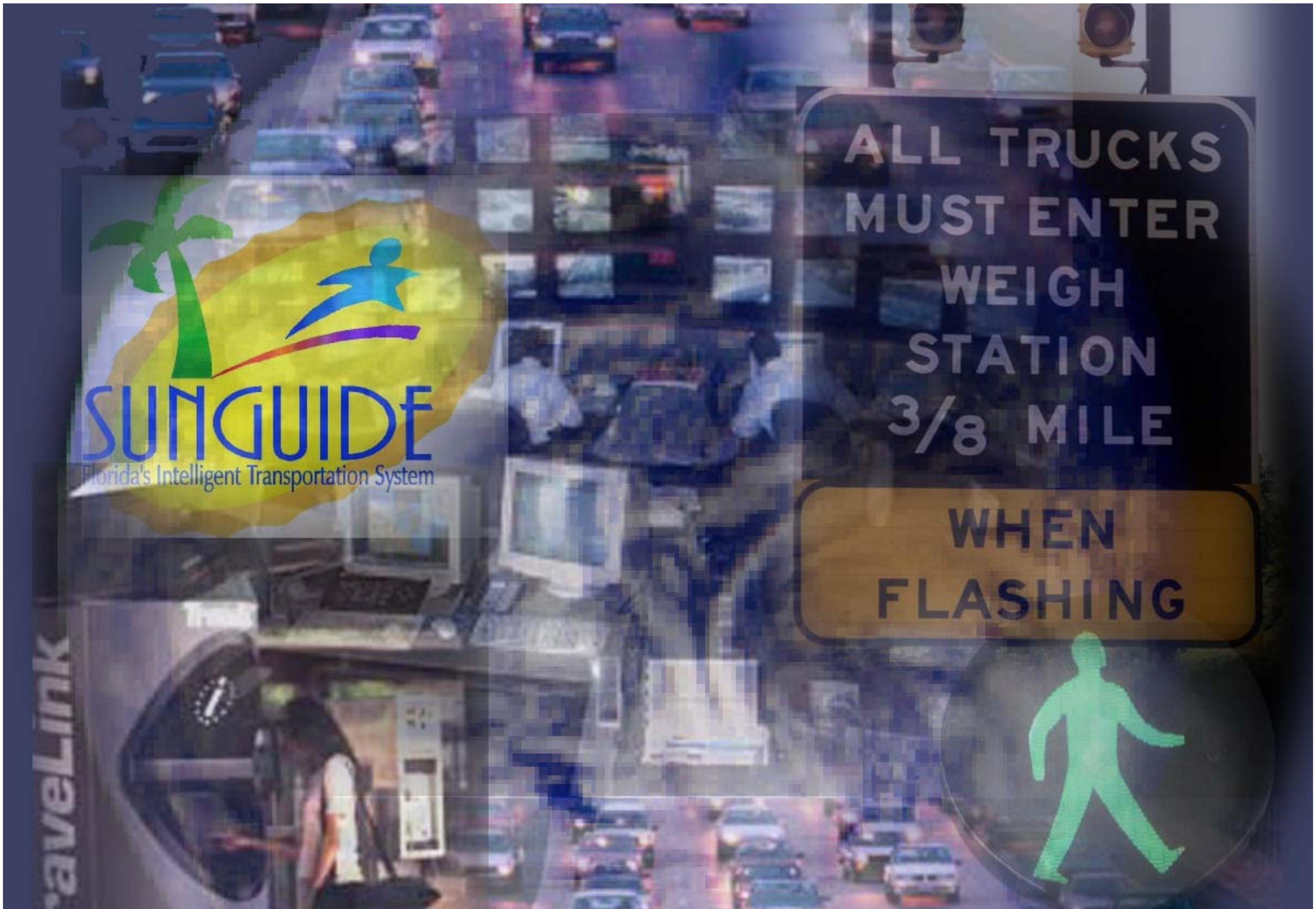

Intelligent Transportation Systems Plan: Saving Lives, Time, and Money

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January 2003

Document Control Panel	
Document Name:	Florida's Intelligent Transportation Systems Plan: Saving Lives, Time, and Money
File Location:	W:\ITS Program\ITS GC\TWO3-ITS Program Plan\Program Plan\January 2003 Finals\030130 ITS Plan V2.doc
Created By:	Terrel Shaw
Date Created:	June 28, 2002
Version Number:	2
Reviewed By:	Travis Justice, Diane Quigley
Modified By:	Pamela Hoke
Date Modified:	January 30, 2003

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List of Acronyms

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ABT	Alcohol, Beverage and Tobacco
AD	Archived Data
ADA	Americans with Disabilities Act
ADMS	Archived Data Management Subsystem
AHS	Automated Highway System
API	Application Program Interface
APTA	American Public Transit Association
APTS	Advanced Public Transportation System
ARG	Autonomous Route Guidance
ASTM	American Society for Testing and Materials
ATC	Advanced Transportation Controller
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
AVI	Automated Vehicle Identification
AVL	Automated Vehicle Location
AVSS	Advanced Vehicle Safety System
CCTV	Closed-Circuit Television
CEA	Consumer Electronics Association
CMAQ	Congestion Mitigation Air Quality
CMS	Changeable Message Sign
CORBA	Common Object Request for Broker Architecture
CR	County Road
CV	Commercial Vehicle
CVIEW	Commercial Vehicle Exchange Window System
CVISN	Commercial Vehicle Information Systems Network
CVO	Commercial Vehicle Operations
DARC	Data Radio Channel
DASH	Daytona Area Smart Highway
DATEX	Data Exchange
DHSMV	Department of Highway Safety and Motor Vehicles
DMS	Dynamic Message Sign
DOT	Department of Transportation
DRG	Dynamic Route Guidance
DSRC	Dedicated Short-Range Communications

E-911 — Enhanced 911
EIA — Electronic Industries Association
EM — Emergency Management
EMC — Emergency Management Center
EOC — Emergency Operations Center
EPS — Electronic Payment System
ESS — Environmental Sensor Station
ETC — Electronic Toll Collection
FAMU — Florida Agricultural and Mechanical University
FCC — Federal Communications Commission
FDLE — Florida Department of Law Enforcement
FDOT — Florida Department of Transportation
FEMA — Federal Emergency Management Agency
FFN — Florida Fiber Network
FHP — Florida Highway Patrol
FHWA — Federal Highway Administration
FIHS — Florida Intrastate Highway System
FMS — Freeway Management System
FON — Fiber Optic Network
FSU — Florida State University
FTA — Federal Transit Administration
FTP — File Transfer Protocol
GUL — General-Use Lane
HAR — Highway Advisory Radio
HARTline — Hillsborough Area Regional Transit
HAZMAT — Hazardous Materials
HEFT — Homestead Extension of Florida's Turnpike
HOT — High Occupancy Toll
HOV — High Occupancy Vehicle
HPMS — Highway Performance Monitoring System
ICC — Interstate Commerce Commission
IEEE — Institute of Electrical and Electronics Engineers
IFTA — International Fuel Tax Agreement
IMMS — Incident Management Message Set
IMS — Incident Management System
IP — Internet Protocol
ISP — Information Service Provider
ITN — Invitation to Negotiate

ITS..Intelligent Transportation System
IVR.. Interactive Voice Response
JPO..Joint Program Office
JTF ....Joint Task Force
LEETRAN .... Lee County Transit
LOA ....Letter of Agreement
LOS..Level of Service
LYNX .... Central Florida Regional Transportation Authority
MCAT...Manatee County Area Transit
MCCO..Motor Carrier Compliance Office
MCO ....Maintenance and Construction Operations
MDTA.. Miami-Dade Transit Authority
MDX .... Miami-Dade Expressway Authority
MIST™ ....Management Information System for Transportation™
MOT... Maintenance of Traffic
MOU ....Memorandum of Understanding
MPH...Miles Per Hour
MPO.. Metropolitan Planning Organization
MPOAC ....Metropolitan Planning Organization Advisory Council
MS/ETMCC........ Message Set for External Traffic Management Center Communications
NEPA ....National Environmental Policy Act
NHS... National Highway System
NITSA..*National ITS Architecture*
NTCIP....................................National Transportation Communications for ITS Protocol
OOCEA...Orlando-Orange County Expressway Authority
ORT..Open Road Tolling
PAHS ....Partially Automated Highway System
PD&E...Project Development and Environmental Manual
PMPP ....Point-to-Multipoint Protocol
P-Spec ....Process Specification
PSTA.. Pinellas Suncoast Transit Authority
PTMC... Portable Traffic Management Center
PTO .... Public Transportation Office
RCC...Regional Communications Center
RCI ....Roadway Characteristics Inventory
RITE.. Research Institute for Traffic Engineering
ROO ....Regional Operating Organization
RR Service Patrol...Road Ranger Service Patrol

RTMC .... Regional Traffic Management Center
RWIS........ Road Weather Information System
SAE .... Society of Automotive Engineers
SEMP .... *Systems Engineering Management Plan*
SEOC .... State Emergency Operations Center
SIS........ Strategic Intermodal System
SITSA........ *Statewide ITS Architecture*
SMIS .... Surveillance Motorist Information System
SR........ State Road
STIC6........ Subcarrier Traffic Information Channel
STMC........ Satellite (or Secondary) Traffic Management Center
STMF .... Simple Transportation Management Framework
STMP .... Simple Transportation Management Protocol
STP........ Surface Transportation Program
SUL .... Special-Use Lane
TalTran........ Tallahassee Transit
TCP .... Transmission Control Protocol
TEA-21 .... Transportation Equity Act for the 21st Century
TERL........ Traffic Engineering Research Laboratory
THCEA .... Tampa-Hillsborough County Expressway Authority
TiRN™ .... Traveler Information Radio Network™
TMC........ Traffic Management Center
TMDD........ Traffic Management Data Dictionary
TranStat........ FDOT's Transportation Statistics Office
Tri-Rail........ Tri-County Commuter Rail Authority
TRS .... Telecommunications Relay Services
TTMS........ Telemetered Traffic Monitoring Sites
UCF........ University of Central Florida
UDP........ User Datagram Protocol
USDOT .... United States Department of Transportation
VMS........ Variable Message Signs
VMT........ Vehicle-Miles Traveled
VOTRAN........ Volusia County Transit Agency
VTMC .... Virtual Traffic Management Center
WIM........ Weigh-in-Motion
WPA........ Work Program Administration

Executive Summary

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.

Saving Lives…

In the year 2000, we lost nearly 2,000 people along our interstates, turnpikes and other limited-access facilities. Over the next decade, intelligent transportation systems (ITS) could save 120 lives through improved traffic flow, information and management These are people who go home at the end of the day who would not have without the introduction of these technologies. Similarly, 11,000 victims of traffic related injuries and nearly 26,000 accidents could be spared by operating and managing our system better using ITS over the next decade.

Saving Time…

ITS could save 20 million hours lost in congestion over the next decade. This translates into more than 6,600 workdays each year!

Saving Money…

Travelers in Florida could save $3 billion in safety benefits and travel-time savings over the next decade from the introduction of ITS technologies.

What are Intelligent Transportation Systems?

Intelligent transportation systems (ITS) are the application of information systems and technologies to serve transportation.

Ready, Set . . . Deploy

To support the coordinated deployment of ITS on a statewide basis, the Florida Department of Transportation (FDOT) established an ITS Office in July 2000. The mission of the ITS Office is to coordinate and promote the deployment of ITS and incident management activities conducted by FDOT. **This *ITS Plan* reflects the major actions and the anticipated benefits that will be derived from coordinated ITS deployments in Florida.** This *Plan* was prepared as the first major step in the development of this program. It outlines an agenda for the successful deployment of ITS to ensure that FDOT maximizes the benefits delivered to the citizens of Florida for the investments made in better managing and operating its transportation system.

The ITS Office was established as a result of a strategic planning process adopted by FDOT that culminated in *Technical Memorandum No. 5.2 – ITS Strategic Deployment Prioritization Plan*. As a result of the *Plan* and continuing program development activities, four major program areas were established in the ITS Office:

- Telecommunications Program;
- ITS Architectures and Standards Program;
- ITS Program Management; and
- Commercial Vehicle Operations (CVO)/Electronic Toll Collection (ETC) Program.

The major initiatives being undertaken by the ITS Office include the following:

- Guide the deployment of a communications backbone to serve ITS on major transportation corridors throughout the state;

- Adopt a corridor approach to the implementation of the principal Florida Intrastate Highway System (FIHS) limited-access corridors (Figure ES.1) and develop conceptual systems engineering solutions for these corridors to support procurement and deployment of ITS services;

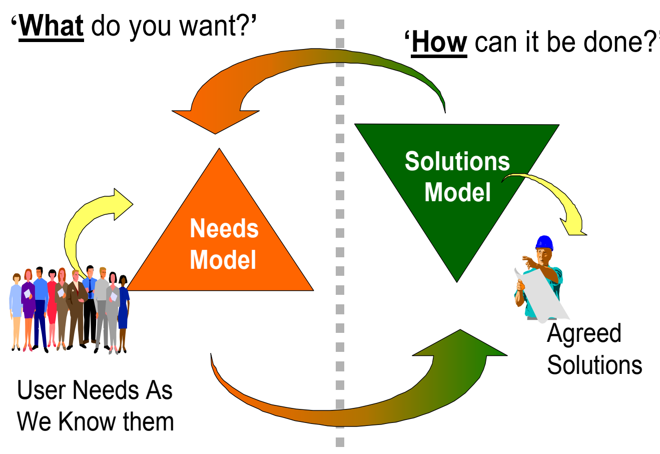
Figure ES.1 – FIHS Corridors

- Establish statewide standards and specifications for ITS that include the resolution of disparate traffic management center (TMC) software;
- Support the deployment of a statewide central data warehouse to support advanced traffic/traveler information services;
- Support the deployment of information and communications technologies to serve commercial vehicles and promote electronic payment systems (EPS);
- Provide technical support and assistance to FDOT's district offices and other partners; and
- Support ITS professional capacity building to provide a qualified work force in support of ITS deployments.

Process for Developing the ITS Plan

This *ITS Plan* was developed in cooperation with the FDOT's district offices and through a coordinated review of ITS needs on a statewide basis. In determining needs, traffic growth and the resulting safety and congestion problems were identified. Existing ITS corridor master plans were used extensively and new analyses were conducted to ensure that consistent ITS deployments will be achieved on the corridors to support program goals and objectives. Since this *ITS Plan* reflects the first phase of a strategically-prioritized statewide ITS, it emphasizes a corridor approach on Florida's limited-access facilities that consists of interstates, turnpikes, and other expressways to provide freeway and incident management services and advanced traveler information systems (ATIS). Once this critical backbone of ITS services is deployed along the FIHS limited-access routes, long-term integration and coordination of Florida's advanced traffic management systems (ATMS) on other state-maintained facilities and advanced public transportation systems (APTS) will be pursued to provide a coordinated, integrated, and effective statewide ITS .

Figure ES.2 – ITS Needs Model and Solutions Model Relationship



The development of each of the ITS corridor master plans prepared by the district offices involved the general public, local governments, business interests, and our transportation partners such as law enforcement, emergency management, and metropolitan planning organizations (MPOs). Each *ITS Corridor Master Plan* defines a preferred approach for implementing ITS within that district or region. The results of these plans were compiled and coordinated along each corridor to ensure a consistent approach to freeway and incident management will be achieved. Specific recommendations for ITS projects to fully deploy ITS and integrate with existing systems and programmed projects were then made.

These ITS project needs were then compiled into a statewide database. This database along with additional criteria based on safety, congestion, persons served, evacuation coordination, CVO, production readiness, and coordination with capacity improvement projects was then analyzed to prioritize and recommend projects for funding within the *ITS Plan*. These priorities were then compared to anticipated funding levels and selected to form a phased implementation plan. The anticipated funding to support operations and management of these deployments was also considered although they are not funded through this program.

Major Elements of the ITS Plan

Current Situation

The inventory of existing ITS-related services and elements included a comprehensive review of current ITS services to ensure that proposed projects are properly coordinated to make maximum use of FDOT's existing investments and needs for interoperability are identified. The inventory also included a comprehensive review of other significant features that affect the need for ITS (such as traffic crash locations) and stakeholders who are affected by ITS deployments (major trade and tourism attractions).

Mission, Vision, and Goals

A detailed assessment of the needs, issues, problems, and objectives for ITS services was performed. These needs, issues, problems, and objectives were used to define the program mission, vision, goals, and objectives. These goals and objectives were linked to the *Florida Transportation Plan* and supporting goals to ensure ITS deployments are aligned with the FDOT's overall mission.

Concept of Operations and Business Plan

Technical Memorandum No. 4.1 – Concept of Operations and *Technical Memorandum No. 4.2 – ITS Business Plan* were prepared to outline how ITS services will be managed, operated, implemented, and maintained. The *Concept of Operations* discusses specific roles and responsibilities for corridor deployments from an operational requirements perspective. The *ITS Business Plan* identifies major program objectives, specific strategies and tactics to accomplish these objectives, and the roles and responsibilities of the interested parties in carrying out the *Plan*.

Systems Engineering Management Plan (SEMP)

Concurrent to the development of the *ITS Plan*, a comprehensive systems engineering approach that addresses the entire life-cycle of ITS deployments was proposed that draws on the principles of professionally accepted techniques in the electronic and information systems industries and was tailored to the transportation industry. This approach is being developed further through a *Systems Engineering Management Plan (SEMP)* that will accompany this *ITS Plan* to promote a consistent approach to ITS deployments; reduce the time required to move from concept to deployed systems; ensure that the systems deployed meet the system's users and operators needs; reduce the costs of deploying systems; ensure the latest proven technologies are used; reduce the number of engineering changes and, therefore, improve the time-reliability and reduce the costs of deployment; improve system quality, reliability, and performance; improve communications during the engineering of the system; improve the ability to sustain and upgrade system products after deployment; and reduce development risks.

ITS Corridor Master Plans

Along each of the five principal FIHS limited-access corridors – Interstate 4 (I-4), Interstate 10 (I-10), Interstate 75 (I-75), Interstate 95 (I-95), and Florida's Turnpike – an *ITS Corridor Master Plan* was prepared that promotes a corridor approach to deployment of ITS. These *ITS Corridor Master Plans* were derived from ITS plans previously prepared by the districts and new systems engineering analyses that resulted in recommendations to support a consistent approach to ITS deployments and support overall program objectives.

This systems engineering approach included the development of a common logical architecture (or high-level approach to ITS deployments) and corridor-specific physical architectures (the detailed requirements, data flows, stakeholders, and standards associated with each activity) that reflect the unique operating characteristics along the corridors using the *National ITS Architecture (NITSA).* The *NITSA* was developed by the Federal Highway Administration (FHWA) and adopted for Florida in the *Statewide ITS Architecture (SITSA)*. Several recommendations for updates to the *SITSA* were made including adoption of:

- Services to support evacuation coordination through a new user service and market package; and

- Services to support maintenance and construction activities through a new user service and market package.

The systems engineering analysis performed in this study satisfies the FHWA *Rule 940*, *Intelligent Transportation Systems Architectures*, published April 8, 2001, in the Federal Register that requires all federal-aid projects conform to a systems engineering approach and be consistent with a regional architecture.

Advanced Traveler Information Systems (ATIS)

Concurrent to the preparation of the *ITS Corridor Master Plans*, feasibility studies were conducted on three possible ATIS market areas: 13 counties along the I-4 corridor from Tampa to Daytona Beach, four counties along I-75 from Naples to Manatee, and four counties in the Jacksonville area along I-95 and I-10. These feasibility studies included detailed marketability analysis and development of business plans to support ATIS within the regions. Additionally, a S*tatewide 511 Implementation Plan* was prepared to support deployment of a single source for traveler information in Florida.

Commercial Vehicle Operations (CVO)/Commercial Vehicle Information Systems and Networks (CVISN) Business Plan

Concurrent to the preparation of the *ITS Corridor Master Plans*, FDOT prepared a business plan for the use of technology to support the CVO through the use of the Commercial Vehicle Information Systems and Networks (CVISN). The business plan recommended several strategies for electronic clearance, credentialing, and other information systems to support CVO.

Ten-Year ITS Cost Feasible Plan

This *Ten-Year ITS Cost Feasible Plan* summarizes the phased implementation plan for ITS deployments along the principal FIHS limited-access corridors and for ATIS.

Anticipated Impacts and Benefits

Impacts – No adverse direct or secondary impacts are anticipated from the deployment of these ITS services. During design and construction, the specific siting of these field devices will need to be evaluated and relocated, if necessary, to avoid or reduce any impacts. Since all of the deployments are planned to occur on FDOT-owned right-of-ways no long-term permanent adverse impacts are anticipated.

Benefits – To determine the effectiveness of the proposed ITS services for the principal FIHS limited-access corridors, the following benefits were identified from studies around the country and were determined to be applicable to Florida's limited-access facilities:

- A 15 percent decrease in delay is anticipated as a result of incident management systems (IMS).
- A 15 percent reduction in injury-related accidents and fatalities is anticipated as a result of freeway management services.
- A 35 percent reduction in property-damage only accidents is anticipated as a result of freeway management services.

- A 7:1 benefit to cost ratio is anticipated for the sum of CVO that will be deployed in FDOT's CVISN program and the virtual weigh station proposed for I-4 in the Tampa area.

- Benefits associated with ATIS include reductions in travel time and operating costs. Additional benefits are anticipated from congestion avoidance and improvement in the quality of driver convenience. A generally accepted benefit to cost ratio of 1.5:1 was used to estimate these benefits. However, the greatest benefits of ATIS are improved customer service and providing drivers with the opportunity to avoid congestion.

- Benefits associated with smart work zones are anticipated to include reductions in travel time and operating costs, reductions of accident rates and the severity of accident rates in work zones, and improvement in the quality of driver information.

The ITS projects identified in this *ITS Plan* will provide significant benefits resulting from the ***saving of lives, time, and money*** for travelers and commercial vehicles operating along the limited-access corridors.

Figure ES.3 – Florida's Major Intelligent Transportation Systems (ITS)

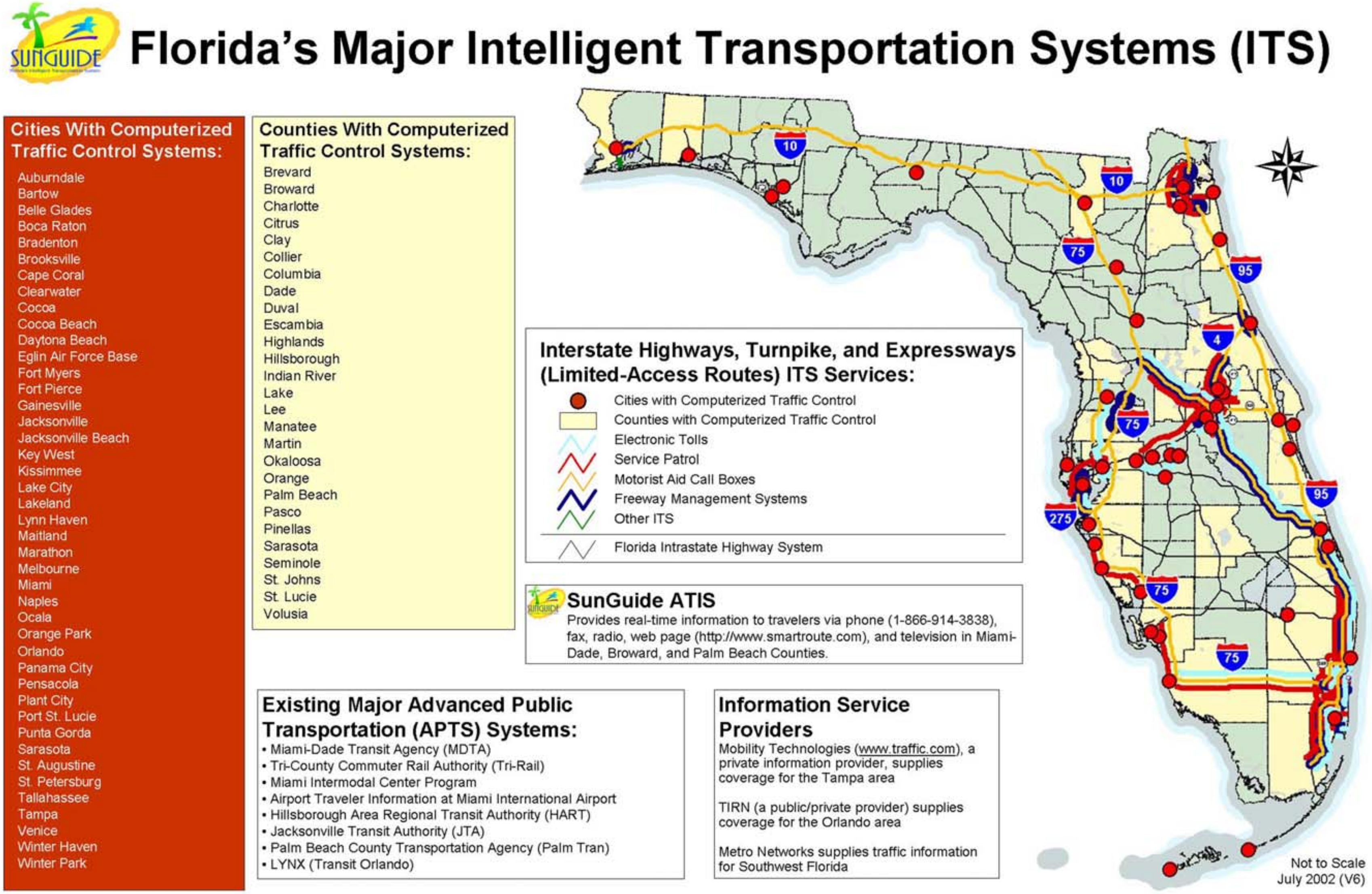


Figure ES.4 – Florida Major Intelligent Transportation Systems (ITS) Inset Map

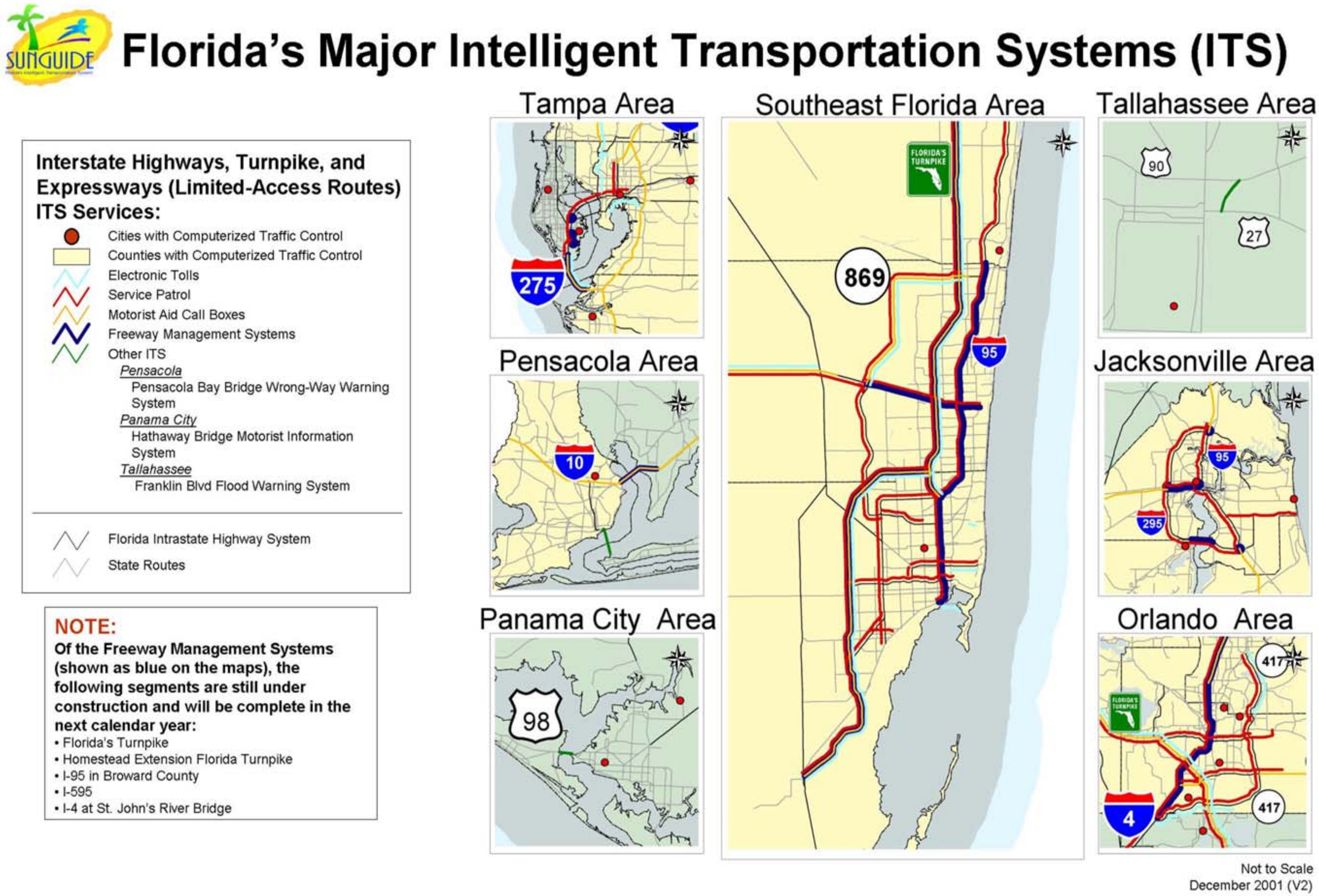


Figure ES.5 – Intelligent Transportation Systems (ITS) Needs Map

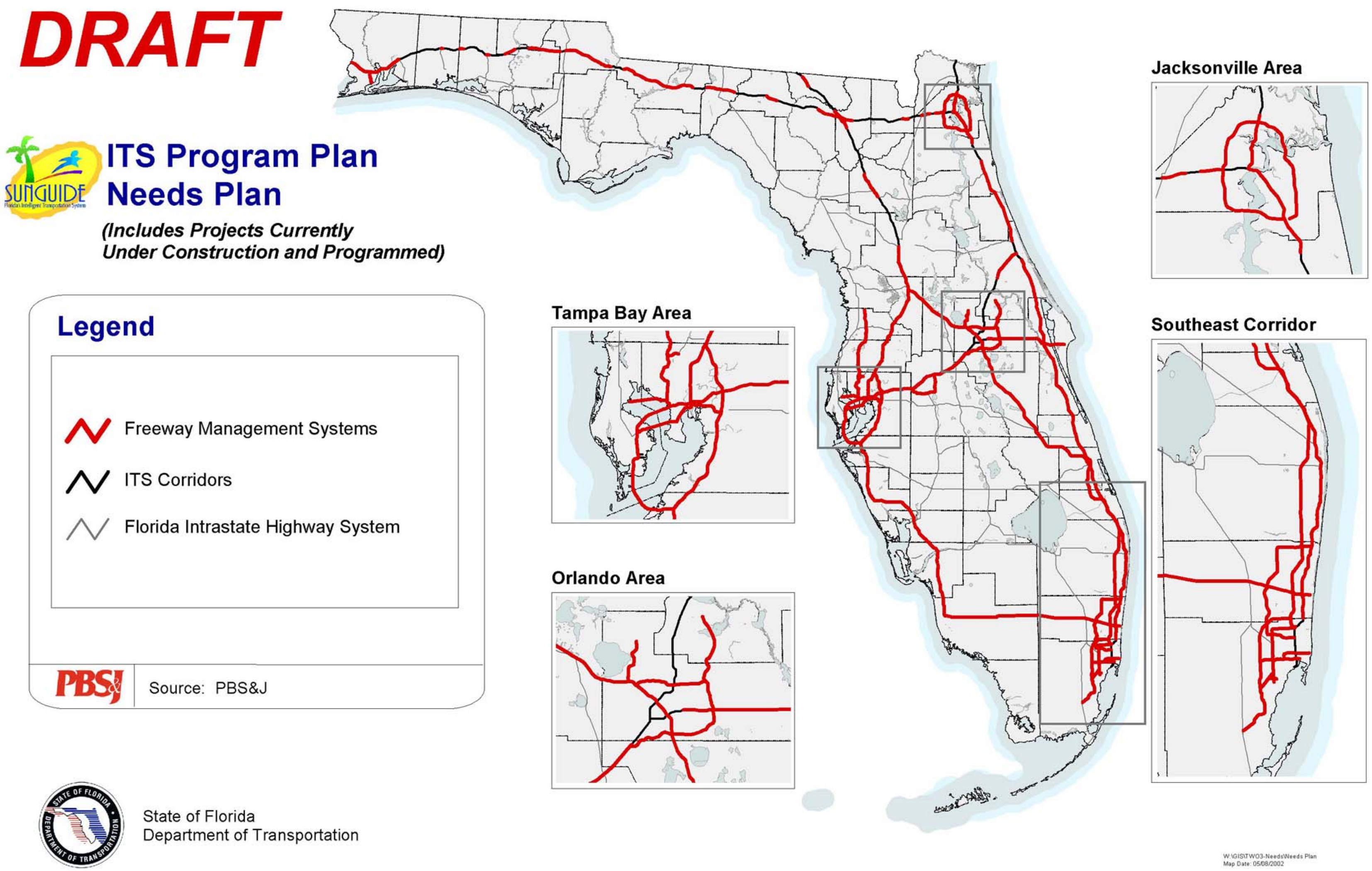
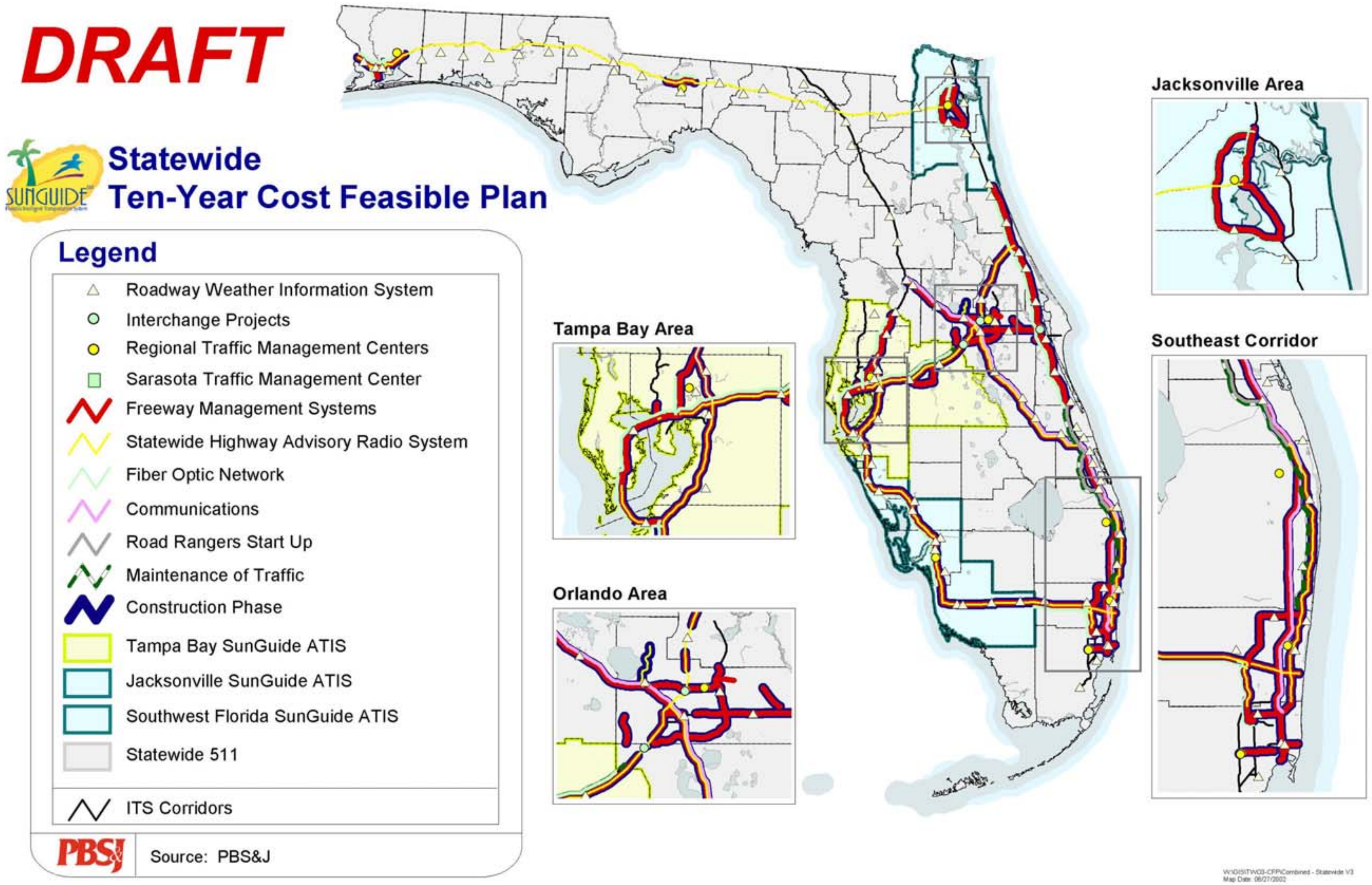


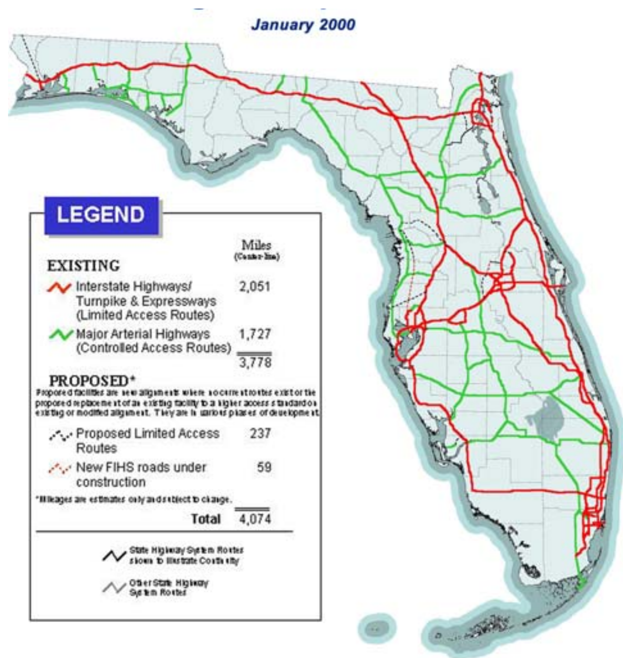
Figure ES.6 – Statewide *Ten-Year ITS Cost Feasible Plan*



1. Introduction

1.1 Background

Figure 1.1 – FIHS Existing and Proposed Routes



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, the 16 million residents of Florida, and one of the United State's fastest growing populations is outpacing the ability of the state and local governments to build new highways to meet this demand. For example, on the FIHS – a priority system of about 3,778 miles of freeways, toll roads, and intercity arterials – travel demand, measured in vehicle-miles traveled (VMT), increased 43 percent and the percent of travel that is congested during peak conditions (5:00 to 6:00 PM) increased 40 percent from 1990 to 1999 [FDOT's Transportation Statistics (TranStat) Office]. During the same period, FDOT invested more than $3.1 billion in construction only on the FIHS. This investment resulted in a 10.3 percent increase in the number of lane-miles. Florida's growth is not expected to subside. By the year 2020, more than 21 million residents and 80 million visitors are projected. The 2020 system must also respond to an anticipated three-fold increase in Florida's imports and exports. VMT is expected to increase by about 60 percent, transit trips by about 40 percent, and air travel will more than double. Traditional roadway expansion and infrastructure management 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.

The ITS Office provides statewide program management and leadership that will be used to leverage FDOT's resources and implement fully-integrated statewide ITS services in a cost-effective manner. This program will build on Florida's history of success in ITS deployments.

1.2 FDOT's ITS Office

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 ITS Office was established as a result of a strategic planning process adopted by FDOT. Four major program areas were developed: the Telecommunications Program, ITS Architectures and Standards, ITS Program Management, and CVO/ETC.

The major initiatives being undertaken by the ITS Office are:

- Guide the deployment of a communications backbone to serve ITS on major transportation corridors throughout the state;
- Adopt a corridor approach to the implementation of the principal FIHS limited-access corridors and develop conceptual systems engineering solutions for these corridors to support procurement and deployment of ITS services;
- Establish statewide standards and specifications for ITS that include the resolution of disparate TMC software;
- Support the deployment of a statewide central data warehouse to support ATIS;
- Support the deployment of information and communications technologies to serve commercial vehicles and promote EPS;
- Provide technical support and assistance to FDOT's district offices and other partners; and
- Support ITS professional capacity building to provide a qualified work force in support of ITS deployments.

1.3 Purpose

The purpose of the *ITS Plan* is to summarize the strategies, tactics, and related roles and responsibilities of the key stakeholders involved in the deployment of ITS along the principal FIHS limited-access corridors.

The FIHS limited-access corridors are identified in Figure 1.2 and the total mileage covered is identified in Table 1.1.

Figure 1.2 – FIHS Limited-Access Corridors

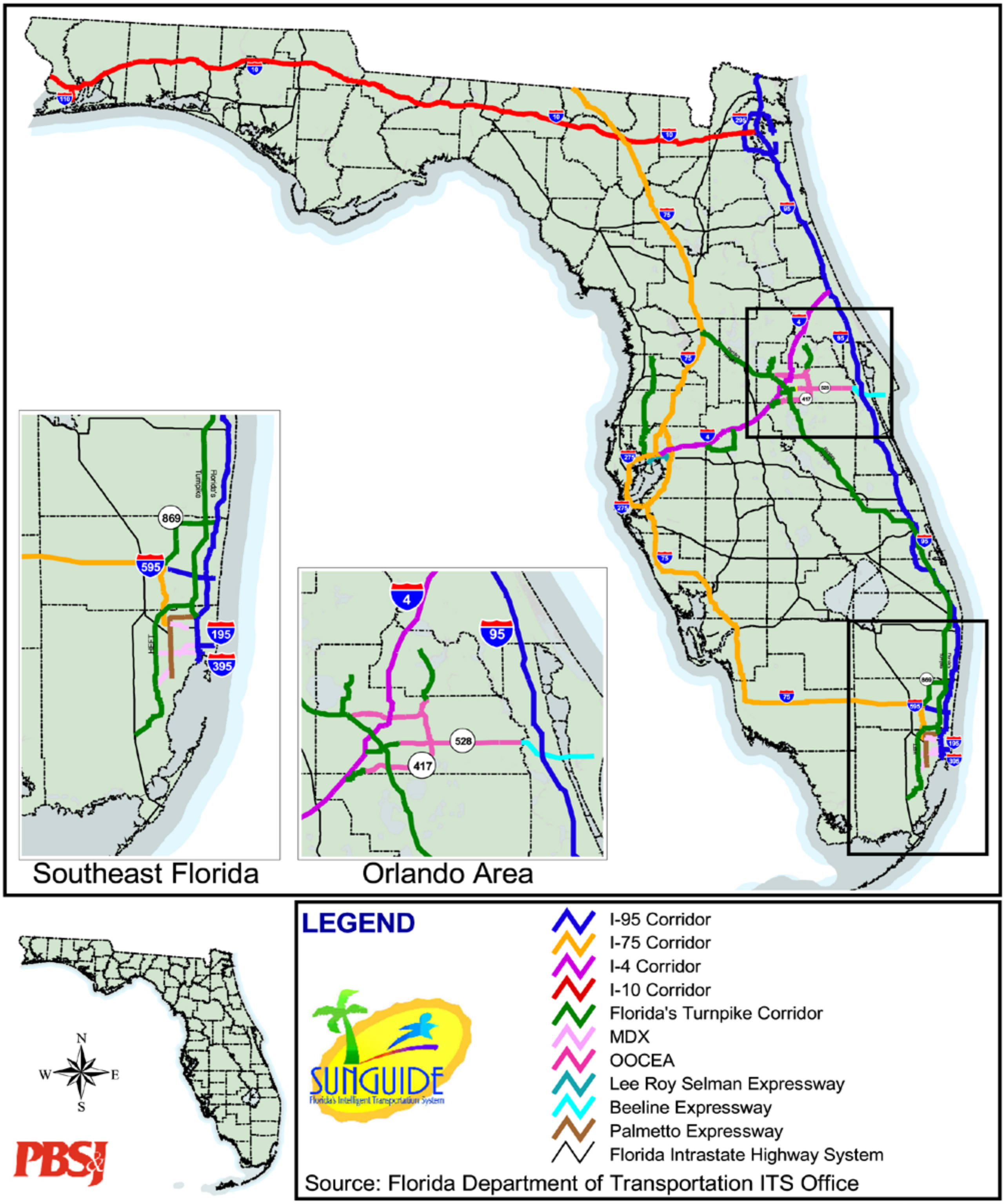


Table 1.1 – FIHS Limited-Access Facility Mileage by Corridor

I-10 Corridor	
I-10	362.28
I-110	6.94
	369.22
I-95 Corridor	
I-95	382.07
I-195	4.42
I-295	35.51
I-395	1.29
I-595	12.86
SR 9A	20.00
	456.16
I-75 Corridor	
I-75	470.74
I-175	1.44
I-275	60.82
I-375	1.34
	534.33
I-4 Corridor	
I-4	132.30
	132.30
Bee Line Corridor	
SR 528	17.72
	17.72
THCEA Corridor	
SR 618	13.96
	13.96

Turnpike	
SR 91	264.48
SR 417	18.42
SR 528	8.38
SR 821	47.86
SR 869	23.81
SR 429	9.80
SR 589	15.23
SR 570	24.15
Suncoast	41.43
	453.56
Palmetto Corridor	
SR 826	24.69
	24.69
MDX Corridor	
SR 112	4.62
SR 836	11.76
SR 874	7.20
SR 924	5.38
	28.95
OOCEA Corridor	
SR 408	17.03
SR 417	30.38
SR 528	27.25
	74.66

Total Corridor Mileage
2105.55

2. Current Situation

2.1 Freeway and Incident Management Services

Florida's ITS services are rapidly emerging on the principal FIHS limited-access corridors. However, the current coverage of existing critical services varies widely. Table 2.1 summarizes the coverage of major surveillance devices for incident detection and verification, Road Ranger (RR) Service Patrols, and traveler information technologies along the five principal FIHS limited-access corridors – I-4, I-10, I-75, I-95, and Florida's Turnpike. Figures 2.1 and 2.2 illustrate this coverage graphically.

Table 2.1 – Existing Freeway and Incident Management Services

Mainline Corridors[1]	Existing Coverage (Percent of Miles)[2]					
	CCTV[3]	Vehicle Detectors[4]	Road Ranger Service Patrols	Motorist Aid Call Boxes	DMS	HAR[5]
I-4	34.2%	28.0%	64.3%	29.0%	22.9%	0.0%
I-10	2.6%	1.6%	6.0%	99.1%	0.7%	0.0%
I-75	0.0%	0.0%	36.4%	98.1%	0.0%	0.0%
I-95	4.6%	3.0%	29.7%	70.5%	5.2%	0.0%
Florida's Turnpike[6]	0.0%	0.0%	47.8%	100%	0.2%	4.9%
TOTAL	4.5%	3.4%	32.1%	86.4%	3.3%	0.8%

Source: PBS&J

[1] Mainline only; does not include other FIHS limited-access routes.
[2] The range of influence considered is one mile in each direction for closed-circuit television cameras (CCTV), a half-mile for a vehicle detection station, one mile in each direction for motorist aid call boxes, a half-mile for dynamic message signs (DMS), and three miles in each direction for highway advisory radio (HAR).
[3] Does not include CCTV at tollbooths.
[4] Does not include telemetered traffic monitoring sites (TTMS).
[5] Does not include the Traveler Information Radio Network (TiRN™).
[6] The Turnpike currently has three operational HAR stations. Six others are programmed. (Source: Turnpike Enterprise.)

Figure 2.1 – Existing Intelligent Transportation Systems (ITS)

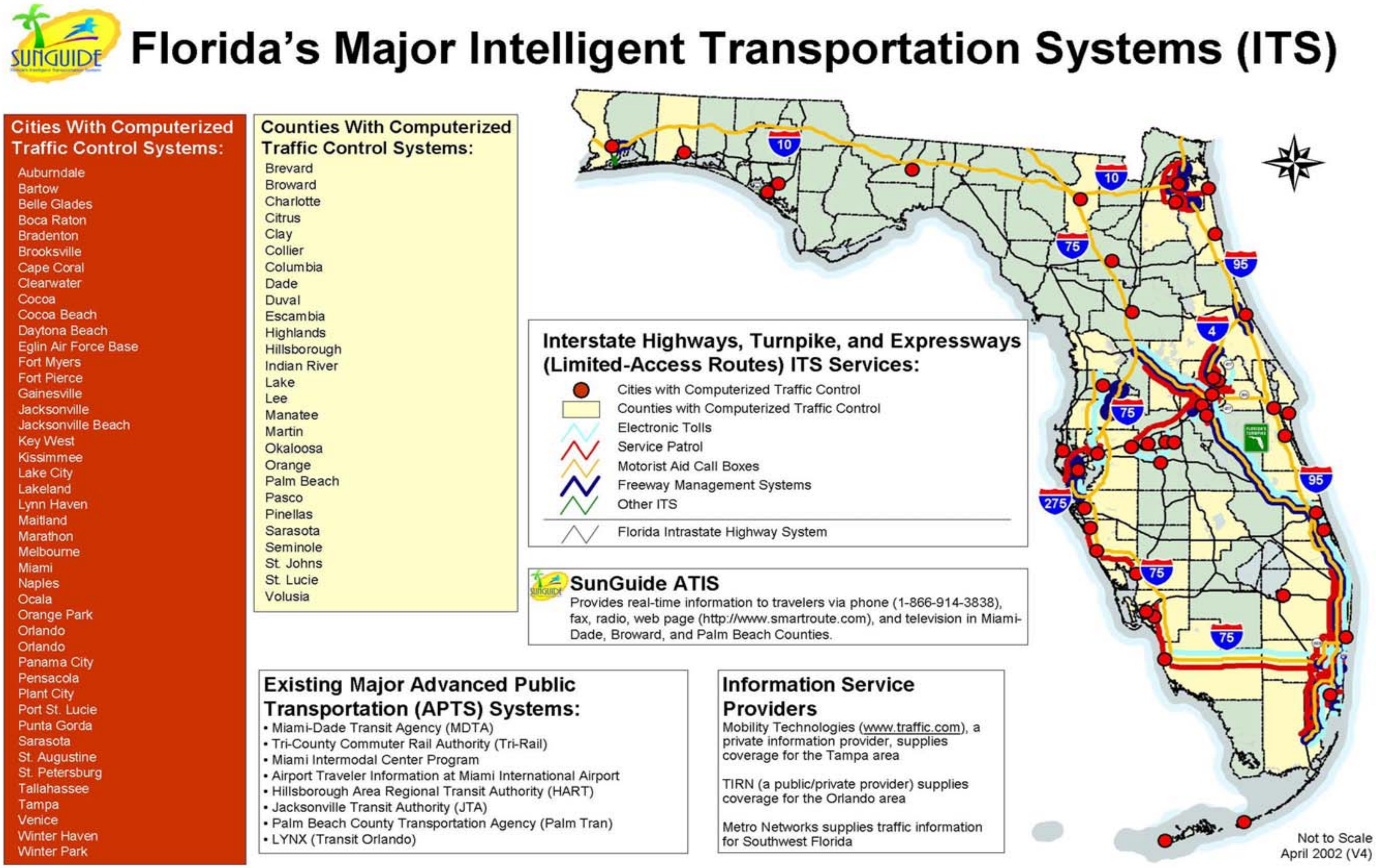
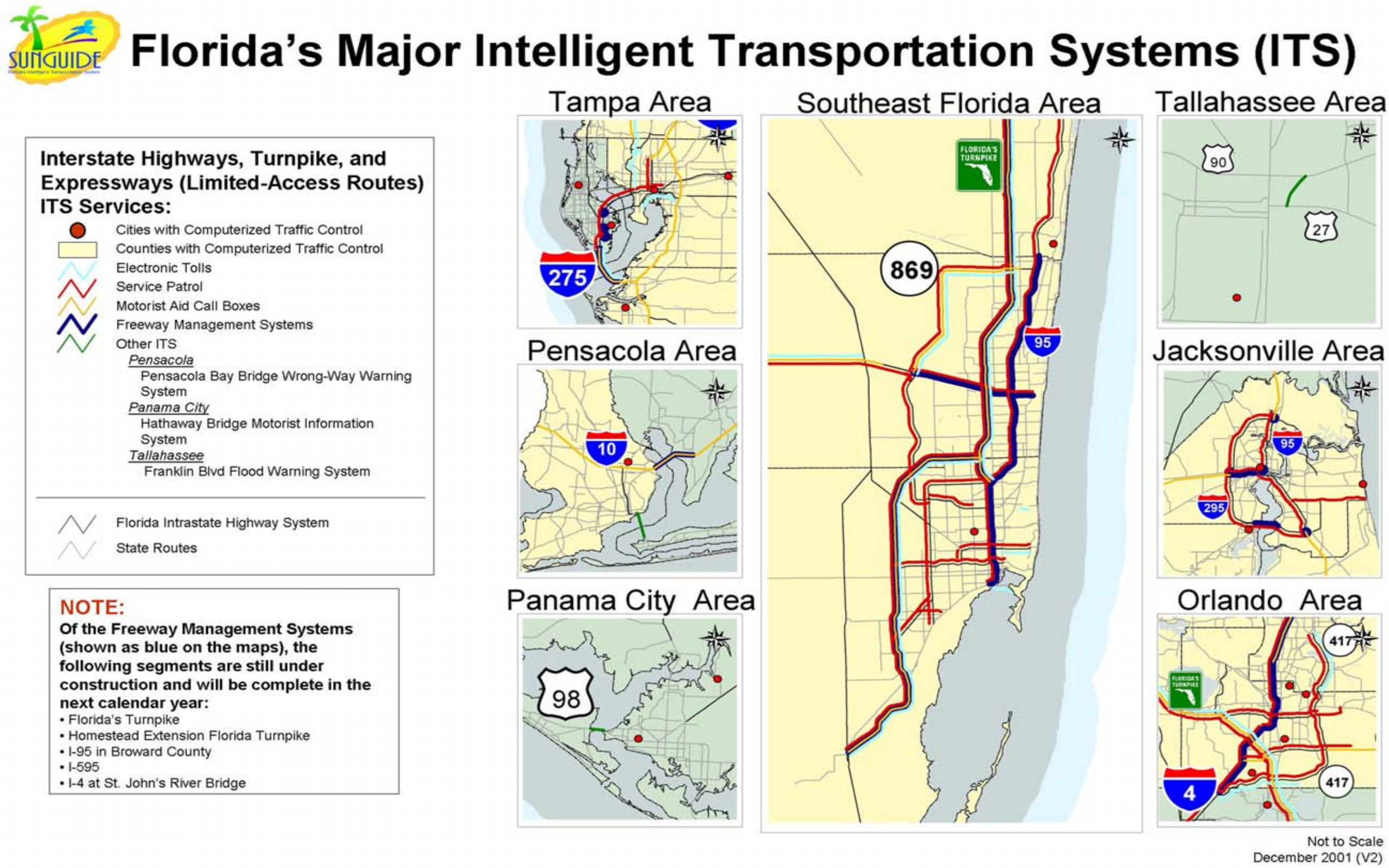


Figure 2.2 – Existing Intelligent Transportation Systems (ITS) Inset Map



2.2 Advanced Traveler Information Systems (ATIS)

In addition to freeway and incident management services, FDOT plans to provide a statewide ATIS, branded SunGuide℠, to be implemented over the next several years. These services include the collection of traffic and traveler information, road weather information, construction work zone information, lane closure information, incident information, and evacuation coordination information. These services may be provided through a variety of media including commercial radio, television, internet, subscriber-based customized information services, and 511 or interactive voice response (IVR) systems.

2.2.1 Southeast Florida SunGuide℠

Currently, the SunGuide℠ ATIS operates in the southeast Florida tri-county area, covering Miami-Dade, Broward, and Palm Beach counties. This ATIS is operated by a privately owned information service provider (ISP), SmartRoute Systems, a Westwood One Company, contracted by FDOT. Basic traffic, incident, and construction-related information is provided along the facilities shown in Figure 2.3. Transit and airport-related landside information is provided in the tri-county region as well. Information is disseminated through the internet, telephone, e-mail, and fax back services.

Figure 2.3 – Southeast Florida SunGuide℠ Coverage Area

2.2.2 Traveler Information Radio Network™ (TiRN™)

TiRN™ has operated since 1999 and provides traveler information on 1680 AM, WTIR, in Orange, Osceola, Seminole, and Brevard counties. TiRN™ was the nation's first 24-hour commercial radio network for traffic, weather, and tourism information. One hundred sixty one roadside signs advertise TiRN™ along I-4, I-95, and Florida's Turnpike in central Florida. Information disseminated is oriented to tourists in central Florida and other information during emergencies.

2.2.3 Highway Advisory Radio (HAR)

Florida's Turnpike currently operates nine HAR sites along the mainline. These sites are used to provide traffic and traveler information during major incidents and evacuations or severe congestion. The SunGuide^{SM} ISP will operate the HAR site existing in Southeast Florida.

2.2.4 511

In July 2000, the Federal Communications Commission (FCC) designated 511 as the United States' national traveler information telephone number. The FCC ruling does not address implementation issues and schedules, but leaves these matters for state and local agencies and telecommunications carriers to resolve. In 2005, the FCC will review the progress made around the country in implementing 511.

Two 511 implementations are active in Florida. In Southeast Florida, the existing telephone information numbers are being converted to 511. All information currently available using other SunGuide^{SM} media will be available to cellular and landline callers in Miami-Dade, Broward, and Palm Beach counties. An I-4 Hotline is also being planned to offer 511 service for cellular callers in Orlando for the areas where public agency data is available. In the very near term, this coverage will include I-4 from U.S. 27 in Polk County to County Road (CR) 471 in Volusia County, the I-4/I-95 Interchange area, and the State Road (SR) 528/I-95 Interchange area. Additional partners and information is being considered through the Regional ITS Consortium in Orlando.

2.3 Electronic Toll Collection (ETC)

SunPass® is a statewide prepaid toll program being implemented by FDOT on most of Florida's toll roads. The innovative system incorporates the latest in prepaid toll programs, saving commuters time and money, while creating more efficient, less congested roadways. The transponder, which allows motorists to have tolls electronically deducted from a prepaid account, costs \$25.00 (plus tax) and requires a minimum opening balance of \$25.00 – a \$50.00 start-up cost that has a full 45-day money back guarantee. Frequent users of the ***SunPass***® prepaid toll program will receive a ten percent (10%) rebate after 40 or more transactions are made each calendar month on Florida's Turnpike and participating non-Turnpike toll plazas. To ensure accuracy, ***SunPass***® transponders have several built-in self-tests that check key internal components such as memory and battery voltage each time the device passes through a ***SunPass***® toll lane. Transponders are warranted against manufacturing problems or defects for one year after the date of purchase. E-Pass, operated by the Orlando-Orange County Expressway Authority (OOCEA), provides a parallel service along their expressway facilities. E-Pass and ***SunPass***® have been interoperable since 2000. Together, ***SunPass***® and E-Pass have about 700,000 transponders in use in Florida and hope to reach 1,000,000 by 2005. ***SunPass***® is operated by the Office of Toll Operations, which is now an element of FDOT's Turnpike Enterprise.

Possible uses of transponders as vehicle probes to support vehicle travel times and speed for ATIS are being explored by the ITS Office.

2.4 Weigh-in-Motion (WIM)

Currently, nine weigh stations are located on interstate facilities throughout the state. Six of the nine are weigh-in-motion (WIM) stations with four more WIMs programmed for implementation within the near future. It is the Motor Carrier Compliance Office's (MCCO) goal to convert the remaining static scales along the interstate facilities to WIMs. WIMs are beneficial in decreasing travel delays, reducing queuing on the interstates, and improving truck mobility by allowing trucks to approach and go through these stations at up to 45 miles per hour (mph), where they are electronically weighed and cleared. Alternate lanes are provided for vehicles exceeding their weight limits to remove them from the main WIM lane and to prevent congestion within the station itself. These WIM upgrades are being implemented due to the increased amount of truck traffic along the roadways. Static weigh stations have several deficiencies associated with them. Operationally, trucks must stop to be weighed and cleared for travel on Florida's roads. This process creates truck queues that can be potentially hazardous to mainline interstate travel. Another area of concern with static weigh stations is the weave sections associated with trucks merging in and out of traffic both upstream and downstream from the station. WIMs will process larger truck volumes at a higher rate while also providing safer entrances and exits to their mainline facilities. Table 2.2 identifies the location of the existing and planned WIMs along the intrastate facilities.

Table 2.2 – Weigh-in-Motion (WIM) Sites

Facility	County	Location	Status
I-10	Columbia	Ellaville	Planned (10/01)
I-10	Escambia	Pensacola	Planned (07/02)
I-10	Jackson	Sneads	Existing
I-75	Charlotte	Punta Gorda	Existing
I-75	Hamilton	White Springs	Existing
I-75	Sumter	Wildwood	Existing
I-95	Flagler	Flagler Beach	Existing
I-95	Duval	Yulee	Existing
I-95	Martin	Martin County	Planned (12/04)
I-4	Polk	Relocating from Plant City to SR 33 in Polk County	Planned (FY 05/06)

Source: Motor Carrier Compliance Office (MCCO), 2001

3. Need for ITS and Proposed Deployment Concepts

3.1 Needs, Issues, Problems, and Objectives

The following needs, issues, problems, and objectives were identified for ITS deployments along the principal FIHS limited-access corridors. The needs, issues, problems, and objectives were organized based on FDOT's mission statement as follows:

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.

From this mission, FDOT derived four primary goals to carry out the mission. Associated with each goal are a number of objectives for implementation.

3.1.1 Safe Transportation – Moving People and Goods Safely

- In 1999, 2,290 people died on Florida's highways resulting in a fatal accident rate (2.1 per million vehicle-miles) higher than the national average (1.5 per million vehicle-miles). Less than one percent of these crashes were due to road-related conditions. Strategies are needed to provide a safer driving environment and to improve vehicular safety to reduce the potential for driver errors and severe accidents.

- FDOT's *FIHS Cost Feasible Plan* will be implemented as proposed, resulting in significant capacity improvement projects, interchange modifications, and related programs on a statewide basis along each of the major corridors. These programs will result in a significant number of construction work zones along these major corridors.

- Providing safe work zones and maintaining traffic along these high-traffic volumes is a priority needed to support FDOT's mission to provide "safe" transportation services.

- Highway-rail crossings are dangerous for vehicular and rail passengers. At-grade rail crossings near interchanges along I-95 at several locations present a safety problem as a result of queue formation along the mainline and within interchanges.

- The safety of commercial vehicle operators is dependent on reliable and predictable traffic flows at interchanges, weigh and inspection stations, and gates for intermodal facilities – such as rail, port, and airport cargo facilities. The formation of queues on these corridors is a safety concern for the commercial vehicle operators and other vehicles.

- Commercial vehicle operators seek safe environments at our rest and weigh stations where vehicles can be parked overnight to satisfy rest requirements of the Interstate Commerce Commission (ICC).

- Innovative technologies are needed to enhance the coverage and accuracy of inspection and enforcement of commercial vehicle safety requirements.

- Florida has the greatest risk of landfall of hurricanes in the nation requiring residents and visitors to respond quickly to events requiring evacuation. Based on the average since 1900, a named storm is anticipated to land in Florida once per year and a storm that requires a major evacuation is likely once every one to three years. Services are needed that can:

    - Support pre-planning for evacuations;
    - Manage traffic during evacuation scenarios;
    - Manage demand through communications with shelters and other safe harbors;
    - Provide route guidance information and information on traffic/travel conditions and weather including winds, rainfalls, and storm surges;
    - Support remote configuration management of highways during evacuation conditions or other emergencies;
    - Provide accurate and timely traveler information regarding incidents on evacuation routes;
    - Share emergency information among local and regional TMCs and emergency management facilities; and
    - Detect, verify, respond, and clear incidents and manage traffic around accidents, emergencies, and other incidents.

- A number of other weather and natural events affect traffic and transportation including flooding, fog, tornados, wildfires, and heavy rainfalls where unsafe driving conditions may exist or diversions of major corridors are required. Surveillance and information of when these unsafe conditions exist are needed to improve driving conditions and manage traffic.

- Improve and expand our ability to identify motorists in need and verify and respond to their needs in an efficient and cost-effective manner.

- Reduce the risk of accidents and other incidents by warning drivers of approaching congestion, inclement weather, steep downgrades, sharp curves, and other hazardous conditions.

3.1.2 System Management – Preservation and Management of Florida's Transportation System

- Four of Florida's metropolitan areas are severely congested and rank among the nation's fifty most congested areas: Miami, Orlando, Tampa, and Jacksonville. (Source: 2000 Urban Mobility Study, Texas Transportation Institute.) In Florida's seven largest urbanized counties (those with 500,000 or more in population including Miami-Dade, Broward, Palm Beach, Pinellas, Hillsborough, Orange, and Duval), the amount of traffic that is congested along these corridors doubled from 1990 to 1999. (Source: Florida's Mobility Performance Measures Program.) In order to manage the efficiency of the transportation system, the following objectives are needed:

  - Improve travel times along the corridors;
  - Improve predictability and reliability of travel times;
  - Reduce accidents and other incidents during normal flows that result from congestion and delays that result from "rubber-necking" during incidents;
  - Reduce congestion-related delays by reducing queues and spillback from other facilities;
  - Reduce delays caused by congestion in construction work zones;
  - Manage traffic accessing these major corridors at interchanges to improve through-put and traffic flow;
  - Reduce unnecessary delays at tollbooths; and
  - Reduce unnecessary delays at the gates of intermodal facilities.

- In addition to managing traffic flows, additional alternatives are needed to enable coordinated regional transportation operations by sharing information among regional traffic operations centers and agencies to maximize efficiency of the system and demand between modes. Information to support and promote transit and other multi-modal use and manage transit vehicles or fleets has the potential to reduce congestion on highways and increase mobility.

- Commercial vehicles present a considerable loading on our roadway infrastructure and proper enforcement is needed to eliminate illegally over-weight vehicles that cause damage to pavement and bridges.

- Improve our abilities to detect, verify, respond to, and clear incidents to minimize the impacts on traffic flow.

- Improve traveler information to better manage traffic and inform travelers of delays and breakdowns in our largest metropolitan areas, even when no alternative can be offered to divert or re-route travelers to other modes or roadways. Traveler information services are valuable communications tools that can help us manage our system more efficiently by modifying driver behavior and increasing awareness of traffic conditions.

- Technologies are needed to support the operations and management of alternate highway configurations such as special-use lanes (SULs) that serve high occupancy vehicles (HOVs), operate as express toll lanes, provide preferences to commercial vehicles or transit vehicles, open road tolling (ORT), and other alternative configurations and management plans to promote the efficiency and effectiveness of our infrastructure.

- During the course of ITS corridor and program deployments nationally and in Florida, there is an increasing need for data and information sharing to better manage and operate the system by:

  - Supporting system evaluation and alternative analysis of future ITS deployments to ensure we are deploying resources efficiently and effectively;
  - Supporting and supplementing other data collection programs such as the 200-highest hour report, highway performance monitoring systems (HPMS), and designing traffic factors for geometric and pavement design;
  - Supporting highway operational performance reporting, modeling simulation, and other techniques for the operations and management of the system; and

- Providing "before" and "after" studies for ITS deployments. Many current programs are unable to assess their benefits or effectiveness because no data was collected on conditions and performance prior to the installation of ITS.

3.1.3 Economic Competitiveness – A Transportation System that Enhances Florida's Economic Competitiveness

- Commercial vehicles form the backbone of the state'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 economy. Motor carriers haul 77 percent of all shipments originating in Florida (by weight), have a combined value of $154 billion, and provide the landside link to all of our intermodal facilities. The following objectives are needed to support Florida's economic competitiveness:

  - Ensure efficient landside access to intermodal, port, airport, and truck terminal facilities;
  - Ensure efficient intermodal transfer of people and goods;
  - Promote safe and efficient access of vehicles to markets; and
  - Expedite permitting and clearance of commercial vehicles at weigh and agricultural inspection sites to keep commerce moving.

- Tourism is one of Florida's top industries and providing a safe, efficient, and easily navigable transportation network to support more than 60 million visitors each year is essential to Florida's long-term economic prosperity. The following objectives are needed to support Florida's economic competitiveness:

  - Ensure efficient access to major activity centers such as tourist attractions, state parks, and other areas of interest; and
  - Provide safe and efficient tourist travel and reduce VMT through the provision of accurate and timely traveler information.

- FDOT, along with its partners, is currently considering the designation of the Strategic Intermodal System (SIS). Each of the five principal transportation corridors will likely be part of this SIS because of their roles in regional, statewide, and national transportation linkages.

3.1.4 Quality of Life – Increasing Mobility Options for a More Livable Florida

- To ensure we provide more livable communities in Florida, the planning and design of transportation systems should support communities' visions and be compatible with corridors of statewide and regional significance. The following is needed to support this objective:

  - Provide efficient statewide ITS services with autonomy for decision-making to support local needs and regional cooperation to promote efficiency and regional and statewide goals;
  - Improve interoperability of ITS services through the development of statewide uniform device standards and specifications;
  - Support integration of ITS into local planning processes, programs, and capacity projects;
  - Provide name recognition of key ITS-related services through branding that will instill trust and confidence in traveler information services, roadside assistance, electronic payment services, and other strategic services;
  - Provide easy access and central data warehousing capabilities for transportation planning and design for all partners to support decision-making; and
  - Provide accurate real-time data to technology, business, and operational users for effective and responsive transportation operations.

- Improve the quality of the environment by reducing the air quality impacts of mobile source emissions through a more efficient and reliable transportation system.

- Reduce impacts of hazardous materials (HAZMAT) incidents by providing response systems that provide first responders with access to information on the content of vehicles and vehicle locations so they can quickly respond and clear areas.

- Improve the availability of weather, traveler, and shelter information during natural and man-made disasters.

- Provide safe and efficient travel routes for freight carriers to reduce potential HAZMAT incidents in densely populated areas.

3.2 Mission and Vision

The ITS mission and vision statements were developed for the *ITS Corridor Master Plans* and *ITS Plan* to assist in defining the ultimate twenty-year ITS for the interstate corridors and to guide the selection of appropriate solutions to fulfill the ultimate ITS vision.

3.2.1 Mission

Provide effective ITS services for the five principal FIHS limited-access corridors that enhance the safety and mobility of people and goods, economic competitiveness, and the quality of our environment and communities.

3.2.2 Vision

Two decades into the 21st century, travelers and shippers of goods along Florida's limited-access transportation corridors are benefiting from infrastructure, and information and communications technologies that improve the safety, mobility, economic competitiveness, and livability of communities in Florida. Information is available that assists travelers and shippers in route planning, predicting travel times, and scheduling their trips/shipments to reduce delays and arrive at scheduled times. When congestion is severe along specific facilities, alternate routes and modes of travel will be suggested that may be more reliable or cost-effective. During their trip, information of travel conditions is provided in real-time so that scheduling and diversions can be planned if needed as a result of an incident. If an incident occurs, automated information technologies are capable of verifying the location and assessing the appropriate response to incidents. If necessary, emergency personnel or roadside assistance is dispatched, arriving in a short period of time. Traffic flow is restored quickly and delays minimized.

During normal operations, traffic flow is managed within the corridor to keep traffic moving. Information on weather conditions is provided to an in-vehicle information service that alerts the driver when visibilities are compromised and advises a safe travel speed. If a natural disaster is impending, information is provided on appropriate local shelter locations, routes for travelers choosing to drive to another area, and other modes of travel that are available instead of driving.

The economy is thriving as a result of world-class access to international markets at ports, airports, and railheads from our agricultural, mining, and manufacturing industries and efficient deliveries of goods and services at the local level. Decisions on the operations, management, and future improvements to the corridors are made through a number of key partners. These decisions are based on measured benefits and a record of the performance of various technologies and elements are customized for communities to reflect their unique values and priorities. However, similar services are available statewide and on related arterial systems and are easily recognized by elderly drivers or visitors since strong name recognition exists for traveler information, roadside assistance, electronic tolls, and other essential services. FDOT is viewed as an ITS powerhouse and a model for how to cost-effectively deploy ITS services and partner with other public agencies and the private sector to create win-win agreements for the benefit of the citizens of Florida.

3.3 Initial Concept of Operations

During the December 2000 ITS Working Group Meeting, a concept of operations was proposed for statewide deployments. This proposed concept became the basis for the development of *Technical Memorandum No. 4.1 – Concept of Operations* for the five principal FIHS limited-access corridors.

3.3.1 Concept

ITS should, to the greatest extent possible, be developed and deployed to function statewide as a seamless system, recognizing separate but coordinated management and operations within local areas and within each region of the state.

Such a system shall be consistent with the *NITSA*, as applied in the *SITSA* and derivative regional ITS architectures. Development of the system shall include a transitional period for any disparate local or regional subsystems to become consistent, as necessary, within the system.

Teams of transportation professionals, working with public safety agencies, will operate and communicate in real-time to jointly perform coordinated operations, active travel management, and central data warehousing.

3.3.2 Coordinated Operations

Coordinated operations will provide information sharing via communications links that connect TMCs located in separate regions of the state. Within each region, these centers will also link to and coordinate operations with local TMCs and ISPs. Finally, coordinated operations will link each county's emergency management center (EMC) with the State Emergency Operations Center (SEOC). The information sharing will occur in real-time to benefit transportation system users, to help mitigate the impact of incidents, and to assist with emergency evacuations when they occur.

3.3.3 Active Travel Management

Active travel management includes transportation facility monitoring, traffic control, and information delivery functions to support transportation system users, incident response, clearance, emergency management, and transit operations. It also supports the efficient functioning of advanced signal control and SULs on expressways and other arterial highways.

3.3.4 Central Data Warehousing

Central data warehousing is a process to coordinate the measurement and collection of transportation data statewide, to assure data accuracy and timeliness, to process data as necessary to make it useful, to make it available to transportation system users and to transportation professionals on a current basis in useful formats, and to maintain an archive of such data for transportation planning, design, and operations in accordance with a statewide data plan.

3.4 Themes and Strategies for Deployment

The following themes and strategies summarize the desired outcomes of the ITS deployments along the FIHS limited-access corridors and were derived from the initial *Concept of Operations* identified in *Section 3.3, Initial Concept of Operations*.

3.4.1 Coordinated Operations

- Facilitate, support, and enhance the coordination and implementation of interagency efforts in response to the needs of intercity travel, major incidents or special events of regional significance along the corridor, and the security of the transportation infrastructure.

- Promote coordination and cooperation among all organizations involved in incident management including state, county, and local transportation departments, toll road authorities, law enforcement agencies, emergency service providers, and other operating agencies within the corridor.

- Foster and facilitate the continued development and implementation of regional incident management initiatives and educate the public and responders to the benefits of incident management.

- Encourage technology and resource sharing by coordinating the development of training programs to support member agencies' incident management programs and activities.

- Demonstrate and evaluate the application of innovative procedures and technologies to enhance incident management activities.

- Provide regional solutions for serving intercity travel by promoting the through movement of vehicles.

- Provide procedures and coordination during evacuation and other emergency situations to make the best use of system resources.

- Promote coordination among agencies in the notification and implementation of maintenance and construction.

3.4.2 Active Facilities Management

- Support traffic management along all facilities in a coordinated way.

- Support incident management for the detection of, response to, and clearance of accidents and other major incidents such as freeway service patrols and Mayday/Enhanced 911 (E-911) support, development of incident response scenarios and traffic diversion plans, incident response centers or command posts, and traffic surveillance technologies.

- Provide transit management, including bus, commuter rail, and park-and-ride facilities, as well as other transit-related activities, and manage SULs, such as high occupancy toll or other value pricing, reversible lane control for HOV facilities, and transit or emergency vehicle signal preemption systems.

- Improve the ability to monitor, schedule, and dispatch maintenance, construction, special services, or other public/community transportation fleets.

- Manage traffic flow and safety during evacuations related to hurricanes, fires, and other emergencies.

- Serve CVO, such as electronic screening systems, to verify the compliance of motor carriers with size, weight, safety and credentials regulations, and emergency response systems.

- Promote the use of ETC and EPS to improve traffic flow efficiencies and reduce infrastructure requirements.

- Implement procedures and systems that cost-effectively manage work zone activities.

- Manage lane closure prediction and scheduling.

- Collect/Maintain data on work zone locations and delay and alternate routing for mainlines and standard diversion or evacuation routes.

- Automate speed enforcement and variable speed limits in work zones.
- Support ATIS.
- Provide evacuation guidance that includes basic information to assist potential evacuees in determining whether evacuation is necessary. Once the decision is made to evacuate, the services will also assist evacuees in determining destination routes to shelters and other lodging options. This function will also provide guidance for returning to evacuated areas, information regarding clean up, and other pertinent information to be distributed from federal, state, and local agencies.
- Provide evacuation travel information that will benefit evacuees in planning their evacuation trip once that decision has been made. This function will also allow travelers to change course during the trip based on route and destination conditions.
- Provide evacuation traffic management to assist evacuation coordination personnel in the management of evacuation operations on the transportation network.
- Provide evacuation planning to support the evacuation process by providing information, current and historical, to emergency management planning personnel.
- Promote evacuation resource sharing to allow information and resource sharing between agencies involved in the evacuation including transportation, emergency management, law enforcement, and other emergency service agencies.
- Improve the coordination of construction activities and other roadway activities with maintenance.
- Provide infrastructure security against terrorist attacks.

3.4.3 Information Sharing

- Coordinate data collection and information processing, management, and distribution.
- Coordinate data collection programs and sensor installation/operations.
- Inform and exchange data through coordinated operations.
- Centralize information processing, management, and storage.
- Open access to information delivery and use.
- Coordinate information report development.
- Coordinate transportation management strategy development.

3.5 Ideal Solutions

To achieve these goals and objectives and fulfill the themes and strategies for implementation, the following major types of deployments are anticipated as the ideal solution for ultimate deployment:

- Deployment of full scale freeway management systems (FMS) and IMS on the five principal FIHS limited-access corridors –
    - Coordinated ITS interregional operations;
    - Full scale FMS and IMS in urbanized areas;
    - IMS at a minimum in rural areas including Road Ranger Service Patrols (RR Service Patrols); and
    - E-911 services.

- Statewide ATIS and 511 services –
    - ATIS and 511 in the urbanized/transitioning counties; and
    - Statewide ATIS and 511 along each corridor for emergency management and evacuation coordination.

- Statewide central data warehousing of traffic and incident data to support ATIS and 511 services and to support highway performance monitoring and evaluation.

- Full scale deployment of the *CVO/CVISN Business Plan*.

- Smart work zones for all sites where capacity improvements and maintenance and construction operations on the principal FIHS limited-access corridors are located.

- Systems and operational integration of FMS with arterial traffic management systems.

3.6 Need for Working Policies

Working policies are needed to support each of the themes and strategies. However, the development of these working policies is outside the scope of work for this operational concept effort. These policies should address more specifically how each theme and strategy should be implemented and what the responsibilities for the stakeholders in each will be.

4. Deployment Issues

Through the deployment of these existing ITS, a number of critical ongoing issues have emerged that should be addressed in order to achieve successful ITS deployments along the principal FIHS limited-access corridors.

4.1 Incorporating Legacy and Sunk Investments

The *ITS Plan* must take full account of the need to preserve legacy systems and make maximum use of sunk investments in existing infrastructure and organizational arrangements. For example, if TMC software is being used successfully, plans for future TMC software should build on this deployment and migration to new statewide TMC software should occur over time to manage risk and leverage existing investments. Similarly, field equipment that does not meet current standards should only be replaced in accordance with normal maintenance schedules unless the existing element can not be fully integrated into new software or comply with other standards migration.

4.2 Partnering with Local Operational Management to Achieve Synergy

There is a huge opportunity to boost the effectiveness and efficiency of the proposed ITS deployments through the exploitation of synergy and the development of suitable regional partnering arrangements. The full exploitation of opportunities to share infrastructures such as sensors, information delivery systems, command and control, and communications systems will ensure cost effectiveness, minimize risk, and maximize the delivery of real benefits to Florida's transportation customers. This infrastructure and information sharing will also enable the delivery of innovative services and additional value to the customer. For maximum effect, such collaboration should span the full range of activities from research and development, planning and deployment, through funding, procurement, and evaluation, to commissioning and operational management. This cooperation should span the primary operational agencies involved, such as the respective FDOT districts along the corridors, but should also encompass other transportation partners such as MPOs, law enforcement agencies, emergency services, and local governments in full support of successful planning and implementation of ITS on an integrated regional basis.

4.3 Promoting Efficient Operations and Management

Operations and management have become a critical part of the overall application of ITS since the use of information and communications technologies have the greatest impact in this part of the transportation system management process. Due to the complex nature of ITS, the need to support data sharing, and the application of complementary management strategies and procedures, care must be taken when developing and defining operations and management approaches. The development of common procedures for similar tasks in different partner organizations and the agreement to apply pre-defined, coordinated management strategies will be important elements in meeting this challenge. These coordinated management strategies will support cooperation and sharing of work efforts in the definition of such procedures, staff training, and implementation support.

4.4 Integrating Software to Promote Statewide Coordination and Communications

Early ITS deployment activities in the state have resulted in a set of legacy software platforms that must be integrated to support the data and information sharing required to achieve statewide objectives. Bringing the software to a common base of functionality in support of agreed operations and management strategies is an important step in meeting this challenge.

The ITS Office recently completed a *TMC Software Study* with the Michigan Department of Transportation that looked at synergies and reducing costs for TMC software. The study recommended the following:

- Do not abandon the current efforts underway at TMCs within the state. Continue those development efforts over the short-term.

- Begin development of a statewide operational concept to define what capabilities are required for both statewide and district-by-district operations. Buying software systems to satisfy non-codified requirements is inefficient. This effort has begun under the direction of the ITS Office as part of developing functional requirements to support procurement of a statewide TMC software.

- Based on the statewide definition of requirements, begin development of a statewide library of functional components. These will form the basis of new deployments and eventually replace components of the existing systems. Seek to form multi-state coalitions for software expenditures.

- Use a currently deployed, commercially available system already licensed to Florida (PB Farradyne's Management Information System for Transportation™ (MIST™) for short-term implementation needs. Pay careful attention to system network design to assure that transition to statewide components can be accomplished efficiently as they become available.

- Utilize statewide buying power (for quantities) to acquire national standards-compliant hardware.

The integrated statewide TMC software system will provide a unifying platform to ensure that technologies can work together smoothly and efficiently. The statewide TMC software system will allow unified function of TMCs, toll collection, freeway and incident management, traveler information over wireless, microwave, copper, and fiber optic communications.

4.5 Developing Statewide Standards, Specifications, Procurement Guidelines, and Performance Measures

To support the effective and complete implementation of the desired end-state as defined by the corridor-wide ITS architecture, standards will be required. These standards will need to address the major interfaces between subsystems and can be derived from standards development work at international, national, or local levels. Subsystems will also need to be addressed through the development of standard specifications for devices and components to be integrated and the specification of equipment packages for procurement. In support of effective procurement of the ITS hardware and software required, procurement guidelines and bulk purchase arrangements will be required.

4.6 Balancing the Need for Local Autonomy and Control with Centralized Coordination and Cost Efficiency

The need and desire for increased service coordination has been clearly identified in the course of the architecture development work. The preservation of local management and control in support of the independent pursuit of transportation policy objectives has also been identified as a primary requirement. In order to support the attainment of both objectives, the technical and organizational elements of the systems will need to be carefully balanced. Subsystems and interfaces must be designed to support the balanced application of data and information sharing, with the implementation of locally directed strategies and procedures. Operating and management procedures and approaches are defined in this technical memorandum.

4.7 Implementing Services to Provide Coordinated Operations, Active Facilities Management, and Information Sharing

The primary elements of the desired future ITS state have been captured and defined from a systems perspective in terms of logical and physical architectures and directly mapped to a range of desired ITS User Services that will be supported by the architectures. This end-state has been defined in terms of three major themes or service groups – coordinated operations, active facilities management, and information sharing. The effective implementation of these services will require the definition of technical and organizational strategies and tactics that fully support their development and introduction in a logical, financially viable manner.

4.8 Supporting the Needs of the Full Range of ITS Users including Commuters, Tourists, Commercial Vehicles, and Evacuees

It is recognized that the intended user group for the services to be provided by the corridor-wide ITS deployments is composed of several different sub-groups, the most important of which include commuters, tourists, commercial vehicle operators, and evacuees from natural or man-made disasters. The strategies and tactics devised to support the development and subsequent operations and management of the ITS deployments must take full account of the varying needs of each of these sub-groups. For example, users in the commuters' sub-group will have a focus on access to traveler information and traffic management from a number of different information delivery channels. Strategies and tactics to leverage existing and planned information delivery systems, operated by both public and private organizations, will need to be developed to address this need. Users in the tourists' sub-group may well be interested in information regarding access to recreational and resort areas or specific tourist attractions. In this case, there may be a need to strike partnership arrangements with tourism and leisure industry operators for the provision and collection of traveler information. In the case of the commercial vehicle operators, the need may revolve around the estimation of travel times and the improvement of travel time prediction accuracy and travel time reliability. This may require strategies that make use of public sector roadside infrastructures for travel time data collection and that harness private sector CVO information and fleet management services to deliver the required information in a cost-effective manner. For evacuees, links to shelter management personnel, travel time, and weather information are critical.

4.9 Deploying ITS in a Coherent, Structured Manner that Provides a Complete Backbone of ITS Services along the Five Principal FIHS Limited-Access Corridors at an Early Stage

The overall *ITS Business Plan* must coordinate a logical deployment sequence that fully supports the effective and efficient deployment of the corridor-wide ITS in an optimum sequence over time and geographical coverage areas. This must take into account past and current public sector deployments and planned private sector initiatives.

4.10 Developing Efficient and Rapid Deployment Based on Practical Experience and Lessons Learned throughout Florida and Nationally

The deployment sequence identified and supported in the *ITS Business Plan* must also address the need to support efficient and rapid deployment of several "early winner" projects and initiatives. These should be selected on the basis of lessons learned and experiences gained in the course of prior deployments in Florida and nationally. Early elements of the deployment sequence ideally should be robust, low risk, high confidence projects that make use of proven technologies.

4.11 Supporting the Effective Development and Deployment of the Communications Infrastructure Required to Support ITS, including the Florida Fiber Network (FFN)

The *Plan* must also provide support for the effective planning and deployment of the communications infrastructure required to support the level of data and information sharing desired. The definition of strategies and tactics that define the public sector investment program and potential public-private partnership opportunities will be essential. In particular, the Florida Fiber Network (FFN) element of the communications infrastructure represents a key part of the communications capability required for the corridor and the state. Consequently, the overall *ITS Business Plan* activities must provide full support for the ultimate development and deployment of this infrastructure.

4.12 Supporting Continued Professional Capacity Building and Training

To support the progression from conventional transportation network deployment and management to the application of advanced technologies, improved professional capacity building education and training will be required. ITS Florida has been tasked with coordinating ITS training activities in Florida. Strategies and tactics should be defined in the *ITS Business Plan* to support the development of current capabilities, the identification of future needs, and the development of new education and training capabilities that fully support the development, deployment, and operation of the proposed ITS.

ITS Florida has also initiated a structured training program to support training needs throughout the ITS profession in Florida that will supplement training programs developed by FDOT.

4.13 Use ITS to Support Public Safety

The September 11, 2001, attacks by terrorists in New York City, Virginia[7], and Pennsylvania have resulted in a heightened awareness of public safety issues. ITS provides information that may be useful in certain situations for law enforcement to prevent similar attacks using surface transportation systems in Florida.

ITS can also play a role following man-made or natural disasters. The role of ITS as a traffic management tool and the use of information systems to support disaster recovery efforts has tremendous potential to reach large numbers of travelers and prevent unnecessary delays or further damages. Continued study of the potential role of ITS in these scenarios is needed.

4.14 Life-Cycle Considerations

Little attention has been given to the full funding of life-cycle costs for ITS deployments in the past. For traditional highway improvements, life cycles are planned to be twenty years for pavement structures and fifty years for bridges. However, the life cycles of ITS elements can be as short as three years for some information technology hardware and typically five to seven years for field devices such as CCTV. Replacement costs of field devices, software upgrades, and the migration to meet new standards and performance specifications should be careful considerations of any program plan. A ten-year life-cycle is recommended for planning purposes.

[7] The Pentagon is located along the western banks of the Potomac River in Arlington, Virginia.

4.15 Proving Technology through Research and Pilot Studies

ITS technology and strategies are emerging at a rapid rate. Prudent use of emerging technologies is dependent on adequate research and demonstration in pilot studies prior to a broad adoption. This approach will manage risk and ensure resources are being utilized for proven technologies.

4.16 Performance Measures and Evaluation

> ***We measure ourselves for two reasons - to make sure we are spending the taxpayers' money as efficiently as possible and to try to improve how we provide transportation to the people of Florida.***
>
> Secretary Tom Barry

Performance measures are "yardsticks" that transportation agencies use to measure their operating results and to assess investment options. Performance measures can be used by FDOT to help focus their limited resources to better serve customer needs. By defining specific measures, FDOT will be able to better define the goals and objectives and measure the effectiveness of their programs in meeting these objectives.[8] The measures will help FDOT staff to be more effective and more accountable to the citizens of Florida. The ability to focus on and measure results will also assist FDOT in allocating resources more efficient with its objectives and to identify needs in a more consistent manner. Secretary Tom Barry recently stated, "We measure ourselves for two reasons – to make sure we are spending the taxpayers' money as efficiently as possible and to try to improve how we provide transportation to the people of Florida." Performance measures are becoming an important part of the way government works in Florida and by proactively approaching the development and recommendation of these measures, FDOT is ensuring its long-term sustainability by having measures that reflect their mission statement.

FDOT's mission is to:

"Provide a safe transportation system that ensures the mobility of people and goods, while enhancing economic prosperity and sustaining the quality of our environment."

8 The measurement of transportation system performance is a complex problem and many externalities, such as the economy and resulting changes in driver behavior, can have profound impacts on system performance. These external factors are outside FDOT's control and, therefore, the use of performance measures only in the assessment of agency performance may not accurately reflect the full effectiveness of FDOT.

FDOT establishes the goals and objectives for the state transportation system from its mission statement. The *Florida Transportation Plan* includes a long-range component that establishes goals and objectives for twenty years and a short-range component that establishes objectives for the next ten years. The long-range component is updated every three to five years and the short-range component is updated annually. Progress towards the accomplishment of FDOT's objectives is reported on an annual basis in the *Annual Performance Report*. In this context, ITS performance measures are just one type of performance measure FDOT uses to evaluate agency performance. Other performance measures used by FDOT include mobility, safety, pavement condition, bridge condition, public transportation facility asset management, and environmental concerns.

Similar to FDOT's other major programs, ITS performance measures are needed to assess the agency's performance in supporting the *Florida Transportation Plan* through ITS deployments. The types of measures needed include mobility- and safety-related performance measures and agency oriented-measures.

4.17 Integration of ITS Data and Planning Data Systems

Data collected through the instrumentation of transportation systems provides an opportunity to improve transportation planning as a whole. However, the operational data is collected using ITS and the planning-related data is collected through Florida's TTMS. Significant synergies and costs savings are possible through the integration of these data sources.

5. Current ITS Plans and Programs

5.1 Freeway and Incident Management Services

FDOT has been very active over the last few years in developing freeway and incident management plans for deployments in a majority of the eight districts. Each of these plans and existing deployments has been carefully inventoried and the existing and proposed locations of field devices to support these deployments have been identified. **The existing district ITS plans address most of the FIHS limited-access corridors.** Remaining geographical system gaps along these corridors include:

- I-10 – Madison, Suwannee, Columbia, Baker, and Nassau Counties, District 2;
- I-75 – Alachua, Columbia, and Hamilton Counties, District 2;
- I-75 – Broward County, District 4;
- I-95 – Martin, St. Lucie, and Indian River Counties, District 4; and
- I-95 – St. Johns and Nassau Counties, District 2.

These plans consist of freeway and incident management services involving:

- Vehicle detector systems;
- CCTV cameras;
- DMS and other types of information signs;
- Roadway weather information stations (RWIS);
- HAR;
- Communications systems to link these field devices with regional traffic management centers (RTMCs);
- RTMCs and TMCs to manage and operate these facilities;
- Provisions for center-to-center communications involving the RTMCs and TMCs, and other transportation, law enforcement, fire and rescue, and emergency control centers;
- HAR networks and commercial radio traveler services (i.e., TiRN™);
- ETC systems, automated vehicle identification (AVI), and automated vehicle location (AVL) systems using ETC on toll roads;
- Incident management services involving RR Service Patrols; and
- Roadside assistance using motorist aid call boxes.

The typical spacing for the primary field devices identified in these plans is summarized in Table 5.1.

Table 5.1 – Field Device Spacing for Existing or Planned Deployments by District

District	HAR (miles)	CCTV (miles)		DMS (miles)		Detectors (miles)	
		Urban	Rural	Urban	Rural	Urban	Rural
1		1	1	At interchanges	At interchanges	0.5	2.0
2		1	N/A[9]	1	N/A	0.5	N/A
3		1	At interchanges	At interchanges	At interchanges	0.5	At interchanges
4		1	1	2	2	0.5	N/A
5		0.5	1	At interchanges	At interchanges	0.5	1
6		1	1	1	N/A	0.5	N/A
7		1	At interchanges	At interchanges	At interchanges	0.5	At interchanges
Turnpike[10]	3	1	1	At interchanges	At interchanges	0.5	0.5
Recommended Spacing	3	1	At interchanges	1	At interchanges	0.5	2

As illustrated in Table 5.1, device spacing standards for urban and rural applications should be developed and agreed upon by all districts to ensure consistent statewide device coverage.

Technical Memorandum No. 3.5.1 – Standard Specifications for ITS Devices and *Technical Memorandum No. 3.5.2 – Standards Application Plan* address the specific functional requirements and standards for each of these devices for deployment along these corridors.

9 The Turnpike's Communications Master Plan calls for CCTV cameras at one-mile intervals and vehicle detection stations on both sides of the Turnpike at half-mile intervals for the entire length of the Turnpike. Actual CCTV camera and vehicle detector station deployments in rural areas may be at significantly greater intervals. In the initial deployment phase, CCTV cameras are to be installed at each of the DMS sites. There are 19 DMS installations currently underway with the 20th programmed but not yet sited. Spacing of the DMS devices is dictated by the ability to effectively provide for Turnpike traffic diversion routing. Nine HAR transmitter sites on the Turnpike mainline are currently active.

10 N/A – Not Applicable. No plans are available to determine device spacing.

5.1.1 Closed-Circuit Television (CCTV) Surveillance

For urban areas, more dense system surveillance coverage is needed to support traffic management functions and provide incident data to support traveler information. For rural areas, surveillance using CCTVs is typically needed only at major interchanges and areas where above average numbers of accidents have been documented, as well as areas where the direction of traffic has been reversed during hurricane evacuation activities. Full CCTV surveillance is typically required at one-mile intervals.

5.1.2 Vehicle Detection Systems

Vehicle detection systems are required less frequently in rural areas than urbanized areas. Typical spacing is recommended at two-mile intervals in rural areas or at major interchanges; however, half-mile spacing is required in urban areas.

5.1.3 Traveler Information [Dynamic Message Signs (DMS)/Highway Advisory Radio (HAR)]

In rural areas, traveler information needs are oriented to long-distance travel times and major incidents such as crashes, lane closures, and construction zones. Primary markets served are tourism and CVO. Wide-area coverage of traveler information using HAR is more cost-effective than the use of permanent DMS. However, DMS at major interchanges may be more efficient.

Traveler information needs are oriented to shorter trips and commuter market places that are most concerned with the predictability and reliability of travel times. Information on incidents such as crashes, lane closures, and construction zones is needed. DMS signs should be located in advance of interchanges or at one-mile intervals (whichever is greater) in urbanized areas.

Table 5.2 identifies the functional gaps where existing services with any current plans in place would not meet the recommended deployments identified in the active facilities management and coordinated operations themes or device spacing criteria recommended in Table 5.1. Information sharing is addressed in *Section 2.2, Advanced Traveler Information Systems (ATIS)*.

Table 5.2 – Functional Gap Analysis for Freeway and Incident Management Services

Functional Segment	Coordinated Operations	Active Facilities Management
I-4 ITS Corridor		
I-4 in District 7	✓	✓
I-4 in District 1 from District 7 to U.S. 27	✓	✓
I-4 in District 5 from U.S. 27 to I-95	✓	✓
I-10 ITS Corridor		
I-10 in District 3 from the Alabama/Florida state line to U.S. 19	✓	✓
I-10 in District 2 from U.S. 19 to I-95		
I-75 ITS Corridor		
I-75 in District 6 from SR 826 to SR 821	✓	✓
I-75 from SR 821 in District 6 to U.S. 27 in District 4		
I-75 in District 4 from U.S. 27 to CR 833		
I-75 in District 1 from CR 833 to Alico Road	✓	✓
I-75 in District 1 from Alico Road to U.S. 301	✓	✓
I-75 from U.S. 301 in District 1 to SR 50 in District 7	✓	✓
I-75 in District 7 from SR 50 to U.S. 98 in District 5		
I-75 in District 5 from U.S. 98 to CR 318 in District 2	✓	✓
I-75 in District 2 from CR 318 to I-10 in District 2		
I-75 in District 2 from I-75 to the Georgia/Florida state line		
I-95 ITS Corridor		
I-95 in District 6 to Ives Dairy Road in District 6	✓	✓
I-95 in District 4 from Ives Dairy Road in District 6 to SR 706/Indiantown Road in District 4	✓	✓
I-95 in District 4 from SR 706/Indiantown Road to CR 512 in District 5		
I-95 in District 5 from CR 512 to U.S. 1 in District 2	✓	✓
I-95 in District 2 from U.S. 1 to I-295 South		
I-95 in District 2 from I-295 South to Airport Road	✓	✓
I-95 in District 2 from Airport Road to the Georgia/Florida state line		
Florida's Turnpike		
Mainline to I-95 (North)	✓	✓
Mainline to I-75	✓	✓
Homestead Extension of Florida's Turnpike (HEFT) (SR 821)	✓	✓
Sawgrass (SR 869)	✓	✓
SR 528	✓	✓
SR 417	✓	✓

Notes:

(1) Plans for implementation of information sharing-related deployments include ATIS, 511, and HAR services and are discussed in *Section 5.2,Advanced Traveler Information Services*.

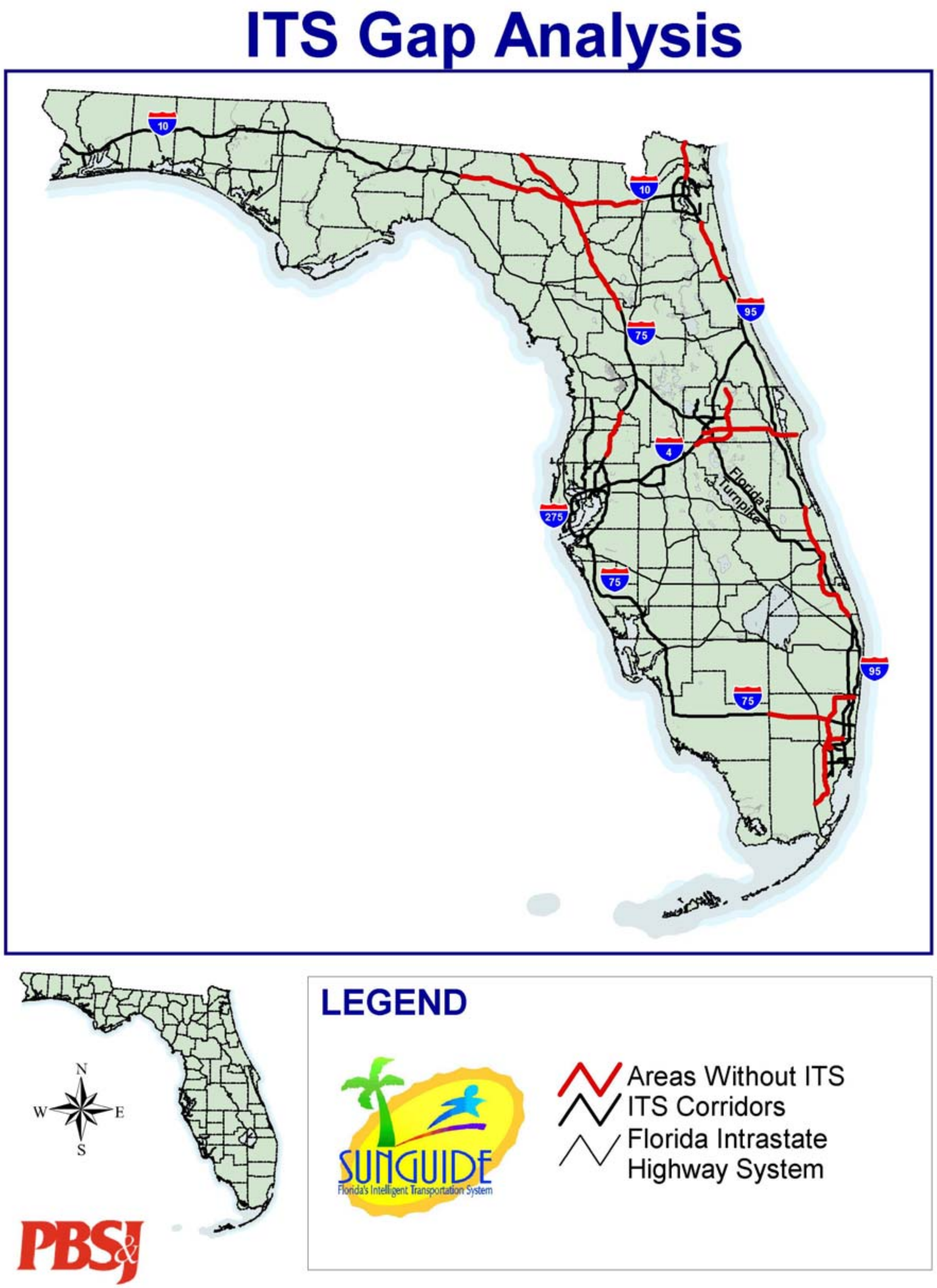
(2) ✓ indicates existing, programmed, or planned services that will satisfy the basic requirements for the implementation theme.

The segments identified in Table 5.2 as having functional gaps for active facilities management or coordinated operations are illustrated in Figure 5.1 and include:

- I-10 – Madison, Suwannee, Columbia, Baker, and Nassau Counties, District 2;
- I-75 – Alachua, Columbia, and Hamilton Counties, District 2;
- I-75 – Broward County, District 4;
- I-75 – Miami-Dade County, District 6;
- I-95 – Martin, St. Lucie, and Indian River Counties, District 4;
- I-95 – St. Johns and Nassau Counties, District 2;
- Sawgrass – Broward County, Turnpike;
- SR 528 (Bee Line Expressway) – Orange County, Turnpike; and
- SR 417 (Florida Greeneway) – Orange and Seminole Counties, Turnpike.

Along these gaps, deployments were proposed to fulfill the desired level of service (LOS) and instrumentation along the freeways in the *ITS Corridor Master Plans*. A summary of these corridor plans is provided below.

Figure 5.1 – ITS Gap Analysis



5.2 Advanced Traveler Information Services

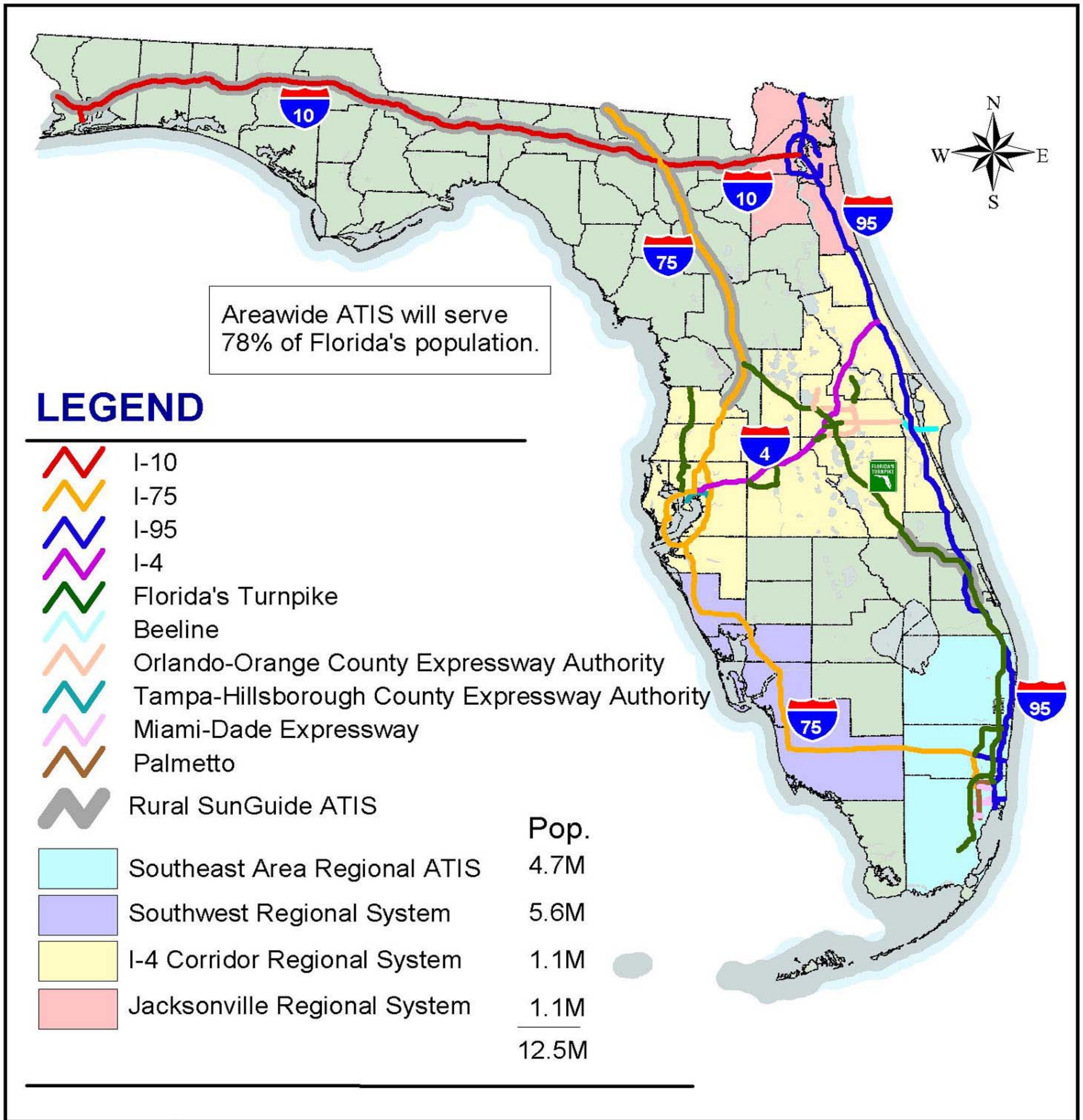
5.2.1 Regional ATIS and 511 Services

During 2002, a *Statewide 511 Implementation Plan* was developed that outlines the following vision for 511:

- By 2005, all travelers in Florida will be able to dial 511 to access travel-related information by telephone.
- At a minimum, information relevant to roadway and transit-based travel will be available. More detailed information will be available in urban areas where ATIS are in place.
- This basic level of information will be available at no additional charge to callers, although in some cases local telecommunications or wireless airtime charges may apply. In some cases, additional services could be provided via 511 (some for a fee) that provide further value to callers.
- 511 services will be implemented and operated in a sustainable fashion, minimizing public sector funding requirements. The 511 service will be marketed so that it will become a common term in Florida.

The vision includes the establishment of four regional ATIS systems using the 511 dialing code and an overlying system that will allow users to receive "high-level" information in areas where there is no regional system. As illustrated in Figure 5.2, the regional systems will serve 78 percent of the state's population and most of the tourist areas. The systems will also link to and between each other, both regionally and statewide. For example, a traveler in Miami may dial 511 and request information for the highways in the Miami area, then link to a system with information in Orlando, Jacksonville, or Ft. Myers. Another example would be that a traveler in Tallahassee might dial 511 and receive general highway information for the northwestern part of the state and then link to a more specific system (regional) in Miami or elsewhere. These five interconnected systems will provide seamless statewide services.

Figure 5.2 – Proposed Statewide Information Sharing ATIS



Source: PBS&J

Florida's 511 system will leverage the extensive efforts of the 511 Deployment Coalition in defining the information – or "content" – to be made available. The Coalition's implementation guidelines provide detailed recommendations on the types of content to be provided. (See http://www.its.dot.gov/511/511_Guidelines.htm.) These content guidelines will be the basis for Florida's 511 system. The implementation guidelines establish some concepts regarding content that will be essential elements of Florida's 511 services:

- **Basic and Optional Services** – Basic content will be consistent across all regional systems and the statewide system (although in less detail). Optional content, such as additional public sector-oriented information and/or private sector support services, can be added elements to any of the five services at the discretion of the implementers.

- **Basic highway information is automated, corridor-based, and focused on FIHS.** – Callers will receive recorded/automated messages – at a minimum – for FIHS roadways. The roadways will be individually selectable and divided into logical segments.

- **More detail will be provided in urban areas.** – Due to the increased congestion and importance of information in urban areas, content will be more detailed, roadway segments will be smaller in length, and content update requirements will be more stringent for the regional systems than the statewide system. Table 5.3 illustrates the nature of basic content that will be available in the regional (urban) and statewide (non-urban) systems. In urban areas, estimated segment travel times will also be provided.

- **All major public transportation agencies in urban areas will be invited to provide information via 511.** – Regional 511 systems will work in conjunction with existing customer service centers operated by transit agencies in each region. Providing information on service disruptions, changes or additions, and the ability to offer direct transfers to customer service centers will be explored.

Table 5.3 – Basic 511 Content for Highways

Content Type	Geography		Content Detail					
	Non-Urban	Urban	Location	Direction of Travel	General Description and Impact	Days/Hours and/or Duration	Detours/ Restrictions/ Routing Advice	General Forecasted Weather and Road Surface
Construction/Maintenance	✓	✓	✓	✓	✓	✓	✓	
Road Closures/Major Delays	✓	✓	✓	✓	✓	✓	✓	
Major Special Events	✓	✓	✓		✓	✓	✓	
Weather and Road Conditions	✓	✓	✓		✓			✓
Minor Incidents/Accidents *		✓	✓	✓	✓			
Congestion Information		✓	✓	✓	✓			
Emergency Interruptions		✓	✓	✓				
Transit Participation		✓						

* Major Congestion Information and Incidents/Accidents are considered part of the "Road Closures/Major Delays" content type.

To meet the needs of Florida's residents and tourists for reliable information that is easily accessible, the five systems that will collectively deliver 511 in Florida must be consistent in several key areas:

- **Voice Recognition User Interface** – Though the systems may have corresponding touch-tone interfaces, the use of voice recognition is the safest and most easily understood user interface and will be the primary interface for all systems. *(Note: This will require a change to the Southeast Florida SmartRoute service described later in this document.)*

- **Evacuation/Emergency Message Interrupt** – To facilitate quick access to important information in times of emergencies or evacuations, each IVR system will have an override capability to support "alert" messages at the start of the call or at the start of each report. For example, the caller might hear the following message immediately after connection with the 511 service and prior to being offered the options menu:

  > "The following message is being provided as a result of an emergency condition in your area. A hurricane warning is in effect for Miami-Dade, Broward, and Palm Beach counties until midnight tomorrow. The hurricane is expected to make landfall at approximately 10:00 AM tomorrow. All coastal and low-lying areas in the region are under mandatory evacuation orders at this time. Please stay on the line for menu options to access information regarding specific evacuation routes."

- **Americans with Disabilities Act (ADA) Accessible** – FDOT must consider that under Section 255 of the Telecommunications Act of 1996, carriers and equipment manufacturers must provide access to and make their services and products usable by individuals with disabilities "if readily achievable." Title II of the Americans with Disabilities Act (ADA) prohibits public entities (states, local governments, and any departments, agencies, or other instrumentality of state or local governments) from discriminating against those with disabilities in all services that they provide to the public. FDOT's 511 system will provide disabled community access through telecommunications relay services (TRS).

- **Multi-Lingual** – To offer services to an ever-increasing Spanish-speaking resident and tourist population, each system will be accessible and will provide information in Spanish as well as English. The basis for this determination is Florida's relatively high Hispanic resident population, aside from those who visit the state from Spanish-speaking nations. According to the 2000 Census, 12.5 percent of the population in the United States is people of Hispanic origin, while that in all of Florida is 16.8 percent. In Miami-Dade County, almost 60 percent of the population is of Hispanic descent. Other Florida counties with significantly high Hispanic populations are Osceola with just under 30 percent, Collier with almost 20 percent, Orange with slightly less than 19 percent, Hillsborough with 18 percent, and Broward and Monroe with about 16 percent. Although the fact that a person is of Hispanic descent does not necessarily signify that he or she is Spanish-speaking, the population figures are representative as such.

- **No Link to 911** – No direct link with 911 will be available. A thorough study of a possible link to 911, including a message at the beginning of a call (e.g., "If this is an emergency, please hang up and dial 911") has been done; however, the national guidelines have recommended against a direct link to 911 emergency call centers.

- **Branding/Marketing** – From the standpoint of building product recognition and customer retention, a single brand name should be used across all systems. As FDOT uses the SunGuide℠ brand name for the current traveler information projects, it is recommended that the SunGuide℠ 511 name be used to represent the telephonically delivered ATIS services across the state.

5.2.2 Highway Advisory Radio (HAR)

To support evacuation needs along interstate routes that are candidates for one-way operations during evacuations for natural or man-made disasters, a statewide system of HAR is proposed. This system will provide major incident, traffic, and emergency management-related information during these major incidents.

5.3 Commercial Vehicle Information Systems Network (CVISN) Business Plan

Florida is committed to improving the safety and operations of intrastate commercial vehicle travel and enhancing the economy through the implementation and operation of innovative ITS techniques. Florida's *CVISN Business Plan* was recently completed to identify new ITS technologies and strategies to improve CVO and to guide the state's participation in the national CVISN program.

Currently, several ITS CVO deployments operate within the state of Florida including:

- WIM technology at interstate weigh stations;
- Utilization of ASPEN-equipped laptop computers;
- Participation in a national pre-clearance program; and
- Participation in national-level information systems for commercial drivers' licensing and safety data management.

The *CVISN Business Plan* recommends projects for incremental implementation to improve the CVO regulatory system, ensure CVO safety, guide CVISN deployment, and optimize safe and efficient travel throughout the state. The projects recommended for deployment include:

- Electronic Credentialing Software Design and Development;
- Automated Routing and Permitting Software Design and Development;
- Networked Information Systems Design and Development;
- Electronic Screening at Weigh Stations;
- Electronic Screening at Agricultural Inspection Stations;
- Compliance Help Desk/Service Representatives; and
- International Fuel Tax Agreement (IFTA) Clearinghouse.

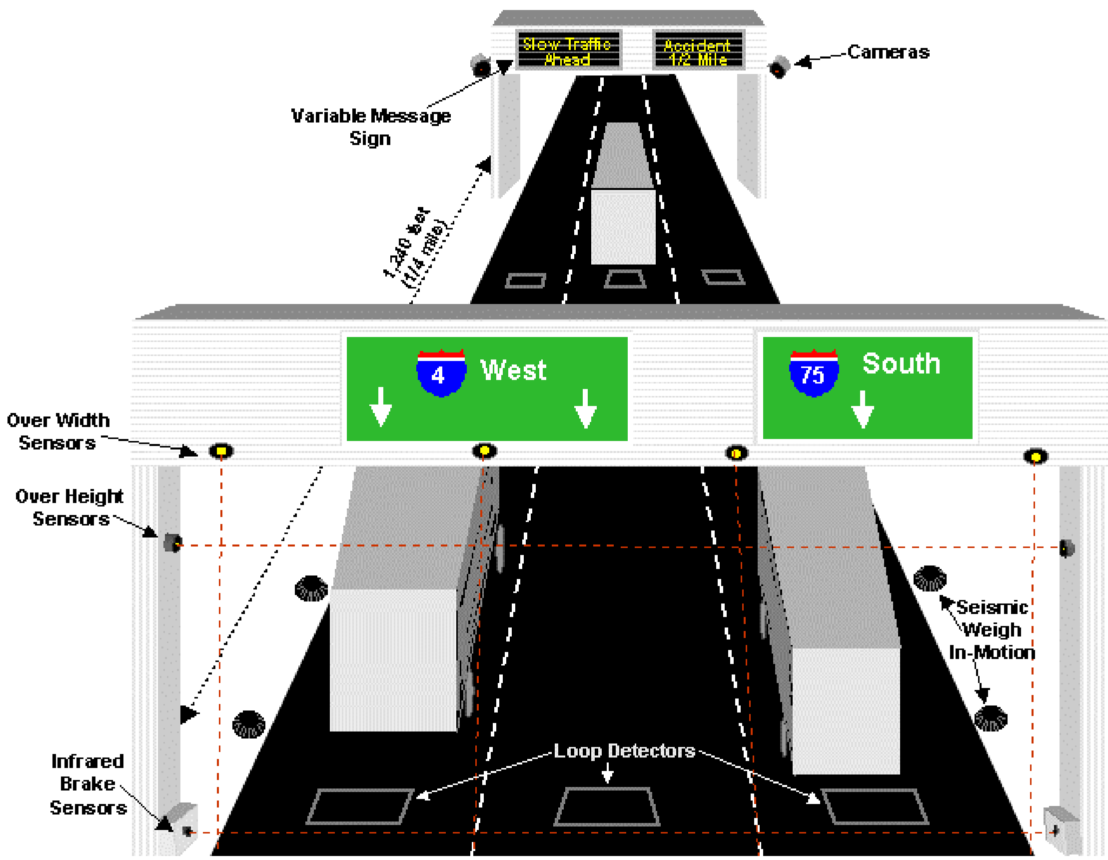
The schedule of deployment for these recommended ITS CVO systems is dependent upon statewide funding and resource allocation.

5.3.1 Virtual Weigh-in-Motion (WIM) Station

The principal FIHS limited-access corridors were identified as major trade and tourism routes in the FIHS Modal Plan and are critical transportation corridors for Florida's economic prosperity. The reliance on these corridors will continue to grow for carriers servicing intermodal freight and distribution centers given the planned growth in these transportation sectors. In an effort to keep transportation costs down while still maintaining commercial vehicle screening along the corridor, a pilot virtual weigh/screening station is currently being proposed for a research project. The goal of the station will be to provide a low cost and efficient means of performing CVO along the corridor.

The site being considered for application for a virtual weigh station is located in western Hillsborough County along I-4 near the Port of Tampa to screen vehicles moving on and off I-4/I-275 and I-75. The site could be constructed with minimal investment and provide portable seismic WIM scales along the roadside combined with over-height, over-width, and roadside enforcement for a test operation. Once proven successful, traditional scales and other permanent deceleration, storage, and acceleration could be provided. Figure 5.3 illustrates the concept of a virtual weigh station.

Figure 5.3 – Virtual Weigh Station Concept



5.3.2 Work Zone Management Applications

ITS work zone management applications will be implemented over the next several years as several major construction projects are programmed along the interstate facilities. These projects include the utilization of interim surveillance and portable traffic information devices as well as portable, virtual TMCs for construction, engineering, and inspection and maintenance of traffic (MOT). The majority of the interim devices will be leased and will not become permanent. However, some districts have instituted policies to work towards permanent placement of ITS devices.

Examples of Florida ITS work zone management applications include:

- District 1 – I-4 Portable Work Zone ITS, Polk County;
- District 4 – I-95 Interim Traffic Management System in Palm Beach County;
- District 5 – I-4 Auxiliary Lane Construction and ITS Relocation/Replacement in Orange County;
- District 7 – I-75 and I-4 Interchange Reconstruction Interim ITS, Hillsborough County; and
- District 7 – I-4 Segment 3A and 3B Reconstruction Interim ITS, Hillsborough County.

The deployment of this application will become more common as the reduction of incidents and improvement in travel times is realized along the intrastate corridors.

5.4 Evacuation Coordination Services

Florida has adopted an ITS strategy for evacuation coordination that involves the option of reversing general-use lanes (GULs) to create one-way facilities during an evacuation for a majority of the five major intrastate facilities. These plans involve reversing the southbound lanes to northbound lanes and reversing east and westbound lanes in the direction of the evacuation. Entrance ramps at the interchanges in the reverse lane direction would be closed to prohibit normal directional flow of traffic during the evacuation event. A few of the evacuation plans have been developed as shoulder-use plans, which convert the interstate shoulder to a travel lane in lieu of reversing major travel lanes.

These reverse lane and shoulder-use plans also include deployment of DMS and HAR for traveler information, barricade and arrow board locations, aircraft surveillance, and the notification and stationing of emergency personnel and vehicles to direct the flow of traffic and provide security.

The Florida Highway Patrol (FHP) and FDOT are developing reverse lane operational plans for the five major intrastate corridors. Currently, only seven locations have been documented and completed. The evacuation facilities and the type of plans are identified in Table 5.4.

Table 5.4 – Major Evacuation Corridors

Facility	Type of Evacuation Plan
Florida's Turnpike from St. Lucie County to Orange County	Reverse Lane
I-75/Alligator Alley from Broward County to Charlotte County	Reverse Lane
I-4 from Tampa to Orlando	Reverse Lane
SR 528 (Bee Line Expressway) from SR 520 to SR 417	Reverse Lane
I-75/Sarasota County from Toledo Blade Boulevard to SR 681	Shoulder-Use
I-75/Hillsborough/Manatee County line to Hillsborough/Pasco County line	Shoulder-Use
I-10 from I-295 in Jacksonville to U.S. 231	Reverse Lane

Source: FDOT and FHP

Additionally, the United States Army Corps of Engineers drafted a study entitled *Southeast United States Hurricane Evacuation Traffic Study* that identifies reverse lane standards and ITS strategies for Florida's intrastate corridors. This study also makes recommendations for the implementation of additional ITS strategies to assist in the safe and efficient evacuation of Florida residents. Table 5.5 illustrates the recommendations.

Table 5.5 – Recommendations for ITS Deployments for Evacuation Coordination

Corridor	Location	Recommended ITS Devices
HEFT	I-75 to U.S. 1	CCTV
I-10	I-75 to SR 285	CCTV, HAR, VMS
I-75	SR 24 to South of U.S. 90	VMS
I-95	SR 528 to U.S. 192	CCTV, VMS
SR 528	U.S. 427	CCTV
Turnpike	SR 870 to Thomas B. Manual Bridge	CCTV

Source: *Southeast United States Hurricane Evacuation Traffic Study, Technical Memorandum 3.*

These recommendations are addressed in the *ITS Corridor Master Plans* through freeway and incident management services. The primary purpose of these devices would be freeway management services and, since the potential for the landfall of a major storm event typically occurs only once every one to three years, deployment of ITS devices specifically for one-way operations support was not recommended.

6. *ITS Corridor Master Plans*

6.1 Topics Common to All Corridors

The development of ITS along the principal FIHS limited-access corridors in a coordinated approach required a common framework for the deployments that were then tailored to the specific local needs within each corridor and district. This section summarizes the topics and discussions common in each of the *ITS Corridor Master Plans*.

6.1.1 Logical Architecture

A single logical architecture was developed for the coordinated deployment of ITS along the principal FIHS limited-access corridors. The logical framework is a tool used by system developers and transportation engineers to define the processes and data flows for ITS. A logical framework is a technology-independent view of the final architecture. It indicates the data and information processing that is required to satisfy all of the user services and highlights the data flows that should be supported between processes to ensure that the whole system works as a single harmonious unit. It also specifies the most efficient grouping of work processes, maximizing the ability to exploit specialization in work procedures and tools. This assists in organizing the functional processes and data flows of a system and is a valuable step towards the definition of a physical architecture.

ITS User Services are the core of requirements definitions and document what ITS services should do from a user's perspective. A user might be the public, a public system operator, or a private system operator. In the *NITSA* development effort, the United States Department of Transportation (USDOT) and ITS America, with significant stakeholder input, have defined 31 user services to date. A number of functions are required to accomplish each of these user services. To reflect this, each of the ITS User Services was broken down into successively more detailed functional requirements, called User Service Requirements.

Table 6.1 identifies the applicable near-term and future big picture deployment of the ITS User Services. The future big-picture user services represent full ITS deployments along the corridors that are likely to be implemented over the next twenty years and the near-term user services represent those ITS deployments that are likely to occur in the next few years, given the legacy ITS deployments and the corridors' programmed transportation improvements. These ITS User Services, except the Evacuation Coordination User Service, were derived from the *NITSA* and the *SITSA*.

Table 6.1 – Timing of Deployments of User Services

User Services		Applicable (Big Picture)	Applicable (Near-term)
1.0	**Travel and Traffic Management**		
1.1	**Pre-Trip Travel Information**		
1.1.1	Travel Services	✓	✓
1.1.2	Current Conditions	✓	✓
1.1.3	Trip Planning	✓	✓
1.1.4	User Access	✓	✓
1.2	**En-Route Driver Information**		
1.2.2	Driver Advisory	✓	✓
1.2.3	In-Vehicle Signing		
1.3	**Route Guidance**		
1.3.1	Provide Directions	✓	
1.3.2	Static Mode	✓	
1.3.3	Real-Time Mode	✓	
1.3.4	User Interface	✓	
1.4	**Ride Matching and Reservation**		
1.4.1	Rider Request (Demand)	✓	
1.4.2	Transportation Provider Services (Supply)	✓	
1.4.3	Information Processing (Marrying Supply and Demand)	✓	
1.5	**Traveler Services Information**		
1.5.1	Information Receipt	✓	✓
1.5.2	Information Access	✓	✓
1.6	**Traffic Control**		
1.6.1	Traffic Flow Optimization	✓	✓
1.6.2	Traffic Surveillance	✓	✓
1.6.3	Control Function	✓	✓
1.6.4	Provide Information	✓	✓
1.7	**Incident Management**		
1.7.1	Incident Identification	✓	✓
1.7.2	Response Formulation	✓	✓
1.7.3	Response Implementation	✓	✓
1.7.4	Predict Time and Location of Hazardous Conditions	✓	✓
1.8	**Travel Demand Management**		
1.8.1	Increase Efficiency of Transportation System	✓	✓
1.8.2	Provide Wide Variety of Mobility Options	✓	✓
1.9	**Emissions Testing and Mitigation**		
1.9.1	Wide Area Pollution Monitoring	✓	
1.9.2	Roadside Pollution Assessment	✓	
1.10	**Highway-Rail Intersection**		
1.10.1	Standard Rail Subservice (<80 MPH Trains)	✓	✓
1.10.2	High-Speed Rail Subservice (80 to 125 MPH Trains)	✓	
2.0	**Public Transportation Management**		
2.1	Public Transportation Management		
2.1.1	Operation of Vehicles and Facilities	✓	✓
2.1.2	Planning and Scheduling Services	✓	✓
2.1.3	Personnel Management		
2.1.4	Communications	✓	✓

Table 6.1 (Continued)

User Services		Applicable (Big Picture)	Applicable (Near-term)
2.2	**En-Route Transit Information**		
2.2.1	Information Distribution	✓	✓
2.2.2	Information Receipt	✓	✓
2.2.3	Information Processing	✓	✓
2.3	**Personalized Public Transit**		
2.3.1	Rider Request		
2.3.2	Vehicle Assignment		
2.3.3	Data Collection		
2.3.4	Information Processing		
2.3.5	Communications		
2.4	**Public Travel Security**		
2.4.2	Security Sensors Function	✓	✓
2.4.3	Personal Sensors Items		
2.4.4	Security Management and Control	✓	✓
3.0	**Electronic Payment**		
3.1	**Electronic Payment Services**		
3.1.1	Electronic Toll Collection (ETC)		
3.1.2	Electronic Fare Collection	✓	
3.1.3	Electronic Parking Payment		
3.1.4	Electronic Payment Systems (EPS) Integration		
3.1.5	Roadway Pricing	✓	
4.0	**Commercial Vehicle Operations (CVO)**		
4.1	**Commercial Vehicle Electronic Clearance**		
4.1.1	Fixed Facility	✓	✓
4.1.2	Vehicle System	✓	
4.2	**Automated Roadside Safety Inspection**		
4.2.2	Roadside Facility	✓	✓
4.2.3	Vehicle System	✓	
4.3	**On-Board Safety Monitoring**		
4.3.1	Fixed Facility		
4.3.2	Vehicle System		
4.4	**Commercial Vehicle Administrative Processes**		
4.4.1	Electronic Purchase of Credentials	✓	✓
4.4.2	Automated Mileage and Fuel Reporting and Auditing	✓	✓
4.4.3	International Border Electronic Clearance		
4.5	**Hazardous Materials (HAZMAT) Incident Response**		
4.5.1	Hazardous Materials (HAZMAT) Incident Notification	✓	✓
4.5.2	Operational Focal Point	✓	✓
4.5.3	Communications	✓	✓
4.6	**Commercial Fleet Management**		
4.6.1	Real-Time Routing		
4.6.2	Real-Time Communications		

Table 6.1 (Continued)

User Services		Applicable (Big Picture)	Applicable (Near-term)
5.0	**Emergency Management**		
5.1	**Emergency Notification and Personnel**		
5.1.1	Driver and Personal Security (Manual)	✓	✓
5.1.2	Automated Collision Notification	✓	✓
5.2	**Emergency Vehicle Management**		
5.2.1	Fleet Management	✓	✓
5.2.2	Route Guidance	✓	✓
5.2.3	Signal Priority	✓	✓
5.3	**Evacuation Coordination**		
5.3.1	Evacuation Guidance	✓	✓
5.3.2	Evacuation Travel Information	✓	✓
5.3.3	Evacuation Traffic Management	✓	✓
5.3.4	Evacuation Planning Support	✓	✓
5.3.5	Evacuation Resource Sharing	✓	✓
6.0	**Advanced Vehicle Safety Systems (AVSS)**		
6.1	**Longitudinal Collision Avoidance**		
6.1.1	Rear-End		
6.1.2	Backing		
6.1.3	Head-On/Passing		
6.2	**Lateral Collision Avoidance**		
6.2.1	Lane Change/Merge		
6.2.2	Single Vehicle Roadway Departure		
6.3	**Intersection Collision Avoidance**		
6.3.1	Advisory System		
6.3.2	Driver Action System		
6.3.3	Automatic Control System		
6.4	**Vision Enhancement for Crash Avoidance**		
6.4.1	Enhanced Vision System	✓	
6.5	**Safety Readiness**		
6.5.1	Driver Monitor		
6.5.2	Vehicle Condition		
6.5.3	Infrastructure Condition		
6.6	Pre-Crash Restraint Deployment		
6.6.1	Automatic Activation System		
6.7	Automated Vehicle Operation		
6.7.1	Automated Highway System (AHS)		
6.7.2	Partially Automated Highway System (PAHS)		
7.0	**Information Management**		
7.1	Archived Data		
7.1.1	Historical Data Archive	✓	✓
7.1.2	Operational Data Control	✓	✓
7.1.3	Data Import and Verification	✓	✓
7.1.4	Automatic Data Historical Archive	✓	✓
7.1.5	Data Warehouse Distribution	✓	✓
7.1.6	ITS Community Interface	✓	✓

Table 6.1 (Continued)

User Services		Applicable (Big Picture)	Applicable (Near-term)
8.0	**Maintenance and Construction Operations (MCO)**		
8.1	Maintenance Vehicle Fleet Management		
8.2	Roadway Management	✓	✓
8.3	Roadway Maintenance Conditions and Work Plan Dissemination	✓	✓
8.4	Smart Work Zones	✓	✓

In addition, an Evacuation Coordination User Service has been added that provides the capability to efficiently manage an evacuation and provide evacuees with information they need during the evacuation, as well as reentry. It consists of five major functions:

- Evacuation Guidance;
- Evacuation Travel Information;
- Evacuation Traffic Management;
- Evacuation Planning Support; and
- Evacuation Resource Sharing.

For further information regarding the Evacuation Coordination User Service, refer to *Appendix A*, . In addition, the USDOT issued a Maintenance and Construction Operations (MCO) User Service in February 2001 that will be evaluated for use in these corridors. Detailed documentation of this new user service is contained in *Appendix B*.

The purpose of the MCO User Service is to effectively manage, monitor, operate, and improve the physical condition of the roadways, associated infrastructure equipment on the roadways, and the available resources to conduct these activities. It consists of five major functions:

- Maintenance vehicle fleet management;
- Roadway management;
- Work zone management and safety (similar to smart work zones);
- Roadway maintenance conditions and work plan dissemination; and
- Roadway weather information data collection, processing, and distribution.

To ensure that the selected user services are consistent with the previously identified system goals and objectives, a traceability matrix was prepared that maps one element to the other. Goal Number 5 – Deploy an Integrated, Effective System – can be mapped to each of the ITS User Services.

Table 6.2 exhibits the standard market packages from the *NITSA* and those selected as applicable for the five principal FIHS limited-access corridors statewide. These market packages, grouped into eight general categories, will support ITS deployments for the principal corridors over the long-term.

To ensure that the selection of specific market packages adequately addresses the statewide ITS needs, market packages were mapped to the system themes, strategies, and user services. The selected ITS User Services characterize the needs, issues, problems, and objectives of the system and must be directly and specifically addressed by the selected market packages. Table 6.3 illustrates the relationship between market packages and themes. These represent a logical grouping of selected ITS solutions.

A further review of the market packages was necessary to determine those that are feasible for deployment over the near-term (five to ten years). Additionally, the agencies responsible for deployment and the methodology of deployment were also considered prior to developing recommendations to ensure that all projects included in the *ITS Corridor Master Plans* were reasonable, production-ready projects.

The market packages feasible for near-term (ten-year) deployments include:

- APTS – fixed-route transit operations, vehicle tracking, routing, and fare payment;
- ATIS – traveler information, RWIS, 511 implementation, and route guidance;
- ATMS – incident/freeway management, RWIS, HOV, and reversible lanes;
- CVO – electronic clearance and WIM;
- Emergency Management – evacuation management, Mayday support, and emergency response;
- Archived Data Management – ITS data mart and central data warehousing; and
- MCO.

In reviewing the potential deployment of these market packages, several of the proposed projects could not be recommended as corridor ITS projects because they are deployed on a statewide, systems-level basis and not on a corridor-by-corridor basis. These market packages include ATIS, CVO, and Archived Data. The ITS Central Office will be developing and deploying these ITS as part of a statewide initiative. Additionally, the APTS, MCO, Emergency Management, and Evacuation Coordination Market Packages are deployed through other state or local agency programs.

Table 6.2 – Recommended Market Packages for the *ITS Corridor Master Plans* from Version 3.0 of the *NITSA*

Market Package Number	Market Package Name	Applicable
Advanced Public Transportation Systems (APTS)		
APTS1	Transit Vehicle Tracking	✓
APTS2	Transit Fixed-Route Operations	✓
APTS3	Demand Response Time Operations	N/A
APTS4	Transit Passenger and Fare Management	✓
APTS5	Transit Security	✓
APTS6	Transit Maintenance	N/A
APTS7	Multi-Modal Coordination	✓
APTS8	Transit Traveler Information	✓
Advanced Traveler Information Systems (ATIS)		
ATIS1	Broadcast Traveler Information	✓
ATIS2	Interactive Traveler Information	✓
ATIS3	Autonomous Route Guidance (ARG)	N/A
ATIS4	Dynamic Route Guidance (DRG)	N/A
ATIS5	ISP-Based Route Guidance	N/A
ATIS6	Integrated Transportation Management/Route Guidance	N/A
ATIS7	Yellow Pages and Reservations	✓
ATIS8	Dynamic Ridesharing	✓
ATIS9	In-Vehicle Signing	N/A
Advanced Traffic Management Systems (ATMS)		
ATMS01	Network Surveillance	✓
ATMS02	Probe Surveillance	✓
ATMS04	Freeway Control	✓
ATMS05	High Occupancy Vehicle (HOV) Lane Management	✓`
ATMS06	Traffic Information Dissemination	✓
ATMS07	Regional Traffic Control	✓
ATMS08	Incident Management System (IMS)	✓
ATMS09	Traffic Forecast and Demand Management	✓
ATMS10	Electronic Fare Collection	✓
ATMS11	Emissions Monitoring and Management	N/A
ATMS12	Virtual TMC and Smart Probe Data	N/A
ATMS13	Standard Railroad Grade Crossing	✓
ATMS14	Advanced Railroad Grade Crossing	✓
ATMS15	Railroad Operations Coordination	✓
ATMS16	Parking Facility Management	✓
ATMS17	Reversible Lane Management	✓
ATMS18	Road Weather Information System (RWIS)	✓
ATMS19	Regional Parking Management	N/A
FL ATMS20	Speed Management	✓

Table 6.2 (Continued)

Market Package Number	Market Package Name	Applicable
Advanced Vehicle Safety Systems (AVSS)		
AVSS01	Vehicle Safety Monitoring	N/A
AVSS02	Driver Safety Monitoring	N/A
AVSS03	Longitudinal Safety Warning	N/A
AVSS04	Lateral Safety Warning	N/A
AVSS05	Intersection Safety Warning	N/A
AVSS06	Pre-Crash Restraint Deployment	N/A
AVSS07	Driver Visibility Improvement	N/A
AVSS08	Advanced Vehicle Longitudinal Control	N/A
AVSS09	Advanced Vehicle Lateral Control	N/A
AVSS10	Intersection Collision Avoidance	N/A
AVSS11	Automated Highway System (AHS)	N/A
Commercial Vehicle Operations (CVO)		
CVO01	Fleet Administration	N/A
CVO02	Freight Administration	✓
CVO03	Electronic Clearance	✓
CVO04	CVO Administrative Process	✓
CVO05	International Border Electronic Clearance	N/A
CVO06	Weigh-in-Motion (WIM)	✓
CVO07	Roadside CVO Safety	✓
CVO08	On-Board CVO Safety	✓
CVO09	CVO Fleet Maintenance	✓
CVO10	Hazardous Materials (HAZMAT) Management	✓
Emergency Management (EM)		
EM1	Emergency Response	✓
EM2	Emergency Routing	✓
EM3	Mayday Support	✓
FL EM4	Evacuation Management	✓
Archived Data and Management (AD)		
AD1	ITS Data Mart	✓
AD2	ITS Data Warehouse	✓
AD3	ITS Virtual Data Warehouse	✓
Maintenance and Construction Operations (MCO)		
FL MCO1	Maintenance and Construction Management	✓

Note: N/A – Not Applicable

Table 6.3 – Market Packages Mapped to Themes

Market Packages		Themes		
MP No.	**Market Package Name**	**Coordinated Operations**	**Active Facilities Management**	**Information Sharing**
APTS1	Transit Vehicle Tracking		•	
APTS2	Transit Fixed-Route Operations		•	
APTS4	Transit Passenger and Fare Management		•	
APTS5	Transit Security		•	
APTS7	Multi-Modal Coordination	•	•	
APTS8	Transit Traveler Information		•	•
ATIS1	Broadcast Traveler Information			•
ATIS2	Interactive Traveler Information			•
ATIS7	Yellow Pages and Reservations			•
ATIS8	Dynamic Ridesharing		•	•
ATMS01	Network Surveillance		•	
ATMS02	Probe Surveillance		•	
ATMS04	Freeway Control		•	
ATMS05	HOV Lane Management		•	
ATMS06	Traffic Information Dissemination	•	•	•
ATMS07	Regional Traffic Control	•	•	
ATMS08	Incident Management System (IMS)	•	•	
ATMS09	Traffic Forecast and Demand Management		•	•
ATMS10	Electronic Fare Collection	•	•	•
ATMS13	Standard Railroad Grade Crossing		•	
ATMS14	Advanced Railroad Grade Crossing		•	
ATMS15	Railroad Operations Coordination	•	•	
ATMS16	Parking Facility Management	•	•	
ATMS17	Reversible Lane Management	•	•	
ATMS18	Road Weather Information System (RWIS)		•	•
FL ATMS20	Speed Management		•	
CVO02	Freight Administration		•	
CVO03	Electronic Clearance	•	•	•
CVO04	CVO Administrative Process	•	•	
CVO06	Weigh-in-Motion (WIM)		•	
CVO07	Roadside CVO Safety		•	
CVO08	On-Board CVO Safety		•	
CVO09	CVO Fleet Maintenance		•	
CVO10	HAZMAT Management	•	•	
EM1	Emergency Response	•	•	
EM2	Emergency Routing	•	•	
EM3	Mayday Support	•	•	
FL EM4	Evacuation Management	•	•	•
AD1	ITS Data Mart			•
AD2	ITS Data Warehouse			•
AD3	ITS Virtual Data Warehouse			•
FL MCO1	Maintenance and Construction Management	•	•	•

Figure 6.1 is a graphical view of a generic section of the FDOT ITS logical architecture. They are often referred to as data flow diagrams or simply "bubble charts". The bubble labeled "ITS" is known as a process. A process is defined as the work required to convert data flows into the bubble and then data flows out of the bubble. Processes and data flows are grouped to form particular transportation management functions, which break down into several levels of detail.

A process specification (P-Spec) is a succinct summary of the processing that takes place inside the bubble. The curved arrows are data flows. These data flows can flow into and out of the processes or bubbles. The rectangles are called terminators and represent interaction and data flows between the ITS under consideration and the rest of the regional transportation context. Terminators represent other systems and entities that the FDOT ITS has to relate to, but over which they have no design control. Terminators are the external entities that communicate data from and to the ITS functional process. The *NITSA* groups the terminators into four categories:

- **Users** – This category includes personnel, operators, and travelers.
- **Systems** – Non-ITS centers that interact with ITS, such as government agencies, traditional signals and sensors, and braking and steering systems are included in this category.
- **Environment** – This category includes air quality, weather, etc.
- **Other Subsystems** – Other subsystems are included to represent the interaction among multiple similar subsystems that currently exist, such as center-to-center communications.

Figure 6.2 presents a high-level view of the major processes, data flows, and terminators required to achieve coordinated operations. Coordinated operations are a series of "linked hubs" that will be developed to provide corridor and statewide coordination. The logical framework will guide ITS deployments in various sub-regions along the corridor. This figure depicts the exchange of information among the major processes in a sub-region and their counterparts, which are depicted as terminators. For example, each hub in Tallahassee and in Tampa will contain the Manage Traffic Process. The figure shows that the Manage Traffic Process in Tallahassee (Sub-Region) will need to share information with the Manage Traffic Process in Tampa (Other Traffic Management Subsystem) to achieve coordinated operations.

ITS will be deployed along the principal FIHS limited-access corridors to enable transportation agencies to operate and manage these facilities more effectively. The logical framework for active facilities management is depicted in Figure 6.3. The exception is that the logical framework for evacuation coordination is not included within this diagram but follows in Figure 6.4.

Communications networks and protocols will be developed to enable data sharing among agencies and jurisdictions in the corridor, either through the creation of central databases or through links among existing databases and systems. The logical framework for information sharing is depicted in Figure 6.5.

Figure 6.1 – Generic Section of FDOT's ITS Logical Architecture

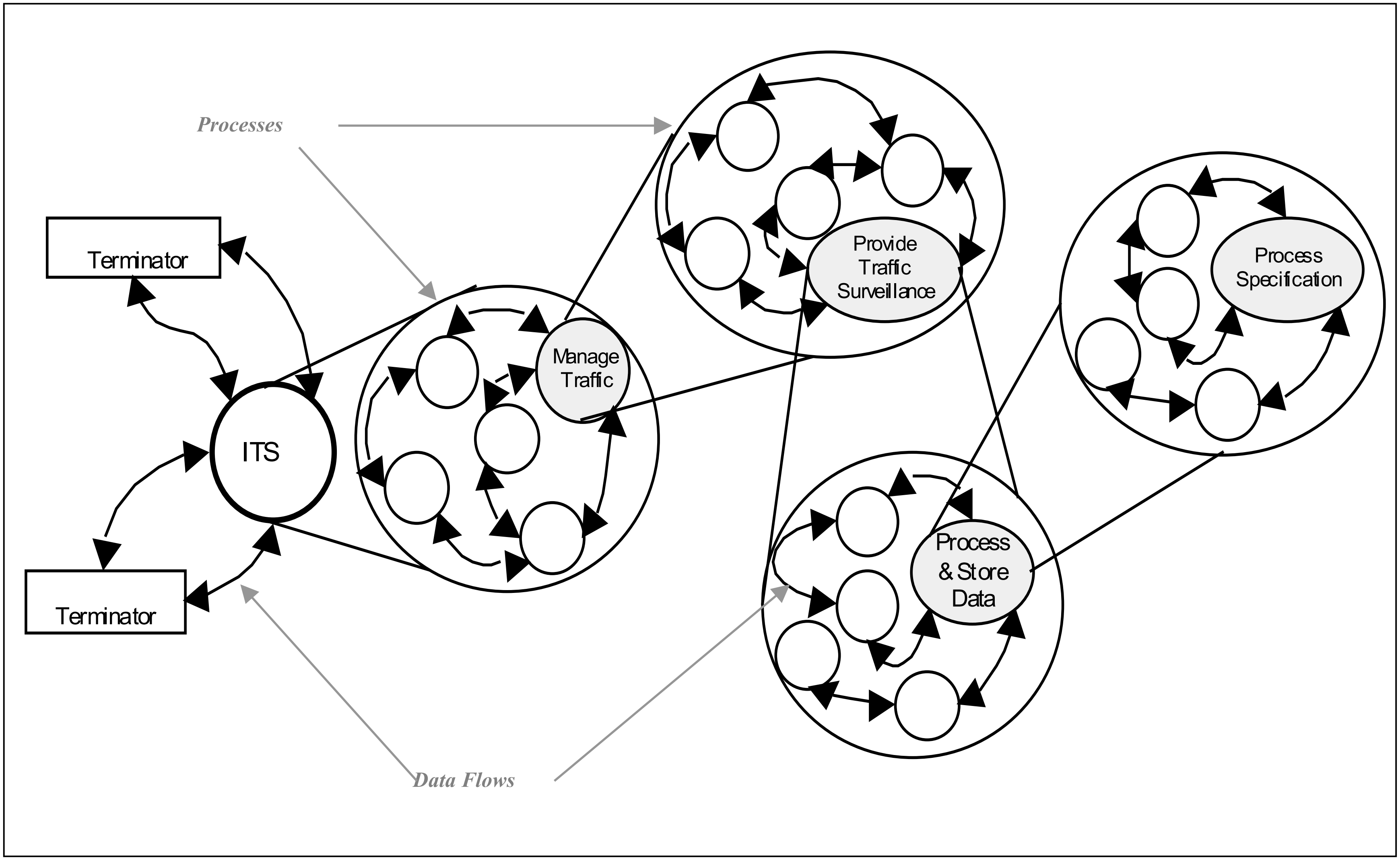


Figure 6.2 –Logical Framework Process for Coordinated Operations

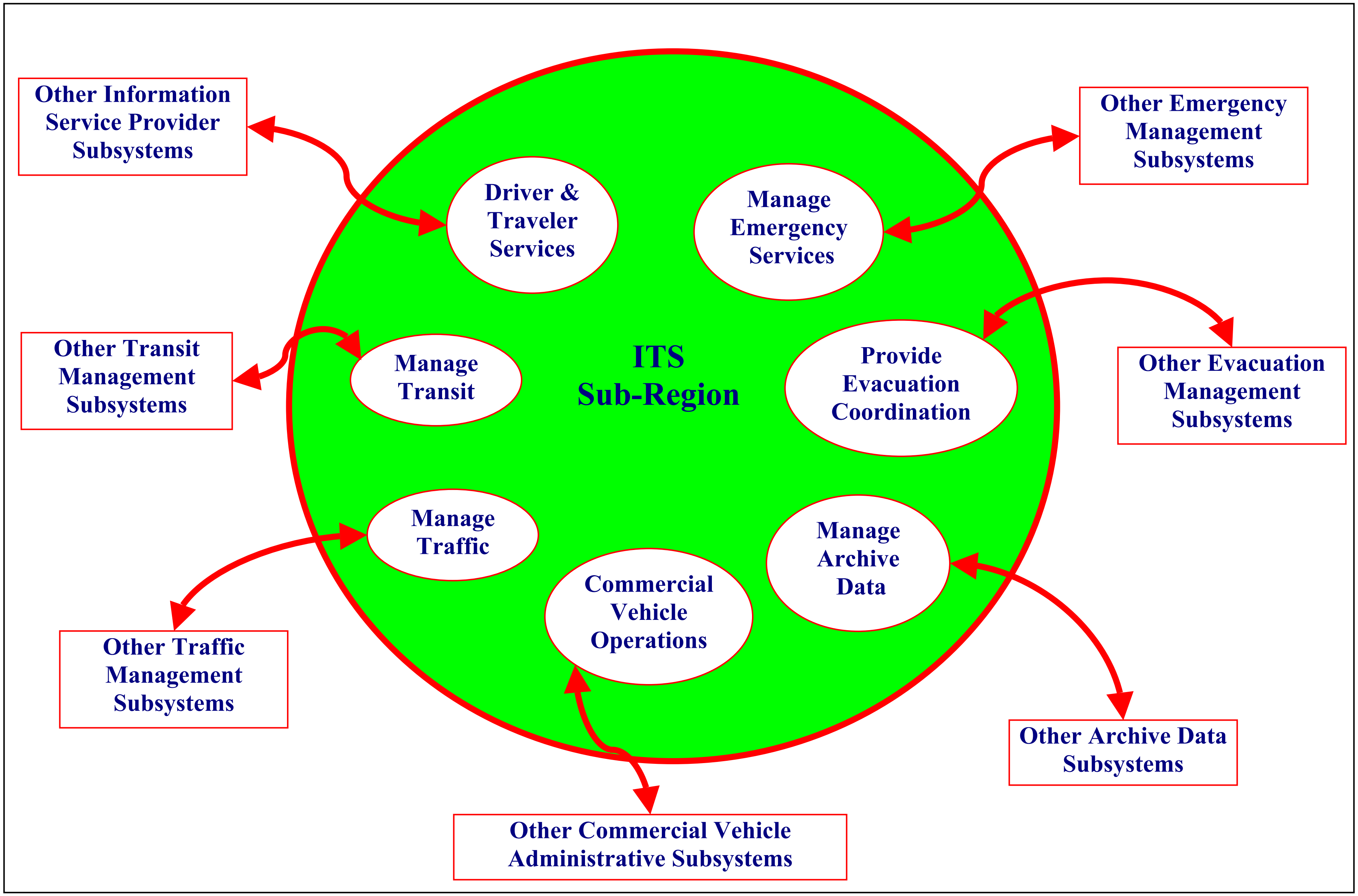


Figure 6.3 – Logical Framework for Active Facilities Management (Except Evacuation Coordination)

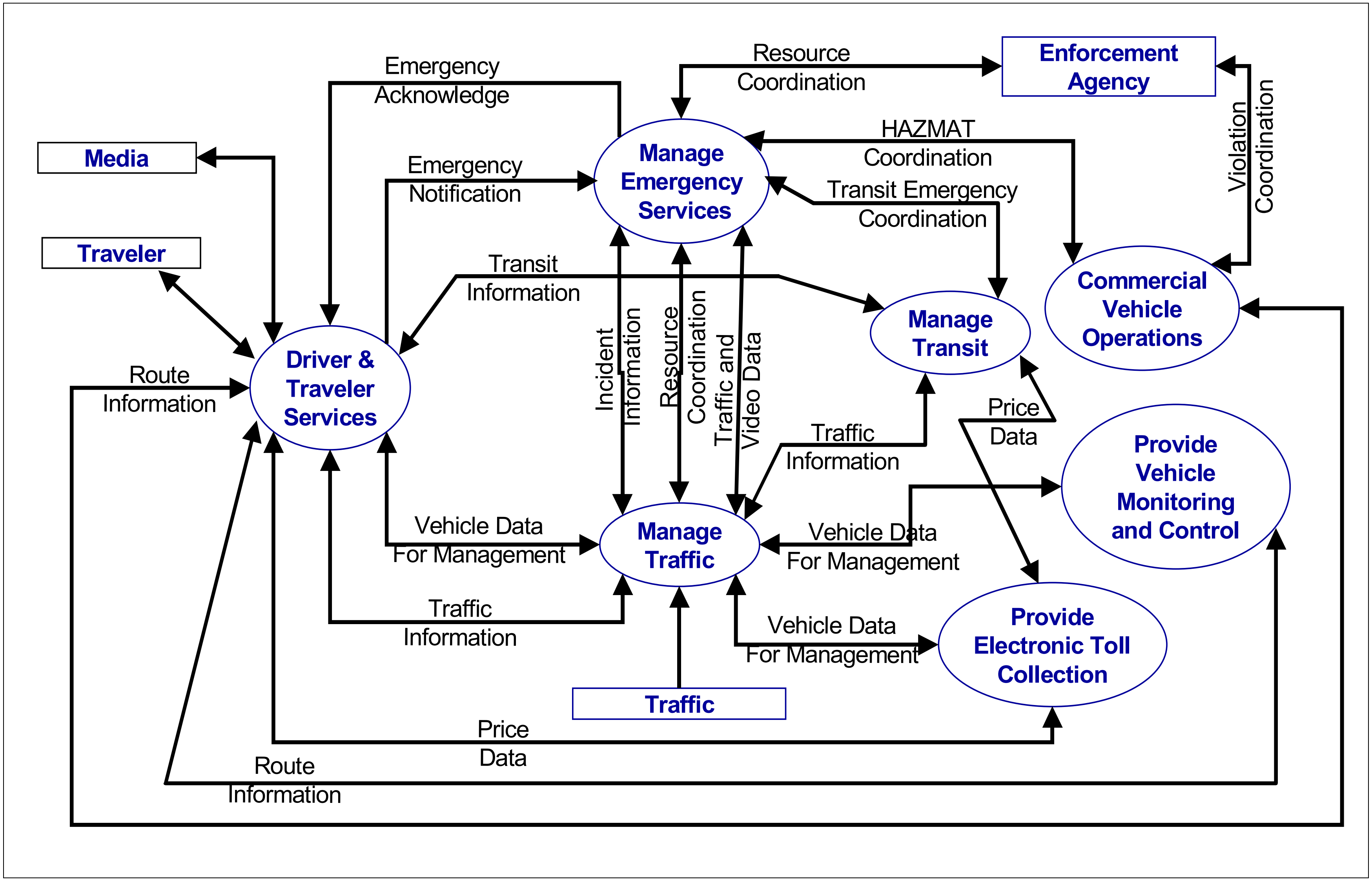


Figure 6.4 – Logical Framework for Evacuation Coordination

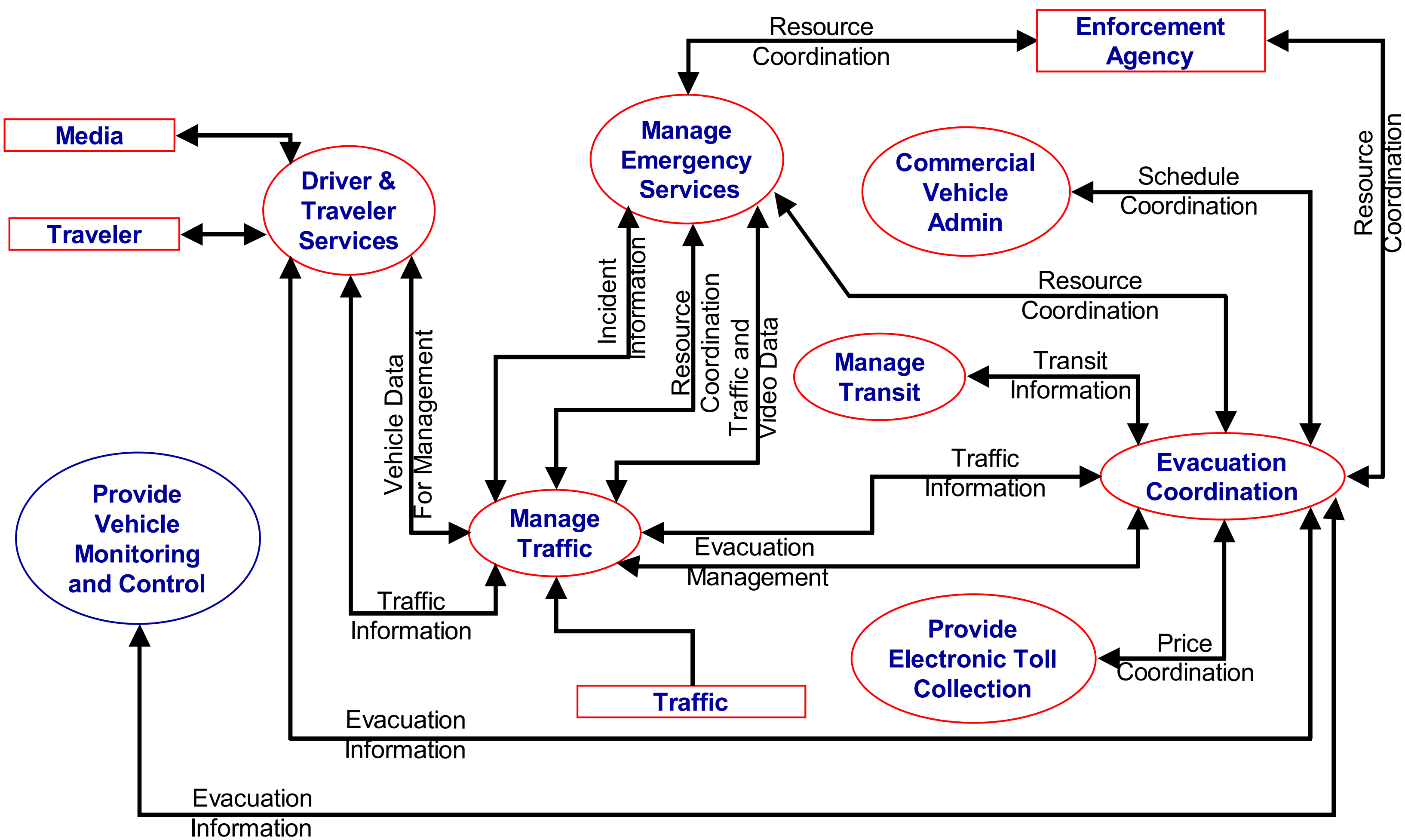
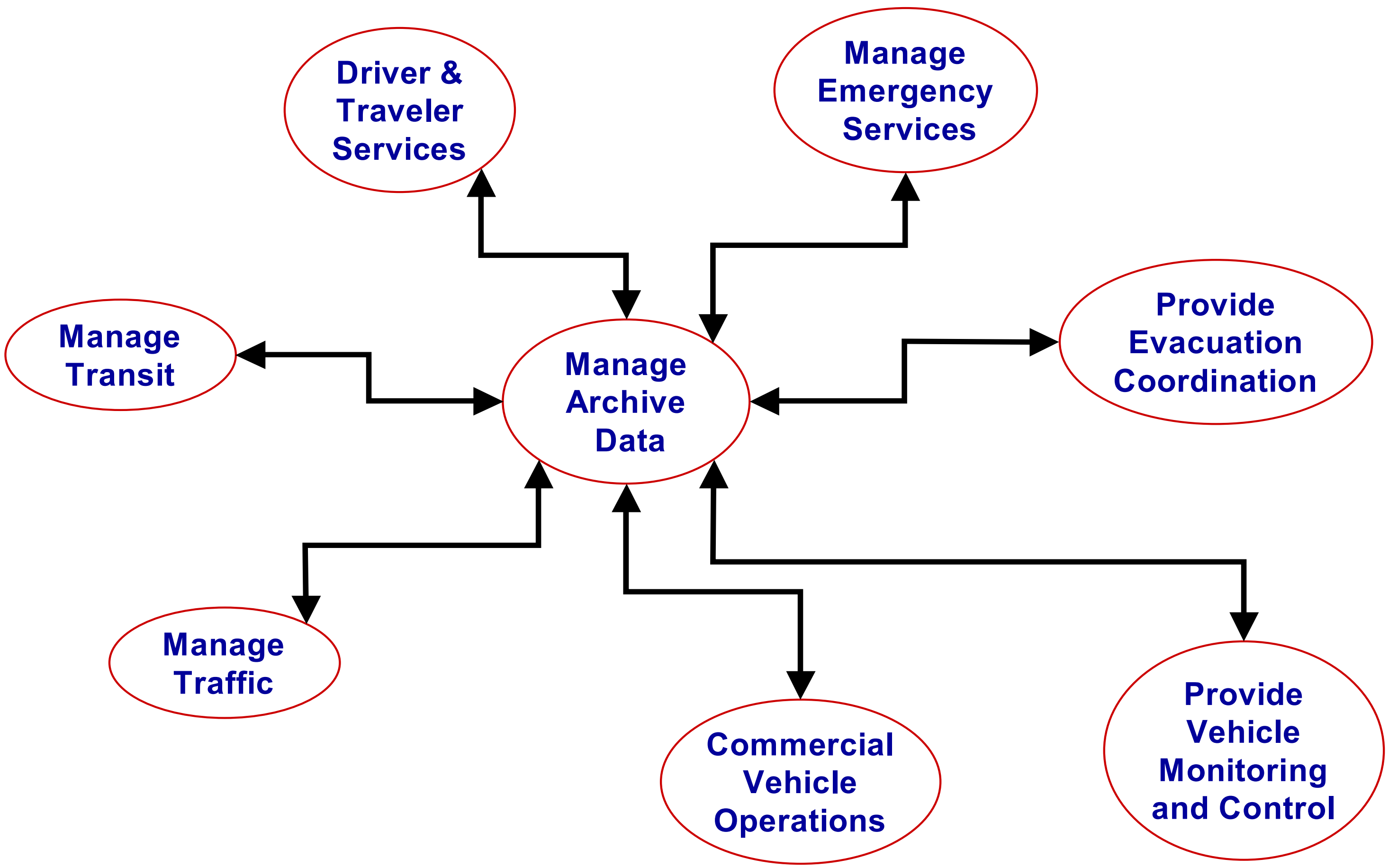


Figure 6.5 – Logical Framework for Information Sharing



6.1.2 Physical Architectures

Physical architectures were developed for each ITS corridor.

The physical architecture identifies the physical subsystems and the architecture flows between subsystems that will implement the processes and support the data flows of the ITS logical architecture. The physical architecture further identifies the system terminator inputs (sources) and system terminator outputs (destinations) for architecture flows in and out of the system.

The goal is to develop a framework that describes the processing to be carried out, identifies the most logical place to carry out the processing, and defines the data flows required to allow the whole framework to act as a single system.

The key components of the physical architecture are defined in terms of layers and elements. The physical architecture is structured in three layers: transportation, communications, and institutional. An overview of each layer is provided.

- **Transportation Layer –** This layer performs transportation functions such as traffic management and the provision of traveler information. Functions (i.e., P-Specs in the logical architecture) are assigned to subsystems so that the interfaces between subsystems represent candidate interfaces in the physical world. The remainder of this document focuses specifically on the analysis of data and the presentation of the results for this layer only.

- **Communications Layer –** This layer represents the technology that will support the interfaces between transportation functions. Each data flow required by the transportation functions is evaluated with respect to the type of communications service that will be needed.

- **Institutional Layer –** This layer represents the policy makers, planners, and other users of the ITS services. These agencies and organizations are further addressed in the *ITS Corridor Master Plans*.

The physical architecture contains the elements on which the evaluations, standards, and deployment and implementation strategies for the corridors have been built. The elements define the framework for the whole architecture. Key elements are identified as follows:

- **Subsystems –** Subsystems are the primary structural components of the physical architecture. Stakeholder input, institutional issues, and technology constraints and capabilities are used to determine the subsystems that are supported by each institution. These institutions perform functions that "belong" together and whose interfaces may require standards to promote interoperability and compatibility.

- **Physical Architecture Flows –** Processes from the logical architecture are assigned to each of the subsystems according to stakeholder inputs. Architecture flows between subsystems are determined based on the data exchange implied by the P-Spec assignments and the data flows defined in the logical architecture.

- **Physical Architecture Interconnections –** Each type of data flowing between subsystems requires a specific type of interconnect. The collection of interconnects that support all data flows is defined in the communications layer of the architecture.

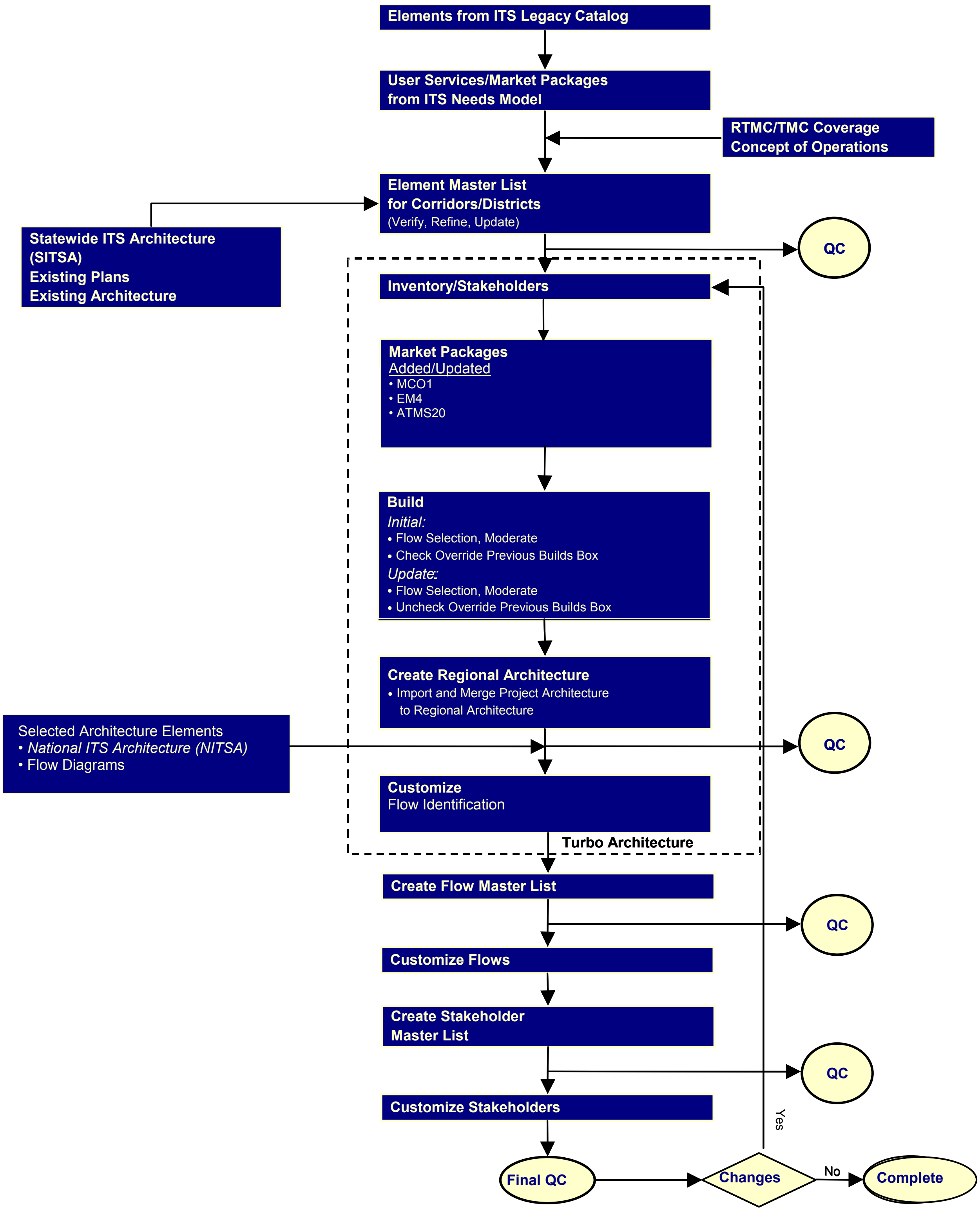
The approach taken in developing the physical architectures provides validated information as to what physical architecture elements (i.e., subsystems, terminators, and data flows) have to be supported if all of the limited-access corridors' ITS objectives are to be met. (Refer to the *NITSA* for complete definitions of the subsystems, terminators, and data flows.) These products are utilized to perform a detailed analysis and develop the most reasonable and appropriate physical framework. The physical framework focuses specifically on intrastate facility requirements. A conscious decision has been made to ignore current institutional and/or organizational elements and specific technologies that may be deployed at this stage.

For the development of the ITS corridor architectures, the *SITSA* was used as a starting point. The regional components of the statewide architecture were reviewed for content. All architecture subsystems, terminators, and flows contained in the regional components of the *SISTA*, but not directly related to the interstate corridor ITS operations, were excluded from the corridor architectures. Market packages, subsystems, terminators, and flows necessary for the corridor architectures, but not contained in the *SISTA*, were added.

The Turbo Architecture tool used in this study allows the user to select the applicable physical architecture elements for the corridors or the regions. It also provides users with a systems integration and planning design aid that facilitates the use of the *NITSA*. This application provides users with useful reports and graphics that show a high-level view of the district corridor architecture for system designers. The primary value-added benefits of this tool are that it is linked with standardized, validated *NITSA* databases. This ensures a consistent, standardized, and replicable baseline that is in conformance to the *NITSA*. The use of this architectural concept is required to receive federally allocated funds.

Through various graphical outputs, the Turbo Architecture tool illustrates the levels of communication, data flows, and interconnections between the various elements in the architecture. These flows and interconnects are useful in the development of communications infrastructure designs, ITS design/build criteria packages, and TMC software. Figure 6.6 illustrates the corridor architecture development process.

Figure 6.6 – Turbo Architecture Development Process



Selected market packages for each corridor were identified in the *Technical Memorandum No. 2.0 – ITS Needs Model*. These selected market packages were then mapped to each of the FIHS corridors based on their specific characteristics. Approximately 90 percent of the market packages identified in the *ITS Needs Model* were applicable to all corridors; however, certain market packages apply only to a limited number of corridors or corridor segments. For example, the ATMS17 market package for Reversible Lane Management only applies to certain segments of I-4, I-10, I-75, and Florida's Turnpike that will have reverse lane operations during hurricane evacuations. *Appendix A* identifies the market packages selected for each FIHS limited-access corridor by FDOT district.

Master Element Lists were created from the *SITSA* inventory of elements and other existing architectures. In order to ensure quality and the preservation of the process, these Master Element Lists were reviewed for consistency and errors and were modified and approved before the element information was entered into the Turbo Architecture databases.

Next, a series of project architectures were identified for each corridor by region. These project architectures grouped related market packages together. From project architectures, elements were added to each market package to coincide with their terminators and subsystems.

Once all of the initial preparation and data collection was completed, the data were entered into Turbo Architecture Version 1.1 software. This is indicated in Figure 6.7, by the group of tasks encompassed by the larger dashed box. The key steps to the Turbo Architecture data entry are as follows:

- **Inventory –** allows the architecture developer to add/delete/modify elements and assign them to a project or regional architecture;
- **Market Packages –** provides the developer with a complete list of all the *NITSA* market packages and allows the selection of each market package while also providing the necessary elements to associate to them;
- **Build –** allows the developer to build a list of architecture flows based on inventory and market package selections; and
- **Customize –** allows the developer to pick and choose connections and flows between elements.

6.1.3 Technology Review

A technology review was conducted that presents an overview of each selected market package and the products and services associated with the market package. In addition, the document presents estimates of the benefits and unit costs associated with the market package. Finally, implementation, operations, and maintenance issues, both technical and institutional, are discussed.

The benefits reported for each market package were obtained mainly from the ITS Benefit Database and corresponding reports produced by the Joint Program Office (JPO) of the USDOT. Other resources were used to obtain estimates of the benefits, as needed. In these cases, these sources are identified in the text.

Planning-level estimates of unit costs were obtained based mainly on the *NITSA, Version 3.0,* documentation, the ITS Central Office user-identified market packages, and the ITS Cost Database produced by the USDOT's JPO for ITS. As with the benefit estimates, other resources were used in the estimation of costs as needed. In these cases, these sources are identified in the text.

The technology review of this document addresses the market packages that are candidates for early deployments on the corridors. These include the ATMS, ATIS, CVO, Emergency Management, and Archived Data Market Packages. The APTS and the AVSS Market Packages, which are not candidates for early deployments, are not reviewed in this document.

Based on an assessment of each market package, "early winners" among these market packages for near-term deployments were identified. Once identified, "early winners" can be formulated into statements of work or "early projects." These "early projects" were used to support the recommendations of project phasing and priority. The following summarizes the recommended "early winners." Table 6.4 summarizes the analysis of the recommended "early winner" market packages.

- Broadcast Traveler Information;
- Interactive Traveler Information;
- Autonomous Route Guidance (ARG);
- Network Surveillance;
- Probe Surveillance;
- Freeway Control;
- Traffic Information Dissemination (DMS);
- Traffic Information Dissemination (HAR);
- Regional Traffic Control;
- Incident Management Systems (IMS);
- Traffic Forecast and Demand Management;
- Electronic Fare Collection;
- Virtual TMC (Work Zone);
- Standard Railroad Grade Crossing;
- Advanced Railroad Grade Crossing;
- Railroad Operations Coordination;
- Road Weather Information Systems (RWIS);
- Speed Management;
- Fleet Administration;
- Electronic Clearance;

- Commercial Vehicle (CV) Administrative Process;
- Weigh-in-Motion (WIM);
- Roadside CVO Safety;
- HAZMAT Management;
- Emergency Response;
- Emergency Routing;
- Mayday Support;
- Evacuation Management;
- ITS Data Mart;
- ITS Data Warehouse;
- Maintenance and Construction Operations (MCO);
- Transit Vehicle Tracking;
- Transit Fixed-Route Operations;
- Transit Passenger and Fare Management;
- Multi-Modal Coordination; and
- Transit Traveler Information.

Table 6.4 – Early Market Package Analysis

Market Package No.	Market Package Name	Move People/ Goods Safely	Preserve and Manage System	Enhance Economic Competitiveness	Enhance Quality of Life	Overall
APTS 1	Transit Vehicle Tracking	3	4	3	3	3
APTS 2	Transit Fixed- Route Operations	3	4	3	3	3
APTS 4	Transit Passenger and Fare Management	3	5	4	4	4
APTS 5	Transit Security	5	3	3	5	4
APTS 7	Multi-Modal Coordination	3	5	4	4	4
APTS 8	Transit Traveler Information	3	3	5	5	4
ATIS1	Broadcast Traveler Information	3	3	4	3	3
ATIS2	Interactive Traveler Information	3	3	4	3	3
ATIS3	Autonomous Route Guidance (ARG)	2	2	4	3	3
ATIS4	Dynamic Route Guidance (DRG)	3	3	5	3	4
ATIS5	ISP-Based Route Guidance	3	3	5	3	4
ATIS6	Integrated Transportation Management/Route Guidance	3	5	5	3	4
ATIS7	Yellow Pages and Reservations	1	2	5	4	3
ATIS8	Dynamic Ridesharing	2	2	2	4	3
ATIS9	In-Vehicle Signing	5	2	2	3	3
ATMS1	Network Surveillance	3	3	2	4	3
ATMS2	Probe Surveillance	2	3	2	4	3
ATMS3	Surface Street Control	3	5	4	4	4
ATMS4	Freeway Control	3	5	4	4	4
ATMS5	HOV Lane Enforcement	1	4	2	2	2
	High Occupancy Toll (HOT) Lanes	2	4	4	3	3
ATMS6	Traffic Information Dissemination (DMS)	3	3	3	3	3
	Traffic Information Dissemination (HAR)	3	3	3	3	3

Table 6.4 (Continued)

Market Package No.	Market Package Name	Move People/ Goods Safely	Preserve and Manage System	Enhance Economic Competitiveness	Enhance Quality of Life	Overall
ATMS7	Regional Traffic Control	3	4	3	3	3
ATMS8	Incident Management System (IMS)	4	5	4	4	4
ATMS9	Traffic Forecast and Demand Management	3	4	3	3	3
ATMS10	Electronic Fare Collection	3	4	4	3	4
ATMS12	Virtual TMC (Work Zone)	4	4	3	3	4
	Smart Probe Data	2	3	2	4	3
ATMS13	Standard Railroad Grade Crossing	5	2	2	2	3
ATMS14	Advanced Railroad Grade Crossing	5	3	3	2	3
ATMS15	Railroad Operations Coordination	5	3	3	2	3
ATMS16	Parking Facility Management	1	1	4	3	2
ATMS17	Reversible Lane Management	4	4	3	3	4
ATMS18	Road Weather Information System (RWIS)	5	2	2	2	3
FL ATMS20	Speed Management	5	2	2	2	3
CVO1	Fleet Administration	4	3	5	3	4
CVO2	Freight Administration	4	3	5	3	4
CVO3	Electronic Clearance	5	4	5	3	4
CVO4	CVO Administrative Process	4	4	5	3	4
CVO5	International Border Electronic Clearance	3	4	5	3	4
CVO6	Weigh-in-Motion	5	4	5	3	4
CVO7	Roadside CVO Safety	4	4	5	3	4
CVO8	On-Board CVO Safety	4	4	5	3	4
CVO10	HAZMAT Management	5	4	5	5	5
EM1	Emergency Response	5	4	4	3	4
EM2	Emergency Routing	5	4	4	3	4

Table 6.4 (Continued)

Market Package No.	Market Package Name	Move People/ Goods Safely	Preserve and Manage System	Enhance Economic Competitiveness	Enhance Quality of Life	Overall
EM3	Mayday Support	5	4	4	3	4
FL EM4	Evacuation Management	5	4	3	4	4
AD1	ITS Data Mart	3	4	2	4	3
AD2	ITS Data Warehouse	4	5	3	5	4
AD3	ITS Virtual Data Warehouse	4	5	3	5	4
FL MCO1	Maintenance and Construction Management	1	4	2	4	3

6.1.4 Standards Application Plan

A comprehensive standards application plan was prepared that is summarized in Table 6.5. This table identifies all of the relevant national standards applicable to market and equipment packages selected for deployment along the corridors.

Following the identification of applicable standards, an analysis of the critical standards was prepared. The corridor ITS architecture early deployments include many center-to-center interfaces. The standards that support these interfaces will allow regional interoperability and facilitate the sharing of information and control between agencies. Many of these standards are expected to reach an acceptable maturity level in the next few years and should be considered high priority standards. These high priority standards include Data Exchange (DATEX) National Transportation Communications for ITS Protocol (NTCIP) standards, Traffic Management Data Dictionary (TMDD), Message Set for External TMC Communications (MS/ETMCC), the ATIS data dictionary, the ATIS message set, and incident management standards. The maturity of these standards should be monitored and experience and lessons learned from early implementation of these standards should be carefully examined. Additions to the center-to-center standards will be needed to accommodate the Evacuation Coordination Market Package introduced for the principal FIHS limited-access corridors.

Support of the Common Object Request for Broker Architecture (CORBA) standards should be considered as this standard matures in the future and if the need to implement this standard arises. The maturity level of this standard in the next few years is unknown. Thus, in the near future, the use of the DATEX standards is recommended. The standard development activities that have been initiated to support the data archiving market packages should be closely monitored to determine their effects on the central data warehousing projects.

Many of the early corridor market packages are supported by center-to-roadway NTCIP standards. These standards support product interoperability, allowing equipment from multiple vendors to interoperate, reducing lock-in to single vendors and allowing easier upgrades or expansion of systems. These are high priority standards and consideration should be given to the implementation of these standards as they mature. As stated earlier, most of these standards will mature in the next one to four years. NTCIP standards that are expected to reach an acceptable maturity level before other standards do include DMS and weather information system NTCIP standards.

Critical standards that support early deployment market packages should also be considered for implementation when they reach an acceptable maturity level. These include dedicated short-range communications (DSRC) standards for commercial vehicles, other commercial vehicle standards, DSRC standards for emergency vehicle preemption, mayday reporting interfaces, and standards that support communications between ISPs and mobile information devices. These standards support national interoperability and their deployment will become critical as deployments around the nation increase. In particular, it appears that the DSRC standards for commercial vehicles are close to reaching an acceptable maturity level and should be considered as high priority standards.

Table 6.5 – ITS Standards that Support Corridor ITS Deployments

SDO	Document ID	Standard Title	Status
AASHTO	1207	NTCIP - Object Definitions for Ramp Meter Control	Approved
AASHTO	1208	NTCIP - Object Definitions for Video Switches	Under Development
AASHTO	2303	NTCIP - File Transfer Protocol (FTP) – Application Profile	Approved
AASHTO	1204	NTCIP - Object Definitions for Environmental Sensor Stations (ESS)	Published
AASHTO	1301	NTCIP – Weather Report Message Set for ESS	Published
AASHTO	2302	NTCIP - Trivial FTP – Application Profile	Approved
AASHTO	2304	NTCIP - Application Profile - DATEX	Under Development
AASHTO	2305	NTCIP - Application Profile for CORBA	Under Development
AASHTO	1102	NTCIP - Octet Encoding Rules	In Ballot
AASHTO	1101	NTCIP - Simple Transportation Management Framework (STMF)	Published
AASHTO	1104	NTCIP – CORBA Naming Convention Specification	Under Development
AASHTO	1105	NTCIP – CORBA Security Service Specification	Under Development
AASHTO	1106	NTCIP – CORBA Near Real-Time Data Service Specification	Under Development
AASHTO	2001	NTCIP - Class B Profile	Published
AASHTO	1201	NTCIP - Global Object Definitions	Published
AASHTO	1202	NTCIP - Object Definitions for Actuated Traffic Signal Controller Units	Published
AASHTO	1203	NTCIP - Object Definitions for DMS	Published
AASHTO	2101	NTCIP - Point-to-Multipoint Protocol (PMPP)/RS232 Subnetwork Profile	Approved
AASHTO	1209	NTCIP - Object Definitions for Transportation Sensor Systems (formerly SEN)	Under Development
AASHTO	1206	NTCIP – Object Definition for Data Collection	Under Development
AASHTO	2301	NTCIP - STMF Application Profile	Approved
AASHTO	1103	NTCIP - Simple Transportation Management Protocol (STMP)	Under Development
AASHTO	2104	NTCIP - Subnetwork Profile for Ethernet	In Ballot
AASHTO	2103	NTCIP - Subnetwork Profile for Point-to-Point Protocol Using RS 232	Under Development
AASHTO	2102	NTCIP - Subnetwork Profile for PMPP using FSK Modem	In Ballot
AASHTO	1205	NTCIP - Data Dictionary for CCTV	In Ballot
AASHTO	2202	NTCIP - Internet [Transmission Control Protocol (TCP)/ Internet Protocol (IP) and User Datagram Protocol (UDP)/IP] Transport Profiles	Approved

Table 6.5 (Continued)

SDO	Document ID	Standard Title	Status
AASHTO	2201	NTCIP – Transportation Transport Profiles	Under Development
AASHTO	8003	NTCIP – Profiles – Framework and Classification of Profiles	Approved
AASHTO	2501	NTCIP - Information Profile for DATEX	Under Development
AASHTO	2502	NTCIP - Information Profile for CORBA	Under Development
ITE	TM 1.03	Standard for Functional Level TMDD	In Ballot
ITE	9603-1	Advanced Transportation Controller (ATC) Software Application Program Interface (API)	Under Development
ITE	9603-2	ATC Physical Cabinet Functional Design	Under Development
ITE	9603-3	ATC Functionality and Interface Definitions	In Ballot
ITE	TM 2.01	MS/ETMCC	In Ballot
ITE	1400	TCIP – Framework Document	Approved
ITE	1407	TCIP – Control Center Business Area Standard	Approved
ITE	1401	TCIP – Common Public Transportation Business Area Standard	Published
ITE	1408	TCIP – Fare Collection Business Area Standard	Approved
ITE	1402	TCIP – Incident Management Business Area Standard	Published
ITE	1406	TCIP – On-Board Business Area Standard	Approved
ITE	1403	TCIP – Passenger Information Business Area Standard	Published
ITE	1404	TCIP – Scheduling/Runcutting Business Area Standard	Published
ITE	1405	TCIP – Spatial Representation Business Area Standard	Published
ITE	TS 3.TM	TCIP – Traffic Management Business Area Standard	Under Development
ANSI	TS284	Commercial Vehicle Safety Reports	Published
ANSI	TS285	Commercial Vehicle Safety and Credentials Information Exchange	Published
ANSI	TS286	Commercial Vehicle Credential	Published
ASTM	PS111-98	Standard Specification for DSRC – Physical Layer 902-928 MHz	Published
ASTM	PS105-99	Standard Specification for DSRC – Data Link Layer (Draft)	Published
ASTM	AG	Archived Data Management Subsystem Standard Guidelines	Under Development
ASTM	DD	Archived Data Management Subsystem (ADMS) Data Dictionary Specifications	Under Development
ASTM	N/A	Standard Specification for 5.9 GHz Data Link Layer	Under Development
ASTM	N/A	Standard Specification for 5.9 GHz Physical Layer	Under Development
EIA/CEA	EIA-794	Data Radio Channel (DARC) System	Published

Table 6.5 (Continued)

SDO	Document ID	Standard Title	Status
ASTM	N/A	Standard Specification for 5.9 GHz Physical Layer	Under Development
EIA/CEA	EIA-794	DARC System	Published
EIA/CEA	EIA-795	Subcarrier Traffic Information Channel (STIC) System	Published
IEEE	1512	Standard for Common Incident Management Message Set (IMMS) for use by EMCs	Published
IEEE	1455	Message Sets for DSRC ETTM and CVO	Published
IEEE	1512.a	Standard for Emergency Management Data Dictionary	Under Development
IEEE	1512.2	Standard for Public Safety IMMS for Use by EMCs	Under Development
IEEE	1512.3	Standard for HAZMAT IMMS for use by EMCs	Under Development
IEEE	1512.1	Standard for Traffic IMMS for Use by EMCs	Under Development
IEEE	1556	Standard for Security and Privacy of Vehicle/Roadside Communications	Under Development
IEEE	1570	Standard for Interface between the Rail Subsystem and the Highway Subsystem at a Highway-Rail Intersection.	Under Development
SAE	J1663	Truth-In Labeling Standards for Navigation Map Database	Published
AE	J1760	ITS Data Bus Data Security Services Recommended Practice	In Ballot
SAE	J1746	ISP-Vehicle Location Referencing Standard	Published
SAE	J2256	In-Vehicle Navigation System Communications Device Message Set Information Report	Published
SAE	J2313	On-Board Land Vehicle Mayday Reporting Interface	Published
SAE	J2353	ATIS Data Dictionary	Published
SAE	J2354	ATIS Message Set	Published
SAE	J2364	Standard for Navigation and Route Guidance Function Accessibility while Driving	Published
SAE	2366/2	ITS Data Bus Protocol – Link Layer Recommended Practice	In Ballot
SAE	J2366/1	ITS Data Bus Protocol – Physical Layer Recommended Practice (J2366-1)	In Ballot
SAE	J2366/4	ITS Data Bus Protocol – Thin Transport Layer Recommended Practice	In Ballot
SAE	J2366/7	ITS Data Bus Protocol – Application Layer Recommended Practice	In Ballot
SAE	J2367	ITS Data Bus Gateway Recommended Practice	Under Development
SAE	J2369	Standards for ATIS Message Sets Delivered Over Bandwidth Restricted Media	Published
SAE	J2395	ITS In-Vehicle Message Priority	In Ballot
SAE	J2396	Measurement of Driver Visual Behavior Using Video Based Methods (Definition and Measurement)	Published

Table 6.5 (Continued)

SDO	Document ID	Standard Title	Status
SAE	J2399	Adaptive Cruise Control – Operating Characteristics and User Interface	In Ballot
SAE	J2400	Forward Collision Warning – Operating Characteristics and User Interface	Under Development
SAE	J2529	Rules for Standardizing Street Names and Route IDs	Under Development
SAE	J2540	Messages for Handling Strings and Look-Up Tables in ATIS Standards	Under Development

Source: USDOT *ITS Standards Program*, website, updated by PBS&J.

Incorporating legacy systems and the migration of existing deployments to more mature nationally adopted standards will be a significant challenge for the legacy systems. The existing corridor ITS deployments are mainly in the ATMS and ETC areas. The *ITS Corridor Master Plans* should protect the investment made in the existing legacy systems. This section discusses the effect of ITS standards on legacy systems. The discussion is also applicable to future legacy systems, which includes future corridor ITS that are deployed before applicable standards are adopted.

In general, center-to-center communications standards can be implemented in either of two basic ways:

- Keep the center-to-center protocol software separate from the existing transportation management software. This involves a loosely coupled connection between the two software packages, which may make use of an existing data interface available in the TMC. This approach avoids or minimizes the need for changes to the existing software.

- Tightly couple the center-to-center protocol and management software with the existing transportation management software. This involves alteration of the existing software to provide integration. This option provides a more integrated application but may cost more.

The loosely coupled approach might be more cost-effective to connect existing centers with other centers since it makes use of existing software/hardware. However, the tightly coupled approach and its additional benefits can be obtained much more economically when it is provided as part of a new system development or upgrade.

It may not be feasible to modify existing field devices to make them NTCIP-compatible due to constraints such as computing power, memory availability, and cost of modifications. If these devices are not scheduled for replacement or upgrade, TMCs will probably have to continue communicating with these devices using the existing protocols. However, current devices and software may be capable of modification to be NTCIP-compliant and vendors of these devices should be consulted regarding this issue.

In general, NTCIP and non-NTCIP devices cannot be mixed on the same communications channel. Therefore, all devices sharing a channel must be upgraded simultaneously. A computer that communicates with both NTCIP and non-NTCIP devices will need to use different communications ports for NTCIP and for non-NTCIP devices and will need to support both protocols.

An approach that has been recommended for migrating to NTCIP-compliant center-to-roadway interfaces is to operate two separate systems during the transition period. One is NTCIP-compliant. The other is non-NTCIP compliant. Field devices can then be switched to NTCIP-compliant as they are replaced or upgraded.

6.1.5 Standard Specifications for Field Devices

Draft minimum specifications for ITS devices have been previously developed independently by the Traffic Engineering Research Laboratory (TERL), in conjunction with the Research Institute for Traffic Engineering (RITE) at the Florida Agricultural & Mechanical University (FAMU)/Florida State University (FSU) College of Engineering. All draft specifications were developed to be consistent with available national standards.

In addition, an approved minimum specification exists for permanent mount DMS, also developed by TERL. That document can be found at http://rite.eng.fsu.edu. DMS, permanent mount DMS, permanent mount DMS summary reports, and specifications on permanent mount DMS are included.

During this effort, we determined it necessary to develop minimum standard specifications for CCTV systems and RWIS. These minimum specifications include information to aid the districts in the procurement of devices. The specifications developed identify the minimum requirements without creating requirements that will result in vendor specific procurements and provide for a consistent application statewide. These documents are attached as *Appendix D*, which includes acoustic, infrared, magnetic, microwave, radar, ultrasonic, video detection, CCTV, and RWIS devices. *Appendix E* contains the minimum permanent mount DMS specifications.

6.1.6 Project Toolbox

To determine the cost, benefits, and impacts associated with the proposed ITS projects, the type and location of devices and capital equipment were estimated based on conceptual ITS design standards. For the FMS projects, a standard template or toolbox was developed for both rural and urban ITS deployments. Figures 6.7 and 6.8 present the conceptual design template for both the rural and urban FMS applications. The spacing standards included in the toolbox are derived from the review of Florida's existing FMS in comparison with national device spacing standards.

Figure 6.7 – Rural Interchange

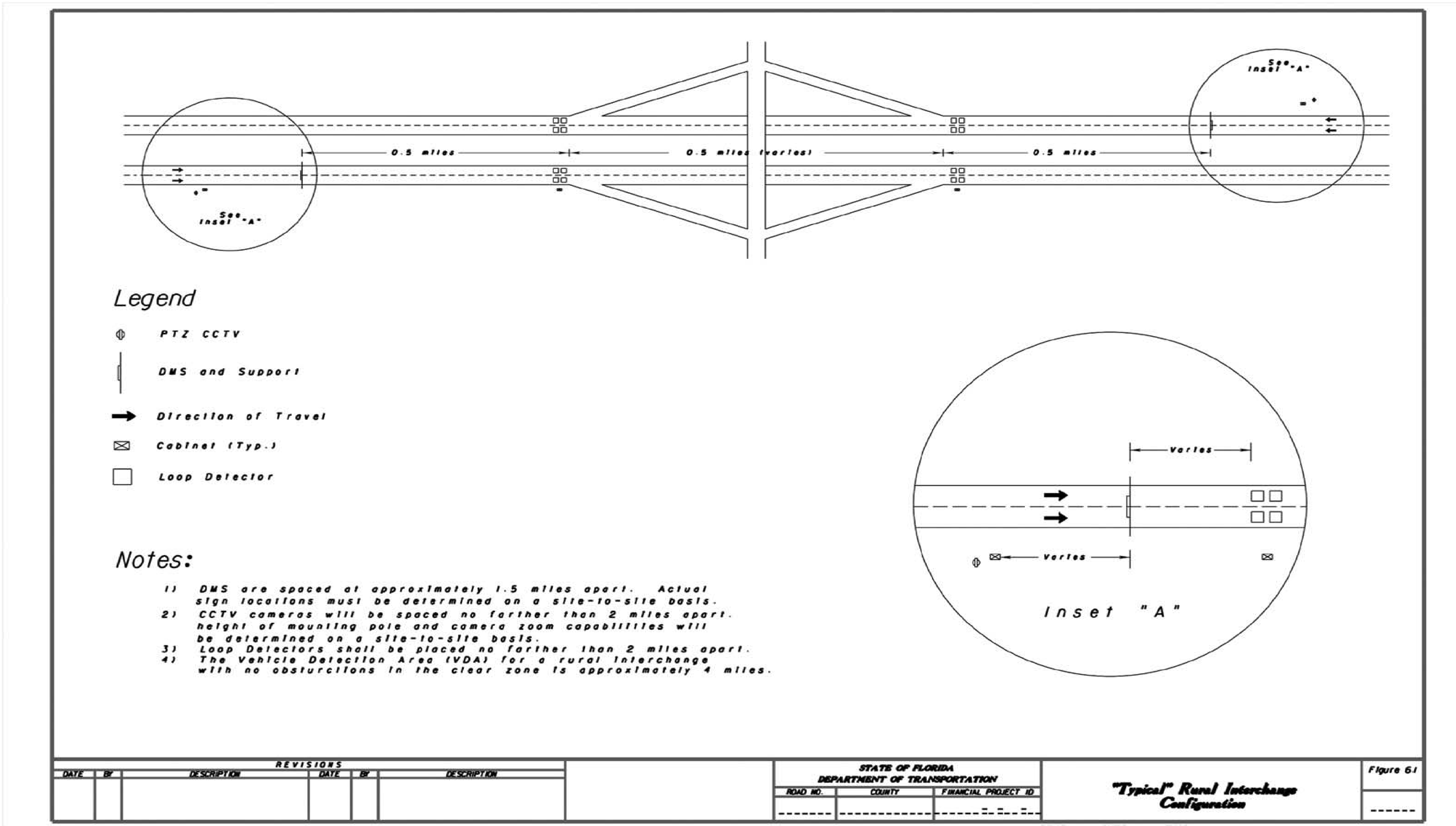
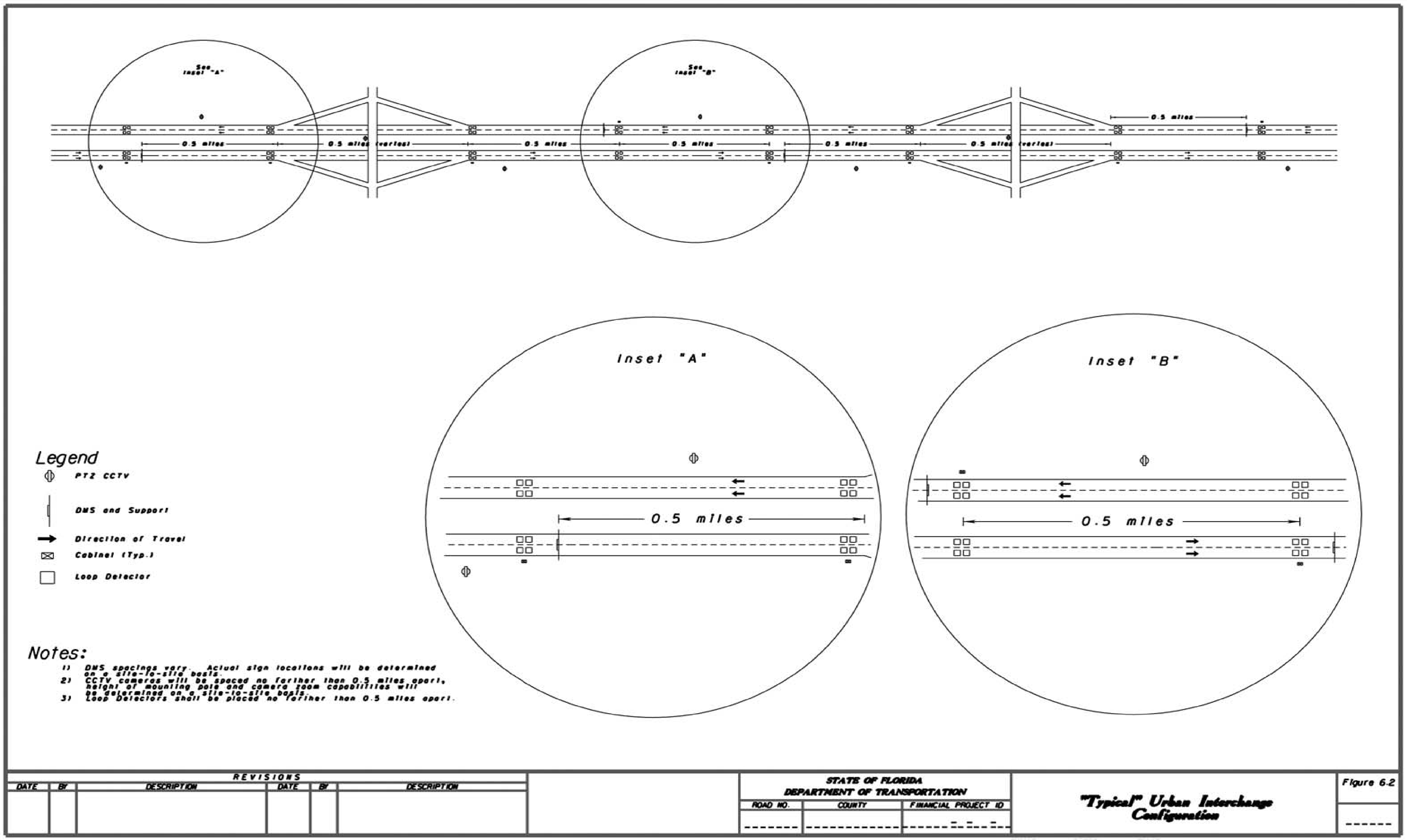


Figure 6.8 – Urban Interchange



The rural FMS conceptual design illustrates the need for ITS devices primarily at the rural interchanges for incident detection, verification, and clearance. DMS and CCTV systems are located at the approaches to the rural interchanges and the detection devices are located at all ramps. The urban FMS conceptual design assumes a much higher density of devices due to higher traffic volumes and complexity of data collection needs. The recommended spacing for the urban FMS is a half-mile for CCTVs, detection devices, and DMS at the approaches to each urban interchange. Based on district recommendations, CCTVs will be spaced no farther than one mile apart in urban areas.

These toolbox templates were then applied to the proposed corridor projects to determine the number, type, and location of proposed devices that were used to estimate project costs, benefits, and impacts.

6.1.7 Institutional Agreements

A critical step of ITS project implementation is to identify existing and proposed institutional agreements among agencies or between agencies and private entities addressing ITS services or deployments. The effectiveness of ITS implementations depends on the support and cooperation of many stakeholders, while the efficiency depends on the identification of a clearly defined organization system, lines of communication, and responsibilities and roles. Each stakeholder must have a consensus and understand how they are to participate, where they are needed, what their duties will be, when they will be needed, and who will be responsible. These agreements can be extended over local, regional, and statewide jurisdictions. Depending on the service provided, roles taken by participating stakeholders, familiarity among and between stakeholders, and the internal legal restrictions between each stakeholder organization, agreements could take one of several forms:

- Informal –
  - Verbal.

- Semi-Formal –
  - Memorandum of Understanding (MOU); and
  - Letters of Agreement (LOA).

- Formal –
  - Recorded Contracts.

As needs, services, stakeholder involvement, and system architectures are refined, issues will become better identified, establishing a basis for the types of agreements to be pursued. Generally, those agreements will fall into one or more of the categories listed below.

Jurisdictional Authority Agreements are needed when there is more than one agency providing similar or identical services within the same region and authority has not been clearly established by the Legislature. In these instances, there is a need for the participating agencies to clearly understand who will have authority and responsibility for given situations or circumstances where authority may be invoked and under what conditions that authority may be transferred.

Legal Agreements are needed when there are public agencies procuring services and/or commodities or leasing commodities from private entities.

Resource Allocation / Sharing Agreements are needed when there is more than one agency that will provide similar or identical services within the same region. In this instance, the agreement establishes what resources will be allocated by each of the agencies and how the sharing will take place. Resources could be staff, maintenance vehicles, replacement equipment, or transportation management facilities. Costs and benefits are outlined and clear lines of communications and responsibility for funding, operations, and maintenance are established.

Funding Agreements are needed when there will be a sharing of planning, design, procurement, operations, and maintenance services among public agencies and even public/private ventures. Funding areas that will most likely be the subject of interagency agreements are as follows:

- Non-Recurring Costs –
  - Planning;
  - Design;
  - Construction; and
  - Property.

- Recurring Costs –
  - Utilities;
  - Power;
  - Communications; and
  - Software/Hardware enhancements, upgrades, and expansions.

Communications/Coordination Agreements are needed when there are agencies or public/private ventures sharing responsibility for operating and maintaining services and systems.

Planning Agreements are needed when there is more than one agency with an interest in the development of a service or services in the same region. These agreements will typically address funding, responsibility, scheduling and milestones, stakeholder review, and areas of special interest.

Design Agreements are needed when there is more than one agency pursuing the development of a service or services in the same region. These agreements will typically address funding, responsibility, scheduling and milestones, stakeholder review, and areas of special interest.

Procurement Agreements are needed when there is more than one agency involved in providing similar or identical services within the same region, requiring similar or identical private services and equipment. In this instance, the agreement establishes what resource will be procured by each of the agencies, how the funding will take place, how upgrades, enhancements, warranties, and/or replacements will be handled, and who will be responsible for operations and maintenance. Funding areas that will most likely be the subject of interagency agreements are as follows:

- Field Equipment;
- Physical Plant Facility –
    - Building;
    - Property;
    - Security;
    - Furnishings; and
    - Communications; and
- Hardware/Software.

Construction Agreements are needed when there is more than one agency involved in providing similar or identical services within the same region, requiring similar or identical private services and equipment. In this instance, the agreement establishes what each agency's responsibility is and how the funding and approvals will be handled.

Operations Agreements are needed when there is more than one agency providing similar or identical services within the same region. In this instance, the agencies will identify which portions of the operation each will be responsible for, how that responsibility will be shared or transferred when warranted, and how funding will be handled. Operational areas that will most likely be the subject of interagency agreements are as follows:

- Staffing;
- Security;
- Hardware / Software management;
- Communications plants;
- Signal control;
- Incident management;
- Data management;
- Data distribution;
- Changeable message sign (CMS) operation and control;
- CCTV operation and control; and
- Detection systems operation and control.

Maintenance Agreements are needed when there is more than one agency providing similar or identical services within the same region. In this instance, the agencies will identify which portions of the maintenance each will be responsible for, how that responsibility will be shared or transferred when warranted, and how funding will be handled. Maintenance areas that will most likely be the subject of interagency agreements are as follows:

- Field Equipment;
- Physical Plant Facility –
  - Building management;
  - Security;
  - Furnishings; and
  - Grounds;
- Hardware / Software;
- Communications Management; and
- Utility Locations.

6.1.8 Project Priorities and Phasing

Once the planned ITS projects were defined, they were combined with the planned ITS projects developed by FDOT Districts 2, 4, 5, and 6 as part of their ITS feasibility studies. The proposed and planned projects were regrouped as projects and then prioritized according to the following prioritization methodology.

Prioritization Methodology – Table 6.6 lists the assumptions and constraints considered in developing the strategic approach for prioritization of ITS.

Table 6.6 – Criteria for Prioritizing ITS Deployments

Criteria	Measure	Score	Weighting
Population and Urbanization	Population within each county as derived from the 2000 Census.	Based on percentile rank of the most populated to the least populated.	10%
Incidents	Safety ratio as provided by the Safety Office.	Based on percentile rank from the highest to the lowest safety ratio.	20%
Congestion Levels	Percent of travel heavily congested (LOS E/F) along each corridor as defined by the Mobility Performance Measures program (TranStat).	Based on percentile rank from the highest percentage of travel congested to the lowest.	20%
Special Event Generators	Number of attendees of special events in each county each year as provided by Visit Florida and through research of known venues and special events.	Based on percentile rank from the highest number of attendees to the lowest by county.	10%
Evacuation Coordination	Number of evacuees generated on each facility during a critical storm event as determined using the demand estimating tool generated by PBS&J for the U.S. Army Corps of Engineers.	Based on percentile rank from the highest number of evacuees to the lowest by county.	15%
CVO Operations	Truck volume as reported in the Roadway Characteristics Inventory (RCI).	Based on percentile rank from the highest truck volume to the lowest by segment.	5%
Production Capability	Project Phase Complete o Design Complete o Design Criteria Complete or Design Underway	 100 67	5%
Programmed Improvement Construction Capacity	Programmed capacity improvement where permanent installation can be used to support smart work zone management.	Improvement Fiscal Year FY 03 – 100% FY 04 – 80% FY 05 – 60% FY 06 – 40% FY 07 – 20%	15%
		TOTAL	**100%**

Following the application of these prioritization criteria, the results were analyzed and adjusted to reflect the following:

- Systems continuity and connectivity to existing ITS services and communications systems;

- Coordination with capacity improvement projects that are included in the *Ten-Year FIHS Cost Feasible Plan;*

- Reasonableness and logical termini;

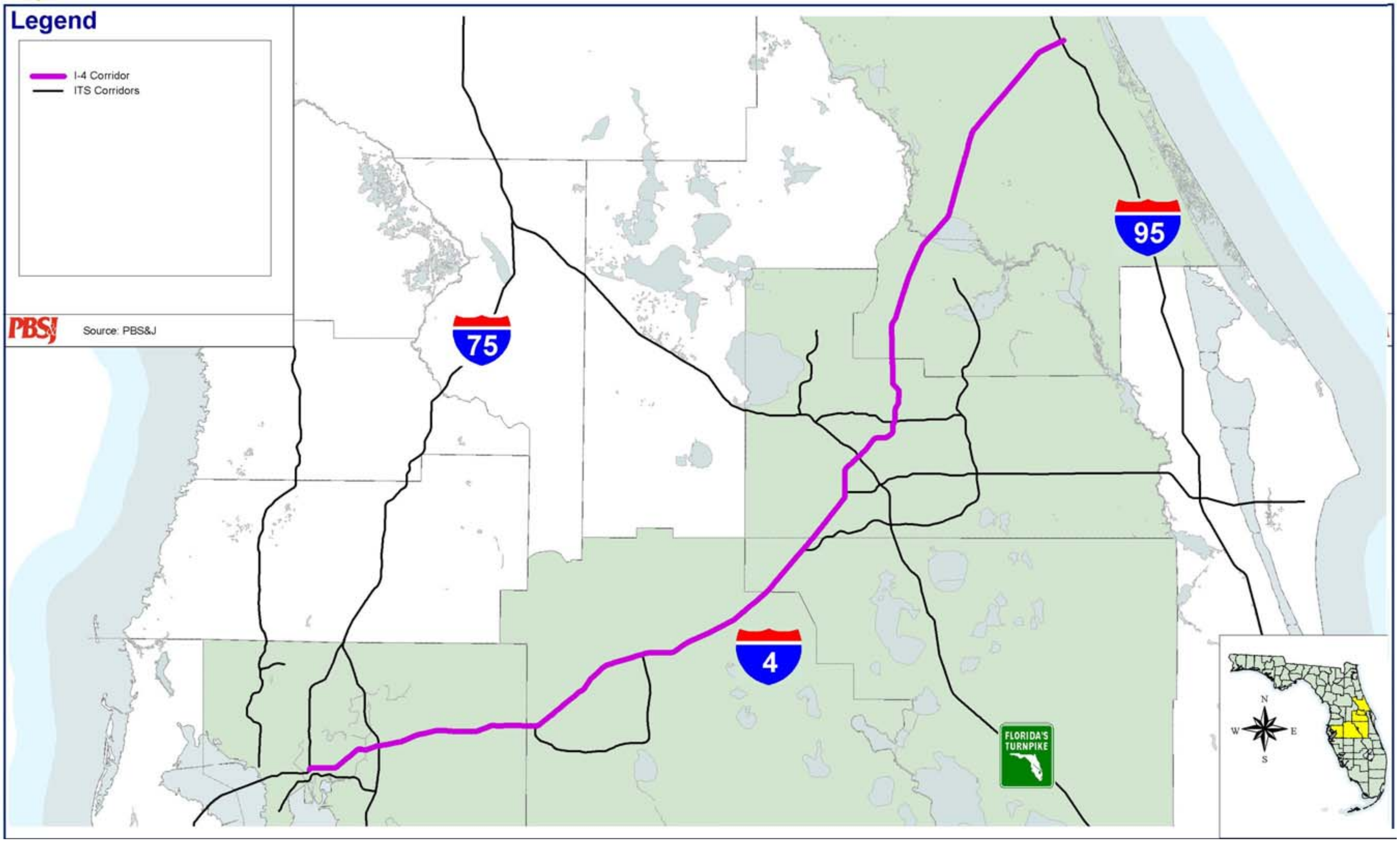
- Local needs and priorities addressed in corridor and regional ITS plans prepared by the districts and expressway authorities;
- Congestion mitigation for severely congested facilities;
- Safety considerations to address high-accident locations; and
- Consideration of priorities provided by the expressway authorities.

6.2 I-4 ITS Corridor Master Plan

6.2.1 Corridor Description

The limits of the I-4 corridor are I-275 in Hillsborough County to I-95 in Volusia County. I-4 begins in Hillsborough County from I-275, traversing through Polk, Osceola, Orange, and Seminole counties and terminating at I-95 in Volusia County. District 7 will be responsible for command and control of I-4 from I-275 to U.S. 27 (Polk County). District 5 will control I-4 from U.S. 27 (Polk County) to I-95 in Volusia County. District 1 will provide maintenance for I-4 in Polk County. Figure 6.9 shows the I-4 corridor location.

Figure 6.9 – I-4 Corridor Location



6.2.2 Legacy Systems

The following text identifies existing physical and operational conditions along the I-4 corridor as presented in *Technical Memorandum No. 1 – ITS Legacy Catalog* prepared for the *ITS Corridor Master Plans*:

- I-4 consists mainly of four GULs except for small sections in Hillsborough and Orange counties that are comprised of six to eight lanes.

- I-4 also has a somewhat high interchange density of 2.2 miles per interchange. Its highest interchange densities are located within the urban areas of Hillsborough and Orange counties. The interchange locations for I-4 are shown on Figure 6.10 and the corridor area types are illustrated in Figure 6.11.

- Several high accident locations are scattered throughout the I-4 corridor. The area exhibiting the highest concentration of accidents is the interchange of I-275 and I-4 located in the downtown Tampa area. Typically, large interstate-to-interstate interchanges experience high accident volumes due to the complex nature of the weaving and merging patterns at these interchanges. Figure 6.12 illustrates the high crash frequency locations for the I-4 corridor.

- As shown in Figure 6.13, the I-4 corridor has 91,013 vehicles per day (vpd) in average annual daily traffic (AADT) for the year 2000. The traffic volume is estimated to increase 31 percent from 2000 to 2010 with 132,045 vpd and 32 percent from 2010 to 2020 with 195,003 vpd. Figures 6.14 and 6.15 illustrate the 2010 and 2020 AADTs, respectively, for the I-4 corridor. The largest projected area of growth for the corridor is the Orlando/Orange County area. Travel demand in Orange County is expected to more than double to 310,284 vpd by the year 2020. Seminole County is also forecasted to have the same increase in travel demand. The existing six- to eight-lane interstate facilities will not be able to accommodate the forecasted demand at adequate LOS. Volusia County has the lowest projected traffic volume of the corridor. It is expected to increase to 102,600 vpd by 2020. This indicates that I-4 is and will continue to be a highly traveled roadway in an area of increasing population throughout central Florida.

- Tourism is Florida's largest industry. Due to the high volume of annual tourists, the state transportation system must be designed to accommodate the social and recreational travel generated by the major tourist attractions and activity centers in addition to supporting the daily commuter and freight travel. Therefore, by locating the state's major activity centers, special generators, and tourist attractions, ITS solutions such as real-time traveler information systems and incident management techniques can be implemented in coordination with multi-modal improvements to improve mobility to and around these major activity centers.

Figure 6.10 – Interchange Locations on the I-4 Corridor

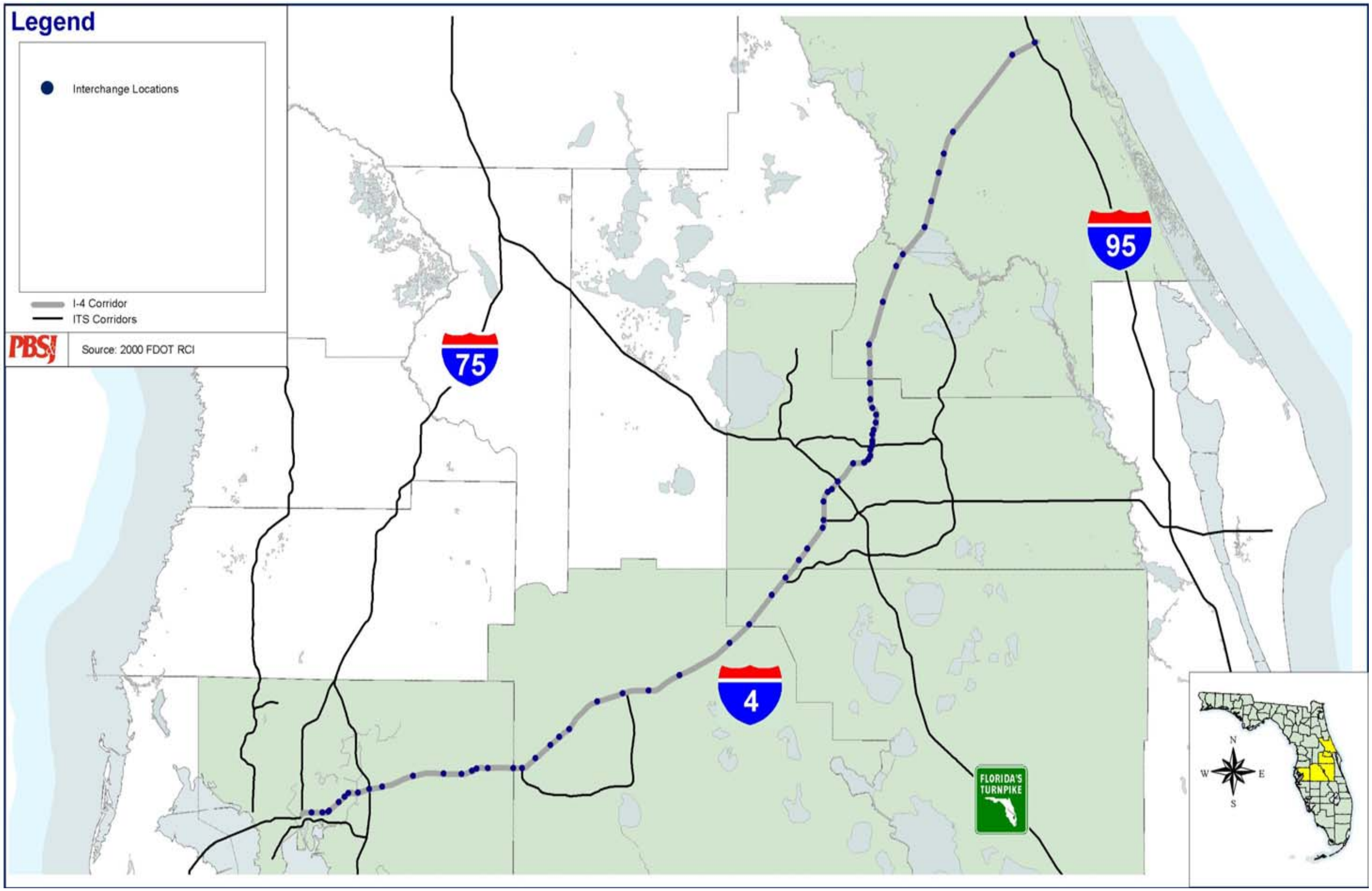


Figure 6.11 – I-4 Corridor Area Types

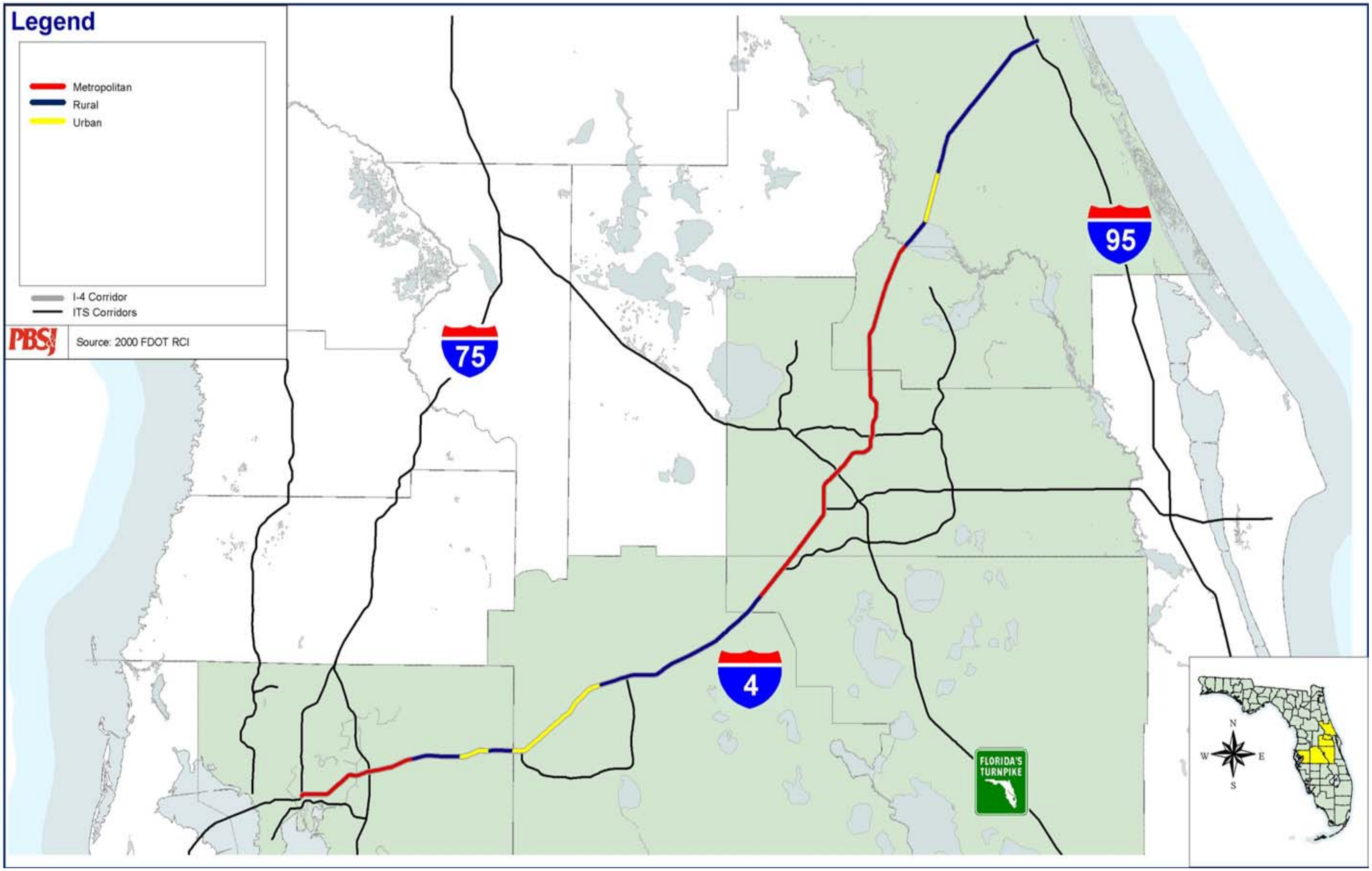


Figure 6.12 – High Crash Frequency Locations on the I-4 Corridor

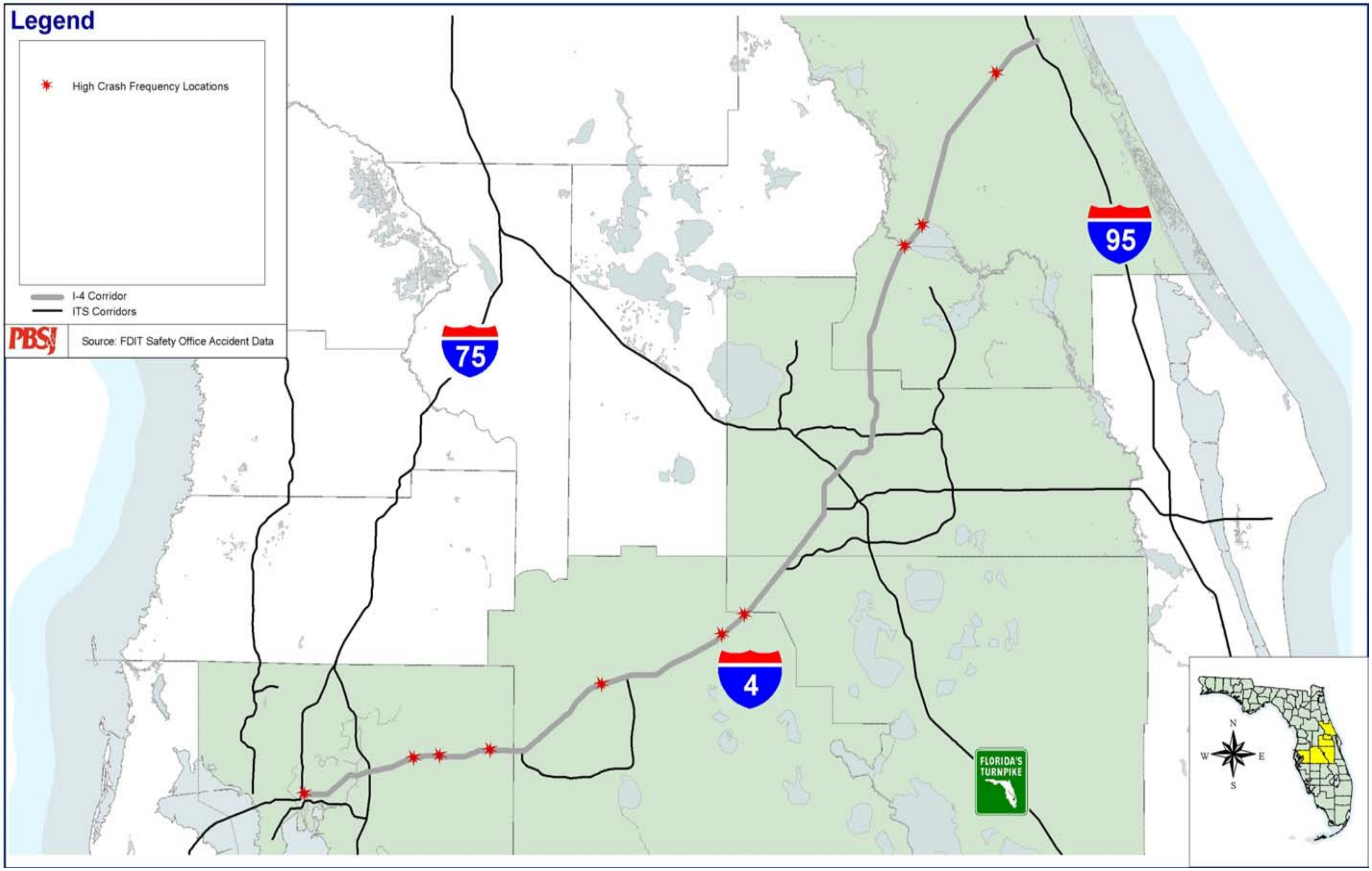


Figure 6.13 – I-4 Corridor 2000 AADT

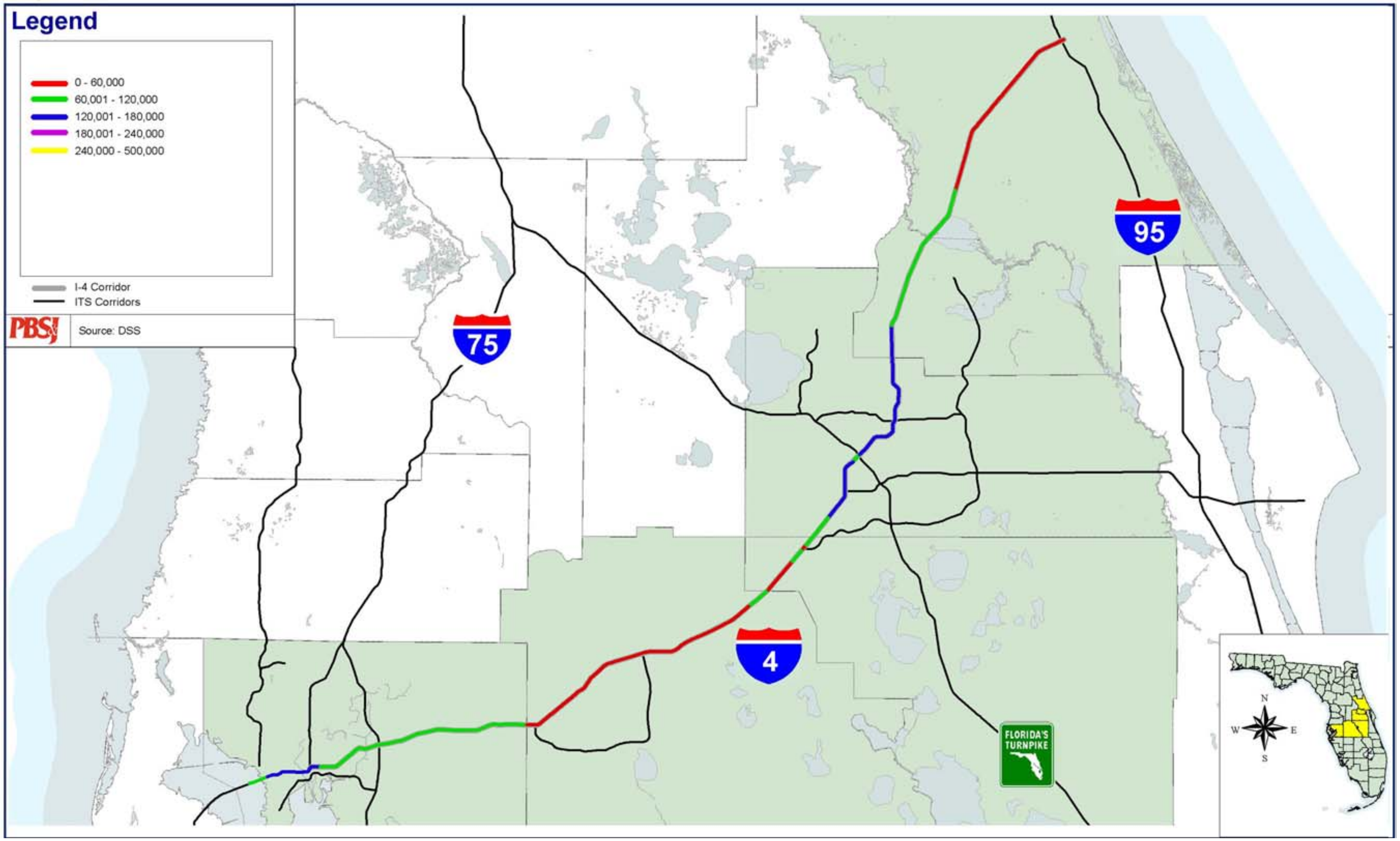


Figure 6.14 – I-4 Corridor 2010 AADT

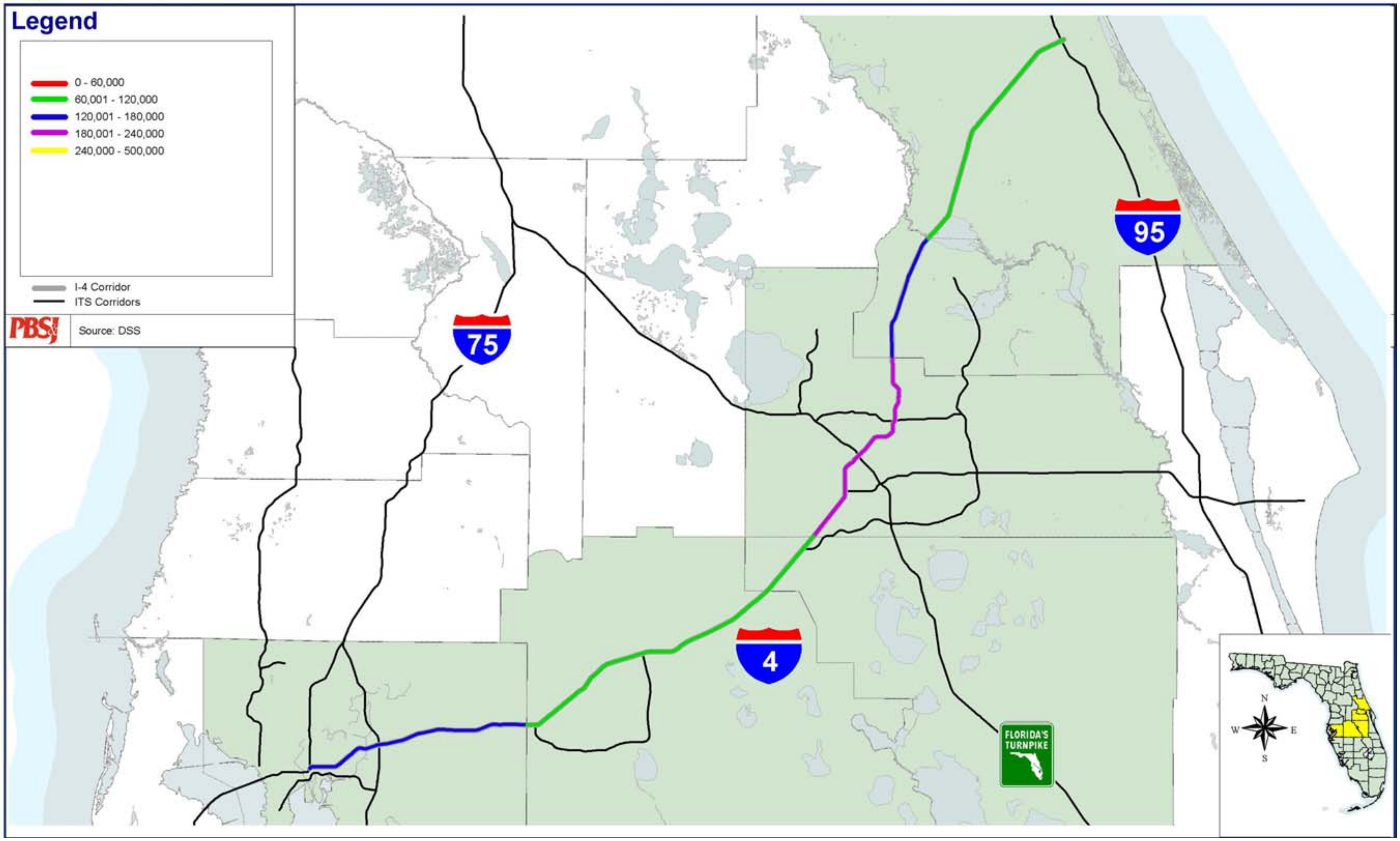
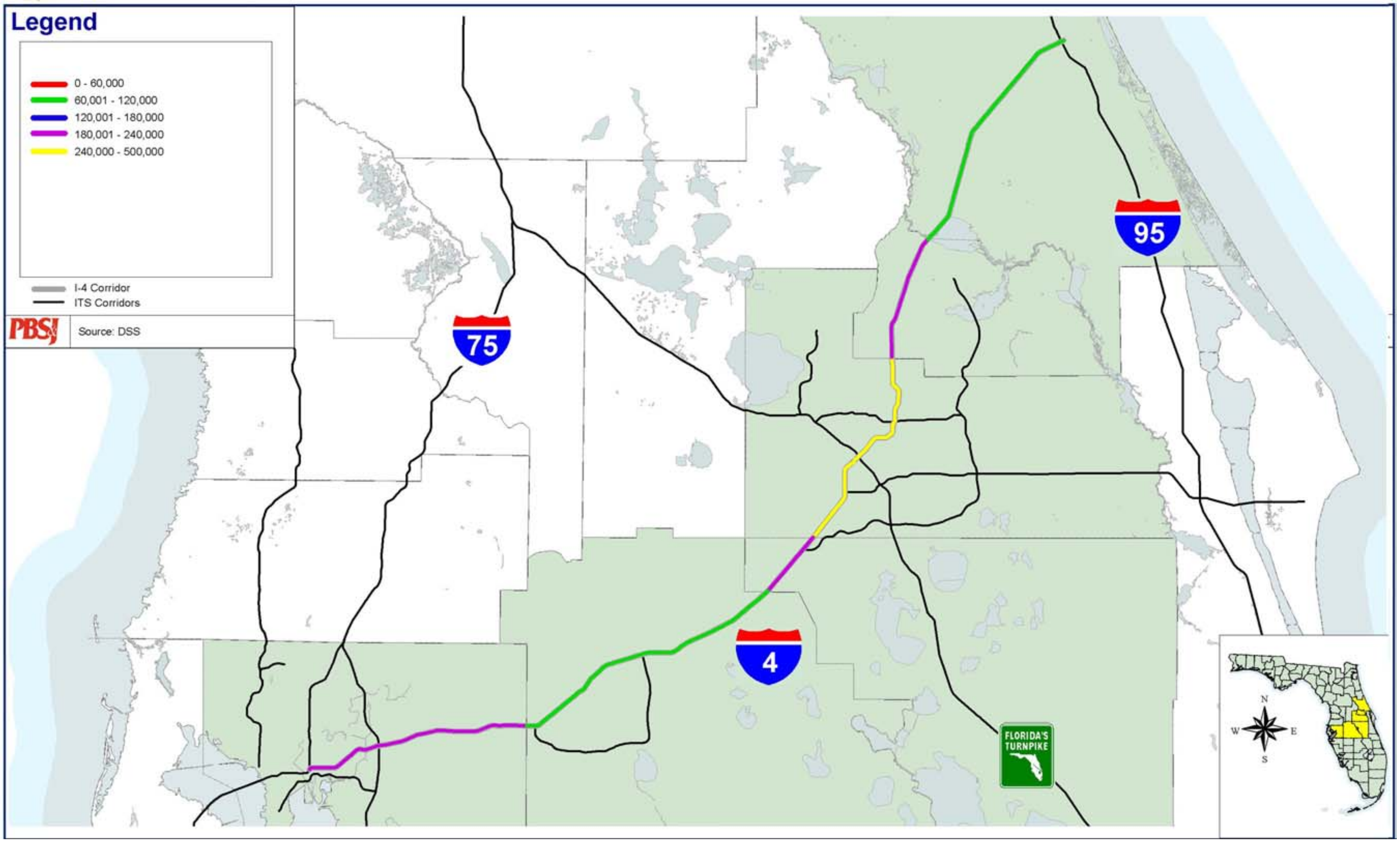


Figure 6.15 – I-4 Corridor 2020 AADT



Most of the major theme parks in the state are located along the I-4 corridor in the central portion of the state. These theme parks draw millions of visitors each year. Attendance for some of these theme parks can range from 4,200,000 visitors at Busch Gardens in 1998 to 15,600,000 visitors at Disney World during the same year. Other major activity centers in the central portion of the state include the MGM and Universal theme parks, Disney's Animal Kingdom, and Epcot Center.

6.2.3 Current ITS Plans and Programs

This section identifies existing, programmed, and planned ITS along the I-4 corridor. These services will be mapped in *Section 4, Deployment Issues,* of this report to determine gaps in existing and planned services.

- **Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire length of I-4 at one-mile intervals. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. The FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

- **RR Service Patrols** – This ITS program, operated by the FDOT districts through private contractors, includes roadside assistance and incident clearance. RR Service Patrols are currently being operated along the entire length of the I-4 corridor by Districts 1, 5, and 7.

- **CVO** – A virtual weigh station concept is being developed through a research grant from the FHWA for implementation in close proximity to the Port of Tampa to screen vehicle movements on and off of I-275, I-4, and I-75. There is currently a weigh station in Hillsborough County where there are geometric restrictions on acceleration and storage.

- **ATIS** – A 511 implementation plan is currently being developed to deploy a 511 service along the entire length of the I-4 corridor.

- District 5 is planning a district-wide expansion of the existing I-4 Surveillance Motorist Information System (SMIS) (U.S. 192 to Lake Mary Boulevard) and the Daytona Area Smart Highway (DASH) system (I-95 and I-4 Interchange). These IMS will eventually cover the entire length of I-4 in District 5. FDOT is also working with Volusia County and the Volusia County Transit Agency (VOTRAN) to integrate ITS for the purpose of sharing incident data, traveler information, and transportation data.

- District 7 has programmed the deployment of a FMS for the entire length of I-4 in Hillsborough and Polk counties.

Figures 6.16 through 6.18 show the existing, programmed, and planned ITS coverage for I-4.

Figure 6.16 – Existing ITS Coverage on the I-4 Corridor

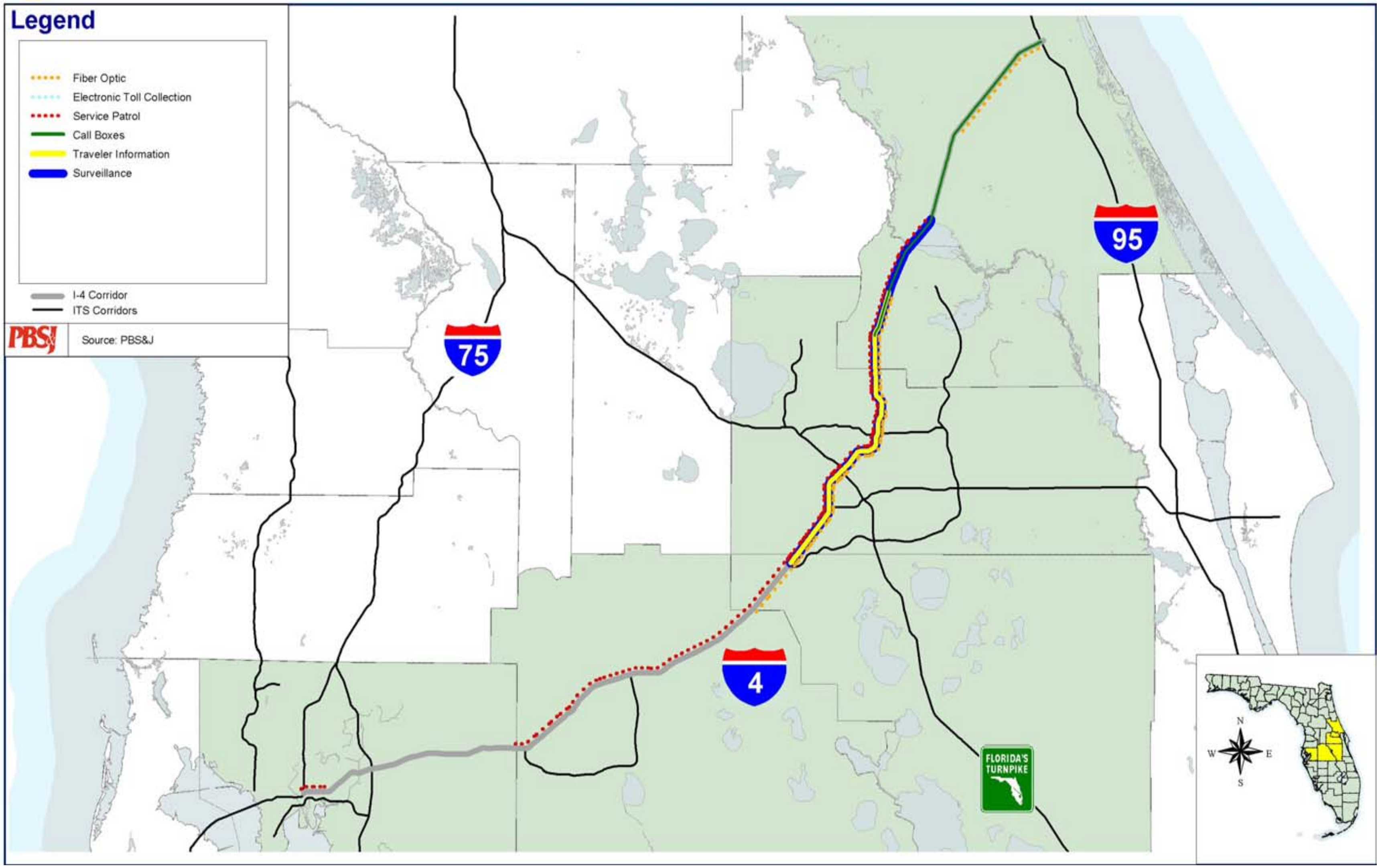


Figure 6.17 – Programmed ITS Coverage on the I-4 Corridor

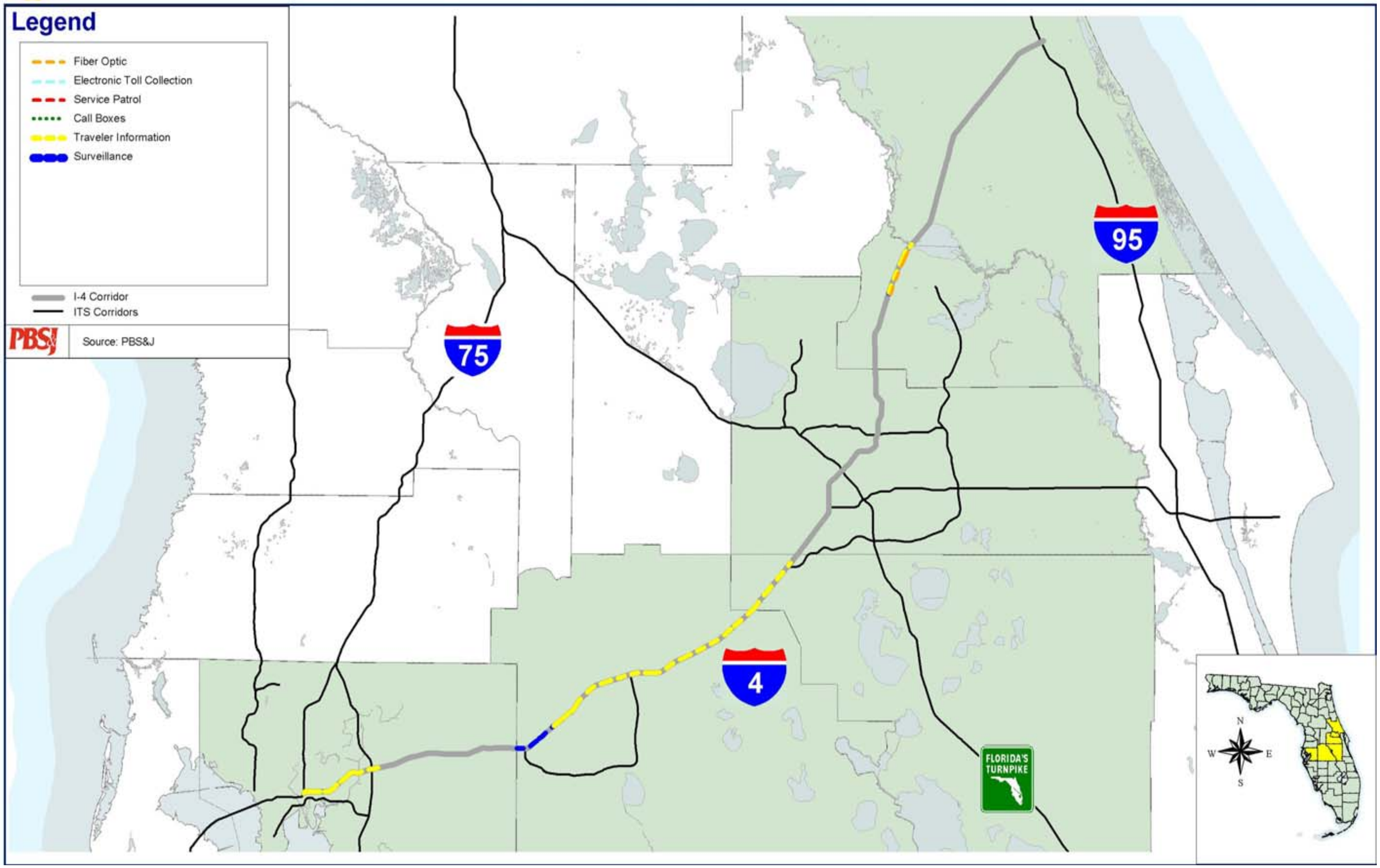
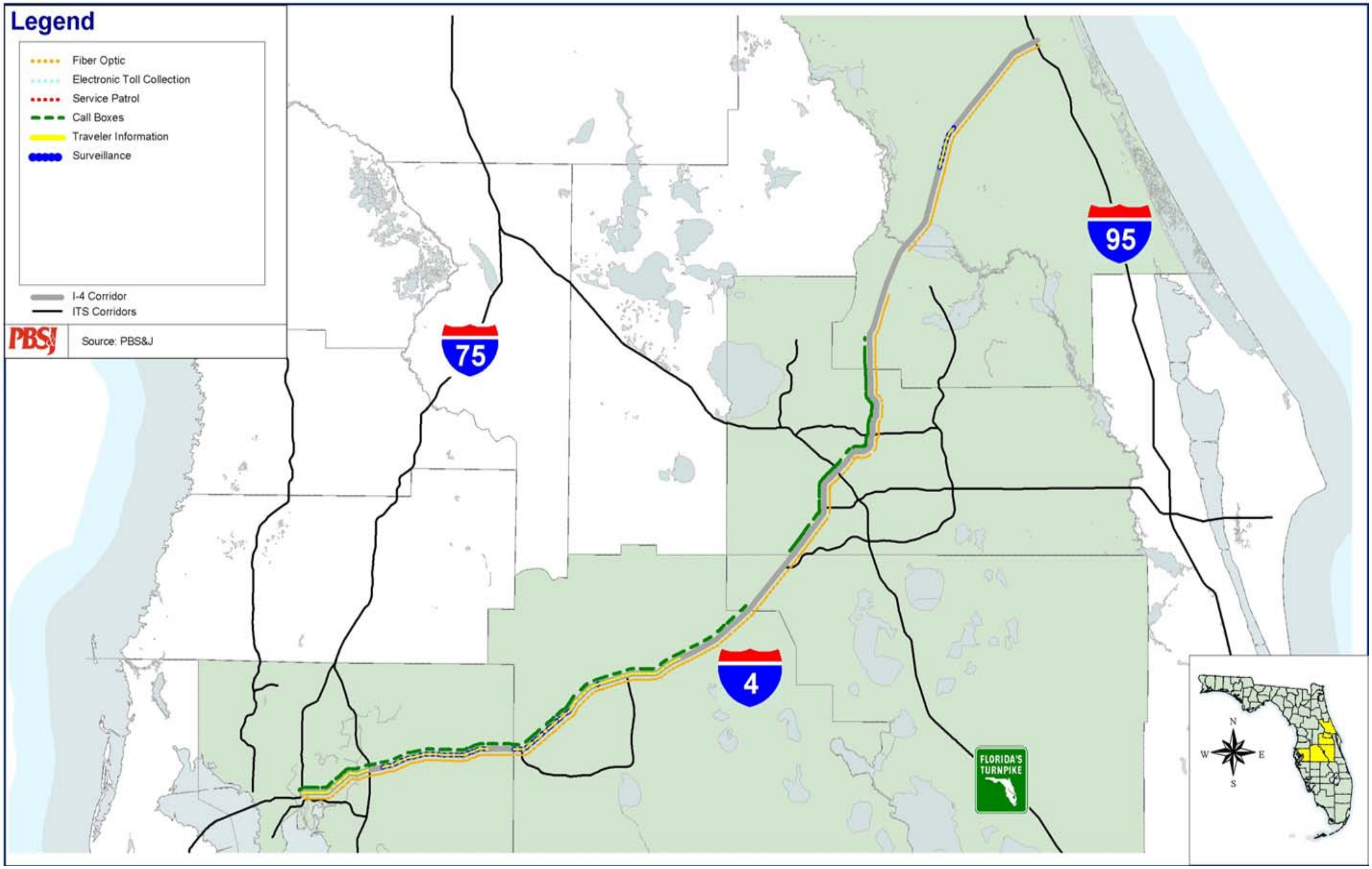


Figure 6.18 – Planned ITS Coverage on the I-4 Corridor



6.2.4 Existing Communications Infrastructure

Currently, the data communications systems available along the I-4 corridor consist of both fiber and microwave backbones. Due to the complexity and volume of the data required to support proposed ITS deployments along the principal FIHS limited-access corridors, the existing communications system will require an upgrade. District 5 will be deploying fiber in their system from U.S. 27 to I-95. District 7 has plans to complete the fiber optic network (FON) along the I-4 corridor by deploying fiber from I-275 to U.S. 27 in Polk County. The FON would be optimal for the communications needs of the statewide ITS deployments due to its capacity to accommodate a large volume of data.

Figure 6.19 illustrates the existing microwave tower locations along I-4 and Figure 6.20 illustrates existing fiber locations.

6.2.5 Proposed Capacity Improvement Projects

It is important to identify the programmed improvements and cost feasible plan improvements (construction only) as funding for potential ITS deployments can be leveraged with the funding of the capacity improvements and consideration of the roadway modifications can be included in the design of the ITS improvements. Figures 6.21 through 6.23 illustrate the programmed, planned, and 2025 cost feasible improvements for the I-4 corridor in FDOT Districts 1, 5, and 7. As identified in Figure 6.21, the I-4 corridor has seven interchange modification projects identified as programmed, along with the addition of two lanes to the existing facility to build six. One planned capacity improvement project in Volusia County is programmed to add two lanes to the existing facility to build six and is identified in Figure 6.22. Figure 6.23 identifies the roadway widening projects along I-4 that are identified in the *Ten-Year ITS Cost Feasible Plan* to add two lanes to build six in Volusia County to I-95. Several ITS projects are also identified in Orange and Polk counties. Also identified in Figure 6.23 is the planned addition of two SULs, from central Orlando to the Orange/Volusia County line.

6.2.6 Additional Project Needs

The *I-4 ITS Corridor Study*[11] provided a logical phased implementation of services along the entire length of the facility. Projects developed from the study were created and placed into the five-year work program for both Districts 5 and 7. These projects provide complete coverage for the facilities in each of the gap analysis' functional service areas. Therefore, no additional conceptual projects are being recommended for deployment along the I-4 corridor.

[11] The FDOT Systems Planning Office completed this project in the fall of 2001.

Figure 6.19 – Existing Microwave Tower Locations on the I-4 Corridor

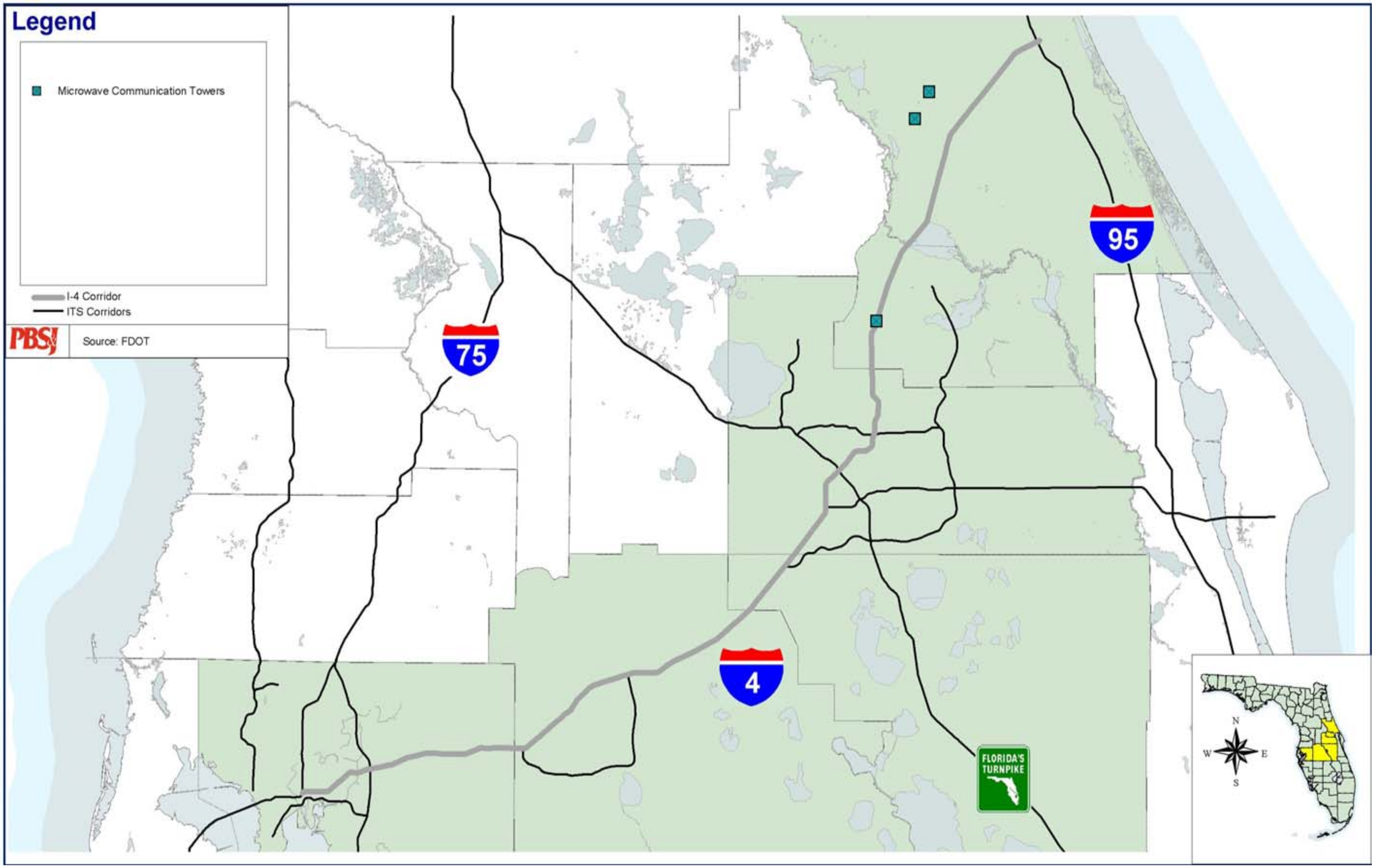


Figure 6.20 – Existing Fiber Optic Cable Locations on the I-4 Corridor

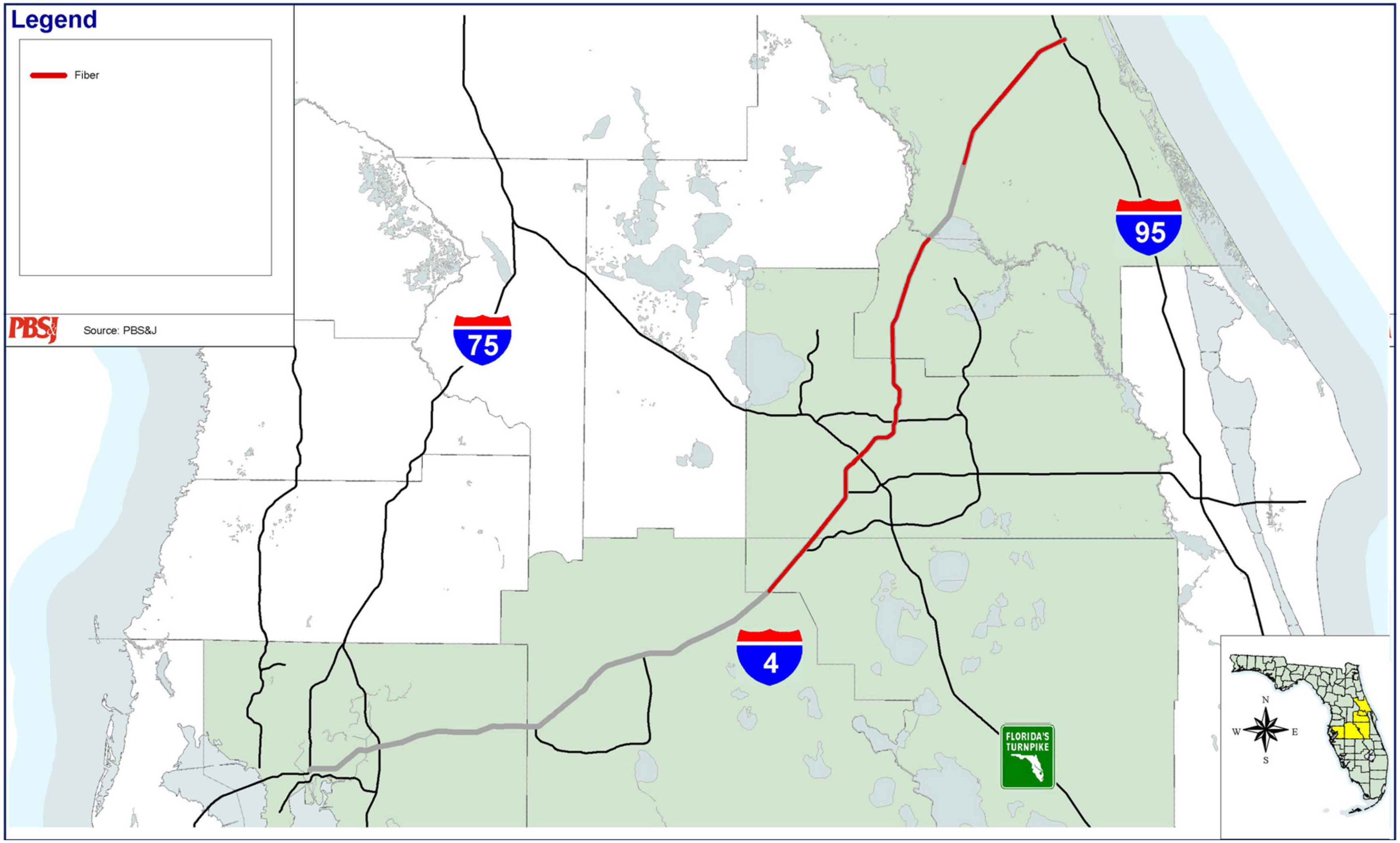


Figure 6.21 – Programmed Capacity Improvements for the I-4 Corridor

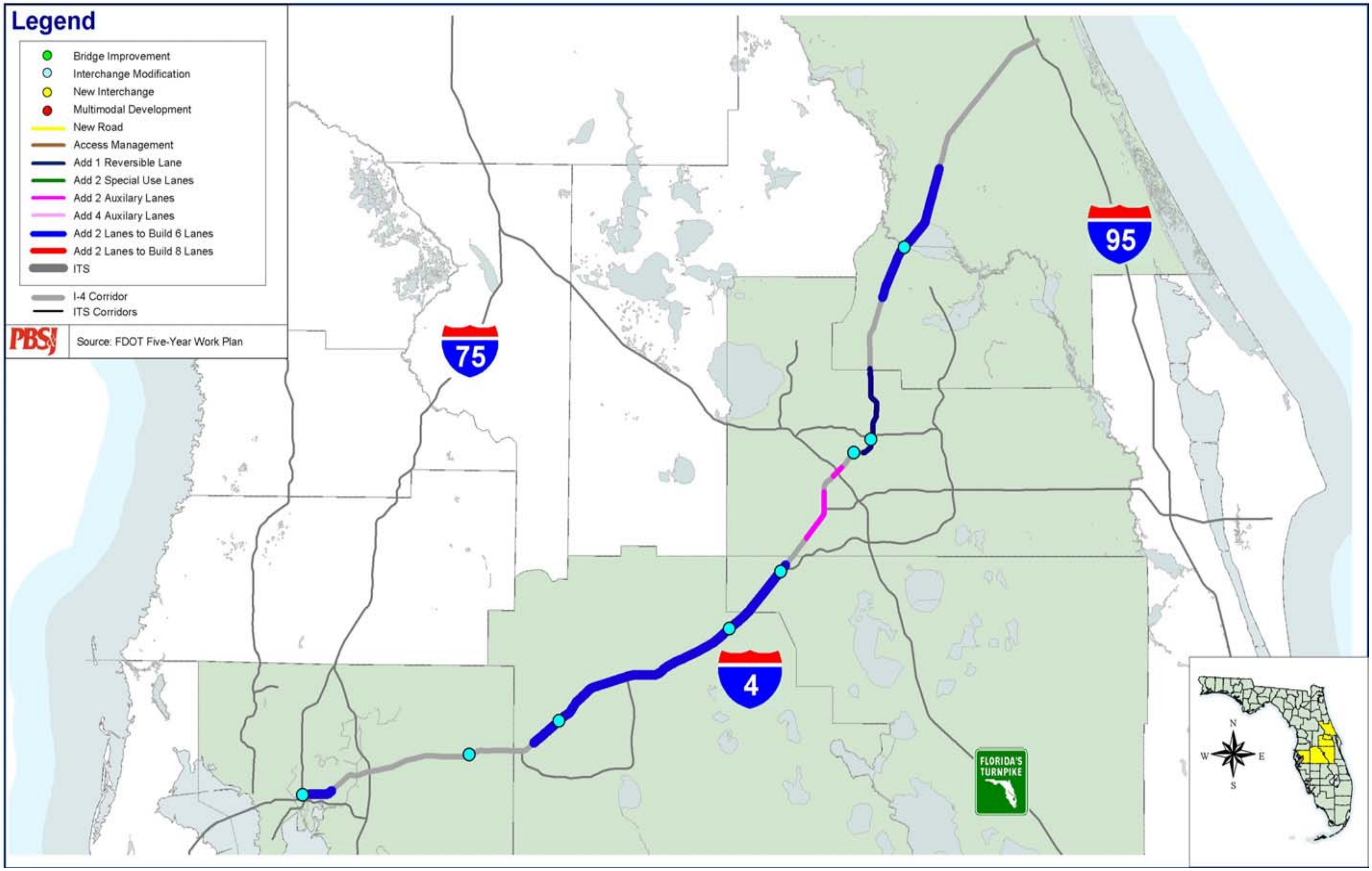


Figure 6.22 – Planned Capacity Improvements for the I-4 Corridor

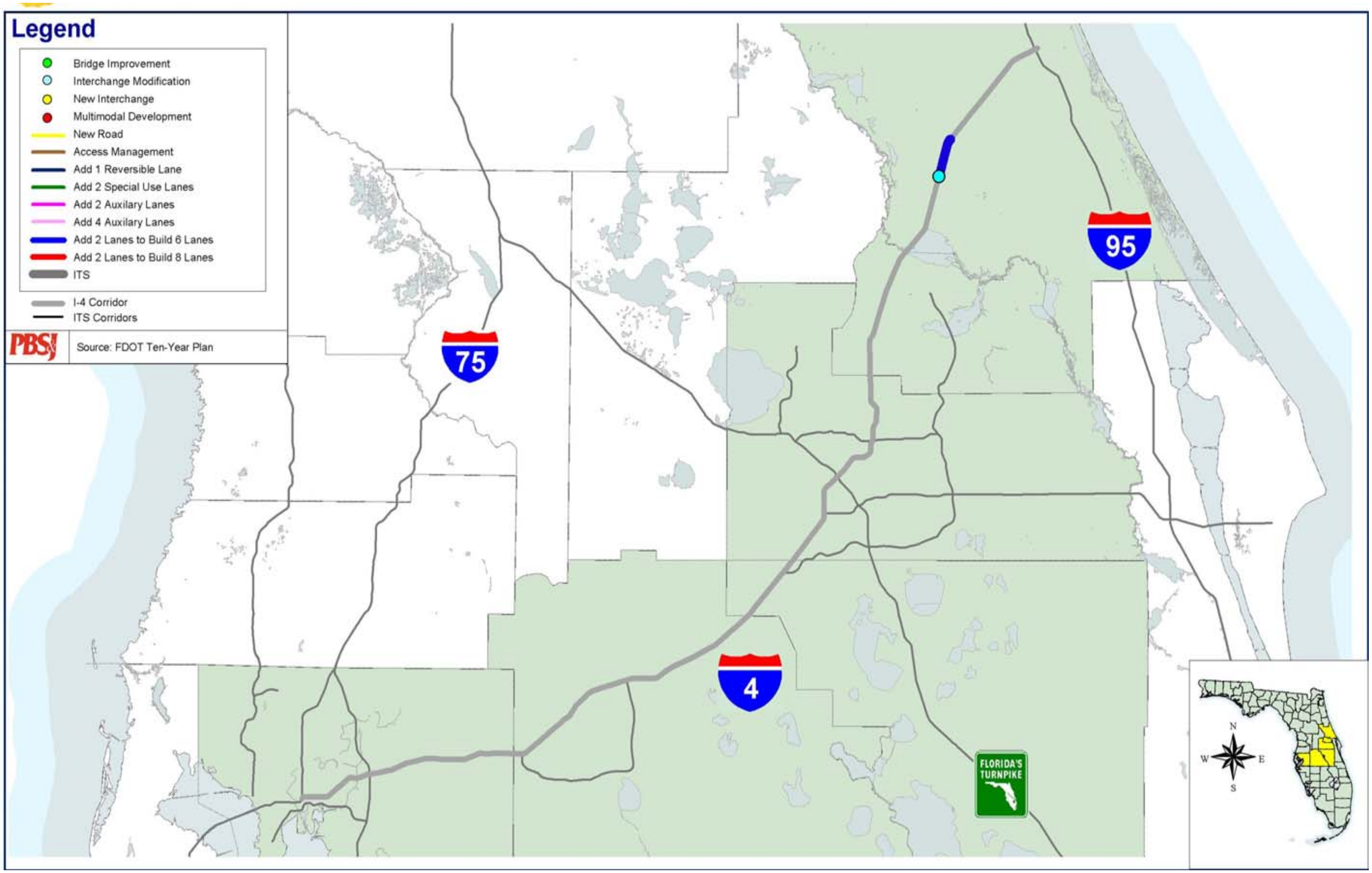
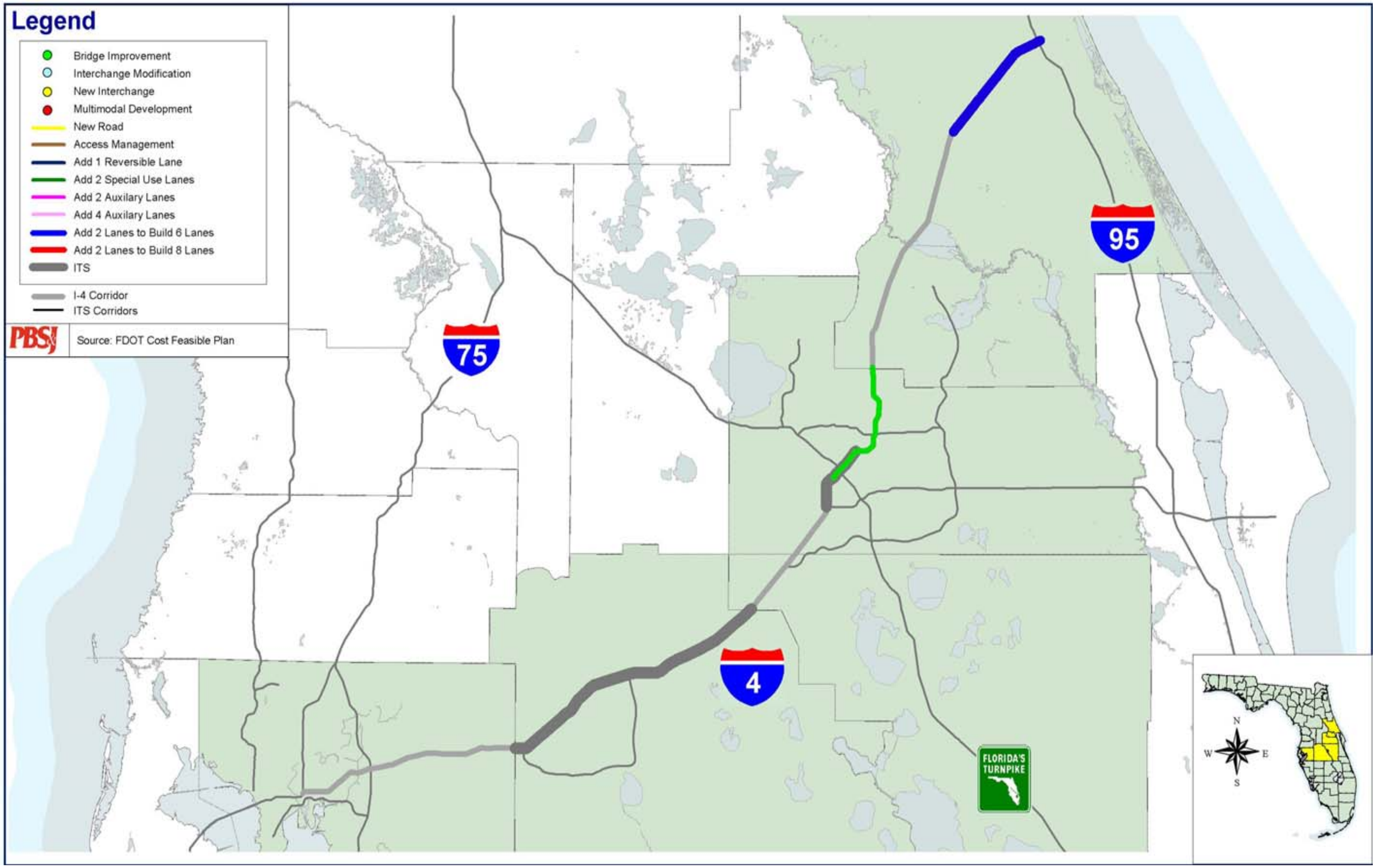


Figure 6.23 – *Ten-Year ITS Cost Feasible Plan* Improvements for the I-4 Corridor



6.3 I-10 ITS Corridor Master Plan

6.3.1 Corridor Description

The limits of the I-10 corridor are from the Alabama state line in Escambia County to I-95 in Duval County. The I-10 corridor also includes I-110 in Escambia County. The corridor traverses several counties, including Duval, Baker, Columbia, Suwannee, Madison, Jefferson, Leon, Gadsden, Jackson, Washington, Holmes, Walton, Okaloosa, Santa Rosa, and Escambia. The corridor provides access to several major metropolitan areas including Jacksonville, Lake City, Tallahassee, and Pensacola. Figure 6.24 illustrates the corridor location. Currently, District 2 operates and maintains the interstate from Duval to Jefferson County and District 3 operates and maintains I-10 and I-110 from Jefferson to Escambia County.

Figure 6.24 – I-10 Corridor Location

6.3.2 Legacy Systems

The following text identifies existing physical and operational conditions along the I-10 corridor as presented in the *ITS Legacy Catalog* prepared for the FIHS *ITS Corridor Master Plans*:

- I-10 consists mainly of four GULs except for a small portion of the interstate located in Duval County that is comprised of six lanes. I-110, in Escambia County, is comprised of four lanes along the entire corridor.

- I-10 also has a low interchange density of 6.2 miles per interchange, which is typical for a primarily rural corridor. Its highest interchange densities are located within the urban areas of Duval and Escambia counties. The interchange locations for I-10 are shown in Figure 6.25 and the corridor area types are illustrated in Figure 6.26.

- The I-10 corridor exhibits an unusually high concentration of accident locations for a rural four-lane facility, particularly in the area from Jackson County to Madison County. The interchanges of I-10 and I-75, and I-10 and I-95 are also identified as high accident locations. Typically, large interstate-to-interstate interchanges experience high accident volumes due to the complex nature of the weaving and merging patterns at these interchanges. The high crash frequency locations for I-10 are shown on Figure 6.27.

- Based on year 2000 statistics, the I-10 corridor has an AADT of 24,782 vpd. The average traffic volume forecasts for the years 2010 and 2020 are 35,438 vpd and 49,929 vpd. These forecasts represent an increase of 30 percent from 2000 to 2010 and 29 percent from 2010 to 2020 for the entire corridor. Duval County contains the largest urban section of the corridor with an AADT of 83,907 vpd. Travel demand is expected to double (159,087 vpd) in Duval County by the year 2020 as well. The other areas of potential high travel demand growth along I-10 are Leon, Jefferson, Escambia, and Columbia counties. Figures 6.28 through 6.30 illustrate the existing and forecasted AADTs for the I-10 corridor.

- Tourism is Florida's largest industry. Due to the high volume of annual tourists, the state transportation system must be designed to accommodate the social and recreational travel generated by the major tourist attractions and activity centers, in addition to supporting the daily commuter and freight travel. Therefore, by locating the state's major activity centers, special generators, and tourist attractions, ITS solutions such as real-time traveler information systems and incident management techniques can be implemented in coordination with multi-modal improvements to improve mobility to and around these major activity centers.

- Major activity centers along the I-10 corridor include several state parks and local recreational theme parks; however, the largest travel generators are the Alltel Stadium in Jacksonville and the beaches located in the Florida panhandle.

Figure 6.25 – Interchange Locations on the I-10 Corridor

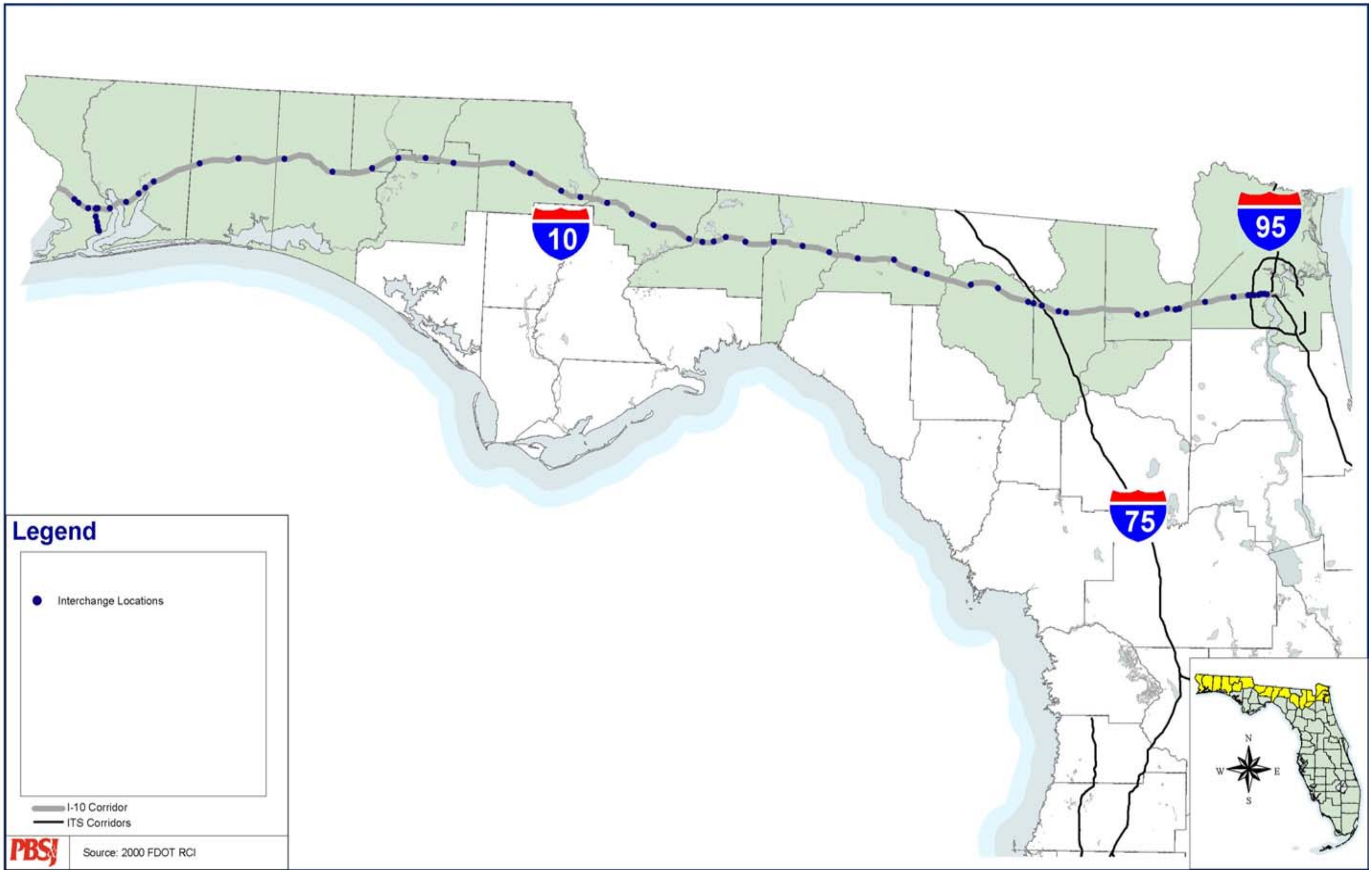


Figure 6.26 – I-10 Corridor Area Types

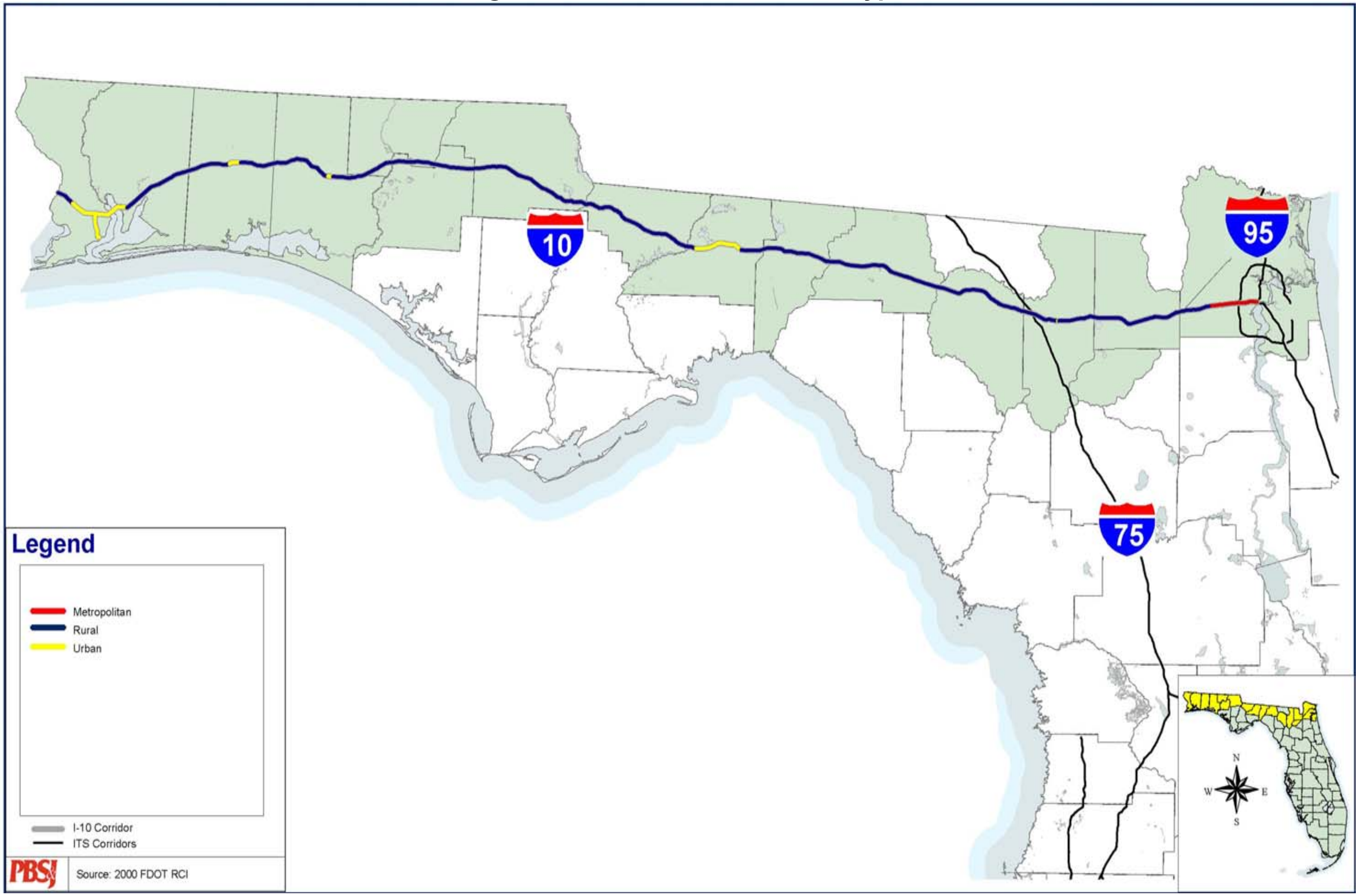


Figure 6.27 – High Crash Frequency Locations on the I-10 Corridor

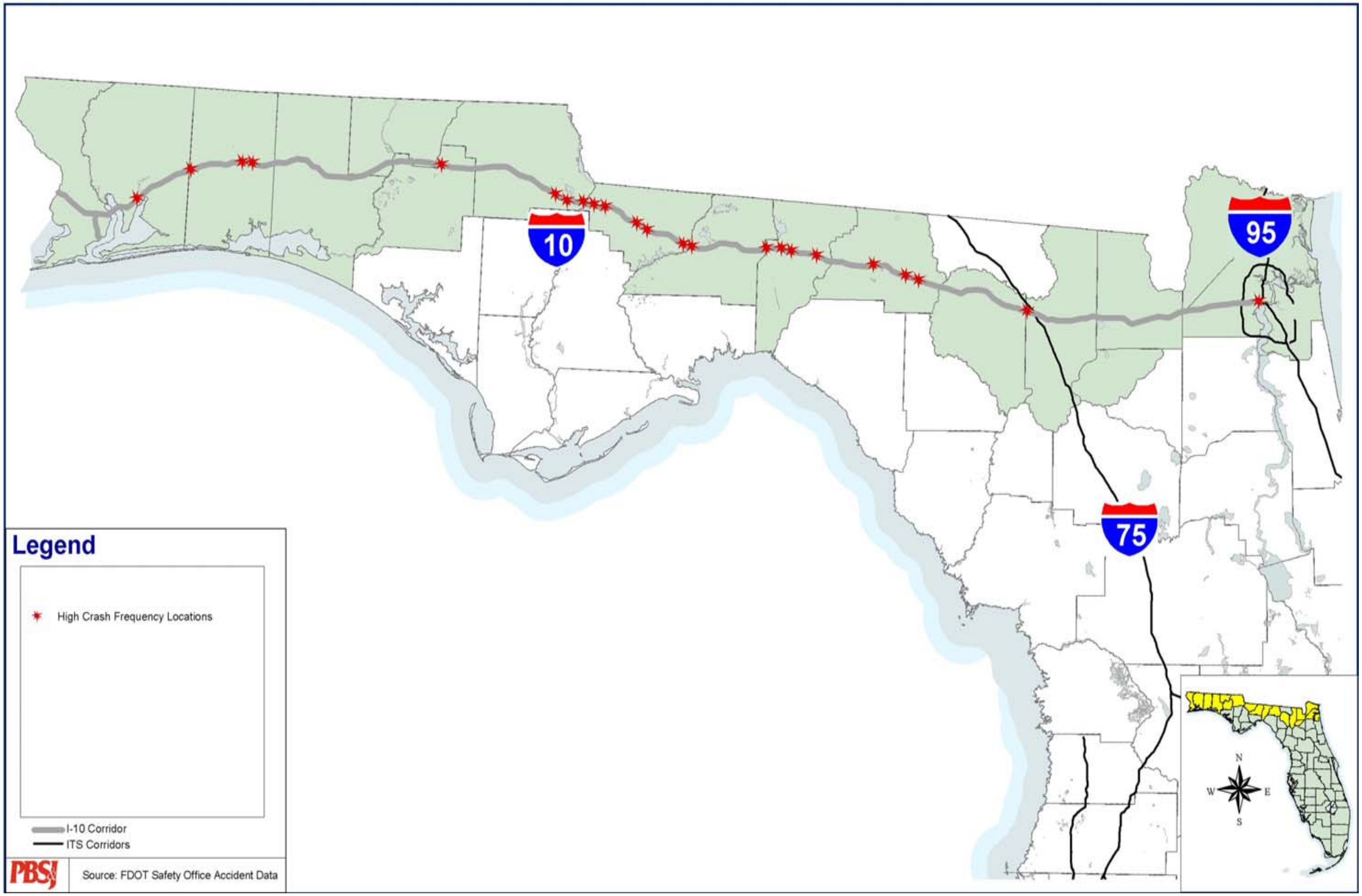
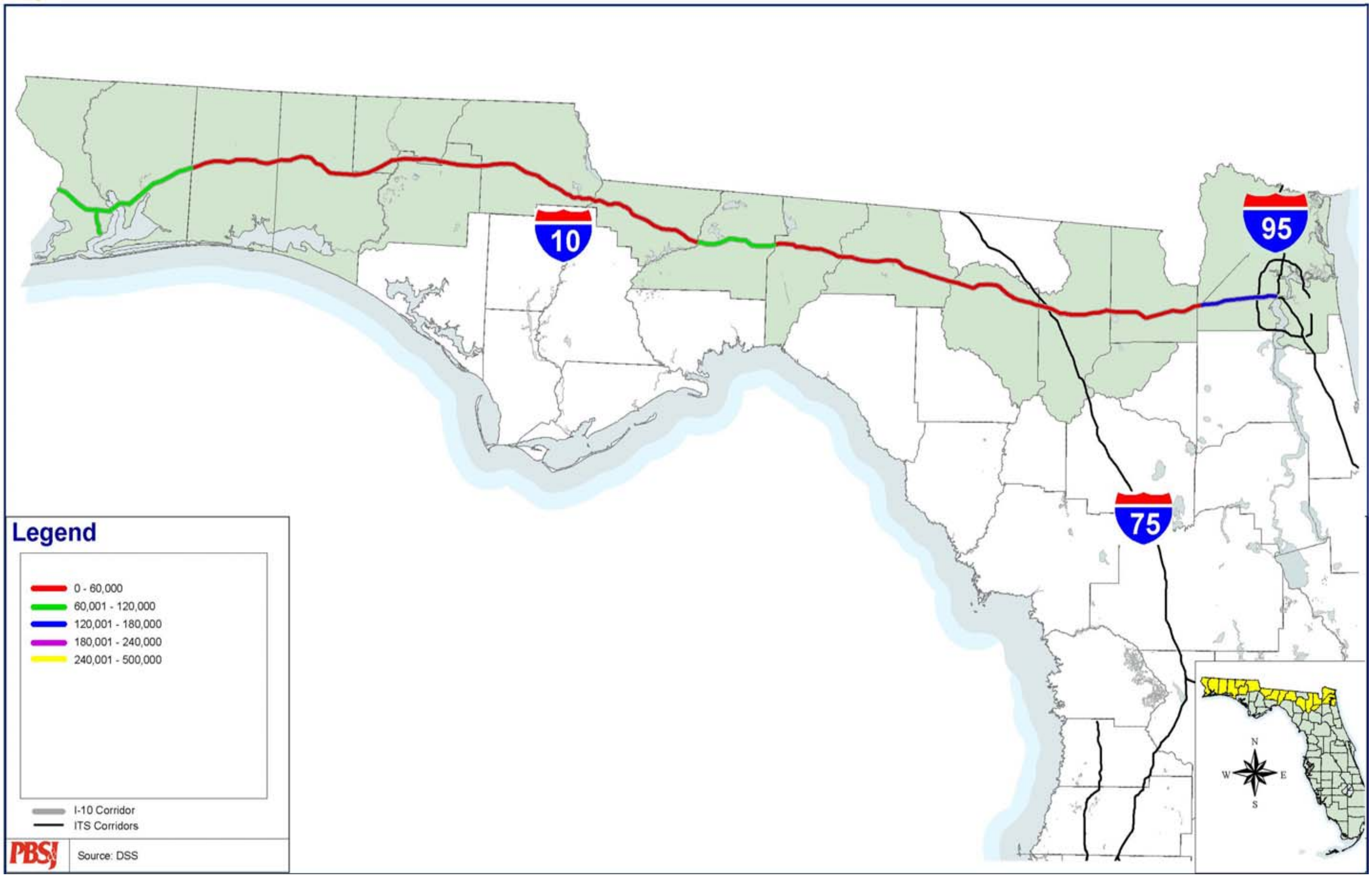


Figure 6.28 – I-10 Corridor 2000 AADT

Figure 6.29 – I-10 Corridor 2010 AADT

Figure 6.30 – I-10 Corridor 2020 AADT



6.3.3 Current ITS Plans and Programs

This section identifies existing and planned ITS along the I-10 corridor. These services will be mapped in *Section 4, Deployment Issues,* of this report to determine gaps in existing and planned services.

- **Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire length of I-10 at one-mile intervals. The call boxes are a partnership between FDOT and the FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

- **RR Service Patrols** – This ITS program, operated by the FDOT districts through private contractors, includes roadside assistance and incident clearance. RR Service Patrols are currently operating along the study interstate facilities primarily in the large urbanized area of Jacksonville.

- **CVO** – A WIM site is currently located along I-10 in Jackson County. There are also two more WIM sites planned for the I-10 corridor in Madison and Escambia counties.

- District 2 has begun a comprehensive program of implementing an incident management program along I-10 in the Jacksonville area. This system currently exists along I-10 from I-295 to I-95 and will eventually encompass the entire interstate network as the FON is expanded.

- District 3 has a small-scale IMS along the I-10 Escambia Bay Bridge; however, they have recently completed an *ITS Plan for Interstate System* that identifies the need for FMS along I-10 in Pensacola, Tallahassee, and the rural areas in between. In addition, the FMS will include traveler information kiosks at a welcome center located east of SR 87.

Figures 6.31 and 6.32 show the existing and planned ITS coverage for I-10.

Figure 6.31 – Existing ITS Coverage on the I-10 Corridor

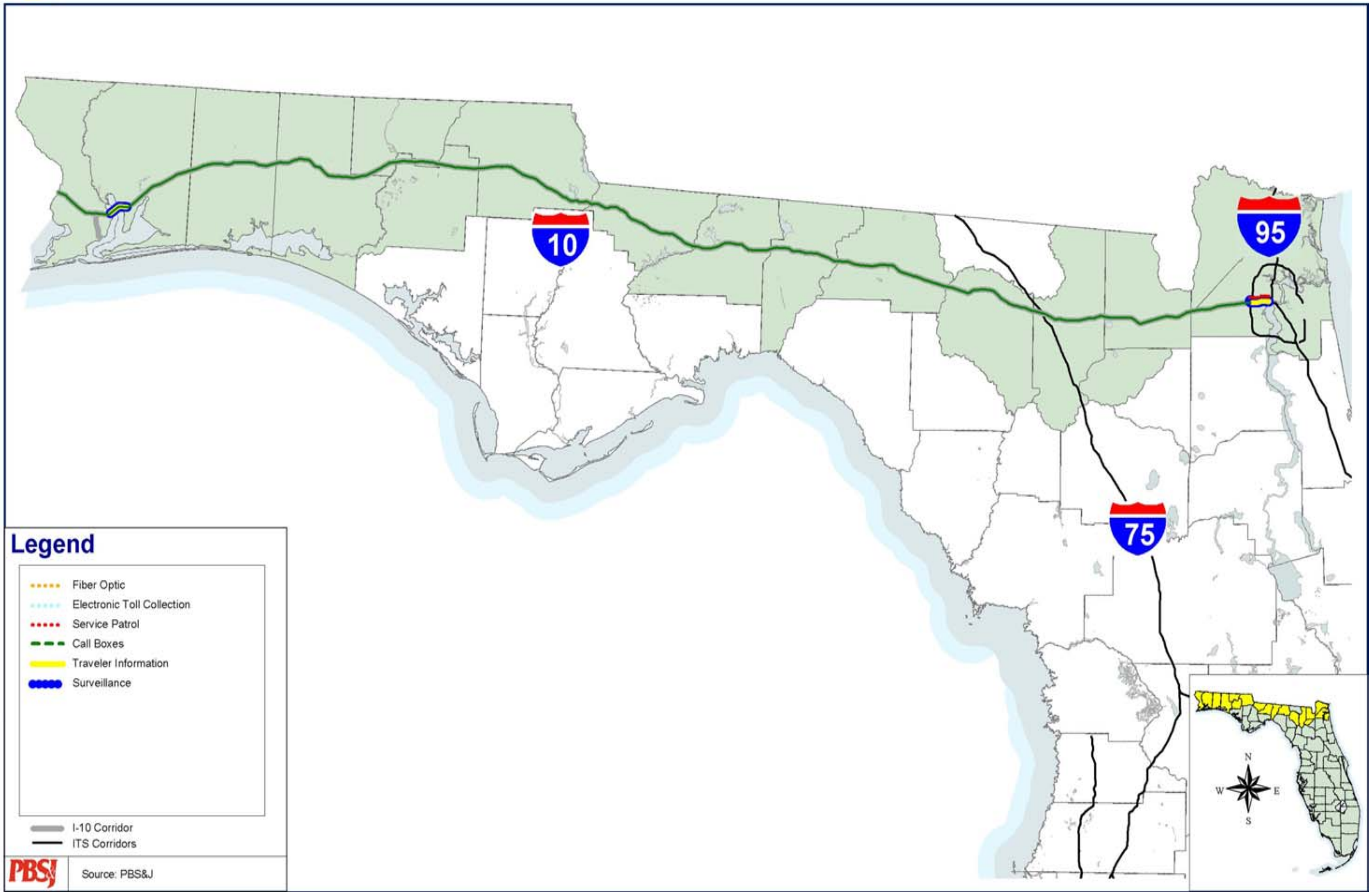
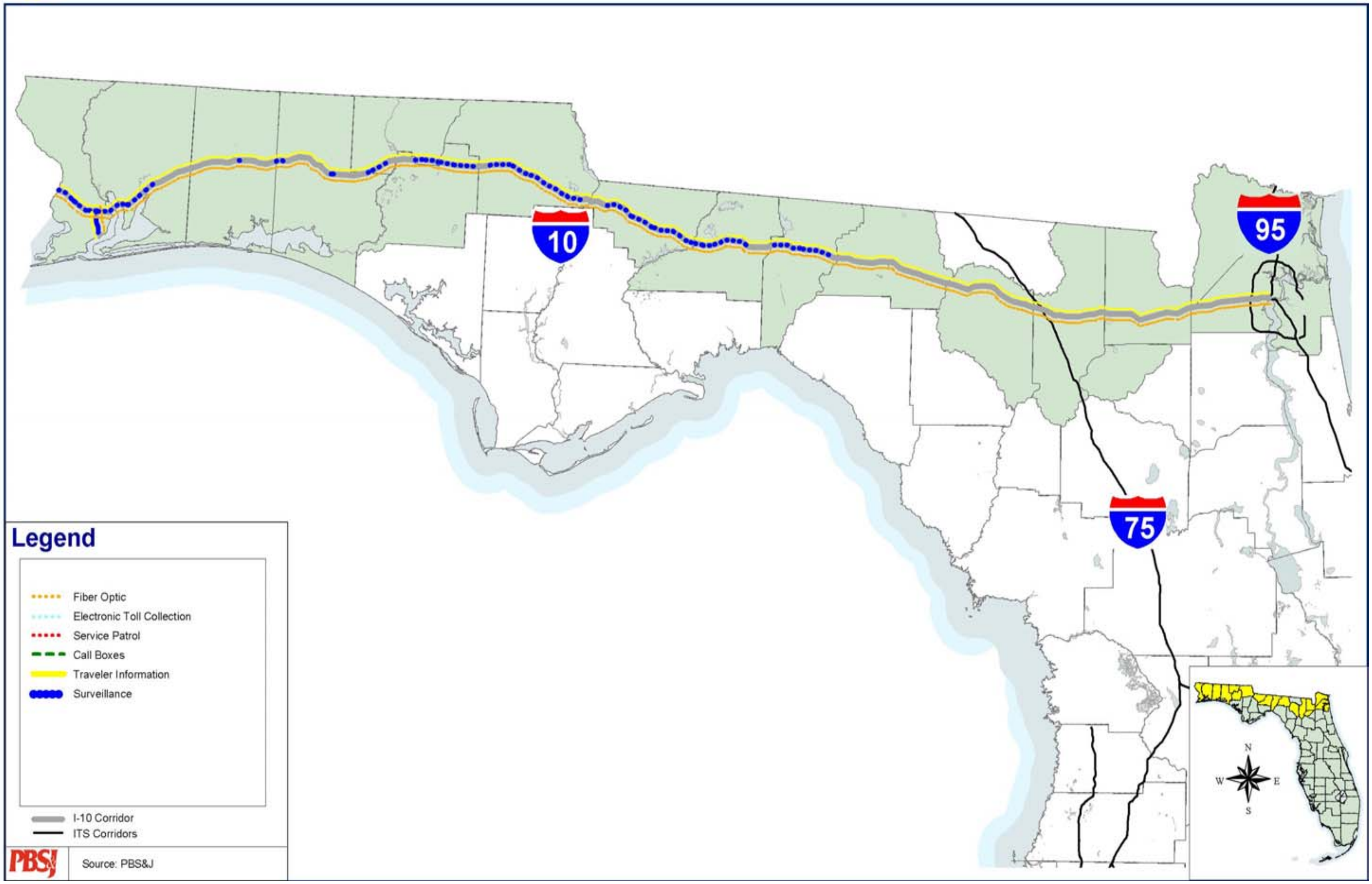


Figure 6.32 – Planned ITS Coverage on the I-10 Corridor



6.3.4 Existing Communications Infrastructure

Currently, the only data communications system available along the I-10 corridor is a microwave system. Due to the complexity and volume of the data required to support proposed ITS deployments along the FIHS corridors, the existing microwave communications system will require an upgrade, which is scheduled for the year 2004. Plans to implement a FON along the FIHS corridors are currently under development. The FON would be optimal for the communications needs for the statewide ITS deployments due to its capacity to accommodate a large volume of data.

Additionally, several municipalities along the corridor have installed small segments of fiber with planned interconnection to the intrastate fiber network. The City of Tallahassee has provided fiber optic connections terminating at I-10 for future connection to their ATMS.

Figure 6.33 illustrates the existing microwave tower locations along I-10 and Figure 6.34 illustrates existing fiber locations.

6.3.5 Proposed Capacity Improvement Projects

It is important to identify programmed and cost feasible plan improvements (construction only) so funding for potential ITS deployments can be leveraged with funding of capacity improvements and consideration of the roadway modifications can be included in the design of the ITS improvements. Figure 6.35 and 6.36 illustrate the programmed and 2025 cost feasible improvements for the I-10 and I-110 corridors in FDOT Districts 2 and 3. The statewide ten-year plan for FIHS facilities did not contain any projects for the I-10 and I-110 corridor. As identified in Figure 6.35, the I-10 corridor has only a few interchange modification projects identified as programmed. Roadway widening projects along I-10 are identified in the cost feasible plan for the Pensacola, Tallahassee, and Jacksonville areas.

Figure 6.33 – Existing Microwave Tower Locations on the I-10 Corridor

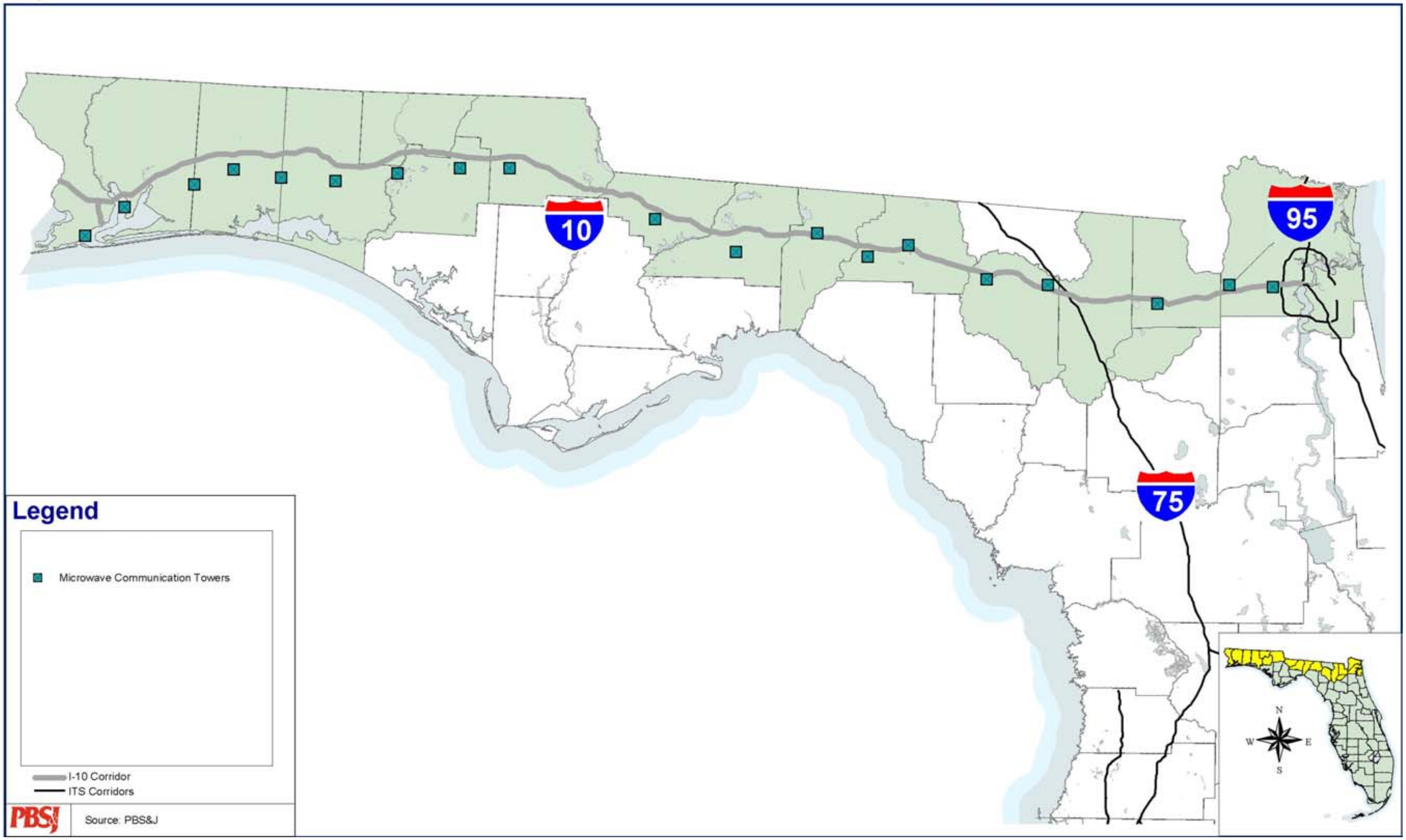


Figure 6.34 – Existing Fiber Optic Cable Locations on the I-10 Corridor

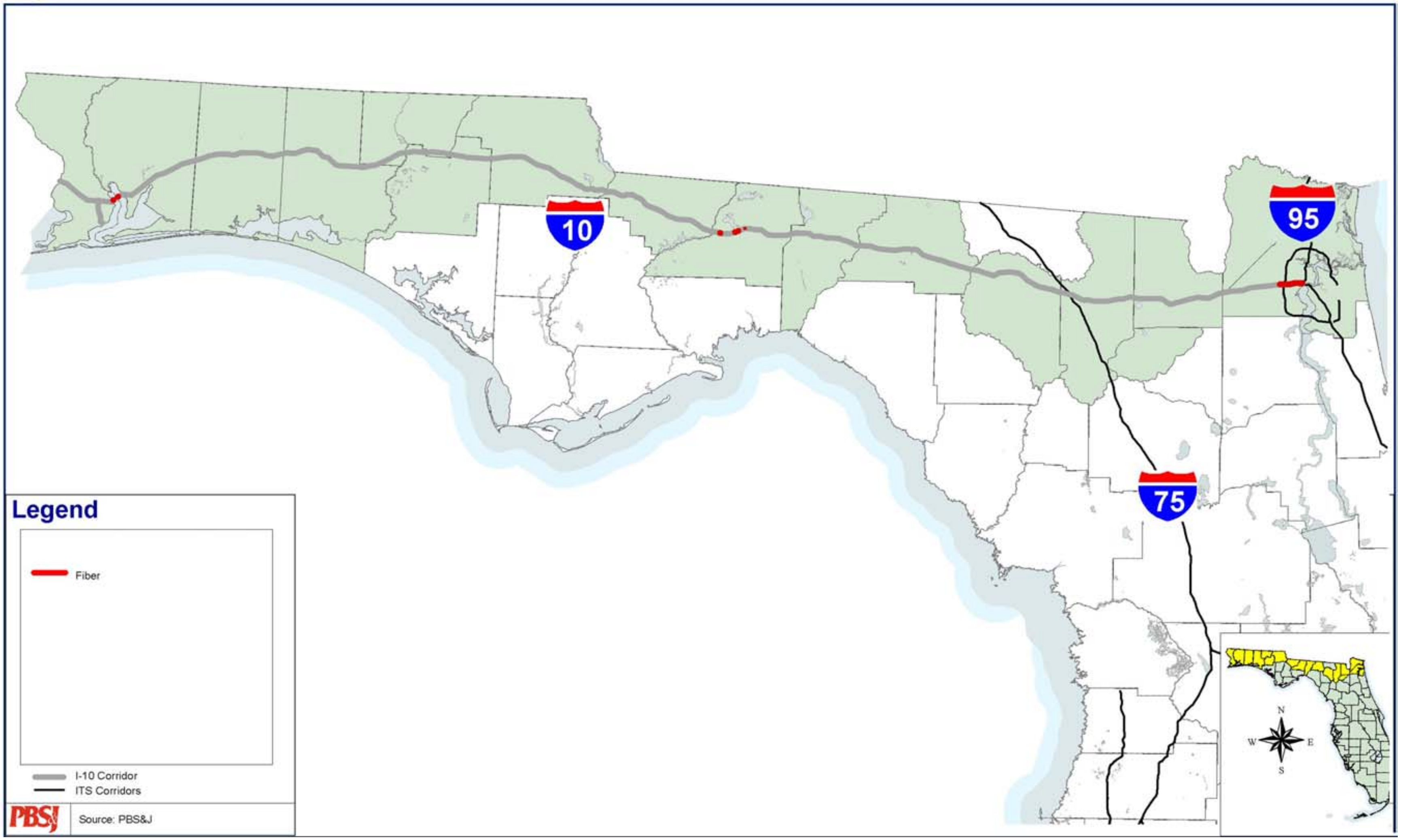


Figure 6.35 – Programmed Capacity Improvements for the I-10 Corridor

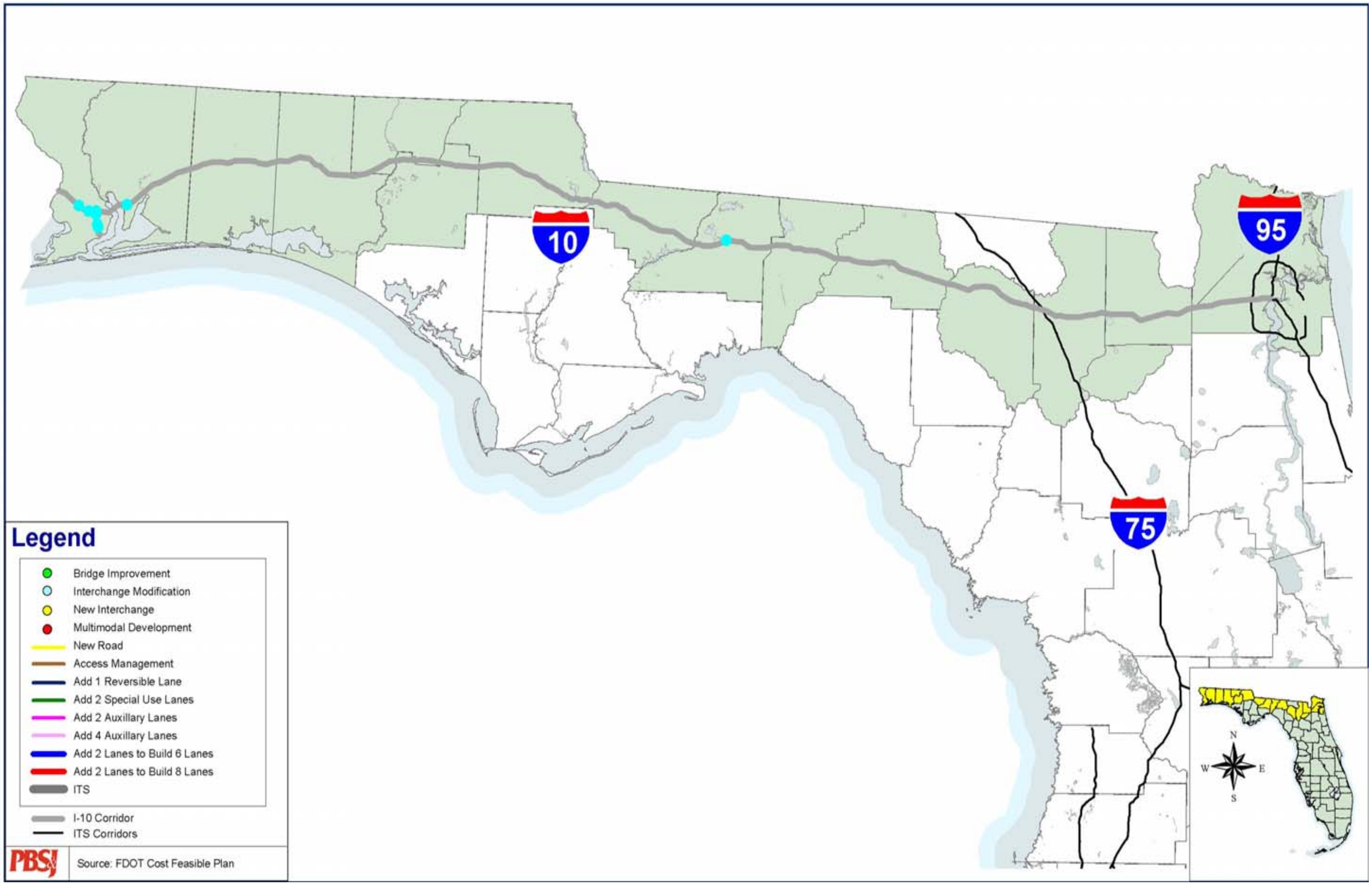
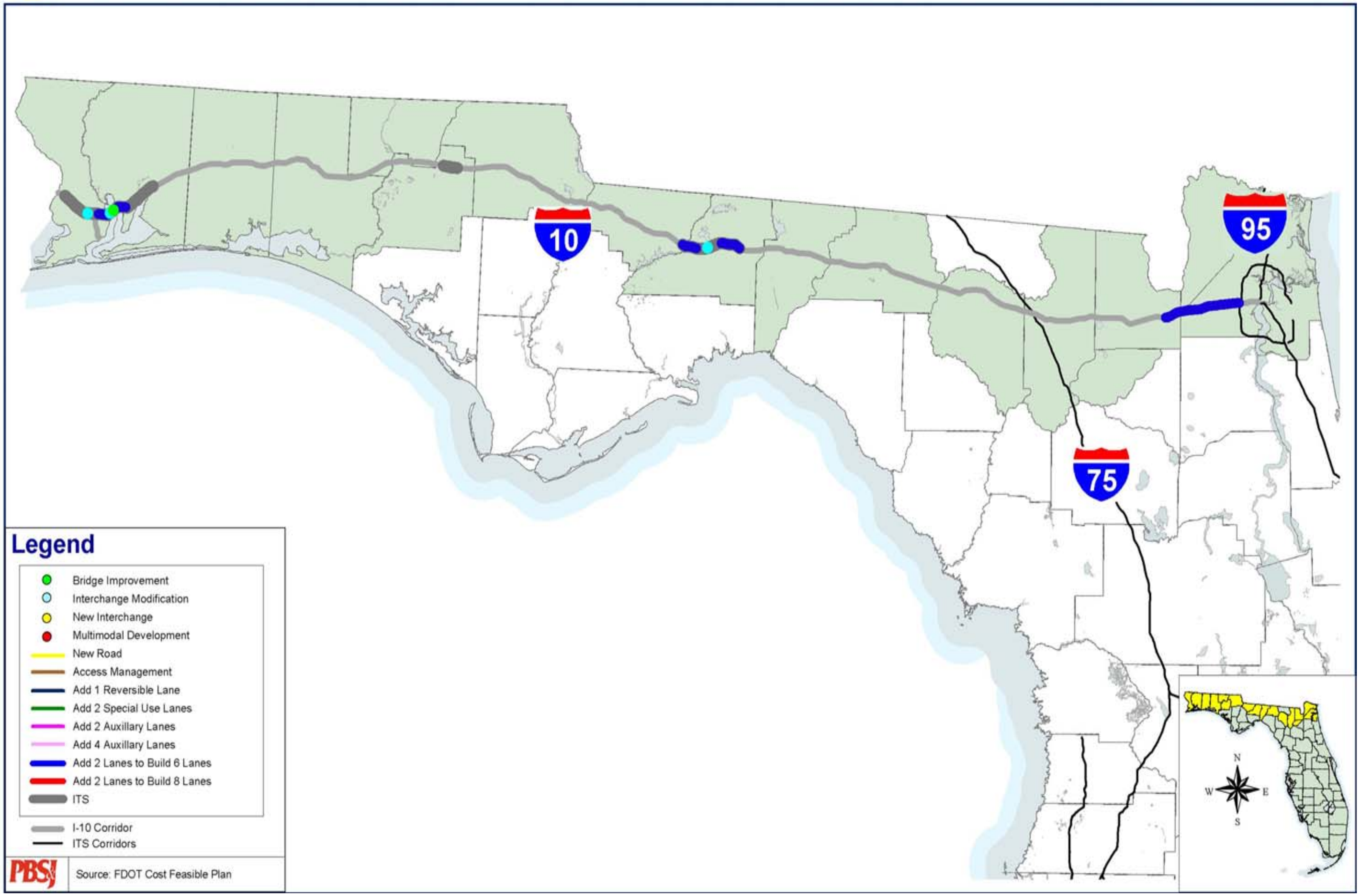


Figure 6.36 – *Ten-Year ITS Cost Feasible Plan* Improvements for the I-10 Corridor



6.3.6 Needs Gap Analysis by Segment and Market Packages

This section provides an analysis of existing, programmed, and planned ITS deployments along the I-10 and I-110 facilities utilizing work program information and conceptual project information provided by the districts. This analysis evaluates areas of ITS coverage and identifies "gaps" in the system. These gaps represent segments of the facilities that will not be addressed by existing, programmed, or planned ITS projects. *Section 5, Current ITS Plans and Programs,* of this report will recommend ITS projects to fill the gaps to provide a consistent, comprehensive ITS infrastructure statewide.

For the purpose of the analysis, the ITS deployments were categorized into two market package areas. These areas are as follows: FMS and RR Service Patrols. Motorist aid call boxes and Evacuation Coordination were included in the gap analysis for potential future deployments.

These market packages were selected for implementation to fulfill one of the most important goals identified for statewide ITS services: moving people and goods safely and effectively. A FMS complimented by the RR Service Patrols and motorist aid call boxes will assist motorists by providing timely, accurate travel data that will reduce the number of incidents, thus saving time, money, and lives. Additionally, these deployments will assist agencies in better detection, verification, and clearance of incidents.

These deployments will also serve to develop a base infrastructure for statewide ITS deployments on which more complex, data intensive ITS services can be deployed. With the data collection, surveillance, and traveler information devices deployed through the implementation of FMS, future ITS deployments such as ATIS, APTS, and CVO will be more effective and more easily implemented.

The classification of these proposed ITS deployments into market package-related areas will assist in identifying appropriate ITS strategies to address the gaps. Table 6.7 illustrates the location of each FMS and RR Service Patrol gap for the I-10 and I-110 facilities. Motorist aid call boxes are located along the entire length of the facility.

Table 6.7 – Identified ITS Functional Gaps on I-10 and I-110

Facility	Service Area	County	District	From	To
I-10	FMS	Washington	3	SR 189 Interchange	
I-10	FMS	Okaloosa	3	CR 279 Interchange	
I-10	FMS	Jackson	3	SR 276 Interchange	
I-10	FMS	Jackson	3	SR 69 and SR 69A Interchanges	
I-10	FMS	Jefferson	3	SR 59 Interchange	
I-10	FMS	Jefferson	3	SR 53 Interchange	
I-10	FMS	Madison, Suwannee, Columbia, Baker, Duval	2	East of CR 257	U.S. 301
I-10	FMS	Duval	2	East of U.S. 301	I-295
I-110	RR Service Patrols	Escambia	3	I-110/I-10 Interchange	I-110 Terminus
I-10	RR Service Patrols	Various	3	Alabama State Line	Washington/Jackson County Line
I-10	RR Service Patrols	Various	3	Washington/Jackson County Line	Madison/Suwannee County Line
I-10	RR Service Patrols	Various	2	Madison/Suwannee County Line	I-295

Source: PBS&J, 2002

6.3.7 Conceptual Project Implementations

The functional gaps identified in *Section 4, Deployment Issues,* were reviewed and developed as recommended conceptual projects for advancement along the I-10 and I-110 corridors. The conceptual projects focused on three main functional areas: FMS, RR Service Patrols, and motorist aid call boxes. These projects were recommended to better detect, verify, and respond to incidents and non-recurring congestion due to incidents. Table 6.8 identifies the conceptual projects and their locations.

Table 6.8 – Proposed Conceptual Projects for the I-10 Corridor

Facility	Service Type	County	District	Area Type	From	To
I-10	FMS	Washington	3	Rural	SR 189 Interchange	
I-10	FMS	Okaloosa	3	Rural	CR 279 Interchange	
I-10	FMS	Jackson	3	Rural	SR 267 Interchange	
I-10	FMS	Jackson	3	Rural	SR 69 Interchange SR 69A Interchange	
I-10	FMS	Jefferson	3	Rural	SR 59 Interchange	
I-10	FMS	Jefferson	3	Rural	CR 257 Interchange	
I-10	FMS	Madison	2	Rural	U.S. 221 Interchange SR 14 Interchange SR 53 Interchange CR 255 Interchange U.S. 90 Interchange CR 137 Interchange	
I-10	FMS	Madison	2	Rural		
I-10	FMS	Madison	2	Rural		
I-10	FMS	Madison	2	Rural		
I-10	FMS	Suwannee	2	Rural		
I-10	FMS	Suwannee	2	Rural		
I-10	FMS	Columbia	2	Rural	I-75 Interchange	
I-10	FMS	Columbia	2	Rural	U.S. 41 Interchange U.S. 441 Interchange U.S. 90 Interchange CR 229 Interchange CR 125 Interchange SR 121 Interchange SR 228 Interchange U.S. 301 Interchange	
I-10	FMS	Columbia	2	Rural		
I-10	FMS	Baker	2	Rural		
I-10	FMS	Baker	2	Rural		
I-10	FMS	Baker	2	Rural		
I-10	FMS	Baker	2	Rural		
I-10	FMS	Baker	2	Rural		
I-10	FMS	Duval	2	Rural		
I-10	FMS	Duval	2	Rural	East of the U.S. 301	I-295
I-110	RR	Escambia	3	Rural	I-110/I-10	I-110 Terminus
I-10	RR Service Patrols	Various	3	Rural	Alabama State Line	Washington/Jackson County Line
I-10	RR Service Patrols	Various	3	Rural	Washington/Jackson County Line	Madison/Suwannee County Line
I-10	RR Service Patrols	Various	2	Rural	Madison/Suwannee County Line	I-295

6.3.8 Conceptual Project Descriptions

SR 189 Interchange in Okaloosa County and the CR 279 Interchange in Washington County – This project will include the deployment of an IMS/FMS at these two interchanges located on rural four-lane sections of I-10 in District 3. Each interchange ITS deployment will consist of two CCTV cameras, four DMS, and 16 loop detectors. The total number of devices for this project is four CCTV cameras, four DMS, and 32 loop detectors. Although these interchanges are located within the rural freeway IMS ITS project defined by District 3, ITS deployments were not included at these interchanges. They have been proposed as new projects to be included with the deployment of the rural freeway IMS because the SR 189 Interchange with I-10 was identified as a high accident location and CR 279 serves as an evacuation route from the Panama City area via SR 77 and SR 79.

SR 267 Interchange and SR 69 and 69A Interchanges in Jackson County – This project will include the deployment of an IMS/FMS at these two interchanges located on rural four-lane sections of I-10 in District 3. Each interchange ITS deployment will consist of two CCTV cameras, four DMS, and 16 loop detectors. The total number of devices for this project is four CCTV cameras, four DMS, and 32 loop detectors. Although these interchanges are located within the rural freeway IMS ITS project defined by District 3, ITS deployments were not included at these interchanges. They have been proposed as new projects to be included with the deployment of the rural freeway IMS because both interchanges were identified as high accident locations and are also shown as moderate priority segments.

SR 59 and CR 257 Interchanges in Jefferson County – This project will include the deployment of an IMS/FMS at these two interchanges located on rural four-lane sections of I-10 in District 3. Each interchange ITS deployment will consist of two CCTV cameras, four DMS, and 16 loop detectors. The total number of devices for this project is four CCTV cameras, four DMS, and 32 loop detectors. Although these interchanges are located within the rural freeway IMS ITS project defined by District 3, ITS deployments were not included at these interchanges. They have been proposed as new projects to be included with the deployment of the rural freeway IMS because both interchanges were identified as high accident locations and are also shown as moderate priority segments.

U.S. 221, SR 14, SR 53, and CR 255 Interchanges in Madison County along with U.S. 90, U.S. 129, and the CR 137 Interchange in Suwannee County – This project will also deploy an IMS/FMS at each of these rural four-lane sections of I-10 in District 2. Each interchange project will consist of two CCTV cameras, two DMS, and 16 loop detectors. The total number of devices for this project is 14 CCTV cameras, 14 DMS, and 56 loop detectors. These interchanges were also proposed as rural ITS deployments as they coincide with high accident locations.

I-75/I-10 Interchange Project – This project lies within a rural section of I-10, yet it is a major interchange where incidents are likely to occur and cause delays. In essence, this interchange is a rural interchange operating as an urban interchange. This project will deploy only the I-10 portion of the IMS/FMS needed to support this interchange ITS deployment. Also, this project may require devices to be located on each ramp due to the complexity of the merging and weaving sections of this interchange. The project will have a total of two CCTV cameras, two DMS, and 16 loop detectors. There will also be a proposed I-10 interchange project included in the *I-75 ITS Corridor Master Plan* that will include the remaining devices for the completion of the interchange. These two projects may be consolidated into one in the *ITS Plan*.

U.S. 41 and U.S. 441 Interchanges in Columbia County, U.S. 90, CR 229, CR 125, SR 121 and the SR 228 Interchanges in Baker County, and the U.S. 301 Interchange in Duval County – The total number of devices needed to support the FMS at these interchanges is 16 CCTV cameras, 16 DMS, and 64 loop detectors.

IMS/FMS from East of U.S. 301 to I-295 in Duval County – This portion of I-10 still consists of four lanes. The total number of devices that is needed to support this portion of the project is eight CCTV cameras, eight DMS, and 64 loop detectors. Integration with the existing FMS along I-10 from I-295 to I-95 will be a consideration in the design of this project.

6.3.9 Rule 940 Integration

As part of the ITS conceptual project implementation process, the FHWA has implemented *Rule 940* which guides the integration of ITS projects into the planning process. *Rule 940* states that all projects receiving federal funding, in whole or in part, must comply with the stipulations outlined in the *Rule.* Since these projects will be integrated into the statewide ITS program for federal and state funding, the proposed conceptual projects recommended as part of this document must comply.

Rule 940 stipulates that in order for a project to advance into the design phase, a systems engineering analysis must be completed and must include, at a minimum:

- Identification of the portions of the regional (corridor) architecture being implemented;
- Identification of participating agencies' roles and responsibilities; and
- Procurement options.

The following sections address these topics for future project implementation.

6.3.10 Portions of the Corridor Architecture being Implemented

Each district's corridor architecture for I-10 provides a "big picture" or high-level view of ITS in that region. The I-10 corridor architecture consists of the architectures for both FDOT Districts 2 and 3. An ITS architecture typically defines:

- Functions (e.g., gathering traffic information or requesting route information) that must be performed to implement a given user service or market package;
- Physical entities or subsystems where these functions reside (e.g., roadside or the vehicle);
- Interfaces/Information flows between the physical systems; and
- Communications requirements for the information flows (e.g., wireline or wireless).

In addition, it identifies and specifies the requirements for the standards needed to support national and regional interoperability, as well as product standards needed to support economy of scale considerations in deployment. More information on the development of the corridor architecture is contained in *Technical Memorandum No. 3.4 – ITS Physical Architecture*. Table 6.9 identifies the market packages from the *NITSA* and the statewide and corridor architectures that were implemented by the proposed I-10 corridor projects.

Table 6.9 – Architecture Market Packages Implemented by I-10 Projects

MP NO.	Market Package Name	FMS	RR Service Patrols	Motorist Aid Call Boxes
Advanced Traffic Management Systems (ATMS)				
ATMS01	Network Surveillance	✓		
ATMS04	Freeway Control	✓		
ATMS06	Traffic Information Dissemination	✓		
ATMS07	Regional Traffic Control	✓		
ATMS08	Incident Management System (IMS)	✓		
ATMS09	Traffic Forecast and Demand Management	✓		
ATMS18	Road Weather Information System (RWIS)	✓		
FL ATMS20	Speed Management	✓		
Emergency Management (EM)				
EM1	Emergency Response		✓	✓
EM2	Emergency Routing	✓	✓	✓
EM3	Mayday Support		✓	✓
FL EM4	Evacuation Management	✓	✓	

6.3.11 Institutional Agreements

Several existing agreements for the I-10 corridor are identified in the *ITS Legacy Catalog* as follows:

- **Joint ITS Agreement for the District 2 ITS** – This agreement is between FDOT District 2 and the Department of Highway Safety and Motor Vehicles (DHSMV). It is a five-year agreement, originally initiated in April 2001, which addresses the operation and maintenance of a TMC, staffing of the TMC, and traffic management on the interstate system. District 2 designed, installed, and maintains the ITS services; FHP provides staff for monitoring and dispatching; and District 3 provides an attendant for TMC equipment maintenance.

- **MOU for the Florida Bay County ITS Integration Project** – This agreement is between FDOT District 3, the Bay County Traffic Engineering Department, and the Bay County School District. It defines the roles and responsibilities of each agency in the design, construction, implementation, operation, and maintenance of the ATMS and fiber optic communications plant. District 3 will design and construct the FON and plant, which includes integration with the existing Hathaway Bridge IMS. Bay County Engineering will be responsible for long-term operations and maintenance of the system and components and the school board will participate in the funding of the system in exchange for use of the FON. The system is planned to connect to the FFN.

- **Operation Agreements of Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire I-10 corridor at one-mile intervals. The call boxes are a partnership between FDOT and the FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

Based on the defined FMS and RR Service Patrol projects for I-10, the agreements shown in Table 6.10 may be necessary to provide support for ITS deployments and cooperation among the stakeholders.

Table 6.10 – Institutional Agreements for Future ITS Project Implementations

Category	Stakeholders		Agreement
Freeway Management Systems	FDOT District 2	FDOT District 3	Jurisdictional authority agreement for FDOT District 3 to maintain and operate the I-10 corridor segment between the current district boundary and the proposed RTMC boundary.
	FDOT District 2's Jacksonville RTMC	FDOT District 3's Tallahassee RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		City of Jacksonville TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		FHP Troops B and G	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and FHP.
	FDOT District 3's Tallahassee RTMC	Pensacola Satellite Traffic Operation Facility	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the STMC
		Escambia County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Leon County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
	FDOT District 3's Tallahassee RTMC	FHP Troops A and H	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and FHP.
	Escambia County TMC	City of Pensacola TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between local TMCs.
	Leon County TMC	City of Tallahassee Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between local TMCs.

Table 6.10 (Continued)

Category	Stakeholders	Agreement	Category
RR Service Patrols	FDOT District 2's Jacksonville RTMC	Private Sectors	Legal agreements for FDOT procuring services from private sectors.
	FDOT District 3's Tallahassee RTMC	Private Sectors	Legal agreements for FDOT procuring services from private sectors.
	FDOT District 2's Jacksonville RTMC	FDOT District 3's Tallahassee RTMC	Operations/Maintenance agreements for incident management and operations between RR Service Patrols and RTMCs.
FMS / RR Service Patrols	FDOT District 2	FDOT District 3	Funding, design, planning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.

6.3.12 Project Cost Estimates

As discussed previously in *Section 6.1.6, Project Toolbox*, the toolbox was used to estimate the project devices and conceptual design. These devices were then inventoried for each proposed project and a unit cost was applied to the devices to determine construction, operations, and maintenance costs for the proposed projects. The unit costs are based on estimates provided by the districts as well as the FHWA ITS Unit Costs Database. Each proposed project was then combined with the projects developed by FDOT Districts 2 and 3. The unit costs are provided in *Appendix F*.

The same methodology was used to calculate the costs of the planned I-10 projects presented by District 3. The devices and device locations were derived from the *I-10 ITS Feasibility Study* prepared by District 3 and the FHWA ITS unit costs were applied to develop project cost estimates consistent with the proposed projects. The planned project costs were compared to the costs developed by District 3 to ensure that the revised costs were, at a minimum, no less than the district's estimated project costs. The RR Service Patrol cost estimates are for initiation of services only and were based on FHWA cost estimates.

Operations and maintenance costs were calculated based on the life-cycle of the project devices, assuming a ten-year life cycle. The life-cycle unit costs were also derived from the FHWA ITS Unit Costs Database and are also contained in *Appendix F*. Once the construction, operations, and maintenance costs were estimated, design, construction, engineering, and inspection costs were calculated based on FDOT's standard cost estimation methodology, which assumes a percentage of the project construction cost. Fifteen percent of the construction cost was assumed for design and twenty percent was assumed for construction, engineering, and inspection.

6.3.13 I-10 Corridor ITS Needs

Table 6.11 and Figure 6.37 illustrate all of the ITS needs for the I-10 corridor.

Table 6.11 – I-10 Corridor ITS Needs

Facility: I-10

District	From	To	Description	Type	Phase	PDC
2	Jacksonville RTMC	Jacksonville RTMC	Jacksonville RTMC Relocation for Joint Dispatch Building	RTMC	PE	$0.200
2	Jacksonville RTMC	Jacksonville RTMC	Jacksonville RTMC Relocation for Joint Dispatch Building	RTMC	CONST	$6.000
2	Jacksonville RTMC	Jacksonville RTMC	Jacksonville RTMC Relocation for Joint Dispatch Building	RTMC	CEI	$1.200
2	US 301Interchange	I-295 Interchange	Rural Areas Freeway Management System (R-5)	FMS	PE	$0.402
2	US 301Interchange	I-295 Interchange	Rural Areas Freeway Management System (R-5)	FMS	CONST	$2.682
2	US 301Interchange	I-295 Interchange	Rural Areas Freeway Management System (R-5)	FMS	CEI	$0.537
2	US 221 Interchange	CR 255 Interchange (Madison)	Rural Areas Freeway Management System (R-6)	FMS	PE	$0.402
2	US 221 Interchange	CR 255 Interchange (Madison)	Rural Areas Freeway Management System (R-6)	FMS	CONST	$2.682
2	US 221 Interchange	CR 255 Interchange (Madison)	Rural Areas Freeway Management System (R-6)	FMS	CEI	$0.537
2	US 90 Interchange	SR 228 Interchange	Rural Areas Freeway Management System (R-8)	FMS	PE	$0.402
2	US 90 Interchange	SR 228 Interchange	Rural Areas Freeway Management System (R-8)	FMS	CONST	$2.682
2	US 90 Interchange	SR 228 Interchange	Rural Areas Freeway Management System (R-8)	FMS	CEI	$0.537
2	US 90 Interchange (Suwannee)	CR 137 Interchange (Suwannee)	Rural Areas Freeway Management System (R-9)	FMS	PE	$0.302
2	US 90 Interchange (Suwannee)	CR 137 Interchange (Suwannee)	Rural Areas Freeway Management System (R-9)	FMS	CONST	$2.012
2	US 90 Interchange (Suwannee)	CR 137 Interchange (Suwannee)	Rural Areas Freeway Management System (R-9)	FMS	CEI	$0.402
2	I-75 Interchange	US41 / US441 Interchange	Rural Areas Freeway Management System (R-7)	FMS	PE	$0.302
2	I-75 Interchange	US41 / US441 Interchange	Rural Areas Freeway Management System (R-7)	FMS	CONST	$2.012
2	I-75 Interchange	US41 / US441 Interchange	Rural Areas Freeway Management System (R-7)	FMS	CEI	$0.402
					PDC Sum	$23.696

Table 6.11 (Continued)

Facility: I-10

District	From	To	Description	Type	Phase	PDC
3	Pensacola TMC	Pensacola TMC	Pensacola Traffic Management Center Building	RTMC	PE	$0.120
3	Pensacola TMC	Pensacola TMC	Pensacola Traffic Management Center Building	RTMC	CONST	$1.650
3	Pensacola TMC	Pensacola TMC	Pensacola Traffic Management Center Building	RTMC	CEI	$0.330
3	Pensacola TMC	Pensacola TMC	Pensacola Traffic Management Center Systems	RTMC	CONST	$0.573
3	Alabama State Line	Jefferson / Madison Co. Line	Portable DMS (12) for Emergency Management	EVAC	CONST	$0.360
3	Tallahassee RTMC	Tallahassee RTMC	Tallahassee Regional Traffic Management Center Building	RTMC	PE	$0.116
3	Tallahassee RTMC	Tallahassee RTMC	Tallahassee Regional Traffic Management Center Building	RTMC	CONST	$1.638
3	Tallahassee RTMC	Tallahassee RTMC	Tallahassee Regional Traffic Management Center Building	RTMC	CEI	$0.328
3	Tallahassee RTMC	Tallahassee RTMC	Tallahassee Regional Traffic Management Center Systems	RTMC	CONST	$0.573
3	Welcome Center	East of SR 87	Pensacola Area Freeway Management System	FMS	PE	$0.931
3	Welcome Center	East of SR 87	Pensacola Area Freeway Management System	FMS	CONST	$6.205
3	Welcome Center	East of SR 87	Pensacola Area Freeway Management System	FMS	CEI	$1.241
3	West of US 90 (Gadsden County)	East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	PE	$0.696
3	West of US 90 (Gadsden County)	East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	CONST	$4.637
3	West of US 90 (Gadsden County)	East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	CEI	$0.927
3	SR 189 Interchange	CR 257 Interchange (Jefferson)	Rural Areas Freeway Management System (R-1)	FMS	PE	$0.704
3	SR 189 Interchange	CR 257 Interchange (Jefferson)	Rural Areas Freeway Management System (R-1)	FMS	CONST	$4.694
3	SR 189 Interchange	CR 257 Interchange (Jefferson)	Rural Areas Freeway Management System (R-1)	FMS	CEI	$0.939
3	SR 285 Interchange	SR 79 Interchange	Rural Areas Freeway Management System (R-2)	FMS	PE	$0.402
3	SR 285 Interchange	SR 79 Interchange	Rural Areas Freeway Management System (R-2)	FMS	CONST	$2.682
3	SR 285 Interchange	SR 79 Interchange	Rural Areas Freeway Management System (R-2)	FMS	CEI	$0.537
3	SR 77 Interchange	SR 69A Interchange	Rural Areas Freeway Management System (R-3)	FMS	PE	$0.503

Table 6.11 (Continued)

Facility: I-10

District	From	To	Description	Type	Phase	PDC
3	SR 77 Interchange	SR 69A Interchange	Rural Areas Freeway Management System (R-3)	FMS	CONST	$3.353
3	SR 77 Interchange	SR 69A Interchange	Rural Areas Freeway Management System (R-3)	FMS	CEI	$0.671
3	SR 69 Interchange	SR 267 Interchange	Rural Areas Freeway Management System (R-4)	FMS	PE	$0.310
3	SR 69 Interchange	SR 267 Interchange	Rural Areas Freeway Management System (R-4)	FMS	CONST	$2.064
3	SR 69 Interchange	SR 267 Interchange	Rural Areas Freeway Management System (R-4)	FMS	CEI	$0.413
3	US 90 West	US 90 East	Fiber Optic Network	FON	PE	$0.208
3	US 90 West	US 90 East	Fiber Optic Network	FON	CONST	$1.740
3	US 90 West	US 90 East	Fiber Optic Network	FON	CEI	$0.139
3	Alabama State Line/I-10 Welcome Center	SR 87	Fiber Optic Network	FON	PE	$0.326
3	Alabama State Line/I-10 Welcome Center	SR 87	Fiber Optic Network	FON	CONST	$2.719
3	Alabama State Line/I-10 Welcome Center	SR 87	Fiber Optic Network	FON	CEI	$0.218
3	Jefferson/Madison Co. Line	I-295	Fiber Optic Network	FON	PE	$1.684
3	Jefferson/Madison Co. Line	I-295	Fiber Optic Network	FON	CONST	$14.030
3	Jefferson/Madison Co. Line	I-295	Fiber Optic Network	FON	CEI	$1.120
3	SR 87	US 90 West	Fiber Optic Network	FON	PE	$2.230
3	SR 87	US 90 West	Fiber Optic Network	FON	CONST	$18.660
3	SR 87	US 90 West	Fiber Optic Network	FON	CEI	$1.490
3	US 90 East	Jefferson/Madison Co. Line	Fiber Optic Network	FON	PE	$0.361
3	US 90 East	Jefferson/Madison Co. Line	Fiber Optic Network	FON	CONST	$14.030
3	US 90 East	Jefferson/Madison Co. Line	Fiber Optic Network	FON	CEI	$1.120

Table 6.11 (Continued)

Facility: I-110

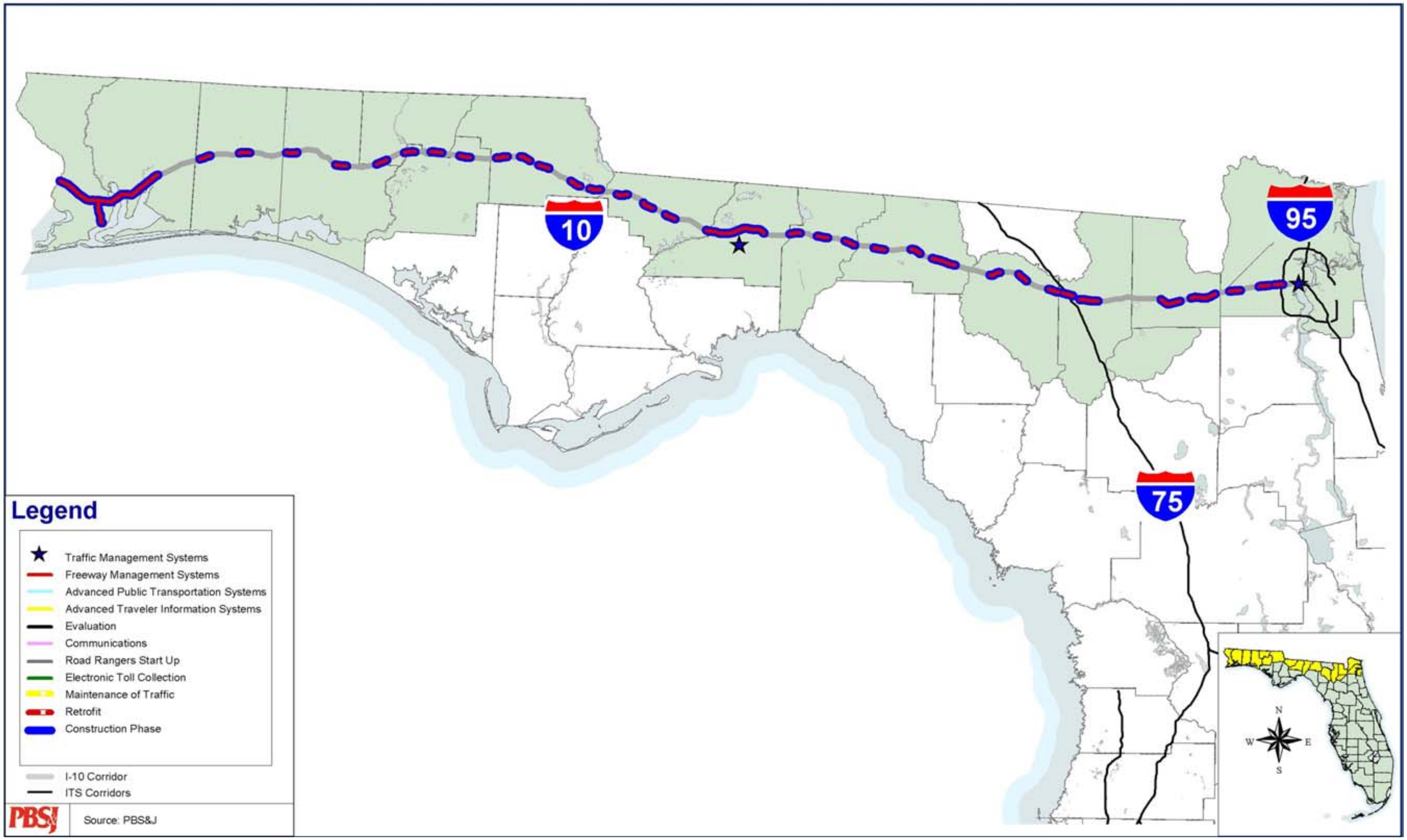
District	From	To	Description	Type	Phase	PDC
3	I-10	Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	PE	$0.328
3	I-10	Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	CONST	$2.189
3	I-10	Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	CEI	$0.438
3	Pensacola Bay Bridge	I-10	Fiber Optic Network	FON	PE	$0.088
3	Pensacola Bay Bridge	I-10	Fiber Optic Network	FON	CONST	$0.738
3	Pensacola Bay Bridge	I-10	Fiber Optic Network	FON	CEI	$0.059
					PDC Sum	$3.841

Facility: I-110

District	From	To	Description	Type	Phase	PDC

Grand Total All Facilities *$125.206*

Figure 6.37 – I-10 Corridor ITS Needs



6.3.14 Project Priorities and Phasing

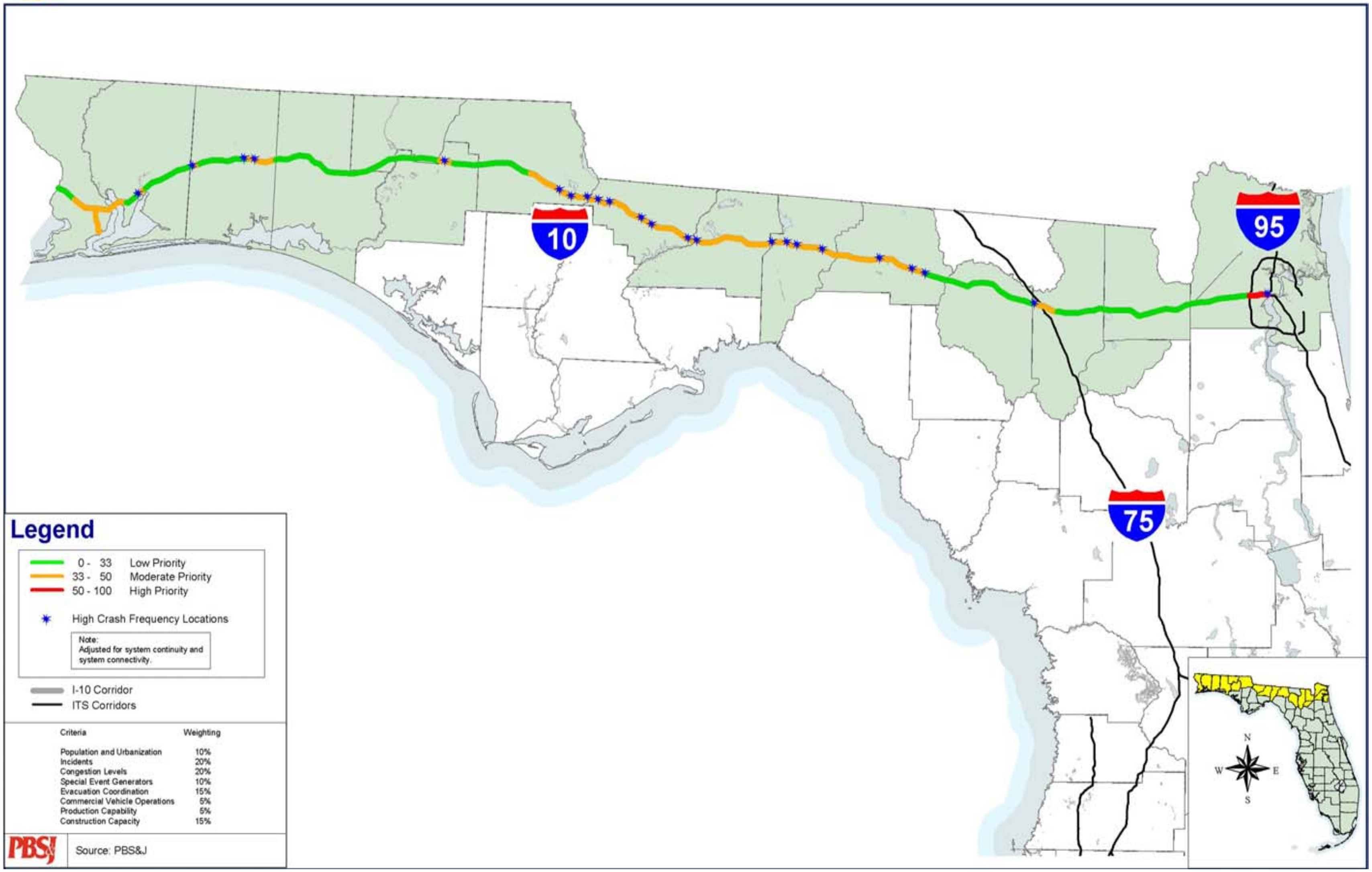
Table 6.12 summarizes the high and moderate priority segments for I-10 and I-110. The need for ITS deployment is supported on a statewide basis for all FIHS limited-access corridors. This table summarizes the relative priority of ITS for the purposes of phasing implementation only. Figure 6.38 illustrates the result of the prioritization analysis for the I-10 corridor and recommended prioritization based on high, moderate, and low priorities.

Table 6.12 – Priority Segments for ITS Deployments on the I-10 Corridor

Facility	Relative Priority	Area	From	To	Existing FMS?
I-10	High	Jacksonville	I-295	I-95	Yes
I-10	Moderate	Pensacola	U.S. 90	SR 281	
I-110	Moderate	Pensacola	Entire length		
I-10	Moderate	Crestview	SR 85	Okaloosa/Walton County Line	
I-10	Moderate	Marianna to Madison (includes Tallahassee)	SR 73	U.S. 90	
I-10	Low	Madison to Columbia	U.S. 90	I-75	
I-10	Moderate	I-75 and I-10 Interchange	I-75 and I-10 Interchange	I-75 and I-10 Interchange	

The recommended ranking and phasing of the District 3 projects as presented in the *I-10 ITS Feasibility Study* were retained.

Figure 6.38 – I-10 Corridor *ITS Plan* Priorities (Adjusted)



6.4 I-75 ITS Corridor Master Plan

6.4.1 Corridor Description

The limits of the I-75 corridor are from the Palmetto Expressway in Miami-Dade County to the Georgia state line. This corridor will also include I-275 from Manatee County to north Hillsborough County. The corridor traverses several counties including Miami-Dade, Broward, Collier, Lee, Charlotte, Sarasota, Manatee, Hillsborough, Pasco, Hernando, Sumter, Marion, Alachua, Columbia, Suwannee, and Hamilton counties. The corridor provides access to several major metropolitan areas including Ft. Lauderdale, Ft. Myers, Tampa, Ocala, and Gainesville. Figure 6.39 illustrates the corridor location. The corridor is operated and maintained as follows:

- District 6 for Miami-Dade County;
- District 4 for Broward County;
- District 1 from Collier County to Manatee County;
- District 7 from Hillsborough County to Hernando County;
- District 5 for Sumter and Marion counties; and
- District 2 from Alachua to Hamilton County.

6.4.2 Legacy Systems

- I-75 in the north-central portion of the state primarily consists of six lanes. Small eight-lane segments of I-75 are located in Hillsborough and Broward counties and the remainder of the facility, extending through southwest Florida is primarily four lanes. As with the urban sections of I-4 and I-75 in Hillsborough County, I-275 is primarily an eight-lane facility. The existing six-lane portions of I-275, located in the northern portion of the segment, are currently being expanded to eight lanes.

- I-75 also has a relatively low interchange density of 5.3 miles per interchange, which is typical for a primarily rural corridor. I-275 is classified as an urban facility due to its high interchange density of 2.2 miles per interchange. Both I-75 and I-275 interchange densities are the highest within the urban areas of Pinellas and Hillsborough counties. The interchange locations for I-75 are shown in Figure 6.40 and the corridor area types are illustrated in Figure 6.41.

- Compared with the other major study facilities, the I-75 corridor experiences an unusually high concentration of accident locations from I-275 to the Turnpike. This may be due to the high volume of I-275 and Turnpike traffic merging with the interstate. Another cluster of high accident locations occurs in the Alachua County/Gainesville area. South of I-4, the corridor exhibits a high crash rate at two interchanges in Sarasota County and several locations along Alligator Alley from Collier to Broward County. The high crash frequency locations for I-75 are shown in Figure 6.42.

Figure 6.39 – I-75 Corridor Location

Figure 6.40 – Interchange Locations on the I-75 Corridor

Figure 6.41 – I-75 Corridor Area Types

Figure 6.42 – High Crash Frequency Locations on the I-75 Corridor

- I-75 has an AADT of 49,731 vpd based on statistics for the year 2000. The traffic volume is expected to increase 31 percent to 72,297 vpd from 2000 to 2010 and 30 percent to 104,494 vpd from 2010 to 2020. The greatest amount of existing traffic volume along the corridor occurs in Miami-Dade County at 94,625 vpd. Traffic demand in Miami-Dade County is anticipated to increase by the year 2020 to 193,414 vpd. I-75 will see the largest increase in travel demand in the southwestern and southeastern portions of the state. The central Florida portions of I-75 generate the lowest traffic volumes. Their growth will be steady in these locations; however, they will not grow at the rapid rate anticipated in the southeastern and southwestern portions of the interstate corridor. I-275 has an AADT of 58,968 vpd. The traffic volume is forecasted to increase 17 percent from 2000 to 2010 with 71,518 vpd and 27 percent from 2010 to 2020 with 97,647 vpd. The highest estimated AADT on I-275 is 126,643 vpd located in Hillsborough County. Travel demand along this portion of the interstate is expected to increase to 227,341 vpd by 2020. Based on these forecasts, I-275 will likely generate a greater volume of traffic than either I-4 or I-75. The lowest AADT (36,091 vpd) occurs in Manatee County, which only contains a small segment of the corridor. Figures 6.43 through 6.45 illustrate the existing and forecasted AADTs for the I-75 corridor.

- Tourism is Florida's largest industry. Due to the high volume of annual tourists, the state transportation system must be designed to accommodate the social and recreational travel generated by the major tourist attractions and activity centers, in addition to supporting the daily commuter and freight travel. Therefore, by locating the state's major activity centers, special generators, and tourist attractions, ITS solutions such as real-time traveler information systems and incident management techniques can be implemented in coordination with multi-modal improvements to improve mobility to and around these major activity centers.

- The I-75 and I-275 corridors provide access to I-4 and central Florida. Central Florida contains the majority of Florida's tourist attractions such as MGM Studios Florida, Universal Studios Florida, and Disney World. I-75 does not provide direct access to these theme parks; however, it does provide direct access to one of Florida's largest trip generators, Busch Gardens. Statistics from 1998 indicate that Busch Gardens attracted more than 4,200,000 visitors alone. Other large trip generators for the I-275 and I-75 corridors are the Raymond James Stadium (Tampa Bay Buccaneers), Tropicana Field (Tampa Bay Devil Rays), and the Ice Palace (Tampa Bay Lightning).

Figure 6.43 – I-75 Corridor 2000 AADT

Figure 6.44 – I-75 Corridor 2010 AADT

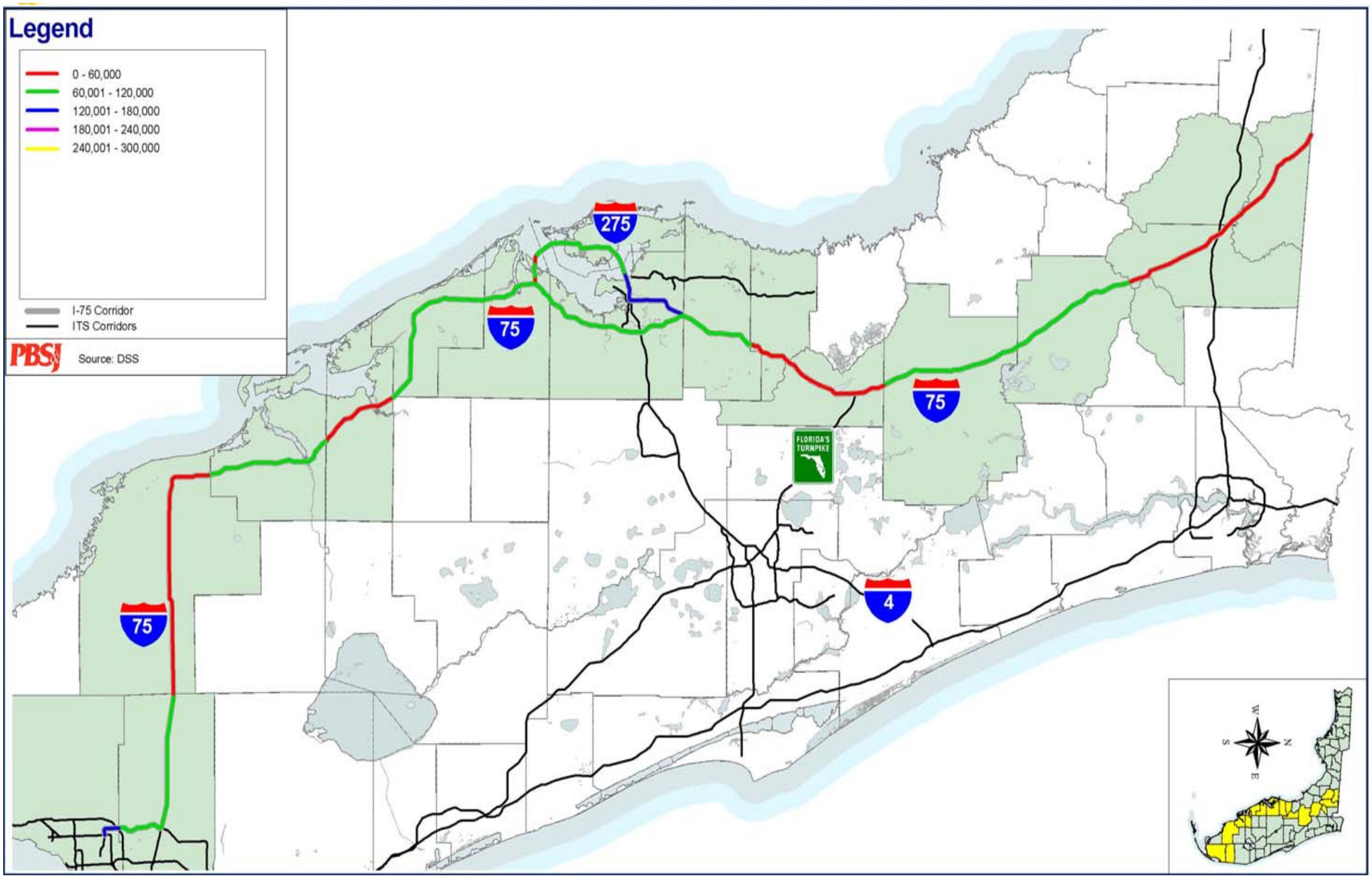
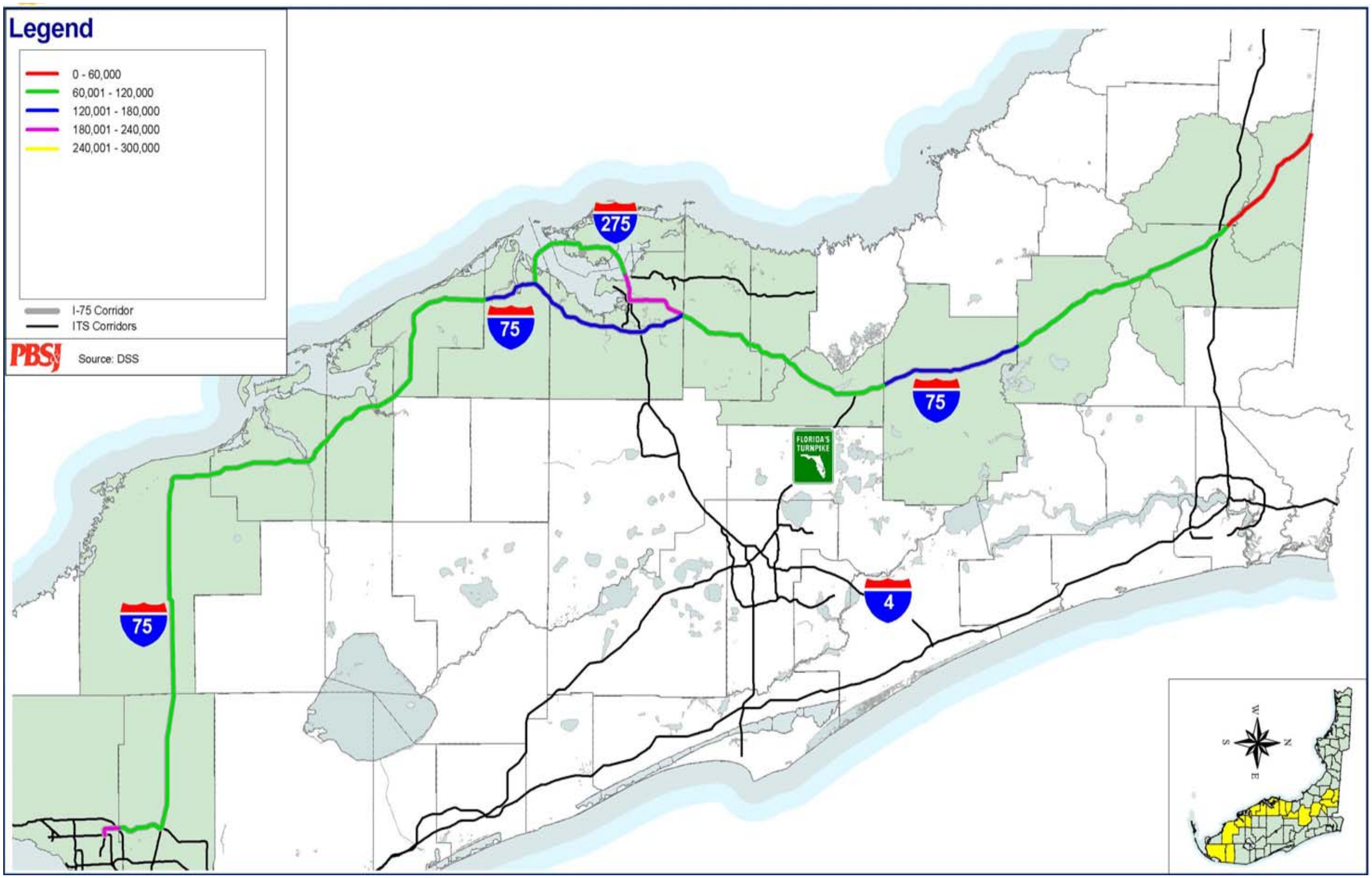


Figure 6.45 – I-75 Corridor 2020 AADT



6.4.3 Current ITS Plans and Programs

This section identifies existing and planned ITS along the I-75 corridor. These services will be mapped in *Section 6.4, I-75 ITS Corridor Master Plan,* of this report to determine gaps in existing and planned services.

- **Motorist Aid Call Boxes –** A statewide motorist aid system using roadside call boxes has been deployed along the entire length of I-75 and I-275 at one-mile intervals along both sides of the facility. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

- **RR Service Patrols –** This ITS program, operated by the FDOT districts through private contractors, includes roadside assistance and incident clearance. RR Service Patrols are currently operating along I-75 from Miami-Dade County to Ft. Myers in Lee County and from Port Charlotte in Charlotte County to just south of the Sarasota/Manatee County line. I-275 currently has RR Service Patrols in operation along the portion of the corridor contained in District 7.

- **CVO –** Two WIM sites are currently located along I-75 in Charlotte and Hamilton counties. There are no plans to construct additional WIM stations.

- District 1 does not currently operate or maintain any ITS services; however, they are in the process of implementing an IMS along I-75 in Lee and Collier counties, with long-term plans for expansion in Charlotte, Sarasota, and Manatee counties.

- Districts 4 and 6 have recently entered into a regional agreement for the integration of ITS services and the sharing of data for ATIS services. Additional plans for I-75 in District 4 include a FMS/IMS and an overweight vehicle control system.

- District 5 is planning a district-wide expansion of the existing SMIS. These IMS will eventually cover the entire length of I-75 in District 5 for Sumter and Marion counties.

- District 7 has implemented a traveler information system along I-275 for special events at Tropicana Field in addition to a bridge advisory and monitoring system along the Sunshine Skyway Bridge. The district has recently completed an ITS master plan for the interstate system and has planned a FMS/IMS along all of I-275 and I-75 in District 7 in addition to enhancements to the Sunshine Skyway Bridge Advisory Monitoring System.

Figures 6.46 and 6.47 show the existing and planned ITS coverage for I-75.

Figure 6.46 – Existing ITS Coverage on the I-75 Corridor

Figure 6.47 – Planned ITS Coverage on the I-75 Corridor

Currently, the only data communications system available along the I-75 and I-275 corridors is a microwave system. Due to the complexity and volume of the data required to support proposed ITS deployments along the FIHS corridors, the existing microwave communications system will require an upgrade, which is scheduled for the year 2004. Plans to implement a FON along the FIHS corridors are also currently in development. The FON would be optimal for the communications needs for statewide ITS deployments due to its capacity to accommodate a large volume of data.

Additionally, I-275 has small portions of fiber located on the Sunshine Skyway Bridge and Hillsborough County has fiber along I-275 for its ATMS.

Figure 6.48 illustrates the existing microwave tower locations and Figure 6.49 illustrates existing fiber locations for I-75 and I-275.

6.4.4 Proposed Capacity Improvement Projects

It is important to identify programmed and cost feasible plan improvements (construction only) because funding for potential ITS deployments can be leveraged with the funding of the capacity improvements and consideration of the roadway modifications can be included in the design of the ITS improvements. Figures 6.50 through 6.52 illustrate the programmed, planned, and 2025 cost feasible improvements for the I-75 and I-275 corridors in each FDOT district. As identified in Figure 6.50, the I-75 and I-275 corridors have only a few interchange modification projects and a new interchange project identified as programmed. Figure 6.51 identifies three roadway-widening projects for I-75, which will add two lanes to the existing facilities. Additionally, I-275 has only one planned project that will add four auxiliary lanes. Roadway-widening projects and interchange modifications along I-75 and I-275 are identified in the *2025 FIHS Cost Feasible Plan*.

Figure 6.48 – Existing Microwave Tower Locations on the I-75 Corridor

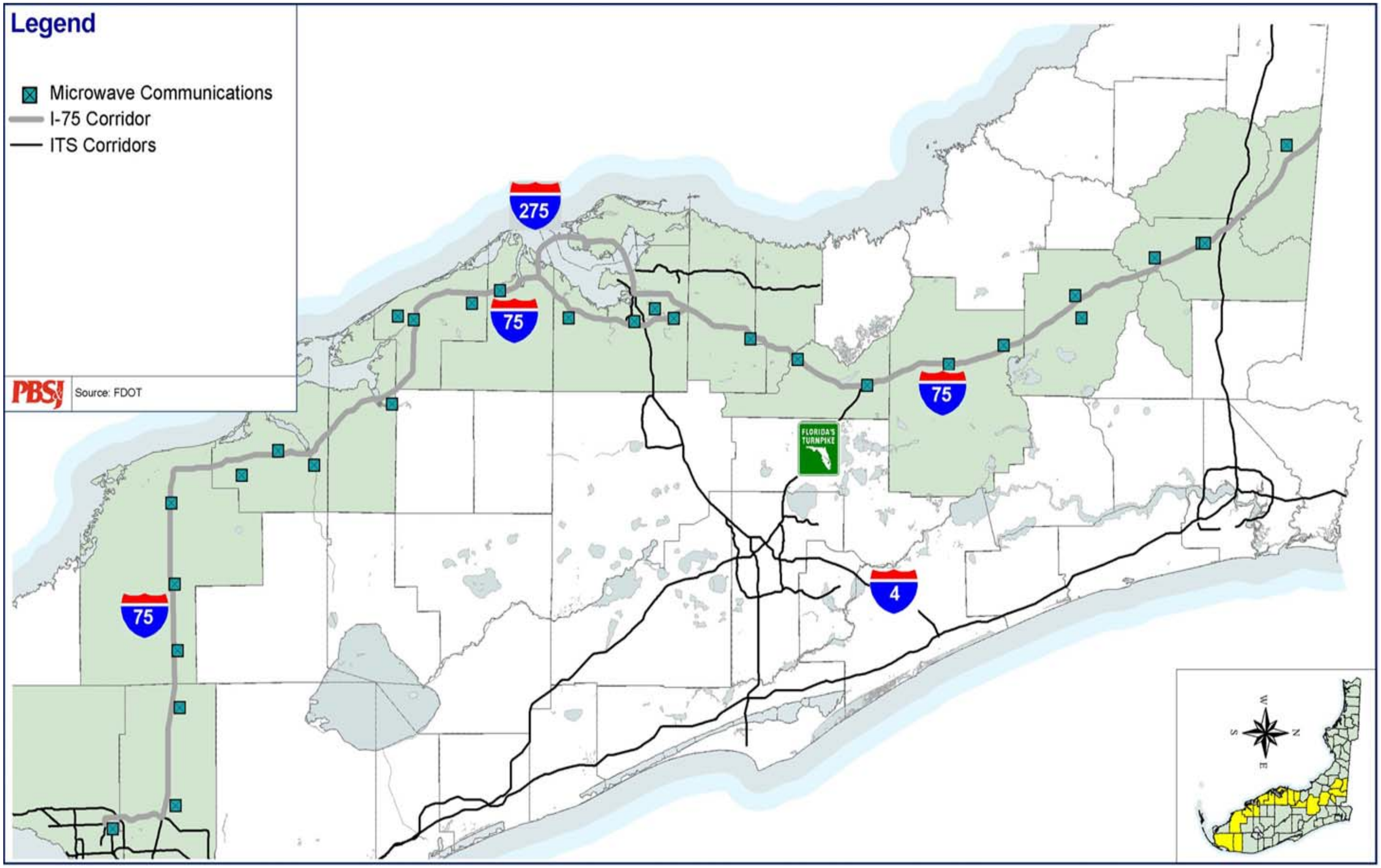


Figure 6.49 – Existing Fiber Optic Cable Locations on the I-75 Corridor

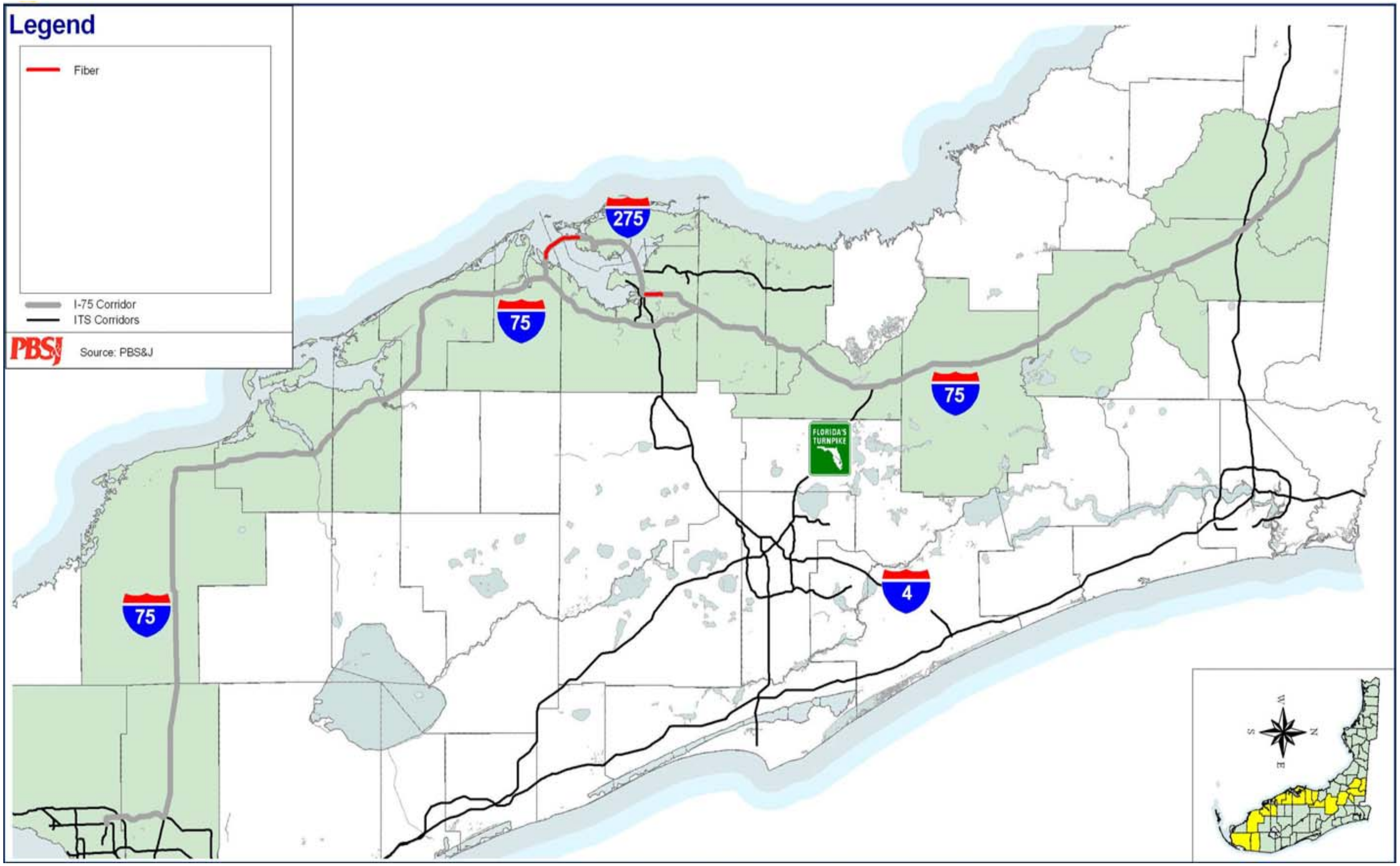


Figure 6.50 – Programmed Capacity Improvements for the I-75 Corridor

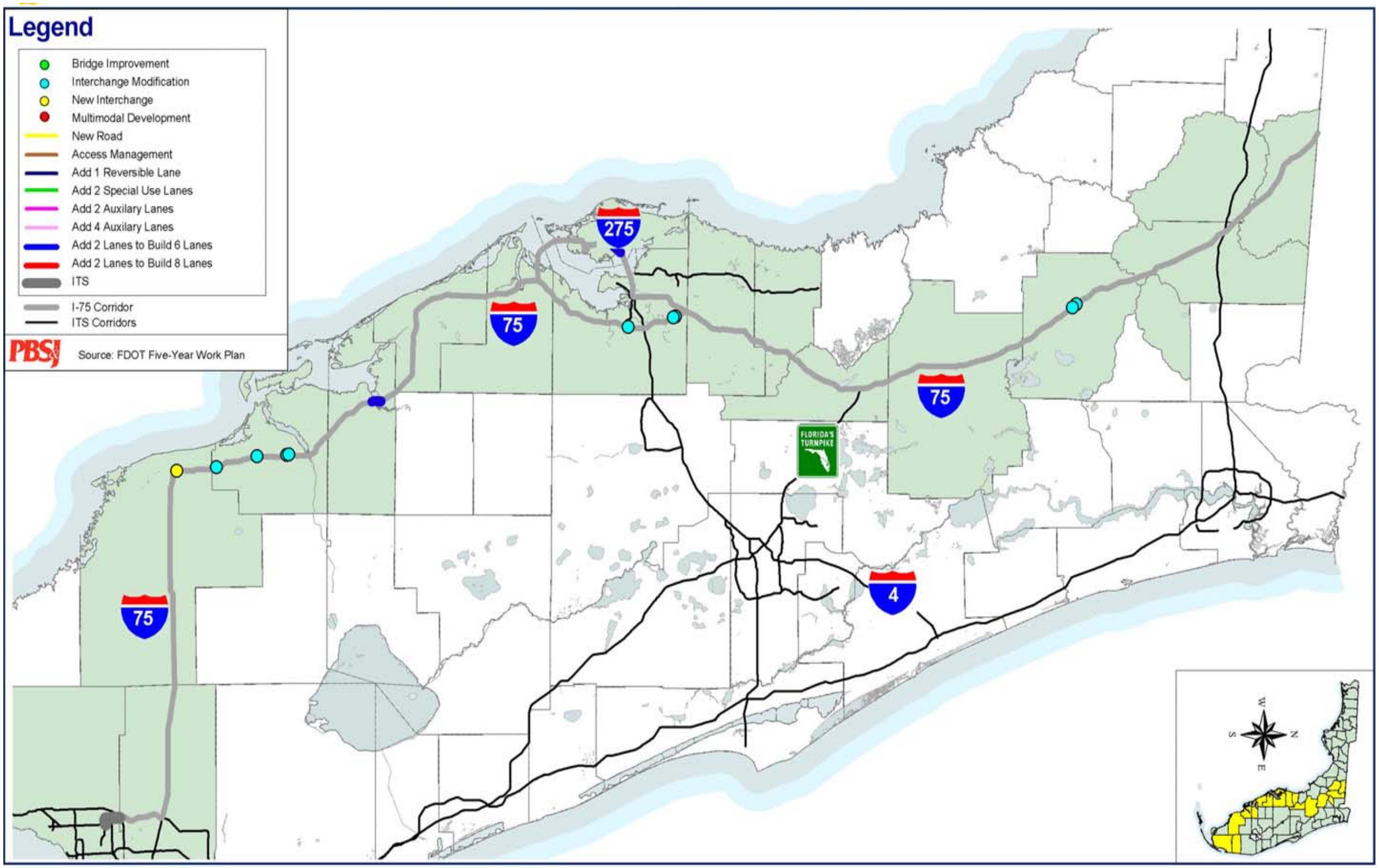


Figure 6.51 – Planned Capacity Improvements for the I-75 Corridor

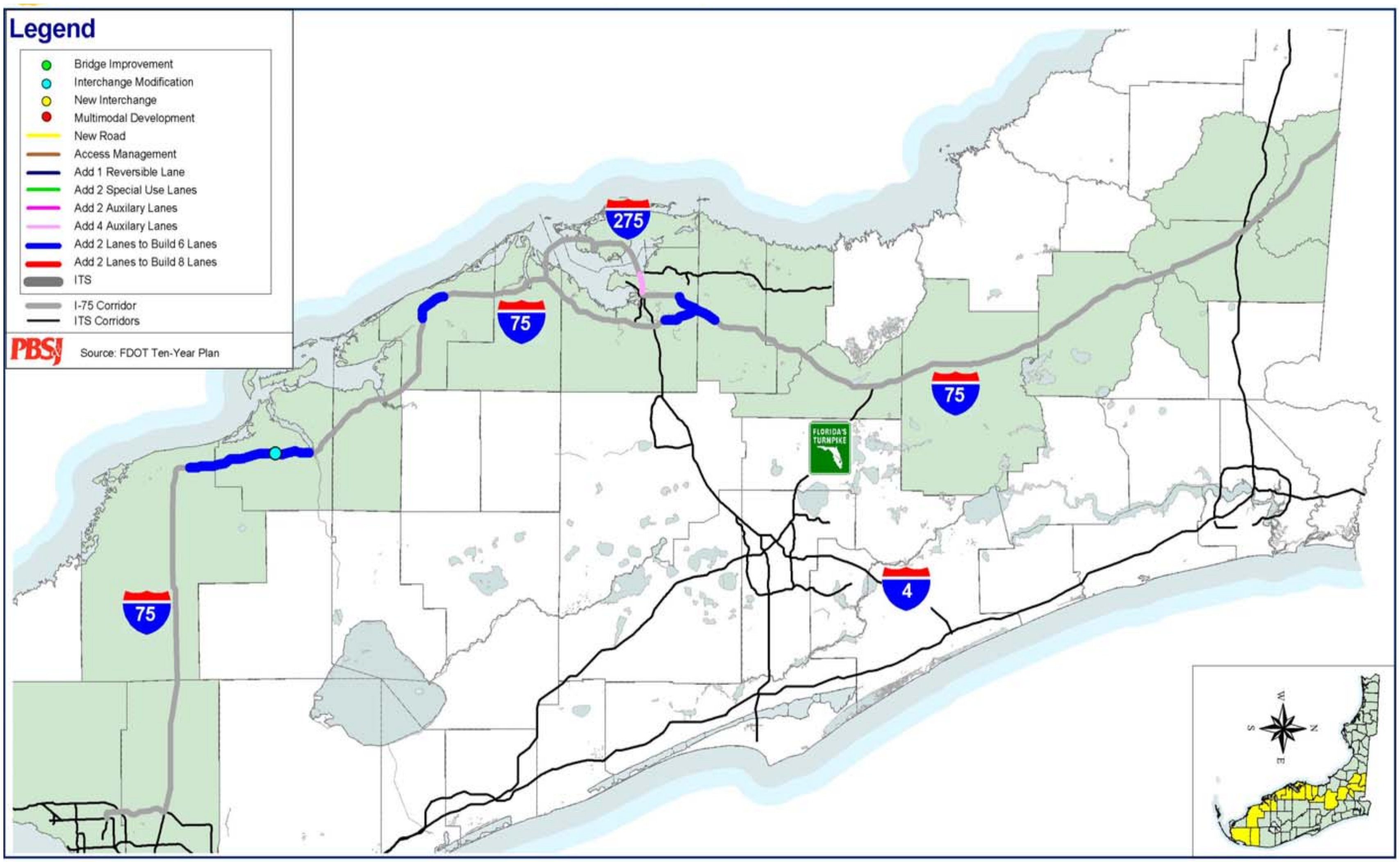
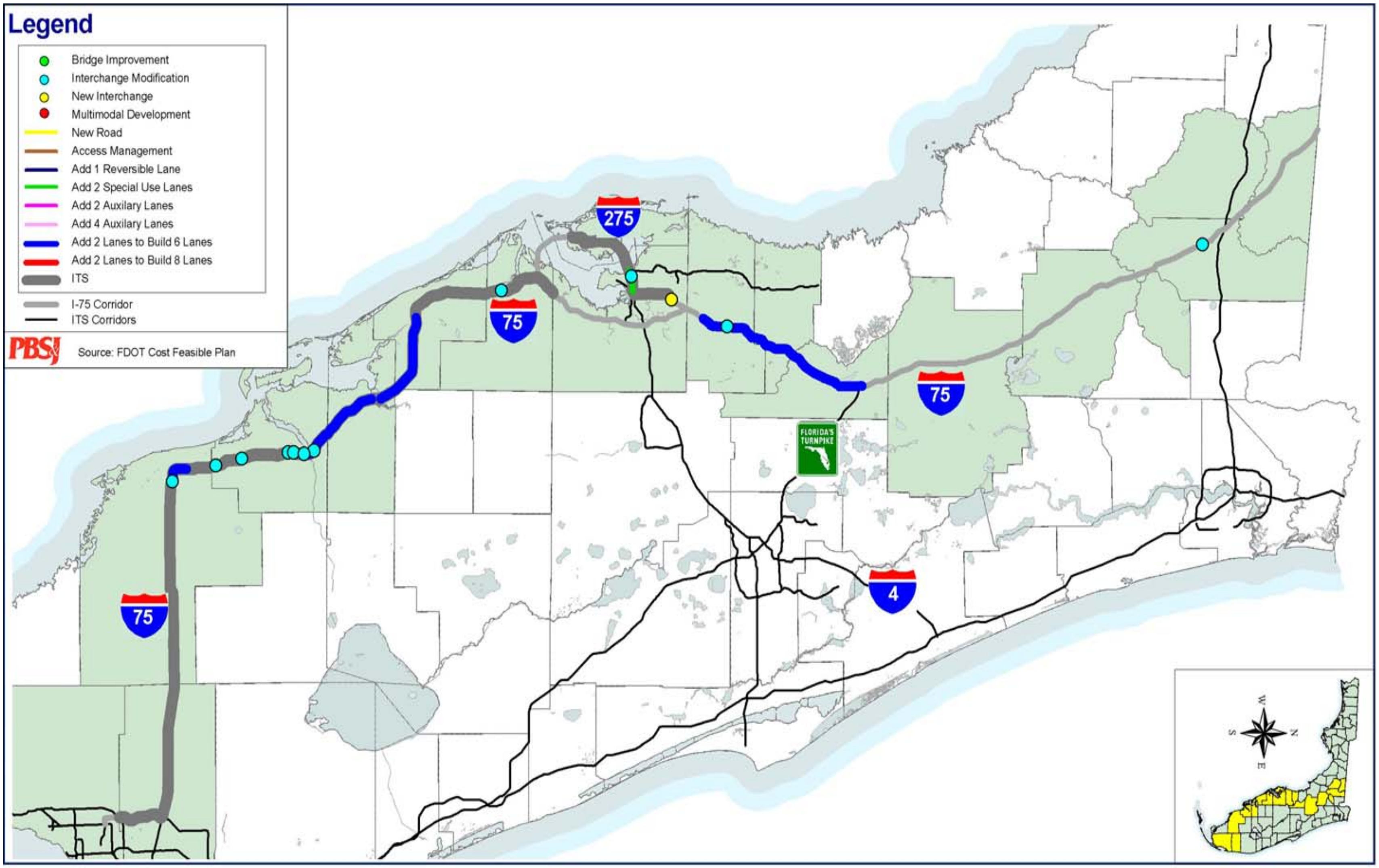


Figure 6.52 – *Ten-Year ITS Cost Feasible Plan* Improvements for the I-75 Corridor



6.4.5 Conceptual Project Implementations

The functional gaps identified in *Section 4, Deployment Issues,* were reviewed and developed as recommended conceptual projects for advancement along the I-75 and I-275 corridors. The conceptual projects focused on three main functional areas: FMS, RR Service Patrols, and motorist aid call boxes. These projects were recommended to better detect, verify, and respond to incidents and non-recurring congestion due to incidents. Table 6.13 identifies the conceptual projects and their locations.

Table 6.13 – Proposed Conceptual Projects for the I-75 Corridor

Facility	Service Type	County	District	Area Type	From	To
I-75	FMS	Various	4	Urban	Southern Terminus	Sawgrass Expressway
I-75	RR Service Patrols	Various	1	Rural	SR 82 Interchange	River Road Interchange
I-75	RR Service Patrols	Various	1	Rural	SR 72 Interchange	Manatee/Hillsborough County Line
I-75*	FMS	Various	7	Rural	I-275 Interchange (Manatee)	U.S. 301 Interchange (Brandon)
I-75*	FMS	Various	7	Rural	SR 54 Interchange	Hernando/Sumter County Line
I-75	RR Service Patrols	Various	5	Rural	Hernando/Sumter County Line	Marion/Alachua County Line
I-75	FMS	Alachua	2	Urban	SR 121 Interchange	SR 222 Interchange
I-75	FMS	Alachua	2	Rural	U.S. 441 Interchange SR 236 Interchange	
I-75	FMS	Columbia	2	Rural	U.S. 90 Interchange I-10 Interchange SR 136 Interchange	
I-75	FMS	Suwannee	2	Rural		

* This gap is addressed in the District 7 FMS plans as a limited FMS. This implementation plan is recommending an upgrade to a full FMS deployment for regional consistency and integration with full FMS deployments for Districts 1 and 5.

6.4.6 Conceptual Project Descriptions

I-275 Interchange (Manatee County) to the U.S. 301 Interchange (Brandon), Hillsborough County – This project will include the deployment of an upgrade to a full IMS/FMS. District 7 has a planned rural IMS/FMS for this area. However, this section of I-75 is classified as a high and moderate priority segment with several high accident locations. Additionally, District 1 is proposing a full FMS deployment up to their jurisdictional control boundary (I-275 in Manatee County). Therefore, an upgrade of District 7's rural IMS/FMS is recommended to ensure system continuity and integration. The upgrade will consist of deploying CCTV cameras at one-mile intervals and vehicle incident detectors at half-mile intervals while DMS will be placed only at interchanges. The total number of devices needed for the upgrade is eleven CCTVs and 24 vehicle incident detectors.

SR 54 Interchange to the Hernando/Sumter County Line – This project will include the deployment of an upgrade to a full IMS/FMS. District 7 has a planned rural IMS/FMS for this area. However, this section of I-75 is classified as a high and moderate priority segment with several high accident locations. Additionally, District 5 is proposing a full FMS deployment for the entire length of I-75 in Marion and Sumter counties. Therefore, an upgrade of District 7's rural IMS/FMS is recommended to ensure system continuity and integration. The upgrade will consist of deploying CCTV cameras at one-mile intervals and vehicle incident detectors at half-mile intervals while DMS will be placed only at interchanges. The total number of devices needed for the upgrade is 18 CCTVs and 48 vehicle incident detectors.

SR 121 Interchange to the SR 222 Interchange in Alachua County – This project will include the deployment of an IMS/FMS between these two interchanges located on an urban six-lane section of I-75 that traverses through Gainesville in District 2. The deployment will consist of loop detectors at half-mile intervals, CCTV cameras at half-mile intervals, and two DMS for each interchange within the project limits. Two interchanges (the SR 24 and SR 26 Interchanges) lie between the SR 121 and SR 222 Interchanges. The total number of devices for this project is eleven CCTV cameras, eight DMS, and 252 loop detectors. This project is proposed for deployment as a part of a rural freeway IMS in District 2 because these interchanges lie within an urban section of I-75 in District 2. Also, they are identified as a moderate priority segment with several high accident locations.

U.S. 90 Interchange and I-10/I-75 Interchange (Columbia County) and the SR 136 Interchange in Suwannee County – This project will include the deployment of an IMS/FMS at these three interchanges located on rural six-lane sections of I-75 in District 2. Each ITS interchange deployment will consist of two CCTV cameras, two DMS, and 16 loop detectors. The total number of devices for this project is six CCTV cameras, six DMS, and 48 loop detectors. This project is being proposed to provide system continuity and each interchange is located on a moderate priority segment of I-75 where incidents are likely to occur. Also, the I-10/I-75 Interchange lies within a rural section of I-75, yet it is a major interchange where incidents are likely to occur and cause delays. In essence, this interchange is a rural interchange operating as an urban interchange. This project will deploy only the I-75 portion of the IMS/FMS. Also, this project may require devices to be located on each ramp due to the complexity of the merging and weaving sections of this interchange. There will also be a proposed I-75 Interchange project included in the *I-10 ITS Corridor Master Plan* that will include the remaining devices for the completion of the interchange. These two projects may be consolidated into one in the *ITS Plan*.

U.S. 129 Interchange and SR 6 Interchange and the SR 143 Interchange in Hamilton County –This project will include the deployment of an IMS/FMS at these three interchanges located on rural four-lane sections of I-75 in District 2. Each interchange ITS deployment will consist of two CCTV cameras, two DMS, and 16 loop detectors. The total number of devices for this project is six CCTV cameras, six DMS, and 48 loop detectors. This project is being recommended for addition to the I-75 FMS because this section of I-75 experiences high volumes of heavy vehicle traffic (truck volume) and incidents are likely to occur at each interchange.

6.4.7 Portions of the Corridor Architecture being Implemented

Each district corridor architecture for I-75 provides a "big picture" or high-level view of ITS in that region. The I-75 corridor architecture consists of the FDOT Districts 1, 2, 4, 5, 6, and 7 I-75 corridor architectures. An ITS architecture typically defines:

- Functions (e.g., gathering traffic information or requesting route information) that must be performed to implement a given user service or market package;
- Physical entities or subsystems where these functions reside (i.e., roadside or the vehicle);
- Interfaces/Information flows between the physical systems; and
- Communications requirements for the information flows (i.e., wireline or wireless).

In addition, it identifies and specifies the requirements for the standards needed to support national and regional interoperability, as well as product standards needed to support economy of scale considerations in deployment. More information on the development of the corridor architecture is contained in the *ITS Physical Architecture*. Table 6.14 identifies the market packages from the *NITSA* and the statewide and corridor architectures that were implemented by the proposed I-75 corridor projects.

Table 6.14 – Architecture Market Packages Implemented by I-75 Projects

MP NO.	Market Package Name	FMS	RR Service Patrols	Motorist Aid Call Boxes
Advanced Traffic Management Systems (ATMS)				
ATMS01	Network Surveillance	✓		
ATMS04	Freeway Control	✓		
ATMS06	Traffic Information Dissemination	✓		
ATMS07	Regional Traffic Control	✓		
ATMS08	Incident Management System (IMS)	✓		
ATMS09	Traffic Forecast and Demand Management	✓		
ATMS18	Road Weather Information System (RWIS)	✓		
FL ATMS20	Speed Management	✓		
Emergency Management (EM)				
EM1	Emergency Response		✓	✓
EM2	Emergency Routing	✓	✓	✓
EM3	Mayday Support		✓	✓
FL EM4	Evacuation Management	✓	✓	

6.4.8 Institutional Agreements

Several existing agreements for the I-75 corridor are identified in the *ITS Legacy Catalog* as follows:

- **Joint ITS Agreement for the District 2 ITS** – This agreement is between FDOT District 2 and the DHSMV. It is a five-year agreement, originally initiated in April 2001, which addresses the operation and maintenance of a TMC, staffing of the TMC, and traffic management on the interstate system. District 2 designed, installed, and maintains the ITS; FHP provides staff for monitoring and dispatching; and District 3 provides an attendant for TMC equipment maintenance.

- **MOU for SunGuide^{SM} ATIS Services for Miami-Dade, Broward, and Palm Beach Counties** – This agreement, executed in August of 1999, is a regional ITS agreement that addresses the roles and responsibilities of each agency regarding the operation and deployment of the SunGuide^{SM} ATIS services for the tri-county area. The eight agencies involved include:

- FDOT (Districts 4 and 6 and Florida's Turnpike Enterprise);
- MPO for the Miami Urbanized Area;
- Miami-Dade County;
- Broward County MPO;
- Broward County;
- MPO of Palm Beach County;
- Tri-County Commuter Rail Authority (Tri-Rail); and
- Miami-Dade Expressway Authority (MDX).

The ATIS project covers interstate and Turnpike facilities in the tri-county area and includes the coordination of all existing and planned ITS services within the area. The ATIS project creates an additional ITS infrastructure layer providing seamless multi-modal ITS services including 22 of the 31 user services. The primary roles of the partners as identified in the agreement are as follows:

- **District 6** is identified as the lead agency, providing oversight for technical analysis, preparation of plans and documents, public involvement, and agency notification and coordination. Additionally, they are responsible for all coordination and review of actions to support the deployment of systems and normal service operations as specified in the contractual agreements.

- **District 4, the Turnpike, Tri-Rail, and MDX** will provide coordination and technical assistance related to advancing ATIS services in their jurisdictions and will provide general support for deployment and operations. The MPOs will assist FDOT in coordinating ATIS through the MPOs and between county agencies. The counties will be responsible for review and evaluation of location plans submitted for approval of any new or existing installations necessary in conjunction with the deployment of ATIS.

- **Operations and Maintenance Agreement for I-275 DMS System** – This agreement, executed in June of 1999 between FDOT District 7 and the City of St. Petersburg, addresses the installation, maintenance, and operation of a DMS system on I-275 for Tropicana Field. This system will provide traveler information and guidance for special event traffic. FDOT was responsible for the installation, construction, engineering, and inspection of the DMS system, while the City of St. Petersburg is responsible for the operations and maintenance of the system. The control center for the system will be located at the St. Petersburg Police Department Control Center.

- **I-275 Sunshine Skyway Bridge Speed Advisory Warning System** – This system is designed to warn travelers of high winds and/or poor visibility on the Sunshine Skyway Bridge on I-275 and to dynamically lower speed limits during these conditions. It is maintained and operated by District 7 at the St. Petersburg North Toll Plaza. FHP responds to incidents when notified.

- **Operation Agreements for Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire I-75 corridor at one-mile intervals. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

Based on the defined FMS and RR Service Patrol projects for I-75, the following agreements shown in Table 6.15 may be necessary to provide support for the ITS deployments and cooperation among the stakeholders:

Table 6.15 – Institutional Agreements for Future ITS Project Implementations

Category	Stakeholders		Agreement
Freeway Management System4	FDOT District 7	FDOT Turnpike, FDOT District 1	Jurisdictional authority agreement for FDOT District 7 and FDOT Turnpike to maintain and operate the Polk County Parkway in District 1.
		FDOT Turnpike	Jurisdictional authority agreement for FDOT District 7 to monitor and operate the Veterans Expressway in District 7.
		FDOT District 1	Jurisdictional authority agreement for FDOT District 7 to maintain and operate the I-275 Sunshine Skyway Bridge and also to implement ITS projects.
	FDOT District 7's Tampa RTMC	FDOT District 1's Ft. Myers RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT Turnpike/ Turkey Lake RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 5's Orlando RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		Pinellas County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Hernando County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Manatee County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		City of Lakeland TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		District 1's Bartow VTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and VTMC.
		Jacksonville RTMC/Lake City VTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and VTMC.
		Pasco County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Hillsborough County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Tampa RCC Center (FHP Troop C)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and RCC.
		SunPass® Service Center	Operations, maintenance/resource allocation, and sharing agreements for toll operations and management between the RTMC and ***SunPass***® Service Center.

Table 6.15 (Continued)

Category	Stakeholders		Agreement
Freeway Management System	FDOT District 1's Ft. Myers RTMC	FDOT District 4's Broward RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	Charlotte County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	Sarasota Satellite TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and STMC.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	Lee County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	Collier County TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	Collier County Transit Management Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local transit authority.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	***SunPass***® Service Center	Operations, maintenance/resource allocation, and sharing agreements for toll operations and management between the RTMC and the ***SunPass***® Service Center.
Freeway Management System	FDOT District 1's Ft. Myers RTMC	FHP Troop F	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and RCC.
Freeway Management System	FDOT District 4's Broward RTMC	FDOT District 6's Miami RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
Freeway Management System	FDOT District 4's Broward RTMC	FDOT Turnpike/ Pompano Beach RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
Freeway Management System	FDOT District 4's Broward RTMC	FDOT Turnpike/ Pompano Beach RTMC	Operations/Maintenance agreements for the Turnpike Pompano Beach RTMC as a back-up for the Broward County RTMC.
Freeway Management System	FDOT District 4's Broward RTMC	Broward County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
Freeway Management System	FDOT District 4's Broward RTMC	Broward County Transit Agency	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local transit authority.
Freeway Management System	FDOT District 4's Broward RTMC	Lake Worth RCC (FHP Troop L)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and RCC.
Freeway Management System	FDOT District 4's Broward RTMC	***SunPass***® Service Center	Operations, maintenance/resource allocation, and sharing agreements for toll operations and management between the RTMC and the ***SunPass***® Service Center.
Freeway Management System	FDOT District 4's Broward RTMC	SunGuide[SM] Smart Route TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and TMC.

Table 6.15 (Continued)

Category	Stakeholders		Agreement
RR Service Patrols	FDOT District 7's Tampa RTMC	Private Sectors	Legal agreements for FDOT to procure services from private sectors.
		FDOT District 1's Ft. Myers RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
	FDOT District 1's Ft. Myers RTMC	Private Sectors	Legal agreements for FDOT to procure services from private sectors.
		FDOT District 4's Broward County RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
	FDOT District 4's Broward County RTMC	Private Sectors	Legal agreements for FDOT to procure services from private sectors.
		FDOT District 6's Miami RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
FMS/RR Service Patrols	FDOT District 7	FDOT District 1	Funding, design, planning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.
	FDOT District 1	FDOT District 4	Funding, design, planning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.

6.4.9 I-75 Corridor ITS Needs

Table 6.16 lists the ITS needs for the I-75 corridor. Figure 6.53 illustrates the ITS needs for the I-75 corridor.

Table 6.16 – I-75 Corridor ITS Needs

Facility: I-275

District	From	To	Description	Type	Phase	PDC
7	Bearss Ave	I-75	Freeway and Incident Management System	FMS	PE	$0.388
7	Bearss Ave	I-75	Freeway and Incident Management System	FMS	CONST	$2.334
7	Bearss Ave	I-75	Freeway and Incident Management System	FMS	CEI	$0.518
7	I-75	54th Ave S	Freeway and Incident Management System	FMS	PE	$0.977
7	I-75	54th Ave S	Freeway and Incident Management System	FMS	CONST	$6.516
7	I-75	54th Ave S	Freeway and Incident Management System	FMS	CEI	$1.303
7	Sunshine Skyway	54th Ave. South	I-275 Freeway Management System	FMS	CONST	$2.200
7	South of Sunshine Skyway Bridge	McKinley Drive	Communication Link for Sunshine Skyway Bridge to FHP	FON	CONST	$8.000
7	Fowler Ave	Bearss Ave	Fiber Optic Network	FON	PE	$0.030
7	Fowler Ave	Bearss Ave	Fiber Optic Network	FON	CONST	$0.267
7	Fowler Ave	Bearss Ave	Fiber Optic Network	FON	CEI	$0.021
7	I-75 South	Sunshine Skyway Bridge	Fiber Optic Network	FON	PE	$0.080
7	I-75 South	Sunshine Skyway Bridge	Fiber Optic Network	FON	CONST	$0.730
7	I-75 South	Sunshine Skyway Bridge	Fiber Optic Network	FON	CEI	$0.060
7	I-75 South	Sunshine Skyway	I-275 Freeway Management System	FMS	CONST	$1.450
7	Howard Frankland Bridge	Hillsborough River	Links II/III	FMS	PE	$0.200
7	Howard Frankland Bridge	Hillsborough River	Links II/III	FMS	CONST	$2.100
7	Howard Frankland Bridge	Hillsborough River	Links II/III	FMS	CEI	$0.300
7	Bearss Ave	I-75	Fiber Optic Network	FON	PE	$0.095
7	Bearss Ave	I-75	Fiber Optic Network	FON	CONST	$0.793
7	Bearss Ave	I-75	Fiber Optic Network	FON	CEI	$0.063

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
1	Collier/Lee County Line	Lee/Charlotte County Line	Freeway and Incident Management System	FMS	PE	$0.370
1	Collier/Lee County Line	Lee/Charlotte County Line	Freeway and Incident Management System	FMS	CONST	$3.087
1	Collier/Lee County Line	Lee/Charlotte County Line	Freeway and Incident Management System	FMS	CEI	$0.617
1	Sarasota/Manatee County Line	I-275 (Manatee)	Freeway Management System	FMS	PE	$0.482
1	Sarasota/Manatee County Line	I-275 (Manatee)	Freeway Management System	FMS	CONST	$3.216
1	Sarasota/Manatee County Line	I-275 (Manatee)	Freeway Management System	FMS	CEI	$0.643
1	Charlotte/ Sarasota County Line	Sarasota /Manatee County Line	Freeway Incident Management System	FMS	PE	$0.714
1	Charlotte/ Sarasota County Line	Sarasota/ /Manatee County Line	Freeway Incident Management System	FMS	CONST	$5.950
1	Charlotte/ Sarasota County Line	Sarasota /Manatee County Line	Freeway Incident Management System	FMS	CEI	$1.190
1	Ft.Myers RTMC	Ft.Myers RTMC	Ft. Myers RTMC/Systems Integration	RTMC	CONST	$2.000
1	Broward/Collier County Line	Collier/Lee County Line	Freeway Incident Management System	FMS	PE	$0.616
1	Broward/Collier County Line	Collier/Lee County Line	Freeway Incident Management System	FMS	CONST	$5.134
1	Broward/Collier County Line	Collier/Lee County Line	Freeway Incident Management System	FMS	CEI	$1.030
1	Sarasota TMC	Sarasota TMC	Sarasota TMC/Building	RTMC	PE	$0.240
1	Sarasota TMC	Sarasota TMC	Sarasota TMC/Building	RTMC	CONST	$2.000
1	Sarasota TMC	Sarasota TMC	Sarasota TMC/Building	RTMC	CEI	$0.400
1	Sarasota TMC	Sarasota TMC	Sarasota TMC/Systems	RTMC	CONST	$0.612
1	SR 82 Interchange	River Road Interchange	Road Ranger Service Patrol	RR	PE	$0.968
1	SR 72 Interchange	Manatee/ Hillsborough County Line	Road Ranger Service Patrol	RR	PE	$0.506
1	Broward/Collier Co. Line	Collier/Lee Co. Line	Fiber Optic Network	FON	PE	$0.881

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
1	Broward/Collier Co. Line	Collier/Lee Co. Line	Fiber Optic Network	FON	CONST	$7.366
1	Broward/Collier Co. Line	Collier/Lee Co. Line	Fiber Optic Network	FON	CEI	$0.589
1	Collier/Lee Co. Line	Lee/Charlotte Co. Line	Fiber Optic Network	FON	PE	$0.475
1	Collier/Lee Co. Line	Lee/Charlotte Co. Line	Fiber Optic Network	FON	CONST	$3.960
1	Collier/Lee Co. Line	Lee/Charlotte Co. Line	Fiber Optic Network	FON	CEI	$0.316
1	Lee/ Charlotte Co. Line	Charlotte/Sarasota Co. Line	Fiber Optic Network	FON	PE	$0.306
1	Lee/ Charlotte Co. Line	Charlotte/Sarasota Co. Line	Fiber Optic Network	FON	CONST	$2.550
1	Lee/ Charlotte Co. Line	Charlotte/Sarasota Co. Line	Fiber Optic Network	FON	CEI	$0.204
1	Sarasota/Manatee Co. Line	I-275 (Manatee County)	Fiber Optic Network	FON	PE	$0.213
1	Sarasota/Manatee Co. Line	I-275 (Manatee County)	Fiber Optic Network	FON	CONST	$1.781
1	Sarasota/Manatee Co. Line	I-275 (Manatee County)	Fiber Optic Network	FON	CEI	$0.142
1	Charlotte/Sarasota Co. Line	Sarasota/Manatee Co. Line	Fiber Optic Network	FON	PE	$0.593
1	Charlotte/Sarasota Co. Line	Sarasota/Manatee Co. Line	Fiber Optic Network	FON	CONST	$4.943
1	Charlotte/Sarasota Co. Line	Sarasota/Manatee Co. Line	Fiber Optic Network	FON	CEI	$0.396
1	Lee/Charlotte Co. Line	Charlotte/ Sarasota Co. Line	Freeway and Incident Management System	FMS	PE	$1.030
1	Lee/Charlotte Co. Line	Charlotte/Sarasota Co. Line	Freeway and Incident Management System	FMS	CONST	$5.162
1	Lee/Charlotte Co. Line	Charlotte/Sarasota Co. Line	Freeway and Incident Management System	FMS	CEI	$0.620

PDC Sum $61.301

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
2	Lake City Virtual TMC	Lake City Virtual TMC	Lake City Virtual TMC/Systems	RTMC	CONST	$0.230
2	SR 121 Interchange	SR 222 Interchange	Urban Area Freeway Management System	FMS	PE	$0.476
2	SR 121 Interchange	SR 222 Interchange	Urban Area Freeway Management System	FMS	CONST	$3.171
2	SR 121 Interchange	SR 222 Interchange	Urban Area Freeway Management System	FMS	CEI	$0.643
2	US 441 Interchange	SR 236 Interchange	Rural Areas Freeway Management System	FMS	PE	$0.206
2	US 441 Interchange	SR 236 Interchange	Rural Areas Freeway Management System	FMS	CONST	$1.371
2	US 441 Interchange	SR 236 Interchange	Rural Areas Freeway Management System	FMS	CEI	$0.274
2	US 90 Interchange	SR 136 Interchange	Rural Areas Freeway Management System	FMS	PE	$0.308
2	US 90 Interchange	SR 136 Interchange	Rural Areas Freeway Management System	FMS	CONST	$2.056
2	US 90 Interchange	SR 136 Interchange	Rural Areas Freeway Management System	FMS	CEI	$0.411
2	US 129 Interchange	SR 143 Interchange	Rural Area Freeway Management System	FMS	PE	$0.302
2	US 129 Interchange	SR 143 Interchange	Rural Area Freeway Management System	FMS	CONST	$2.012
2	US 129 Interchange	SR 143 Interchange	Rural Area Freeway Management System	FMS	CEI	$0.402
2	Marion / Alachua Co. Line	Georgia State Line	Road Ranger Service Patrol	RR	PE	$1.510
2	SR 200	CR 135	Fiber Optic Network	FON	PE	$0.950
2	SR 200	CR 135	Fiber Optic Network	FON	CONST	$8.034
2	SR 200	CR 135	Fiber Optic Network	FON	CEI	$0.655
2	Lake City	Georgia State Line	Fiber Optic Network	FON	PE	$0.603
2	Lake City	Georgia State Line	Fiber Optic Network	FON	CONST	$5.030
2	Lake City	Georgia State Line	Fiber Optic Network	FON	CEI	$0.402
					PDC Sum	$29.046

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
4	Sawgrass Expressway	Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE	$0.720
4	Sawgrass Expressway	Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	$4.805
4	Sawgrass Expressway	Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI	$0.962
4	Miami-Dade/Broward Co. Line	Broward/Palm Beach Co. Line	OVCS Variable Speed Zone	FMS	PE	$0.300
4	Miami-Dade/Broward Co. Line	Broward/Palm Beach Co. Line	OVCS Variable Speed Zone	FMS	CEI	$0.400
4	Southern Terminus	Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE	$1.423
4	Southern Terminus	Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	$9.490
4	Southern Terminus	Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI	$1.898
4	Sawgrass Expressway	Broward/Collier Co. Line	Fiber Optic Network	FON	PE	$0.467
4	Sawgrass Expressway	Broward/Collier Co. Line	Fiber Optic Network	FON	CONST	$3.883
4	Sawgrass Expressway	Broward/Collier Co. Line	Fiber Optic Network	FON	CEI	$0.311
4	Southern Terminus	Sawgrass Expressway	Fiber Optic Network	FON	PE	$0.262
4	Southern Terminus	Sawgrass Expressway	Fiber Optic Network	FON	CONST	$2.185
4	Southern Terminus	Sawgrass Expressway	Fiber Optic Network	FON	CEI	$0.175
					PDC Sum	$27.280

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
5	Hernando/Sumter Co. Line	Sumter/Marion Co Line	Rural Freeway Incident Management System	FMS	PE	$0.717
5	Hernando/Sumter Co. Line	Sumter/Marion Co Line	Rural Freeway Incident Management System	FMS	CONST	$4.778
5	Hernando/Sumter Co. Line	Sumter/Marion Co Line	Rural Freeway Incident Management System	FMS	CEI	$0.956
5	Sumter/Marion Co. Line	Marion/Alachua Co. Line	Rural Freeway Incident Management System	FMS	PE	$1.256
5	Sumter/Marion Co. Line	Marion/Alachua Co. Line	Rural Freeway Incident Management System	FMS	CONST	$8.374
5	Sumter/Marion Co. Line	Marion/Alachua Co. Line	Rural Freeway Incident Management System	FMS	CEI	$1.675
5	Hernando/Sumter Co. Line	Marion/Alachua Co. Line	Road Ranger Service Patrol	RR	PE	$1.076
					PDC Sum	$18.832

Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
7	Bruce B Downs	SR 54	Freeway and Incident Management System	FMS	PE	$0.244
7	Bruce B Downs	SR 54	Freeway and Incident Management System	FMS	CONST	$1.627
7	Bruce B Downs	SR 54	Freeway and Incident Management System	FMS	CEI	$0.325
7	Fowler Ave	Bruce B Downs	Freeway and Incident Management System	FMS	PE	$0.342
7	Fowler Ave	Bruce B Downs	Freeway and Incident Management System	FMS	CONST	$2.283
7	Fowler Ave	Bruce B Downs	Freeway and Incident Management System	FMS	CEI	$0.457
7	SR 54	Hernando/Sumter Co Line	Rural Freeway Incident Management System	FMS	PE	$0.386
7	SR 54	Hernando/Sumter Co Line	Rural Freeway Incident Management System	FMS	CONST	$2.576
7	SR 54	Hernando/Sumter Co Line	Rural Freeway Incident Management System	FMS	CEI	$0.515
7	I-275 (Manatee County)	US 301(Brandon)	Limited Freeway Management System	FMS	PE	$0.656
7	I-275 (Manatee County)	US 301(Brandon)	Limited Freeway Management System	FMS	CONST	$4.373
7	I-275 (Manatee County)	US 301(Brandon)	Limited Freeway Management System	FMS	CEI	$0.875
7	I-275 (Manatee County)	US 301(Brandon)	Upgrade to Full Freeway Management System	FMS	PE	$0.214
7	I-275 (Manatee County)	US 301(Brandon)	Upgrade to Full Freeway Management System	FMS	CONST	$1.248
7	I-275 (Manatee County)	US 301(Brandon)	Upgrade to Full Freeway Management System	FMS	CEI	$0.249
7	SR 54	Hernando/ Sumter Co. Line	Upgrade to Full Freeway Management System	FMS	PE	$0.346
7	SR 54	Hernando/ Sumter Co. Line	Upgrade to Full Freeway Management System	FMS	CONST	$2.304
7	SR 54	Hernando/ Sumter Co. Line	Upgrade to Full Freeway Management System	FMS	CEI	$0.461
7	Manatee/Hillsborough County Line	Hernando/Sumter Co Line	Road Ranger Service Patrol	RR	PE	$1.367
7	I-275	Hillsborough Co. Line	I-75 Freeway Management System	FMS	CONST	$0.450

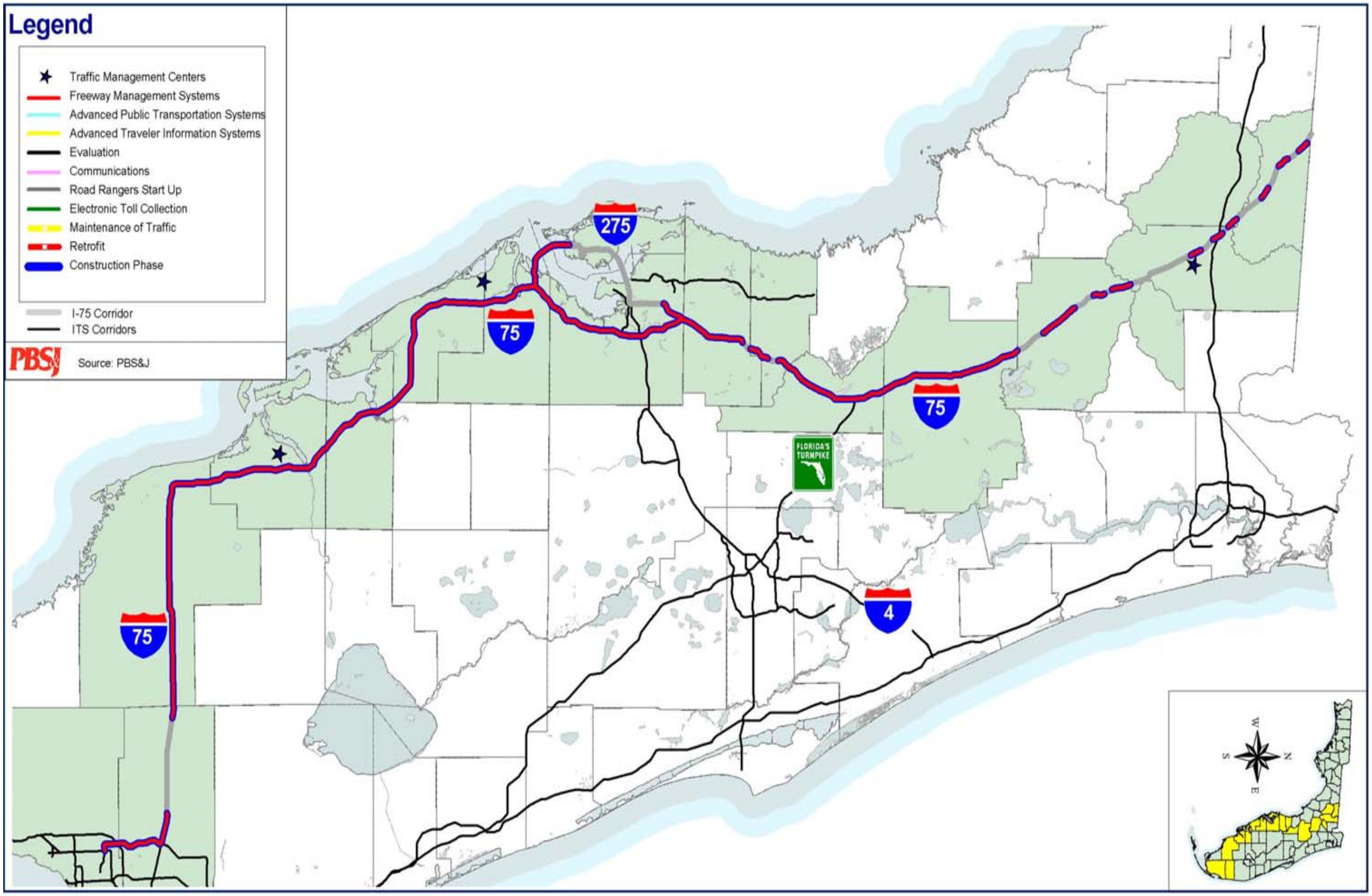
Table 6.16 (Continued)

Facility: I-75

District	From	To	Description	Type	Phase	PDC
7	Fowler Ave.	Bruce B. Downs Blvd.	I-75 Freeway Management System	FMS	CONST	$1.500
7	Bruce B. Downs Blvd.	I-275 (Pasco Co.)	I-75 Freeway Management System	FMS	CONST	$1.240
7	I-275	Hernando Co. Line	I-75 Freeway Management System	FMS	CONST	$2.600
7	Pasco Co. Line	SR 50	I-75 Freeway Management System	FMS	CONST	$0.500
7	Manatee Co. Line	US 301	I-75 Freeway Management System	FMS	CONST	$2.100
7	I-275 (Manatee County)	SR 54	Fiber Optic Network	FON	PE	$0.856
7	I-275 (Manatee County)	SR 54	Fiber Optic Network	FON	CONST	$7.136
7	I-275 (Manatee County)	SR 54	Fiber Optic Network	FON	CEI	$0.571
7	SR 54	Hernando/Sumter Co. Line	Fiber Optic Network	FON	PE	$0.487
7	SR 54	Hernando/Sumter Co. Line	Fiber Optic Network	FON	CONST	$3.730
7	SR 54	Hernando/Sumter Co. Line	Fiber Optic Network	FON	CEI	$0.299
7	SR 54	SR 50	Fiber Optic Network	FON	PE	$0.210
7	SR 54	SR 50	Fiber Optic Network	FON	CONST	$1.770
7	SR 54	SR 50	Fiber Optic Network	FON	CEI	$0.140
7	US 301 (Brandon)	SR 54	Fiber Optic Network	FON	PE	$0.540
7	US 301 (Brandon)	SR 54	Fiber Optic Network	FON	CONST	$3.630
7	US 301 (Brandon)	SR 54	Fiber Optic Network	FON	CEI	$0.230
					PDC Sum	$48.836

Grand Total All Facilities $213.721

Figure 6.53 – I-75 Corridor ITS Needs



6.4.10 Project Priorities and Phasing

Table 6.17 summarizes the high and moderate priority segments for I-75 and I-275. The need for ITS deployment is supported on a statewide basis for all the principal FIHS limited-access corridors. This table summarizes the relative priority of ITS for the purposes of phasing implementation only. Figure 6.54 illustrates the result of the prioritization analysis for the I-75 corridor and recommended prioritization based on high, moderate, and low priorities.

Table 6.17 – Priority Segments for ITS Deployments on the I-75 Corridor

Facility	Relative Priority	Area	From	To	Existing FMS?
I-75	High	Tampa	Hernando/Pasco County Line	I-275 (North)	
I-275	High	Tampa	I-75 (North)	U.S. 92	
I-75	High	Miami	SR 821	SR 826	
I-75	Moderate	Lake City	I-10	U.S. 90	
I-75	Moderate	Gainesville	SR 236	SR 26	
I-75	Moderate	Hernando/Citrus Counties	Turnpike	Hernando/Pasco County Line	
I-75	Moderate	Tampa	I-275 North	SR 674	
I-275	Moderate	St. Petersburg	U.S. 92	U.S. 19	Yes
I-75	Moderate	Venice	Jacaranda Boulevard		
I-75	Moderate	Ft. Myers	SR 82	Corkscrew Road	
I-75	Moderate	Collier County	Lee/Collier County Line	SR 821	

Figure 6.54 – I-75 Corridor *ITS Plan* Priorities (Adjusted)

6.5 I-95 ITS Corridor Master Plan

6.5.1 Corridor Description

The limits of the I-95 corridor are from the southern terminus of U.S. 1 in Miami-Dade County to the Georgia state line. This corridor will also include I-195 and I-395 in Miami-Dade County, I-595 in Broward County, and I-295/9A around Jacksonville in Duval County. The I-95 corridor is primarily classified as metropolitan and urban in the southeast portion of the state and becomes more rural in character as it traverses the central-eastern portion of the state. Still, the corridor area type varies to urban as it passes through some of the smaller urban areas and cities along the east coast. Once the corridor enters Duval County, it is classified as a metropolitan facility. Similarly, I-295 and SR 9A in Duval County are classified as metropolitan facilities. Additionally, the small segment of I-195, I-395, and I-595 located in Miami-Dade and Broward counties, respectively, are identified as metropolitan facilities. The corridor traverses several counties including Nassau, Duval, St. Johns, Flagler, Volusia, Brevard, Indian River, St. Lucie, Martin, Palm Beach, Broward, and Miami-Dade counties. The corridor provides access to several major urban areas including Jacksonville, Daytona Beach, Melbourne, Palm Bay, Port Saint Lucie, West Palm Beach, Boca Raton, Pompano Beach, Ft. Lauderdale, and Miami. Figure 6.55 illustrates the corridor location. Currently, FDOT District 2 operates and maintains the interstate from Nassau to St. Johns counties; District 5 operates and maintains the interstate from Flagler to Brevard counties; District 4 operates and maintains the interstate from Indian River to Broward counties, and District 6 operates and maintains the interstate in Miami-Dade County.

Figure 6.55 – I-95 Corridor Location

6.5.2 Legacy Systems

I-95 consists mainly of four lane segments in rural areas that expand to six, eight, and greater than eight lanes in the urban areas of Dade, Broward, Palm Beach, and Duval counties. The majority of I-295 is four lanes, while the segment located between I-10 and I-95 south is six lanes with several sections of eight or more lanes. Similar to I-295 north, SR 9A is a four-lane facility, with one small six-lane section. Both I-395 and I-195 consist of six lanes.

I-95 has the greatest density of interchanges, which is not surprising considering the extent of urbanized areas along the corridor. Miami-Dade, Duval, Broward, and Palm Beach counties' urban areas contain a major portion of I-95's interchanges. I-95 in Miami-Dade County exhibits the greatest interchange density in the state, averaging an interchange every half-mile. Several corridors with high interchange densities are the urban facilities such as I-395, I-195, and SR 9A. Each of these roadways has an interchange density of less than two miles per interchange. The interchange locations for I-95 are shown on Figure 6.56 and the corridor area types are illustrated in Figure 6.57.

The I-95 corridor exhibits an unusually high concentration of accident locations. On the southeast portion of the I-95 corridor, high accident locations are primarily located at its intersection with the Turnpike or Turnpike facilities such as the Sawgrass Expressway and the HEFT. The other significant clusters of high accident locations along I-95 occur in Indian River and St. Johns counties, and at the interchange with I-10 in Jacksonville. I-195 in Miami-Dade County reveals one high accident location, while I-395, I-595, I-295, and SR 9A remain clear. Typically, large interstate-to-interstate interchanges experience high accident volumes due to the complex nature of the weaving and merging patterns at these interchanges. The high crash frequency locations for I-95 are shown in Figure 6.58.

Based on year 2000 statistics, the I-95 corridor has an AADT of 24,782 vpd. The average traffic volume forecasts for the years 2010 and 2020 are 35,438 vpd and 49,929 vpd, respectively. These forecasts represent an increase of 30 percent from 2000 to 2010 and 29 percent from 2010 to 2020 for the entire corridor. Duval County contains the largest urban section of the corridor with an AADT of 83,907 vpd. Travel demand is expected to double (159,087 vpd) in Duval County by the year 2020 as well. Figures 6.59 through 6.61 illustrate the 2000, 2010, and 2020 AADT for the I-95 corridor.

Figure 6.56 – Interchange Locations on the I-95 Corridor

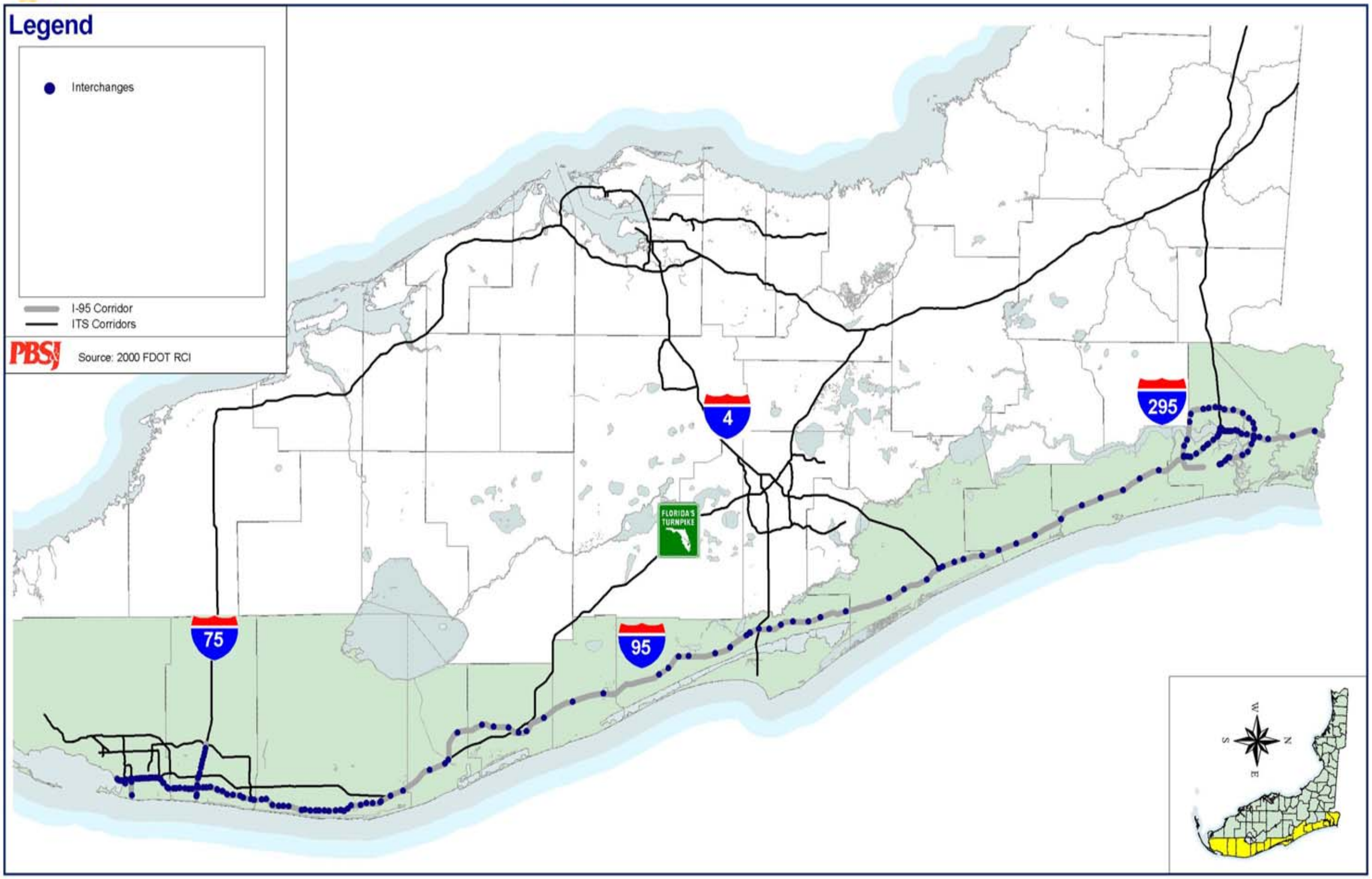


Figure 6.57 – I-95 Corridor Area Types

Figure 6.58 – High Crash Frequency Locations on the I-95 Corridor

Figure 6.59 – I-95 Corridor 2000 AADT

Figure 6.60 – I-95 Corridor 2010 AADT

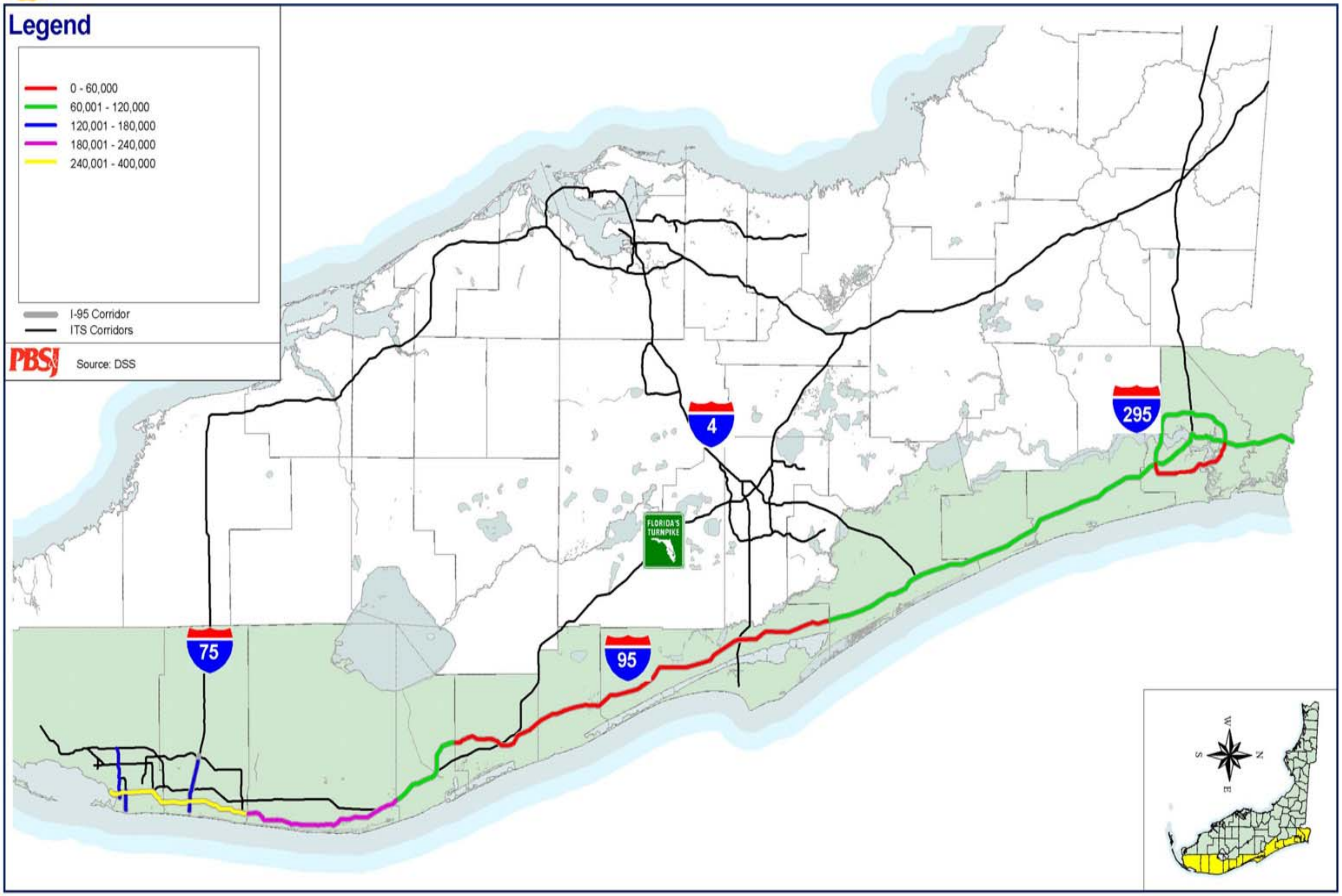
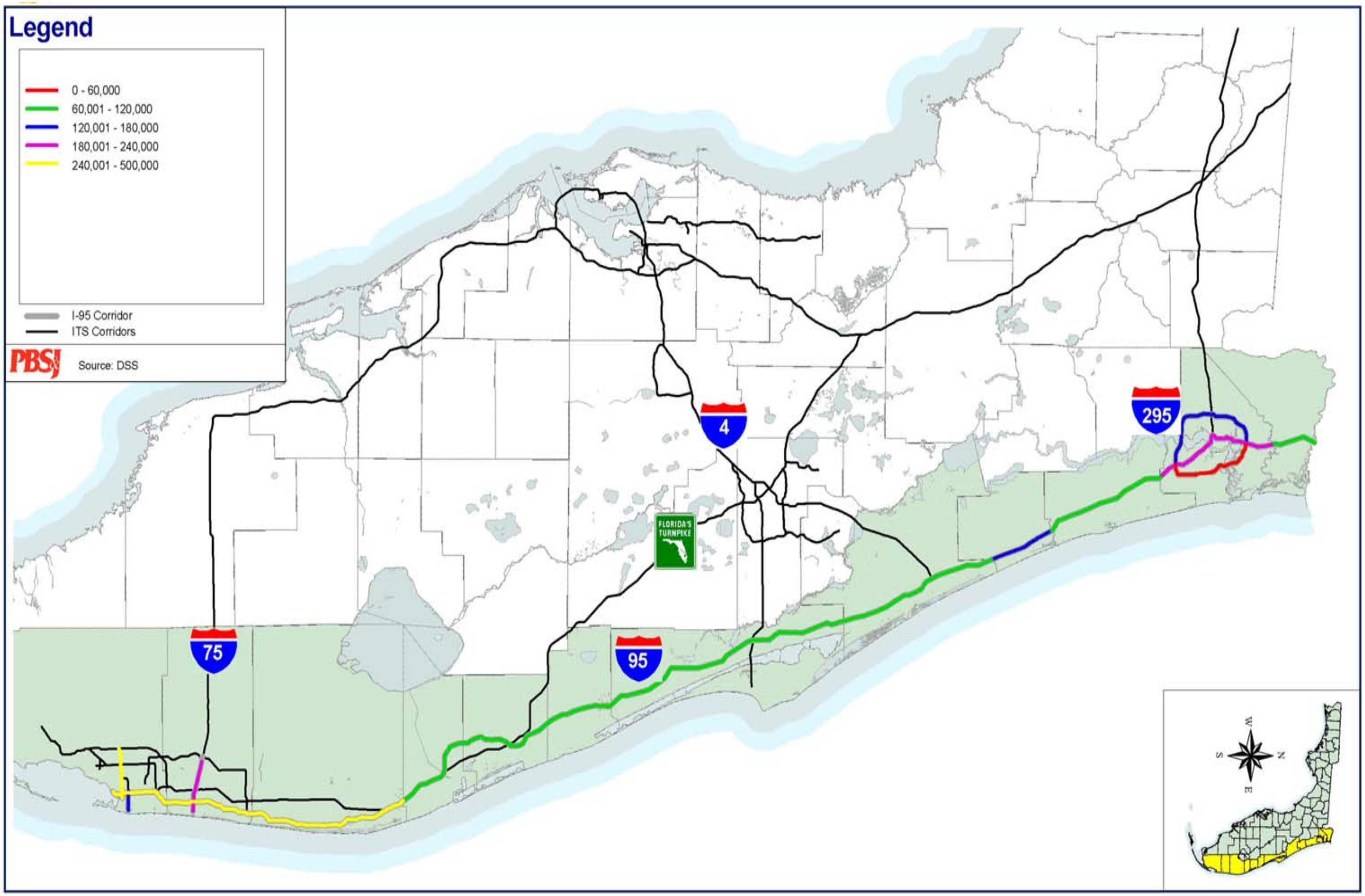


Figure 6.61 – I-95 Corridor 2020 AADT



Tourism is Florida's largest industry. Due to the high volume of annual tourists, the state transportation system must be designed to accommodate the social and recreational travel generated by major tourist attractions and activity centers, in addition to supporting the daily commuter and freight travel. Therefore, by locating the state's major activity centers, special generators, and tourist attractions, ITS solutions such as real-time traveler information systems and incident management techniques can be implemented in coordination with multi-modal improvements to improve mobility to and around these major activity centers.

6.5.3 Current ITS Plans and Programs

This section identifies existing, programmed, and planned ITS along the I-95 corridor. These services will be mapped in *Section 4, Deployment Issues,* of this report to determine gaps in existing and planned services.

- **Motorist Aid Call Boxes –** A statewide motorist aid system using roadside call boxes has been deployed along the entire length of I-95 at one-mile intervals. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

- **RR Service Patrols –** This ITS service, operated by the FDOT districts through private contractors, includes roadside assistance and incident clearance. RR Service Patrols are currently operating along the study interstate facilities primarily in the large urbanized area of Jacksonville.

- **CVO –** A WIM site is currently located along I-95 in Jackson County.

- District 2 has begun a comprehensive program of implementing an incident management program along I-95 in the Jacksonville area. This system currently exists along I-95 from I-295 to I-95 and will eventually encompass the entire interstate network as the FON is expanded.

Figures 6.62 through 6.64 show the existing, programmed, and planned ITS coverage for I-95.

Figure 6.62 – Existing ITS Coverage on the I-95 Corridor

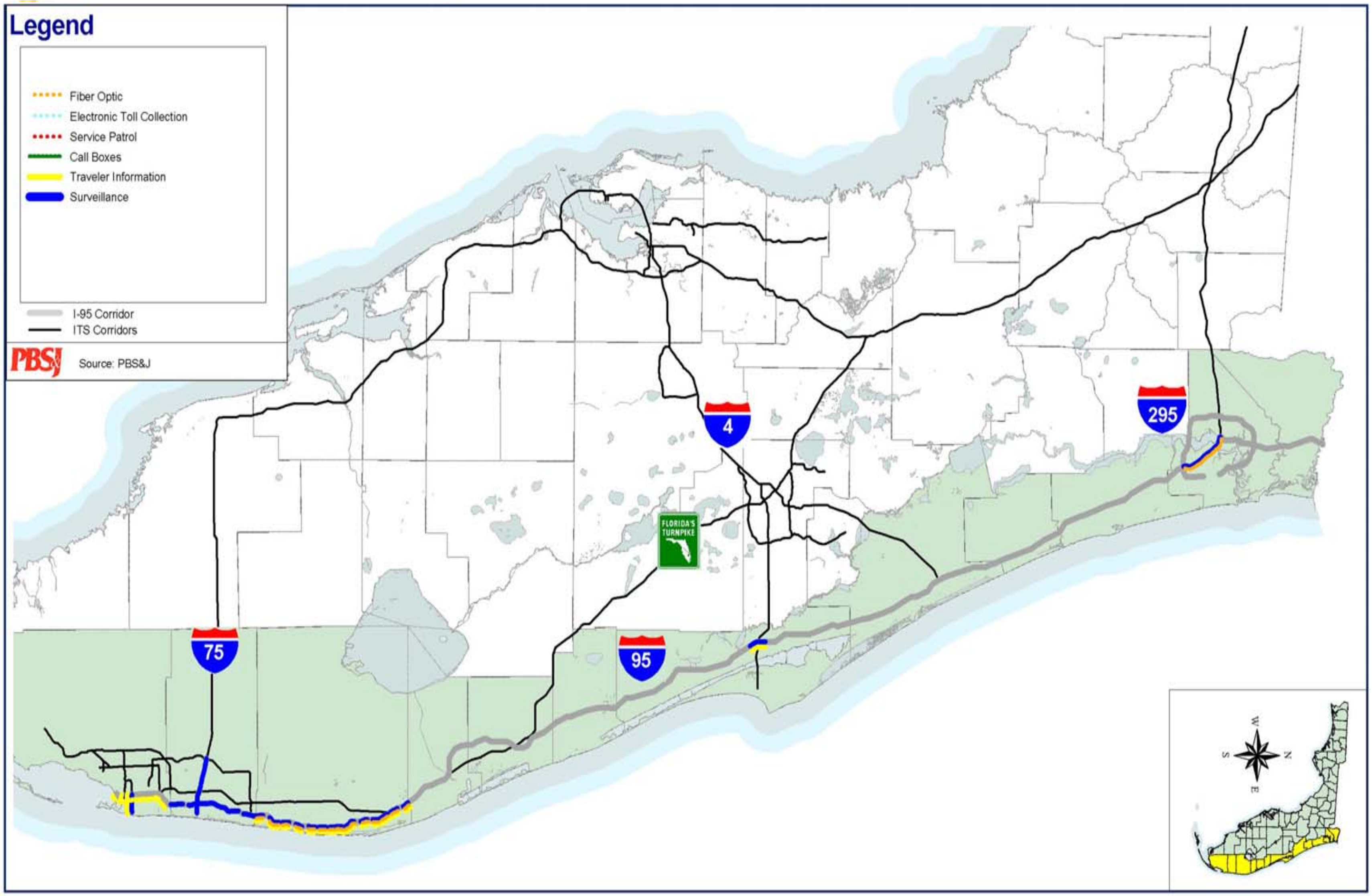


Figure 6.63 – Programmed ITS Coverage on the I-95 Corridor

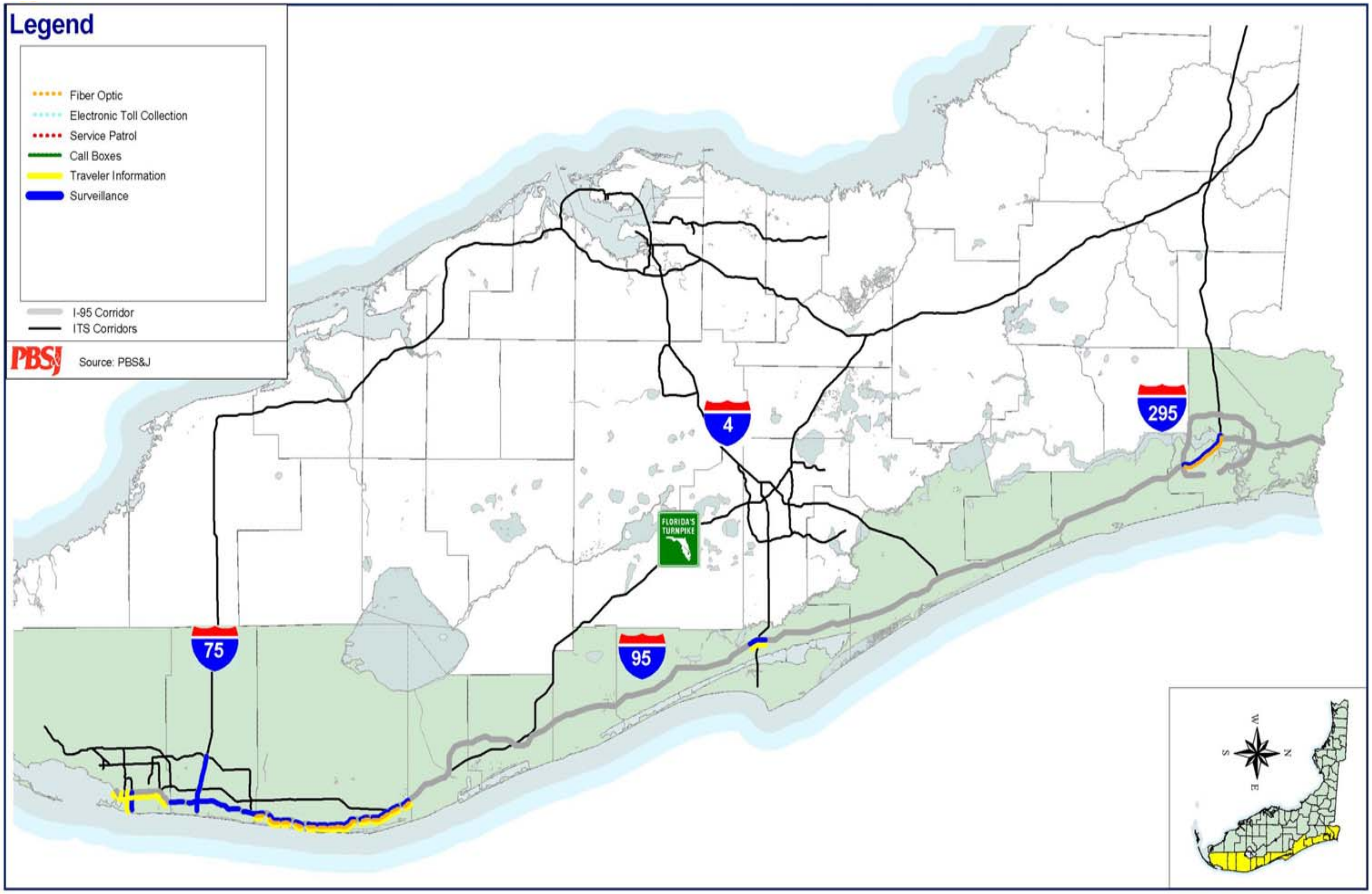
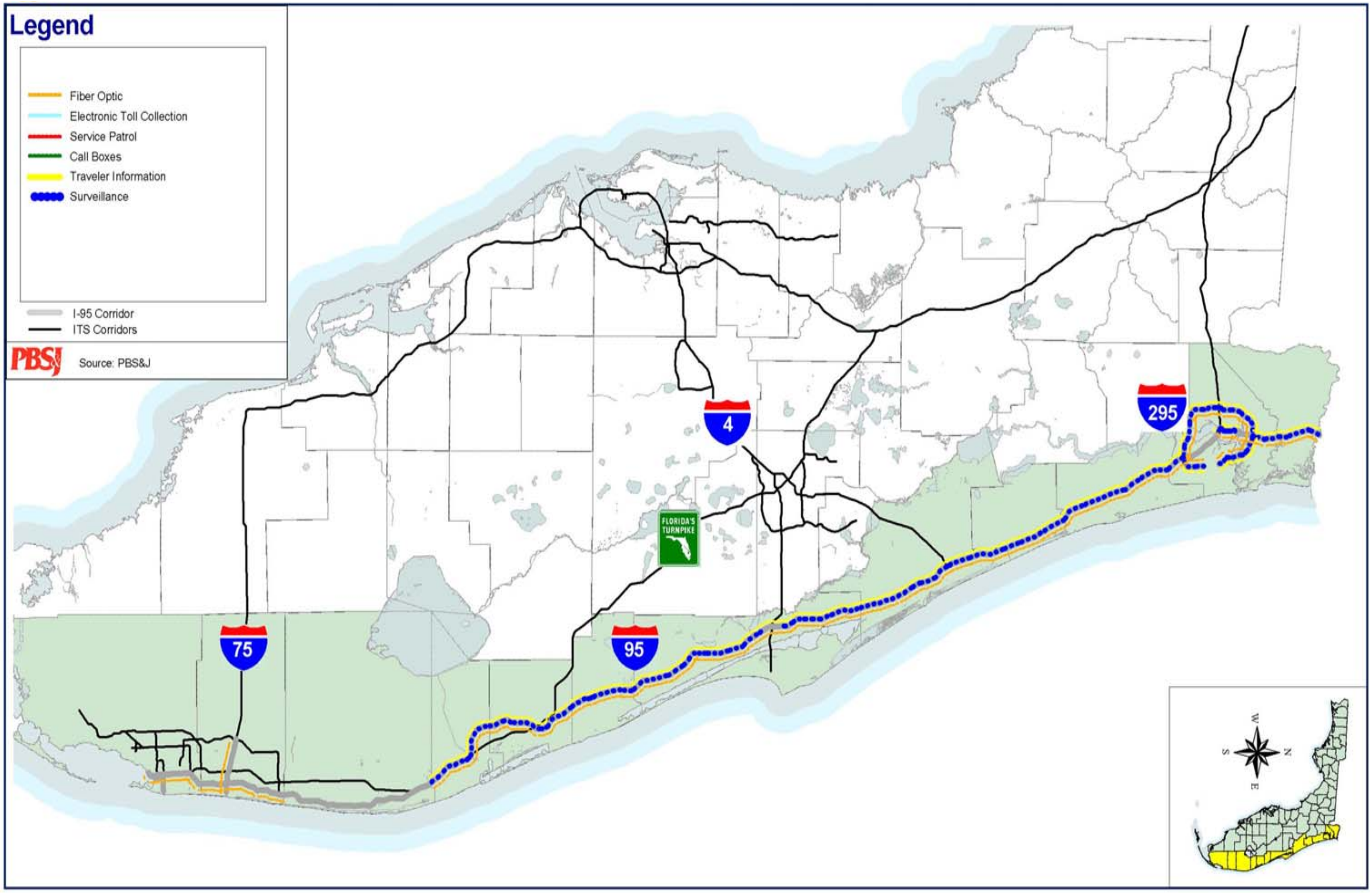


Figure 6.64 – Planned ITS Coverage on the I-95 Corridor



6.5.4 Existing Communications Infrastructure

Currently, the only data communications system available along the I-95 corridor is a microwave system. Due to the complexity and volume of the data required to support the proposed ITS deployments, the existing microwave communications system will require upgrades. Plans to implement a FON along the FIHS corridors are currently under development. The FON would be optimal for the communications needs for statewide ITS deployments.

Additionally, several municipalities along the corridor have small segments of fiber with planned interconnection to the intrastate fiber network. The City of Tallahassee has provided fiber optic connections terminating at I-95 for future connection to their ATMS.

Figure 6.65 illustrates the microwave tower locations and Figure 6.66 illustrates existing fiber locations for I-95.

6.5.5 Proposed Capacity Improvement Projects

It is important to identify programmed and cost feasible plan improvements (construction only) because funding for potential ITS deployments can be leveraged with the funding of the capacity improvements and consideration of the roadway modifications can be included in the design of the ITS improvements. Figures 6.67 through 6.69 illustrate the programmed, planned, and 2025 cost feasible improvements for the I-95 corridor in FDOT Districts 2, 4, 5, and 6. The statewide ten-year plan for FIHS facilities did not contain any projects for the I-95 corridor. As identified in Figure 6.67, the I-95 corridor has only a few interchange modification projects identified as programmed.

Figure 6.65 – Existing Microwave Tower Locations on the I-95 Corridor

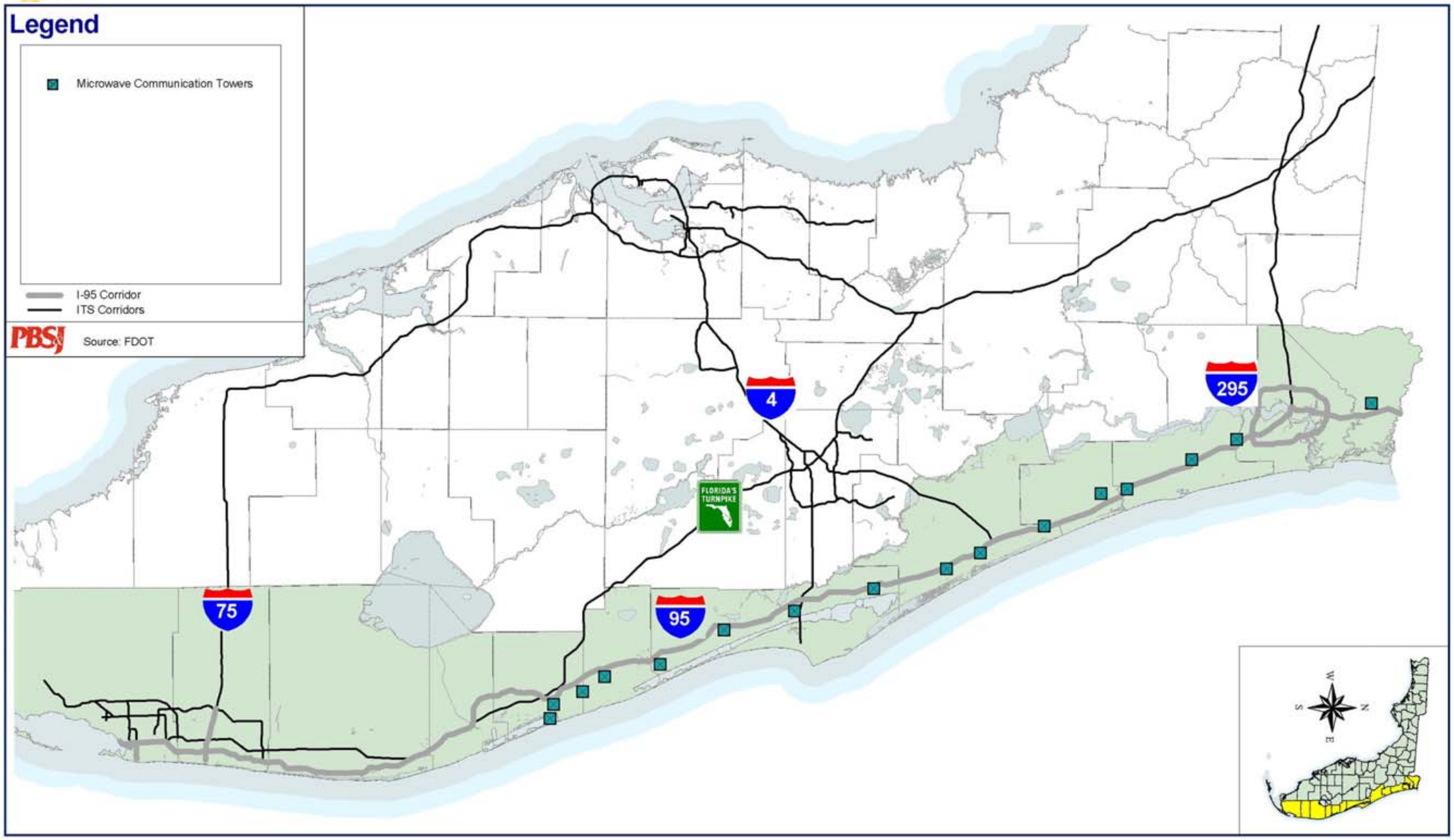


Figure 6.66 – Existing Fiber Optic Cable Locations on the I-95 Corridor

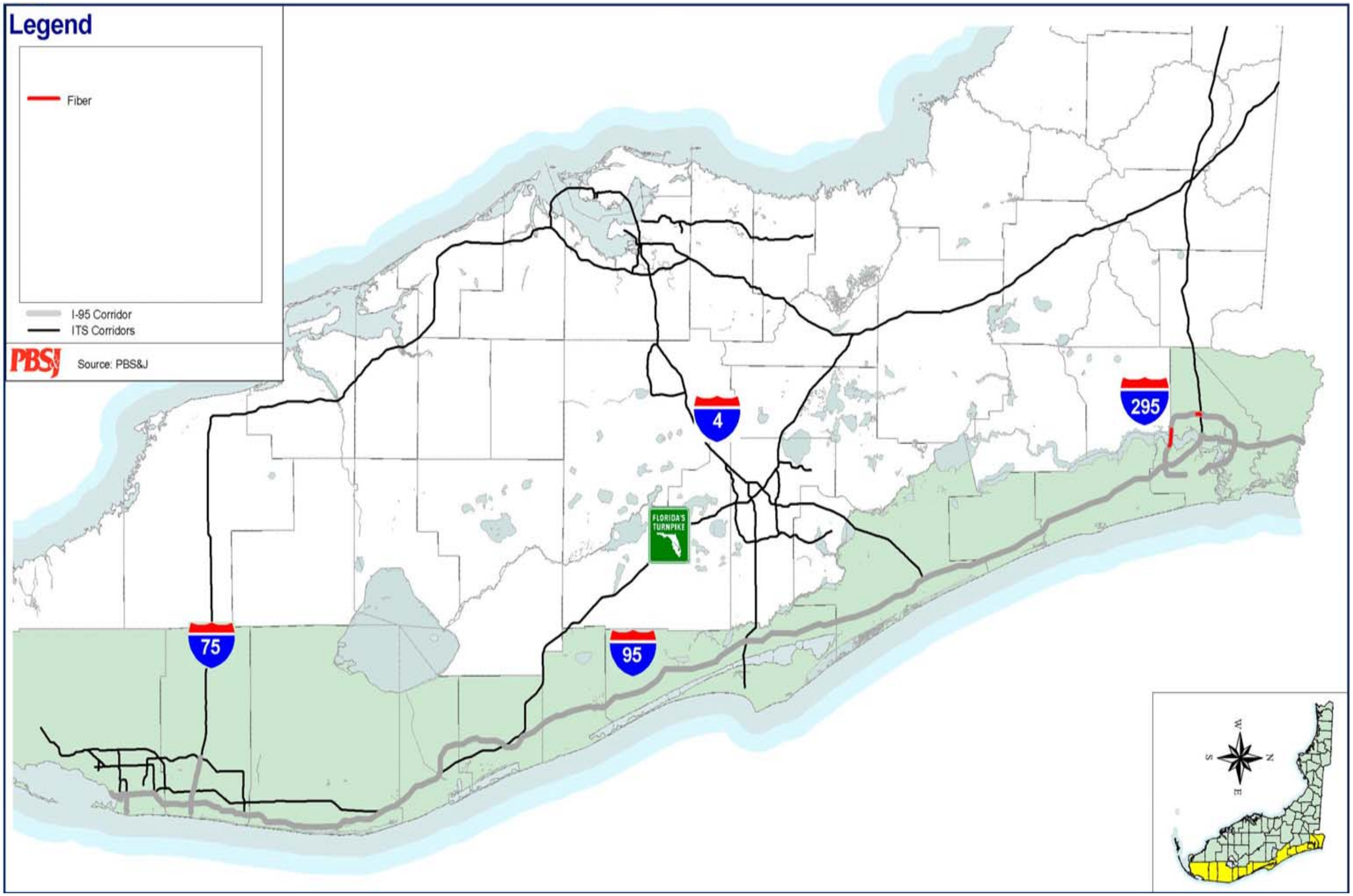


Figure 6.67 – Programmed Capacity Improvements for the I-95 Corridor

Figure 6.68 – Planned Capacity Improvements for the I-95 Corridor

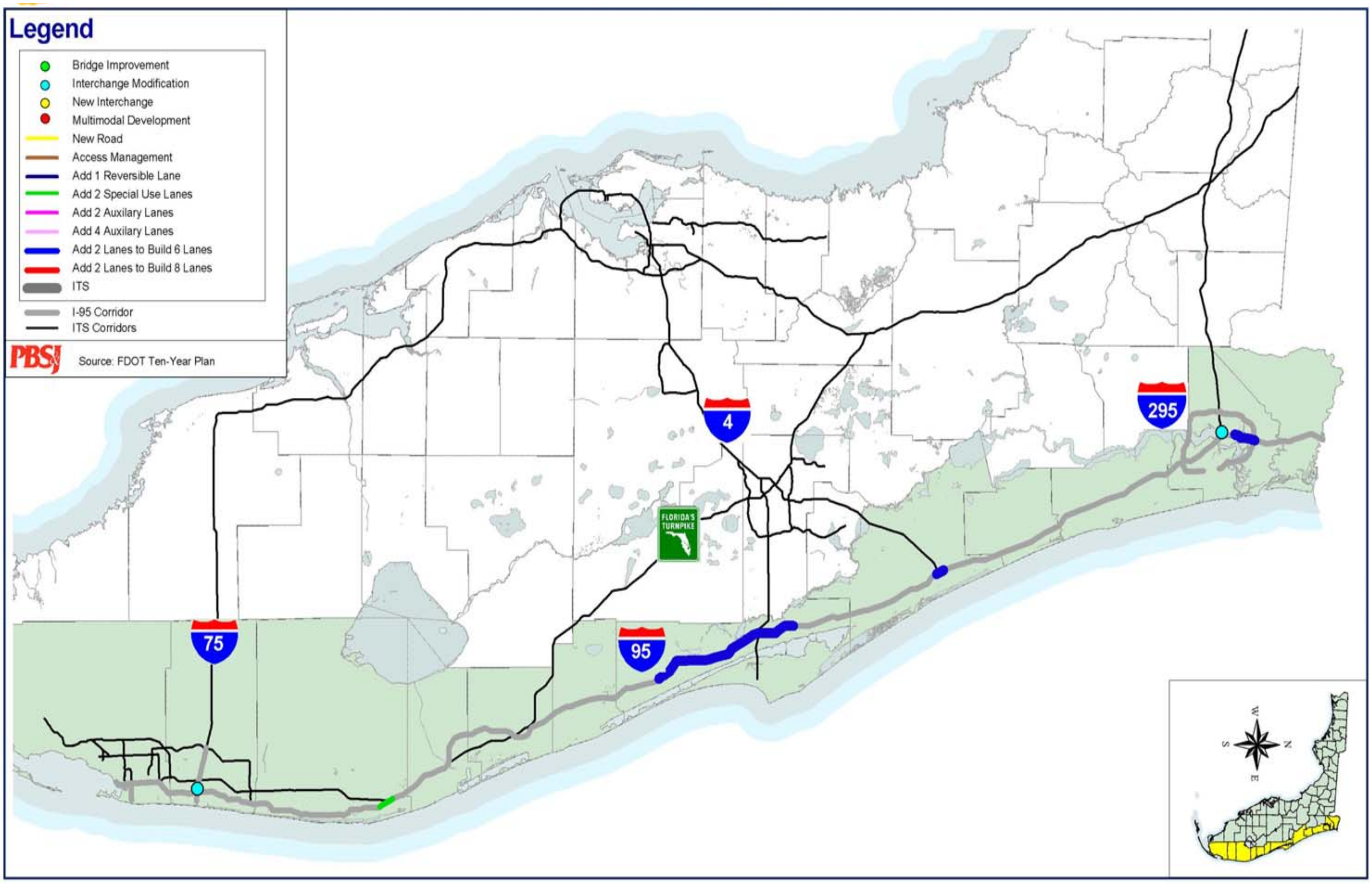


Figure 6.69 – *Ten-Year ITS Cost Feasible Plan* Improvements for the I-95 Corridor

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6.5.6 Gap Analysis and Other Deployment Issues

The classification of these proposed ITS deployments into market package-related areas will assist in identifying appropriate ITS strategies to address the gaps. Table 6.18 illustrates the location of each FMS and RR Service Patrol gap for the I-95 facility. Motorist aid call boxes are located along the entire length of the facility.

Table 6.18 – Identified ITS Functional Gaps on the I-95 Corridor

Facility	Service Area	County	District	From	To
I-95	FMS	St. Johns	2	U.S. 1 at Flagler County Line	I-295 South
I-95	FMS	Nassau	2	Duval/Nassau County Line	Nassau/Georgia State Line
I-95	RR Service Patrols	Martin	4	Palm Beach/Martin County Line	Martin/St. Lucie County Line
I-95	RR Service Patrols	St. Lucie	4	Martin/St. Lucie County Line	St. Lucie/Indian River County Line
I-95	RR Service Patrols	Indian River	4	St. Lucie/Indian River County Line	Indian River/Brevard County Line
I-95	RR Service Patrols	Brevard	5	Indian River/Brevard County Line	Brevard/Volusia County Line
I-95	RR Service Patrols	Volusia	5	Brevard/Volusia County Line	Volusia/Flagler County Line
I-95	RR Service Patrols	Flagler	5	Volusia/Flagler County Line	Flagler/St. Johns County Line
I-95	RR Service Patrols	Nassau	2	Duval/Nassau County Line	Nassau/Georgia St. Line
I-295	RR Service Patrols	Duval	2	I-295 South at I-95	Old St. Augustine Road
I-295	RR Service Patrols	Duval	2	U.S. 17 Interchange	I-295 North at I-95
SR 9A	RR Service Patrols	Duval	2	SR 9A South at I-95	SR 9A North at I-95

Source: PBS&J, 2002

6.5.7 Conceptual Project Implementations

The functional gaps identified in *Section 4, Deployment Issues,* were reviewed and developed as recommended conceptual projects for advancement along the I-95, I-295, I-595, and SR 9A corridors. The conceptual projects focused on three main functional areas: FMS, RR Service Patrols, and motorist aid call boxes. These projects were recommended to better detect, verify, and respond to incidents and non-recurring congestion due to incidents. Table 6.19 identifies the conceptual projects and their locations.

Table 6.19 –Proposed Conceptual Projects for the I-95 Corridor

Facility	Service Area	County	District	Area Type	From	To
I-95	FMS	St. Johns	2	Rural	CR 210 Interchange	
I-95	FMS	St. Johns	2	Rural	SR 16 Interchange North	SR 16 Interchange South
I-95	FMS	St. Johns	2	Rural	SR 206 Interchange	
I-95	FMS	St. Johns	2	Rural	SR 207 Interchange	
I-95	FMS	Nassau	2	Rural	U.S. 17 Interchange and Visitor Center	
I-95	FMS	Nassau	2	Rural	SR A1A Interchange	
I-95	RR Service Patrols	Martin	4	Rural	Palm Beach/Martin County Line	Martin/St. Lucie County Line
I-95	RR Service Patrols	St. Lucie	4	Rural	Martin/St. Lucie County Line	St. Lucie/Indian River County Line
I-95	RR Service Patrols	Indian River	4	Rural	St. Lucie/Indian River County Line	Indian River/Brevard County Line
I-95	RR Service Patrols	Brevard	5	Rural	Indian River/Brevard County Line	Brevard/Volusia County Line
I-95	RR Service Patrols	Volusia	5	Rural	Brevard/Volusia County Line	Volusia/Flagler County Line
I-95	RR Service Patrols	Flagler	5	Rural	Volusia/Flagler County Line	Flagler/St. Johns County Line
I-95	RR Service Patrols	Nassau	2	Rural	Duval/Nassau County Line	Nassau/Georgia State Line
I-295	RR Service Patrols	Duval	2	Rural	I-295 South at I-95	Old St. Augustine Road
I-295	RR Service Patrols	Duval	2	Rural	U.S. 17 Interchange	I-295 North at I-95
SR 9A	RR Service Patrols	Duval	2	Rural	SR 9A South at I-95	SR 9A North at I-95

6.5.8 Conceptual Project Descriptions

CR 210, SR 16, SR 206, and SR 207 Interchanges in St. Johns County – This project will include the deployment of an IMS/FMS at these four interchanges located on rural four-lane sections of I-95 in District 2. Each interchange ITS deployment will consist of two CCTV cameras, two DMS, and 16 loop detectors. The total number of devices for this project is eight CCTV cameras, eight DMS, and 64 loop detectors. They have been proposed as new projects to be included with the deployment of the rural freeway IMS because these I-95 interchanges were identified as high accident locations.

U.S. 17 Interchange and SR A1A Interchange in Nassau County – This project will include the deployment of an IMS/FMS at these two interchanges located on rural four lane sections of I-95 in District 2. Each interchange ITS deployment will consist of two CCTV cameras, two DMS, and 16 loop detectors. The total number of devices for this project is four CCTV cameras, four DMS, and 32 loop detectors. They have been proposed as new projects to be included with the deployment of the rural freeway IMS because both interchanges were identified as high accident locations and are also shown as moderate priority segments.

6.5.9 Rule 940 Integration

As part of the ITS conceptual project implementation process, the FHWA has implemented *Rule 940* which guides the integration of ITS projects into the planning process. *Rule 940* states that all projects receiving federal funding, in whole or in part, must comply with the stipulations outlined in the *Rule*. Since these projects will be integrated into the statewide ITS Program for federal and state funding, the proposed conceptual projects recommended as part of this document must comply.

Rule 940 stipulates that in order for a project to advance into the design phase, a systems engineering analysis must be completed and must include, at a minimum:

- Identification of the portions of the regional (corridor) architecture being implemented;
- Identification of participating agencies roles and responsibilities; and
- Procurement options.

The following sections address these topics for future project implementation.

6.5.10 Portions of the Corridor Architecture being Implemented

Each district corridor architecture for I-95 provides a "big picture" or high-level view of ITS in that region. The I-95 corridor architecture consists of both FDOT Districts 2 and 3 I-95 corridor architectures. In order to comply with *Rule 940* implementation, each of the proposed projects in Table 6.14 must identify which portions of the national, statewide, and district corridor ITS architectures they are implementing. Table 6.20 identifies the market packages from the *NITSA* and the statewide and corridor architectures that were implemented by the proposed I-95 corridor projects.

Table 6.20 – Architecture Market Packages Implemented by the I-95 Projects

MP NO.	Market Package Name	FMS	RR Service Patrols	Motorist Aid Call Boxes
Advanced Traffic Management Systems (ATMS)				
ATMS01	Network Surveillance	✓		
ATMS04	Freeway Control	✓		
ATMS06	Traffic Information Dissemination	✓		
ATMS07	Regional Traffic Control	✓		
ATMS08	Incident Management System (IMS)	✓		
ATMS09	Traffic Forecast and Demand Management	✓		
ATMS18	Road Weather Information System (RWIS)	✓		
FL ATMS20	Speed Management	✓		
Emergency Management (EM)				
EM1	Emergency Response		✓	✓
EM2	Emergency Routing	✓	✓	✓
EM3	Mayday Support		✓	✓
FL EM4	Evacuation Management	✓	✓	

Each district's corridor architecture for I-95 provides a high-level view of ITS in that region. The I-95 corridor architecture consists of both FDOT Districts 2, 4, 5, and 6's I-95 corridor architectures. An ITS architecture typically defines:

- Functions (i.e., gathering traffic information or requesting route information) that must be performed to implement a given user service or market package;
- Physical entities or subsystems where these functions reside (i.e., roadside or the vehicle);
- Interfaces/Information flows between the physical systems; and
- Communications requirements for the information flows (i.e., wireline or wireless).

In addition, it identifies and specifies the requirements for the standards needed to support national and regional interoperability, as well as product standards needed to support economy of scale considerations in deployment. More information on the development of the corridor architecture is contained in the *ITS Physical Architecture*.

6.5.11 Institutional Agreements

Several existing agreements for the I-95 corridor are identified the *ITS Legacy Catalog* as follows:

- **Joint ITS Agreement for the District 2 ITS** – This agreement is between FDOT District 2 and DHSMV. It is a five-year agreement, originally initiated in April 2001, which addresses the operation and maintenance of a TMC, staffing of the TMC, and traffic management on the interstate system. District 2 designed, installed, and maintains the ITS; the FHP provides staff for monitoring and dispatching; and District 3 provides an attendant for TMC equipment maintenance.

- **MOU Relative to the Funding, Design, Construction, Operations, and Maintenance of the Broward County ITS Operations Facility –** The agreement is between FDOT District 4 and the Broward County Traffic Engineering Division for the joint funding, design, construction, operations, and maintenance of the Broward County ITS Operations Facility. District 4 will fund the design, construction, and construction engineering for the first floor of the facility that is designated for ITS operations. Likewise, the county will be responsible for the same elements on the second floor that will house county traffic engineering operations. The Broward County ITS Operations Facility will monitor and operate the CMS system, and the Broward County signal system for I-95 and I-595, and will be expandable for other ITS services implemented in the county.

- **Daytona Area Smart Highways (DASH)** – DASH provides traffic surveillance, incident management, and traveler information along I-4 between SR 44 and I-95 and along I-95 from I-4 to U.S. 92. The project is a partnership between FDOT District 5, the City of Daytona Beach, and the Daytona Beach Police. District 5 maintains and operates DASH. The primary control center is located at the City of Daytona Beach's TMC, while the secondary control center is located at the Daytona Beach Police's dispatch and communications center. The FHP is collocated at the TMC and uses incident information collected by DASH to dispatch response vehicles along the interstates. District 5 headquarters has a dial-up connection to review data and can control the VMS and CCTV cameras.

- **Integration of ITS in Volusia County** – A program is currently planned in District 5 which will allow District 5, the City of Daytona Beach, Volusia County Traffic Engineering, and VOTRAN to share all available tourist, incident, congestion, and emergency information via existing ITS services. A design/build criteria package has been developed and a private entity will be selected to develop plans and specifications for the integration of the ITS services. The plans will develop a Volusia County ITS architecture that will include a physical architecture, concept of operations and communications, and a master plan. The concept of operations will define the roles and responsibilities of each agency, develop an institutional agreement, and address any operational and maintenance issues associated with the ITS project.

- **MOU for SunGuide^{SM} ATIS Services for Miami-Dade, Broward, and Palm Beach Counties** – This agreement, executed in August of 1999, is a regional ITS agreement that addresses the roles and responsibilities of each agency regarding the operation and deployment of the SunGuide^{SM} ATIS services for the tri-county area. The eight agencies involved include:

    - FDOT - District 4; District 6; and Turnpike
    - MPO for the Miami Urbanized Area;
    - Miami-Dade County;
    - Broward County MPO;
    - Broward County;
    - MPO of Palm Beach County;
    - Tri-Rail; and
    - MDX.

The ATIS project covers interstate and Turnpike facilities in the tri-county area and includes the coordination of all existing and planned ITS services within the area. The ATIS project creates an additional ITS infrastructure layer providing a seamless multi-modal ITS including 22 of the 31 user services. The primary roles of the partners as identified in the agreement are as follows: District 6 is identified as the lead agency, providing oversight for technical analysis, preparation of plans and documents, public involvement, and agency notification and coordination. Additionally, they are responsible for all coordination and review of actions to support the deployment of systems and normal service operations as specified in contractual agreements. District 4, the Turnpike, Tri-Rail, and MDX will provide coordination and technical assistance related to advancing ATIS services in their jurisdictions and will provide general support for deployment and operations. The MPOs will assist FDOT in coordinating ATIS through the MPOs and between county agencies. The counties will be responsible for review and evaluation of location plans submitted for approval of any new or existing installations necessary in conjunction with the deployment of ATIS.

- **SR 836 (East-West Expressway) ITS Agreement** – This agreement, executed in August of 2000, is between the FHWA, FDOT District 6, and MDX for the implementation, operation, and maintenance of an ATMS along SR 836 between the HEFT and I-95. The ATMS components will be operated and maintained by District 6 at their SunGuide^{SM} Control Center and the ATMS components will be integrated with the SunGuide^{SM} ATIS to provide seamless ITS services in Miami-Dade County. MDX will be responsible for the implementation, coordination, and administration of the project.

- **Operation Agreements of Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire I-95 corridor at one-mile intervals. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

Based on the defined FMS and RR Service Patrol projects for I-95, the agreements shown in Table 6.21 may be necessary to provide support for the ITS deployments and cooperation among the stakeholders.

6.5.12 I-95 Corridor ITS Needs

Table 6.22 lists the ITS needs for the I-95 corridor. Figure 6.70 illustrates the ITS needs for the I-95 corridor.

Table 6.21 – Institutional Agreements for Future ITS Project Implementations

Category	Stakeholders		Agreements
Freeway Management Systems	FDOT Turnpike Enterprise	FDOT District 4	Jurisdictional authority agreement for the Turnpike to maintain and operate the Turnpike mainline and the Sawgrass Expressway in District 4.
		FDOT District 6	Jurisdictional authority agreement for the Turnpike to maintain and operate the Turnpike mainline and HEFT in District 6.
	FDOT District 6's Miami RTMC	FDOT District 4's Broward County RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		Turnpike Enterprise's Pompano Beach RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		MDX TMC	Agreements for information sharing, exchange, and coordination between the RTMC and the local traffic authority.
		Miami-Dade Transit Authority (MDTA)	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		SunGuide℠ Smart Route TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
		Miami-Dade County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		SunPass® Service Center	Operations, maintenance/resource allocation, and sharing agreements for toll operations and management between the RTMC and the ***SunPass***® Service Center.
		Tri-Rail	Communications/Coordination agreements for information sharing, exchange, urban planning, and coordination between the RTMC and the local commuter rail authority.
		Miami RCC (FHP Troop F)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and the RCC.
	FDOT District 4's Broward County RTMC	Turnpike Enterprise's Pompano Beach RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
			Operations/Maintenance agreements for the Turnpike's Pompano Beach RTMC to act as a back-up for the Broward County RTMC.
		Broward County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Tri-Rail	Communications/Coordination agreements for information sharing, exchange, urban planning, and coordination between the RTMC and the local commuter rail authority.
		Broward County Transit Agency	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local transit authority.

Table 6.21 (Continued)

Category	Stakeholders	Agreements	Category
Freeway Management Systems	FDOT District 4's Broward County RTMC	Lake Worth RCC (FHP Troop L)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and the RCC.
		SunPass® Service Center	Operations, maintenance/resource allocation, and sharing agreements for toll operations and management between the RTMC and the ***SunPass***® Service Center.
		SunGuide℠ Smart Route TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
	District 4's Palm Beach County RTMC	Turnpike Enterprise's Pompano Beach RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 5's Orlando RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMCs.
		FDOT District 4's Broward County RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMCs.
		Martin County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		St. Lucie County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Palm Beach County Traffic Control Center	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Palm Beach County Transportation Authority	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local TMC.
		Lake Worth RCC (FHP Troop L)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and the RCC.
		SunGuide℠ SmartRoute TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
		Tri-Rail	Communications/Coordination agreements for information sharing, exchange, urban planning, and coordination between the RTMC and the local commuter rail authority.

Table 6.21 (Continued)

Category	Stakeholders	Agreements	Category
Freeway Management Systems	FDOT District 2's Jacksonville RTMC	FDOT District 5's Orlando RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		St. Augustine TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
		City of Jacksonville TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
		Jacksonville Transit Authority TMC	Communications/Coordination agreements for information sharing, exchange, and coordination between the RTMC and the local transit authority.
		Jacksonville RCC (FHP Troop G)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and the RCC.
RR Service Patrols	FDOT District 6's Miami RTMC	Private Sector	Legal agreements for the procurement of services by FDOT from private sectors.
		FDOT District 4's Broward County RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		Turnpike Enterprise's Pompano Beach RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
	FDOT District 4's Broward County RTMC	Private Sector	Legal agreements for the procurement of services by FDOT from private sectors.
		FDOT District 4's Palm Beach County RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		Turnpike Enterprise's Pompano Beach RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
	FDOT District 4's Palm Beach County RTMC	Private Sectors	Legal agreements for the procurement of services by FDOT from private sectors.
		FDOT District 5's Orlando RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		Turnpike Enterprise's Pompano Beach RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
	FDOT District 2's Jacksonville RTMC	Private Sectors	Legal agreements for the procurement of services by FDOT from private sectors.
		FDOT District 5's Orlando RTMC	Operations/Maintenance agreements for incident management operations between the RR Service Patrols and the RTMC.

Table 6.21 (Continued)

Category	Stakeholders	Agreements	Category
Managemen t Systems/R R Service	FDOT District 4	FDOT District 6	Funding, design, planning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.
		Turnpike Enterprise	Funding, design, planning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.

Table 6.22 – I-95 Corridor ITS Needs

Facility: I-295

District	From	To	Description	Type	Phase	PDC
2	I-10	I-95 N	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	PE	$0.360
2	I-10	I-95 N	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CONST	$3.000
2	I-10	I-95 N	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CEI	$0.600
2	I-95 S	I-10	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	PE	$0.558
2	I-95 S	I-10	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CONST	$3.722
2	I-95 S	I-10	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CEI	$0.744
2	I-295 S at I-95	Old St. Augustine Road	Road Ranger Service Patrol	RR	PE	$0.062
2	US 17 Interchange	I-295 N at I-95	Road Ranger Service Patrol	RR	PE	$0.509
2	I-10	I-95N	Fiber Optic Network	FON	PE	$0.200
2	I-10	I-95N	Fiber Optic Network	FON	CONST	$1.675
2	I-10	I-95N	Fiber Optic Network	FON	CEI	$0.130
2	I-95S	I-10	Fiber Optic Network	FON	PE	$0.286
2	I-95S	I-10	Fiber Optic Network	FON	CONST	$2.390
2	I-95S	I-10	Fiber Optic Network	FON	CEI	$0.190
					PDC Sum	$14.426

Table 6.22 (Continued)

Facility: I-595

District	From	To	Description	Type	Phase	PDC
4	I-75	U.S. 1	OVCS Variable Speed Zone	FMS	PE	$0.300
4	I-75	U.S. 1	OVCS Variable Speed Zone	FMS	CONST	$2.000
4	I-75	U.S. 1	OVCS Variable Speed Zone	FMS	CEI	$0.400

PDC Sum $2.700

Table 6.22 (Continued)

Facility: I-95

District	From	To	Description	Type	Phase	PDC
2	I-10	Airport Road	Fiber Optic Network	FON	PE	$0.163
2	I-10	Airport Road	Fiber Optic Network	FON	CONST	$1.355
2	I-10	Airport Road	Fiber Optic Network	FON	CEI	$0.110
2	I-10	Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	PE	$0.142
2	I-10	Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CONST	$0.945
2	I-10	Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CEI	$0.189
2	Trout River	Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	PE	$0.263
2	Trout River	Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CONST	$1.754
2	Trout River	Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CEI	$0.351
2	CR 210 Interchange		Rural Freeway Incident Management System(R-1)	FMS	PE	$0.101
2	CR 210 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CONST	$0.671
2	CR 210 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CEI	$0.134
2	SR 16 Interchange N	SR 16 Interchange S	Rural Freeway Incident Management System(R-1)	FMS	PE	$0.101
2	SR 16 Interchange N	SR 16 Interchange S	Rural Freeway Incident Management System(R-1)	FMS	CONST	$0.671
2	SR 16 Interchange N	SR 16 Interchange S	Rural Freeway Incident Management System(R-1)	FMS	CEI	$0.134
2	SR 206 Interchange		Rural Freeway Incident Management System(R-1)	FMS	PE	$0.101
2	SR 206 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CONST	$0.671
2	SR 206 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CEI	$0.134
2	SR 207 Interchange		Rural Freeway Incident Management System(R-1)	FMS	PE	$0.101
2	SR 207 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CONST	$0.671

Table 6.22 (Continued)

Facility: I-95

District	From	To	Description	Type	Phase	PDC
2	SR 207 Interchange		Rural Freeway Incident Management System(R-1)	FMS	CEI	$0.134
2	US 17 Interchange and Visitor Center		Rural Freeway Incident Management System(R-2)	FMS	PE	$0.101
2	US 17 Interchange and Visitor Center		Rural Freeway Incident Management System(R-2)	FMS	CONST	$0.671
2	US 17 Interchange and Visitor Center		Rural Freeway Incident Management System(R-2)	FMS	CEI	$0.134
2	SR A1A Interchange		Rural Freeway Incident Management System (R-2)	FMS	PE	$0.101
2	SR A1A Interchange		Rural Freeway Incident Management System (R-2)	FMS	CONST	$0.671
2	SR A1A Interchange		Rural Freeway Incident Management System (R-2)	FMS	CEI	$0.134
2	Duval/Nassau Co. Line	Nassau/Georgia State Co. Line	Road Ranger Service Patrol	RR	PE	$0.196
2	Flagler/St. Johns Co. Line	St. Johns/Duval Co. Line	Fiber Optic network	FON	PE	$0.483
2	Flagler/St. Johns Co. Line	St. Johns/Duval Co. Line	Fiber Optic network	FON	CONST	$4.030
2	Flagler/St. Johns Co. Line	St. Johns/Duval Co. Line	Fiber Optic Network	FON	CEI	$0.322
2	I-295 N	Georgia State Line	Fiber Optic Network	FON	PE	$0.285
2	I-295 N	Georgia State Line	Fiber Optic Network	FON	CONST	$2.377
2	I-295 N	Georgia State Line	Fiber Optic Network	FON	CEI	$0.190
					PDC Sum	$18.585

Table 6.22 (Continued)

Facility: I-95

District	From	To	Description	Type	Phase	PDC
4	Martin/St. Lucie Co. Line	St. Lucie Indian River Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE	$0.612
4	Martin/St. Lucie Co. Line	St. Lucie Indian River Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	$4.083
4	Martin/St. Lucie Co. Line	St. Lucie Indian River Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI	$0.817
4	Palm Beach/Martin Co Line	Martin/St. Lucie Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE	$0.411
4	Palm Beach/Martin Co Line	Martin/St. Lucie Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	$2.742
4	Palm Beach/Martin Co Line	Martin/St. Lucie Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI	$0.548
4	St. Lucie Co. Line/Indian Co. Line	Indian Co. Line/Brevard Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE	$0.201
4	St. Lucie Co. Line/Indian Co. Line	Indian Co. Line/Brevard Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	$1.341
4	St. Lucie Co. Line/Indian Co. Line	Indian Co. Line/Brevard Co. Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI	$0.268
4	Broward/Palm Beach Co. Line	Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	PE	$0.300
4	Broward/Palm Beach Co. Line	Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	CONST	$2.000
4	Broward/Palm Beach Co. Line	Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	CEI	$0.400
4	Miami-Dade/Broward Co. Line	Broward/Palm Beach Co. Line	OVCS Variable Speed Zone	FMS	CONST	$2.000
4	Palm Beach/Martin Co Line	Martin/St. Lucie Co. Line	Road Ranger Service Patrol	RR	PE	$0.325
4	Martin/St. Lucie Co. Line	St. Lucie Indian River Co. Line	Road Ranger Service Patrol	RR	PE	$0.435
4	St. Lucie Co. Line/Indian Co. Line	Indian Co. Line/Brevard Co. Line	Road Ranger Service Patrol	RR	PE	$0.307
4	Palm Beach/Martin Co. Line	Indian River/Brevard Co. Line	Fiber Optic Network	FON	PE	$0.990
4	Palm Beach/Martin Co. Line	Indian River/Brevard Co. Line	Fiber Optic Network	FON	CONST	$8.260
4	Palm Beach/Martin Co. Line	Indian River/Brevard Co. Line	Fiber Optic Network	FON	CEI	$0.661
					PDC Sum	$26.701

Table 6.22 (Continued)

Facility: I-95

District	From	To	Description	Type	Phase	PDC
5	US 1 (Volusia County)	US 1 at the Flagler County Line	Surveillance Motorist Information System/Daytona Area Smart Highways Phase IV	FMS	PE	$0.900
5	US 1 (Volusia County)	US 1 at the Flagler County Line	Surveillance Motorist Information System/Daytona Area Smart Highways Phase IV	FMS	CONST	$5.980
5	US 1 (Volusia County)	US 1 at the Flagler County Line	Surveillance Motorist Information System/Daytona Area Smart Highways Phase IV	FMS	CEI	$1.190
5	SR 44	US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	PE	$0.276
5	SR 44	US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	CONST	$1.837
5	SR 44	US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	CEI	$0.367
5			District 5 Headquarters STMC in Deland	RTMC	CONST	$0.230
5	Indian River/Brevard Co. Line	SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	PE	$1.864
5	Indian River/Brevard Co. Line	SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	CONST	$12.428
5	Indian River/Brevard Co. Line	SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	CEI	$2.486
5	Indian River/ Brevard Co. Line	Brevard/Volusia Co. Line	Road Ranger Service Patrol	RR	PE	$1.225
5	Brevard/Volusia Co. Line	Volusia/Flagler Co. Line	Road Ranger Service Patrol	RR	PE	$0.799
5	Volusia/Flagler Co. Line	Flagler/St. Johns Co. Line	Road Ranger Service Patrol	RR	PE	$0.330
5	US 1 (Volusia County)	US 1 at the Flagler/St. Johns Co. Line	Fiber Optic Network	FON	PE	$0.050
5	US 1 (Volusia County)	US 1 at the Flagler/St. Johns Co. Line	Fiber Optic Network	FON	CONST	$0.377
5	US 1 (Volusia County)	US 1 at the Flagler/St. Johns Co. Line	Fiber Optic Network	FON	CEI	$0.030
5	Indian River/Brevard Co. Line	SR 44	Fiber Optic Network	FON	PE	$0.845
5	Indian River/Brevard Co. Line	SR 44	Fiber Optic Network	FON	CONST	$7.050

Table 6.22 (Continued)

Facility: I-95

District	From	To	Description	Type	Phase	PDC
5	Indian River/Brevard Co. Line	SR 44	Fiber Optic Network	FON	CEI	$0.564
5	SR 44	US 1 (Volusia County)	Fiber Optic Network	FON	PE	$0.235
5	SR 44	US 1 (Volusia County)	Fiber Optic Network	FON	CONST	$1.960
5	SR 44	US 1 (Volusia County)	Fiber Optic Network	FON	CEI	$0.156
					PDC Sum	$41.178

Facility: SR 9A

District	From	To	Description	Type	Phase	PDC
2	FIHS Limits		Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	PE	$0.430
2	FIHS Limits		Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CONST	$3.601
2	FIHS Limits		Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CEI	$0.720
2	SR 9A S at I-95	SR 9A N at I-95	Road Ranger Service Patrol	RR	PE	$0.400
2	FIHS Limits		Fiber Optic Network	FON	PE	$0.200
2	FIHS Limits		Fiber Optic Network	FON	CONST	$1.680
2	FIHS Limits		Fiber Optic Network	FON	CEI	$0.134
					PDC Sum	$7.165

Facility: SR 9A

District	From	To	Description	Type	Phase	PDC
			Grand Total All Facilities			$110.755

Figure 6.70 – I-95 Corridor ITS Needs

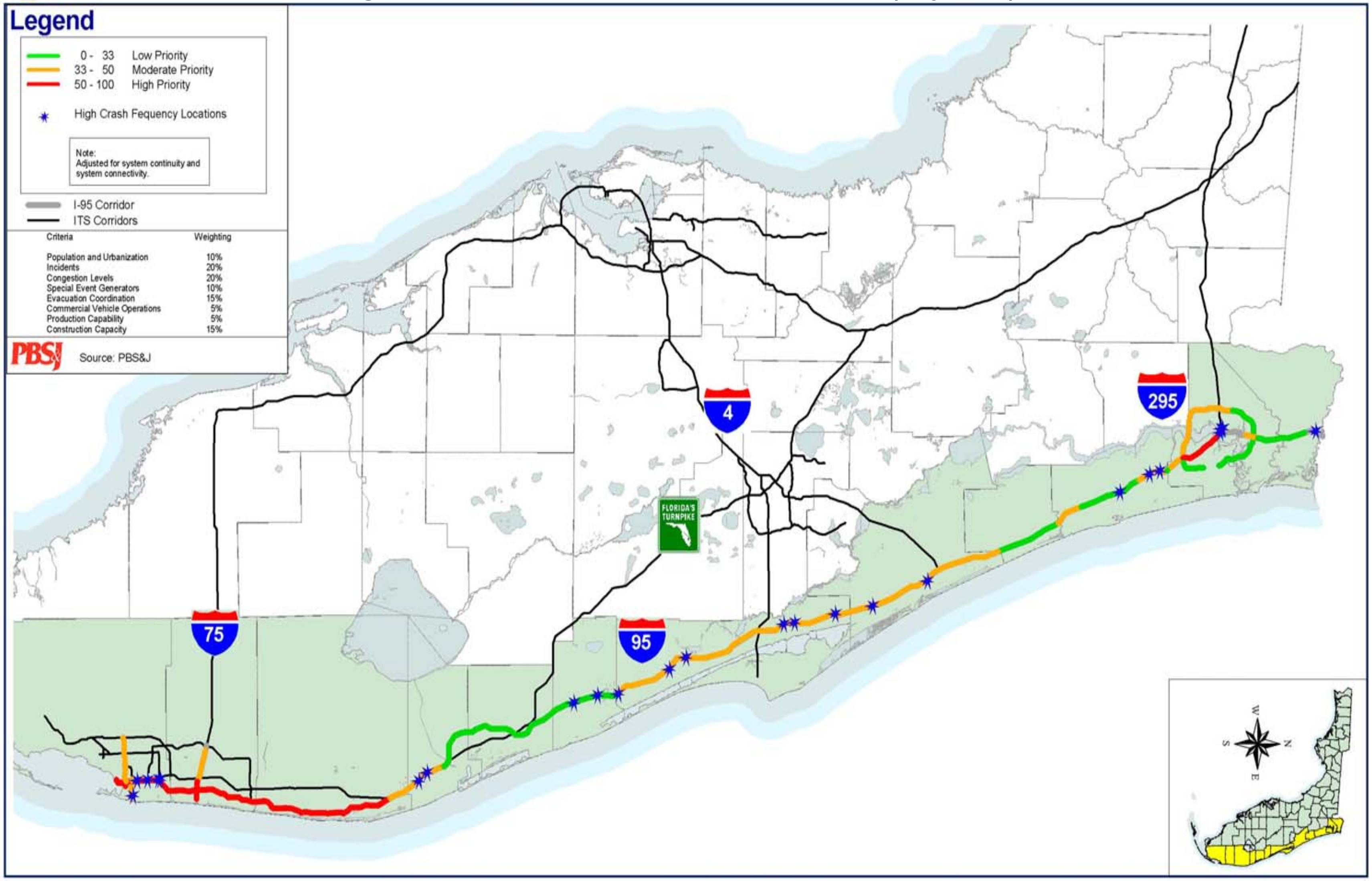
6.5.13 Project Priorities and Phasing

Table 6.23 summarizes the high and moderate priority segments for I-95, I-295, I-595, and SR 9A. The need for ITS deployment is supported on a statewide basis for all FIHS limited-access corridors. This table summarizes the relative priority of ITS for the purposes of phasing implementation only. Figure 6.71 illustrates the result of the prioritization analysis for the I-95 corridor and recommended prioritization based on high, moderate, and low priorities.

Table 6.23 – Priority Segments for ITS Deployments on the I-95 Corridor

Facility	Relative Priority	Area	From	To	Existing FMS?
I-95	High	Jacksonville	I-10	I-295	
I-95	High	Miami	U.S. 1 (Dixie Highway)	Ives Dairy Road	Yes
I-95	High	Ft. Lauderdale/ Palm Beach	Ives Dairy Road	CR 706/Donald Ross Road (Martin County)	
I-595	High	Ft. Lauderdale	SR 7	SR 5	
I-95	Moderate	Jacksonville	CR 110	Bay Street West	
I-95	Moderate	Jacksonville	I-295	Duval/St. Johns County Line	
I-295	Moderate	Jacksonville	Pritchard Road	I-95 (South)	
I-95	Moderate	St. Augustine	SR 206	St. Johns/Flagler County Line	
I-95	Moderate	Daytona/Cocoa	Flagler/Volusia County Line	Brevard/Indian River County Line	
I-95	Moderate	Stuart/Jupiter	SR 76	Donald Ross Road	
I-595	Moderate	Ft. Lauderdale	S.W. 136th Avenue	SR 7	
I-195	Moderate	Miami	Entire length		

Figure 6.71 – I-95 Corridor *ITS Plan* Priorities (Adjusted)



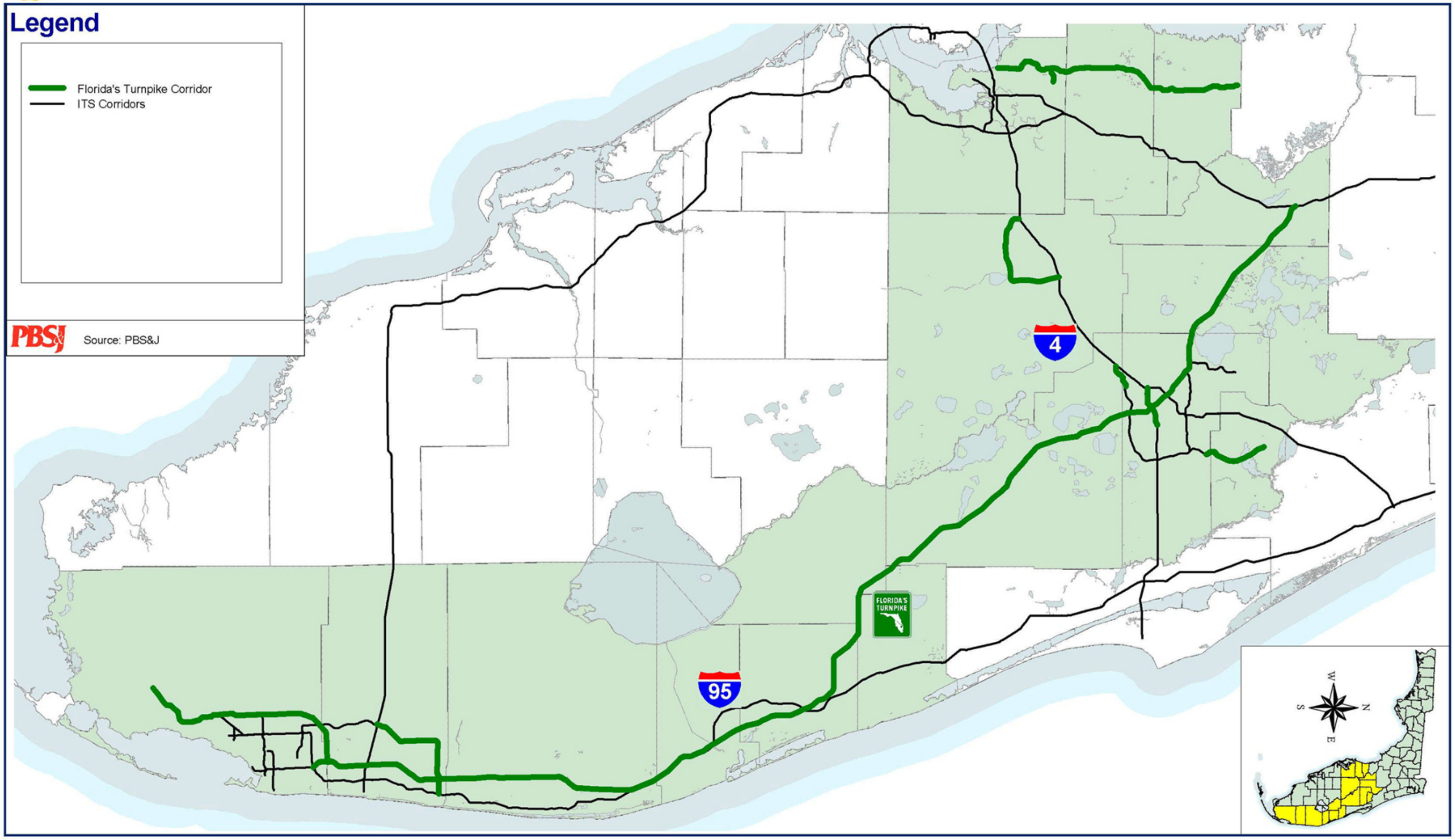
6.6 Turnpike ITS Corridor Master Plan

6.6.1 Corridor Description

The limits of Florida's Turnpike corridor include the HEFT and the Turnpike mainline to Milepost 0X. The corridor will also include the Sawgrass Expressway, the Seminole Expressway, and FDOT-owned sections of SR 417 (the Southern Connector Extension) and SR 528 (the Bee Line Expressway). Figure 6.72 illustrates the location of the Turnpike-owned facilities. The following list details the limits of each Turnpike facility:

- Turnpike mainline from I-95 to I-75;
- SR 821/HEFT from the Turnpike to U.S. 1 in Miami-Dade County;
- SR 869/Sawgrass Expressway from I-75 to the Turnpike in Broward County;
- SR 417/Seminole Expressway, from the Seminole County line to U.S. 17/92 in Seminole County;
- SR 417/Southern Connector Extension, the FDOT portion from I-4 to SR 417, in Orange County; and
- SR 528/Bee Line Expressway, the FDOT portion from I-4 to Sand Lake Road in Orange County.

Figure 6.72 – Florida's Turnpike Corridor Location



6.6.2 Legacy Systems

The following text identifies existing physical and operational conditions along Florida's Turnpike corridor as presented in the *ITS Legacy Catalog* as prepared for the FIHS *ITS Corridor Master Plans*:

- Turnpike facilities listed in this report primarily consist of four or six lanes.

- The Turnpike facilities included in the study network have very low interchange densities. Access locations along these facilities are strictly regulated to minimize potential delays and congestion. Additionally, the Turnpike mainline is primarily a rural corridor, with many of the ancillary segments located in large metropolitan areas such as Miami, Ft. Lauderdale, and Tampa. Figure 6.73 illustrates the interchange locations and Figure 6.74 illustrates the corridor area types.

- The Turnpike mainline and Turnpike facilities experience relatively few high accident locations except at the Sawgrass and I-95 Interchange and the SR 408 and Turnpike mainline interchange. Their high crash frequency locations are shown in Figure 6.75.

- Florida's Turnpike (SR 91) has an AADT of 31,838 vpd. By the year 2010, it is expected to increase 31 percent to 45,992 vpd and 32 percent between years 2010 and 2020. The county exhibiting the greatest traffic volume on the Turnpike is Broward with 64,588 vpd. It is projected to increase to 127,388 vpd by 2020. The Turnpike will also experience the largest amount of travel demand growth in the southeastern tri-county area (Broward, Miami-Dade, and Palm Beach counties). The lowest AADT (19,900 vpd) occurs in the more rural areas of both Okeechobee and Indian River counties. The Turnpike also has three other facilities included in this study: SR 869 (the Sawgrass Expressway), SR 528 (the Bee Line Expressway), and SR 417 (the Southern Connector Extension). Each corridor is expected to double in traffic volume by the year 2020. The most heavily traveled of the three Turnpike facilities is the Bee Line Expressway located in Orange County. Figures 6.76 through 6.78 illustrate the 2000, 2010, and 2020 AADT forecasted for Florida's Turnpike corridor.

- Tourism is Florida's largest industry. Due to the high volume of annual tourists, the state transportation system must be designed to accommodate the social and recreational travel generated by major tourist attractions and activity centers, in addition to supporting the daily commuter and freight travel. Therefore, by locating the state's major activity centers, special generators, and tourist attractions, ITS solutions, such as real-time traveler information systems and incident management techniques, can be implemented in coordination with multi-modal improvements to improve mobility to and around these major activity centers.

Figure 6.73 – Interchange Locations on Florida's Turnpike Corridor

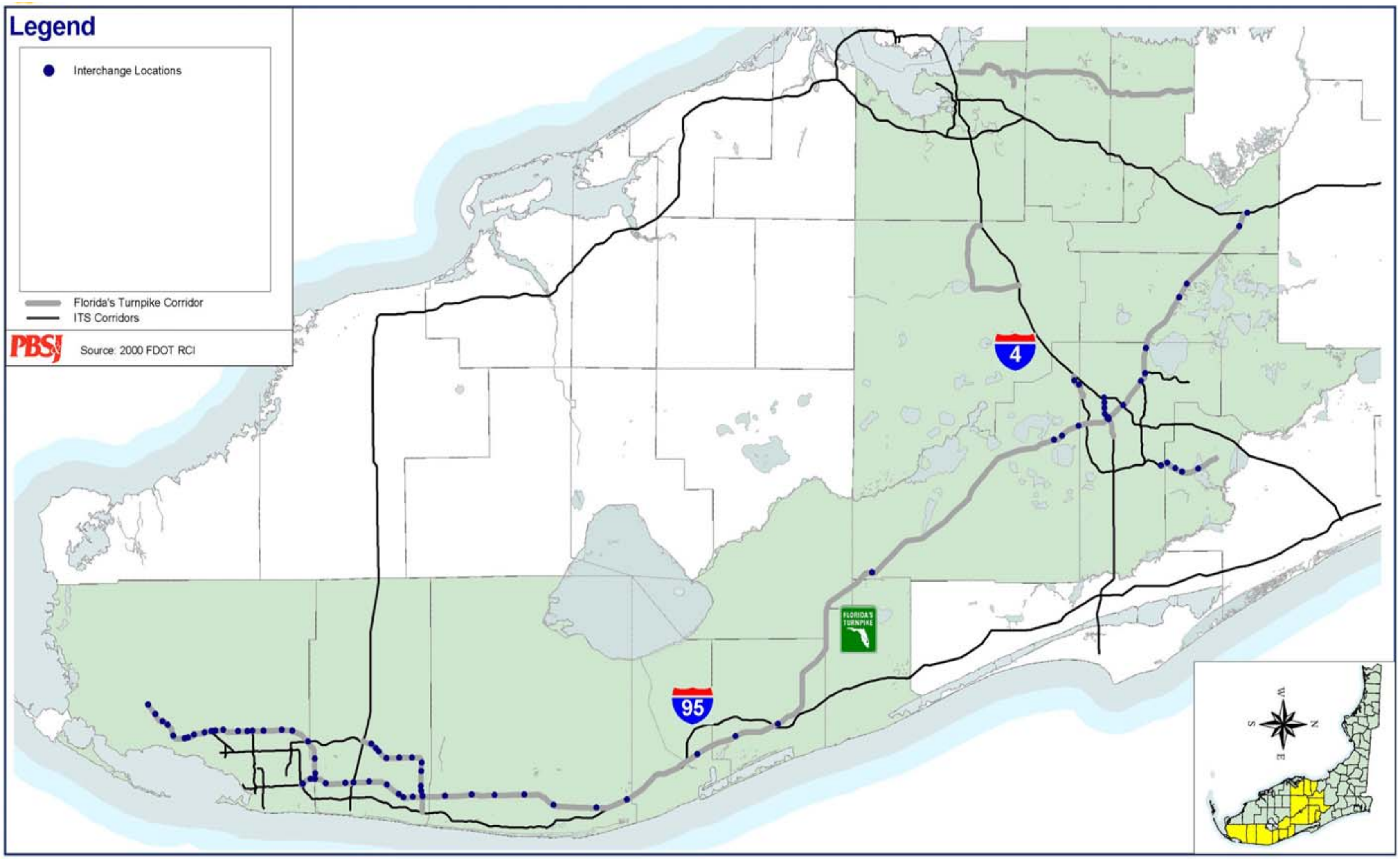


Figure 6.74 – Florida's Turnpike Corridor Area Types

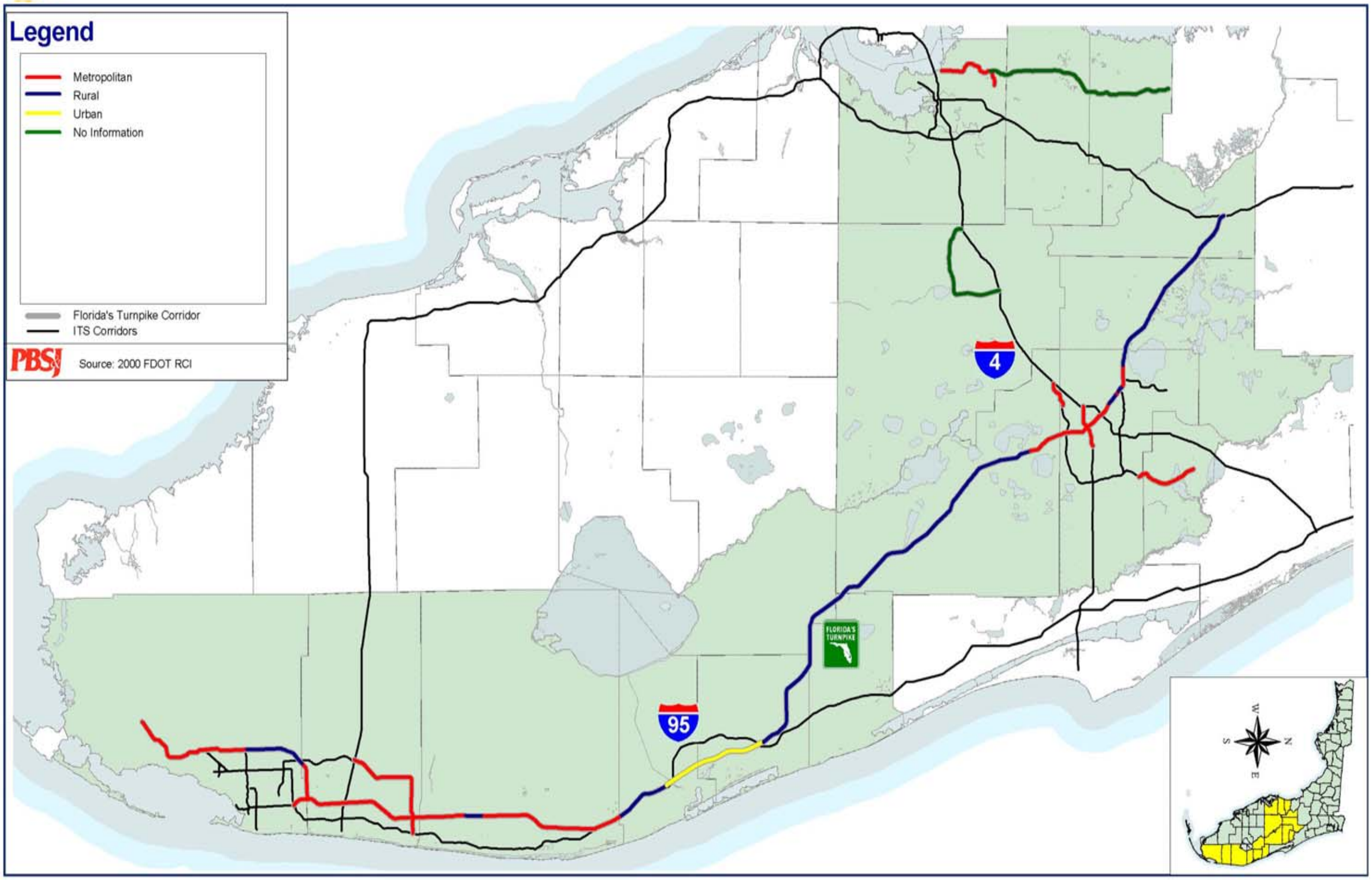


Figure 6.75 – High Crash Frequency Locations on Florida's Turnpike Corridor

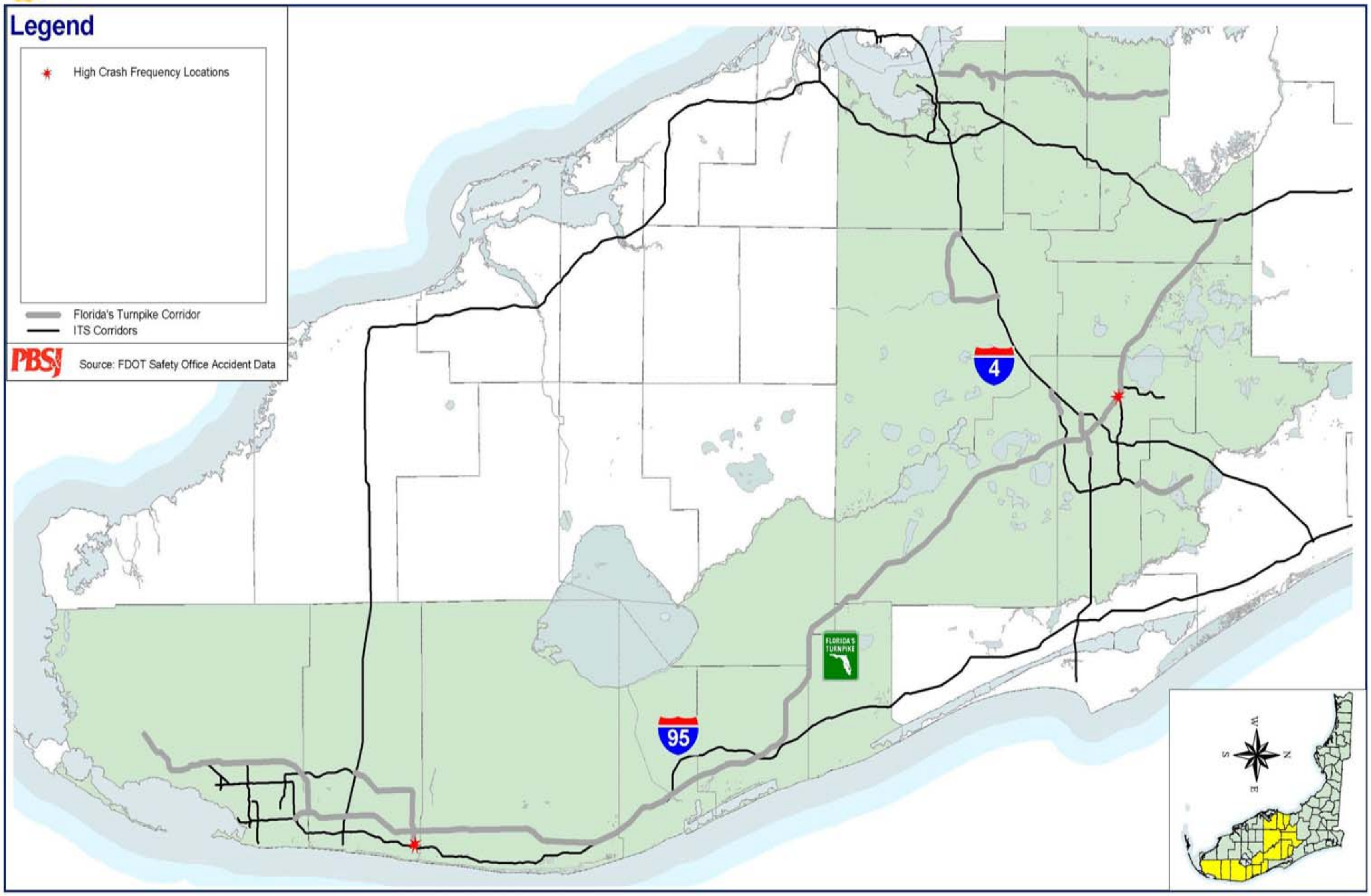


Figure 6.76 – Florida's Turnpike Corridor 2000 AADT

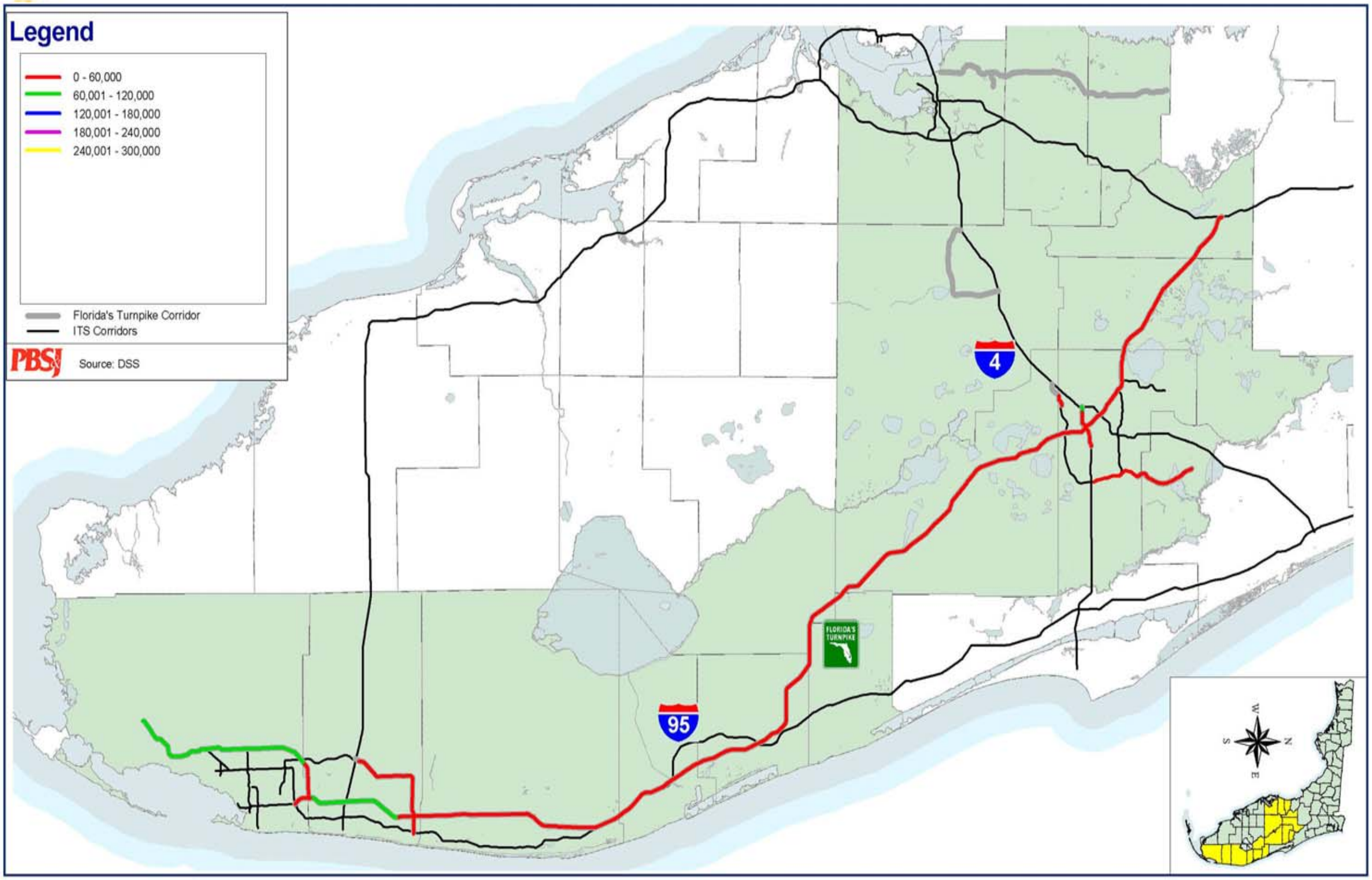


Figure 6.77 – Florida's Turnpike Corridor 2010 AADT

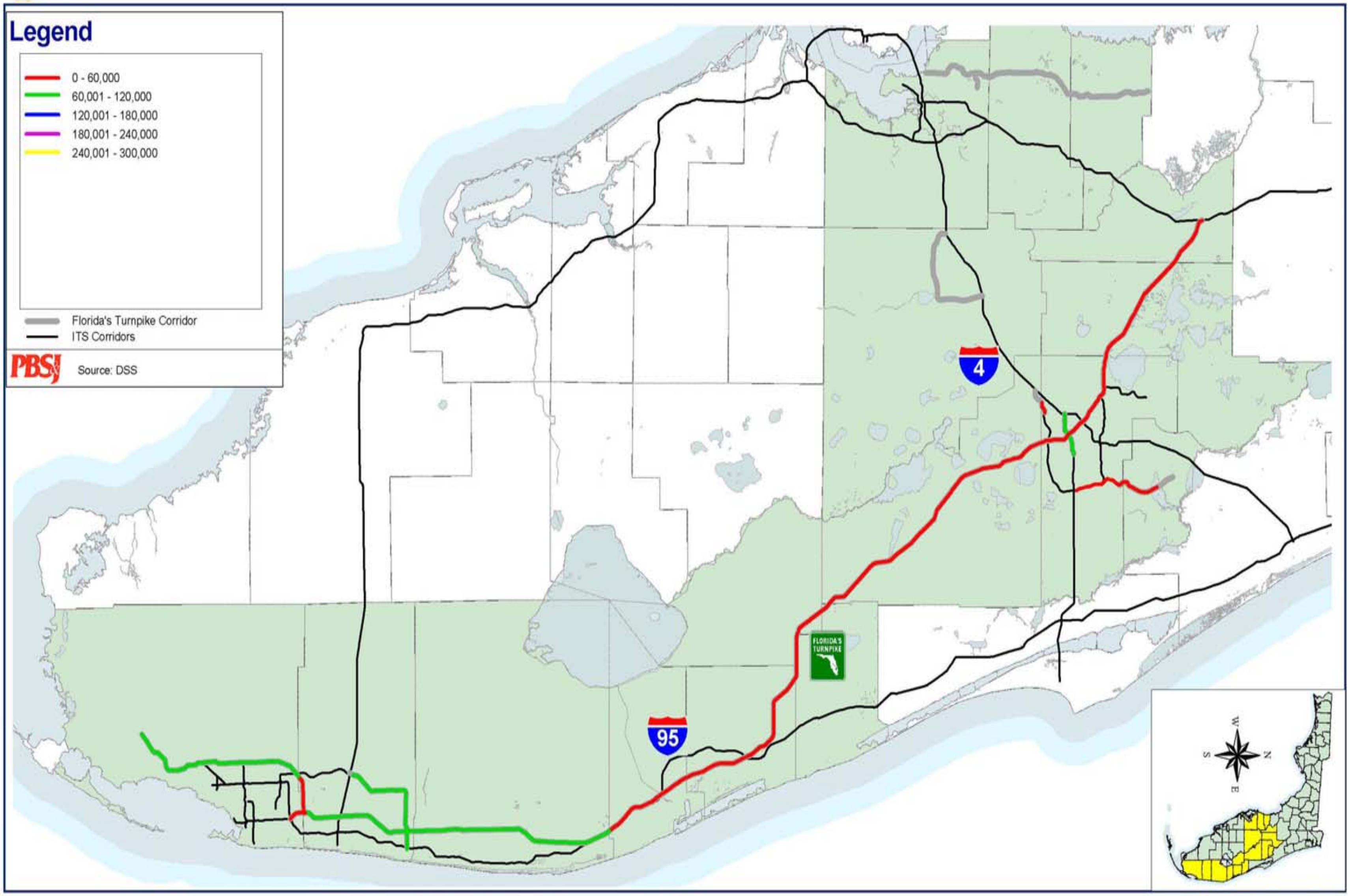
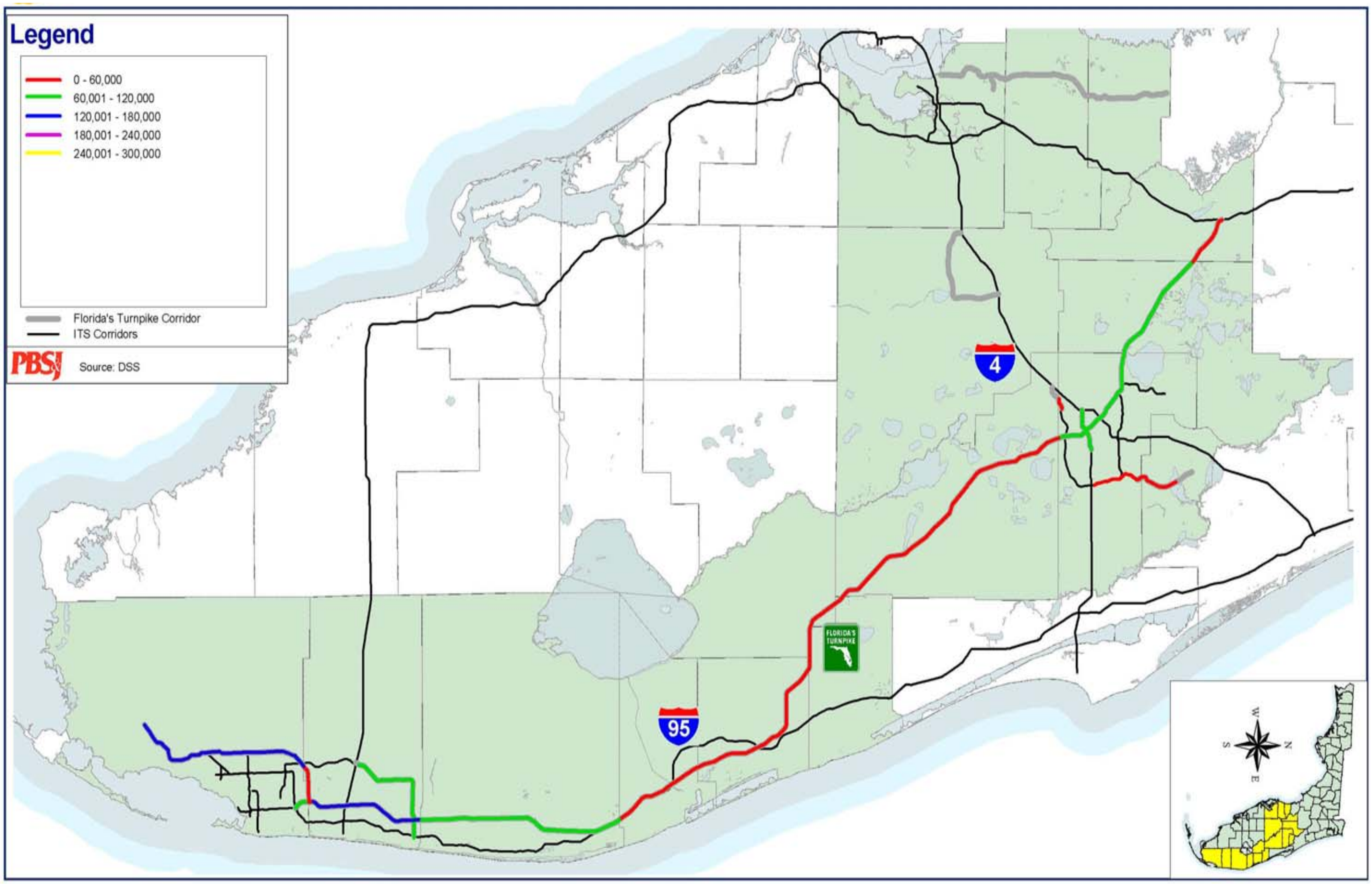


Figure 6.78 – Florida's Turnpike Corridor 2020 AADT



- Florida's Turnpike mainline provides direct access to Orlando, which contains Florida's largest trip generator, Disney World. Other Turnpike facilities such as the Southern Connector Extension and the Seminole Expressway almost completely encircle Orlando. The Sawgrass Expressway and the HEFT provide access to a variety of major trip generators in Miami. The HEFT also terminates into U.S. 1, which is the only route in and out of the Florida Keys.

6.6.3 Current ITS Plans and Programs

This section identifies existing and planned ITS services along Florida's Turnpike corridor. These services will be mapped in *Section 4, Deployment Issues,* of this report to determine gaps in existing and planned services.

- **Motorist Aid Call Boxes** – A statewide motorist aid system, using roadside call boxes, has been deployed along the entire length of the Turnpike mainline, the Suncoast Parkway, and the Turnpike limits of the Bee Line Expressway. The call boxes are a partnership between FDOT and FHP. The Turnpike Enterprise maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

- **RR Service Patrols** – This ITS service, operated by the FDOT districts through private contractors includes roadside assistance and incident clearance. RR Service Patrols are currently operating along the Turnpike facilities at the following locations: The Turnpike mainline (HEFT) from Milepost 0 to Milepost 99 (including the Sawgrass Expressway), the Turnpike's mainline from Milepost 236 to Milepost 288, and Turnpike-owned portions of SR 528 and SR 417. The Turnpike also maintains and operates their own wrecker/roadside assistance along the entire length of their mainline.

- **CVO** – Currently none of the Turnpike facilities have a CVO system. This is mainly due to the low truck volumes experienced on these corridors. However, the Turnpike is the only intrastate facility that allows dual trailer trucks and plans are being made to incorporate an electronic passing system for commercial vehicles at all Turnpike toll facilities.

The Turnpike currently maintains and operates electronic toll systems on all its facilities and operates a HAR system on the mainline. ITS improvement plans include the implementation of a DMS system, CCTV, an incident detection system, and the installation of fiber optics on the mainline, HEFT/Sawgrass, Bee Line Expressway, and the Southern Connector Extension. Plans for the secondary Turnpike system facilities include ATIS on the Bee Line Expressway and the Southern Connector Extension. The Turnpike Enterprise along with Districts 4 and 6 have recently entered into a regional agreement for the integration of ITS services and the sharing of data for ATIS services. Although not included in this implementation plan, plans for CCTV, DMS and a vehicle detection system are being developed for the SR 589/Veterans/Suncoast Parkway and the Polk County Parkway. Figures 6.79 through 6.81 show the existing, programmed, and planned ITS coverage for the Turnpike facilities.

Figure 6.79 – Existing ITS Coverage on Florida's Turnpike Corridor

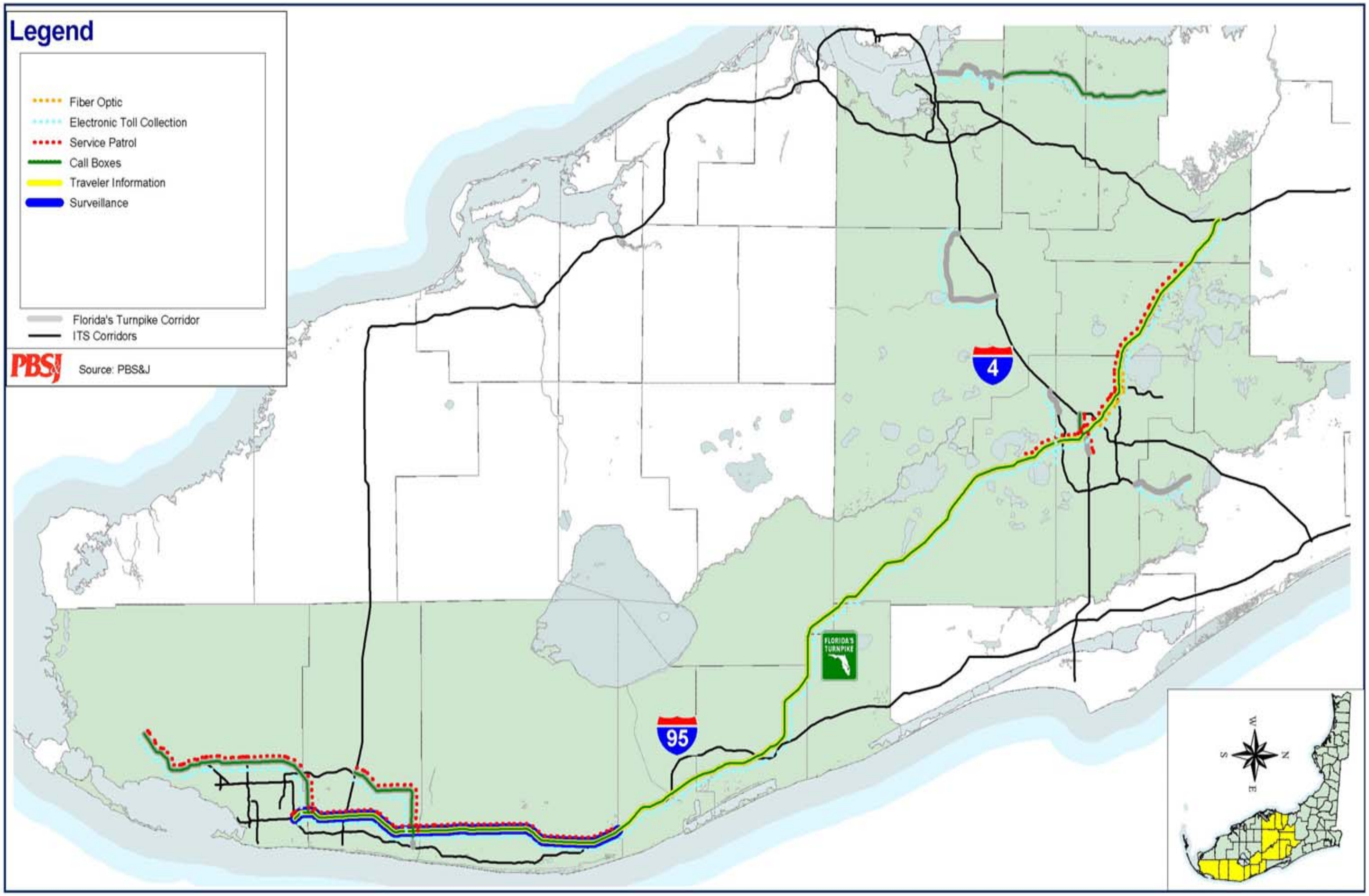


Figure 6.80 – Programmed ITS Coverage on Florida's Turnpike Corridor

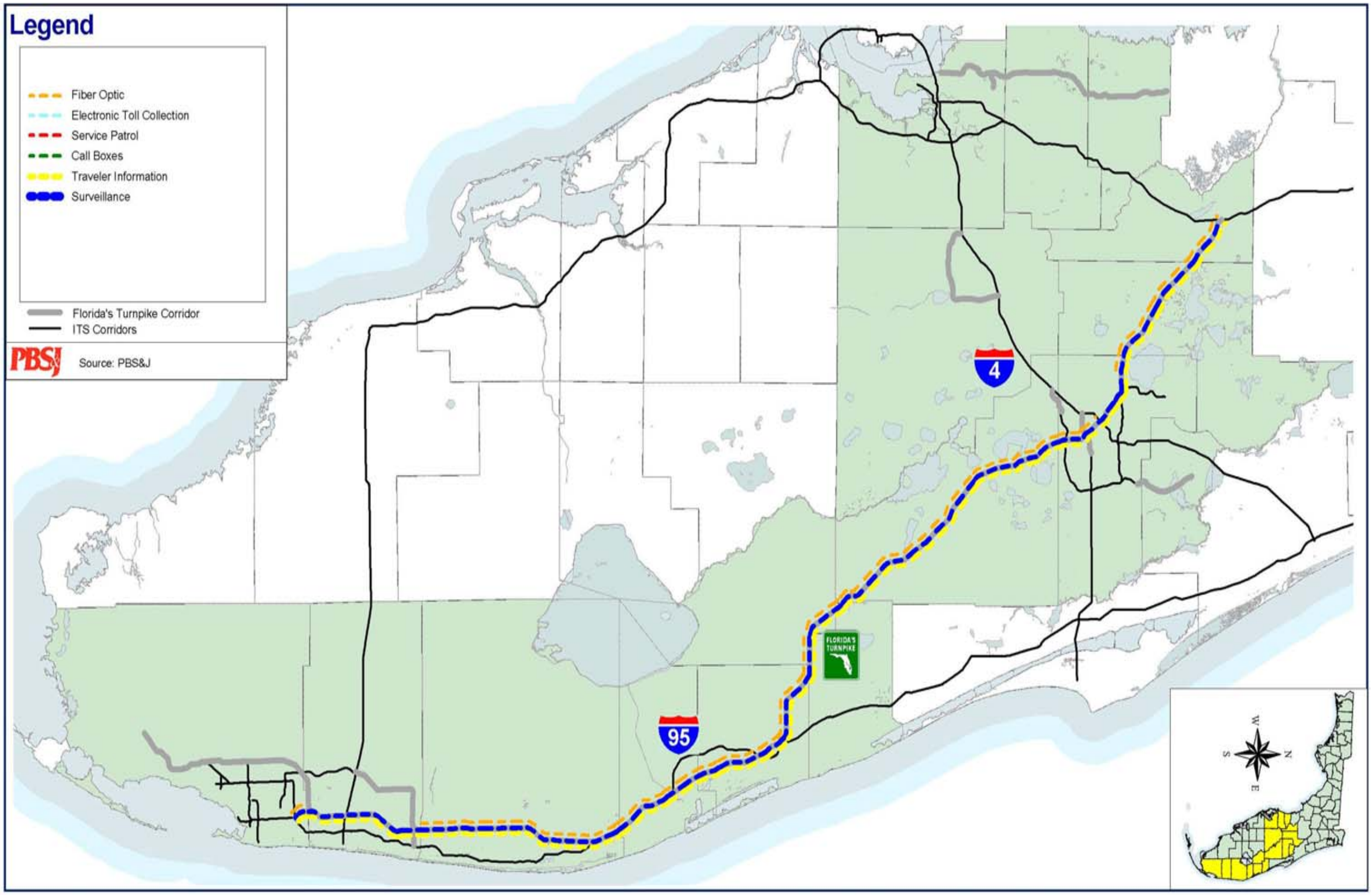
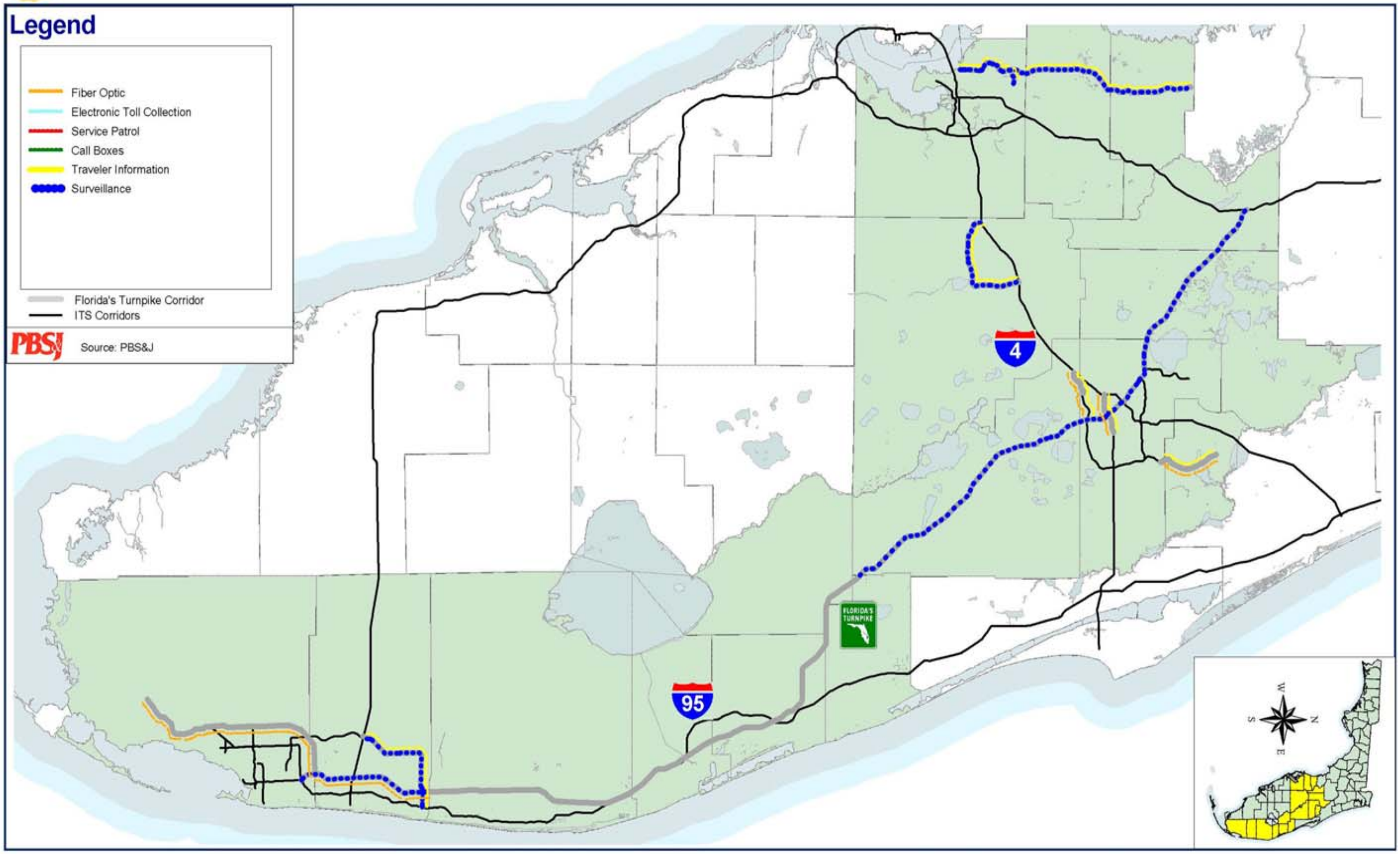


Figure 6.81 – Planned ITS Coverage on Florida's Turnpike Corridor



NOTE: The Seminole II "missing link" is currently under construction and will be covered by a future ITS deployment.

6.6.4 Existing Communications Infrastructure

Currently, Florida's Turnpike corridor has a microwave system in place on the entire mainline from I-75 to I-95. Due to the complexity and volume of the data required to support proposed ITS deployments along the FIHS corridors, the existing microwave communications system will require an upgrade, which is scheduled for the year 2004. Plans to implement a FON along the FIHS corridors are also currently under development. The FON would be optimal for the communications needs for the statewide ITS deployments due to its capacity to accommodate a large volume of data.

Figure 6.82 illustrates the existing microwave tower locations along the Turnpike facilities and Figure 6.83 illustrates existing fiber locations.

6.6.5 Proposed Capacity Improvement Projects

It is important to identify programmed and cost feasible plan improvements (construction only) as funding for potential ITS deployments can be leveraged with the funding of the capacity improvements and consideration of the roadway modifications can be included in the design of the ITS improvements. Figures 6.84 through 6.86 illustrate the programmed, planned, and 2025 cost feasible improvements for the Turnpike facilities. As identified in Figure 6.84, the Turnpike facilities have three interchange modification projects, two new interchange construction projects, and three projects that will construct two lanes to build six identified as programmed. There are five interchange modifications along with two widening projects identified in Figure 6.85. Both widening projects will add two lanes to the existing facilities; however, the mainline project will add the two lanes to build eight. The following also identify tentative work program capacity improvements:

- Miami-Dade County –
  - HEFT widening from U.S. 1 to SR 874;
  - S.W. 8th Street interchange modification; and
  - N.W. 74th Street interchange modification.

- Broward County –
  - Mainline widening from Griffin to Sunrise;
  - Mainline widening from HEFT to Griffin;
  - Mainline widening from Sunrise to Atlantic;
  - Hollywood Boulevard interchange modification;
  - Sunrise Boulevard interchange modification; and
  - Mainline widening from Atlantic to Sawgrass.

- Palm Beach County –
  - Jug Road interchange and modification.

Figure 6.82 – Existing Microwave Tower Locations on Florida's Turnpike Corridor

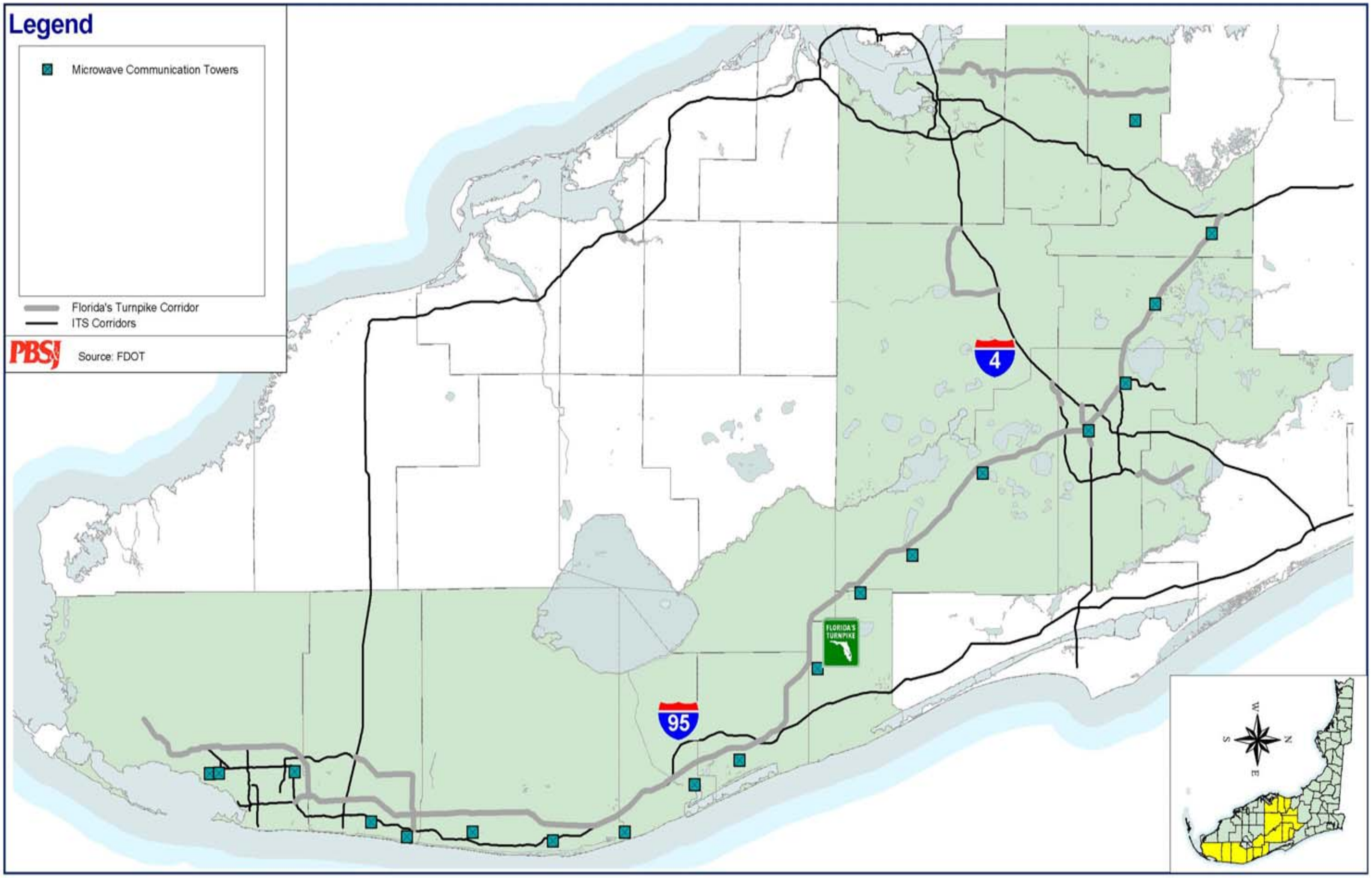


Figure 6.83 – Existing Fiber Optic Cable Locations on Florida's Turnpike Corridor

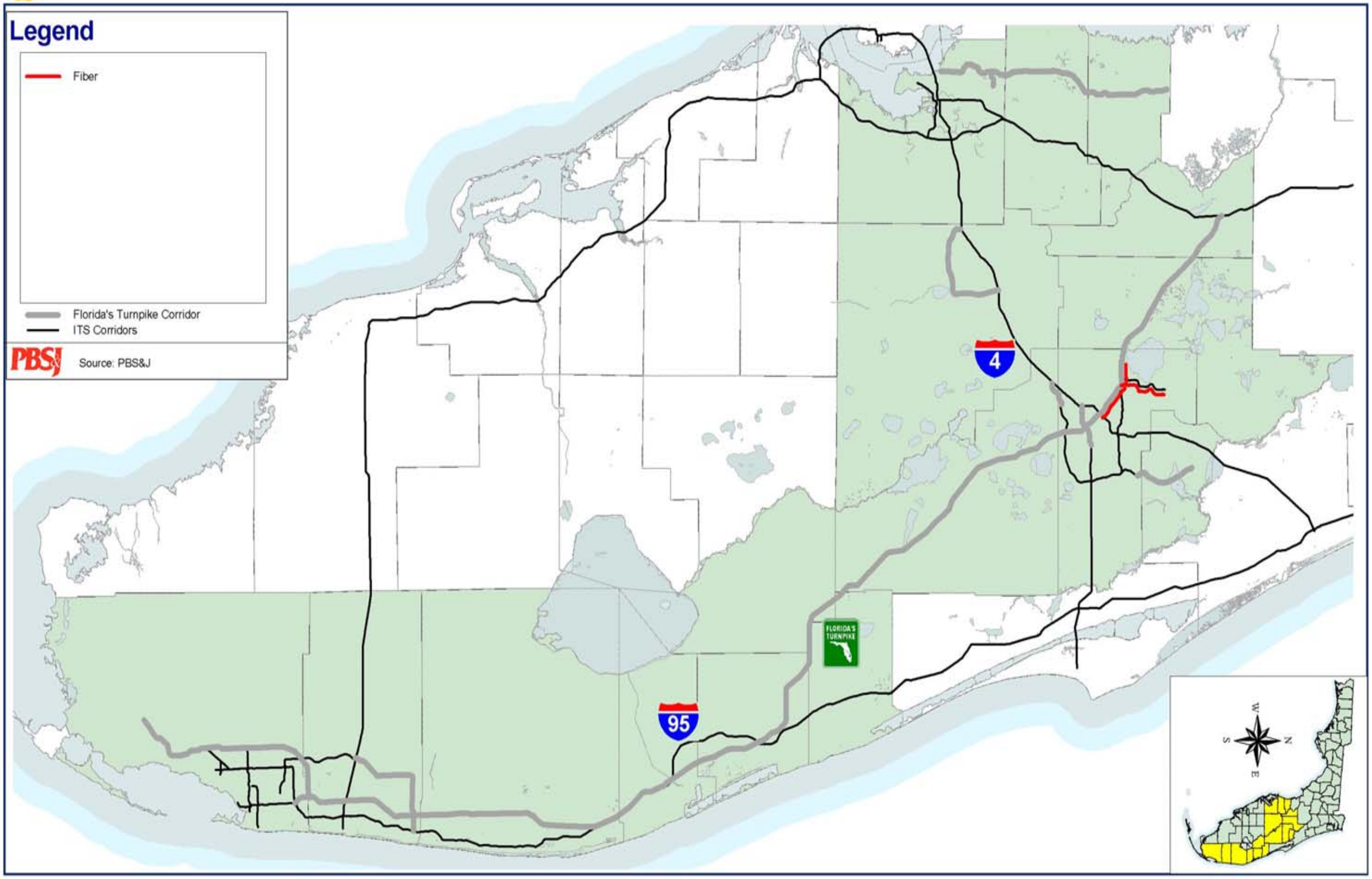


Figure 6.84 – Programmed Capacity Improvements for Florida's Turnpike Corridor

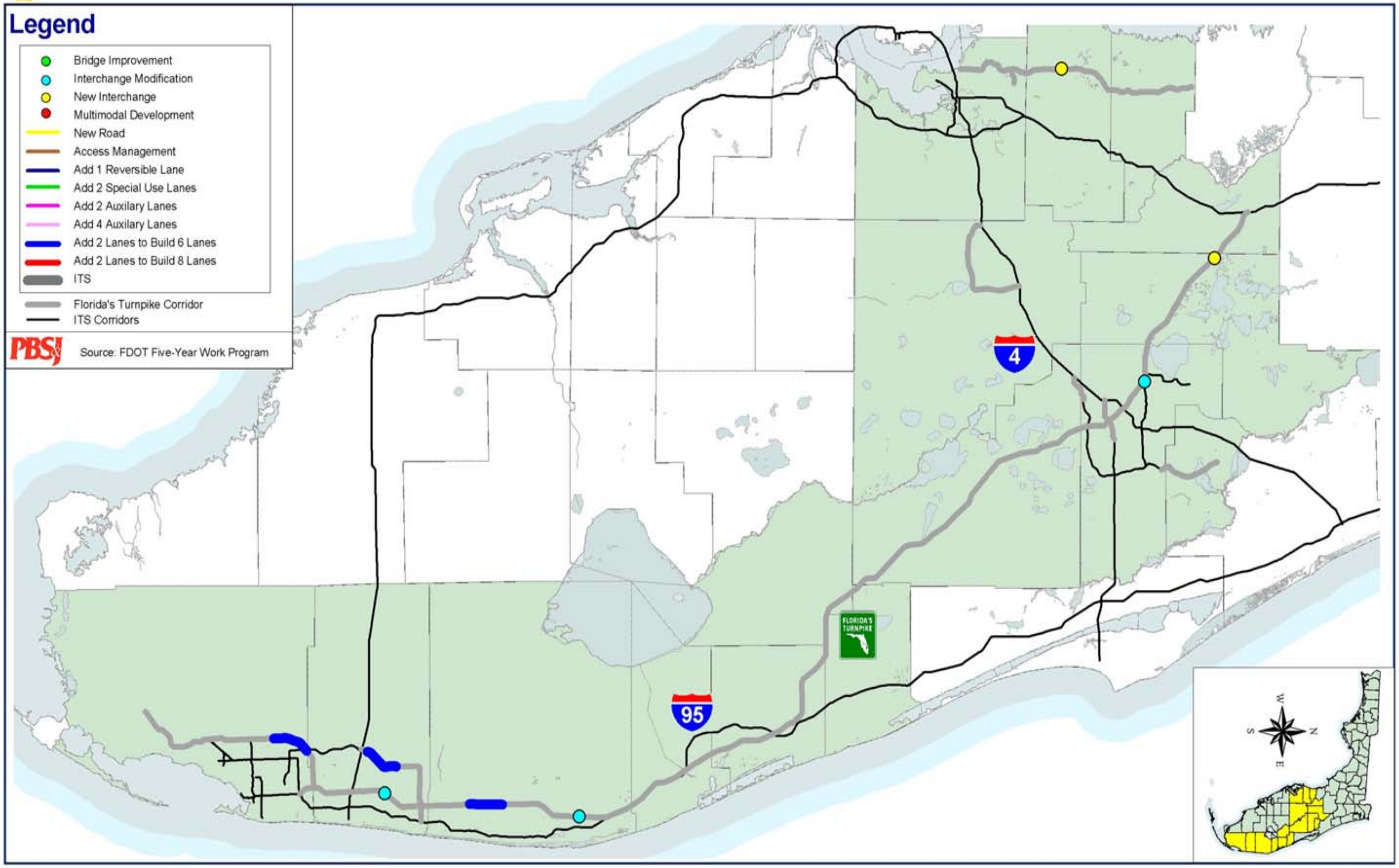


Figure 6.85 – Planned Capacity Improvements for Florida's Turnpike Corridor

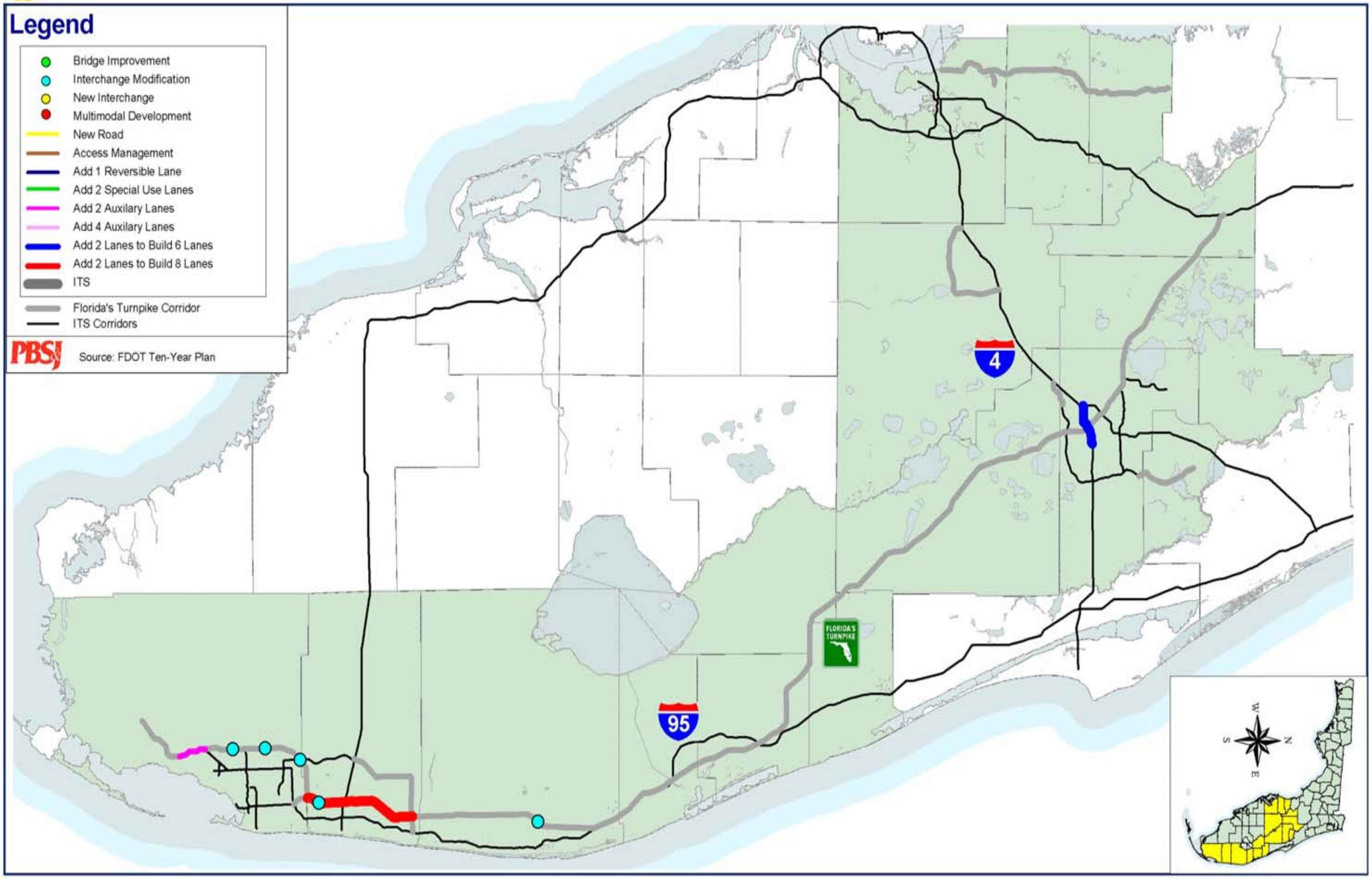
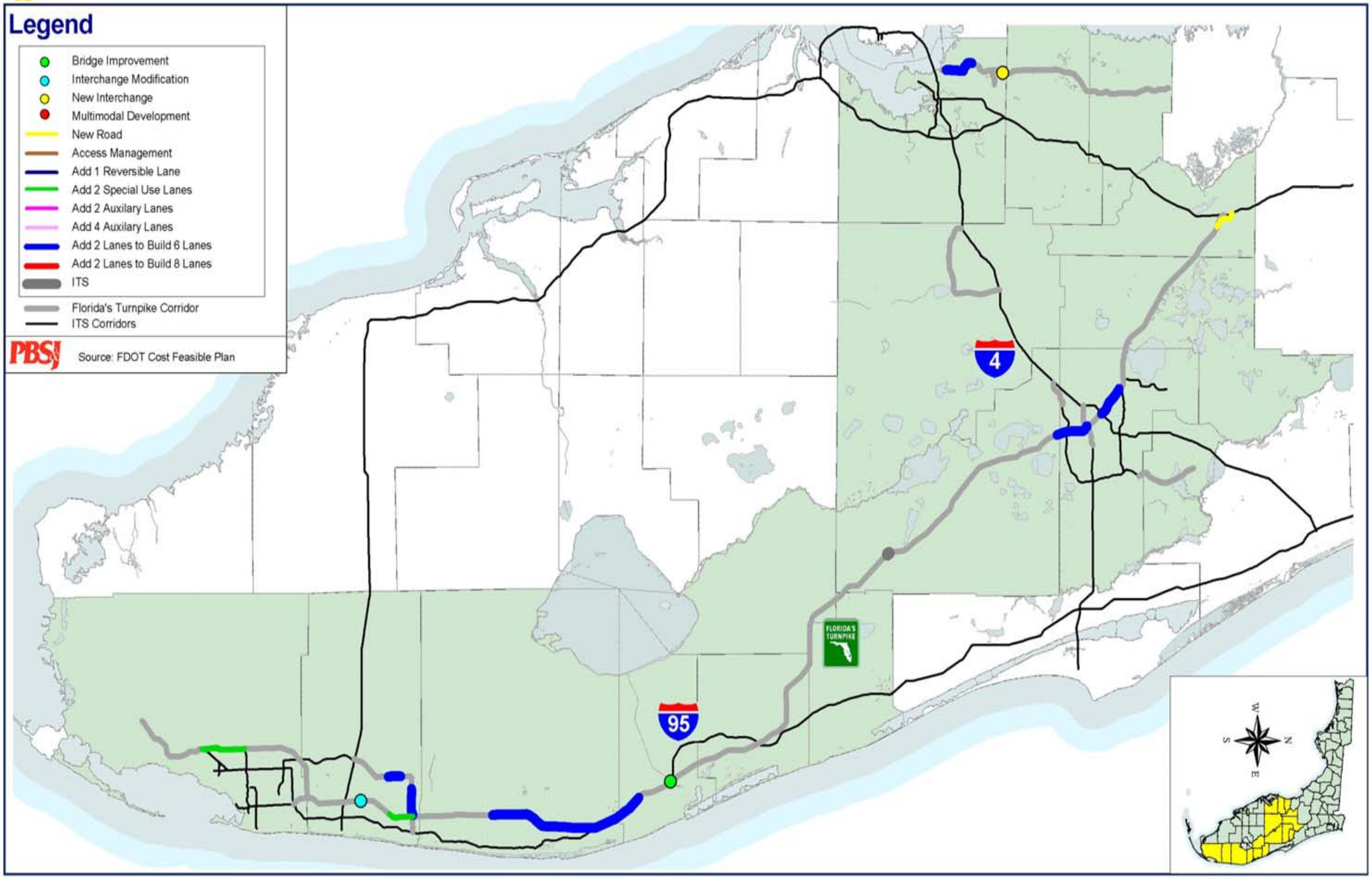


Figure 6.86 – *Ten-Year ITS Cost Feasible Plan* Improvements for Florida's Turnpike Corridor



6.6.6 Gap Analysis and Other Deployment Issues

The classification of these proposed ITS deployments into market package-related areas will assist in identifying appropriate ITS strategies to address the gaps. In order to locate gaps in the three primary services areas (FMS, RR Service Patrols, and motorist aid call boxes) programmed and planned project information and device locations were mapped in a straight-line format referencing roadway identification numbers and beginning and ending mileposts. By mapping the existing, planned, and programmed ITS, functional system gaps were easily identifiable. Table 6.24 identifies these gaps for the Turnpike facilities.

Table 6.24 – Identified ITS Functional Gaps on Florida's Turnpike Corridor

Facility	Service Area	County	District	Area Type	From	To
SR 91	FMS	Various	8	Urban/Rural	Milepost 145	Milepost 308
SR 91	RR Service Patrols	Various	8	Rural	Palm Beach/Martin County Line	Milepost 236
SR 91	RR Service Patrols	Sumter	8	Rural	Milepost 272	I-75
SR 417	RR Service Patrols	Osceola, Orange	8	Urban	Turnpike Limits	
SR 417	Motorist Aid Call Boxes	Osceola, Orange	8	Urban	Turnpike Limits	
SR 417	FMS	Osceola, Orange	8	Urban	Turnpike Limits	
SR 528	FMS	Orange	8	Urban	Turnpike Limits	
SR 589	RR Service Patrols	Various	8	Urban/Rural	Turnpike Limits	
SR 589	Motorist Aid Call Boxes	Hillsborough	8	Urban	I-275	Hillsborough/Pasco County Line
SR 589	FMS	Various	8	Urban/Rural	Turnpike Limits	
SR 570	RR Service Patrols	Polk	8	Urban	Turnpike Limits	
SR 570	Motorist Aid Call Boxes	Polk	8	Urban	Turnpike Limits	
SR 570	FMS	Polk	8	Urban	Turnpike Limits	
SR 869	RR Service Patrols	Broward	8	Urban	Turnpike Limits	
SR 869	FMS	Broward	8	Urban	Turnpike Limits	

6.6.7 Conceptual Project Implementations

The Turnpike Enterprise is developing their own comprehensive, phased implementation plan to address each of their facility's needs. The Turnpike Enterprise will also be funding all of their deployments through Turnpike revenues. Therefore, it is in the best interest of both the Turnpike Enterprise and this document not to recommend any additional conceptual projects for deployment along any of the Turnpike facilities. This document will list all of the Turnpike Enterprise's proposed deployments and provide a sequenced implementation phasing (based on priority provided by the Turnpike) and the costs for each project.

6.6.8 Conceptual Project Descriptions

No conceptual projects are proposed in addition to the Turnpike's planned projects.

6.6.9 Institutional Agreements

Several existing agreements for Florida's Turnpike corridor are identified in the *ITS Legacy Catalog* as follows:

- ***SunPass*®/E-Pass Interoperability Agreement between FDOT's Turnpike Enterprise and OOCEA** – An agreement has been signed and put in place for the sharing of electronic toll data between the Turnpike's ***SunPass***® electronic toll payment system and OOCEA's E-Pass electronic toll payment system. The agreement will allow the agencies to read electronic payment account information and financial data from each system. The transponders and software systems will remain separate, but interoperable.

- **Operation Agreements for Motorist Aid Call Boxes** – A statewide motorist aid system using roadside call boxes has been deployed along the entire Turnpike corridor at one-mile intervals. The call boxes are a partnership between FDOT and FHP. Each FDOT district maintains the call boxes, acknowledges calls for assistance, and redirects calls to the FHP. FHP dispatches service vehicles to aid the motorists. The system utilizes a microwave communications backbone operated and maintained by FDOT.

Based on the defined FMS and RR Service Patrol projects for the Turnpike and the future RTMC coverage identified in *Section 9, Operations*, the following agreements shown in Table 6.25 may be necessary to provide support for ITS deployments and cooperation among the stakeholders:

Table 6.25 – Institutional Agreements for Future ITS Project Implementations

Category	Stakeholders		Agreement
FMS	FDOT Turnpike Enterprise	FDOT District 7	Jurisdictional authority agreement for District 7 to monitor and operate the Veterans Expressway in District 7.
		FDOT District 7, FDOT District 1	Jurisdictional authority agreement for the Turnpike Enterprise to install devices and District 7 to maintain and operate the Polk County Parkway in District 1.
		FDOT District 5	Jurisdictional authority agreement for District 5 to install devices and the Turnpike Enterprise to maintain and operate SR 417, SR 528, and SR 408.
		FDOT District 6's Miami RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 4's Palm Beach RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 4's Broward County RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 4's Broward County RTMC	Operations/Maintenance agreements for the Broward County RTMC to serve as a back-up for the Pompano Beach RTMC.
		Lake Worth RCC (FHP Troop K)	Operations/Maintenance agreements for regional security, incident management, and operations between the RTMC and the RCC.
		SunPass® Service Center	MOU for toll operations and management between the RTMC and the ***SunPass***® Service Center.
		SunGuide℠ SmartRoute TMC	Communications/Coordination agreements for ATIS information sharing, exchange, and coordination between the RTMC and the TMC.
		FDOT District 5's Orlando RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
		FDOT District 7's Tampa RTMC	Communications/Coordination agreements for information sharing, exchange, and coordination between RTMCs.
RR Service Patrols	FDOT Turnpike Enterprise	Private Sectors	Legal agreements for the procurement of services by the Turnpike Enterprise from private sectors to perform RR Service Patrols. FHP provides the dispatch.
		FDOT District 4's Palm Beach County RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		FDOT District 4's Broward County RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		FDOT District 6's Miami RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		FDOT District 5's Orlando RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.
		FDOT District 7's Tampa RTMC	Operations/Maintenance agreements for incident management and operations between the RR Service Patrols and the RTMC.

Table 6.25 (Continued)

Category	Stakeholders		Agreement
FMS / RR Service Patrols	FDOT Turnpike Enterprise	FDOT District 5	Funding, design, panning, procurement, construction, and operations and maintenance agreements when implementing ITS projects among authorities.
		FDOT District 7	
		FDOT District 1	
		FDOT District 6	
		FDOT District 4	

6.6.10 Florida's Turnpike Corridor ITS Needs

Either FDOT's work program or the Turnpike Enterprise identified all projects and project cost estimates indicated in this document. Table 6.26 and Figure 6.87 identifies Florida's Turnpike corridor ITS needs. The summary of ITS unit costs utilized by the ITS Office is contained in *Appendix F*.

Table 6.26 – Florida's Turnpike Corridor ITS Needs

Facility: SR 417

District	From	To	Description	Type	Phase	PDC
5	Northern Turnpike Section to I-4		CCTV, DMS and Vehicle Detection	FMS	PE	$0.190
5	Northern Turnpike Section to I-4		CCTV, DMS and Vehicle Detection	FMS	CONST	$1.267
5	Northern Turnpike Section to I-4		CCTV, DMS and Vehicle Detection	FMS	CEI	$0.253
5	Southern Turnpike Section		CCTV, DMS and Vehicle Detection	FMS	PE	$0.079
5	Southern Turnpike Section		CCTV, DMS and Vehicle Detection	FMS	CONST	$0.524
5	Southern Turnpike Section		CCTV, DMS and Vehicle Detection	FMS	CEI	$0.105
					PDC Sum	$2.417

Facility: SR 417

District	From	To	Description	Type	Phase	PDC
8	MP 38	MP 54	SunNav ITS Phase VII	FMS	CONST	$3.520
8	MP 0	MP 5	SunNav ITS Phase VIII	FMS	CONST	$1.100
					PDC Sum	$4.620

Facility: SR 528

District	From	To	Description	Type	Phase	PDC
5	Turnpike Limits		CCTV, DMS and Vehicle Detection	FMS	PE	$0.173
5	Turnpike Limits		CCTV, DMS and Vehicle Detection	FMS	CONST	$1.151
5	Turnpike Limits		CCTV, DMS and Vehicle Detection	FMS	CEI	$0.230
					PDC Sum	$1.554

Table 6.26 (Continued)

Facility: SR 528

District	From	To	Description	Type	Phase	PDC
8	MP 0	MP 8	SunNav ITS Phase V	FMS	CONST	$1.760
					PDC Sum	$1.760

Facility: SR 570

District	From	To	Description	Type	Phase	PDC
8	I-4 East	I-4 West	CCTV, DMS and Vehicle Detection	FMS	PE	$0.313
8	I-4 East	I-4 West	CCTV, DMS and Vehicle Detection	FMS	CONST	$2.087
8	I-4 East	I-4 West	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.417
					PDC Sum	$2.818

Facility: SR 589

District	From	To	Description	Type	Phase	PDC
8	I-275	Suncoast	CCTV, DMS and Vehicle Detection	FMS	PE	$0.563
8	I-275	Suncoast	CCTV, DMS and Vehicle Detection	FMS	CONST	$3.753
8	I-275	Suncoast	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.751
8	MP 2	MP 55	SunNav ITS Phase VI	FMS	CONST	$11.660
					PDC Sum	$16.727

Facility: SR 869

District	From	To	Description	Type	Phase	PDC
8	MP 0	MP 17	SunNav ITS Phase IV	FMS	CONST	$3.740
					PDC Sum	$3.740

Table 6.26 (Continued)

Facility: SR 91

District	From	To	Description	Type	Phase	PDC
8	MP 0x	MP 4x	CCTV, DMS and Vehicle Detection	FMS	PE	$0.124
8	MP 0x	MP 4x	CCTV, DMS and Vehicle Detection	FMS	CONST	$0.626
8	MP 0x	MP 4x	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.165
8	MP 4x	MP 75	CCTV, DMS and Vehicle Detection	FMS	PE	$0.491
8	MP 4x	MP 75	CCTV, DMS and Vehicle Detection	FMS	CONST	$3.273
8	MP 4x	MP 75	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.655
8	Orange Co Line	Orange Co Line	CCTV, DMS and Vehicle Detection	FMS	PE	$0.380
8	Orange Co Line	Orange Co Line	CCTV, DMS and Vehicle Detection	FMS	CONST	$2.534
8	Orange Co Line	Orange Co Line	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.507
8	Orange Co Line	Wildwood	CCTV, DMS and Vehicle Detection	FMS	PE	$0.317
8	Orange Co Line	Wildwood	CCTV, DMS and Vehicle Detection	FMS	CONST	$2.110
8	Orange Co Line	Wildwood	CCTV, DMS and Vehicle Detection	FMS	CEI	$0.422
8	Indian River/Osceola Co. Line	Osceola/ Orange Co. Line	Incident / Freeway Management System	FMS	PE	$0.536
8	Indian River/Osceola Co. Line	Osceola/ Orange Co. Line	Incident / Freeway Management System	FMS	CONST	$3.571
8	Indian River/Osceola Co. Line	Osceola/ Orange Co. Line	Incident / Freeway Management System	FMS	CEI	$0.714
8	MP 75	MP 145	SunNav ITS Phase II	FMS	CONST	$13.985
8	MP 299	MP 309	Wildwood ITS	FMS	CONST	$1.193
8	MP 0	MP 309	Backbone Infrastructure	FMS	CONST	$1.380
8	MP 0	MP 75	SunNav ITS Phase III	FMS	CONST	$4.041
8	MP 0	MP 309	Communication Connectivity	FMS	CONST	$3.531

PDC Sum $40.754

Table 6.26 (Continued)

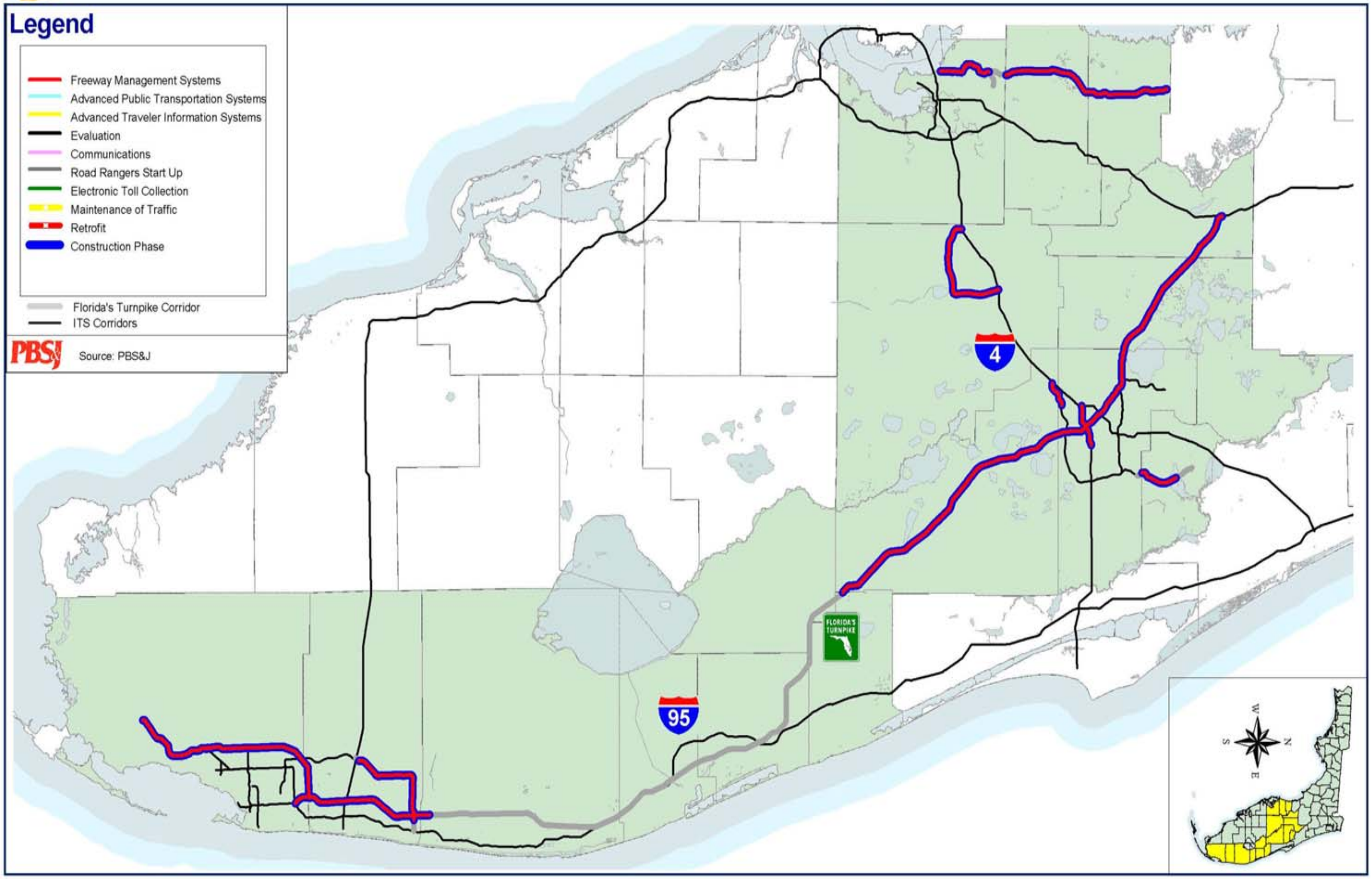
Facility: *Various*

District	From	To	Description	Type	Phase	PDC
8	Statewide	Statewide	ITS SmartZone	FMS	CONST	$0.285
8	Statewide	Statewide	System Maintenance	FMS	CONST	$11.241
					PDC Sum	$11.526

Facility: *Various*

District	From	To	Description	Type	Phase	PDC
			Grand Total All Facilities			*$85.915*

Figure 6.87 – Florida's Turnpike Corridor ITS Needs



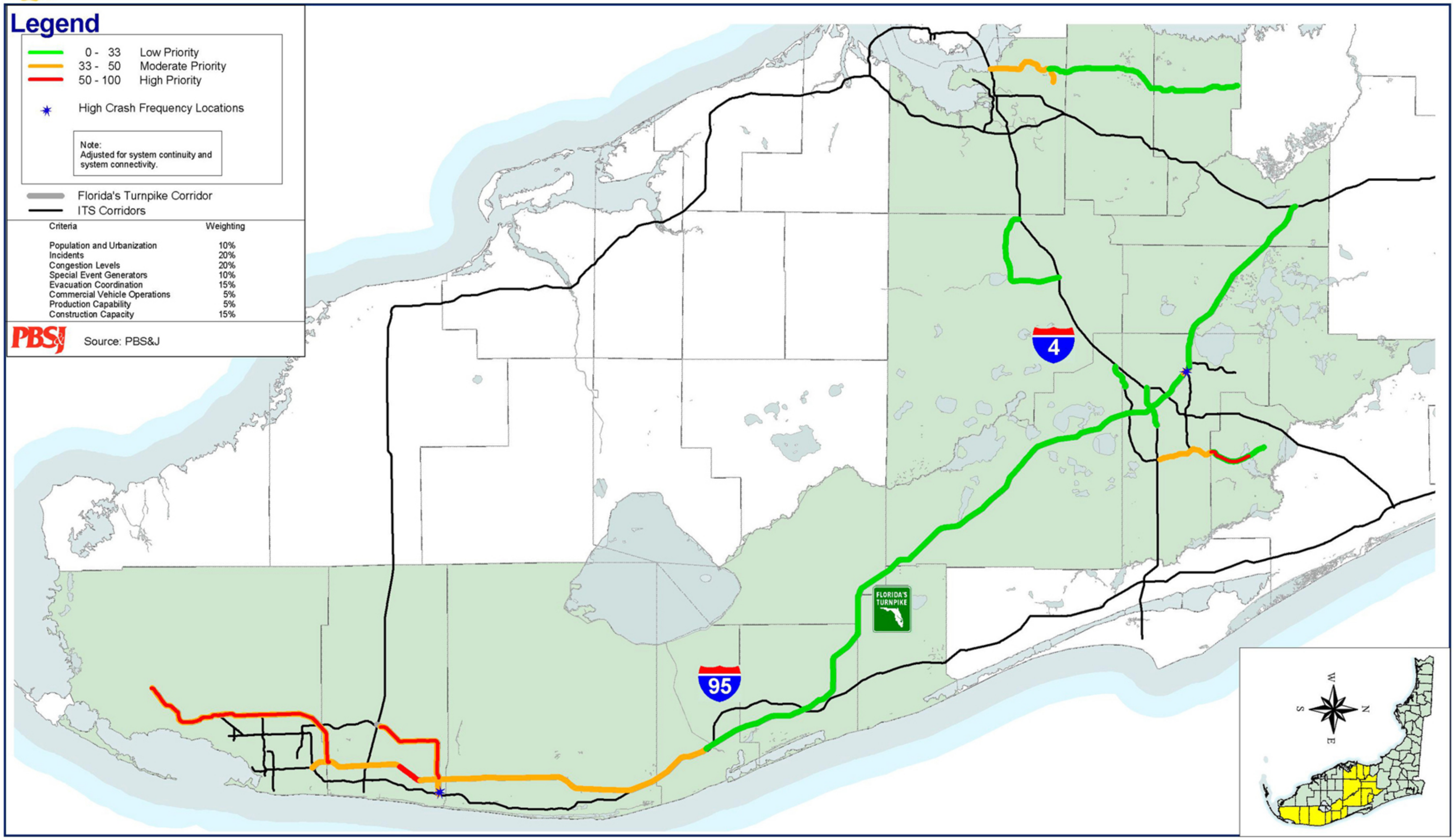
6.6.11 Project Priorities and Phasing

Table 6.27 summarizes the high and moderate priority segments for the Turnpike facilities. The need for ITS deployment is supported on a statewide basis for the principal FIHS limited-access corridors. This table summarizes the relative priority of ITS for the purposes of phasing implementation only. Figure 6.88 illustrates the result of the prioritization analysis for Florida's Turnpike corridor and recommended prioritization based on high, moderate, and low priorities.

Table 6.27 – Priority Segments for ITS Deployments on Florida's Turnpike Corridor

Facility	Relative Priority	Area	From	To	Existing FMS?
Florida's Turnpike	Moderate	Palm Beach/ Broward Counties	HEFT	Palm Beach/ Martin County Line	
HEFT	Moderate	Miami-Dade County	Southern Terminus	Florida's Turnpike	
Sawgrass Expressway	Moderate	Miami-Dade County	I-75	Florida's Turnpike	
Veterans' Expressway	Moderate	Tampa	I-275	SR 52	

Figure 6.88 – Florida's Turnpike Corridor *ITS Plan* Priorities (Adjusted)



6.7 Ten-Year ITS Cost Feasible Plan

6.7.1 Summary of ITS Needs

Table 6.28 and Figures 6.89 through 6.98 summarize the ITS projects that are currently programmed for deployment along the FIHS limited-access corridors. These projects are funded using ITS Program funds, district-allocated funds, Turnpike revenue, expressway programs, and private sources and the additional projects that have been identified are funded using ITS Program funds through 2012. This *Ten-Year ITS Cost Feasible Plan* was completed on October 21, 2002, and approved by the FDOT Executive Committee on October 23, 2002.

Table 6.28 - Ten-Year ITS Cost Feasible Plan (October 21,2002)

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
4100201	1	I-4	From Hillsborough Co. Line to Polk Co. Line	I-4 Corridor Consultant	MOT	CONST	$5.47											$5.47	District	
4100201	1	I-4	From Hillsborough Co. Line to Polk Co. Line	I-4 Corridor Consultant	MOT	CEI	$1.40											$1.40	Statewide	
102501	1	I-75	From Collier/Lee County Line to Lee/Charlotte County Line	Freeway and Incident Management System	FMS	PE				$0.41								$0.41	Statewide	
102502	1	I-75	From Collier/Lee County Line to Lee/Charlotte County Line	Freeway and Incident Management System	FMS	CONST				$3.42								$3.42	Statewide	
102503	1	I-75	From Collier/Lee County Line to Lee/Charlotte County Line	Freeway and Incident Management System	FMS	CEI				$0.68								$0.68	Statewide	
102701	1	I-75	From Sarasota/Manatee County Line to I-275 (Manatee)	Freeway Management System	FMS	PE										$0.65		$0.65	Statewide	
102702	1	I-75	From Sarasota/Manatee County Line to I-275 (Manatee)	Freeway Management System	FMS	CONST											$4.47	$4.47	Statewide	
102703	1	I-75	From Sarasota/Manatee County Line to I-275 (Manatee)	Freeway Management System	FMS	CEI											$0.89	$0.89	Statewide	
102801	1	I-75	From Charlotte/ Sarasota County Line to Sarasota /Manatee County Line	Freeway Incident Management System	FMS	PE								$0.90				$0.90	Statewide	
102802	1	I-75	From Charlotte/ Sarasota County Line to Sarasota/ /Manatee County Line	Freeway Incident Management System	FMS	CONST									$5.03	$2.80		$7.83	Statewide	
102803	1	I-75	From Charlotte/ Sarasota County Line to Sarasota /Manatee County Line	Freeway Incident Management System	FMS	CEI									$1.01	$0.56		$1.57	Statewide	
103602	1	I-75		Ft. Myers RTMC/Systems Integration	RTMC	CONST				$2.22								$2.22	Statewide	
104201	1	I-75	From Broward/Collier County Line to Collier/Lee County Line	Freeway Incident Management System	FMS	PE				$0.68								$0.68	Statewide	
104202	1	I-75	From Broward/Collier County Line to Collier/Lee County Line	Freeway Incident Management System	FMS	CONST				$5.69								$5.69	Statewide	
104203	1	I-75	From Broward/Collier County Line to Collier/Lee County Line	Freeway Incident Management System	FMS	CEI				$1.14								$1.14	Statewide	
111701	1	I-75		Sarasota TMC/Building	RTMC	PE				$0.27								$0.27	Statewide	
111702	1	I-75		Sarasota TMC/Building	RTMC	CONST				$2.22								$2.22	Statewide	
111703	1	I-75		Sarasota TMC/Building	RTMC	CEI				$0.44								$0.44	Statewide	
111802	1	I-75		Sarasota TMC/Systems	RTMC	CONST				$0.68								$0.68	Statewide	
137301	1	I-75	From Collier/Lee Co. Line to Lee/Charlotte Co. Line	Telecom Infrastructure	COM	PE				$0.53								$0.53	Statewide	
137302	1	I-75	From Collier/Lee Co. Line to Lee/Charlotte Co. Line	Telecom Infrastructure	COM	CONST				$4.39								$4.39	Statewide	
137303	1	I-75	From Collier/Lee Co. Line to Lee/Charlotte Co. Line	Telecom Infrastructure	COM	CEI				$0.35								$0.35	Statewide	
137401	1	I-75	From Lee/ Charlotte Co. Line to Charlotte/Sarasota Co. Line	Telecom Infrastructure	COM	PE								$0.39				$0.39	Statewide	
137402	1	I-75	From Lee/ Charlotte Co. Line to Charlotte/Sarasota Co. Line	Telecom Infrastructure	COM	CONST								$3.22				$3.22	Statewide	
137403	1	I-75	From Lee/ Charlotte Co. Line to Charlotte/Sarasota Co. Line	Telecom Infrastructure	COM	CEI								$0.26				$0.26	Statewide	
137501	1	I-75	From Sarasota/Manatee Co. Line to I-275 (Manatee County)	Telecom Infrastructure	COM	PE										$0.29		$0.29	Statewide	
137502	1	I-75	From Sarasota/Manatee Co. Line to I-275 (Manatee County)	Telecom Infrastructure	COM	CONST											$2.48	$2.48	Statewide	
137503	1	I-75	From Sarasota/Manatee Co. Line to I-275 (Manatee County)	Telecom Infrastructure	COM	CEI											$0.20	$0.20	Statewide	
138201	1	I-75	From Charlotte/Sarasota Co. Line to Sarasota/Manatee Co. Line	Telecom Infrastructure	COM	PE									$0.77			$0.77	Statewide	
138202	1	I-75	From Charlotte/Sarasota Co. Line to Sarasota/Manatee Co. Line	Telecom Infrastructure	COM	CONST									$6.44			$6.44	Statewide	
138203	1	I-75	From Charlotte/Sarasota Co. Line to Sarasota/Manatee Co. Line	Telecom Infrastructure	COM	CEI									$0.52			$0.52	Statewide	
138501	1	I-75	From Lee/Charlotte Co. Line to Charlotte/ Sarasota Co. Line	Freeway and Incident Management System	FMS	PE								$1.30				$1.30	Statewide	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
138502	1	I-75	From Lee/Charlotte Co. Line to Charlotte/Sarasota Co. Line	Freeway and Incident Management System	FMS	CONST								$6.51				$6.51	Statewide	
138503	1	I-75	From Lee/Charlotte Co. Line to Charlotte/Sarasota Co. Line	Freeway and Incident Management System	FMS	CEI								$0.78				$0.78	Statewide	
2020621	1	I-75	From Lee/ Charlotte County Line to Manatee/Hillsborough County Line	I-75 Incident Management Project Plan for Charlotte, Sarasota and Manatee Counties	FMS	Planning	$0.50											$0.50	District	Initially showing PE phase updated to planning in order to be consistent with Work Program
2133061	2		From Jacksonville TMC to Jacksonville TMC	Jax ITS/Phase-1 Traffic Center Building	FMS	CONST	$0.11											$0.11	District	
204401	2	I-295	From I-10 to I-95 N	Incident Management System, Traveler Information, Management Center and Fiber	FMS	PE										$0.48		$0.48	Statewide	
204402	2	I-295	From I-10 to I-95 N	Incident Management System, Traveler Information, Management Center and Fiber	FMS	CONST											$4.17	$4.17	Statewide	
204403	2	I-295	From I-10 to I-95 N	Incident Management System, Traveler Information, Management Center and Fiber	FMS	CEI											$0.83	$0.83	Statewide	
204501	2	I-295	From I-95 S to I-10	Incident Management System, Traveler Information, Management Center and Fiber	FMS	PE									$0.73			$0.73	Statewide	
204502	2	I-295	From I-95 S to I-10	Incident Management System, Traveler Information, Management Center and Fiber	FMS	CONST										$5.01		$5.01	Statewide	
204503	2	I-295	From I-95 S to I-10	Incident Management System, Traveler Information, Management Center and Fiber	FMS	CEI										$1.00		$1.00	Statewide	
237001	2	I-295	From I-10 to I-95N	Telecom Infrastructure	COM	PE									$0.26			$0.26	Statewide	
237002	2	I-295	From I-10 to I-95N	Telecom Infrastructure	COM	CONST										$2.25		$2.25	Statewide	
237003	2	I-295	From I-10 to I-95N	Telecom Infrastructure	COM	CEI										$0.17		$0.17	Statewide	
237101	2	I-295	From I-95S to I-10	Telecom Infrastructure	COM	PE									$0.37			$0.37	Statewide	
237102	2	I-295	From I-95S to I-10	Telecom Infrastructure	COM	CONST										$3.22		$3.22	Statewide	
237103	2	I-295	From I-95S to I-10	Telecom Infrastructure	COM	CEI										$0.26		$0.26	Statewide	
203901	2	I-95	From I-10 to Airport Road	Telecom Infrastructure	COM	PE			$0.17									$0.17	Statewide	
203902	2	I-95	From I-10 to Airport Road	Telecom Infrastructure	COM	CONST			$1.45									$1.45	Statewide	
203903	2	I-95	From I-10 to Airport Road	Telecom Infrastructure	COM	CEI			$0.12									$0.12	Statewide	
204001	2	I-95	From I-10 to Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	PE			$0.15									$0.15	Statewide	
204002	2	I-95	From I-10 to Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	CONST			$1.01									$1.01	Statewide	
204003	2	I-95	From I-10 to Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	CEI			$0.20									$0.20	Statewide	
204101	2	I-95	From Trout River to Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	PE			$0.28									$0.28	Statewide	
204102	2	I-95	From Trout River to Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	CONST			$0.86	$1.05								$1.91	Statewide	
204103	2	I-95	From Trout River to Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units,	FMS	CEI			$0.17	$0.21								$0.38	Statewide	
2132961	2	I-95	From I-295 S to I-10	Jacksonville Interstate Surveillance and Control System Phase 3	FMS	PE	$0.08											$0.08	District	
2132961	2	I-95	From I-295 S to I-10	Jacksonville Interstate Surveillance and Control System Phase 3	FMS	D/B		$6.62										$6.62	District	
	2	Reserve		District ITS Reserve	TBD	Capital				$1.00	$4.40							$5.40	Statewide	
308301	3	I-10		Pensacola Traffic Management Center Building	RTMC	PE						$0.14						$0.14	Statewide	
308302	3	I-10		Pensacola Traffic Management Center Building	RTMC	CONST						$1.95						$1.95	Statewide	
308303	3	I-10		Pensacola Traffic Management Center Building	RTMC	CEI						$0.39						$0.39	Statewide	
308402	3	I-10		Pensacola Traffic Management Center Systems	RTMC	CONST						$0.68						$0.68	Statewide	
313201	3	I-10		Tallahassee Regional Traffic Management Center Building	RTMC	PE							$0.14					$0.14	Statewide	
313202	3	I-10		Tallahassee Regional Traffic Management Center Building	RTMC	CONST							$2.00					$2.00	Statewide	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
313203	3	I-10		Tallahassee Regional Traffic Management Center Building	RTMC	CEI							$0.40					$0.40	Statewide	
313302	3	I-10		Tallahassee Regional Traffic Management Center Systems	RTMC	CONST							$0.70					$0.70	Statewide	
321501	3	I-10	From Welcome Center to East of SR 87	Pensacola Area Freeway Management System	FMS	PE							$1.14					$1.14	Statewide	
321502	3	I-10	From Welcome Center to East of SR 87	Pensacola Area Freeway Management System	FMS	CONST							$7.58					$7.58	Statewide	This project covers the entire urban area of Pensacola along I-10.
321503	3	I-10	From Welcome Center to East of SR 87	Pensacola Area Freeway Management System	FMS	CEI							$1.52					$1.52	Statewide	
321701	3	I-10	From West of US 90 (Gadsden County) to East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	PE							$0.85					$0.85	Statewide	
321702	3	I-10	From West of US 90 (Gadsden County) to East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	CONST								$5.85				$5.85	Statewide	
321703	3	I-10	From West of US 90 (Gadsden County) to East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	CEI								$1.17				$1.17	Statewide	
336701	3	I-10	From US 90 West to US 90 East	Telecom Infrastructure	COM	PE							$0.25					$0.25	Statewide	
336702	3	I-10	From US 90 West to US 90 East	Telecom Infrastructure	COM	CONST							$2.12					$2.12	Statewide	
336703	3	I-10	From US 90 West to US 90 East	Telecom Infrastructure	COM	CEI							$0.17					$0.17	Statewide	
336801	3	I-10	From Alabama State Line/I-10 Welcome Center to SR 87	Telecom Infrastructure	COM	PE							$0.40					$0.40	Statewide	
336802	3	I-10	From Alabama State Line/I-10 Welcome Center to SR 87	Telecom Infrastructure	COM	CONST							$3.32					$3.32	Statewide	
336803	3	I-10	From Alabama State Line/I-10 Welcome Center to SR 87	Telecom Infrastructure	COM	CEI							$0.27					$0.27	Statewide	
307901	3	I-110	From I-10 to Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	PE							$0.40					$0.40	Statewide	
307902	3	I-110	From I-10 to Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	CONST							$2.67					$2.67	Statewide	This project includes the entire length of I-110.
307903	3	I-110	From I-10 to Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	CEI							$0.53					$0.53	Statewide	
336901	3	I-110	From Pensacola Bay Bridge to I-10	Telecom Infrastructure	COM	PE							$0.11					$0.11	Statewide	
336902	3	I-110	From Pensacola Bay Bridge to I-10	Telecom Infrastructure	COM	CONST							$0.90					$0.90	Statewide	Project includes the entire length of I-110.
336903	3	I-110	From Pensacola Bay Bridge to I-10	Telecom Infrastructure	COM	CEI							$0.07					$0.07	Statewide	
407501	4	I-595	From I-75 to U.S. 1	OVCS Variable Speed Zone	FMS	PE									$0.39			$0.39	Statewide	
407502	4	I-595	From I-75 to U.S. 1	OVCS Variable Speed Zone	FMS	CONST									$2.61			$2.61	Statewide	
407503	4	I-595	From I-75 to U.S. 1	OVCS Variable Speed Zone	FMS	CEI									$0.52			$0.52	Statewide	
2317051	4	I-595	From Eastern Terminus to Sawgrass Expressway	I-595 Broward County Changeable Message Sign System	ATIS	CONST	$1.45											$1.45	District	
401401	4	I-75	From Sawgrass Expressway to Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE						$0.85						$0.85	Statewide	
401402	4	I-75	From Sawgrass Expressway to Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST							$5.87					$5.87	Statewide	Funded in FIHS CFP
401403	4	I-75	From Sawgrass Expressway to Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI							$1.17					$1.17	Statewide	
423301	4	I-75	From Southern Terminus to Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	PE						$1.68						$1.68	Statewide	
423302	4	I-75	From Southern Terminus to Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST						$5.60	$5.79					$11.39	Statewide	
423303	4	I-75	From Southern Terminus to Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CEI						$1.12	$1.16					$2.28	Statewide	
438301	4	I-75	From Sawgrass Expressway to Broward/Collier Co. Line	Telecom Infrastructure	COM	PE						$0.55						$0.55	Statewide	
438302	4	I-75	From Sawgrass Expressway to Broward/Collier Co. Line	Telecom Infrastructure	COM	CONST						$4.59						$4.59	Statewide	
438303	4	I-75	From Sawgrass Expressway to Broward/Collier Co. Line	Telecom Infrastructure	COM	CEI						$0.37						$0.37	Statewide	
438401	4	I-75	From Southern Terminus to Sawgrass Expressway	Telecom Infrastructure	COM	PE						$0.31						$0.31	Statewide	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
438402	4	I-75	From Southern Terminus to Sawgrass Expressway	Telecom Infrastructure	COM	CONST						$2.58						$2.58	Statewide	
438403	4	I-75	From Southern Terminus to Sawgrass Expressway	Telecom Infrastructure	COM	CEI						$0.21						$0.21	Statewide	
4111961	4	I-75	From SR 826 to Broward/Collier Co. Line	I-75 ITS Corridor Plan	ATIS	PD& E	$0.31											$0.31	District	
407401	4	I-95	From Broward/Palm Beach Co. Line to Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	PE									$0.39			$0.39	Statewide	
407402	4	I-95	From Broward/Palm Beach Co. Line to Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	CONST										$2.69		$2.69	Statewide	FIHS CFP
407403	4	I-95	From Broward/Palm Beach Co. Line to Palm Beach/Martin Co. Line	OVCS Variable Speed Zone	FMS	CEI										$0.54		$0.54	Statewide	
2316541	4	I-95		Broward County I.T.S Operational Facility (TMC)	RTMC	PE	$0.35											$0.35	District	
2316541	4	I-95		Broward County I.T.S Operational Facility (TMC)	RTMC	CONST	$13.55											$13.55	District	
2316541	4	I-95		Broward County I.T.S Operational Facility (TMC)	RTMC	Utilities	$0.10											$0.10	District	
2316551	4	I-95	From Dade/Broward Co. Line to Broward/Palm Beach Co Line	Advance Incident Information System (AIIS)	ATIS	PE	$1.31											$1.31	District	
2316551	4	I-95	From Dade/Broward Co. Line to Broward/Palm Beach Co Line	Advance Incident Information System (AIIS)	ATIS	CONST			$11.26									$11.26	Statewide	
2316551	4	I-95	From Dade/Broward Co. Line to Broward/Palm Beach Co Line	Advance Incident Information System (AIIS)	ATIS	Utilities	$0.10											$0.10	District	
2316591	4	I-95	From Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95 Broward County Changeable Message Sign	ATIS	CONST	$0.83											$0.83	District	
2316601	4	I-95	From Broward/Palm Beach Co Line to SR 869 Sawgrass Expressway	Broward County Freeway Video Monitoring System	FMS	CONST	$0.59											$0.59	District	
2317391	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95/I-595 Video Monitoring System Cameras Broward County	FMS	PE		$1.05										$1.05	District	
2317391	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95/I-595 Video Monitoring System Cameras Broward County	FMS	CONST				$10.67								$10.67	District	
2319301	4	I-95		Palm Beach County ITS Operations Facility	RTMC	PE	$1.05											$1.05	District	
2319301	4	I-95		Palm Beach County ITS Operations Facility	RTMC	CONST				$6.58								$6.58	Statewide	
2319301	4	I-95		Palm Beach County ITS Operations Facility	RTMC	PD& E	$1.05											$1.05	District	
4048181	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	Arterial Incident Detour Route Sign System	FMS	PE		$0.55										$0.55	District	
4048181	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	Arterial Incident Detour Route Sign System	FMS	CONST				$2.85								$2.85	District	
4048271	4	I-95	From Broward/Palm Beach Co Line to Palm Beach/Martin Co. Line	Palm Beach County Dynamic Message Sign System (ATIS)	ATIS	PE	$0.08											$0.08	District	
4048271	4	I-95	From Broward/Palm Beach Co Line to Palm Beach/Martin Co. Line	Palm Beach County Dynamic Message Sign System (ATIS)	ATIS	CONST						$4.20						$4.20	Statewide	
4048271	4	I-95	From Broward/Palm Beach Co Line to Palm Beach/Martin Co. Line	Palm Beach County Dynamic Message Sign System (ATIS)	ATIS	CONST						$5.00						$5.00	District	
4090471	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	Broward Co. APTS Master Plan	APTS	PD& E	$0.26											$0.26	District	
4110671	4	I-95	From Broward/Palm Beach Co Line to Palm Beach/Martin Co. Line	Interim Traffic Management System (ITMS)	MOT	PE	$7.50											$7.50	Statewide	
4110671	4	I-95	From Broward/Palm Beach Co Line to Palm Beach/Martin Co. Line	Interim Traffic Management System (ITMS)	MOT	D/B		$8.33	$2.80	$2.80	$2.90	$3.00	$3.10	$3.20				$26.13	Statewide	
4124951	4	I-95	From Palm Beach/Martin Co. Line to Indian River/Brevard Co. Line	SR 9/I-95 Freeway Road Rangers Service Patrol	RR	MAINT				$1.10								$1.10	Statewide	
	4	Reserve		District ITS Reserve	TBD	Capital								$5.40				$5.40	Statewide	
4125201	4	Various	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95/I-595/I-75 Lane Condition Priority System	FMS	PE				$0.40								$0.40	Statewide	
4125201	4	Various	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95/I-595/I-75 Lane Condition Priority System	FMS	CONST				$0.66								$0.66	Statewide	
503802	5	I-4	From SR 44 to I-95	I-4 Surveillance Motorist Information System Phase 5	FMS	CONST			$4.83									$4.83	Statewide	Needed to complete I-4/I-95 SMIS FON provided by a previous project.
503803	5	I-4	From SR 44 to I-95	I-4 Surveillance Motorist Information System Phase 5	FMS	CEI			$0.97									$0.97	Statewide	
2409482	5	I-4	From SR 44 to I-95	Integrate ITS in Volusia County	FMS	D/B	$0.15											$0.15	District	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
2424442	5	I-4	From SR 528 to SR 482	I-4 Auxiliary Lanes from SR 528 to SR 482	FMS	CONST	$0.37											$0.37	District	
2424842	5	I-4	From SR 408 Interchange to	I-4 Interchange @ E/W Expressway Interim Improvements (SR 408)	FMS	CONST				$0.73								$0.73	District	
2424961	5	I-4	From SR 435 to Turnpike	I-4 Auxiliary Lanes from SR 435 to Turnpike	FMS	CONST	$0.22											$0.22	District	
2424991	5	I-4	From SR 423 to SR 436	I-4 Auxiliary Lanes from SR 423 to SR 436	FMS	CONST	$5.50											$5.50	District	
2425231	5	I-4	From World Drive to US 27	I-4 SMIS (7 Miles) Phase 4 / 6- Lane Reconstruction Project	FMS	CONST		$2.00										$2.00	District	
2425311	5	I-4	From US 192 Interchange to	I-4 Interchange Freeway Management System	FMS	CONST			$1.29									$1.29	District	
2427021	5	I-4	From Lake Mary Blvd to SR 472	I-4 SMIS (22 Miles) Phase 3 - St. Johns River Bridge Replacement / Reconstruction	FMS	CONST	$3.00											$3.00	District	
4055151	5	I-4	From SR 536 to SR 528	I-4 Auxiliary Lanes from SR 536 to SR 528	FMS	CONST	$0.34											$0.34	District	
4107242	5	I-4	From SR 44 to DASH (I-95)	I-4 SMIS Fiber Optic Connection to DASH	COM	CONST		$0.56										$0.56	Statewide	
4107251	5	I-4		Regional Traffic Management Center (RTMC) Upgrade/ Retrofit	RTMC	D/B	$1.97											$1.97	District	
512801	5	I-95	From SR 44 to US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	PE					$0.32							$0.32	Statewide	
512802	5	I-95	From SR 44 to US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	CONST					$2.10							$2.10	Statewide	
512803	5	I-95	From SR 44 to US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	CEI					$0.42							$0.42	Statewide	
523901	5	I-95	From SR 514 to SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	PE					$1.58							$1.58	Statewide	
523902	5	I-95	From SR 514 to SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	CONST					$9.74							$9.74	Statewide	
523903	5	I-95	From SR 514 to SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	CEI					$1.94							$1.94	Statewide	
540401	5	I-95	From SR 514 to SR 44	Telecom Infrastructure	COM	PE					$0.75							$0.75	Statewide	
540402	5	I-95	From SR 514 to SR 44	Telecom Infrastructure	COM	CONST					$6.28							$6.28	Statewide	
540403	5	I-95	From SR 514 to SR 44	Telecom Infrastructure	COM	CEI					$0.47							$0.47	Statewide	
540501	5	I-95	From SR 44 to US 1 (Volusia County)	Telecom Infrastructure	COM	PE				$0.26								$0.26	Statewide	
540502	5	I-95	From SR 44 to US 1 (Volusia County)	Telecom Infrastructure	COM	CONST				$2.17								$2.17	Statewide	
540503	5	I-95	From SR 44 to US 1 (Volusia County)	Telecom Infrastructure	COM	CEI				$0.17								$0.17	Statewide	
2422501	5	I-95	From SR 528 & I-95 Interchange to	I-95 phase 2 I-95/SR 528 Hurricane Evacuation System	FMS	D/B	$0.66											$0.66	District	
2422501	5	I-95	From SR 528 & I-95 Interchange to	I-95 Phase 2 I-95/SR 528 Hurricane Evacuation System	FMS	D/B	$3.00											$3.00	Statewide	
	5	Reserve		District ITS Reserve	TBD	Capital					$2.00	$3.40						$5.40	Statewide	
4701	5	Various		ITS-01:OOCEA's SR 408 & SR 417	FMS	PE	$0.24											$0.24	Expwy Auth	Coms on OOCEA's FON
4702	5	Various	From Kirkman Road to SR 417 West	ITS-01:OOCEA's SR 408 & SR 417	FMS	CONST	$2.42											$2.42	Expwy Auth	Coms on OOCEA's FON
4901	5	Various		ITS-02: OOCEA's SR 408, SR 417, & SR 528	FMS	PE	$0.16											$0.16	Expwy Auth	Coms on OOCEA's FON: Costs in SR 408 section 1 entry for ITS-3
4902	5	Various		ITS-02: OOCEA's SR 408, SR 417, & SR 528	FMS	CONST		$1.60										$1.60	Expwy Auth	Coms on OOCEA's FON: Costs in SR 408 section 1 entry for ITS-3
5401	5	Various		ITS-03: OOCEA's SR 408, SR 417, & SR 528	FMS	PE	$0.30											$0.30	Expwy Auth	Coms on OOCEA's FON
5402	5	Various		ITS-03: OOCEA's SR 408, SR 417, & SR 528	FMS	CONST		$3.03										$3.03	Expwy Auth	Coms on OOCEA's FON: Costs in SR 408 entry for ITS-4
5601	5	Various		ITS-04: OOCEA's SR 408, SR 417, & SR 528	FMS	PE		$0.33										$0.33	Expwy Auth	Coms on OOCEA's FON
5602	5	Various		ITS-04: OOCEA's SR 408, SR 417, & SR 528	FMS	CONST		$3.32										$3.32	Expwy Auth	Coms on OOCEA's FON
5801	5	Various		ITS-05: OOCEA's SR 408, SR 417, SR 528, SR 520, & SR 50	FMS	CONST			$2.82									$2.82	Expwy Auth	Coms on OOCEA's FON

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FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
5802	5	Various		ITS-05: OOCEA's SR 408, SR 417, SR 528, SR 520, & SR 50	FMS	PE			$0.28									$0.28	Expwy Auth	Coms on OOCEA's FON
6301	5	Various		ITS-06: Traveler Information	ATIS	PE			$0.13									$0.13	Expwy Auth	
6302	5	Various		ITS-06: Traveler Information	ATIS	CONST			$1.35									$1.35	Expwy Auth	
6401	5	Various		ITS-07: Phase I System Automation	FMS	PE				$0.32								$0.32	Expwy Auth	Coms on OOCEA's FON
6402	5	Various		ITS-07: Phase I System Automation	FMS	CONST				$0.75								$0.75	Expwy Auth	Coms on OOCEA's FON
2502383	6			ITS Building/Comm. HUB Equipment Purchase (RTMC)	FMS	Capital			$0.10									$0.10	Statewide	
2516831	6	I-195	From NW 11 Avenue to SR 907/Alton Road	SR 112/I-195 ITS	FMS	PE			$0.05									$0.05	District	
2516831	6	I-195	From NW 11 Avenue to SR 907/Alton Road	SR 112/I-195 ITS	FMS	D/B				$7.76								$7.76	District	
2516861	6	I-395	From I-95 to West end of MacArthur Bridge	SR 836/I-395 ICS	FMS	PE					$0.35							$0.35	District	
2516851	6	I-75	From SR 826 to Miami-Dade/ Broward Co. Line	SR 93/I-75 ICS	FMS	PE	$0.01	$0.05										$0.05	District	
2516851	6	I-75	From SR 826 to Miami-Dade/ Broward Co. Line	SR 93/I-75 ICS	FMS	D/B				$10.23								$10.23	District	
2502381	6	I-95	From Sunguide RTMC to Sunguide RTMC	I-95 ITS Sunguide Control-Package "C"	FMS	Contract Incentives	$0.50											$0.50	District	Included Contract IncentivesPhase in order to be consistent with Work Program
2502381	6	I-95	From Sunguide RTMC to Sunguide RTMC	I-95 ITS Sunguide Control-Package "C"	FMS	CONST	$0.59											$0.59	District	
2516711	6	I-95	From US 1 to Miami-Dade/Broward County Line	I-95 Post Construction, Operations and Evaluation for Golden Glades Integration Project	FMS	CONST	$0.11											$0.11	District	
2516821	6	I-95	From US 1 to Ives Dairy Road	I-95 Intelligent Corridor System Package B	FMS	Contract Incentives			$1.50									$1.50	Statewide	Included Contract Incentives Phase in order to be consistent with Work Program
2516821	6	I-95	From US 1 to Ives Dairy Road	I-95 Intelligent Corridor System Package B	FMS	PE	$0.51											$0.51	District	
2516821	6	I-95	From US 1 to Ives Dairy Road	I-95 Intelligent Corridor System Package B	FMS	CONST	$3.90											$3.90	Statewide	
2516821	6	I-95	From US 1 to Ives Dairy Road	I-95 Intelligent Corridor System Package B	FMS	CONST	$17.04											$17.04	District	
4040801	6	I-95	From US 1 to Miami-Dade/ Broward Co. Line	SR 9A/I-95 Post Construction Evaluation	FMS	CEI	$0.51											$0.51	District	
4056631	6	I-95	From Sunguide ATIS to Sunguide ATIS	Miami-Dade Countywide Regional Traveler Information	ATIS	PE	$3.11											$3.11	District	
	6	Reserve		District ITS Reserve	TBD	Capital			$5.40									$5.40	Statewide	
2497192	6	SR 826	From NW 154th Street to Golden Glades Interchange	SR 826 (Palmetto Expwy) East/West ITS Deployment	FMS	PE	$0.03											$0.03	District	
2497192	6	SR 826	From NW 154th Street to Golden Glades Interchange	SR 826 (Palmetto Expwy) East/West ITS Deployment	FMS	D/B	$3.02											$3.02	District	
1001802	6	SR 836	From SR 821 to NW 27th Ave	ITS - 002	FMS	CONST	$1.40											$1.40	Expwy Auth	Shown on map as MDX-1.
2502382	6	Various	From Sunguide RTMC to Sunguide RTMC	Package C- ITS Video Wall and Consoles	FMS	CONST			$3.38									$3.38	Statewide	
140601	7	I-275	From I-75 South to Sunshine Skyway Bridge	Telecom Infrastructure	COM	PE									$0.10			$0.10	Statewide	
140602	7	I-275	From I-75 South to Sunshine Skyway Bridge	Telecom Infrastructure	COM	CONST										$0.98		$0.98	Statewide	
140603	7	I-275	From I-75 South to Sunshine Skyway Bridge	Telecom Infrastructure	COM	CEI										$0.08		$0.08	Statewide	
702001	7	I-275	From Bearss Ave to I-75	Freeway and Incident Management System	FMS	PE					$0.44							$0.44	Statewide	
702002	7	I-275	From Bearss Ave to I-75	Freeway and Incident Management System	FMS	CONST					$2.67							$2.67	Statewide	
702003	7	I-275	From Bearss Ave to I-75	Freeway and Incident Management System	FMS	CEI					$0.59							$0.59	Statewide	
737802	7	I-275	From South of Sunshine Skyway Bridge to McKinley Drive	Communication Link for Sunshine Skyway Bridge to FHP	COM	CONST		$5.73	$2.65									$8.38	Statewide	Cost revised to coincide with FHWA ITS Deployment plan.
737901	7	I-275	From Fowler Ave to Bearss Ave	Telecom Infrastructure	COM	PE		$0.03										$0.03	Statewide	
737902	7	I-275	From Fowler Ave to Bearss Ave	Telecom Infrastructure	COM	CONST			$0.29									$0.29	Statewide	

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FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
737903	7	I-275	From Fowler Ave to Bearss Ave	Telecom Infrastructure	COM	CEI			$0.02									$0.02	Statewide	
743301	7	I-275	From Howard Frankland Bridge to Hillsborough River	Links II/III	FMS	PE						$0.24						$0.24	Statewide	
743302	7	I-275	From Howard Frankland Bridge to Hillsborough River	Links II/III	FMS	CONST									$2.74			$2.74	Statewide	See Note 1.
743303	7	I-275	From Howard Frankland Bridge to Hillsborough River	Links II/III	FMS	CEI									$0.39			$0.39	Statewide	See Note 1.
743401	7	I-275	From Bearss Ave to I-75	Telecom Infrastructure	COM	PE					$0.11							$0.11	Statewide	
743402	7	I-275	From Bearss Ave to I-75	Telecom Infrastructure	COM	CONST					$0.91							$0.91	Statewide	
743403	7	I-275	From Bearss Ave to I-75	Telecom Infrastructure	COM	CEI					$0.07							$0.07	Statewide	
2583981	7	I-275	From Howard Frankland Bridge to Himes Ave	Links Stage II	COM	CONST						$1.30						$1.30	Statewide	
2583991	7	I-275	From Himes Ave. to Hillsborough River	Links Stage III	COM	CONST						$1.30						$1.30	Statewide	
2586431	7	I-275	From I-275 and I-4 Interchange to	ITS at I-4/I-275 Interchange	FMS	MOT			$1.10									$1.10	District	
2586432	7	I-275	From Hillsborough River to I-4	I-275/I-4 Freeway Management System	FMS	PE		$0.33										$0.33	District	
2586432	7	I-275	From Hillsborough River to I-4	I-275/I-4 Freeway Management System	FMS	CONST				$1.10								$1.10	Statewide	
4072331	7	I-275	From MLK Blvd to Bearss Ave	I-275 Freeway Management System	FMS	PE		$0.20										$0.20	District	
4072331	7	I-275	From MLK Blvd to Bearss Ave	I-275 Freeway Management System	FMS	CONST				$2.67								$2.67	Statewide	
4072332	7	I-275	From 54th Ave N to Howard Frankland	I-275 Freeway Management System	FMS	PE		$0.40										$0.40	District	
4072332	7	I-275	From 54th Ave N to Howard Frankland	I-275 Freeway Management System	FMS	CONST				$3.69								$3.69	Statewide	
4072333	7	I-275	From Howard Frankland to Kennedy Blvd	I-275 Freeway Management System	FMS	CONST				$0.32								$0.32	Statewide	
4072334	7	I-275	From 54th Ave S to 54th Ave N	I-275/Freeway Management System	FMS	PE			$0.30									$0.30	Statewide	
4072334	7	I-275	From 54th Ave S to 54th Ave N	I-275 Freeway Management System	FMS	CONST						$2.69						$2.69	Statewide	
4072335	7	I-275	From Sunshine Skyway Bridge to 54th Ave S	I-275 Freeway Management System	FMS	PE				$0.40								$0.40	Statewide	
4072335	7	I-275	From Sunshine Skyway to 54th Ave. South	I-275 Freeway Management System	FMS	CONST								$2.77				$2.77	Statewide	See Note 1 and 2.
4072336	7	I-275	From I-75 South to Sunshine Skyway	I-275 Freeway Management System	FMS	CONST											$2.02	$2.02	Statewide	See Note 1 and 2.
4086711	7	I-275	From Sunshine Skyway Bridge North End to Sunshine Skyway Bridge South	Skyway Video Monitoring System Modifications	ATIS	D/B	$1.64											$1.64	District	
740201	7	I-4	From I-275 to US 27 (Polk County)	Telecom Infrastructure	COM	PE			$0.93									$0.93	Statewide	Project added to provide FON backbone for programmed I-4 ITS projects.
740202	7	I-4	From I-275 to US 27 (Polk County)	Telecom Infrastructure	COM	CONST			$4.64									$4.64	Statewide	Project added to provide FON backbone for programmed I-4 ITS projects.
740203	7	I-4	From I-275 to US 27 (Polk County)	Telecom Infrastructure	COM	CEI			$0.37									$0.37	Statewide	Project added to provide FON backbone for programmed I-4 ITS projects.
2584012	7	I-4	From 14th St to 50th St	I-4 Freeway Management System	FMS	CONST				$1.10								$1.10	Statewide	
4093661	7	I-4	From 50th Street to CR 579	I-4Freeway Management System	FMS	PE		$0.20										$0.20	District	
4093661	7	I-4	From 50th Street to CR 579	I-4 Freeway Management System	FMS	CONST				$2.70								$2.70	Statewide	
4093662	7	I-4	From CR 579 to Park Road	I-4 Freeway Management System	FMS	PE			$0.40									$0.40	Statewide	
4093662	7	I-4	From CR 579 to Park Road	I-4 Freeway Management System	FMS	CONST					$4.10							$4.10	Statewide	
4093663	7	I-4	From Park Road to Hillsborough/Polk Co. Line	I-4 Freeway Management System	FMS	PE				$0.61								$0.61	District	
4093663	7	I-4	From Park Road to Hillsborough/Polk Co. Line	I-4 Freeway Management System	FMS	CONST						$1.28						$1.28	District	
4093664	7	I-4	From Hillsborough/Polk Co. Line to US 27	I-4 Freeway Management System	FMS	PE			$0.10									$0.10	District	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
4093664	7	I-4	From Hillsborough/Polk Co. Line to US 27	I-4 Freeway Management System	FMS	CONST						$5.10						$5.10	Statewide	
743701	7	I-75	From US 301 (Brandon) to I-275	Telecom Infrastructure	COM	PE								$0.53				$0.53	Statewide	
743702	7	I-75	From US 301 (Brandon) to I-275	Telecom Infrastructure	COM	CONST								$3.57				$3.57	Statewide	
743703	7	I-75	From US 301 (Brandon) to I-275	Telecom Infrastructure	COM	CEI								$0.23				$0.23	Statewide	
4072321	7	I-75	From Tampa RTMC to Tampa RTMC	Tampa Bay Sunguide Freeway Management Center and System	FMS	PE	$0.80											$0.80	Statewide	
4072321	7	I-75	From Tampa RTMC to Tampa RTMC	Tampa Bay Sunguide Freeway Management Center and System	FMS	CONST			$4.79	$1.09								$5.87	Statewide	
4109091	7	I-75	From US 301 to Fowler Ave	I-75 Freeway Management System	FMS	PE			$0.30									$0.30	District	
4109091	7	I-75	From US 301 to Fowler Ave	I-75 Freeway Management System	FMS	CONST					$4.90							$4.90	Statewide	
4109092	7	I-75	From Fowler Ave to Bruce B Downs Blvd	I-75 Freeway Management System	FMS	PE						$0.10						$0.10	Statewide	
4109092	7	I-75	From Fowler Ave. to Bruce B. Downs Blvd.	I-75 Freeway Management System	FMS	CONST								$1.89				$1.89	Statewide	See Note 1.
4109093	7	I-75	From Bruce B Downs Blvd to I-275(Pasco County)	I-75 Freeway Management System	FMS	PE						$0.32						$0.32	Statewide	
4109093	7	I-75	From Bruce B. Downs Blvd. to I-275 (Pasco Co.)	I-75 Freeway Management System	FMS	CONST								$1.56				$1.56	Statewide	See Note 1.
4109094	7	I-75	From I-275 to Hernando Co. Line	I-75 Freeway Management System	FMS	PE						$0.14						$0.14	Statewide	
4109095	7	I-75	From Pasco Co. Line to SR 50	I-75 Freeway Management System	FMS	PE						$0.10						$0.10	Statewide	
4109096	7	I-75	From Manatee Co. Line to US 301	I-75 Freeway Management System	FMS	PE						$0.21						$0.21	Statewide	
4109096	7	I-75	From Manatee Co. Line to US 301	I-75 Freeway Management System	FMS	CONST								$2.65				$2.65	Statewide	See Note 1.
4109097	7	I-75	From I-275 to Hillsborough Co. Line	I-75 (Freeway Management System	FMS	PE						$0.10						$0.10	Statewide	
	7	Reserve		District ITS Reserve	TBD	Capital						$1.07	$4.33					$5.40	Statewide	Includes $0.34M of previously programmed PE dollars.
2558441	7	SR 589	From I-275 to Hillsborough River	Links Stage I	FMS	CONST			$1.59									$1.59	Statewide	
2558442	7	SR 589	From I-275 to Hillsborough River	Links Stage I	FMS	PE			$0.20									$0.20	Statewide	
2558442	7	SR 589	From I-275 to Hillsborough River	Links Stage I	FMS	CONST					$1.70							$1.70	Statewide	
4122861	8	Sawgrass	From Sawgrass Expressway Limits to Sawgrass Expressway Limits	Sunpass Challenge Sawgrass Expressway	FMS	PE	$0.07											$0.07	District	
4122861	8	Sawgrass	From Sawgrass Expressway Limits to Sawgrass Expressway Limits	Sunpass Challenge Sawgrass Expressway	FMS	CONST		$9.24										$9.24	District	See Note 5
4122861	8	Sawgrass	From Sawgrass Expressway Limits to Sawgrass Expressway Limits	Sunpass Challenge Sawgrass Expressway	FMS	Utilities		$0.21										$0.21	District	
4122861	8	Sawgrass	From Sawgrass Expressway Limits to Sawgrass Expressway Limits	Sunpass Challenge Sawgrass Expressway	FMS	Capital		$0.95										$0.95	District	
4122871	8	Sawgrass	From Sawgrass Expressway Limits to Sawgrass Expressway Limits	Sunpass Challenge Sawgrass Ramps II	FMS	PE	$0.01											$0.01	District	
4122881	8	SR 570	From Polk Parkway Limits to Polk Parkway Limits	Sunpass Challenge Polk Parkway	FMS	PE	$0.00											$0.00	District	
4122881	8	SR 570	From Polk Parkway Limits to Polk Parkway Limits	Sunpass Challenge Polk Parkway	FMS	CONST		$2.33										$2.33	District	See Note 5
4122881	8	SR 570	From Polk Parkway Limits to Polk Parkway Limits	Sunpass Challenge Polk Parkway	FMS	Capital		$0.68										$0.68	District	
843802	8	SR 91	From MP 263 to MP 267	Ocoee Video System and Fiber Optics	FMS	CONST	$0.25											$0.25	District	Bidding proposed to occur in FY'03.
1907501	8	SR 91	From MP4 to MP 75	SunNav Phase 1 Fiber Project	FMS	CONST	$8.00	$3.70										$11.70	District	
1907661	8	SR 91		SunNav sm Software Development and Integration	FMS	PE	$3.07	$5.08	$5.75	$6.07	$6.42	$6.72						$33.10	District	See Note 4
4061221	8	SR 91	From I-95 to I-75	Mainline Communication HUBS & Fiber Distribution Cable	COM	PE	$1.66											$1.66	District	
4061221	8	SR 91	From I-95 to I-75	Mainline Communication HUBS & Fiber Distribution Cable	COM	CONST			$12.46									$12.46	District	

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FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
4061221	8	SR 91	From I-95 to I-75	Mainline Communication HUBS & Fiber Distribution Cable	COM	Utilities			$0.50									$0.50	District	
4061231	8	SR 91	From Turnpike Mainline to	Intelligent Transportation System (ITS) Incident Detection	FMS	PE				$0.81								$0.81	District	
4061231	8	SR 91	From Turnpike Mainline to	Intelligent Transportation System (ITS) Incident Detection	FMS	CONST						$10.66						$10.66	District	
4090601	8	SR 91	From I-95 to I-75	Sunpass System Monitoring Expansion and CCTV equipment	FMS	Capital	$0.90	$2.10	$1.50	$1.50	$1.50	$2.00						$9.50	Statewide	
1907171	8	Various	From I-95 to I-75	Advanced Traveler Information System DMS, HAR , TMC's	FMS	Right Of Way	$0.00											$0.00	District	Included Right Of Way Phase in order to be consistent with Work Program
1907171	8	Various	From I-95 to I-75	Advanced Traveler Information System DMS, HAR , TMC's	FMS	PE	$0.53											$0.53	District	
1907171	8	Various	From I-95 to I-75	Advanced Traveler Information System DMS, HAR , TMC's	FMS	CONST	$0.84											$0.84	District	
1907171	8	Various	From I-95 to I-75	Advanced Traveler Information System DMS, HAR , TMC's	FMS	Utilities	$1.07											$1.07	District	
	9	Central Office		ITS Central Office Consultants and Contingencies	FMS	PE		$7.90	$9.20	$8.40	$10.50	$8.63	$8.63	$7.32	$2.32	$3.31	$3.31	$69.51	Statewide	
915701	9	Central Office	Statewide	CVISN Phase I (Electronic Credentialing System & Automated Routing Software, Items 1-3)	CVISN	PE		$2.56										$2.56	Statewide	
915801	9	Central Office	Statewide	CVISN Phase II (Electronic Payment System and IFTA Clearing House, Items 4-10)	CVISN	PE			$1.08									$1.08	Statewide	
916601	9	Central Office	Statewide	Jacksonville Area SunGuide ATIS	ATIS	PE					$3.18							$3.18	Statewide	Public sector subsidy, private sector participation anticipated
918801	9	Central Office	Statewide	Southwest Florida ATIS	ATIS	PE					$3.00							$3.00	Statewide	Public sector subsidy, private sector participation anticipated
918901	9	Central Office	Statewide	Statewide 511 Services	ATIS	PE				$1.94								$1.94	Statewide	Public sector subsidy, private sector participation anticipated. Advanced 1 yr. To coincide with the 511 Implementation Plan.
924401	9	Central Office	Statewide	Statewide Highway Advisory Radio System Phase 1	ATIS	PE											$0.75	$0.75	Statewide	
924402	9	Central Office	Statewide	Statewide Highway Advisory Radio System Phase 1	ATIS	CONST											$4.98	$4.98	Statewide	
924403	9	Central Office	Statewide	Statewide Highway Advisory Radio System Phase 1	ATIS	CEI											$1.00	$1.00	Statewide	
930701	9	Central Office	Statewide	Statewide Road Weather Information System	ATIS	PE										$0.94		$0.94	Statewide	
930702	9	Central Office	Statewide	Statewide Road Weather Information System	ATIS	CONST										$3.14	$3.24	$6.38	Statewide	
930703	9	Central Office	Statewide	Statewide Road Weather Information System	ATIS	CEI										$0.63	$0.65	$1.28	Statewide	
939001	9	Central Office	Statewide	RTMC Software Library and Configuration Management	RTMC	PE		$1.40	$1.61	$0.75	$0.75	$0.17	$0.17	$0.18	$0.18	$0.19	$0.19	$5.58	Statewide	
4125431	9	I-4	Statewide	Tampa Bay Sunguide ATIS	ATIS	PE		$5.00										$5.00	Statewide	

Programmed Projects

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Total	Fund Source	Comments
				Total Statewide Manageed Funds (TSWMF)			$17.50	$33.70	$65.30	$65.60	$67.50	$55.30	$56.30	$50.00	$25.00	$30.00	$30.00	$496.20		
				Statewide Funds Programmed (S)			$17.50	$15.99	$27.82	$26.08	$15.10	$20.56	$3.10	$3.20	$0.00	$0.00	$0.00	$129.36		
				District Funds Programmed (D)			$81.94	$33.59	$21.55	$39.74	$6.77	$23.66	$0.00	$0.00	$0.00	$0.00	$0.00	$207.25		
				Other Programmed -Private (P)			$4.52	$8.28	$4.58	$1.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$18.44		
				Total Programmed (S+D+P)			$103.96	$57.86	$53.94	$66.89	$21.87	$44.23	$3.10	$3.20	$0.00	$0.00	$0.00	$355.05		
				Funds Available for CFP (TSWMF -S)			$0.00	$17.71	$37.48	$39.52	$52.40	$34.74	$53.20	$46.80	$25.00	$30.00	$30.00	$366.84		
				Cost-Feasible Projects (CFP)			$0.00	$17.61	$36.40	$39.04	$52.23	$34.53	$52.66	$46.48	$24.77	$29.19	$29.17	$362.08		
				District ITS Reserves			$0.00	$0.00	$5.40	$1.00	$6.40	$4.47	$4.33	$5.40	$0.00	$0.00	$0.00	$27.00		
				Contingency ($)			$0.00	$0.09	$1.08	$0.47	$0.17	$0.21	$0.54	$0.32	$0.23	$0.81	$0.83	$4.76		
				Contingency as a % of TSWMF			0%	0%	2%	1%	0%	0%	1%	1%	1%	3%	3%	1%		

** All projects costs shown are escalated or "as-programmed" millions of dollars.*

Note 1: District cost estimates are low compared to estimates performed by the Central Office. Central Office estimates are based on the FHWA device unit costs.

Note 2: Unable to advance project utilizing statewide managed funds. Project can be advanced utilizing district allocated funds.

Note 3: Project limits, costs, and the implementation year for fiber project subject to change based on phasing and implementation of FMS projects for the same facility and limits.

Note 4: Also includes non-ITS work such as burdened costs for traffic operations and administrative staff. traffic engineering, telecommunications, and administrative work; office expenses; and travel expenses.

Note 5: SunPass Challenge projects include toll booth construction, ramp widening and other non-ITS projects.

Note 6: District ITS Reserve funds can be utilized by the Districts to fund any District ITS project with the exception of signal systems.

Acronyms:

ARTS	Advanced Rural Transportation System	DASH	Daytona Area Smart Highways	RTMC	Regional Traffic Management Center
ATIS	Advanced Traveler Information System	DMSS	Dynamic Message Sign System	SWMF	Statewide Managed Funds
CFP	Cost Feasible Plan	IFTA	International Fuel Tax Agreement	SWMFA	Statewide Managed Funds Available
CVISN	Commercial Vehicle Information and System Network	OVCS	Overweight Vehicle Control System	TSWMF	Total Statewide Managed Funds

Figure 6.89 – Statewide *Ten-Year ITS Cost Feasible Plan*

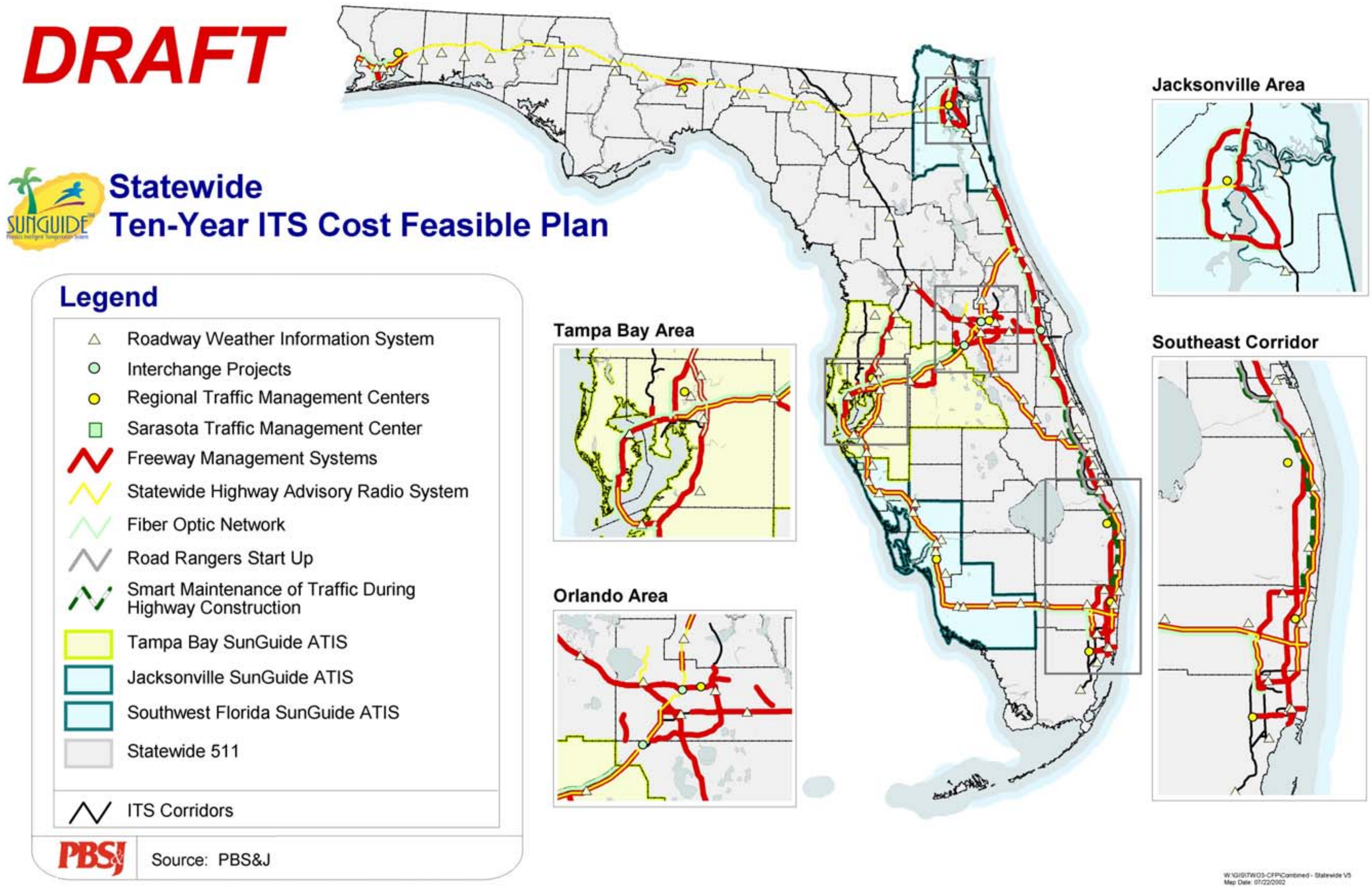


Figure 6.90 – District 1 *Ten-Year ITS Cost Feasible Plan*

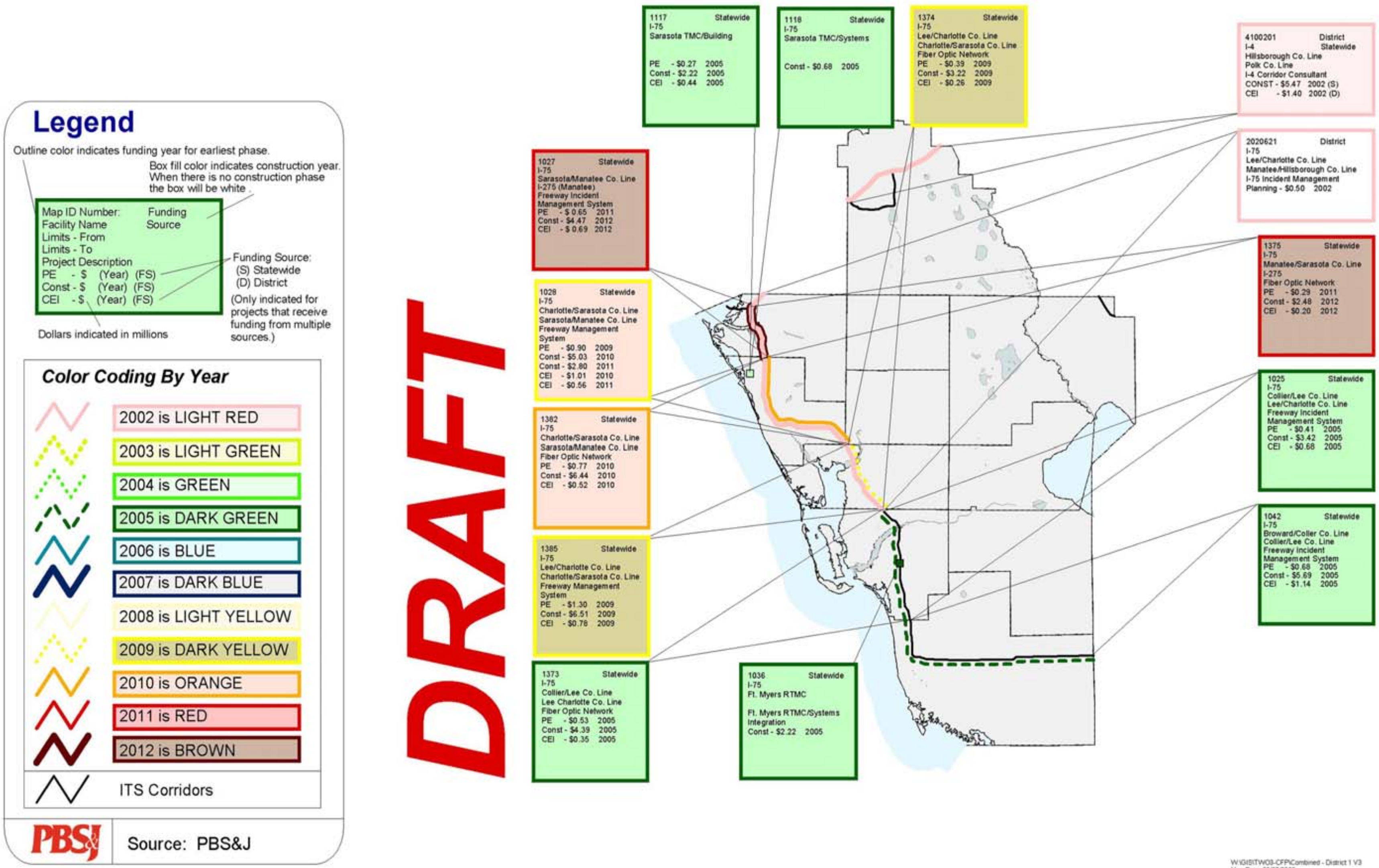


Figure 6.91 – District 2 *Ten-Year ITS Cost Feasible Plan*

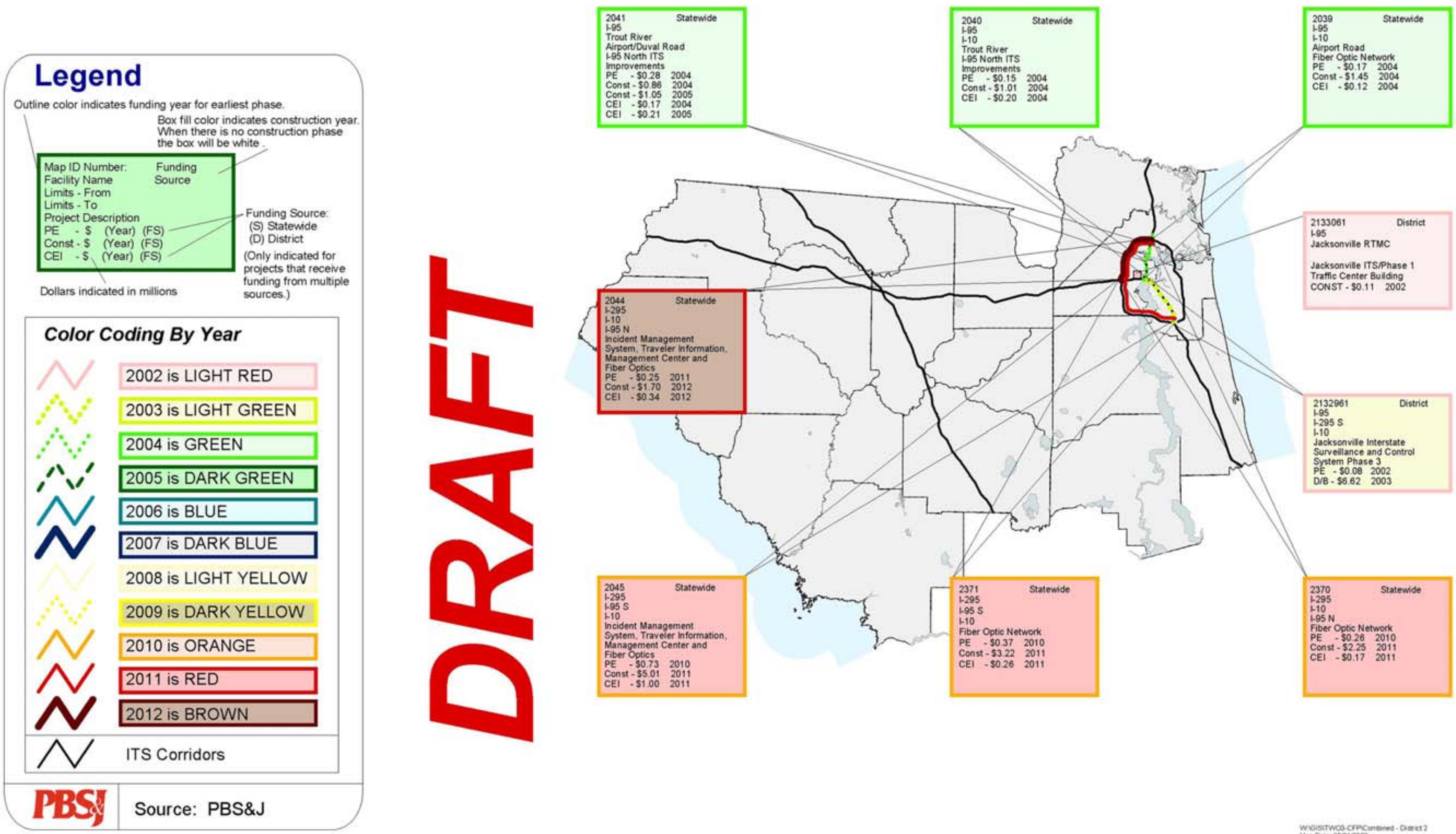


Figure 6.92 – District 3 *Ten-Year ITS Cost Feasible Plan*

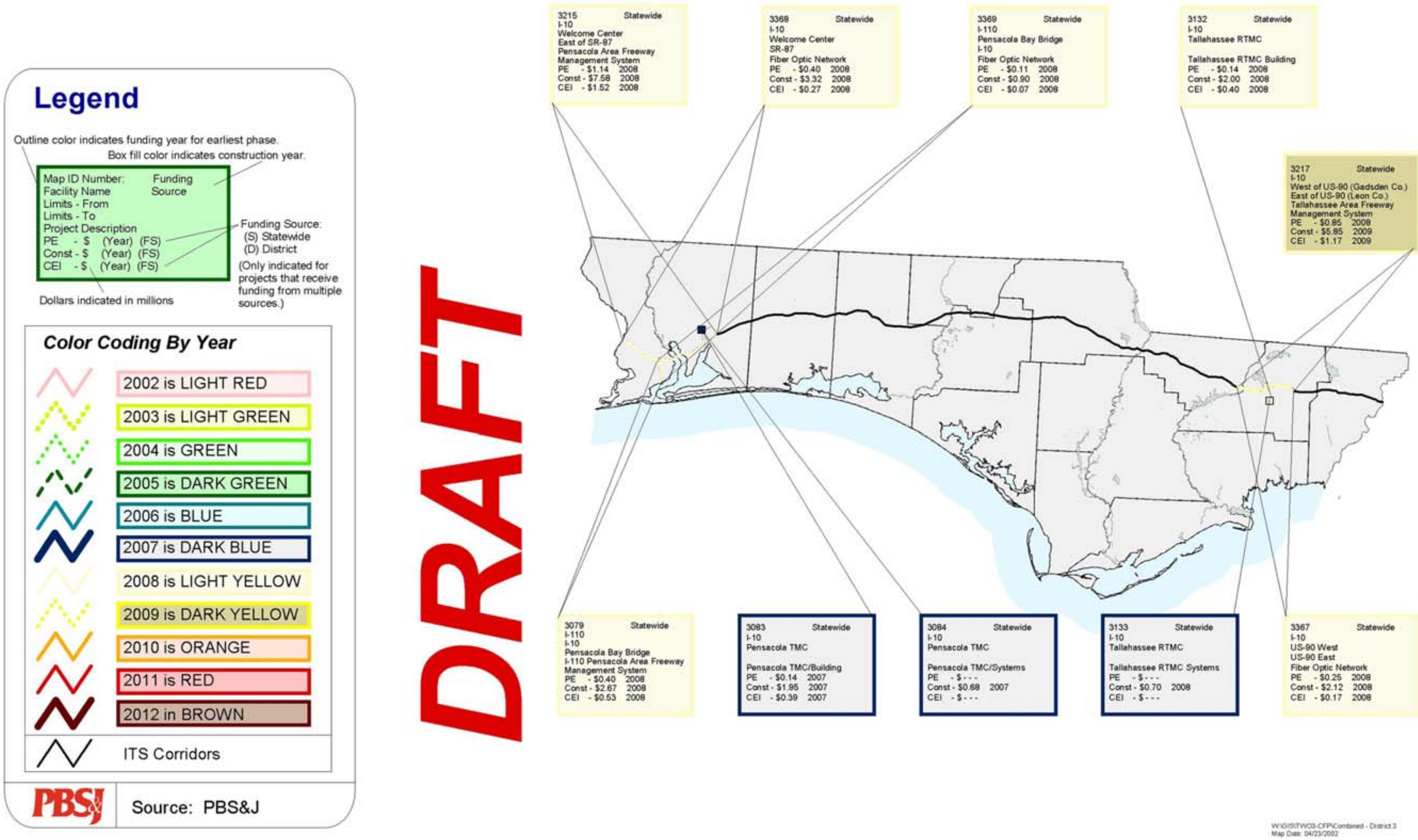


Figure 6.93 – District 4 *Ten-Year ITS Cost Feasible Plan*

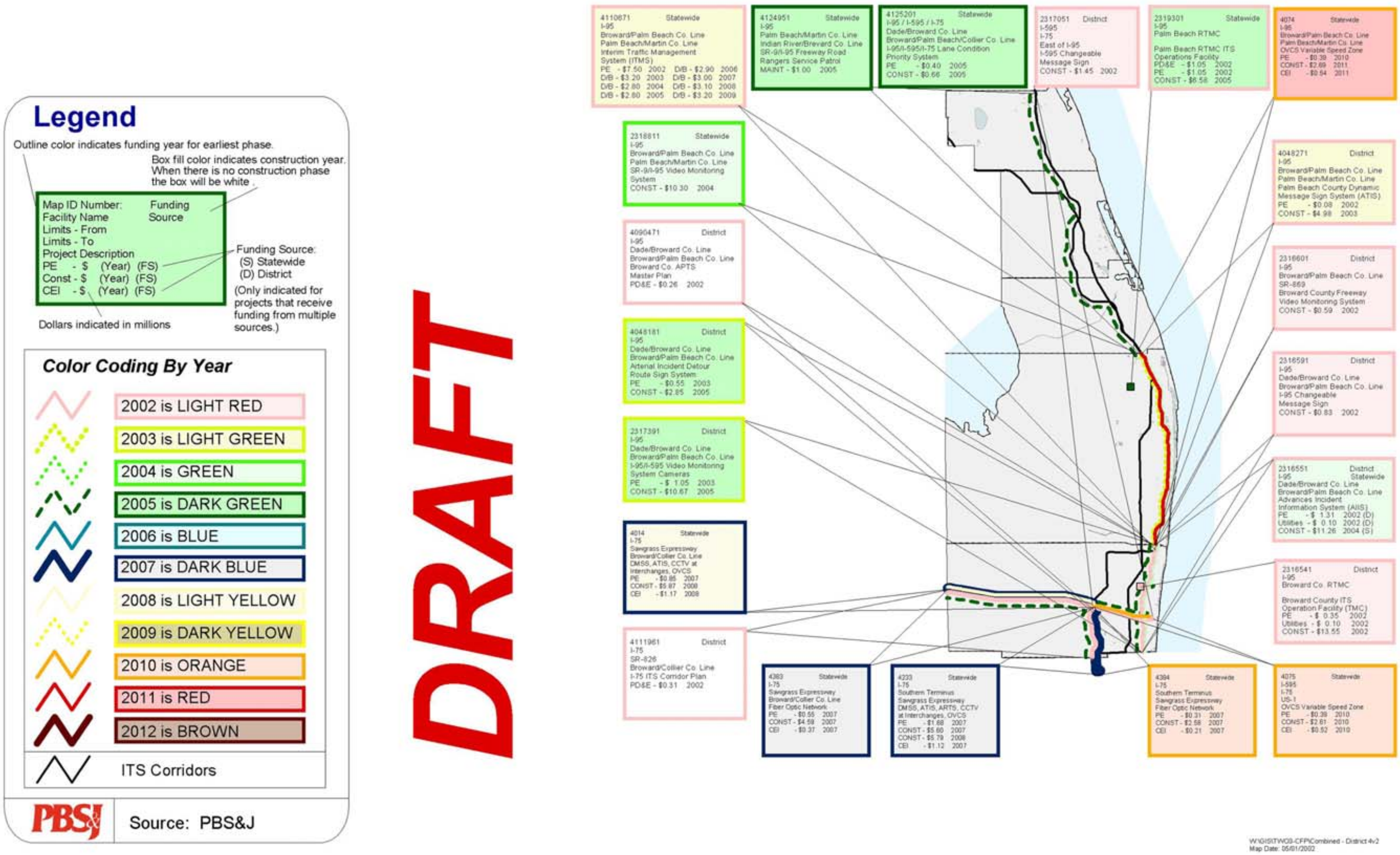


Figure 6.94 – District 5 *Ten-Year ITS Cost Feasible Plan*

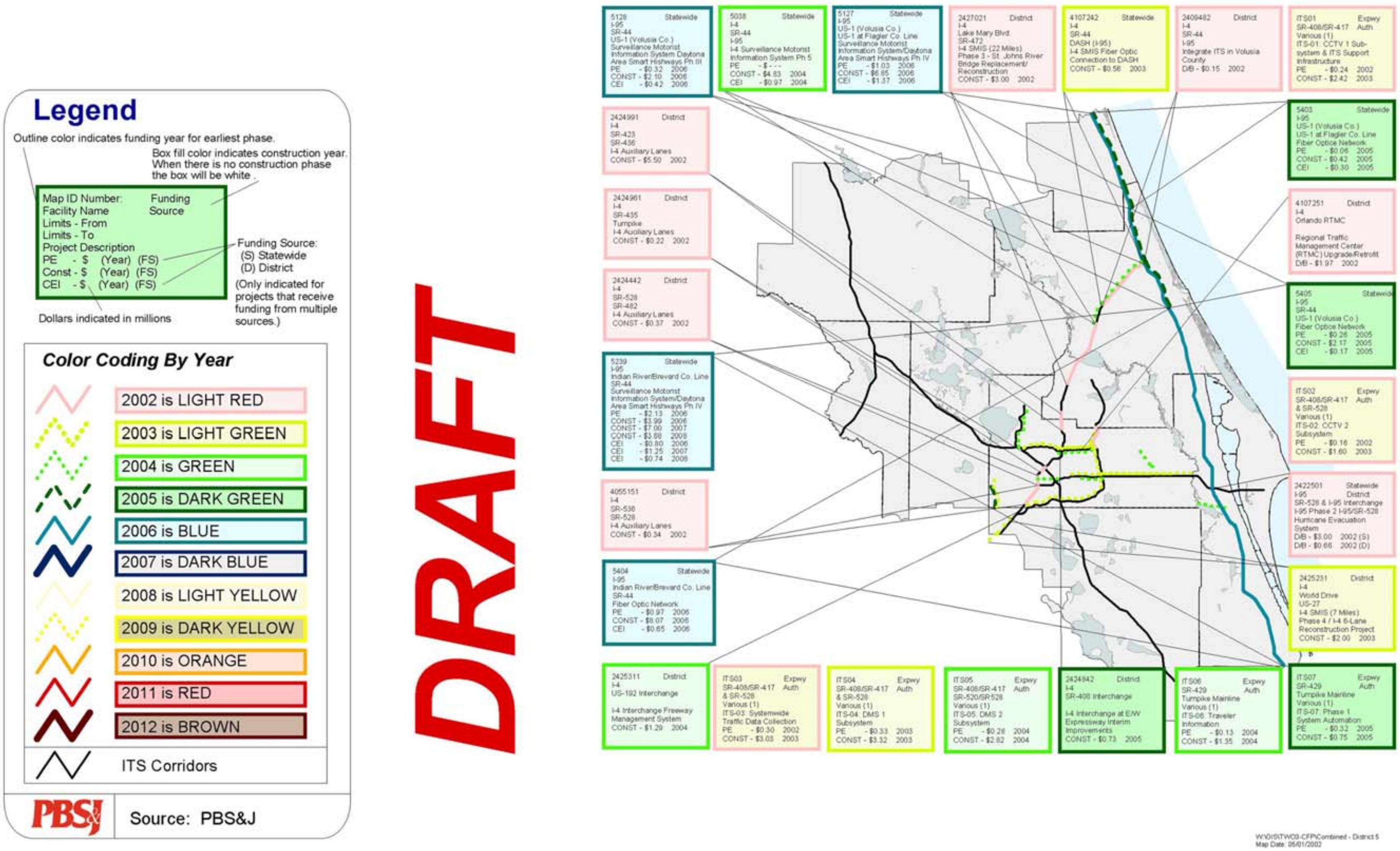


Figure 6.95 – District 6 *Ten-Year ITS Cost Feasible Plan*

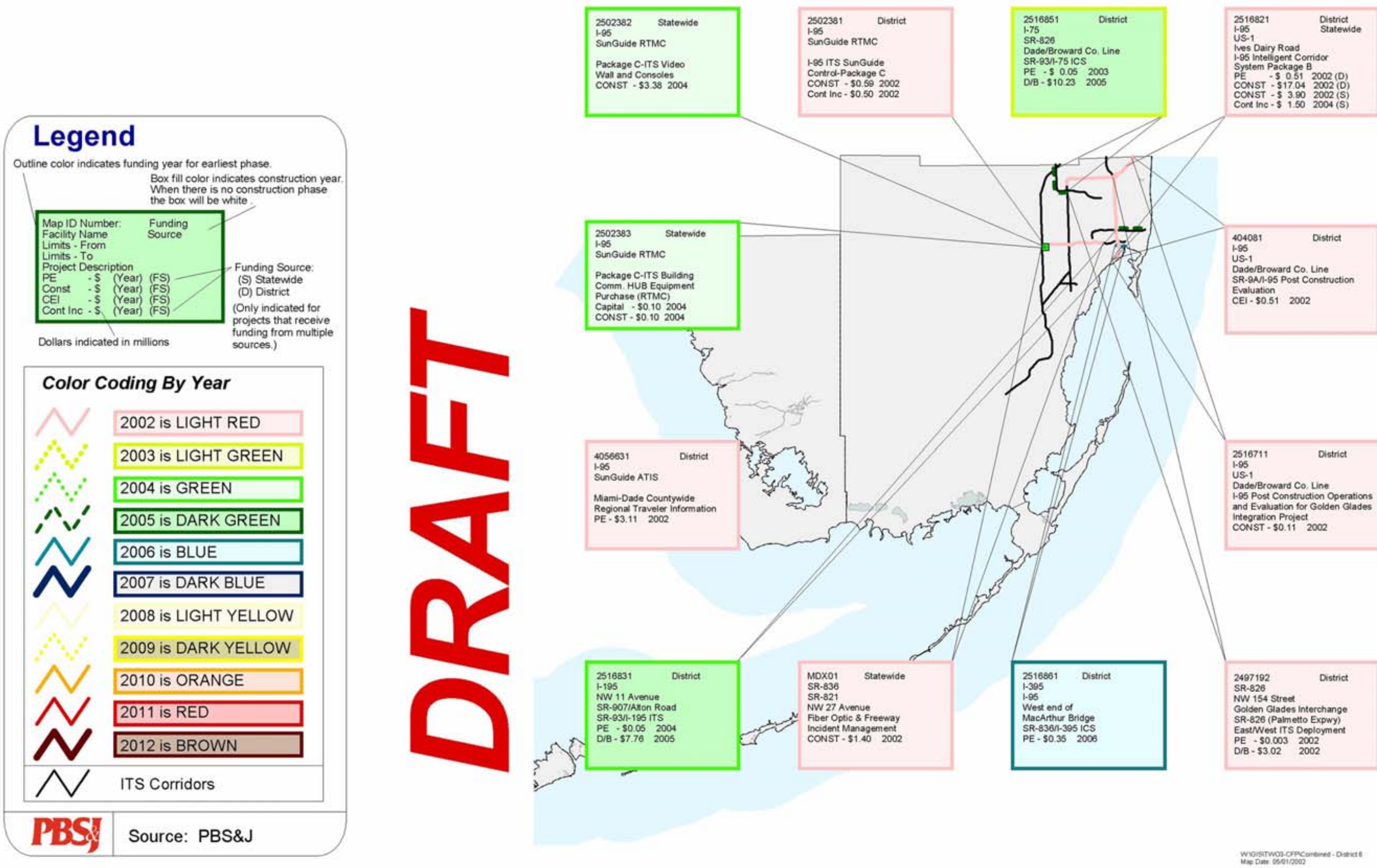


Figure 6.96 – District 7 *Ten-Year ITS Cost Feasible Plan*

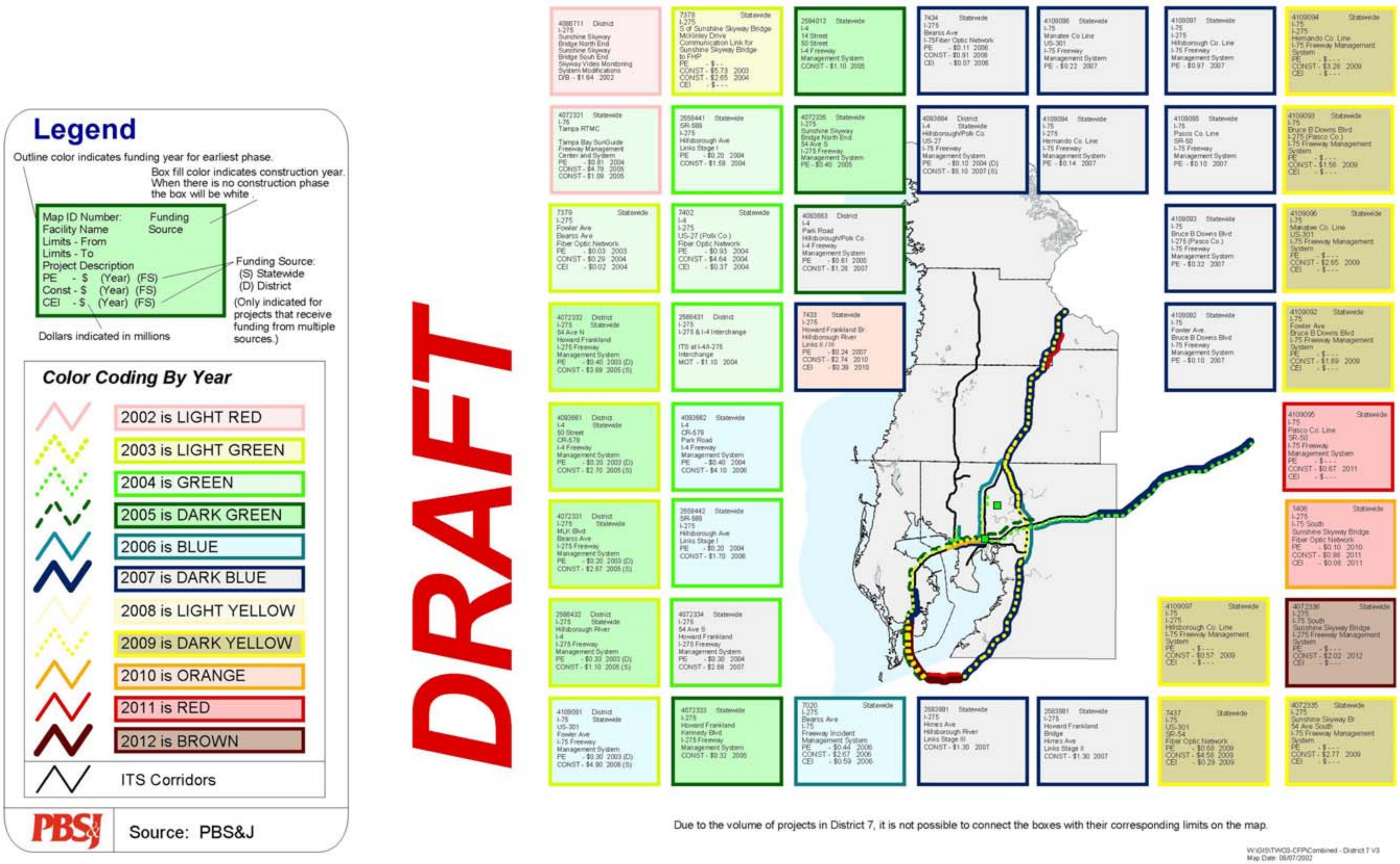
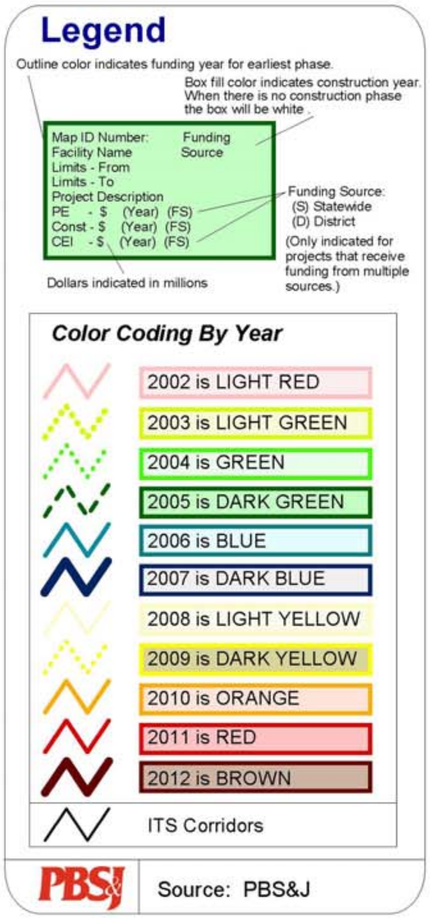
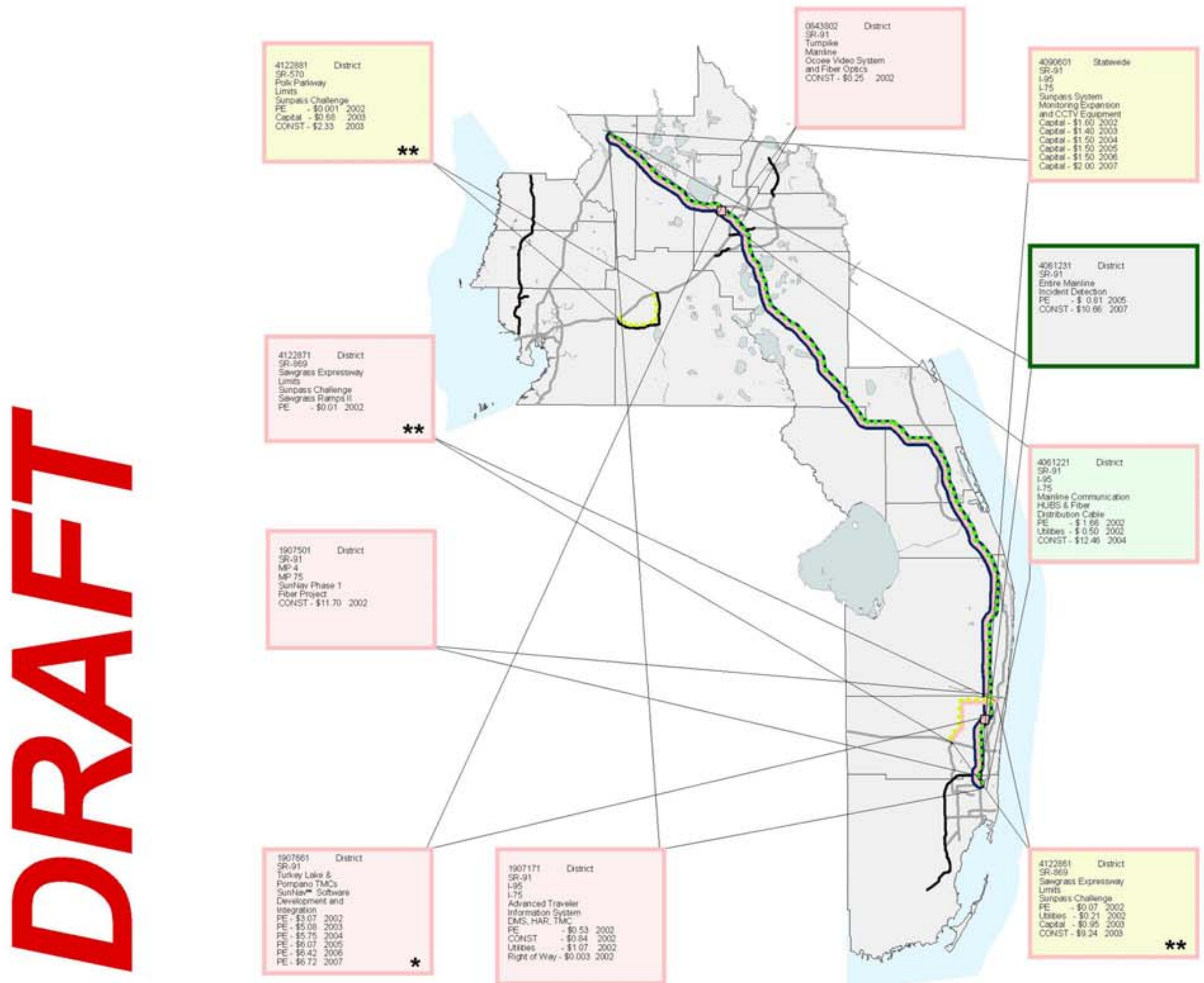


Figure 6.97 – *Ten-Year ITS Cost Feasible Plan* for Florida's Turnpike Corridor

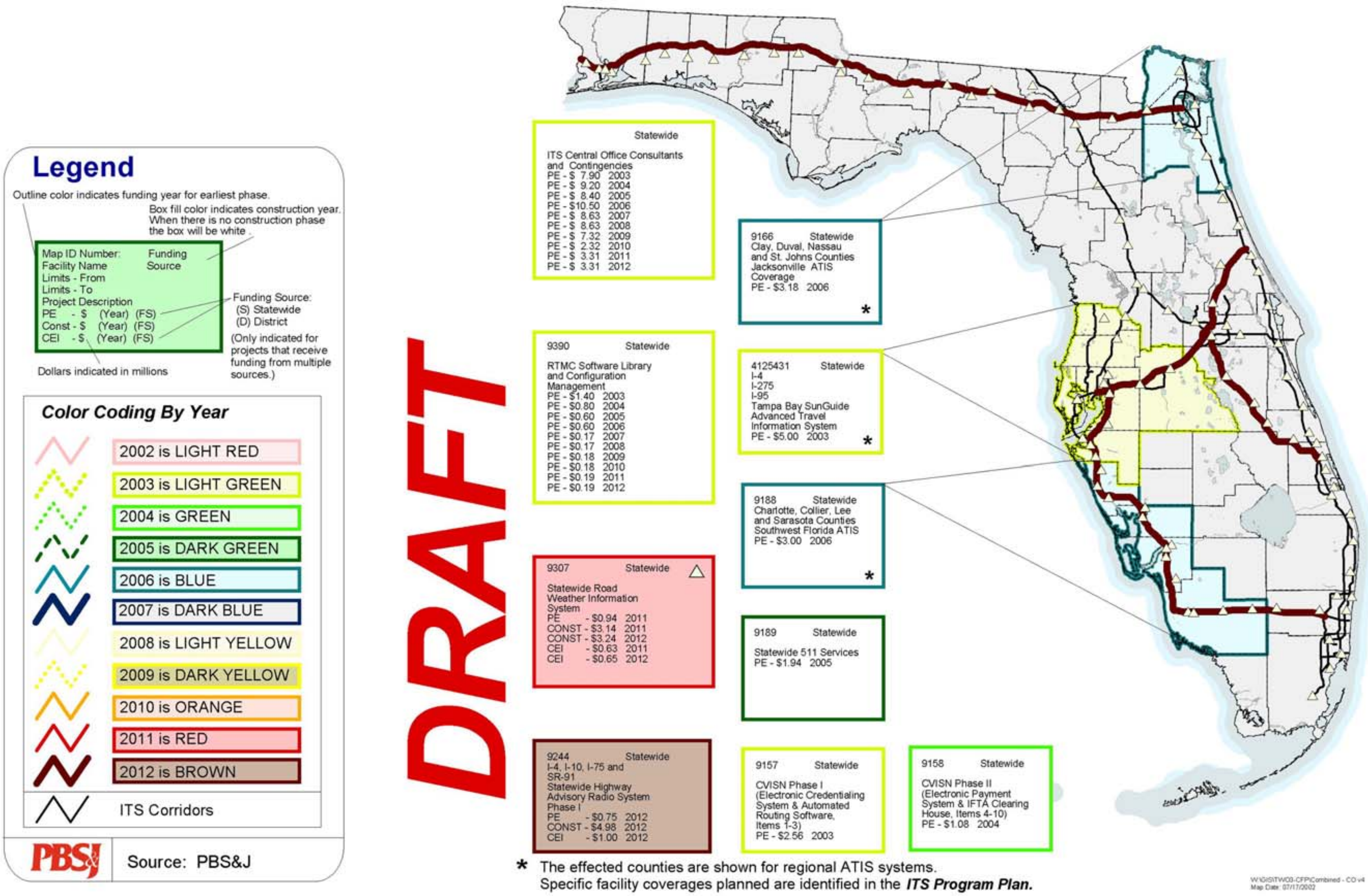




* Also includes non-ITS work such as burdened costs for traffic operations and administrative staff; traffic engineering, telecommunications, and administrative work; office expenses; and travel expenses.

** Sunpass Challenge projects include toll booth reconstruction, ramp widening and other non-ITS projects.

Figure 6.98 – Central ITS Office *Ten-Year ITS Cost Feasible Plan*



7. Analysis of the Proposed System

7.1 Anticipated Benefits

To determine the effectiveness of the proposed ITS for the principal FIHS limited-access corridors, the following benefits were identified from studies around the country and were determined to be appropriate:

- A 15 percent decrease in delay is anticipated as a result of IMS based on data provided by the Maryland CHART Program.

- A 15 percent reduction in injury-related accidents and fatalities is anticipated as a result of freeway management services based on data from the FHWA Fatal Accident Reporting System experience in San Antonio.

- A 35 percent reduction in property-damage only accidents is anticipated as a result of freeway management services based on data from the FHWA Fatal Accident Reporting System experience in San Antonio.

- A 7:1 benefit to cost ratio is anticipated for the sum of the activities that will be deployed in FDOT's CVISN program and the virtual weigh station proposed for I-4 in the Tampa area based on the experiences of the Colorado Department of Transportation.

- Benefits associated with ATIS include reductions in travel time and operating costs. Additional benefits are anticipated from congestion avoidance and improvement in the quality of driver convenience. Since no quantitative data was available to support an estimate of these benefits from other areas, a generally accepted benefit to cost ratio of 1.5:1 was used to estimate these benefits.

- Benefits associated with smart work zones are anticipated to include reductions in travel time and operating costs, reductions of accident rates and the severity of accident rates in work zones saving worker and driver lives, and improvement in the quality of driver information. Based on a cost analysis of a smart work zone system on the I-496 project in Michigan, it was determined that the benefit to cost ratio of the system was 2:1.

These generalized benefits will result in significant savings in time and operating expenses for travelers and commercial vehicles operating on the FIHS limited-access corridors.

In 2000, we lost nearly 2,000 people along our interstates, turnpikes and other limited-access facilities. Over the next decade, ITS could save 120 lives through improved traffic flow, information, and management   These are people who go home at the end of the day who would not have without the introduction of these technologies. Similarly, 11,000 victims of traffic related injuries and nearly 26,000 accidents could be spared by operating and managing our system better using ITS over the next decade.

ITS could save 20 million hours lost in congestion over the next decade. This translates into more than 6,600 workdays each year!

Travelers in Florida could save $3 billion in safety benefits and travel time savings over the next decade from the introduction of ITS technologies.

7.2 Anticipated Impacts

No adverse direct or secondary impacts are anticipated from the deployment of these ITS services. These improvements are eligible for a programmatic categorical exclusion under the 1969 National Environmental Policy Act (NEPA) as implemented by FDOT's Project Development and Environmental (PD&E) Manual and confirmed in a letter from the FHWA dated July 15, 2002. The following summarizes the factors to be considered in the application that is being made for these ITS deployments:

- No adverse impacts to local traffic patterns, property access, community cohesiveness, planned community growth, or land-use patterns are anticipated.
- No adverse impacts to air, noise, or water quality are anticipated.
- No wetland involvement is anticipated. There is sufficient flexibility in the siting of field devices in this program that devices can be relocated to avoid any impacts.
- No Coast Guard permits are anticipated since no new crossings of navigable waterways are proposed.
- No flood plain encroachments are anticipated.
- At most, an insignificant amount of right-of-ways is required for this project. There is sufficient flexibility in the siting of field devices in this program that devices can be relocated to avoid any impacts.
- No residential or business impacts are anticipated.
- No adverse impacts to locations registered as historic properties are anticipated.
- No contamination involvement is anticipated.
- The project does not require a public hearing or an opportunity for a public hearing.

During design and construction, the specific siting of these field devices will need to be evaluated and relocated, if necessary, to avoid or reduce any impacts. Since most of the deployments of field elements are planned to occur on FDOT-owned right-of-ways, at most insignificant adverse impacts are anticipated. Some impacts related to right-of-ways may be identified during design that include the need to accommodate construction of additional storage for queuing of vehicles along ramp segments associated with ramp metering or utility connections to field devices for power or communications. Construction of ITS field devices and communications systems may have temporary adverse impacts such as lane closures. However, these impacts will be temporary and the added benefits when complete outweigh any short-term impacts.

Additionally, exclusion from the NEPA, as proposed in this issue, does not exempt the project from permitting requirements. Some permitting may be required in instances where ITS devices are located outside of the FDOT-owned right-of-ways.

8. Systems Engineering Approach

A systems engineering approach for ITS deployments along the principal FIHS limited-access corridors was adopted by the FDOT ITS Office. The approach identified the major activities needed to ensure FDOT optimizes the resources committed to ITS projects. It also ensures that the identified projects are driven by stakeholder requirements and that the final deployments meet these requirements. The systems engineering approach emphasizes three areas: program management, technical/project management, and professional capacity building to promote cost-efficient and effective deployments that will be fully integrated and seamless. This process includes the project development process for ITS projects.

8.1 Program Management

The program management functions support the deployment of ITS through the strategic, long-range planning of ITS, process definition, configuration management, and information management. The activities associated with this program area are intended to promote:

- Increased efficiency and cost-effectiveness through the establishment of best-management practices;
- Coordinated deployments, development, and maintenance of the *SITSA*;
- Adoption of statewide ITS standards;
- Development and maintenance of the *SEMP*;
- Provision of model scopes of work and work breakdown structures;
- Statewide information sharing, development support, and adoption of statewide policies and procedures;
- Risk analyses and the provision of technical assistance and support on projects; and
- Quality assurance for all processes used in deployment.

8.2 Technical/Project Management

The technical/project management functions support the technical development of the individual ITS projects deployed in Florida. The activities associated with this program area are intended to ensure that individual ITS projects are deployed in a cost-effective and efficient manner. This program area addresses the requirements of the FHWA's *Rule 940* for systems engineering and fully satisfies *IEEE Standard 1220-1998 – Standard for Application and Management of the Systems Engineering Process*. This program area is the traditional emphasis of the systems engineering process for project development and includes:

- Requirements analysis and definition;
- Design;
- Validation; and
- Construction, engineering, inspection, and maintenance.

The activities defined for this systems engineering application include:

- Conceptual design and master plans;
- Design criteria packages;
- Procurement documentation;
- Implementation;
- Operations and management;
- Information sharing;
- Performance evaluation;
- Conflict resolution; and
- Change order management.

8.3 Professional Capacity Building

The professional capacity building functions support the sustainable execution of the systems engineering process and align the program management and technical/project management program areas between FDOT and the ITS stakeholders. These activities are strategically oriented to improve the understanding and effectiveness of ITS deployments. The activities associated with the professional capacity building area include:

- Training for all aspects of ITS deployment;
- Research and development; and
- Mainstreaming ITS with other FDOT activities and transportation partners.

ITS Florida has also initiated a structured training program to support training needs throughout the ITS profession in Florida that will supplement training programs developed by FDOT.

8.4 Roles and Responsibilities

Table 8.1 summarizes the mapping of the requirements of the systems engineering approach proposed in this issue paper to other professionally accepted techniques including FHWA *Rule 940* and the *EIA/IS 731, Systems Engineering Capability Model*. The basic process was also mapped to the Florida Statutes to document the authority of FDOT to develop this systems engineering approach.

Table 8.1 also summarizes the proposed roles of the major stakeholders for ITS deployments along the principal FIHS limited-access corridors. The stakeholders include the FHWA, the ITS Office, the districts, and MPOs.

Recently, ITS Florida has embarked on the development of a structured training program for ITS professionals in Florida. This program will be developed in cooperation with FDOT and other agencies who participate in the ITS Advisory Council.

Table 8.1 – Roles and Responsibilities in the Systems Engineering Approach

Proposed Systems Engineering Approach for ITS Deployments along FIHS Limited-Access Facilities		**Roles and Responsibilities**							
		FHWA		**ITS Office**		**District**		**MPO/Local**	
		Role	**Resp.**	**Role**	**Resp.**	**Role**	**Resp.**	**Role**	**Resp.**
ITS Architecture Conformity in *Rule 940* for Regions	Initial Needs, Issues Problems & Objectives	♦	⊙	□	❍	■	●	□	⊙
	Legacy Systems and Stakeholders	♦	⊙	□	❍	■	●	□	⊙
	Stakeholders Participation	♦	⊙	□	❍	■	●	□	⊙
	Concept of Operations and Business Plan	♦	⊙	□	❍	■	●	□	⊙
	Requirements Analysis	♦	⊙	□	❍	■	●	□	⊙
	Project Architecture and System Requirements	♦	⊙	■	●	□	⊙	□	⊙
	Applicable ITS Standards	♦	⊙	■	●	□	⊙	□	⊙
	Implementation Strategy	♦	⊙	□	⊙	■	●	□	⊙
Systems Engineering in *Rule 940* for Projects	Concept Designs & Master Plans	♦	❍	□	⊙	■	●		
	Concept of Operations and Business Plan	♦	❍	□	⊙	■	●		
	Design Criteria Packages	♦	❍	□	⊙	■	●		
	Performance Criteria	♦	❍	□	⊙	■	●		
	ITS Standards and Specifications	♦	❍	■	●	□	⊙		
	Analysis of Alternate System Configurations & Technologies	♦	❍	□	⊙	■	●		
	Determine Method of Procurement	♦	❍	□	⊙	■	●		
	Statewide Performance Criteria, ITS Standards and Specifications	♦	❍	■	●	□	⊙		
	Statewide Testing Requirements	♦	❍	■	●	□	⊙		
	Statewide Procedures For Management and Operations	♦	❍	■	●	□	⊙		
Additional Steps Required For Technical/Program Management Systems Engineering & Configuration Management	Risk Analysis	♦	❍	□	⊙	■	●		
	Verification of Design/Design Acceptance	□	❍	□	⊙	■	●		
	Validation/Project Acceptance	□	❍	□	⊙	■	●		
	Information Sharing	♦		□	⊙	■	●		
	Performance Evaluation	♦		■	●	□	⊙		
	Conflict Resolution	♦		□	⊙	■	●		
	Change Order Management	♦		□	⊙	■	●		
	Operations	♦		□		■	●		
	Management	♦		□		■	●		
Systems Engineering Program Management & Professional Capacity Building	ITS Program Plan	♦		■	●	□	⊙	□	
	Maintain Statewide ITS Architecture	♦		■	●	□	⊙	□	
	Systems Engineering Management Plan	♦		■	●	□	⊙		
	Statewide Rules, Policies and Procedures for ITS	♦		■	●	□	⊙		
	Model scopes of work and Work Break Down Structures	♦		■	●	□	⊙		
	Review Products for Consistency with ITS Standards & Specifications for State Contract	♦		■	●	□	⊙		
	Quality Assurance Processes and Reviews	□	⊙	■	●	□	⊙		
	Statewide Information Sharing	♦		■	●	□	⊙		
	Professional Capacity Building and Training	□	⊙	■	●	□	⊙		
	Research and Development of New Technologies	□	⊙	■	●	□	⊙		
	Statewide Technical Assistance and Support	□	⊙	■	●	□	⊙		

Legend –

Roles:
- ■ Lead
- □ Participate
- ♦ Advise

Responsibilities:
- ● Perform
- ⊙ Review/Concurrence
- ❍ Approve

9. Operations

9.1 Traffic Management Centers (TMCs)

The heart of ITS operations is the TMC. To determine the most appropriate locations for command and control centers for the ITS deployments, a review of the existing TMCs and stakeholder agency boundaries was conducted. A future conceptual RTMC/TMC classification strategy and coverage was developed for the ITS deployments that coincides with programmed changes in the law enforcement dispatch operations and boundaries. These proposed RTMC dispatch co-locations and coverages were recommended to increase efficiency and cost-effectiveness and to coordinate deployment, development, and maintenance of the *SITSA*.

9.1.1 Functional Requirements

Traffic Management Centers (TMCs) – TMCs shall provide the following desirable and minimum functions:

- Desirable Requirements:
  - Incident detection along the limited-access facilities;
  - Video surveillance along the limited-access facilities;
  - Video surveillance of the interchange areas (along the mainline and crossroads);
  - Management and operations of limited-access facilities during incident management;
  - Management and operations of one-way operations during evacuations;
  - Collection and dissemination of traveler information using DMS, HAR, and ATIS services (511 telephone services, internet, commercial radio, television, text messaging, etc.) for freeway operations and along other arterial routes (where available) independently or through an ISP contractor for ATIS;
  - Detection of road weather conditions that may impact operations;
  - Identification of construction work zones and activities to support operations and management of these work zones and, where smart work zone management is provided, integration of the smart work zone management into FMS and IMS;
  - Coordination with local traffic operation centers;
  - Coordination with county emergency management centers and the SEOC when appropriate;
  - Configuration management of traffic management software until the statewide TMC software is available. Configuration management will then occur at a statewide level. This software should include device drivers, graphical user interfaces, operating systems, databases, and other commercial off-the-shelf software needed to operate and manage the TMC;
  - Coordination with a freeway incident management team involving major stakeholders;
  - Reporting of data needed for performance monitoring and deployment evaluation including HPMS requirements through coordination with the TranStat Office;

- Traffic and delay prediction to support incident management and performance monitoring (including travel times and travel speeds);
- Traffic data archiving and central data warehousing including regional data sharing capabilities;
- Center-to-center communications to support major incidents that effect multiple jurisdictions including evacuation;
- Integration with computer-aided dispatch systems for incident detection with regional communications centers (RCCs) and emergency operations centers (EOCs) through co-location, communications links, and software or provision of operation stations in the TMC; and
- Support APTS – transit, port and airport.

- Minimum Requirements:
  - Video surveillance of the interchange;
  - Management and operations of limited-access facilities during peak demand periods;
  - Traffic data collection to support incident detection;
  - Real-time video display;
  - Real-time video control;
  - Video verification of messages posted on DMS;
  - Incident data archiving;
  - Coordination with all law enforcement, fire and rescue, and emergency management personnel;
  - Management, dispatch, and coordination of RR Service Patrols;
  - System maintenance and management of ITS field devices and communications infrastructure and development of a plan to ensure responsive and preventative maintenance is being carried out;
  - Support operations and management during natural or man-made disasters or evacuations;
  - Maintenance of a list of diversion routes for management of traffic during incidents and evacuations; and
  - Support of lane or road closures during natural or man-made disasters or evacuations.

The primary responsibility for these requirements is at the RTMC. Satellite (or secondary) traffic management centers (STMCs) and virtual traffic management centers (VTMCs) should be capable of fulfilling these responsibilities for limited durations when secondary control is required due to man-made or natural disasters or maintenance activities that require the primary center to be off-line.

In the major urbanized areas, these services should be provided at LOS 5 as defined in the *ITS Strategic Deployment Prioritization Plan* – 24-hour operations, 7 days a week. In other regions, LOS 4 is recommended – 16-hour operations.

Other functions or institutional agreements that may be considered and addressed in the future, but for which technology is not available to support at this time, include:

- Identification of incident locations identified through cell phones using E-911 services;
- Reverse 911 or 511 services to advise travelers of urgent advisories related to emergencies or road closures; and
- Identification of vehicle travel times and delays using probe vehicle technologies that may include ***SunPass***® transponders or AVI technologies on transit, police, or emergency vehicles, or cell phone technologies.

Florida Highway Patrol (FHP), Other Law Enforcement, and Regional Communications Centers (RCCs) – The FHP has the primary responsibility for incident site management and law enforcement on the limited-access facilities. FHP's mission is to promote safe driving environments through law enforcement, education, and awareness. FHP provides responses to crashes, crimes, and natural and man-made disasters. FHP also detects, prevents, and enforces criminal laws relating to highway violence, transportation of illegal substances, auto theft, driver's license fraud, and emissions violations. FHP is in the process of consolidating their dispatch and operations centers with other law enforcement agencies throughout the state into RCCs.

Along the limited-access facilities, FHP and other law enforcement agencies provide the following functions through the RCCs:

- Response to call box actuations for law enforcement;
- Receipt of calls using *FHP cellular services;
- Response to 911 or other calls for assistance;
- Performance of crash investigations;
- Management of incident operations;
- Performance of traffic management at incidents;
- Initiation and coordination of traffic diversions;
- Coordination with TMCs and RCCs;
- Coordination with RR Service Patrols;
- Response to reports of roadway debris;
- Monitoring and reporting of adverse roadway conditions resulting from infrastructure deficiencies and environmental conditions;
- Provision of incident detection and verification to the TMC and vice versa;
- Provision of vehicle tracking for emergency vehicles using automated vehicle detection technologies.

Fire and Rescue – Fire and rescue services are provided throughout the limited-access corridors usually in conjunction with emergency management services. Fire and rescue will provide the following functions:

- Response to vehicle crashes and other emergencies;
- Removal and transport of injured persons for medical care;
- Extinguishing and preventing fires related to vehicles and from adjacent lands along the corridors;
- Response and mitigation of HAZMAT spills; and
- Assistance with evacuation operations, response, and clean-up of natural and man-made disasters.

Emergency Operations Centers (EOCs) – Each county maintains an EOCs in accordance with the *State Emergency Preparedness Plan*. These centers are centrally located and serve as the hub of local information communicated to the SEOC in Tallahassee that, under states of emergency, is commanded by the Governor and is responsible for the deployment and management of all state resources. FDOT, law enforcement, and emergency management agencies are represented in the SEOC. The primary roles of the EOCs are:

- Emergency preparedness for natural and man-made disasters;
- Management and operations of emergency responses and evacuations associated with natural and man-made disasters;
- Recovery and mitigation following disasters;
- Compliance planning and support; and
- Policy and planning coordination among agencies affected by disasters.

9.1.2 Relationship of Traffic Management Centers (TMCs) and their Coverage

A hierarchy of TMCs was developed to determine which TMCs would serve as the coordinated hub for control decisions, operations, and dispatch and which TMCs would serve as STMCs or VTMCs, operating as secondary or peak hour ITS control centers for the intrastate corridors.

Three categories of TMCs were identified to distinguish primary and secondary command and control. These include:

- RTMCs;
- STMCs; and
- VTMCs.

Regional Traffic Management Centers (RTMCs) – The RTMCs will serve as the hub for command and control decisions for operations along the intrastate corridors and will coordinate with other operational stakeholder agencies and transportation control centers as necessary. These RTMCs are designated as "regional" based on the following criteria:

- RTMCs are the regional hub for command and control for operations along major limited-access corridors and link to other TMCs and transportation, law enforcement, fire and rescue, and emergency management control centers within a region.
- RTMCs are the hub for data collection and central data warehousing within the districts.
- RTMCs provide dispatch for the RR Service Patrols for the intrastate corridors.
- RTMCs are co-located with FHP/Florida Department of Law Enforcement (FDLE) joint communications dispatch centers where possible.
- RTMCs may provide space for other agencies to operate in the RTMC to support coordinated operations and serve as the institutional hub for coordinated operations.
- RTMCs are not necessarily defined by city, county, or district boundaries but by functional requirements for the operations and management of the limited-access facilities.
- RTMCs may provide command and control of arterial traffic management systems as well, where feasible.

This premise requires the designation of as few RTMCs as necessary to maintain efficient and effective ITS operations for each district and the division of corridors for command and control operations.

Existing RTMC Coverage – Currently, only three FDOT RTMCs are operational. These include:

- Miami RTMC located at the FDOT District 6 Office and co-located with the FHP Miami RCC (under construction – interim center located within District 6 headquarters);
- Orlando RTMC co-located with the FHP Orlando RCC at the District 5 Urban Office; and
- Jacksonville RTMC located at the District 2 Urban Office.

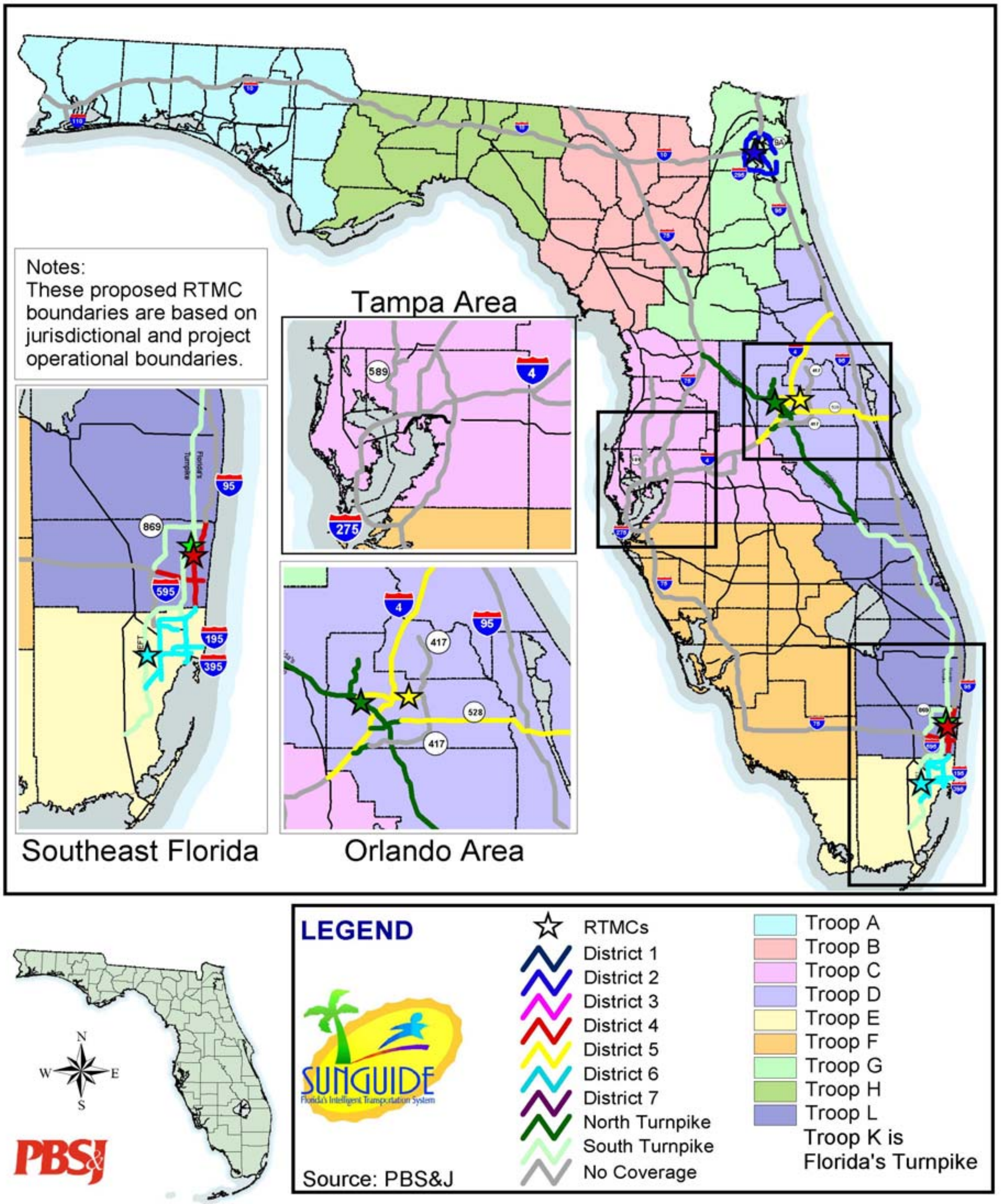
The Miami and Orlando RTMCs are currently co-located with new centralized FHP dispatch centers and the Jacksonville RTMC coordinates closely with the existing FHP Troop G dispatch center. In fact, the FHP Troop G dispatch center serves as secondary control of the I-10 ITS devices when the RTMC is not in operation during evening and weekend hours.

Existing RCC Coverage – Currently, the FHP operates several independent communications centers for each troop throughout their individual districts. However, the current communications centers will be consolidated as the RCC plan is implemented. FHP's personnel will be dispatched from one centralized communications center established for their district, in coordination with other law enforcement agencies. The existing FHP headquarters are currently located at:

- Troop A – West U.S. 98, Panama City;
- Troop B – U.S. 90 West, Lake City;
- Troop C – Adjacent to District 7 Headquarters, McKinley Drive, Tampa;
- Troop D – District 5 RTMC, Semoran Boulevard, Orlando;
- Troop E – District 6 RTMC, N.W. 111th Avenue, Miami;
- Troop F – 53rd Avenue East, Bradenton;
- Troop G – Normandy Boulevard, Jacksonville;
- Troop H – Mahan Drive, Tallahassee;
- Troop K – Florida's Turnpike, West Palm Beach; and
- Troop L – West Lantana Road, Lantana.

Figure 9.1 illustrates the existing RTMCs, their coverages, and the FHP troop boundaries.

Figure 9.1 – Existing RTMC Coverage



Future RTMC Coverage – As mentioned previously, FHP is implementing a program to establish RCCs for the dispatch of FHP, FDLE, MCCO, Alcohol, Beverage and Tobacco (ABT) agency personnel, and resources from each FHP district. A phased implementation plan has been developed for RCCs to ensure that state law enforcement agencies receive efficient, prompt, and coordinated dispatch services and that the appropriate personnel are notified of a critical or unusual incident involving their agency.

Seven RCCs will be established in major metropolitan areas throughout the state and individual communications centers for existing FHP troops will be consolidated with these regional dispatch centers. Currently, three of the seven RCCs exist and the remaining four centers will be implemented over the next several years. Table 9.1 identifies the new RCC locations, the FHP troops dispatched from the RCC, and the RCC implementation dates. A copy of the FHP's RCC Plan is included in *Appendix G* of this report.

Table 9.1 – Implementation of FHP RCCs

RCC	FHP Troops Dispatched from the RCCs	Scheduled Implementation
Miami	Troop E	Existing
Orlando	Troop D	Existing
Lake Worth	Troops L and K	Existing
Ft. Myers	Troop F	July 2002
Tampa	Troop C	June 2002
Jacksonville	Troops B and G	October 2002
Tallahassee	Troops A and H	February 2002

Additionally, FDOT has entered into a MOU with the FDLE Joint Task Force (JTF) Oversight Committee which states that both agencies will work towards the co-location of state law enforcement agencies' dispatch and the TMCs in Miami, Tampa, Jacksonville, and in other areas of the state where the centers are established and where it is feasible for both agencies to co-locate.

With this in mind, future RTMCs and their operational coverages for the intrastate corridors were developed to be coincidental with the RCCs and their dispatch boundaries. In most cases, these boundaries will parallel the district boundaries. However, alternate boundaries were considered where reasonable based on FHP's RCC dispatch boundaries, functional application of RR Service Patrols, and other ITS operational characteristics.

The following existing or planned RTMCs have been identified through the district plans for command and control of the intrastate ITS deployments (from south to north):

- District 6 RTMC located at the FDOT District 6 Office and co-located with FHP Miami RCC (under construction – interim center located within District 6 headquarters);
- Broward County ITS Operations Facility (RTMC) co-located with Broward County traffic management (in final design);
- Palm Beach County ITS Operations Facility planned for location near the I-95/PGA Boulevard Interchange and co-located with Palm Beach County traffic management;
- District 5 RTMC co-located with the FHP Orlando RCC at the District 5 Urban Office;
- District 1 RTMC in Ft. Myers co-located with the FHP Ft. Myers RCC (planned);
- District 7 RTMC co-located with the FHP Tampa RCC located at the District 7 Office (planned);
- Turkey Lake Turnpike RTMC (under development)[12];
- Pompano Beach RTMC (under development) [12];
- Jacksonville RTMC located at the District 2 Urban Office; and
- Tallahassee RTMC to be co-located with the City of Tallahassee and linked to the SEOC and the Troops A and H RCC (planned)[13].

Although FHP and FDOT are working together to coordinate dispatch and control of the intrastate facilities, in some instances it may be infeasible to co-locate. For example, the Lake Worth RCC is currently operational. Space within the existing facility is limited, thus minimizing the potential for co-location with the planned Palm Beach County ITS Operations Facility. However, in the future, as the Palm Beach County ITS Operations Facility is developed, potential relocation of the Lake Worth RCC may be considered. Similarly, the RCC in Jacksonville is currently not housed in the Jacksonville RTMC; however, co-location in the future may be considered. (This concept has been discussed between FDOT and FDLE/FHP but no formal agreements are in place.) In Tallahassee, the location for the RTMC and RCC is currently being reviewed.

Satellite or Secondary Traffic Management Centers (STMCs) – STMCs or operational centers and statewide centers of interest include:

- District 1 STMC in Sarasota (planned);
- ***SunPass***® Service Center in Boca Raton (electronic payment processing center);
- SunGuide℠ SmartRoute TMC (ATIS only) for Districts 4, 6, and the Turnpike;
- MDX TMC (under construction) that operates SR 836, SR 112, SR 878, SR 874, and SR 924;
- District 5 Headquarters STMC in Deland (planned);
- Pensacola Traffic Operations Facility co-located with FHP Troop A (planned); and
- SEOC (Tallahassee).

[12] The Turkey Lake RTMC and Pompano Beach RTMC will be interoperable and capable of assuming full operational control of the Turnpike facilities.

[13] When the Tallahassee RTMC is constructed, it could serve as a primary hub for traffic and incident information during states of emergency and provide a direct link to the SEOC. This concept will require additional refinement and consideration when construction is more imminent.

Virtual Traffic Management Centers (VMTCs) – VTMCs (or remote access terminals with limited physical capital investments) to the RTMCs are also proposed as follows:

- District 1 VTMC in Bartow (planned); and
- District 2 Headquarters VTMC in Lake City (planned).

Portable Traffic Management Centers (PTMCs) – PTMCs may be used to support work zone management or special traffic management scenarios on an as-needed basis. Examples of these traffic management systems could be as simple as a laptop computer and software that is connected to DMS in a work zone using wireless communications to provide traffic and traveler advisories.

Table 9.2 summarizes these responsibilities and the secondary control centers for limited-access facilities. Table 9.3 summarizes the mileage of limited-access facilities each RTMC will operate under this scenario for the full system build-out and based on the *Ten-Year ITS Cost Feasible Plan*.

The proposed RTMCs, their corridor coverage, and the relationship to the FHP RCC boundaries are identified in Figure 9.2.

Figures 9.3 through 9.11 illustrate the conceptual operational approach and connections between the RTMCs, the STMCs, the VMTCs, local TMCs, and state and local emergency response agencies.

Table 9.2 – Summary of Roles and Responsibilities along the Principal FIHS Limited-Access Corridors

Corridor/Segment	Deployment	Primary Operational Command	Secondary FDOT Operational Command[14]	Costs of Maintenance
I-4 ITS Corridor				
I-4 District 7	District 7	Tampa RTMC	District 1 VTMC (Bartow)	District 7
I-4 in District 1 from District 7 to U.S. 27	District 7	Tampa RTMC	District 1 VTMC (Bartow)	District 7
I-4 in District 1 from U.S. 27 to District 5	District 5	Orlando RTMC	District 1 VTMC (Bartow)	District 5
I-4 in District 5 to I-95	District 5	Orlando RTMC	District 5 STMC (Deland)	District 5
I-10 ITS Corridor				
I-10 in District 3 to U.S. 90 in Suwannee County	District 3	Tallahassee RTMC	District 3 VTMC (Pensacola)	District 3
I-10 in District 2 from U.S. 90 in Suwannee to I-95	District 2	Jacksonville RTMC	District 2 VTMC (Lake City)	District 2
I-75 ITS Corridor				
I-75 from SR 826 in District 6 to SR 858 in District 4	District 6	Miami RTMC	Broward County RTMC	District 6
I-75 from SR 858 to U.S. 27 in District 6	District 4	District 4 Broward County RTMC	District 6 RTMC (Miami)	District 4
I-75 in District 4 from U.S. 27 to CR 833	District 4	Ft. Myers RTMC	Broward County RTMC	District 4
I-75 in District 4 from CR 833 to Alico Road in District 1	District 1	Ft. Myers RTMC	Sarasota STMC	District 1
I-75 Alico Road in District 1 to SR 70 in District 1	District 1	Ft. Myers RTMC	District 1 VTMC (Bartow)	District 1
I-75 from SR 70 in District 1 to U.S. 98 in District 7	District 7	Tampa RTMC	District 1 VTMC (Bartow)	District 7
I-75 from U.S. 98 in District 7 to CR 484 in District 5	District 5	Tampa RTMC	District 5 STMC (Deland)	District 5
I-75 in District 5 from CR 484 to CR 318	District 5	Jacksonville RTMC	District 5 VTMC (Deland)	District 5
I-75 in District 5 from CR 318 to the Georgia/Florida state line	District 2	Jacksonville RTMC	District 2 VTMC (Lake City)	District 2

[14] Secondary command and control of some operations currently occurs in partnership with FHP and FDLE where joint dispatch and traffic management do not occur in the same location. For example, District 2's existing secondary center is the FHP/FDLE dispatch center (Normandy Boulevard), which operates and manages the facilities when the FDOT center is not occupied (off-hours). As more centers come "on-line" with co-locations for joint dispatch and traffic management, alternate sites for secondary command and control will be needed. If needed, an additional column can be added to relate these traffic management functions with FHP/FDLE dispatch coverage.

Table 9.2 (Continued)

I-95 ITS Corridor				
District 6 to Ives Dairy Road	District 6	District 6 RTMC	Broward County RTMC	District 6
District 4 from Ives Dairy Road in District 6 to CR 512	District 4	Broward County RTMC	Palm Beach RTMC	District 4
District 5 from CR 512 to U.S. 1	District 5	Orlando RTMC	District 5 STMC (Deland)	District 5
District 2 from U.S. 1 to the Georgia/Florida state line	District 2	Jacksonville RTMC	District 2 VTMC (Lake City)	District 2
Florida's Turnpike				
Mainline to I-95 (North)	Turnpike Enterprise	Pompano Beach RTMC	Turkey Lake RTMC	Turnpike Enterprise
HEFT (SR 821)	Turnpike Enterprise	Pompano Beach RTMC	Turkey Lake RTMC	Turnpike Enterprise
Sawgrass (SR 869)	Turnpike Enterprise	Pompano Beach RTMC	Turkey Lake RTMC	Turnpike Enterprise
SR 528	Turnpike Enterprise	Turkey Lake RTMC	Pompano Beach RTMC	Turnpike Enterprise
SR 417(2)	Turnpike Enterprise	Orlando RTMC	Turkey Lake RTMC	Turnpike Enterprise
Western Beltway	Turnpike Enterprise	Orlando RTMC	Turkey Lake RTMC	Turnpike Enterprise
Veterans/Suncoast Parkway[15]	District 7	District 7 RTMC	Turkey Lake RTMC	District 7
Polk County Parkway[15]	District 7	District 7 RTMC	Turkey Lake RTMC	District 7

[15] This division of responsibilities is based on a tentative agreement between the Turnpike, District 5, and District 7. An operational plan and protocols are needed before the agreement can be formalized. This agreement should address funding, design, construction, operations, and maintenance issues.

Table 9.3 – Summary of Miles of Operation along ITS Corridors for Each RTMC Under the Proposed Concept of Operations

District	Miles
1	205.14
2	378.13
3	281.58
4	169.36
5	315.27
6	85.63
7	307.34
Turnpike	359.43
TOTAL	**2,101.88**

Figure 9.2 – Future RTMC Coverage

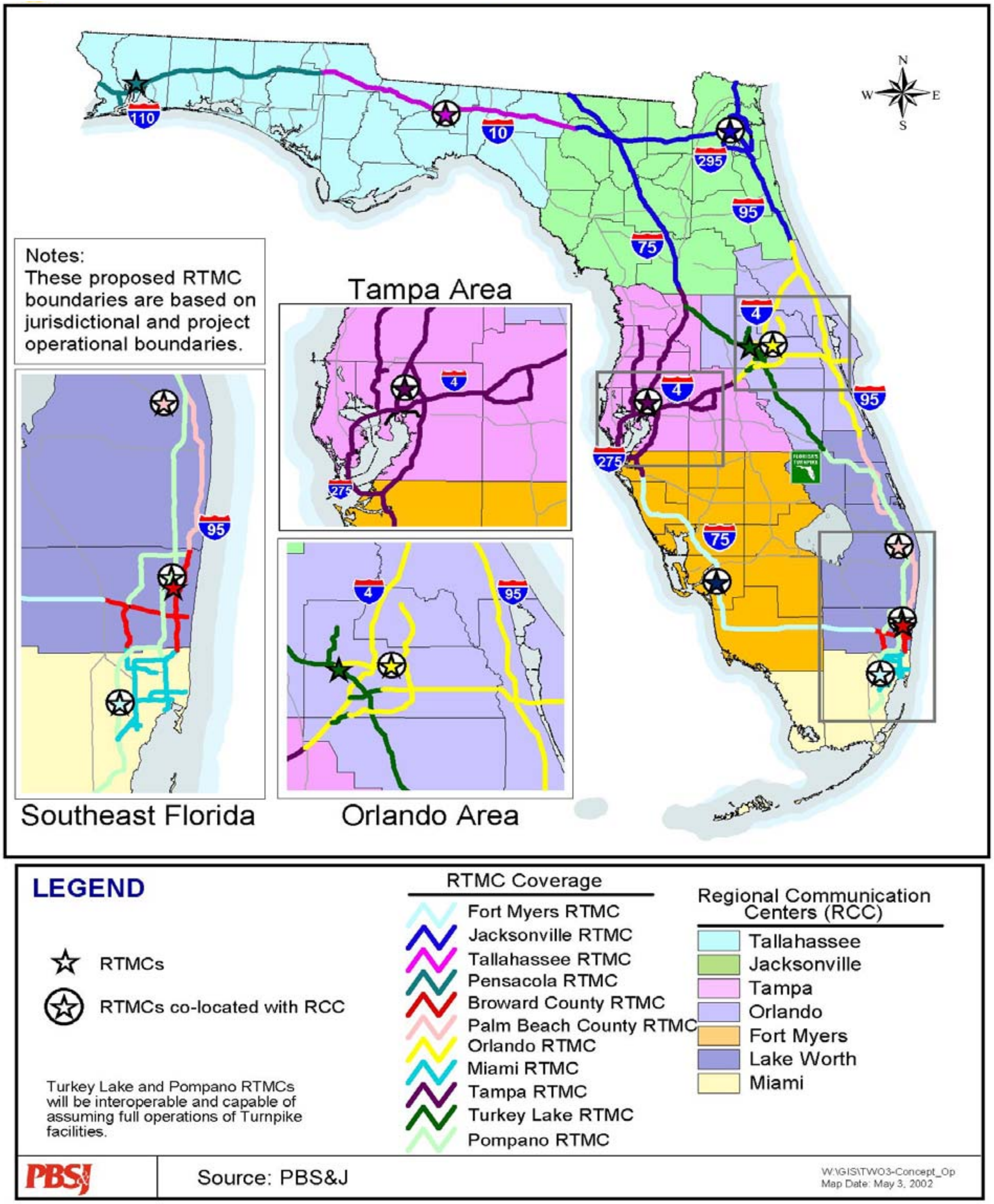
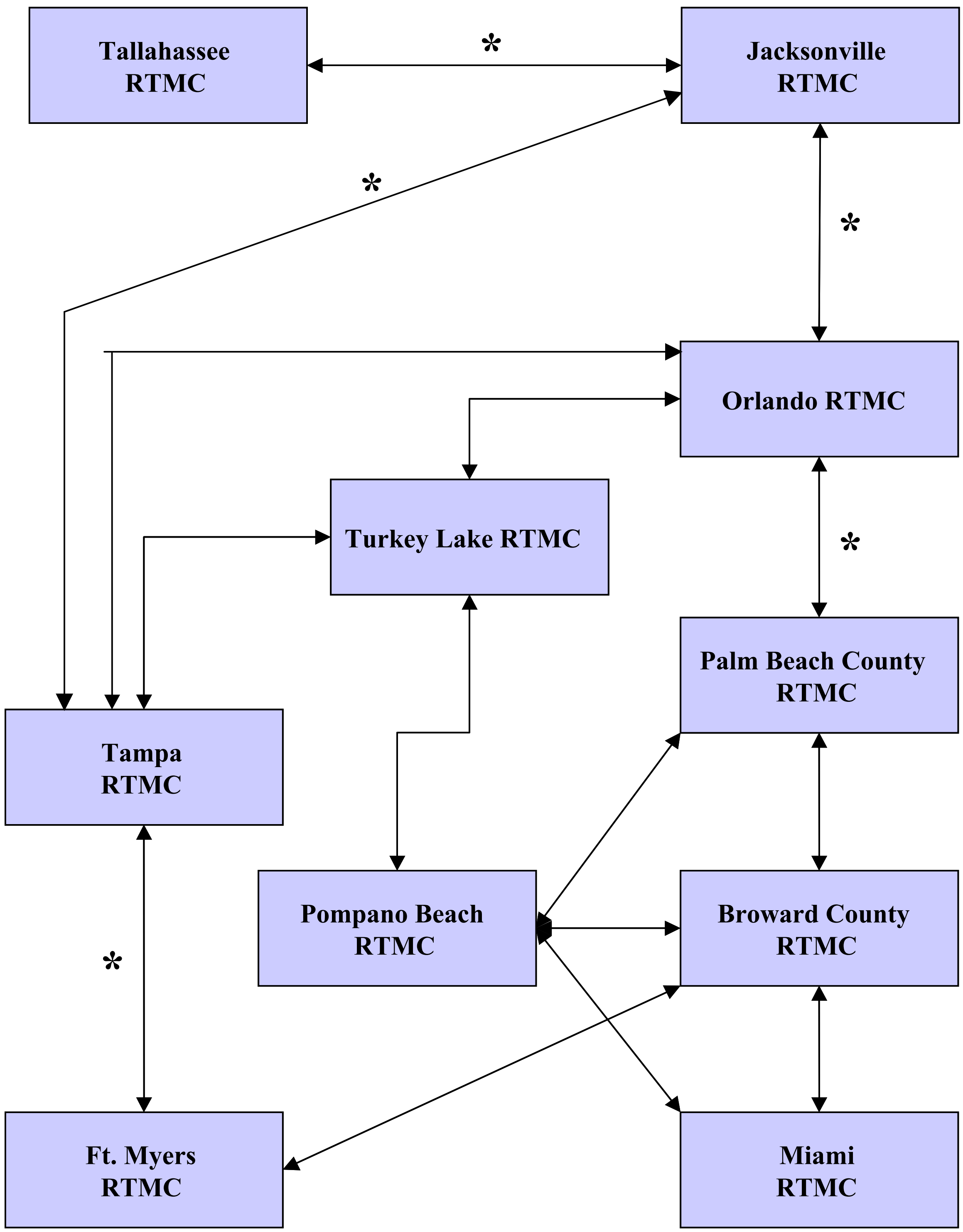
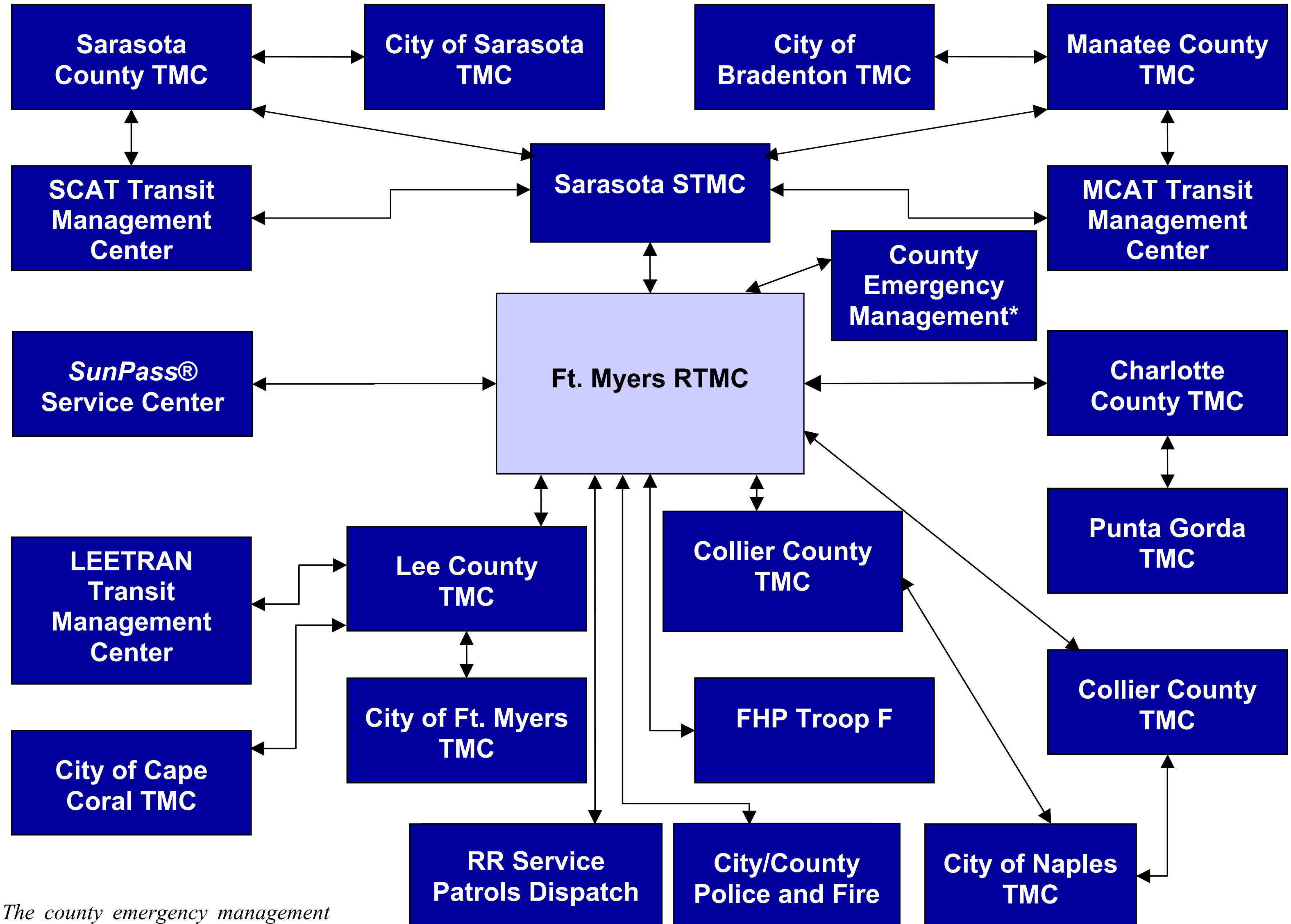


Figure 9.3 – Center-to-Center RTMC Coordination



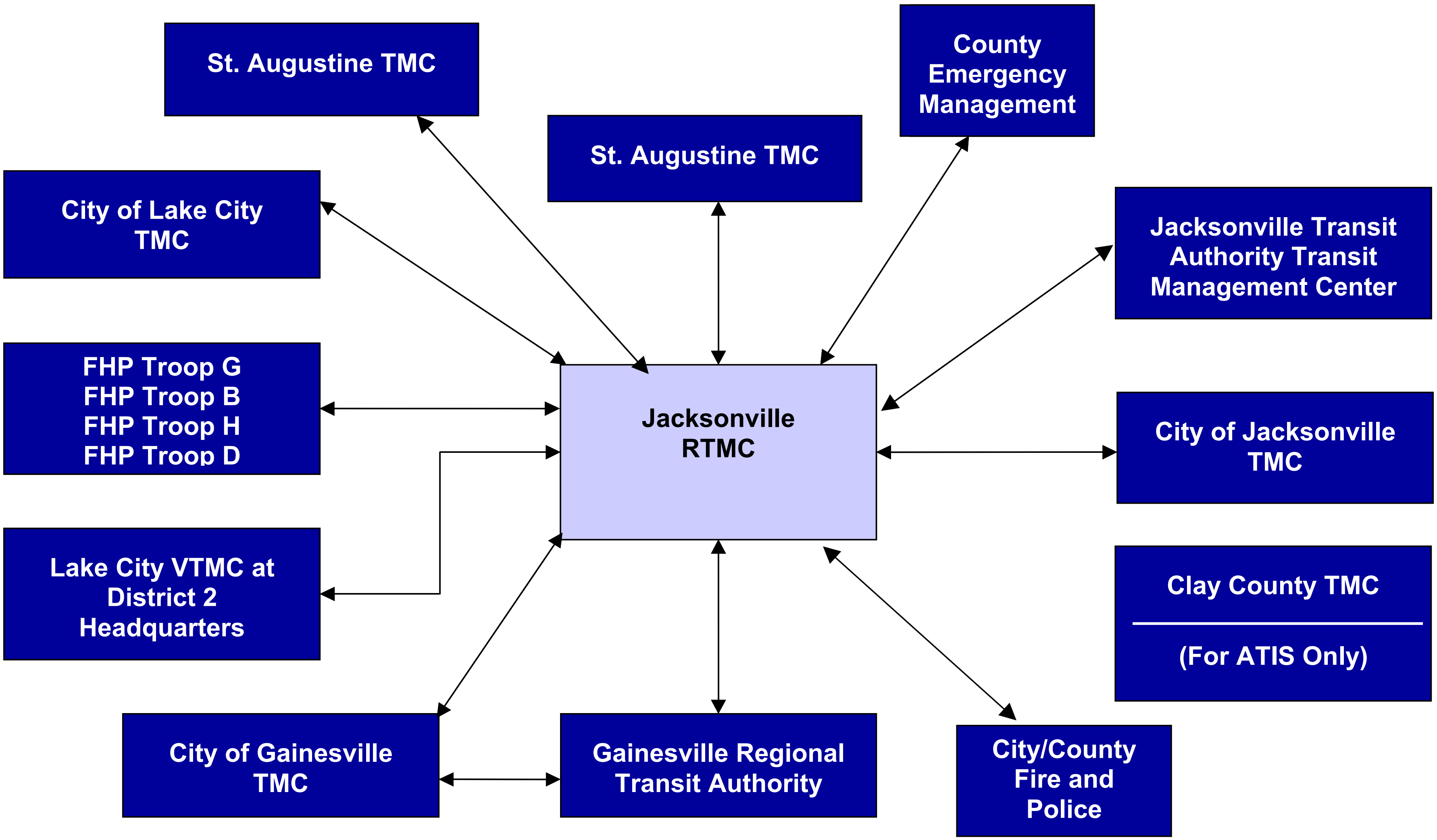
* Direct communications infrastructure links between these RTMCs will be limited to the microwave backbone until the FFN is completed through public/private partnership or the FDOT FON is completed. Telephone systems should also be considered for these connections.

Figure 9.4 – District 1 RTMC Operational Approach



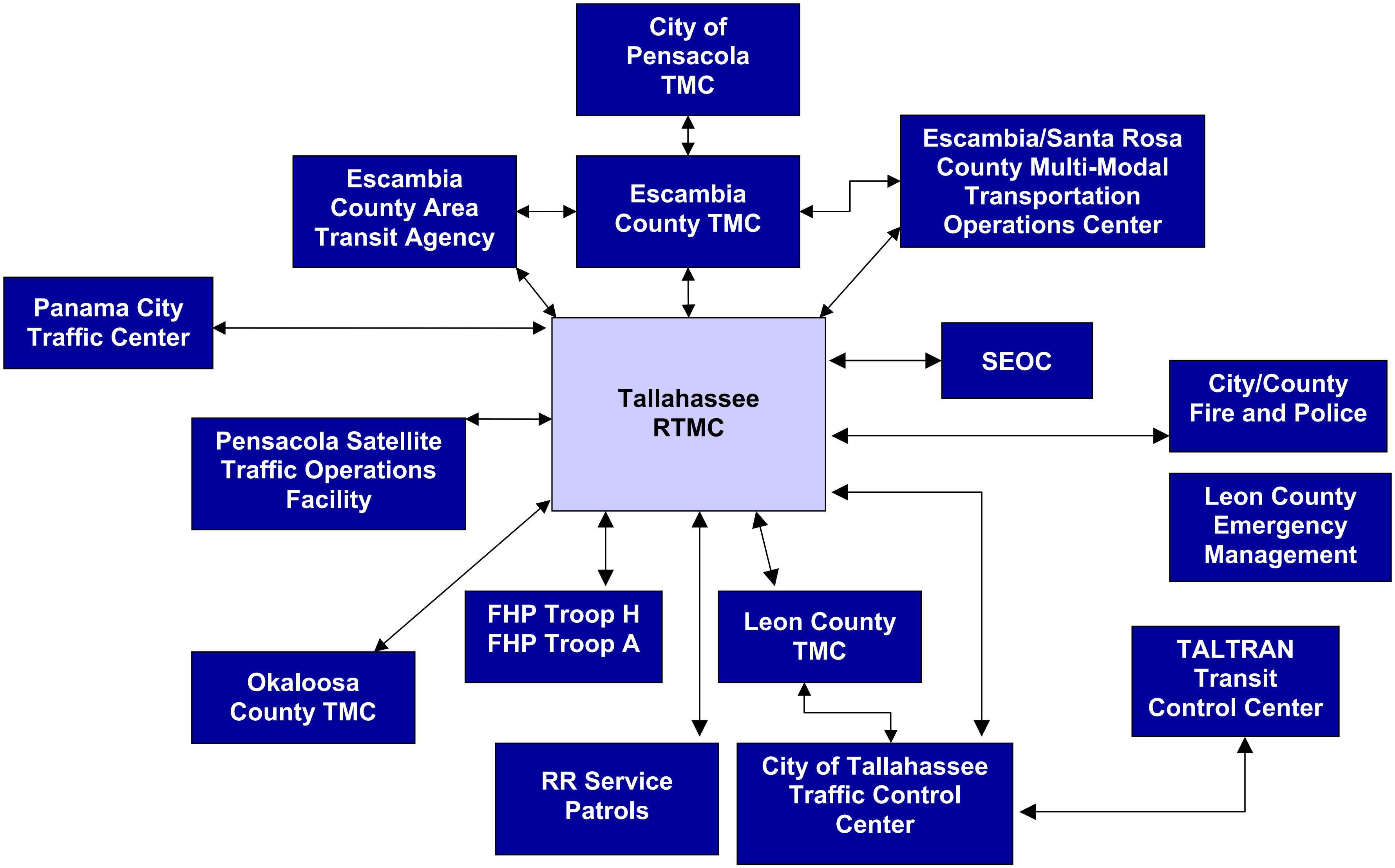
NOTE: The county emergency management center links to all affected counties.

Figure 9.5 – District 2 RTMC Operational Approach



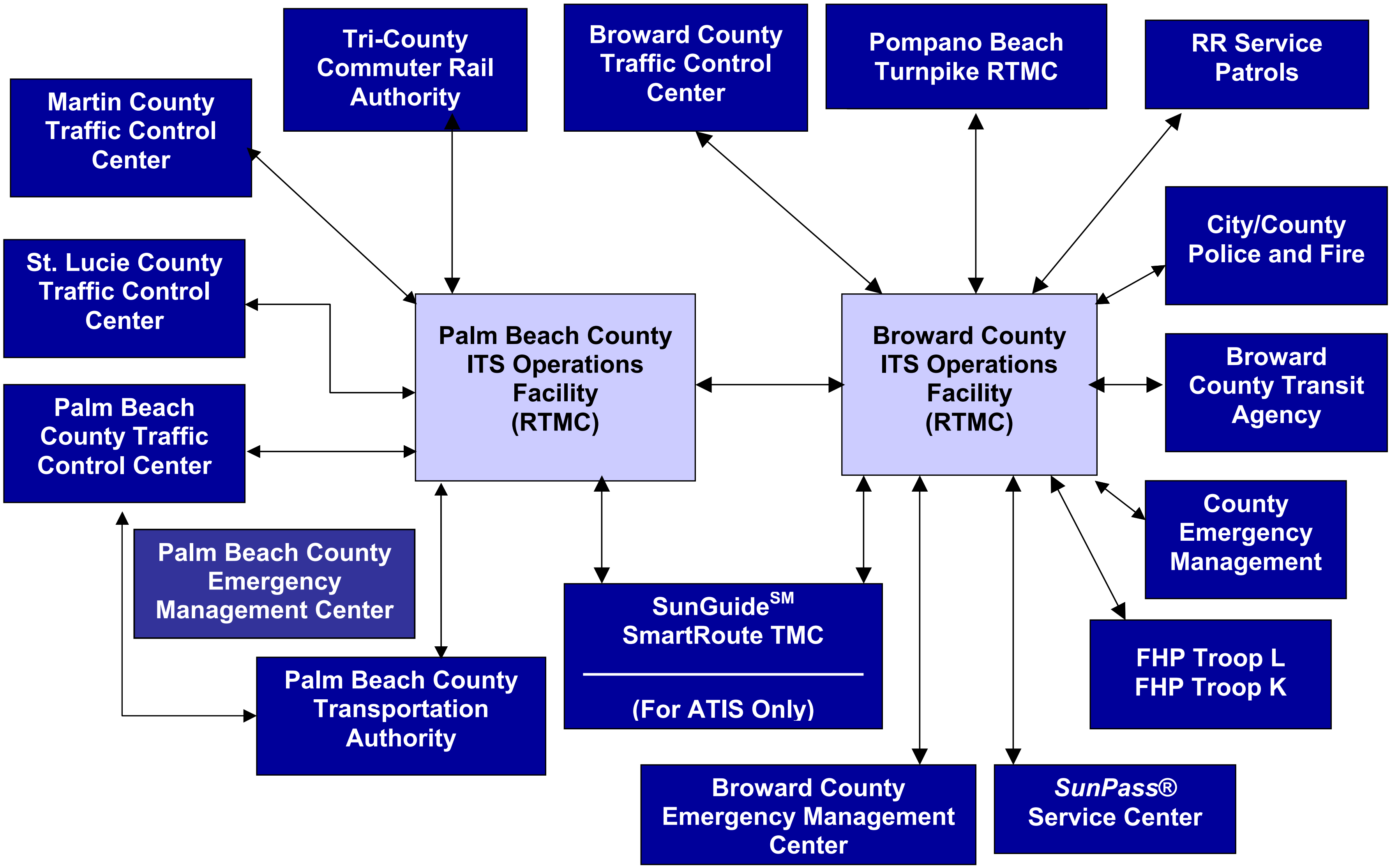
NOTE: The county emergency management center links to all affected counties.

Figure 9.6 – District 3 RTMC Operational Approach



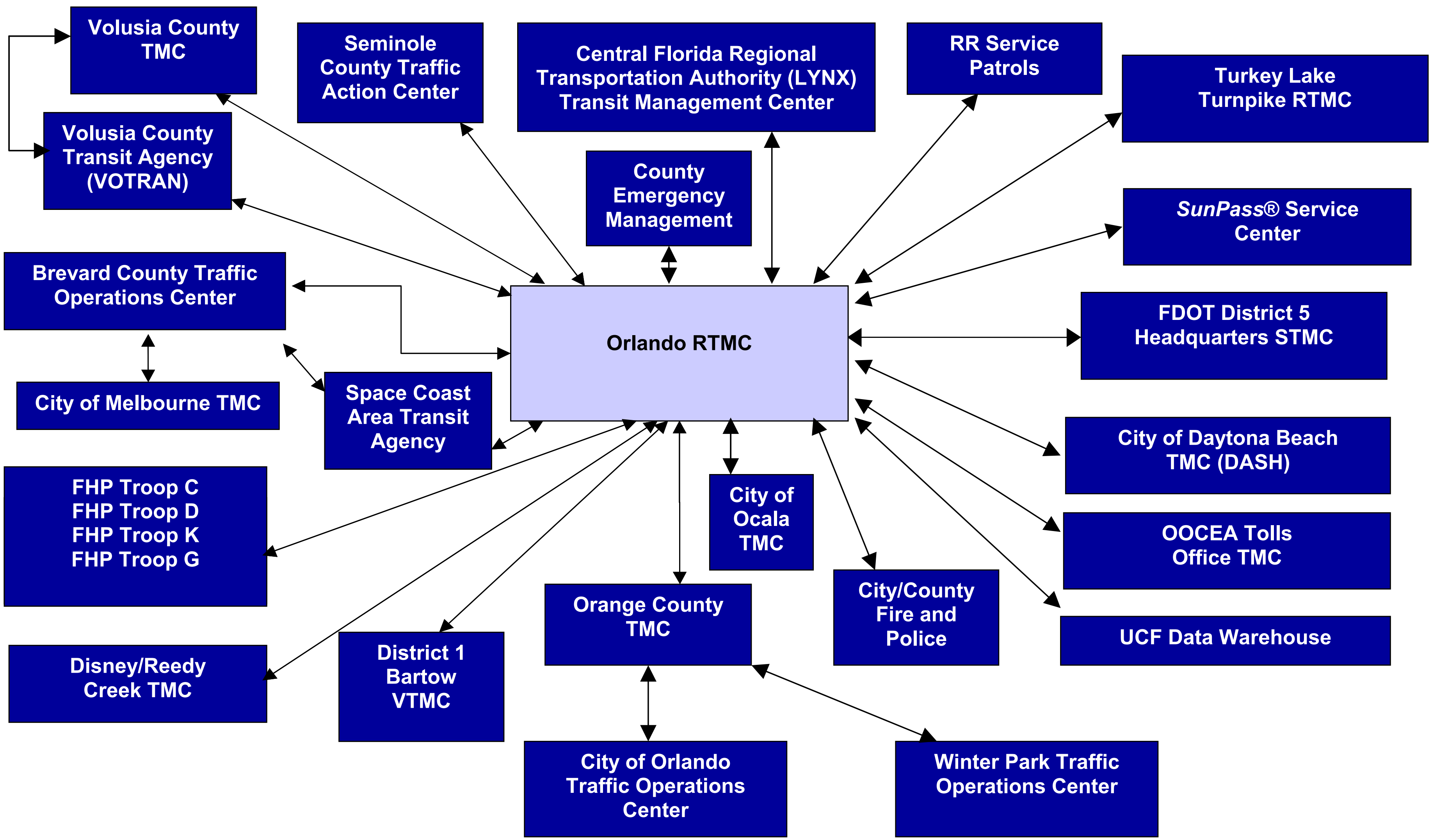
NOTE: Co-location of the City of Tallahassee, FDOT Tallahassee RTMC, and the RCC (dispatch) is currently being explored by these stakeholders.

Figure 9.7 – District 4 RTMC Operational Approach



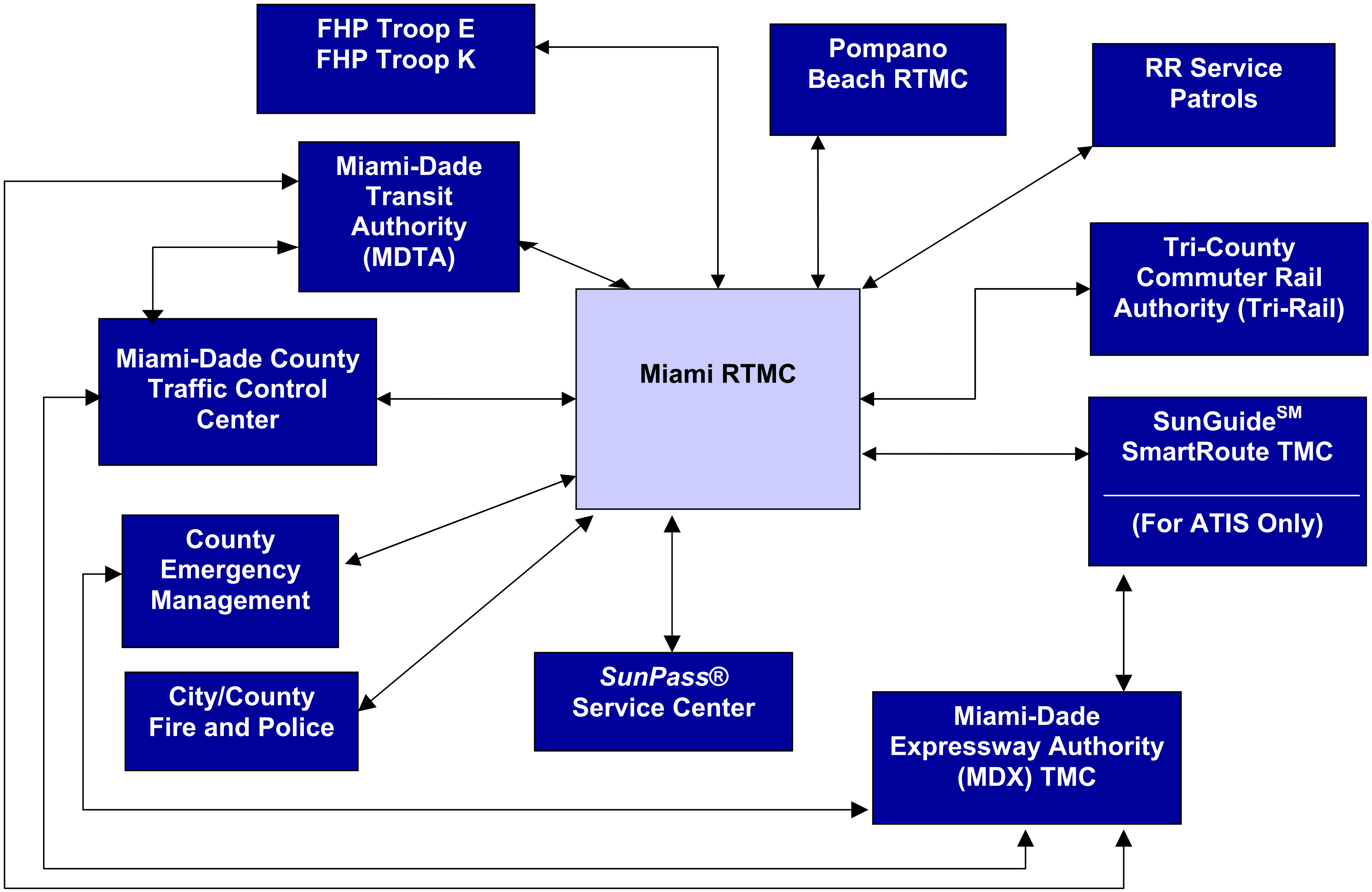
NOTE: The county emergency management centers link to all affected counties.

Figure 9.8 – District 5 RTMC Operational Approach



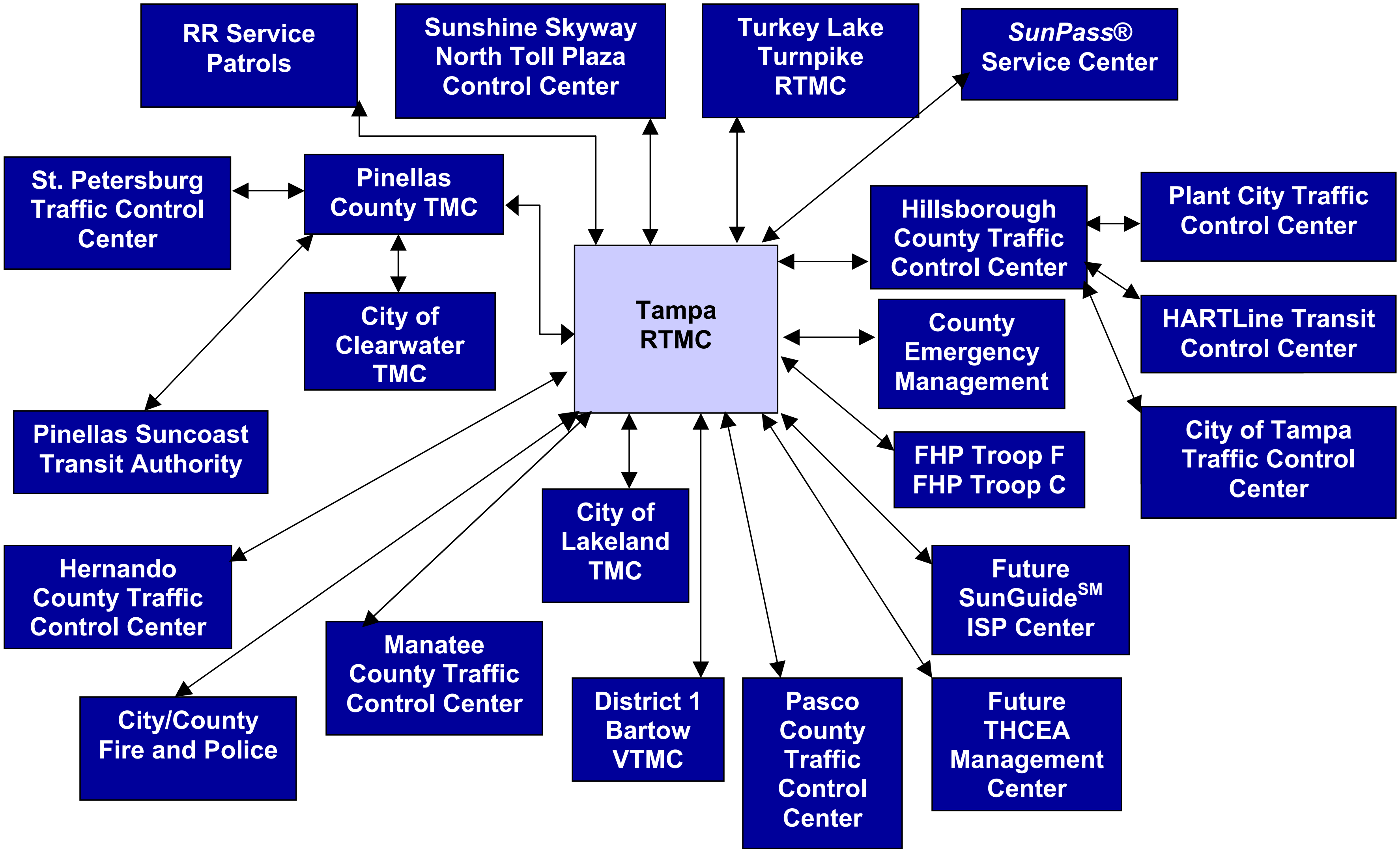
NOTE: The county emergency management center links to all affected counties.

Figure 9.9 – District 6 RTMC Operational Approach



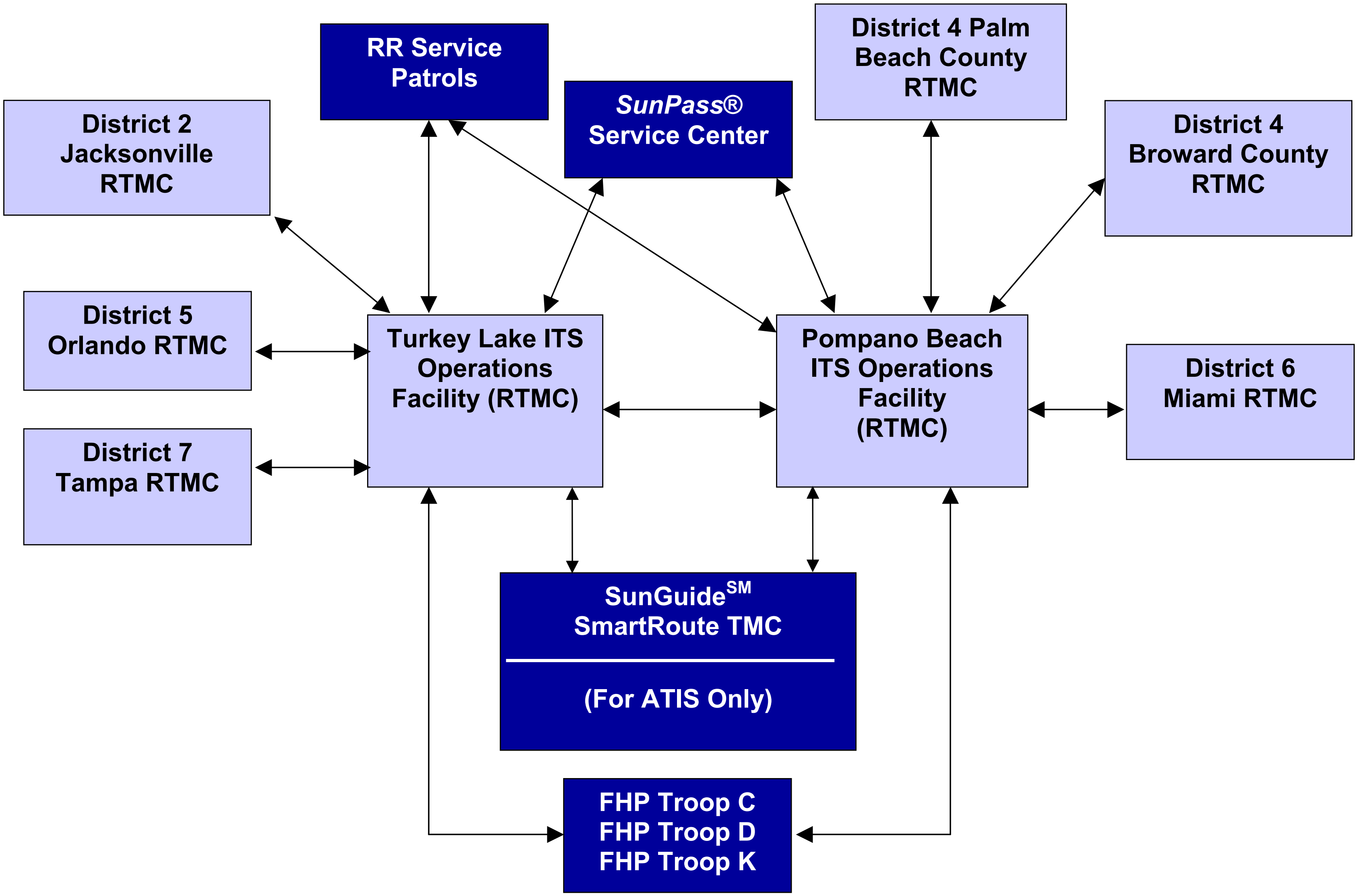
NOTE: The county emergency management center links to all affected counties.

Figure 9.10 – District 7 RTMC Operational Approach



NOTE: The county emergency management center links to all affected counties.

Figure 9.11 – Florida's Turnpike Enterprise RTMC Operational Approach



The following text discusses the conceptual ITS management and operations along the study corridors.

9.1.3 I-4 ITS Corridor

I-4 ITS Corridor Defined – The limits of the I-4 corridor are from I-275 in Hillsborough County to I-95 in Volusia County.

Roles and Responsibilities – The division of roles and responsibilities for the management and operations of I-4 is both functional and geographic. The functional division of responsibilities for I-4 occurs with the Evacuation Coordination User Service. During evacuation conditions, the SEOC is responsible for command and control of all state resources as outlined in the general approach to operations. The district offices are responsible for the command and control of the corridor and for the application of all other operational functions. Agreements have been developed between the districts that delegate responsibility for command, control, and operations of the I-4 corridor as follows:

- District 7 is fully responsible for the I-275 segments of the corridor, command and control and operations and maintenance in Hillsborough County, and command and control of I-4 from I-275 to U.S. 27 in Polk County (District 1).

- District 1 will provide the maintenance of I-4 through Polk County; however, District 7 will be responsible for operations through command and control of the ITS from U.S. 27 west and District 5 from U.S. 27 east. District 1 will develop a VTMC (to provide a communications link to the TMCs in Districts 5, 7, and Florida's Turnpike) in Bartow at the District Headquarters. During local emergencies, District 1 will provide command and control (when the VTMC is complete). Specific protocols for operations during these conditions will be required.

- District 5 is responsible for the command and control of I-4 from U.S. 27 east in Polk County (in District 1) and command, control, operations, and maintenance from the Polk County Line to I-95 (in District 5). The control of I-4 near I-95 will be integrated with the DASH system.

- The Turnpike Enterprise is responsible for the command and control of the Turnpike mainline. A communications link will be provided between the Turnpike Enterprise and other districts as needed.

- District 7 will be responsible for the traffic management of Turnpike facilities located in District 7 such as the Veterans/Suncoast Parkway and Polk County Parkway. The Turkey Lake RTMC will serve as the secondary control center for these facilities.

Two RTMCs are anticipated to be the primary parties responsible for the I-4 corridor: the Tampa RTMC (proposed) and the Orlando RTMC, currently operational. Each district will determine the need for link to the RTMCs.

- The Tampa RTMC will be responsible for the east-west segments of I-275 and I-4 from I-275 to U.S. 27 in Polk County.
- The District 1 VTMC in Bartow will serve as the secondary operational command for the Tampa RTMC.
- The Orlando RTMC will be responsible for I-4 from U.S. 27 in Polk County to I-95.
- The District 1 VTMC in Bartow will serve as the secondary operational command for the Orlando RTMC.

9.1.4 I-10 ITS Corridor

I-10 ITS Corridor Defined – The limits of the I-10 corridor are from the Alabama state line to I-95 in Jacksonville. This corridor will also include I-110 in Escambia County.

Roles and Responsibilities – The division of roles and responsibilities for the management and operations of I-10 is both functional and geographic. The functional division of responsibilities for I-10 occurs with the Evacuation Coordination User Service. During evacuation conditions, the SEOC is responsible for command and control of all state resources as outlined in the general approach to operations. The District 2 and District 3 offices are responsible for the command and control of the corridor for the application of all other operational functions. Command and control of operations on the I-10 corridor will be as follows:

- District 3 is fully responsible for the I-10 corridor from the Alabama state line to U.S. 90 in Suwannee County from the Tallahassee RTMC (planned).
- District 3 is fully responsible for the full extent of the I-110 corridor in Escambia County.
- District 2 is fully responsible for the I-10 corridor in District 3 from U.S. 90 in Suwannee County to I-95 in District 2 from the Jacksonville RTMC.

Based on an analysis of the division boundaries and RCC boundaries, it may be reasonable for District 2 to consider abrogating command and control decisions for I-10 in accordance with the RCC boundaries. This approach would create more efficient dispatch and operational response to incidents occurring along this largely rural corridor. However, this proposal is conceptual and no discussion of this concept has occurred between the districts at this time.

In addition to the primary responsibilities for the corridor, secondary command and control responsibilities will be as follows:

- The Pensacola STMC (planned) will serve as the secondary control center for the Tallahassee RTMC.
- The Lake City VTMC (planned) will serve as the secondary control center for the Jacksonville RTMC.

9.1.5 I-75 ITS Corridor

I-75 ITS Corridor Defined – The limits of the I-75 corridor are from the Palmetto Expressway in Miami-Dade County to the Georgia state line. This corridor will also include I-275 from I-75 in Manatee County to I-75 in north Hillsborough County.

Roles and Responsibilities – The I-75 corridor is one of the most operationally complex corridors along the FIHS limited-access facilities. This corridor travels through Districts 1, 2, 4, 5, 6, and 7. The range of travel conditions along this corridor vary from intense urbanized areas to rural operations with low-density interchanges and high-density rural segments with high truck volumes. The segment of I-75 known as Alligator Alley, which travels from Naples to Ft. Lauderdale, is one of only two tolled interstate facilities in the state. The segment of I-275 known as the Sunshine Skyway Bridge, which spans Tampa Bay from Manatee County to Pinellas County, is the second tolled interstate facility.

The division of roles and responsibilities for the management and operations of I-75 is both functional and geographic. The functional division of responsibilities for I-75 occurs with the Evacuation Coordination User Service. During evacuation conditions, the SEOC is responsible for command and control of all state resources as outlined in the general approach to operations. The district offices are responsible for the command and control of the corridor for the application of all other operational functions. Command and control of operations of the I-75 corridor will be as follows:

- It is proposed that District 6 abrogate command and control of the portion of I-75 that travels through Dade County to District 4. District 6 will maintain responsibility for the costs of field element deployments and maintenance along the corridor.

- District 1 currently operates I-75 along its rural segments from Alico Road to U.S. 27 to provide a single RR Service Patrol contract and consistent operations across the corridor. This approach is anticipated to continue through deployment of freeway and incident management services.

- District 1 is fully responsible for I-75 from CR 833 along Alligator Alley to the CR 683/Moccasin Wallow Road limits of the District 7 Interstate Plan in Manatee County. The remaining section of I-75 in Manatee County will be operated by District 7 as part of the Sunshine Skyway Bridge and I-275 corridors in the District 7 Interstate ITS Plan. District 1 will be responsible for the costs of field deployments and maintenance along the corridor in this section. The facility will be operated from the Sarasota STMC (planned) but all data will be linked to the Ft. Myers RTMC (planned) that is District 1's RTMC.

- District 7 is responsible for the operations of I-75 in Manatee County from CR 683/Moccasin Wallow and fully responsible for I-75 and I-275 within District 7. This facility will be operated from the Tampa RTMC.

- For consistency with RCC dispatch boundaries, it is proposed that District 7's operational control for I-75 extend through Sumter County, abrogating control from District 5 to the Tampa RTMC.

- District 2 is fully responsible for I-75 within its district. The facility will be operated from the Jacksonville RTMC.

- For consistency with RCC dispatch boundaries, District 2's operational control of I-75 would extend through Marion County, abrogated from District 5 to the Jacksonville RTMC.

In addition to the primary responsibilities for the corridor, secondary command and control responsibilities will be as follows:

- The District 5 VTMC in Deland would have secondary control of the portion of I-75 extending through District 5 in Sumter and Marion Counties.

- The Miami RTMC would have secondary control of the portion of I-75 in District 4.

- The Broward RTMC would have secondary control of I-75 in District 6.

- The Sarasota STMC would have secondary control for I-75 in District 1.

- The Lake City VTMC would have secondary control of I-75 in District 2.

- Secondary control of I-75 and I-275 in District 7 shall be the District 1 VTMC in Bartow.

9.1.6 I-95 ITS Corridor

I-95 ITS Corridor Defined – The limits of the I-95 corridor are from the southern terminus of U.S. 1 in Miami-Dade County to the Georgia state line. This corridor will also include I-195 and I-395 in Miami-Dade County, I-595 in Broward County, and I-295/9A around Jacksonville in Duval County.

Roles and Responsibilities – The I-95 corridor, like the I-75 corridor, is one of the most operationally complex corridors along the FIHS limited-access facilities. This corridor is contained in Districts 2, 4, 5, and 6. The range of travel conditions along this corridor varies from intense urbanized areas to rural operations with a low density of interchanges and high-density rural segments with high truck volumes. However, due to the more direct north-south alignment of the corridor and the fact that district boundaries coincide with the RCC coverage boundaries, the division of responsibilities for I-95 is more easily defined.

The division of roles and responsibilities for the management and operations of I-95 is both functional and geographic. The functional division of responsibilities for I-95 occurs with the Evacuation Coordination User Service. During evacuation conditions, the SEOC is responsible for command and control of all state resources as outlined in the general approach to operations.

The district offices are responsible for the command and control of the corridor for the application of all other operational functions. Command and control of operations for the I-95 corridor will be as follows:

- District 6 is fully responsible for I-95 within its district. This facility will be operated from the Miami RTMC (under construction).
- District 4 is fully responsible for I-95 within its district. This facility will be operated from the Broward County RTMC (planned).
- District 5 is fully responsible for I-95 within its district. This facility will be operated from the Orlando RTMC.
- District 2 is fully responsible for I-95 within its district. This facility will be operated from the Jacksonville RTMC.

In addition to the primary responsibilities for the corridor, secondary command and control responsibilities will be as follows:

- The Broward County RTMC (planned) will serve as the secondary control center for the District 6 RTMC in District 6.
- The Palm Beach County RTMC (planned) will serve as the secondary control center for the Broward County RTMC in District 4.
- The Deland VTMC (planned) will serve as the secondary control center for the Orlando RTMC.
- The Lake City VTMC (planned) will serve as the secondary control center for the Jacksonville RTMC.

9.1.7 Florida's Turnpike ITS Corridor

Florida's Turnpike Corridor Defined – The limits of Florida's Turnpike corridor include the HEFT and the Turnpike mainline to milepost 0X[16] The corridor will also include the Sawgrass Expressway, the Seminole Expressway, and FDOT-controlled sections of SR 417 (the Florida Greeneway), and SR 528 (the Bee Line Expressway).

Roles and Responsibilities – The division of roles and responsibilities for the management and operations of the Turnpike facilities is both functional and geographic. The functional division of responsibilities for the Turnpike facilities occurs with the Evacuation Coordination User Service. During evacuation conditions, the SEOC is responsible for command and control of all state resources as outlined in the general approach to operations.

Because the Turnpike facilities are located in various urban areas throughout the state, the command and control of the corridors will have to be closely coordinated between the Turnpike and the surrounding districts. All toll operations and ETC along the facilities will be coordinated and conducted through the ***SunPass®*** Service Center. The Turnpike offices are responsible for the command and control of the Turnpike mainline corridor for the application of all other operational functions. Command and control of operations for Florida's Turnpike corridor will be as follows:

[16] This section connects the Turnpike to I-95 at the Golden Glades interchange.

- The Turnpike Enterprise is responsible for the command and control of the Turnpike mainline. Communications links will be provided between the Turnpike Enterprise and other districts as needed.

- The southern portion of the Turnpike mainline from Miami-Dade County to Yeehaw Junction in Okeechobee County will be controlled from the Pompano Beach RTMC. The northern portion of the Turnpike mainline from Yeehaw Junction to I-75 will be controlled by the Turkey Lake RTMC.

- The command and control for the Turnpike portions of the expressways in Orlando, SR 528 (Bee Line Expressway), SR 417 (Florida Greeneway), and SR 408 (East-West Expressway) will be the Turkey Lake RTMC.

- The Pompano Beach RTMC will control the HEFT and SR 869/Sawgrass Expressway in Miami-Dade and Broward counties.

- Tentatively, District 7 will be responsible for the traffic management of Turnpike facilities located in Districts 1 and 7 such as the Veterans/Suncoast Parkway and Polk County Parkway. Operational plans and protocols are needed before the agreement can be formalized.

In addition to the primary responsibilities for the corridor, secondary command and control responsibilities will be as follows:

- The Turkey Lake RTMC will tentatively serve as the secondary control center for the Veterans Expressway/Suncoast Parkway and Polk County Parkway.

- Secondary control for SR 528 and SR 417 will be from the Pompano Beach RTMC.

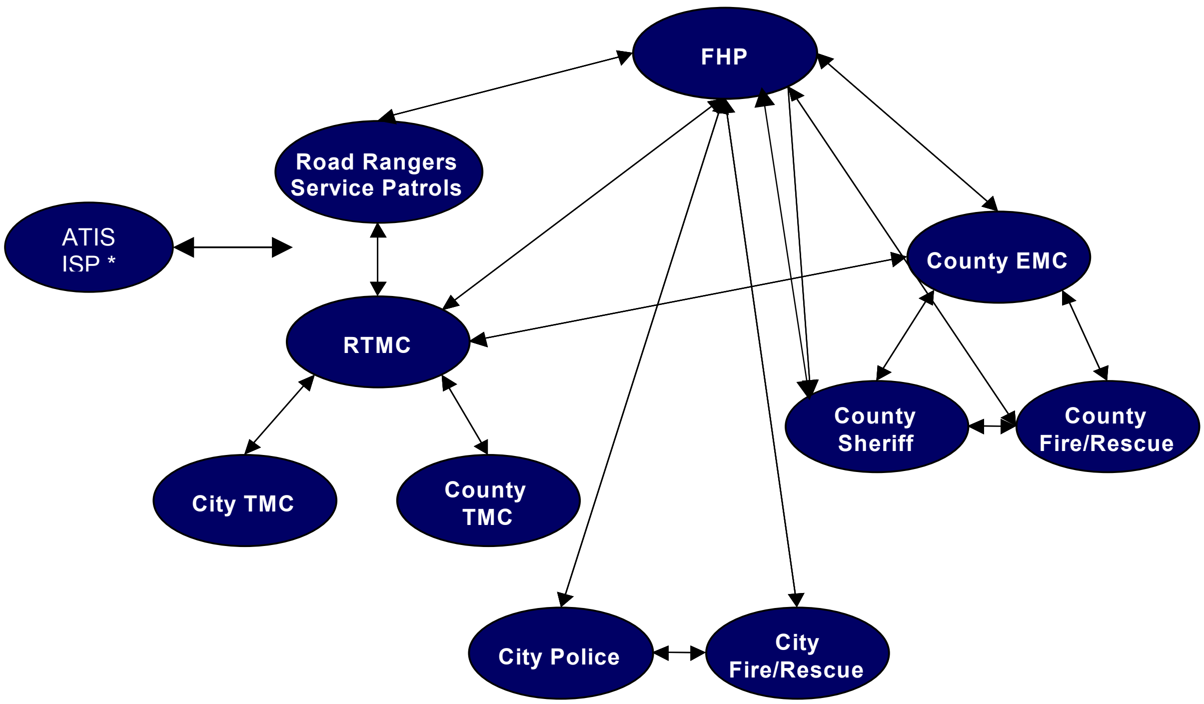
- Secondary control for the HEFT and SR 869/Sawgrass Expressway in Miami-Dade and Broward counties will be from the Pompano Beach RTMC.

9.2 Operations during Evacuations and Other States of Emergency

During evacuations and other situations where a state of emergency is declared, command and control decisions, particularly for deployment of state resources such as the FHP, will be delegated to the SEOC in Tallahassee.

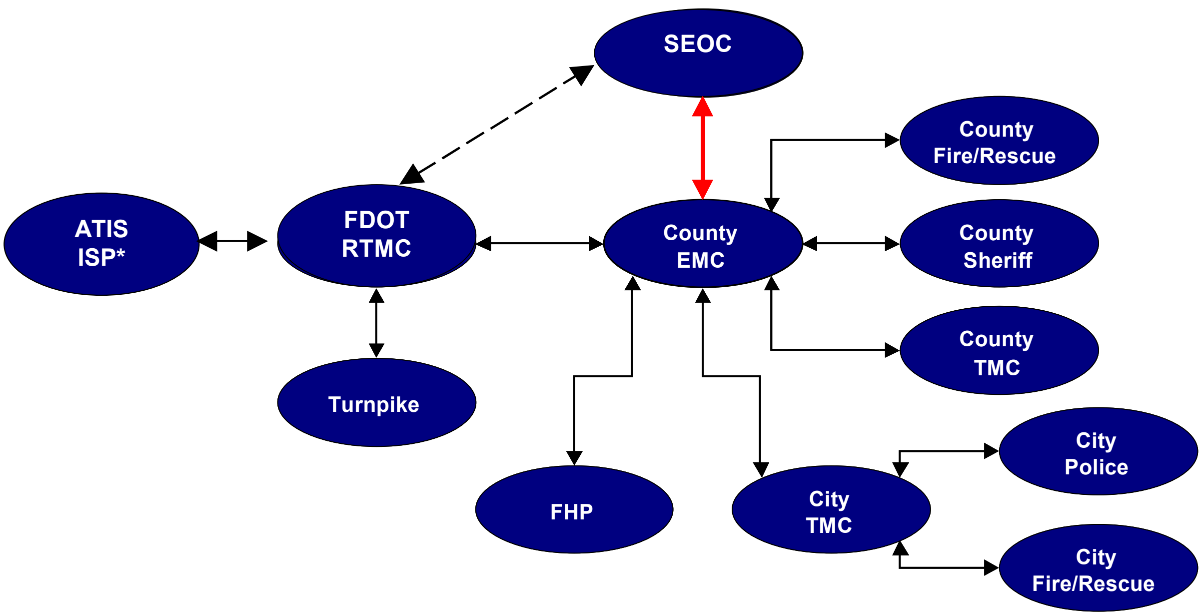
Figures 9.12 and 9.13 illustrate the differences between emergency management during a state of emergency and normal operations for incident management.

Figure 9.12 – Operational Command and Control for Incidents on the Intrastate Corridors (Incident Management – Open Interfaces)



* Where appropriate.

Figure 9.13 – Operational Command and Control for Emergencies on the Intrastate Corridors (Emergency Management – Interface Hierarchy)



* Where appropriate.
_ _ _ _ _ = An informal line of communications may occur during these operations.

9.3 Management

Each district will be responsible for the costs of operating and maintaining the ITS deployments within its district. In some cases, where the district defers operational control of a portion of a facility to another district, e.g., I-4 in District 1, the costs of this operation may also be shared based on an agreement between the districts.

9.4 Center-to-Center Communications and Secondary Control Considerations

Table 9.2 identified the need for center-to-center communications and secondary control of field devices between TMCs. This concept is proposed to provide redundancy in our ability to operate and manage field devices remotely.

The scenarios under which the transfer of command and control to a secondary center may be needed include:

- Natural or man-made disasters;
- Software/Hardware failures; and
- Availability of staff.

To implement remote or secondary command control requirements, the following must be provided to some extent:

- Traffic flow data;
- Incident information;
- Road construction information;
- Traffic camera video images;
- Field device control including DMS and lane configuration management; and
- Traveler information dissemination.

In order to implement secondary control, predefined procedures for operations and management of the systems are needed in each of the TMC operational plans that will address:

- What data (traffic, video, etc.) is needed in the secondary control center from the primary center's jurisdiction?
- How will this data be used (operational decisions)?
- How will the data be provided (communications system)?
- How will the data be stored?
- How will stakeholders be informed of the change in command and control decisions?
- How are requests for incident responses to be handled?
- What decisions are permitted by the secondary center?
- How will field devices be controlled?
- What messages can be disseminated through roadside traveler information (DMS or HAR)?
- Will data be stored?
- How will data be stored?
- What standards are needed?
- What periods must secondary control be provided?
- What security measures are needed to prevent unauthorized use?
- How will these additional responsibilities affect performance of systems in the secondary control center?
- What records of the operations under this scenario are needed to evaluate performance and make recommendations for future scenarios?
- Are technologies and staff interoperable from center to center?

A major effort is now underway to define functional requirements for statewide traffic management software based on the results of the *TMC Software Study* discussed in *Section 4.4, Integrating Software to Promote Statewide Coordination and Communications*.

9.5 Public Safety and Evacuation Coordination

As mentioned previously, in the case of an evacuation, the SEOC will assume primary command and control of the ITS deployments along the FIHS limited-access corridors.

The SEOC will collect, disseminate, and coordinate information for evacuees during an event. These evacuation services will include:

- Evacuation guidance;
- Evacuation travel information;
- Evacuation traffic management;
- Evacuation planning support; and
- Resource sharing.

The SEOC will control devices pertaining to the FIHS limited-access corridors as required by the evacuation management plan, including traffic signals at interchanges, DMS, ramp meters, reversible lane signs, turning restriction signs, road closure devices, lane closure devices, HAR, TiRN™, and shoulder-use signs. The SEOC will also coordinate and dispatch law enforcement and emergency management personnel to the appropriate locations as needed. A new user service for evacuation coordination was developed as part of the physical architecture for this project. More detailed definitions of the requirements associated with these activities are contained in the appendices of the *ITS Physical Architecture*.

Although addressed on a very high level in the *Concept of Operations*, a coordinated approach is needed to address homeland security and public safety issues related to ITS. The following outlines some of the major issues that need to be addressed in defining this approach.

I. Introduction – Everything changed on September 11, 2001.

   A. The world in general;

   B. Transportation;

   C. Emphasis on homeland security –
      1. To date, has been first with responders; and
      2. Transportation roles are significant; however, the goal is a transportation system that is well protected against attacks and that responds effectively to natural and man-made threats and disasters, enabling the continued movement of people and goods even in times of crisis.

D. ITS and operations especially suited to have a role:
   1. Investments in transportation surveillance and response for homeland security will also yield substantial benefits in transportation management from day-to-day and for other major incidents; the converse is also true.

II. ITS use and lessons learned related to September 11th:

A. New York City – Transcom and Virginia/Washington, D.C./ Pentagon; and
B. Hurricane evacuation, response, and recovery.

III. Components of homeland security:

A. Preparedness –
   1. Starts with understanding the problem – scope, magnitude, capacity, and redundancy; and
   2. Needs to engage relevant stakeholders.

B. Prevention and protection –
   1. What are the vulnerabilities?
   2. Where can existing technologies be applied? What are the gaps?
   3. What are the costs/downsides (i.e., legal, social, etc.)? What's the right trade-off?
   4. Types of situations that need prevention –
      - Threats to the infrastructure; and
      - Physical infrastructure information.
   5. Use of the transportation system/vehicles to deliver attacks –
      - Understanding what the sensors are saying; and
      - Getting reports to the right place.
   6. Response –
      - Advance arrangements;
      - Communications/Coordination among responders;
      - Rescue; and
      - Evacuation.
   7. Recovery –
      - Disseminating information to the public;
      - Providing alternatives; and
      - Returning the system to "normal".

IV. Role of ITS in homeland security:

A. ITS provides tools to safeguard the transportation system against threats, both natural and man-made, and to help react in case of disruptions –

1. Providing surveillance of key infrastructure and system activity;
2. Providing logistical and communications tools to enhance existing capabilities for swift, appropriate, and coordinated responses to system disruptions by law enforcement defense, emergency response and security organizations, rescue and treat the injured, clear guideways, smoothly reroute travel to available alternatives, restore services as promptly as possible, and provide the public with prompt and accurate information on transportation alternatives in case of disruptions to portions of the system or when quarantine or evacuation is necessary;
3. Providing surveillance and analysis for freight and intermodal operations: monitoring and maintaining the security of containers and various other mobile assets, matching cargo against bills of lading, matching actual travel against intended route and destination, and assuring the identity of commercial operators;
4. Providing surveillance and analysis for public transit, including identification of threatening or high-risk passenger behavior, matching actual travel against planned routes and schedules, assuring the identity of transit vehicle operators, and providing surveillance and analysis at major transportation centers;
5. Providing tools for the analysis of raw transportation system operational data (either real-time or archived) to detect and prevent potential threats, as well as assist in investigating incidents that may have occurred and identifying and assessing breakdowns or bottlenecks in the system, whatever their cause;
6. Safeguarding ITS services and data (as well as other transportation-related computer controlled systems) against inadvertent or deliberate incursions; and
7. Helping to assure that vehicles' and drivers' licenses, particularly commercial licenses, are issued and used appropriately.

B. Technologies in use today can be adapted to make infrastructure and travelers more secure –
   1. Smart cards;
   2. Biometrics identifiers;
   3. AVL;
   4. Map databases;
   5. Video surveillance;
   6. Vehicle classification sensors;
   7. WIM technology;
   8. Geolocation and routing technologies to track the movements and behavior of vehicles, particularly trucks and transit vehicles. Technologies exist to detect vehicle contents, particularly hazardous substances, explosives, and drugs without opening the vehicle;
   9. Technology is available to match a specific commercial vehicle with a specific operator and cargo and to prevent or halt travel in case of a mismatch; and
   10. Simply doing better surveillance has deterrence value.

C. If an attack does occur, sensor, communications, and analysis technologies used today to better manage travel and transportation can be adapted to assess damage and facilitate recovery logistics, evacuation, or quarantine –
   1. Automated signal systems;
   2. Signal priority systems;
   3. Moveable lane barriers;
   4. DMS;
   5. Incident detection systems;
   6. Mayday systems;
   7. Public safety response systems; and
   8. TMCs, fleet dispatch centers, and telematics services perform portions of this function today.

V. Areas for Action:

A. Role for FDOT –
   1. Participate in threat assessment analysis for areas of jurisdiction and cooperate with adjoining jurisdictions;
   2. Deploy and operate systems for threat detection, prevention, and response;
   3. Establish active interagency and inter-jurisdictional cooperation for threat detection and emergency response;
   4. Plan escape routes and evacuation procedures under various scenarios;

5. Deploy systems to implement emergency rerouting and evacuation;
6. Harden key communications systems from physical threats and hacking and provide redundancy using alternate technologies (i.e., wired and wireless); and
7. Deploy mechanisms for emergency information dissemination to the public, including direct communications via HAR and DMS, plus links to media, telematics providers, etc.

B. Programmatic activity –

1. Monitor and participate in the development of national homeland security/transportation leadership and initiatives of Congress; agencies such as the Office of Homeland Security, Federal Emergency Management Agency (FEMA), Transportation Security Administration, FHWA, FTA; programs such as the National Threat Alert System; and associations such as American Association of State Highway and Transportation Officials (AASHTO), ITS America, American Public Transit Association (APTA), etc.;
2. Determine the institutional structure for guiding the deployment of surface transportation security on a consistent statewide basis to address funding, accountability, and leadership;
3. Provide for enhanced coordination of traffic control centers, emergency response centers, traveler information services to respond to emergencies, and keep the public informed;
4. Expand plans for evacuations and quarantining;
5. Deploy sensors (and associated networks and processing capabilities) to identify suspicious vehicles and detect disruptions;
6. Harden emergency communications and provide redundancy;
7. Deploy systems to track and automatically halt CVO and public transit vehicles that violate security profiles;
8. Expand traffic control systems to handle emergency traffic redirection and evacuations, including reversal of lanes;
9. Provide for better mechanisms for information dissemination to the public;
10. Coordinate emergency services with telematics suppliers and in-vehicle systems to facilitate rerouting and escape;

11. Work with mainstream information technology and transportation infrastructure interests to establish requirements for hardening sensors, communications, processing centers, and databases against hacking, fraudulent messages, etc. Focus on authentication, verification, integrity assurance, etc. Implement technology to respond to the requirements;
12. Archive data and responses; and
13. Evaluate appropriate tradeoffs between security and civil rights; work toward appropriate legislation and education.

C. Funding –
1. Homeland security acts –
   - FEMA;
   - Supplemental appropriations; and
   - New federal legislation.
2. Transportation Equity Act for the 21st Century (TEA-21) earmarks;
3. Reauthorization;
4. Leveraging existing state programs;
5. New state legislation; and
6. Potential project activity.

10. Staffing[17]

In order to reach the maximum potential of any ITS, the staffing of the TMC or operational center is extremely crucial. Staffing levels must be adequate and the staff itself must be competent. To attain full system potential, agencies should consider the staff as much a part of the system as the hardware and software itself. The staffing of each TMC is a function of the market packages that have been implemented (or services provided) and their hours of operation. The *Concept of Operations* identified three basic scenarios of TMC operation that will help identify each position's role within the TMC. Table 10.1 illustrates the long-range services provided from within each TMC.

Table 10.1 – Identification of Long-Term Staffing Scenarios for RTMCs

District	RTMC	Independent of Law Enforcement Dispatch	Co-Located with Law Enforcement Dispatch	Regional ATIS will be Services Provided
1	Ft. Myers		✓	✓
2	Jacksonville		✓	✓
3	Tallahassee		✓	
3	Pensacola	✓		
4	Broward	✓		✓
4	Palm Beach		✓	✓
5	Orlando		✓	✓
6	Miami		✓	✓
7	Tampa		✓	✓
T	Pompano Beach		✓	✓
T	Turkey Lake	✓		✓

Agencies should also create MOUs to document the interagency operation and management issues and agreements. This is commonly done by many agencies and has proven to be a successful tool in facilitating operations and management functions. The following sections identify and describe the needed staffing positions, current staffing levels, and the staffing and budgeting needed to support the *Ten-Year ITS Cost Feasible Plan.*

[17] Major elements of this section were adapted from the *ITS Strategic Deployment Prioritization Plan*.

10.1 Traffic Management Center (TMC) Staffing Positions and Annual Rates

The following lists the TMC staff positions by their titles and roles and define their overall functions in the TMC:

- **TMC Manager –** This position refers to the overall manager of the program or center. As a senior level manager, this position assumes the responsibilities of a combined operations center.
- **Shift Manager –** As mid-level managers, these positions are responsible for shift operations and project management. This position can also be filled with an operations engineer or a maintenance engineer. Therefore, inter-agency sharing of responsibilities is possible with this position
- **System Operator –** The System Operator is responsible for confirming incidents, initiating responses, and disseminating traveler information.
- **Computer Network Support –** Primary responsibility will be the maintenance of the computer systems and networks within each TMC. This position is the same for all of the service scenarios; therefore, inter-agency sharing is possible.
- **Administrative Support –** This position will assume all administrative responsibilities for the TMC. Inter-agency sharing of this position can be easily achieved.

These positions are for TMC operations and additional monies will have to be made available for `their work compensation (salaries). Table 10.2 provides the basis for estimating the occurring annual costs of staffing the TMCs.

Table 10.2 – Basis of ITS Staffing Cost Estimates in Present-Day Costs

Position	Preliminary Annual Rate	Revised Annual Rate	Multipliers		Annual Rate	
			FDOT	Cons.	FDOT(1)	Consultant(2)
TMC Manager	$ 85,000.00	$ 60,000.00	2.0	2.6	$ 120,000.00	$ 156,000.00
Shift Manager	$ 70,000.00	$ 50,000.00	2.0	2.6	$ 100,000.00	$ 130,000.00
System Operator	$ 50,000.00	$ 30,000.00	2.0	2.6	$ 60,000.00	$ 78,000.00
Computer Network Support	$ 65,000.00	$ 65,000.00	2.0	2.6	$ 130,000.00	$ 169,000.00
Administrative Support	$ 30,000.00	$ 25,000.00	2.0	2.6	$ 50,000.00	$ 65,000.00

(1) Rate reflects fully burdened costs for overhead and benefits for FDOT staff. A 2.0 multiplier assumed.
(2) Rate reflects fully burdened costs for overhead, benefits, FCCM, and the operating margin for consultants. A 2.6 multiplier was assumed. The multiplier is based on field office overhead and benefit rates.

The following section details the cost of adding staff to support the deployments identified in the *Ten-Year ITS Cost Feasible Plan*.

10.2 Transportation Management Center (TMC) Staffing Needed to Support the Ten-Year ITS Cost Feasible Plan

Each district supplied their existing staffing levels and an estimate of staffing needed through 2012. Table 10.3 identifies the existing staffing levels and Table 10.4 illustrates the projected staffing as proposed by the districts.

In order to identify the additional costs incurred by the addition of staff, a comparison of existing and projected staffing levels was made. This resulted in the additional staffing (existing minus projected) listed in Table 10.5. The corresponding annual rates were then applied to each position and compiled for each TMC. The results are listed in Table 10.6 for FDOT positions and Table 10.7 for Consultant positions. All values shown in the tables are escalated using the appropriate escalation factors. These factors are listed in Table 10.8. The total additional funding needed to support deployments through 2012 are listed in Table 10.9.

Table 10.3 – Present-Day ITS Operational Staffing Levels as Provided by the Districts (August 12, 2002)

			TMC Manager		Shift Manager, Operations Engineer, Senior Operator, or Maintenance Engineer		System Operator		Computer Network Support		Admin Support		TOTAL		
District	RTMC	LOS(1)	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	Total
1	Ft. Myers	5	-	-	-	-	-	-	-	-	-	-	-	-	-
1	Sarasota	4	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Jacksonville	5	1.00	-	2.00	1.00	1.00	-	-	1.00	-	-	4.00	2.00	6.00
3	Tallahassee	5	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Pensacola	5	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Broward	5	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Palm Beach	5	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Orlando	5	1.00	-	-	2.00	-	9.00	-	0.25	-		1.00	11.25	12.25
6	Miami	5	1.00	-	2.00	1.00	1.00	11.00	1.00	2.00	-	1.00	5.00	15.00	20.00
7	Tampa	5	-	-	-	-	-	-	-	-	-	-	-	-	-
T	Pompano Beach	5	-	1.00	-		-	2.00	-	1.00	-	-	-	4.00	4.00
T	Turkey Lake	5	-	1.00	-	-	-	7.50	-	1.00	-	-	-	9.50	9.50
	Total		3.00	2.00	4.00	4.00	2.00	29.50	1.00	5.25	-	1.00	10.00	41.75	51.75

General Notes:

(1) LOS Indicators: LOS 4 indicates 16 hours of operation per day. LOS 5 indicates 24 hours of operation per day.
(2) Hyphens (e.g., -) in the table above indicate no value or a zero change.
(3) The consultant operational staffing levels needed to support the current ATIS efforts in Orlando and Southeast Florida are addressed through a separate work program item.
(4) The consultant operational staffing levels needed to support future ATIS efforts for the Tampa Bay, Jacksonville, Southwest Florida, and statewide 511 services will be addressed through separate work program items.

Table 10.4 – Projected ITS Operational Staffing Levels as Proposed by the Districts

District	RTMC	LOS[1]	TMC Manager		Shift Manager, Operations Engineer, Senior Operator, or Maintenance Engineer		System Operator		Computer Network Support		Admin Support		TOTAL		
			FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	Total
1	Ft. Myers	5	1.00	-	-	2.00	-	9.00	-	1.00	-	1.00	1.00	13.00	14.00
1	Sarasota	4	1.00	-	-	1.00	-	3.00	-	-	-	-	1.00	4.00	5.00
2	Jacksonville	5	1.00	-	-	2.00	-	9.00	-	2.00	-	-	1.00	13.00	14.00
3	Tallahassee	5	1.00	-	-	3.00	-	5.00	-	3.00	-	2.00	1.00	13.00	14.00
3	Pensacola	5	1.00	-	-	3.00	-	5.00	-	3.00	-	2.00	1.00	13.00	14.00
4	Broward	5	1.00	-	3.00	2.00	-	12.00	-	2.00	-	2.00	4.00	18.00	22.00
4	Palm Beach	5	-	1.00	-	5.00	-	12.00	-	2.00	-	2.00	-	22.00	22.00
5	Orlando	5	1.00	-	-	2.00	-	9.00	-	0.25	-	-	1.00	11.25	12.25
6	Miami	5	1.00	-	2.00	1.00	1.00	11.00	1.00	2.00	-	1.00	5.00	15.00	20.00
7	Tampa	5	1.00	1.00	-	5.00	-	8.00	1.00	1.00	-	2.00	2.00	17.00	19.00
T	Pompano Beach	5	-	1.00	-	3.00	-	7.50	-	1.00	-	-	-	12.50	12.50
T	Turkey Lake	5	-	1.00	-	3.00	-	7.50	-	1.00	-	-	-	12.50	12.50
	Total		9.00	4.00	5.00	32.00	1.00	98.00	2.00	18.25	-	12.00	17.00	164.25	181.25

General Notes:

(1) LOS Indicators: LOS 4 indicates 16 hours of operation per day. LOS 5 indicates 24 hours of operation per day.
(2) Hyphens (e.g., -) in the table above indicate no value or a zero change.
(3) The consultant operational staffing levels needed to support the current ATIS efforts in Orlando and Southeast Florida are addressed through a separate work program item.
(4) The consultant operational staffing levels needed to support future ATIS efforts for the Tampa Bay, Jacksonville, Southwest Florida, and statewide 511 services will be addressed through separate work program items.

Table 10.5 – Additional ITS Operational Staffing Levels as Proposed by the Districts (Resulting from the Comparison of Existing and Projected Staffing Levels)

			TMC Manager		Shift Manager, Operations Engineer, Senior Operator, or Maintenance Engineer		System Operator		Computer Network Support		Admin Support		TOTAL		
District	RTMC	LOS(1)	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	FDOT	Cons.	Total
1	Ft. Myers	5	1.00	-	-	2.00	-	9.00	-	1.00	-	1.00	1.00	13.00	14.00
1	Sarasota	4	1.00	-	-	1.00	-	3.00	-	-	-	-	1.00	4.00	5.00
2	Jacksonville	5	-	-	(2.00)	1.00	(1.00)	9.00	-	1.00	-	-	(3.00)	11.00	8.00
3	Tallahassee	5	1.00	-	-	3.00	-	5.00	-	3.00	-	2.00	1.00	13.00	14.00
3	Pensacola	5	1.00	-	-	3.00	-	5.00	-	3.00	-	2.00	1.00	13.00	14.00
4	Broward	5	1.00	-	3.00	2.00	-	12.00	-	2.00	-	2.00	4.00	18.00	22.00
4	Palm Beach	5	-	1.00	-	5.00	-	12.00	-	2.00	-	2.00	-	22.00	22.00
5	Orlando	5	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Miami	5	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Tampa	5	1.00	1.00	-	5.00	-	8.00	1.00	1.00	-	2.00	2.00	17.00	19.00
T	Pompano Beach	5	-	-	-	3.00	-	5.50	-	-	-	-	-	8.50	8.50
T	Turkey Lake	5	-	-	-	3.00	-	-	-	-	-	-	-	3.00	3.00
	Total		6.00	2.00	1.00	25.00	(1.00)	68.50	1.00	13.00	-	11.00	7.00	119.50	126.50

General Notes:

(1) LOS Indicators: LOS 4 indicates 16 hours of operation per day. LOS 5 indicates 24 hours of operation per day.
(2) Information in parentheses in the table above indicates a reduction/shift in FDOT operational staffing (i.e., positions moved to new assignments) and offset by privatization.
(3) The consultant operational staffing levels needed to support the current ATIS efforts in Orlando and Southeast Florida are addressed through a separate work program item.
(4) The consultant operational staffing levels needed to support future ATIS efforts for the Tampa Bay, Jacksonville, Southwest Florida, and statewide 511 services will be addressed through separate work program items.

Table 10.6 – FDOT Position Results

District	TMC	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Ft. Myers				$132,917	$137,304	$141,835	$146,515	$151,350	$156,345	$161,504	$166,834
1	Sarasota					$137,304	$141,835	$146,515	$151,350	$156,345	$161,504	$166,834
2	Jacksonville[2]					-$297,491	-$307,308	-$317,450	-$327,925	-$338,747	-$349,926	-$361,473
3	Tallahassee									$156,345	$161,504	$166,834
3	Pensacola								$151,350	$156,345	$161,504	$166,834
4	Broward Co.			$450,349	$465,211	$480,563	$496,421	$512,803	$529,726	$547,207	$565,264	$583,918
4	Palm Beach Co.											
5	Orlando											
6	Miami											
7	Tampa			$332,401	$343,370	$354,701	$366,406	$378,498	$390,988	$403,891	$417,219	$430,987
8	Pompano											
8	Turkey Lake											
	Total	$0	$0	$782,750	$941,498	$812,380	$839,188	$866,882	$1,046,839	$1,237,729	$1,278,574	$1,320,767

Table 10.7 – Consultant Position Results

District	TMC	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Ft. Myers				$1,324,743	$1,368,459	$1,413,619	$1,460,268	$1,508,457	$1,558,236	$1,609,658	$1,662,776
1	Sarasota					$416,488	$430,232	$444,429	$459,096	$474,246	$489,896	$506,062
2	Jacksonville[2]		$1,117,844	$1,156,969	$1,195,149	$1,234,588	$1,275,330	$1,317,416	$1,360,890	$1,405,800	$1,452,191	$1,500,114
3	Tallahassee								$2,082,326	$2,151,043	$2,222,027	$2,295,354
3	Pensacola							$2,015,805	$2,082,326	$2,151,043	$2,222,027	$2,295,354
4	Broward Co.			$1,951,513	$2,015,913	$2,082,438	$2,151,159	$2,222,147	$2,295,478	$2,371,229	$2,449,479	$2,530,312
4	Palm Beach Co.						$2,796,506	$2,888,791	$2,984,121	$3,082,597	$3,184,323	$3,289,406
5	Orlando											
6	Miami											
7	Tampa			$1,937,574	$2,001,514	$2,067,564	$2,135,793	$2,206,274	$2,279,082	$2,354,291	$2,431,983	$2,512,238
8	Pompano			$878,181	$907,161	$937,097	$968,021	$999,966	$1,032,965	$1,067,053	$1,102,266	$1,138,640
8	Turkey Lake			$418,181	$431,981	$446,237	$460,963	$476,174	$491,888	$508,120	$524,888	$542,210
	Total	$0	$1,117,844	$6,342,418	$7,876,461	$8,552,871	$11,631,623	$14,031,271	$16,576,629	$17,123,658	$17,688,739	$18,272,467

Table 10.8 – Escalation Factors

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
100.00%	103.60%	107.23%	110.76%	114.42%	118.20%	122.10%	126.13%	130.29%	134.59%	139.03%

Table 10.9 – Total Additional Funding Needed to Support Deployments through 2012

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
$0	$1,037,036	$6,726,287	$8,405,915	$8,939,610	$11,846,738	$13,967,781	$16,367,261	$17,063,726	$17,626,829	$18,208,514	$120,189,697

11. Maintenance[18]

ITS requires an appropriate level of maintenance. Good maintenance will assure reliability and proper operation will protect the investment and enable adjustment to changing conditions. The maintenance of ITS is important because malfunctions can critically affect the ability of the system to perform its intended functions. Failure to function as intended could negatively impact traffic safety, public acceptance, and transportation network capacity. Failure of the system also has the potential to cause measurable economic loss and increase congestion, fuel consumption, pollutants, and traffic accidents.

Unlike traditional capacity improvement projects, providing the operations and maintenance costs to fully support the deployment of ITS is critical. Therefore, the total life-cycle costs for all projects evaluated in the *Concept of Operations* were estimated. ITS operations and management considerations should be evaluated before implementing any technology. Operations and management of ITS technologies and systems extend beyond simply keeping the equipment working. Reacting to emergency failure conditions, maintaining accurate maintenance logs, and conducting preventative maintenance programs all require highly skilled staff that is motivated and fully trained. A maintenance program can also be used to track failures and decrease the time needed to fix the failures.

Most, if not all, public agencies provide maintenance in response to alarms or identified problems. Response maintenance is defined as the repair of failed equipment and its restoration to safe, normal operation. It requires action based on the priority of the subsystem that has failed and takes precedence over preventative maintenance activities for the duration of the emergency. Response maintenance is a critical element of a comprehensive ITS maintenance plan. The importance stems from agencies' responsibility to keep traffic systems operating safely at all times. Table 11.1 summarizes the priorities and guidelines for response maintenance.

The safety of the traveling public and minimizing the agency's exposure to liability represent the two strongest reasons for establishing a sound approach to response maintenance. Typically, response maintenance requires that a qualified technician be on-call to receive notice of any and all problems that arise with field equipment.

[18] Major elements of this section were adopted from the *ITS Strategic Deployment Prioritization Plan*.

Table 11.1 – Response Maintenance Priorities and Guidelines

Priority	Time to Respond	Problem	Time to Repair
High	4 hours	Critical Non-critical	Next rush hour 5 working days
Medium	8 hours	Critical Non-critical	2 working days 10 working days
Low	Next working day	Critical Non-critical	5 working days 20 working days

Response maintenance may involve both field and shop maintenance procedures to fully repair a failed component. Frequently, spares are kept in a ready state in the shop so that they can be used to switch-out the failed device in the field. This provides a means to affect a full and rapid repair in the field and permit the failed device to be completely repaired in the shop where comprehensive diagnostic tools are available and weather elements can be avoided. Spare components suitable to the maintenance demand should be kept on hand for repairs to equipment.

The following guidelines are provided to support response maintenance preparation and need:

- Electronic spare components should be kept in sufficient quantities to repair board failures. It is also advisable to keep some full spare printed circuit boards.

- Spare components are not interchangeable with those of different generations of equipment. It is advisable to note the differences and stock each component.

- Normally, a percentage of components relating to the total existing pieces of equipment in the field are required. Currently, no guidelines exist for inventorying these items; however, this information should be included in the operational plan associated with each RTMC.

- Where failures of certain components become common, it is advisable to stock more than the recommended percentage.

- It may not be appropriate to stock large expensive items such as DMS sign cases, complete with the internal equipment, for the eventuality of a catastrophe because such items may be too expensive to carry on the books.

While most, if not all, public agencies provide response maintenance, few provide preventative maintenance on a regular, routinely scheduled basis. Preventative maintenance, or routine maintenance as it is sometimes referred to, is defined as a set of checks and procedures to be performed at regularly scheduled intervals for the upkeep of equipment. It includes checking, testing, inspection, record keeping, cleaning, and replacement based on the function and rated service life of the device and its components. Preventative maintenance is intended to ensure reliable mechanical and electrical functioning and operation of equipment, thereby reducing equipment failures, response maintenance, road user costs, and liability exposure. The emphasis in preventative maintenance is checking for proper operation and taking proactive steps to repair or replace defective equipment, thus ensuring that problems are not left until failure occurs.

Lack of staffing and funds is often cited as primary reasons why preventative maintenance is not carried out. Furthermore, most ITS field devices are comprised of solid-state components that have become much more reliable in quality over the past five years. As such, most agencies simply replace these components when they fail.

FMS have been planned, designed, and deployed throughout Florida to manage the roadway network in a proactive manner. These systems typically consist of various subsystems, i.e., detectors that monitor roadway conditions, CCTV cameras that verify roadway conditions, variable message signs (VMS) that provide en-route traveler information to motorists, and ramp metering systems that increase capacity at major interstate ramp junctures. Operation and control of these various devices typically occurs from a traffic control center.

The ability to obtain and communicate real-time information about roadway conditions is essential to the successful operation of FMS and the traveling public's trust in using the relayed information. As such, a proactive maintenance program is essential to the continued successful operation of FMS.

Table 11.2 provides guidelines on the suggested preventative maintenance in support of FMS.

Table 11.2 – Preventative Maintenance Guidelines

Subsystem	Minor Maintenance[19]	Major Maintenance[20]	Major Rehabilitation[21]	Life Expectancy[22]
Field Systems				
Cabinets		Twice per year	10 years	20 years
Power Supply	Twice per year	5 years	10 years	20 years
Grounding	Annually	5 years	10 years	25 years
Vehicle Detection Systems				
Loop Detectors and Cables	Twice per year	Annually	5 years	10 years
Controllers		Twice per year	2 years	7 years
Closed-Circuit Television (CCTV) Camera Systems				
Poles	Twice per year	5 years	15 years	50 years
Silicon Intensified Target Cameras		Twice per year	1.5 years	6 years
Charged Coupled Device Cameras		Twice per year	2 years	10 years
Pan-Tilt-Zoom Cameras	Twice per year	Annually	3 years	10 years
Receivers		Twice per year	3 years	10 years
Monitors	Twice per year	5 years		5 years
Dynamic Message Signs (DMS)				
Signcase		Twice per year	1.5 years	10 years
Protective Devices	Twice per year	1 year	2 years	10 years
Pixels, Modules, and Drivers		Twice per year	3 years	6 years
Controllers		Twice per year	3 years	6 years
Ramp Metering Systems				
Signal Wiring	Quarterly	5 years		15 years
Signal Heads and Hardware	Quarterly	Annually	Annually	10 years
Poles and Footings	Annually	5 years	10 years	25 years
Loops and Cables	Quarterly	Twice per year	5 years	10 years
Sensor Units		Quarterly		7 years
Controllers		Quarterly	2 years	7 years
Communications Infrastructure				
Fiber Optic Cable Plant	Annually	5 years	25 years	25 years
Fiber Optic Plant Video and Data Equipment		Twice a year	3 years	10 years
Twisted Pair Cable	2 years	8 years	30 years	40 years
Coaxial Cable	Annually	6 years	20 years	30 years
Spread Spectrum	Twice a year	4 years	10 years	20 years

[19] *Minor Maintenance* – Minor maintenance is that which can be carried out without large scale testing or the use of heavy equipment. It includes visual inspection and checking of many items, elementary testing, cleaning, lubricating, and minor repairs that can be carried out with hand tools or portable instruments.

[20] *Major Maintenance* – As well as all items normally done under minor maintenance, major maintenance also includes extensive testing, overhauling, and replacement of components that require a scheduled power outage, use of bucket trucks, and other heavy equipment.

[21] *Major Rehabilitation* – Major rehabilitation, or complete replacement, is contemplated for devices that experience frequent malfunction or failures.

[22] *Life Expectancy* – The life expectancy of systems, devices, and infrastructures is the period before total replacement is needed.

A statewide ITS asset management system is currently being considered that will track each device location, type, manufacturer, and maintenance/operations issues. This asset management system will provide a better source of information for the planning of preventative maintenance, inventories to support response maintenance, and planning and budgeting for ITS maintenance needs. This proposed system will be based on the ITS Deployment Tracking Database prepared for the *ITS Plan* and *ITS Corridor Master Plans*.

Within the TMC, software is one of the critical elements of ITS services. As discussed in Section 4, Deployment Issues, FDOT is migrating to a component-based statewide TMC software that should minimize the total dollars spent on the maintenance of TMCs at the district level. Since statewide configuration management is proposed, technical and management support for the TMC software will need to be maintained for the full life-cycle of the deployment. A more detailed concept of operations and functional requirements for the TMC software is currently being prepared under a separate document. Staffing and funding of configuration management activities for the statewide TMC software is currently funded through the *Ten-Year ITS Cost Feasible Plan*.

Estimates of the maintenance costs to support the projects identified in the *Ten-Year ITS Cost Feasible Plan* are summarized in Table 11.3. These costs, summarized in Table 11.4, are based on unit costs provided by the Maintenance Program or the FHWA Unit Cost Database where unit costs were not available from the Maintenance Program.

Table 11.3 - Maintenance Costs to Support the Ten-Year ITS Cost Feasible Plan

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FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	Project Opening Yr	End of Life Cycle	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Thru 2012 Total	Funding Source
102502	1	I-75	From Collier/Lee County Line to Lee/Charlotte County Line	Freeway and Incident Management System	FMS	CONST	2006	2015				$0.40	$0.42	$0.43	$0.45	$0.46	$0.48	$0.49	$3.13	Statewide
102702	1	I-75	From Sarasota/Manatee County Line to I-275 (Manatee)	Freeway Management System	FMS	CONST	2013	2022											$0.00	Statewide
102802	1	I-75	From Charlotte/ Sarasota County Line to Sarasota/ /Manatee County Line	Freeway Incident Management System	FMS	CONST	2012	2021										$0.60	$0.60	Statewide
104202	1	I-75	From Broward/Collier County Line to Collier/Lee County Line	Freeway Incident Management System	FMS	CONST	2006	2015				$0.55	$0.57	$0.59	$0.61	$0.63	$0.65	$0.67	$4.25	Statewide
138502	1	I-75	From Lee/Charlotte Co. Line to Charlotte/Sarasota Co. Line	Freeway and Incident Management System	FMS	CONST	2010	2019								$0.33	$0.34	$0.35	$1.03	Statewide
204402	2	I-295	From I-10 to I-95 N	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CONST	2013	2022											$0.00	Statewide
204502	2	I-295	From I-95 S to I-10	Incident Management System, Traveler Information, Management Center and Fiber Optics	FMS	CONST	2012	2021										$0.15	$0.15	Statewide
204002	2	I-95	From I-10 to Trout River	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CONST	2005	2014			$0.03	$0.03	$0.03	$0.03	$0.03	$0.04	$0.04	$0.04	$0.27	Statewide
204102	2	I-95	From Trout River to Airport/Duval Road	I-95 North ITS Improvements - Incident Management - cctvs, vehicle detection units, DMSS	FMS	CONST	2006	2015				$0.07	$0.07	$0.07	$0.07	$0.08	$0.08	$0.08	$0.52	Statewide
321502	3	I-10	From Welcome Center to East of SR 87	Pensacola Area Freeway Management System	FMS	CONST	2009	2018							$0.37	$0.39	$0.40	$0.41	$1.58	Statewide
321702	3	I-10	From West of US 90 (Gadsden County) to East of US 90 (Leon County)	Tallahassee Area Freeway Management System	FMS	CONST	2010	2019								$0.28	$0.29	$0.30	$0.88	Statewide
307902	3	I-110	From I-10 to Pensacola Bay Bridge	I-110 Pensacola Area Freeway Management System	FMS	CONST	2009	2018							$0.13	$0.13	$0.14	$0.14	$0.54	Statewide
401402	4	I-75	From Sawgrass Expressway to Broward/Collier Co Line	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	2009	2018							$0.34	$0.35	$0.36	$0.37	$1.41	Statewide
423302	4	I-75	From Southern Terminus to Sawgrass Expressway	DMSS, ATIS, ARTS, CCTV at Interchanges, OVCS	FMS	CONST	2009	2018							$0.62	$0.64	$0.66	$0.68	$2.60	Statewide
2317391	4	I-95	From Miami-Dade/Broward Co. Line to Broward/Palm Beach Co Line	I-95/I-595 Video Monitoring System Cameras Broward County	FMS	CONST	2006	2015				$0.10	$0.10	$0.11	$0.11	$0.11	$0.12	$0.12	$0.77	District
503802	5	I-4	From SR 44 to I-95	I-4 Surveillance Motorist Information System Phase 5	FMS	CONST	2005	2014			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.01	Statewide
2425231	5	I-4	From World Drive to US 27	I-4 SMIS (7 Miles) Phase 4 / 6- Lane Reconstruction Project	FMS	CONST	2004	2013		$0.10	$0.10	$0.10	$0.11	$0.11	$0.11	$0.12	$0.12	$0.13	$0.99	District
2427021	5	I-4	From Lake Mary Blvd to SR 472	I-4 SMIS (22 Miles) Phase 3 - St. Johns River Bridge Replacement / Reconstruction	FMS	CONST	2003	2012	$0.14	$0.15	$0.15	$0.16	$0.16	$0.17	$0.18	$0.18	$0.19	$0.19	$1.68	District
512802	5	I-95	From SR 44 to US 1 (Volusia County)	Surveillance Motorist Information System/Daytona Area Smart Highways PhaseIII	FMS	CONST	2007	2016					$0.10	$0.10	$0.10	$0.10	$0.11	$0.11	$0.62	Statewide
523902	5	I-95	From SR 514 to SR44	Surveillance Motorist Information System/Daytona Area Smart Highway Phase IV	FMS	CONST	2007	2016					$0.63	$0.66	$0.68	$0.70	$0.72	$0.75	$4.13	Statewide
4702	5	Various	From Kirkman Road to SR 417 West	ITS-01:OOCEA's SR 408 & SR 417	FMS	CONST	2003	2012	$0.07	$0.08	$0.08	$0.08	$0.08	$0.09	$0.09	$0.09	$0.09	$0.10	$0.85	Expwy Auth
4902	5	Various		ITS-02: OOCEA's SR 408, SR 417, & SR 528	FMS	CONST	2004	2013		$0.08	$0.08	$0.08	$0.08	$0.09	$0.09	$0.09	$0.09	$0.10	$0.78	Expwy Auth
5602	5	Various		ITS-04: OOCEA's SR 408, SR 417, & SR 528	FMS	CONST	2004	2013		$0.14	$0.14	$0.15	$0.15	$0.16	$0.16	$0.17	$0.17	$0.18	$1.41	Expwy Auth
5801	5	Various		ITS-05: OOCEA's SR 408, SR 417, SR 528, SR 520, & SR 50	FMS	CONST	2005	2014			$0.13	$0.13	$0.14	$0.14	$0.15	$0.15	$0.16	$0.16	$1.15	Expwy Auth
2516821	6	I-95	From US 1 to Ives Dairy Road	I-95 Intelligent Corridor System Package B	FMS	CONST	2003	2012	$0.55	$0.57	$0.58	$0.60	$0.62	$0.64	$0.67	$0.69	$0.71	$0.73	$6.37	District
1001802	6	SR 836	From SR 821 to NW 27th Ave	ITS - 002	FMS	CONST	2003	2012	$0.05	$0.06	$0.06	$0.06	$0.06	$0.06	$0.07	$0.07	$0.07	$0.07	$0.63	Expwy Auth
702002	7	I-275	From Bearss Ave to I-75	Freeway and Incident Management System	FMS	CONST	2007	2016					$0.10	$0.10	$0.11	$0.11	$0.11	$0.12	$0.65	Statewide
743302	7	I-275	From Howard Frankland Bridge to Hillsborough River	Links II/III	FMS	CONST	2011	2020									$0.24	$0.25	$0.50	Statewide
2586432	7	I-275	From Hillsborough River to I-4	I-275/I-4 Freeway Management System	FMS	CONST	2006	2015				$0.05	$0.06	$0.06	$0.06	$0.06	$0.06	$0.07	$0.42	Statewide
4072331	7	I-275	From MLK Blvd to Bearss Ave	I-275 Freeway Management System	FMS	CONST	2006	2015				$0.12	$0.13	$0.13	$0.14	$0.14	$0.15	$0.15	$0.96	Statewide
4072332	7	I-275	From 54th Ave N to Howard Frankland	I-275 Freeway Management System	FMS	CONST	2006	2015				$0.06	$0.06	$0.07	$0.07	$0.07	$0.07	$0.07	$0.47	Statewide

Programmed Projects (V4)

FIN / MapID	District	Facility	Project Limits	Description	Type	Phase	Project Opening Yr	End of Life Cycle	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Thru 2012 Total	Funding Source
4072333	7	I-275	From Howard Frankland to Kennedy Blvd	I-275 Freeway Management System	FMS	CONST	2006	2015				$0.07	$0.07	$0.07	$0.07	$0.07	$0.08	$0.08	$0.51	Statewide
4072334	7	I-275	From 54th Ave S to 54th Ave N	I-275 Freeway Management System	FMS	CONST	2008	2017						$0.32	$0.33	$0.34	$0.35	$0.36	$1.70	Statewide
2584012	7	I-4	From 14th St to 50th St	I-4 Freeway Management System	FMS	CONST	2006	2015				$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.35	Statewide
4093661	7	I-4	From 50th Street to CR 579	I-4 Freeway Management System	FMS	CONST	2006	2015				$0.12	$0.12	$0.13	$0.13	$0.14	$0.14	$0.15	$0.93	Statewide
4093662	7	I-4	From CR 579 to Park Road	I-4 Freeway Management System	FMS	CONST	2007	2016					$0.23	$0.24	$0.25	$0.25	$0.26	$0.27	$1.51	Statewide
4093663	7	I-4	From Park Road to Hillsborough/Polk Co. Line	I-4 Freeway Management System	FMS	CONST	2008	2017						$0.08	$0.09	$0.09	$0.09	$0.10	$0.45	District
4093664	7	I-4	From Hillsborough/Polk Co. Line to US 27	I-4 Freeway Management System	FMS	CONST	2008	2017						$0.16	$0.16	$0.17	$0.17	$0.18	$0.84	Statewide
4109091	7	I-75	From US 301 to Fowler Ave	I-75 Freeway Management System	FMS	CONST	2007	2016					$0.18	$0.19	$0.20	$0.20	$0.21	$0.22	$1.20	Statewide
2558441	7	SR 589	From I-275 to Hillsborough River	Links Stage I	FMS	CONST	2005	2014			$0.07	$0.07	$0.08	$0.08	$0.08	$0.08	$0.09	$0.09	$0.64	Statewide
843802	8	SR 91	From MP 263 to MP 267	Ocoee Video System and Fiber Optics	FMS	CONST	2003	2012	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.05	$0.05	$0.41	District
1907501	8	SR 91	From MP4 to MP 75	SunNav Phase 1 Fiber Project	FMS	CONST	2004	2013		$0.23	$0.24	$0.25	$0.26	$0.27	$0.28	$0.28	$0.29	$0.30	$2.41	District
4061231	8	SR 91	From Turnpike Mainline to	Intelligent Transportation System (ITS) Incident Detection	FMS	CONST	2008	2017						$0.24	$0.24	$0.25	$0.26	$0.27	$1.26	District
1907171	8	Various	From I-95 to I-75	Advanced Traveler Information System DMS, HAR , TMC's	FMS	CONST	2003	2012	$0.24	$0.25	$0.26	$0.27	$0.27	$0.28	$0.29	$0.30	$0.31	$0.32	$2.80	District
								Yearly Totals	$1.09	$1.68	$1.96	$3.62	$4.98	$5.94	$7.60	$8.46	$8.99	$10.03	$54.35	

Programmed Projects (V4)

Table 11.4 – Estimated Unit Maintenance Costs

Device	Unit	Construction	Operations & Maintenance Costs
Closed-Circuit Television (CCTV)	Each	$48,000.00	$2,350.00
Detector Area	Each	$1,850.00	$162.50
Dynamic Message Signs (DMS)	Each	$272,500.00	$11,600.00
Dynamic Trail Blazer	Each	$75,000.00	$4,000.00
Emergency Stopping Site	Each	$20,000.00	$1,000.00
Fiber	Each	$116,000.00	$1,000.00
Highway Advisory Radio (HAR)	Each	$32,000.00	$1,000.00
Highway Advisory Radio (HAR) Beacon	Each	$75,000.00	$4,000.00
Communications Hub	Each	$107,500.00	$1,000.00
Inductive Loop Detectors	Each	$1,850.00	$162.50
Ramp Metering Station	Each	$56,000.00	$3,500.00
Regional Traffic Management System (RTMS)	Each	$6,000.00	$400.00
Road Weather Information System (RWIS)	Each	$52,000.00	$3,500.00
Vehicle Incident Detection System	Each	$30,000.00	$400.00

12. Guidelines for Traffic Management Center (TMC) Operational Plans

The *Concept of Operations* considers the basic concepts and requirements for operations of the *Ten-Year ITS Cost Feasible Plan* from a high-level. Because of the range and scope of these deployments and the desire to promote local autonomy at the district level with statewide coordination, the concepts presented are principles that will be refined though the development of operational plans/concepts of operations for each of the RTMCs. Each existing RTMC maintains an operational plan. All proposed RTMCs will require the development of a more detailed concept of operations to support design, procurement, implementation, operations, and management of the TMC to reflect the specific needs for that center.

During the development of these concepts of operations and maintenance of the operational plans at existing TMCs, the following issues needed to be addressed based on guidance from the FHWA's *Traffic Management Center Concept of Operations: Implementation Guide* (1997).

The purpose of the TMC concepts of operations is to define the functions (what is accomplished) and processes (how they are accomplished) applicable to the center. Based on the *Guide* and experiences throughout a review of the concepts of operations for deployments in Florida, the concepts of operations should include:

- Purpose;
- Legacy systems;
- Deployment issues;
- Need for ITS;
- Proposed deployment concepts;
- Gap analysis;
- Anticipated impacts and benefits;
- *SEMP* –
    - Program management;
    - Technical/Project management; and
    - Professional capacity building;

- Operations –
  - Functional requirements;
  - Relationship to other centers;
  - Roles and responsibilities;
  - Workload and performance;
  - Organization/Staffing; and
  - Nonstandard operations;

- Maintenance –
  - Responsive maintenance and inventory;
  - Preventative maintenance; and
  - Replacement and disposal;

- Operational facility needs;

- Training and documentation; and

- Procurement and contracting.

Additional guidance on the level of detail each of these sections should include and how to prepare the concept of operations is provided in the *Guide* referenced above.

13. Business Plan

13.1 Strategies and Tactics

A series of strategies and tactics are outlined and associated with each major program area goal outlined in the goals and objectives and were used as a basis for identifying the strategies and tactics to support the deployments in the *Ten-Year ITS Cost Feasible Plan*. The strategies and tactics build upon processes and strategies recommended in the *ITS Strategic Deployment Prioritization Plan* in order to establish, manage, and operate a successful, statewide ITS program. Table 13.1 identifies strategies and tactics contained in both business plans and support and maintain the ITS program's primary goals and objectives:

- Develop the statewide ITS Office.
- Guide the deployment of a communications backbone to serve ITS on major transportation corridors throughout the state.
- Adopt a corridor approach to the implementation of ITS along the principal FIHS limited-access corridors that ideally mirrors the FFN and develop conceptual systems engineering solutions for these corridors to support procurement and deployment of ITS services.
- Establish statewide standards and specifications for ITS that include the resolution of disparate TMC software.
- Support the deployment of statewide central data warehousing to support ATIS.
- Support the deployment of information and communications technologies to serve commercial vehicles and promote EPS.
- Provide technical support and assistance to FDOT's district offices and other partners.
- Support ITS professional capacity building to provide a qualified work force in support of ITS deployments.

Table 13.1 – Strategies, Tactics, Responsibilities, and Status

Strategies and Tactics	Responsibilities				Status	In Florida's *ITS Strategic Deployment Prioritization Plan*
	FDOT Central Office	FDOT Districts	FHWA	Local Government		
Develop a Statewide ITS Office						✓
Establish a statewide ITS Office	●				Complete	✓
Hire a qualified core staff of FDOT personnel	●				Complete	✓
Solicit and procure a Telecommunications General Consultant	●	❍			Complete	
Solicit and procure an ITS General Consultant	●	❍			Complete	
Coordinate ITS statewide planning with districts and other statewide activities/programs	●	❍			On-Going	✓
Develop an *ITS Business Plan* for the ITS Office	●	❍			Complete	✓
Secure statewide-managed funds for the ITS Program	●	❍			Complete	✓
Develop eligibility requirements for use with the statewide-managed funds program	●	❍			Complete	✓
Develop a *Ten-Year ITS Cost Feasible Plan*	⦿	⦿			Complete	✓
Maintain a *Ten-Year ITS Cost Feasible Plan*	⦿	⦿			On-Going	✓
Contribute to the work program cycle for statewide-managed funds	●	❍			On-Going	✓
Provide input to the *Work Program Instructions* for ITS	●	❍			On-Going	
Maintain an integrated master schedule for all ITS-related activities that are Completed, On-Going, or Planned by FDOT	●	❍			On-Going	
Develop model scopes of work and work break down structures for typical ITS deployments	●	❍			FY 02/03	
Conduct risk analyses of new technologies and strategies	●	❍			On-Going	✓
Provide statewide ITS standards conformance reviews for ITS deployments on limited-access corridors	●	❍			FY 02/03	
Coordinate with the FHWA	●	❍			On-Going	✓
Update *ITS Strategic Deployment Prioritization Plan*	●	❍			FY 02/03	
Promote partnerships with other public and private agencies	⦿	⦿	❍	❍	On-Going	✓

Table 13.1 (Continued)

Strategies and Tactics	Responsibilities				Status FDOT Districts	In Florida's *ITS Strategic Deployment Prioritization Plan* FHWA
	FDOT Central Office	FDOT Districts	FHWA	FDOT Central Office		
Adopt a Corridor Approach						
Develop a corridor approach for ITS deployments	●	❍			Complete	✓
Develop a corridor approach for systems engineering	●	❍			On-Going	✓
Develop *ITS Corridor Master Plans* for the FIHS limited-access corridors – I-4, I-10, I-75, I-95, and Florida's Turnpike	●	❍			On-Going	
Develop a concept of operations for the FIHS limited-access corridors	●	❍	❍		On-Going	
Identify ITS needs for other FIHS limited-access routes	●	❍	❍	❍	On-Going	
Develop ITS project concept reports and design criteria packages for ITS deployments along the FIHS limited-access corridors	❍	●			FY 02/03 and beyond	✓
Procure ITS projects along the FIHS limited-access corridors	❍	●			FY 02/03 and beyond	✓
Deploy ITS projects along the FIHS limited-access corridors	❍	●			FY 02/03 and beyond	
Operate and manage the ITS projects along the FIHS limited-access corridors and provide feedback to design and procurements	❍	●			FY 02/03 and beyond	✓
Develop ITS performance criteria and evaluation	●	❍			FY 01/02	✓
Develop ITS performance criteria and evaluation	●	❍			FY 02/03 and beyond	
Develop statewide recognition of brand names for major service areas	●	❍			Complete	
Develop a statewide operations plan and procedures for freeway and incident management services	●	❍			FY 02/03	✓

Table 13.1 (Continued)

Strategies and Tactics	Responsibilities				Status FDOT Districts	In Florida's *ITS Strategic Deployment Prioritization Plan* FHWA
	FDOT Central Office	FDOT Districts	FHWA	FDOT Central Office		
Establish Statewide Standards and Specifications						✓
Develop a statewide ITS architecture in compliance with the *NITSA*	●	❍			Complete	✓
Maintain and update a *SITSA*	●	❍			On-Going	·
Develop corridor ITS architectures	●	❍			On-Going	·
Harmonize statewide, corridor, district, and other regional ITS architectures	●	❍			On-Going	·
Analyze and recommend an approach and standards for center-to-center software	●	❍			Complete	
Develop and maintain a standards application plan based on standards from national standards development organizations, the USDOT, and Florida-specific standards	●	❍			On-Going	✓
Support the testing of field devices for standards compliance	●	❍			On-Going	✓
Develop a *Rule 940 Implementation Plan*	●	❍			On-Going	✓
Develop standard specifications for ITS field devices	●	❍			On-Going	✓
Develop standard specifications for utility connections to ITS field devices	●	❍			FY 01/02	
Provide input to the *Roadway Plans Preparation Manual*, the *Index of Standard of Plans*, and *Standards for Roadway and Bridge Construction*	●	❍			FY 01/02	
Establish an ITS Standards Conformity Committee to guide the development, adoption, and use of standards in Florida	●	❍			FY 01/02	
Establish policies and procedures to support statewide deployment approaches and systems engineering processes	●	❍			FY 01/02	✓
Monitor compliance with policies, procedures, and standards	●	❍			On-Going	✓
Develop and distribute technical tools for ITS design	●	❍			FY 02/03	
Identify and resolve potential conflicts in the interpretation of ITS standards through enhancements and coordination with districts	●	❍			On-Going	✓

Table 13.1 (Continued)

Strategies and Tactics	Responsibilities				Status FDOT Districts	In Florida's *ITS Strategic Deployment Prioritization Plan* FHWA
	FDOT Central Office	FDOT Districts	FHWA	FDOT Central Office		
Support the Deployment of Statewide Information Sharing through Central Data Warehousing and ATIS						
Conduct a feasibility study and requirements analysis for a statewide central data warehouse of ITS data sources	●	❍			On-Going	✓
Deploy a statewide central data warehouse	●	❍			FY 02/03	✓
Conduct feasibility studies for the deployment of ATIS	●	❍			Complete	
Develop an implementation plan for statewide 511 services	●	❍			On-Going	
Develop an invitation to negotiate (ITN) for ATIS along the I-4 corridor	●	❍			On-Going	
Negotiate with an ISP(s) to provide ATIS along the I-4 corridor	●	❍			FY 02/03	
Deploy ATIS along the I-4 corridor	❍	●			FY 03/04	
Operate and manage ATIS along the I-4 corridor	❍	●			FY 04/05	
Develop an ITN for ATIS in the Jacksonville metro area	●	❍			FY 03/04	
Negotiate with an ISP(s) to provide ATIS in the Jacksonville metro area	●	❍			FY 03/04	
Deploy ATIS in the Jacksonville metro area	❍	●			FY 04/05	
Operate and manage ATIS in the Jacksonville metro area	❍	●			FY 05/06	
Develop an ITN for ATIS in Southwest Florida	●	❍			FY 03/04	
Negotiate with an ISP(s) to provide ATIS in Southwest Florida	●	❍			FY 04/05	
Deploy ATIS in Southwest Florida	❍	●			FY 05/06	
Operate and manage ATIS in Southwest Florida	❍	●			FY 06/07	
Develop an ITN for statewide 511 services	●	❍			FY 02/03	
Negotiate with an ISP(s) to provide statewide 511 services	●	❍			FY 03/04	
Deploy statewide 511 services	●	❍			FY 04/05	
Operate and maintain statewide 511 services	●	❍			FY 05/06	

Table 13.1 (Continued)

Strategies and Tactics	Responsibilities				Status FDOT Districts	In Florida's *ITS Strategic Deployment Prioritization Plan* FHWA
	FDOT Central Office	FDOT Districts	FHWA	FDOT Central Office		
Support CVO						✓
Promote CVO-related safety without undue costs to the motor carrier industry	●	❍			On-Going	✓
Improve the state's CVO regulatory environment	●	❍			On-Going	✓
Optimize the safe, efficient movement of people and goods throughout the state	●	❍			On-Going	✓
Guide the development and installation of the adopted CVISN projects and programs in an efficient and cost-effective manner	●	❍			On-Going	✓
Provide Technical Support and Assistance to FDOT's District Offices and Partners						✓
Support the federal oversight review process	●	❍			On-Going	✓
Assist the districts in ITS program management	●				On-Going	✓
Provide systems engineering and construction, engineering, and inspection services as requested by the districts	●	❍			FY 02/03 and beyond	✓
Provide support to other FDOT offices such as Design, Construction, Maintenance, TranStat, and Public Transportation	●	❍			On-Going	✓
Coordinate state-level partners and stakeholders (other DOTs)	●	❍	❍		On-Going	✓
Perform plans and design verification reviews	●	❍			On-Going	
Assist in the resolution of construction and design issues	●	❍			On-Going	
Chair the statewide ITS Standards Conformance Committee and participate in standard conformance reviews on projects	●	❍			FY 02/03 and beyond	
Identify and resolve potential conflicts in the interpretation of ITS standards through enhancements and coordination with the districts	●	❍			On-Going	

Table 13.1 (Continued)

Strategies and Tactics	Responsibilities				Status FDOT Districts	In Florida's *ITS Strategic Deployment Prioritization Plan* FHWA
	FDOT Central Office	FDOT Districts	FHWA	FDOT Central Office		
Professional Capacity Building						✓
Identify training needs	●	❍			Complete	✓
Facilitate career growth and development within FDOT for ITS professionals	●	❍			On-Going	✓
Conduct training	●	❍			On-Going	✓
Support and attend national and regional conferences and expositions on ITS	⦿	⦿			On-Going	
Reward and recognize achievements of public and private sector personnel	⦿	⦿			On-Going	
Identify needs for applied research and development	⦿	⦿			On-Going	✓
Provide oversight for ITS research and development programs	●	❍			On-Going	✓
Participate in ITS America and exhibit at annual meetings from time to time	●	❍			On-Going	
Identify proof-of-concept or pilot projects for deployment based on successful research demonstrations	⦿	⦿	❍	❍	On-Going	
Promote an understanding of ITS benefits and technologies in other FDOT offices	⦿	⦿	⦿	❍	On-Going	✓
Operations and Maintenance of ITS Deployments						✓
Operate ITS deployments	❍	●			On-Going	✓
Maintain ITS deployments	❍	●			On-Going	✓

● = Lead
❍ = Participate
⦿ = Shared Responsibility

13.2 Organizational Structure

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 ITS Office was established as a result of a strategic planning process adopted by FDOT. Mr. Chester Chandler, P.E., was named the ITS Program Manager in July 2000 and a team was assembled. Four major program areas were developed in the ITS Office including the Telecommunications Program, ITS Architectures and Standards, ITS Program Management, and CVO/ETC. Two general consultant teams support these four program areas. This organization is presented in Figure 3.1.

In addition to the staffing chart identified in Figure 13.1, the ITS Office has also developed an organigram that illustrates the relationship between the ITS Office and various stakeholders involved in ITS deployments in Florida as shown in Figure 13.2.

Figure 13.1 – ITS Office Organization Chart

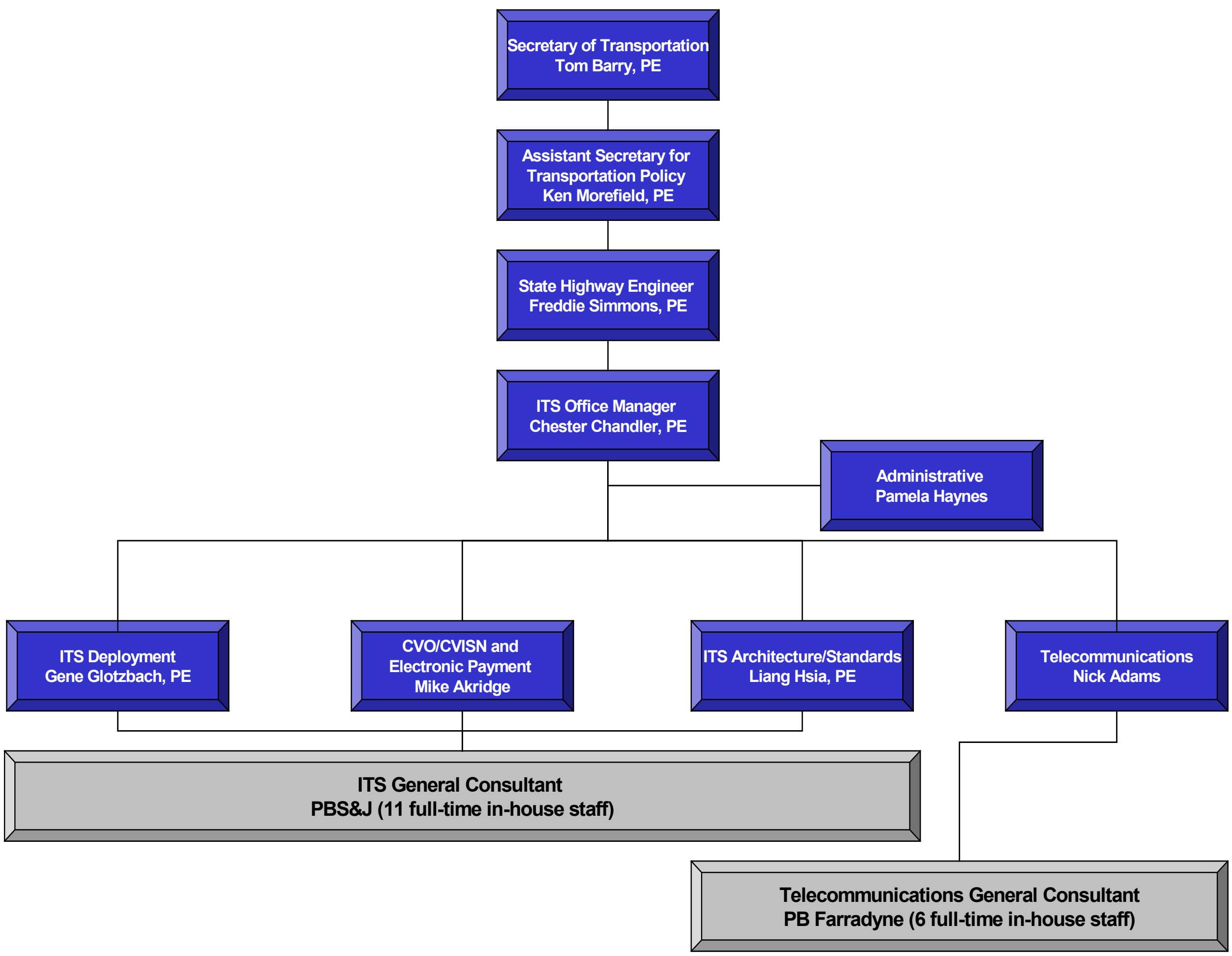
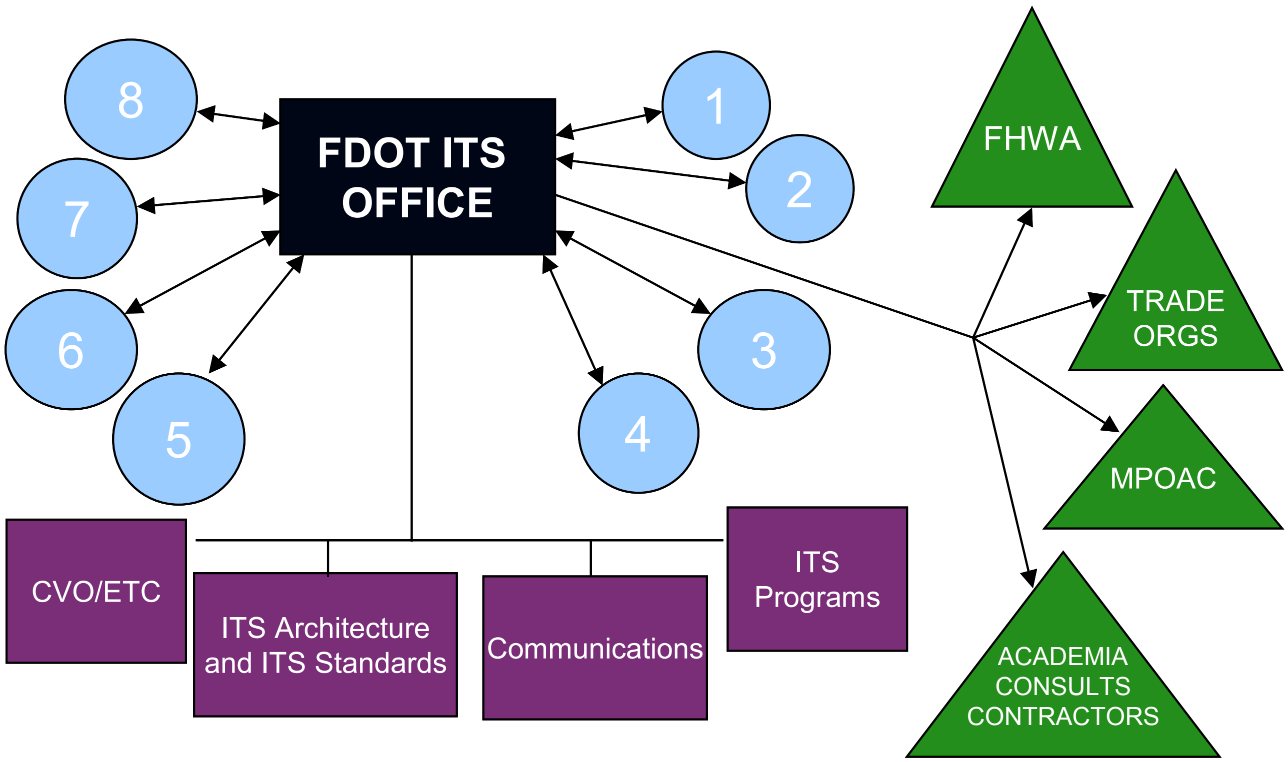


Figure 13.2 – ITS Office Organigram[23]



[23] This organigram is not intended to be limiting or all-inclusive but to provide an indication of the major relationships and stakeholders for which the ITS Office participates. The purple boxes indicate sections within the ITS Office, the blue circles indicate the district offices, and the green triangles indicate other agencies outside FDOT.

13.3 Performance Measures and Benchmarks

The following summarizes the recommended ITS program performance measures. These measures reflect the desired outcomes (system performance from the users' perspective) and outputs (measures that the ITS Office has direct control over and that can influence outcomes). Table 13.2 summarizes the relationship between each of these measures and the goals and objectives for the ITS deployments along the principal FIHS limited-access corridors.

13.3.1 Mobility- and Safety-Related Measures (Outcomes)

The following performance measures are derived from the goals and objectives:

- Total delay in vehicle-minutes;
- Predictability of travel times;
- Reliability of travel times;
- Accident rate per million VMT by severity type;
- Queue length and frequency of queue formation annually; and
- Throughput in passenger car equivalents per lane per hour.

The following are needed to support the national ITS performance measure objectives:

- Improvement in customer satisfaction;
- Reduced travel costs (can be derived from delay);
- Reduced emissions (can be derived from delay); and
- Reduced energy consumption (can be derived from delay).

The only additional performance measure that is not directly derived from the measures based on the goals and objectives statement is improvement in customer satisfaction. To implement this measure for ITS, it is recommended that the ITS Office evaluate the current customer satisfaction survey performed by FDOT to determine if additional items can be added that directly relate to customer satisfaction with ITS deployments. Such items may include satisfaction with traveler information services, service patrols, or incident response times.

13.3.2 Agency Performance Measures (Outputs)

- ATIS coverage;
- Overweight vehicle enforcement coverage;
- IMS coverage;
- FMS and IMS coverage of SULs;
- Data collection system coverage;
- Data collection system functionality;
- Percent of ITS deployments with before and after studies;
- Publish guidelines on how to mainstream ITS in transportation planning;

- Branding of major services;
- HAZMAT response team coverage;
- Designation and signing of detour routes;
- Continue research and development at existing or greater funding levels;
- Publish and implement statewide standards and specifications for ITS field devices;
- Publish and implement statewide standards for TMC software;
- Publish and implement a statewide communications architecture;
- Communications backbone coverage;
- Publish and implement standard operating procedures;
- Publish statewide information exchange network standards and criteria;
- Publish and implement performance measures and archive data requirements;
- Publish a *SEMP*;
- Establish a statewide-managed funds program for ITS;
- Implement ITS funding targets for FDOT;
- Publish *Work Program Instructions*;
- Complete and implement a training program assessment;
- Percent of project costs funded (total cost) by other agencies through public-public partnerships;
- Number of regions that implement regional operating organization (ROO) partnerships; and
- Percent of project costs funded (total cost) through public-private partnerships.

Table 13.2 – Recommended *Ten-Year ITS Cost Feasible Plan* Performance Measures (Goal Area 1)

Goals and Objectives		Performance Measures	Benchmark (for 2012 unless otherwise noted)
1.	**Move People and Goods Safely**		
1.1	**Reduce accident rates.**		
1.1.1	Reduce accident rates caused by driver errors and the severity of accidents.[24]	Accident rate per million VMT annually	Reduce accident rates by 15% where freeway and incident management services are deployed and reduce the severity of accidents by 15% (a reduction of fatality and injury accident rate in proportion to the total rate)
1.1.2	Reduce accident rates and severities in construction work zones.	Accident rate per million VMT annually	Reduce accident rates by 15% where smart work zone management systems are deployed
1.1.3	Reduce accident rates at highway-rail grade crossings.	Accident rate per million VMT annually	Reduce accident rates by 15% where advanced highway-rail grade crossing systems are deployed.
1.2	**Reduce queuing on interstate mainlines.**[25]		
1.2.1	Reduce queues on limited-access roadways from highway-rail grade crossings.	Queue length (feet) on mainline and the frequency of queue formation (times per year)	Reduce queue length and frequency of queue formation by 15% where advanced highway-rail grade crossing systems are deployed.
1.2.2	Reduce queues at weigh and inspection stations along the corridors.	Queue length (feet) on mainline and the frequency of queue formation (times per year)	Reduce queue length and frequency of queue formation by 15% at weigh and inspection stations where electronic clearance and credentialing is deployed.
1.2.3	Reduce queues at intermodal facilities that impact corridor operations.	Queue length (feet) on mainline and the frequency of queue formation (times per year)	Reduce queue length and frequency of queue formation by 15% at intermodal facilities where inspection systems, electronic clearance, and credentialing are deployed.
1.3	**Improve the safety of commercial vehicle operators in rest areas.**	The number of crimes against commercial vehicle operators in rest areas	Reduce the number of crimes committed against commercial vehicle operators where surveillance and public safety systems are deployed.
1.4	**Provide evacuation coordination services and emergency management.**		
1.4.1	Provide pre-trip planning information for evacuation coordination.	ATIS coverage	Dissemination of pre-trip traveler information for evacuations through ISPs to Florida coastal counties.
1.4.2	Provide traffic management during evacuation conditions.	Traffic management services coverage during evacuations	Management of Traffic information on Florida's five principal FIHS limited-access corridors for evacuations.
1.4.3	Manage demand through communication with shelters and other safe harbors.	Communications links to county EMCs and shelter management personnel	Provide communication links from all RTMCs to county EMCs and shelter management personnel and provide shelter information in statewide 511 services.
1.4.4	Provide route guidance information and information on traffic/travel conditions and weather including winds, rainfalls, and storm surges.	Route guidance coverage	Provide route guidance information during evacuations on Florida's five principal FIHS limited-access corridors for evacuations.
1.4.5	Support remote configuration management of highways during evacuation conditions or other emergencies.	Remote configuration deployment coverage	Provide remote configuration technology deployments along all candidate corridors for contra-flow operations during evacuations.
1.4.6	Provide accurate and timely traveler information regarding incidents on evacuation routes and updated weather information.	ATIS coverage	Provide ATIS coverage along Florida's five principal FIHS limited-access corridors.
1.4.7	Share emergency information among local and regional TMCs and emergency management facilities.	Communications links to county EMCs and shelter management personnel	Provide a communications link from all RTMCs and links to local county emergency operation centers and shelter management personnel and provide shelter information in statewide 511 services.
1.4.8	Detect, verify, respond to, and clear incidents and manage traffic around accidents, emergencies, and other incidents	Incident response and clearance times	Minimize the incident response and clearance times during evacuation conditions.
1.4.9	Support infrastructure security through surveillance at critical structures and interchanges.	Percent of critical structures, interchanges with surveillance, and RTMCs	Provide coverage at 75% of the critical structures on the limited-access facilities and at 100% of the RTMCs.

24 The severity of accidents is commonly divided into three strata: accidents involving fatalities, accidents involving injuries (but no fatalities), and accidents involving property damage only.

25 This objective is intended to promote measures that reduce the queuing formed by exiting vehicles on mainlines from surface street elements.

Table 13.2 – Recommended *Ten-Year ITS Cost Feasible Plan* Performance Measures (Goal Area 2)

Goals and Objectives		Performance Measures	Benchmark (for 2012 unless otherwise noted)
2.	**Preserve and Manage the System**		
2.1	**Enhance mobility and efficiency.**		
2.1.1	Improve travel times along the corridors.	Total delay in vehicle-minutes	Reduce delays by 15% where freeway and incident management services are deployed.
2.1.2	Improve predictability and reliability of travel times.	Predictability of travel times in minutes	Provide travel time prediction models for ATIS capable of predicting actual travel times within 5% of trip duration for 95% of all trips along the five principal FIHS limited-access corridors.
		Reliability of travel times measured as the percent of trips that are achieved less than the predicted travel time plus a 20% margin	Operate and manage the system to provide at least 85% reliability for a 20% margin of trip travel time along the five principal FIHS limited-access corridors.
2.1.3	Reduce accidents and other incidents during normal flows that result from congestion and delays that are caused by "rubber-necking" during incidents.	Accident rate per million VMT annually	Reduce accident rates by 15% where freeway and incident management services are deployed.
2.1.4	Reduce congestion-related delays by reducing queues and spillback from other facilities.	Queue length (feet) on mainline and the frequency of queue formation (times per year)	Reduce queue length and frequency of queue formation at ramp interchanges where ramp metering and surface street control is deployed.
2.1.5	Reduce delays caused by congestion in construction work zones.	Total delay in vehicle-minutes	Reduce delay by 15% where smart work zone management systems are deployed.
2.1.6	Manage traffic accessing these major corridors at interchanges to improve mainline throughput and traffic flow.	Total delay in vehicle-minutes	Reduce delays by 15% where freeway and incident management services are deployed.
		Throughput in passenger car equivalents per lane per hour	Increase throughput in interchange areas by 10% where freeway and incident management services are deployed.
2.1.7	Reduce unnecessary delays at tollbooths.	Total delay in vehicle-minutes	Reduce delay at tollbooths by 10% where electronic payment services are deployed.
2.1.8	Reduce unnecessary delays at the gates of intermodal facilities.	Total delay in vehicle-minutes	Reduce delay at intermodal terminals by 10% where electronic clearance and credentialing services are deployed.
2.1.9	Provide traveler information services with route and mode choice information.	ATIS coverage	Provide advanced traveler information services along Florida's five principal FIHS limited-access corridors.
2.2	**System Preservation**		
2.2.1	Improve enforcement of illegally overweight vehicles.	Overweight enforcement coverage	Increase the use of portable overweight vehicle enforcement technologies such as seismic WIM.
2.3	**Incident Management**		
2.3.1	Improve the ability to detect, verify, respond to, and clear incidents.	Incident management service coverage	Provide incident management services on at least 85% of Florida's five principal FIHS limited-access corridors in urbanized areas and at high accident locations in other areas.
		RR Service Patrol coverage	Provide incident management services on at least 85% of Florida's five principal FIHS limited-access corridors in urbanized areas and at high accident locations in other areas.
2.3.2	Improve incident-related traveler information.	ATIS coverage[26]	Provide advanced traveler information services along Florida's five principal FIHS limited-access corridors.
2.3.2.1	Predict delays and clearance times.	Predictability of travel times in minutes	Provide travel time prediction models for ATIS capable of predicting actual travel times within 5% of trip duration for 95% of all trips along the five principal FIHS limited-access corridors.
2.4	**Manage SULs**	Freeway and incident management services coverage of SULs	Provide incident management services on at least 85% of SULs along Florida's five principal FIHS limited-access corridors in urbanized areas and at high accident locations in other areas.
2.5	**Provide Data Archiving and Warehousing**		
2.5.1	System evaluation and alternative analysis.	Data collection system spatial coverage	Provide data collection system coverage for all freeway and incident management services are deployed.
2.5.2	Support and supplement other statewide data collection programs.	Data collection system functionality	Document requirements and provide archived data to other statewide data collection programs.
2.5.3	Support highway operational performance reporting, modeling simulation, and other techniques for operations and management of the system.	Data collection system functionality	Document requirements and provide archived data to highway operational performance reporting, et. al.
2.5.4	Providing before and after studies for ITS deployments	Percent of ITS deployments with before and after data	Implement before and after studies to document the benefits of statewide ITS deployments for at least 10% of all deployments.

[26] Implementation of ATIS requires instrumentation of our highways to provide accurate and reliable travel times in near real-time.

Table 13.2 – Recommended *Ten-Year ITS Cost Feasible Plan* Performance Measures (Goal Areas 3 & 4)

Goals and Objectives		Performance Measures	Benchmark (for 2012 unless otherwise noted)
3.	**Enhance Economic Competitiveness**		
3.1	**Ensure efficient landside access to intermodal, port, airport, and truck terminal facilities.**	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 2.1.8, and 2.2.1.	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 1.2.8, and 2.2.1.
3.2	**Ensure efficient intermodal transfer of people and goods.**	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 2.1.8, and 2.2.1.	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 2.1.8, and 2.2.1
3.3	**Promote safe and efficient access of vehicles to markets.**	See all above.[27]	See all above.
3.4	**Expedite permitting and clearance of commercial vehicles at weigh and agricultural inspection sites to keep commerce moving.**	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 2.1.8, and 2.2.1.	See items 1.1.3, 1.2.1, 1.2.2, 1.2.3, 2.1.8, and 2.2.1.
3.5	**Ensure efficient access to major activity centers such as tourist attractions, state parks, and other areas of interest.**	See all above.	See all above.
3.6	**Provide safe and efficient tourist travel and reduce VMT through the provision of accurate and timely traveler information.**	See items 1.4.1, 1.4.6, 2.1.9, and 2.3.2.	See items 1.4.1, 1.4.6, 2.1.9, and 2.3.2.
3.7	**Support designation of corridors as strategic intermodal corridors and funding for ITS deployments.**	See item 2.5.	See item 2.5.
4.	**Enhance Quality of Life and the Environment**		
4.1	**Provide efficient statewide ITS services with autonomy for decision-making to support local needs and regional cooperation to promote efficiency and support regional and statewide goals.**	See all above.	See all above.
4.2	**Improve interoperability of ITS services through the development of statewide uniform device standards and specifications.**	See Goal Area 5.	See Goal Area 5.
4.3	**Support integration of ITS into local planning processes, programs, and capacity projects.**	Publish guidelines on how to mainstream ITS in transportation planning.	Complete *Rule 940* Implementation Plan by the end of 2002 and provide regular support of MPOs on ITS planning integration.
4.4	**Provide name recognition of key ITS-related services through branding that will instill trust and confidence in traveler information services, roadside assistance, electronic payment services, and other strategic services.**	Branding of major services.	Adopt statewide brands for traveler information services, roadside assistance, and electronic payment services by the end of 2001 and others as needed.
4.5	**Provide easy access and data mining capabilities for transportation planning and design for all partners to support decision-making.**	See item 2.5.	See item 2.5.
4.6	**Provide accurate real-time data to technology, business, and operational users for effective and responsive transportation operations.**	See item 2.5.	See item 2.5.
4.7	**Reduce air-quality emissions from mobile sources.**	See items 2.1.1, 2.1.5, 2.1.6, 2.1.7, 2.1.8, and 2.4.	See items 2.1.1, 2.1.5, 2.1.6, 2.1.7, 2.1.8, and 2.4.
4.8	**Reduce the potential for impacts from HAZMAT incidents.**	See items 1.1.1, 1.1.2, and 1.1.3.	See items 1.1.1, 1.1.2, and 1.1.3.
4.8.1	Improve HAZMAT response systems.	HAZMAT response system coverage.	Provide HAZMAT response coverage on 85% of Florida's principal FIHS limited-access corridors in urbanized areas and at high-accident locations in other areas.
4.8.2	Improve the availability of traveler, weather, and shelter information during man-made and natural disasters.	See items 1.4.1 and 1.4.6.	See items 1.4.1 and 1.4.6.
4.8.3	Provide safe routes for HAZMAT that avoid densely populated areas.	Designation and signing of detour routes.	Designate and sign detour routes for Florida's five principal FIHS limited-access corridors.

[27] All of the measures identified for ITS support this objective.

Table 13.2 – Recommended *Ten-Year ITS Cost Feasible Plan* Performance Measures (Goal Area 5)

Goals and Objectives		Performance Measures	Benchmark (for 2012 unless otherwise noted)
5.	**Deploy an Integrated, Effective System**		
5.1	**Provide research and development for technologies to support deployments.**	Continue research and development at existing or greater funding levels	Promote continued research and development of emerging technologies and activities to support deployments.
5.2	**Develop statewide standards and specifications for ITS field devices.**	Publish statewide standards and specifications for ITS field devices and implement	Complete by end of 2001.
5.3	**Develop statewide standards for TMC software.**	Publish statewide standards for TMC software	Complete by end of 2001.
5.4	**Develop a communications architecture and backbone for statewide deployment.**	Publish and implement statewide communications architecture	Complete by end of 2001.
		Communications backbone coverage	Pursue private partnerships to advance deployment of statewide communications backbone to achieve 50% coverage of the five principal FIHS limited-access corridors.
5.5	**Develop standard procedures for operations and management.**	Publish standard operating procedures	Complete by end of 2002.
5.6	**Develop statewide information exchange network standards and criteria.**	Publish and implement statewide information exchange network standards and criteria	Complete by end of 2002.
5.7	**Brand all critical statewide services such as traveler information, IVR systems (511 or 1-800), RR Service Patrols, *SunPass*®, Pre-Pass, etc.**	Brand all critical statewide services such as traveler information, IVR systems (511 or 1-800), RR Service Patrols, ***SunPass***®, Pre-Pass, etc	Complete by end of 2001.
5.8	**Standardize performance measures and archive data to produce a history of trends and establish benchmarks.**	Publish performance measures and archive data requirements and implement	Complete by end of 2002.
5.9	**Develop statewide procurement guidelines.**	Publish and implement procurement guidelines	Complete by end of 2002.
5.10	**Develop a statewide systems engineering process for design, integration, and testing that includes regular updates and enhancements of statewide architecture.**	Publish a *SEMP*	Complete by end of 2002.
5.11	**Develop statewide procurement contracts to leverage economies of scale.**	Develop statewide procurement contracts	Complete by end of 2002.
5.12	**Develop an ITS asset management program to track and program replacement parts, migrate legacy systems, and manage the life-cycle of deployments.**	Deploy asset management program	Complete by end of 2002.
5.13	**Establish a statewide-managed funding program for ITS with project decision recommendations made by the ITS Office.**	Establish statewide-managed funds program	Complete by end of 2001.
5.14	**Dedicate a percentage of all FDOT funds, statewide-managed and district-allocated, for operations, management, and ITS deployment.**	Implement ITS funding targets for FDOT	Complete by end of 2002.
5.15	**Update *Work Program Instructions* to develop traceability with the *SITSA*.**	Publish work program instruction changes	Complete by end of 2002.
5.16	**Increase the professional capacity of the public and private sectors in Florida to support planned deployments.**	Publish training needs assessment and implement	Complete training needs assessment by end of 2001 and implement structured training program by 2003.
5.17	**Promote public-public partnerships to leverage financial and human resources.**	Percent of project costs funded (total cost) by other agencies through public-public partnerships	One percent of total project costs funded through partnerships on the principal FIHS limited-access corridors.
		Number of regions that implement ROOs partnerships	Establishment of ROO in Orlando, Miami, Jacksonville, and Tampa.
5.18	**Promote public-private partnerships to leverage financial and human resources.**	Percent of project costs funded (total cost) through public-private partnerships	One percent of total project costs funded through partnerships on the principal FIHS limited-access corridors.

13.4 Funding and Work Program Instructions

13.4.1 Funding for ITS Projects

FDOT is a trust funded state agency. That means that funds for FDOT's programs are provided primarily from state fuel taxes, motor vehicle fees, and federal apportionments/grants that are deposited into the State Transportation Trust Fund. Turnpike projects are funded by toll collections, concession revenues, and bond revenue proceeds. State law requires FDOT to develop a Five-Year Work Program that is FDOT's commitment to the public to build specific projects during that time period. Most of FDOT's funds are spent on projects in the work program.

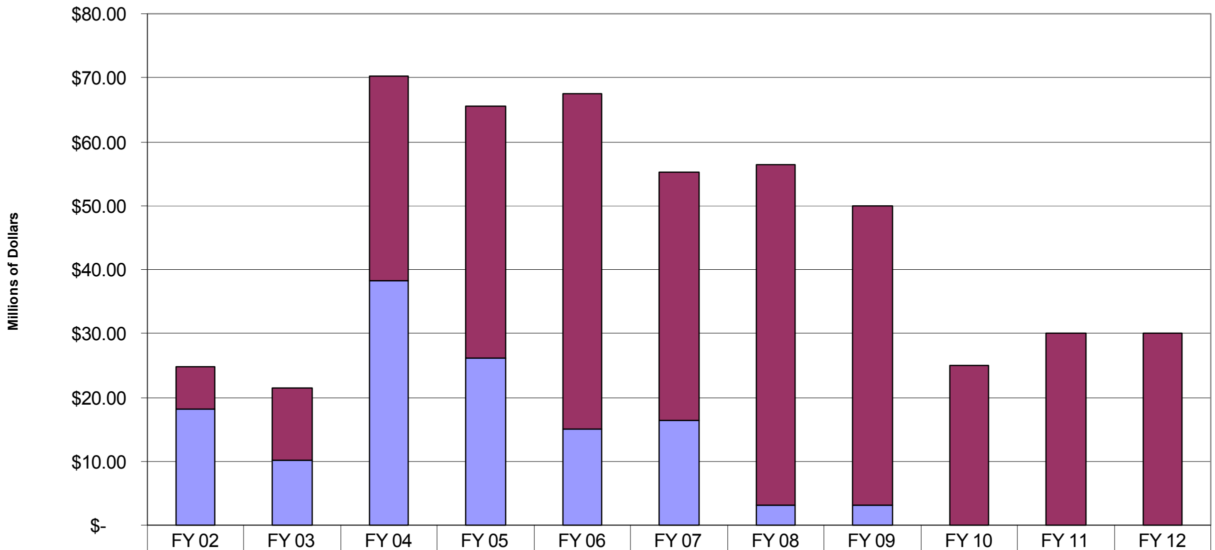
There are many possible approaches to funding ITS projects, including most federal aid categories, state funds, local funds, and public/private partnerships. However, the *ITS Business Plan* is focused on the use of FDOT's statewide-managed funds for the ITS Program. These statewide-managed funds include funding from a number of federal and state funding sources.

The most common funding source for ITS deployment is federal transportation funds. System operations and maintenance costs are eligible and should be estimated in a manner that allows agencies to take full opportunity in securing federal Surface Transportation Program (STP), National Highway System (NHS), Inter-Modal, and Congestion Mitigation Air Quality (CMAQ) funds.

Innovative funding sources should be explored within statutory constraints to supplement available federal and state funds. These potential funding sources could include public/private partnerships, resource sharing with public agencies both within and external to FDOT, and revenue opportunities. Examples of additional revenue opportunities include revenue from ISPs and the leasing of telecommunications capacity.

In July 2000, the FDOT Secretary of Transportation established an ITS Office and dedicated funds for ITS deployments along the FIHS limited-access corridors. This program has now been allocated $496 million dollars through fiscal year 2012. Table 13.3 shows the anticipated funding levels for this program by year.

Table 13.3 – ITS Program Statewide-Managed Funds



	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12
Available	$6.59	$11.24	$31.98	$39.52	$52.40	$38.94	$53.20	$46.80	$25.00	$30.00	$30.00
Committed	$18.21	$10.16	$38.32	$26.08	$15.10	$16.36	$3.10	$3.20	$-	$-	$-

13.4.2 Work Program Instructions[28]

The remainder of this section outlines the proposed *Work Program Instructions* needed to support the programming of funds using the ITS Program, identified as ITSS in the Work Program Administration (WPA).

The next major step in the *Ten-Year ITS Cost Feasible Plan* is the programming of ITS projects in FDOT's work program. The following outlines the recommended revisions to the *Work Program Instructions* for the programming of ITS projects. Once the projects identified in the *Ten-Year ITS Cost Feasible Plan* are included in the work program, procurement, operations, and management can begin.

[28] These draft work program instructions have been submitted to the Program Management Office for review in accordance with the annual work program development schedule. Final instructions will not be available until August 2002.

Definition of ITS – ITS is the application of information systems and communications technologies to serve transportation. ITS projects address the needs of commuters, commercial vehicle operators, tourists, and evacuees. ITS projects are capacity improvements that may include:

- ATMS;
- ATIS;
- CVO;
- ETC; and
- APTS.

There is an annual set-aside of at least $25 million in statewide funds that began in FY 2002 for the FIHS limited-access corridors' ITS projects. These funds will be used to fund the highest priority ITS projects on the principal FIHS limited-access corridors – I-4, I-10, I-75, I-95, and Florida's Turnpike. Emphasis will be on corridor definition of ITS projects with the earliest implementation in areas of greatest need, typically urbanized areas, but within the context of an overall corridor plan. Projects selected shall conform to the *NITSA* and its standards unless specifically agreed to with FHWA. The use of federal funds must be deemed consistent with the MPO's Long Range Transportation Plan and the Transportation Improvement Plan.

ITS projects are another type of capacity improvement. Projects will be selected by the Assistant Secretary for Finance and Administration and the Assistant Secretary for Transportation Policy. ITS projects that are not funded from the set-aside will be prioritized for funding along with other capacity improvement projects identified for the principal FIHS limited-access corridors.

A *Ten-Year ITS Cost Feasible Plan* was completed in the Spring of 2002 that summarizes the ITS needs and priorities along these corridors. This *Ten-Year ITS Cost Feasible Plan* was developed through completion of the *ITS Corridor Master Plans* along the principal FIHS limited-access corridors – I-4, I-10, I-75, I-95, and Florida's Turnpike – for ATIS, communications system needs, and CVO. These *ITS Corridor Master Plans* were completed in accordance with FHWA *Rule 940* and the *NITSA*.

Eligibility for Statewide FIHS ITS Funds – Projects eligible for FIHS statewide set-aside ITS funds include constructing ITS infrastructures, installing ITS devices, acquisition of software, construction of TMCs, deployment of information systems to support ATIS and commercial vehicle information systems and networks, construction of communications infrastructures, construction inspection, testing and acceptance activities, and evaluations of ITS deployments.

Projects are determined to be eligible for statewide funding based on the following criteria:

- The project is located on an FIHS limited-access route. First priority will be given to projects located along the five principal FIHS limited-access corridors – I-4, I-10, I-75, I-95, and Florida's Turnpike.

- The project must lead to a permanent installation of ITS field devices and communications systems. Portable deployments that involve leased equipment are not eligible. These projects consist of the initial installation of the ITS infrastructure, TMCs, communications systems, ITS field devices, or software acquisitions.

- Routine operations and management activities, including replacement costs for permanent installations of field devices, are not eligible.

- The project must be contained in the *Ten-Year ITS Cost Feasible Plan* and identified as a district and statewide priority.

- The project must satisfy the *SITSA*, the corridor architectures, and the *ITS Corridor Master Plans* developed for the principal FIHS limited-access corridors.

- The project must be developed consistently with FDOT's *Proposed Systems Engineering Approach for ITS Deployments along Florida's Limited-Access Corridors*, and FHWA *Rule 940*, *Intelligent Transportation Systems Architectures*.

- The project must conform to all applicable federal and state standards.

- The project must demonstrate a strong commitment to cooperation with corridor stakeholders and any institutional/operational agreements required for the project must be in place prior to procurement.

- The project must be supported by an operations and management plan and funding for operations and management (from other sources) to ensure the deployment is sustainable. These commitments should include the funding necessary to operate TMCs and any contracts for service needed for incident management, providing traveler information services, or general services for ITS program management and may be funded with any eligible district-allocated funds.

Technical Guidelines

(a) ITS projects must be programmed on a specific highway (systems 01-07) or Public Transportation Office (PTO) transportation system (systems 08-11). RTMCs should be programmed as non-system specific improvements

(b) Use of an applicable phase group and corresponding program number is required.

(c) Because of the complexity of ITS projects, it is likely that they will contain several elements that determine work mix such as communications systems, software, physical infrastructures, or field devices. Therefore, assigning the work mix for a project should be based on the major function of the project. Stand-alone ITS projects must be programmed using one of the following work mixes:

0750 ITS Communications Systems

ITS communications systems projects include the planning, design, deployment, and integration of the communications infrastructures that support ITS. ITS communications media include unprotected twisted pair, fiber optics, microwave radios, and other infrastructures that are needed to support wide area or network use of other wireless technologies such as cellular digital package data networks. Examples of project names that should be identified with this work mix include FONs, microwave backbones, and wireless networks.

0751 Other ITS

Other ITS should be used for ITS projects that do not meet any of the other descriptions of ITS work mixes identified herein. The project description should contain the ITS market package identified in the *NITSA* and the *SITSA*.

0752 ITS Surveillance System

Projects included in the ITS Surveillance System work mix include those that provide surveillance of traffic and roadway conditions or security of critical infrastructures such as bridges and TMCs. Projects identified in this category should be limited to surveillance using CCTVs, infrared sensors, or motion sensors. Projects that involve multiple device types such as HAR or DMS should be identified as FMS (0756) or another work mix as appropriate. Examples of project names that should be identified with this work mix include surveillance systems, public security surveillance systems, or infrastructure security surveillance systems.

0753 Traffic Management Centers (TMCs)

TMCs are facilities that may contain multiple agencies interested in the management and operations of transportation facilities and services. These centers are usually hubs for communications infrastructures and contain information systems that support the management and operations of facilities and services. Examples of project names that should be identified with this work mix include RTMCs, traffic operations centers, and transit management centers.

0754 Advanced Traveler Information Systems (ATIS)

ATIS projects include the planning, design, and implementation of the integrated provision of data collection, data fusion, and dissemination using multiple media such as television, commercial radios, HAR, internet, telephone systems, email, or facsimile. All ATIS projects in Florida are branded under the SunGuide℠ name. Examples of project names that should be identified with this work mix include the SunGuide℠ ATIS, HAR systems, and 511 traveler information systems.

0756 Freeway Management Systems (FMS)

FMS projects include the planning, design, deployment, and integration of roadside infrastructures such as vehicle detection devices, RWIS, CCTV cameras, and other sensors to monitor conditions along a freeway. These roadside devices are connected to a TMC using a communications media. In the TMC, information is fused, analyzed, and processed using specialized software. Advisories and other information is then disseminated to users of the freeway using DMS, flashing beacon indicators, HAR, and ATIS. Operations at the TMC support incident detection, verification, response, and clearance. Other emergency management functions such as evacuation coordination also occur at the TMC. Examples of project names that should be identified with this work mix include FMS, IMS, surveillance motorist information systems, and ATMS along limited-access facilities.

0757 Traffic Management Center (TMC) Software and Systems Integration
TMCs require specialized computer software and hardware for data collection, data fusion, and dissemination of real-time traffic and incident information from roadway ITS and the management and operations of these elements. Projects that should be identified using this work mix are those that primarily provide services related to software development, upgrades, or the integration of existing systems. Examples of project names that should be identified with this work mix include TMC software development, systems integration, and software upgrades.

0758 Commercial Vehicle Information Systems and Networks (CVISN)
CVISN is a federal program that brings all data on a commercial vehicle together in one location for the sharing of that data among state agencies. CVISN attempts to bring safety and credentials information from the agencies that regulate and issue credentials and safety checks to the roadside to assist MCCO officers in their day-to-day operations. These include individual safety inspections of trucks, safety audits at trucking terminals, automated by pass or electronic clearance of pre-approved commercial vehicles that allows them to stay on the mainline in some cases, and out-of-state weight and safety inspection facilities. CVISN consists of three main components including electronic clearance, roadside safety inspections, and automated credentialing. Examples of project names that should be identified with this work mix include commercial vehicle exchange window systems (CVIEW), electronic credentialing systems, electronic routing and permitting systems, and EPS for CVO.

0759 ITS Data Archives
ITS data archive projects involve the planning, design, deployment, and maintenance of central data warehouses and other information systems that contain ITS data. They include the development of data marts and warehouses. Examples of project names that should be identified with this work mix include information exchange networks and central data warehouses.

Related work mixes that are often associated with ITS include:

0716 Motorist Aid System (Traffic Control)
Motorist aid system projects include those associated with the planning, design, deployment, and integration of motorist aid call boxes.

0717 Arterial Traffic Management Systems/Traffic Signal System

These projects involve the planning, design, deployment, and integration of traffic signal systems that communicate with a TMC and provide either adaptive or actuated traffic signal systems. Elements of these projects include the physical infrastructures required to deploy these systems such as traffic signals, controllers, communications systems, and computer hardware and software. Examples of project names that should be identified with this work mix include arterial traffic management systems along a controlled-access facility or integrated signal system projects.

8064 Advanced Public Transportation Systems (APTS) and Transit Management

APTS projects provide integrated solutions that support the management of transit fleets, en-route transit information, personalized transit, public transit security systems using surveillance technologies, transit route operations management, transit passenger and fare management, multi-modal coordination, and transit vehicle tracking. These systems usually rely on a wireless communications system to transmit information between vehicles and a management center and transit vehicles. Examples of project names that should be identified with this work mix include transit fleet management and advanced transit management systems.

When ITS projects are funded as part of a larger construction project, the appropriate ITS work mix should be identified as a minor work type.

(d) ITS work funded with statewide ITS set-aside funds will be identified by a specific item group identifier (ITSS).

(e) ITS work funded with other state, federal, or local funds or as part of a larger construction project will be identified by a specific item group identifier (ITSO).

(f) A district may use district-allocated funds to support or deploy any ITS project or program. Interstate ITS projects may also use any other funds eligible for major interstate construction such as DS, DDR, STP, CMAQ, etc.

(g) As required for other statewide-managed programs, the district must notify the Statewide Programs Manager in the Program Development Office and request additional funding before adjustments can be made to ITS Program projects programmed in their district.

(h) When cost estimates on ITS projects' phases decrease as a result of lower bids, the district will transfer funds and budget made available from the estimate decrease to statewide reserve to meet statewide ITS Program priorities.

(i) Any available statewide- or district-allocated funds may be programmed on ITS projects, unless specifically prohibited by FDOT or FHWA procedure.

Ten-Year ITS Cost Feasible Plan **–** The *Ten-Year ITS Cost Feasible Plan* consists of the ITS projects located on FIHS limited-access facilities in the current Adopted Work Program plus five additional years of ITS projects defined in the WPA. With the development of the Tentative Work Program, the sixth year of the previous year's *Ten-Year ITS Cost Feasible Plan* becomes the new fifth year of the Tentative Work Program. The annual update of the *Ten-Year ITS Cost Feasible Plan* will be the development of a new tenth year of the *Plan*.

The projects added to the new tenth year of the *Plan* will be selected by the ITS Office from the *ITS Plan*. Candidate projects will be mapped and summarized in a table format and distributed to the districts for review. At this time, the districts and the ITS Office may consider changes to the priority, cost estimates, or project schedules in the *Plan*. Following review by the districts and by the Assistant Secretary for Policy and Programs, the new tenth year will be added to the *Plan*. The *Ten-Year ITS Cost Feasible Plan* will also be updated to reflect the expenditure of district-allocated funds on the FIHS limited-access corridors in the Adopted Work Program or projects identified by other sources, such as expressway authorities. Following this review, the Statewide Programs Manager and the Program Development Office will finalize statewide balancing actions consistent with guidance from the Assistant Secretary using a process similar to the FIHS Program. A final revised *Ten-Year ITS Cost Feasible Plan* will then be published by the ITS Office.

Florida's Turnpike – Although funding of ITS projects on the Turnpike may be made using only Turnpike funds, these projects shall be programmed in accordance with the *Ten-Year ITS Cost Feasible Plan* for consistency with FDOT policy and standards. Turnpike projects will be reported in the *Ten-Year ITS Cost Feasible Plan* for statewide tracking of ITS deployments.

Expressway Authorities – Although funding of ITS projects on expressway facilities will be made using only expressway funds, these projects will be reported in the *Ten-Year ITS Cost Feasible Plan* for the tracking of statewide ITS deployments.

Other FIHS Arterial Routes – ITS projects on the arterial portion of the FIHS will be funded using district-allocated funds.

Operations and Maintenance Costs – The *Ten-Year ITS Cost Feasible Plan* contains an estimate of the operations and maintenance costs required to support the deployments funded. Operations and maintenance costs are to be funded through the district maintenance programs.