transit Research (NCTR), University of South Florida, *Effectiveness of Bus Signal Priority – Final Report* (January 2002). Contract No. DTRS98-G-0032, Report No. NCTR-416-04. Available online at <http://www.nctr.usf.edu/publications.htm>.

⁹ Intelligent Transportation Society of America, *An Overview of Transit Signal Priority* (September 2002). Available online at [http://www.itsa.org/new.nsf/vLookupReports/\\$first!OpenDocument](http://www.itsa.org/new.nsf/vLookupReports/$first!OpenDocument).

7. Recommendations

Given the APTS activities that have taken place in Florida to date, coupled with the perspectives offered by some of the State's transit experts, and current APTS activities in the Districts and the FDOT PTO, the following initiatives are recommended to mainstream APTS into Florida's ITS Program:

- The FDOT ITS Section should develop and conduct, through each District PTO representative with assistance from the FTPN as needed, a statewide survey to clearly define statewide APTS needs and priorities. To the greatest extent possible, the ITS Section must prioritize the Florida needs that are aligned with national APTS priorities, such as electronic fare payment systems, fleet management systems, TSP, and BRT.
- The FDOT should reevaluate all District ITS architectures to clarify APTS components, and then begin to specify and prioritize APTS projects. Local and regional APTS projects can best be identified in the anticipated cost feasible plan (CFP) for nonlimited access systems. Each local ITS committee must include transit representation.
- The FDOT must increase awareness of services offered by the RAPTS program, and enhance RAPTS' APTS planning and project management services with technical engineering expertise. Also, the FDOT should assist RAPTS in organizing and conducting scanning missions, and publishing Florida APTS case studies.
- The FDOT PTO staff should expeditiously complete its work on identifying signalized intersections eligible for TSP; review this work thoroughly with District ITS engineers to seek concurrence and programmed funding; and use this effort to establish a continuous working relationship in ITS between each respective District ITS engineer and PTO manager.
- The ITS Section should encourage and invite regular APTS information exchange opportunities at ITS Working Group Meetings, and include APTS activities in individual District progress reports.
- The FDOT should encourage joint APTS procurements, deployments, and evaluations. To assist with this promotion, consideration should be given to adding a full-time PTO staff person in the TEOO ITS Section. This person should work closely with the Central Office and District PTOs.
- The RAPTS program and the FTPN should become active participants in the ITSA PT Forum, establishing a leadership role in coordination and integration of APTS development and deployment between state and local governments.