Technical Memorandum No. 1

Intelligent Transportation Systems Legacy Catalog

Prepared for:

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List of Acronyms

AADT ..... Annual Average Daily Traffic
ATIS..... Advanced Traveler Information System
CCTV ..... Closed-Circuit Television
DMS ..... Dynamic Message Sign
DSS ..... Decision Support System
FCC ..... Federal Communications Commission
FDOT ..... Florida Department of Transportation
FHP ..... Florida Highway Patrol
FHWA..... Federal Highway Administration
FIHS..... Florida Intrastate Highway System
GIS ..... Geographic Information System
GUL ..... General-Use Lane
HAR ..... Highway Advisory Radio
HART or HARTline ..... Hillsborough Area Regional Transit Authority
HEFT..... Homestead of Florida's Turnpike
HOV ..... High Occupancy Vehicle
IMS ..... Incident Management System
ISP..... Information Service Provider
ITS..... Intelligent Transportation System
IVR..... Interactive Voice Response
LOS ..... Level of Service
LYNX ..... Central Florida Regional Transportation Authority
MCCO..... Motor Carrier Compliance Office
MDX ..... Miami-Dade Expressway Authority
MPH..... Miles Per Hour
MPO ..... Metropolitan Planning Organization
NITSA ..... *National ITS Architecture*
OOCEA..... Orlando-Orange County Expressway Authority
RCI..... Roadway Characteristics Inventory
RR Service Patrols ..... Road Ranger Service Patrols
SITSA..... *Statewide ITS Architecture*
TALTRAN..... Hillsborough Area Regional Transit Authority
THCEA ..... Tampa Hillsborough County Expressway Authority
TiRN ..... Traveler Information Radio Network
TranStat..... FDOT Transportation Statistics Office
TRI RAIL..... Hillsborough Area Regional Transit Authority
TTMS..... Telemetered Traffic Monitoring Site
VMT..... Vehicle-Miles Traveled
VOTRAN..... Volusia County Transit
VPD..... Vehicles Per Day
WIM..... Weigh-in-Motion

Executive Summary

The interstate facilities selected as part of this concept report possess unique physical and operational characteristics that should be considered when developing intelligent transportation systems (ITS) corridor architectures. This *ITS Legacy Catalog* provides a "snapshot" of existing demographics, geometric characteristics, environmental features, and operational conditions along these ITS corridors and presents a vision of the future physical and operational conditions. It also addresses current intermodal and transportation issues, as well as documenting legacy and planned ITS services along these limited-access corridors.

Figure ES-1 – Florida's ITS Corridors

ITS Corridors

Florida's ITS corridors are comprised of the five principal Florida Intrastate Highway System (FIHS) limited-access corridors in coordination with privately funded expressways. These corridors were identified in coordination with the Florida Department of Transportation's (FDOT) ITS Office. Figure ES-1 provides a graphical illustration of the ITS corridors.

The FIHS was created in 1990 by the Florida Legislature and is composed of interconnected limited and controlled access roadways including interstate highways, Florida's Turnpike, selected urban expressways, and major arterial highways. It is a statewide transportation network that provides for high-speed and high-volume traffic movements within the state. The FIHS is a 3,935-mile (centerline) network of roadways (3,834 existing miles, 96 proposed miles, and five miles of new roads under construction) providing essential transportation services throughout the state. When expressed in terms of all Florida public roads, the FIHS constitutes approximately three percent of the system, but carries approximately 32 percent of the traffic. The FIHS carries approximately 70 percent of all truck travel on the state highway system.

As the major components of the FIHS, these corridors are the centerpieces of the state highway system, linking all modes of travel within the state. They are the backbone of Florida's economy, serving primary freight networks and providing access to major tourist destinations.

Table ES.1 identifies the FIHS limited-access facilities that make up the ITS corridors and their corresponding mileage.

Table ES.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

Source: FDOT ITS Office

Freeway and Incident Management Services

Florida's ITS services are rapidly emerging on the FIHS limited-access corridors. However, the current coverage of existing critical services ranges widely. Table ES.2 summarizes the coverage of major surveillance devices for incident detection and verification and traveler information technologies along 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. Figures ES.2 and ES.3 illustrate this coverage graphically.

Table ES.2 – Existing Freeway and Incident Management Services

Mainline Corridors[1]	Existing Coverage (Percent of Miles)[2]					
	CCTV[3]	Vehicle Detectors[4]	RR 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) cameras, 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 District.)

Figure ES.2 – Existing ITS Services

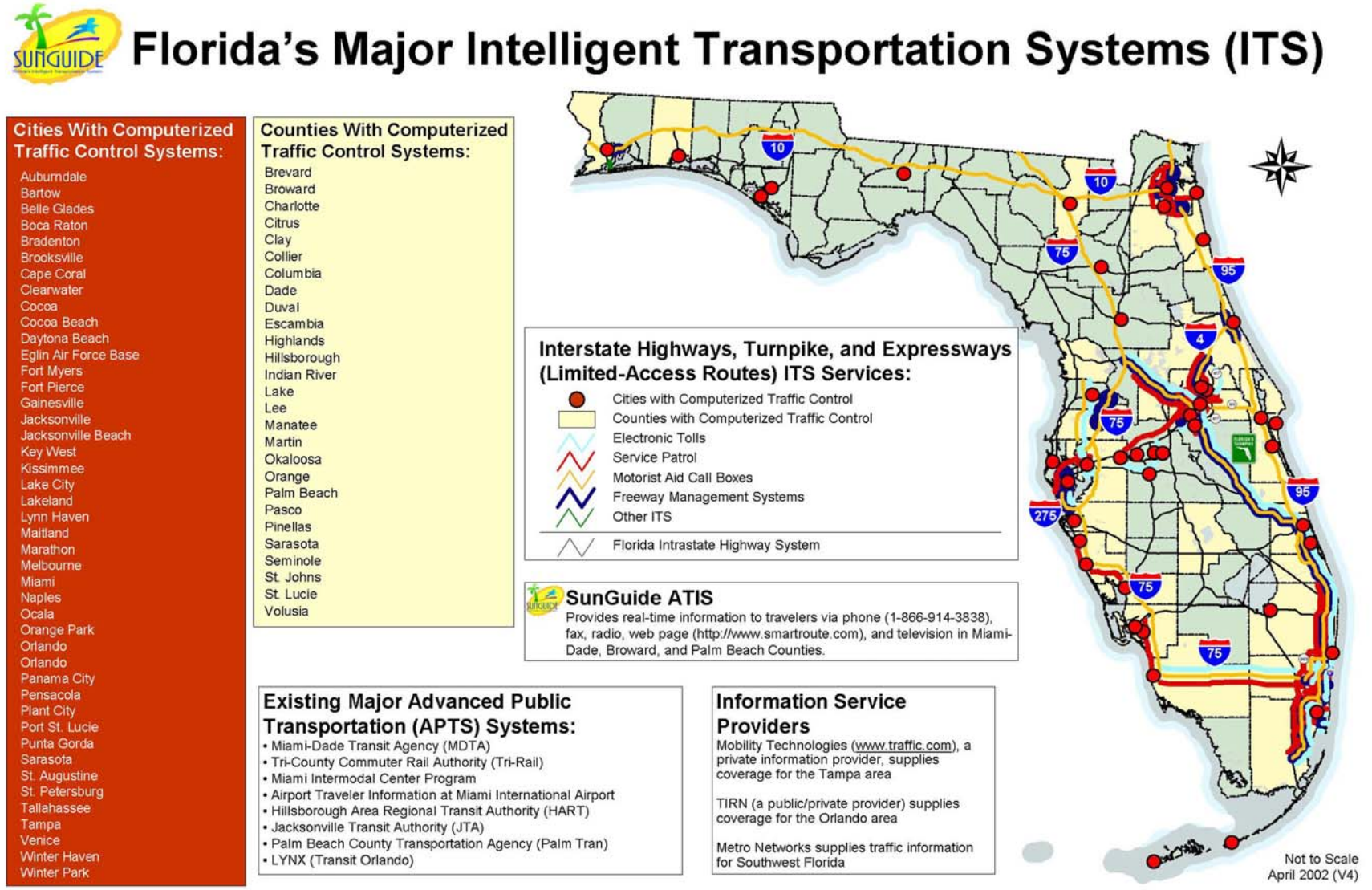
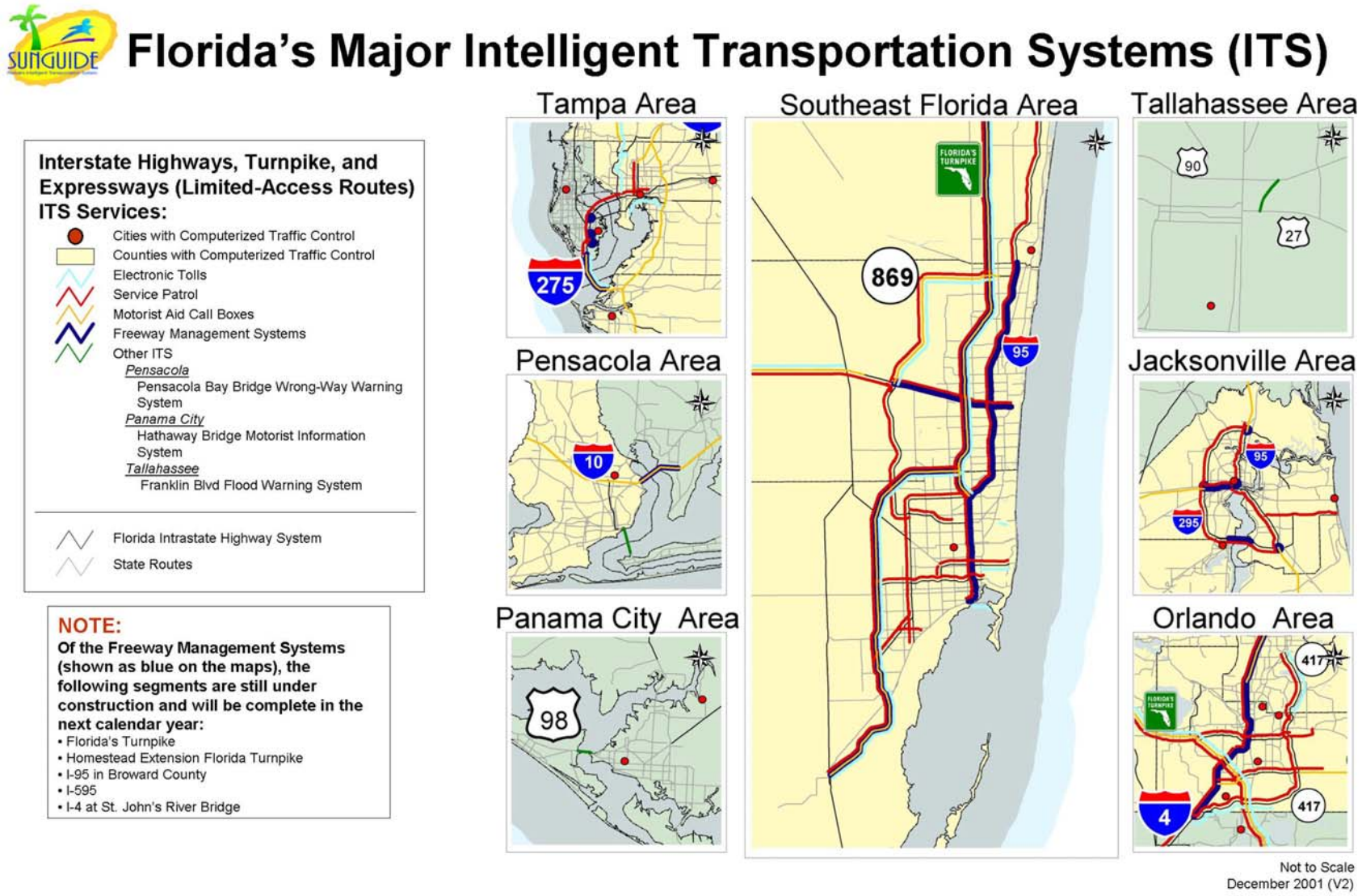


Figure ES.3 – Existing ITS Services



Advanced Traveler Information Systems (ATIS)

In addition to freeway and incident management services, FDOT plans to provide a statewide advanced traveler information system (ATIS), branded using 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.

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 ES.4. 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 service.

Figure ES.4 – Southeast Florida SunGuide℠ Coverage Area

Traveler Information Radio Network™

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.

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℠ ISP will operate the HAR site existing in Southeast Florida.

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℠ 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 CR 471 in Volusia County, the I-4/I-95 interchange area, and the SR 528/I-95 Interchange area. Additional partners and information is being considered through the Regional ITS Consortium in Orlando.

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 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 District.

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

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 interstate, 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 the 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 ES.3 identifies the location of the existing and planned WIMs along the intrastate facilities.

Table ES.3 – 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: MCCO, 2001

1. Introduction

1.1 Overview

The FIHS, created in 1990 by the Florida Legislature, is composed of interconnected limited and controlled access roadways including interstate highways, Florida's Turnpike, selected urban expressways, and major arterial highways. It is a statewide transportation network that provides for high-speed and high-volume traffic movements within the state. The FIHS is a 3,935-mile (centerline) network of roadways (3,834 existing miles, 96 proposed miles, and five miles of new roads under construction) providing essential transportation services throughout the state. When expressed in terms of all Florida public roads, the FIHS constitutes approximately three percent of the system, but carries approximately 32 percent of the traffic. The FIHS carries approximately 70 percent of all truck travel on the state highway system.

Travel demand, measured in vehicle-miles traveled (VMT), on the FIHS increased 43 percent. The percent of travel that is congested during peak operating conditions (5:00 to 6:00 p.m.) increased 40 percent from 1990 to 1999.

Alternatively, Florida cannot build new infrastructure at a fast enough pace to alleviate the congestion and meet increasing travel demand. During the same 1990 to 1999 time period, FDOT invested more than $3.1 billion in construction (only) on the FIHS, which resulted in a 10.3 percent increase in the number of lane miles.

Florida's growth is not expected to abate. By the year 2020, the system must accommodate more than a projected 21 million residents and 80 million visitors. The 2020 system must also respond to an anticipated three-fold increase in Florida's imports and exports. VMT is expected to increase by approximately 60 percent, transit trips by approximately 40 percent, and air travel will more than double. Historical roadway expansion and infrastructure management trends will be insufficient to keep pace with this demand.

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

To alleviate congestion and improve travel, ITS solutions are becoming a viable alternative to conventional capacity improvement projects. According to the Federal Highway Administration (FHWA), ITS is defined as:

> … the application of management strategies and technologies to increase the efficiency and safety of national, regional, and local surface transportation systems… Rather than solving transportation challenges solely by building additional roadway capacity, ITS strategies strive to use existing facilities more efficiently by applying technology and effective management strategies to collect, transfer, process and share historic and real-time transportation information.

1.2 Purpose of the Study

The purpose of this study is to develop *ITS Corridor Master Plans* and an *ITS Plan* for the five principal FIHS limited-access transportation corridors. These plans will be combined into a statewide program plan for the deployment of an integrated, interoperable ITS. This effort will build upon existing and programmed ITS projects and will identify the anticipated ITS needs, funding, and projects recommended for programming on a statewide basis. The *ITS Plan* will be used to prioritize funding set aside for ITS deployments and guide the deployment of ITS. The basis of the *ITS Plan* will be the completion of the conceptual engineering, ITS architecture standards and specifications, and systems engineering analyses for Florida's five principal FIHS limited-access transportation corridors as identified in the following section.

1.2.1 Justification for the Study

Florida's *ITS Strategic Deployment Prioritization Plan* was developed to guide the state and local governments and metropolitan planning organizations (MPOs) in the planning, programming, and implementation of integrated multi-modal ITS elements and services on a short-term and long-term basis. The *ITS Strategic Deployment Prioritization Plan* establishes goals and objectives for Florida's *ITS Plan* that parallel the goals of the *Florida Transportation Plan*. One of the key study recommendations includes:

> "….a fifth goal or expanded goal in the *Florida Transportation Plan* that stresses the importance of the management and operation of the state's transportation system by providing a statewide, integrated transportation system that is managed and operated in real time."

The *ITS Strategic Deployment Prioritization Plan* also establishes guiding principles for implementing Florida's ITS vision. These principles establish the need for an integrated, coordinated statewide *ITS Plan* for the five principal FIHS limited-access corridors. The guiding principles for this study are as follows:

- **Undertake Strategic Deployment** – Clarify ITS project priorities and develop a cost-effective incremental approach to deployment. Both short- and long-term elements should be considered.

- **Provide Service on a Regional, Integrated, and Interoperable Basis** – Provide seamless service through the integration of traffic operations and transit services across jurisdictional lines.

- **Leverage Value of "Conventional" Capital Investments** – The value of conventional capital investments should be leveraged in roadway and transit improvements through ITS features that improve operational efficiency.

- **Develop ITS Funding Strategies** – Pursue the development of specific funding strategies for ITS deployment in MPOs, TIPs, and FDOT's Work Program. Such strategies should include funding for long-term operations and management.

The *ITS Corridor Master Plans* and the *ITS Plan* will fulfill the recommendations and objectives identified in Florida's *ITS Strategic Deployment Prioritization Plan*. Additionally, the *ITS Corridor Master Plans* recommend the development of statewide ITS project standards and specifications that are included as part of this study.

1.3 Study Corridors

Figure 1.1 illustrates the limited-access transportation corridors that will be considered in these concept plans. These corridors were identified for the study in coordination with the ITS Central Office. The total mileage covered is identified in Table 1.1.

As the major components of the FIHS, these corridors are the centerpiece of the state highway system, linking all modes of travel within the state. They are the backbone of Florida's economy, serving the primary freight networks and providing access to major tourist destinations. These study roadways are also designated as emergency evacuation routes.

Figure 1.1 – ITS Study Corridors

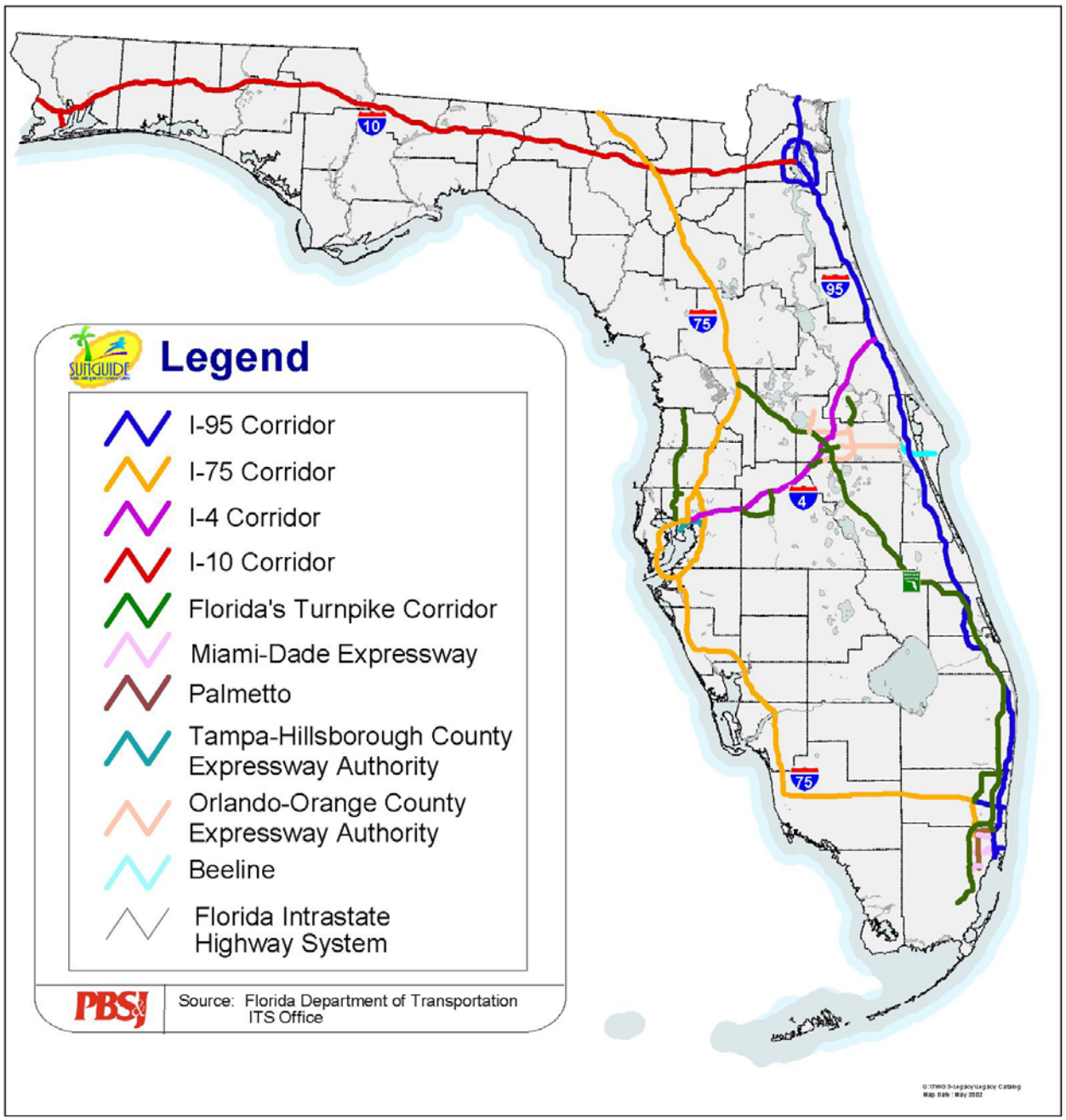


Table 1.1 – FIHS Limited-Access Facility Mileage by Corridor

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SR 528	27.25
	74.66

Total Corridor Mileage
2105.55

Source: FDOT ITS Office

1.4 Study Framework

The purpose of this project is to perform a strategic assessment of ITS services along the five principal FIHS limited-access corridors. This assessment will result in a framework for the deployment of ITS services and will provide guidance for transportation, communications, and institutional elements to ensure the proposed strategies are feasible. The following principles will be followed.

- **Build on the Existing/Incorporate Legacy Systems** – The proposed concept plans and strategic assessments will utilize existing studies, ITS needs assessments, and deployed technologies to the greatest extent possible.

- **Be Consistent with the *National ITS Architecture (NITSA)*, Florida's *ITS Strategic Deployment Prioritization Plan*, and the Florida *Statewide ITS Architecture (SITSA)* and Standards Project** – The concept plans will be consistent with the *NITSA,* Florida's *ITS Strategic Deployment Prioritization Plan,* Florida's *SITSA* and Standards Project, and Rule 940, ITS Architecture and Standards, as developed by the FHWA. Harmonization of these plans is anticipated.

- **Be Consistent with FDOT's Production Schedules** – Consideration will be made to ensure that every opportunity to advance ITS strategies within the corridors will be taken to minimize scheduling effects of any other proposed capital improvements under development by FDOT.

- **Involve Other Stakeholders** – This effort is intended to provide stakeholders with the opportunity to provide input into the formulation of a long-term vision for the deployment of ITS technologies. Careful consideration of other FDOT public involvement programs will be made to ensure a clear and consistent message is being delivered to the public. This effort will require coordination with planning and project development staff at the district level.

- **Support Other FDOT Initiatives** – This effort will be consistent with and provide support to other project development work being performed by FDOT within the corridor. The results of this study should also be compatible with other planning and implementation documents.

1.4.1 Study Goals

These principles will be applied throughout this study to achieve the following goals.

Goal 1 – Produce Corridor ITS Architecture(s). An architecture for ITS services will be developed for each corridor from existing architectures and will include the following:

- A description of the corridors;

- Identification of participating agencies and other stakeholders;
- An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the corridor ITS architectures;
- Identification of agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS-related standards, and the operation of the projects identified in the regional ITS architecture;
- System functional requirements that include specific ITS user services and market packages designed to address specific problems in a planning context on a regional and corridor basis;
- Interface requirements and information exchanges with planned and existing systems and subsystems (i.e., subsystems and architecture flows as defined in the *NITSA*);
- Identification of ITS standards supporting statewide and national interoperability;
- Identification of the sequence of projects required for implementation;
- Maintenance of Florida's *SITSA* and Standards Project as needs evolve within the corridors; and
- Harmonization of statewide, corridor, district, MPO, and project architectures.

Goal 2 – Provide Interim Deployment Strategies. Interim deployment strategies will be identified that will provide long-term cost savings to FDOT in the implementation of the corridor ITS architectures. Interim deployment strategies are those that can be deployed in a short time frame to resolve existing problems and to accommodate future long-term strategies. An example of an interim strategy is to specify the location and required diameter for conduit to be placed along the I-95 corridor during construction that occurs prior to the deployment of long-term strategies.

Goal 3 – Define An Implementation Strategy. A series of critical success factors will be identified for the implementation of the corridor ITS architectures and the interim deployment strategies. These implementation strategies may include, but are not limited to, planning and programming, operations and maintenance, project definitions, funding and procurement, public relations, and program administration. The final implementation strategy will identify a series of projects to be implemented and a phasing plan for implementation. Project costs and potential funding will be addressed.

1.4.2 Study Components

***PHASE I – ITS Corridor Master Plans for Florida's Principal FIHS Limited-Access Corridors*:** The purpose of this activity is to develop the *ITS Corridor Master Plans* that cover the five principal FIHS limited-access transportation corridors and to integrate ITS deployments along the corridors with a consistent systems engineering approach and phased implementation that can be used as the basis for design criteria.

Activities included in this phase of the project include:

- *ITS Legacy Catalog* – This technical memorandum documents existing physical and operational characteristics of the study corridors;

- *ITS Needs Model* – The needs, issues, problems, and objectives for additional ITS services are identified in *Technical Memorandum No. 2*. The technical memorandum also formulates a vision for ITS architectures and develops straw ITS corridor architectures;

- *ITS Solutions Model* – This develops logical and physical architectures, reviews ITS technologies, establishes performance measures, recommends statewide ITS standards, and develops a communications plan for ITS services along the corridor;

- *ITS Corridor Master Plans* – These technical memorandums document the concept of operations, business plans, and implementation strategies for the study corridors; and

- *ITS Stakeholder Participation Plan* – This technical memorandum documents stakeholder participation in the identification of corridor ITS needs, issues, problems, and objectives, and defines stakeholder influence in the development of implementation strategies.

PHASE II – ITS Plan: The purpose of this activity is to develop a statewide plan for the deployment of ITS along Florida's five principal FIHS limited-access transportation corridors to provide a phased comprehensive plan of needs and funding priorities.

Activities included in this phase of the project include:

- *Summary of Trends and Conditions* – This documentation identifies the existing trends and conditions that support the need for and justification of ITS corridor deployments;

- *Summary of Existing ITS-Related Activities, Programs, and Projects* – Documentation of all existing ITS-related activities underway on the study corridor will be provided;

- *Summary of Needs* – This information develops a comprehensive list of ITS needs for the study corridors and develops cost estimates for engineering, construction, operations, and maintenance;

- *Summary of Possible Funding Sources* – This will summarize potential state and federal funding sources for ITS projects;

- *ITS Strategic Deployment Prioritization and Criteria* – This technical memorandum develops criteria and methodology for the statewide prioritization of ITS corridor deployments and identifies a prioritized list of projects; and

- *ITS Plan* – The *ITS Plan* documents and recommends a cost-feasible implementation plan for the deployment of ITS on the five principal FIHS limited-access corridors.

This technical memorandum presents the *ITS Legacy Catalog* for Phase I.

2. Legacy Catalog

The interstate facilities selected as part of this concept report possess unique physical and operational characteristics that should be considered when developing an ITS corridor architecture. This legacy catalog will provide a "snapshot" of existing demographics, geometric characteristics, environmental features, and operational conditions along the study corridors and present a vision of the future physical and operational conditions. It will also address current intermodal and transportation issues, as well as document legacy and planned ITS services along these five principal FIHS limited-access corridors.

2.1 Regional Demographics

When analyzing the existing and future system and operational characteristics of the study corridors, it is important to understand the socioeconomic factors affecting travel demand in the counties the corridors traverse. The primary socioeconomic factors affecting travel demand are population, employment, and income growth. The growth of these socioeconomic factors is directly related to growth in intercity travel volumes along the five principal FIHS limited-access corridors.

Socioeconomic data were collected for the counties surrounding each corridor. For the purposes of this analysis, the study corridors were broken down to the five principal corridors identified as follows:

East-West –

- I-10 including I-110; and
- 1-4.

North-South –

- I-75 including I-275;
- I-95 including I-195, I-395, I-595, I-295, and SR 9A; and
- Florida's Turnpike mainline, including SR 869 (Sawgrass Expressway), SR 528 (Bee Line Expressway), and SR 417 (Central Florida Greeneway).

2.1.1 Population Growth

Table 2.1 identifies the existing population and the 2010 and 2020 forecasted populations surrounding each major corridor. The 1999 population was derived from the *2000 Unadjusted Census Data* and the forecasted population estimates were derived from the *2000 Florida Statistical Abstract*. As illustrated in Table 2.1, the I-10 and I-4 corridors are expected to experience the greatest increase in population with a 33 percent and 34 percent overall population growth, respectively, by the year 2020. I-75, I-95, and Florida's Turnpike corridors will experience an overall 25 to 28 percent population growth. However, these three corridors currently traverse longer distances and affect a greater amount of existing population (1999) at 8,331,128 people for I-75, 7,509,833 people for I-95, and 7,173,753 people for the Turnpike corridor.

The counties exhibiting the greatest amount of growth by the year 2020 along the I-10 corridor are Santa Rosa, Okaloosa, and Walton counties, all located in the western panhandle of the state. Along the I-4 corridor, the greatest increase in population is anticipated in Orange, Osceola, and Seminole counties, with a 41 percent, 56 percent, and 40 percent increase in population, respectively.

Along the I-75 corridor, the greatest amount of population growth by the year 2020 is expected in the southwest area of the state in Collier, Lee, and Charlotte counties and in the central areas of the state in Hernando, Sumter, and Marion counties. All of these counties exhibit a population growth rate of greater than 40 percent.

The I-95 corridor will experience much of its 2020 population growth in Brevard and St. Lucie counties with an approximate 40 percent increase in population, and in the Duval, Nassau, Clay, St. Johns, and Flagler county areas, with greater than a 50 percent increase in population.

And finally, the Turnpike corridor, similar to the other facilities, exhibits high 2020 population growth rates in the Orange, Osceola, and Seminole county areas, in St. Lucie County, and in the central portion of the state in Sumter and Lake Counties.

Table 2.1 – Population Growth

Population Growth Forecasts on the I-4 Corridor (2000 – 2020)			
County	**2000 Population**	**2010 Population**	**2020 Population**
Hillsborough County	998,948	1,124,000	1,270,800
Polk County	483,924	550,000	619,400
Orange County	896,344	1,061,600	1,264,400
Osceola County	172,493	215,200	270,500
Seminole County	365,196	436,100	513,000
Volusia County	443,343	496,100	562,000
I-4 Corridor	**3,360,248**	**3,883,000**	**4,500,100**

Population Growth Forecasts on the I-10 Corridor (2000 – 2020)			
County	**2000 Population**	**2010 Population**	**2020 Population**
Escambia County	294,410	338,100	372,000
Santa Rosa County	117,743	146,400	178,300
Okaloosa County	170,498	218,700	255,400
Walton County	40,601	53,700	66,200
Holmes County	18,564	21,500	23,900
Washington County	20,973	26,700	31,100
Jackson County	46,755	57,100	63,400
Gadsden County	45,087	61,100	70,200
Leon County	239,452	282,500	319,800
Jefferson County	12,902	16,600	18,600
Madison County	18,733	22,400	24,900
Suwannee County	34,844	43,000	51,000
Columbia County	56,513	71,000	83,600
Baker County	22,259	25,900	29,600
Duval County	778,879	863,100	956,100
I-10 Corridor	**1,918,213**	**2,247,800**	**2,544,100**

Table 2.1 (Continued)

Population Growth Forecasts on the I-75 Corridor (2000 – 2020)			
County	**2000 Population**	**2010 Population**	**2020 Population**
Miami-Dade County	2,253,362	2,384,800	2,623,900
Broward County	1,623,018	1,758,500	2,007,000
Collier County	251,377	297,800	372,500
Lee County	440,888	514,500	605,900
Charlotte County	141,627	170,400	201,900
Sarasota County	325,957	371,700	418,500
Manatee County	264,002	302,400	348,200
Hillsborough County	998,948	1,124,000	1,270,800
Pinellas County	921,482	955,900	1,009,400
Pasco County	344,765	381,900	434,000
Hernando County	130,802	161,700	194,200
Sumter County	53,345	69,200	86,500
Marion County	258,916	313,400	373,700
Alachua County	217,955	253,600	282,800
Columbia County	56,513	71,000	83,600
Suwannee County	34,844	43,000	51,000
Hamilton County	13,327	17,900	20,600
I-75 Corridor	**8,331,128**	**9,191,700**	**10,384,500**

Table 2.1 (Continued)

Population Growth Forecasts on the I-95 Corridor (2000 – 2020)			
County	**2000 Population**	**2010 Population**	**2020 Population**
Miami-Dade County	2,253,362	2,384,800	2,623,900
Broward County	1,623,018	1,758,500	2,007,000
Palm Beach County	1,131,184	1,253,000	1,449,500
Martin County	126,731	147,300	171,400
St. Lucie County	192,695	232,000	274,500
Indian River County	112,947	133,100	155,200
Brevard County	476,230	564,200	647,300
Volusia County	443,343	496,100	562,000
Flagler County	49,832	66,800	86,900
St. Johns County	123,135	148,700	181,600
Clay County	140,814	179,500	217,100
Duval County	778,879	863,100	956,100
Nassau County	57,663	73,000	88,200
I-95 Corridor	**7,509,833**	**8,300,100**	**9,420,700**

Table 2.1 (Continued)

Population Growth Forecasts on the Turnpike Corridor (2000 – 2020)			
County	**2000 Population**	**2010 Population**	**2020 Population**
Miami-Dade County	2,253,362	2,384,800	2,623,900
Broward County	1,623,018	1,758,500	2,007,000
Palm Beach County	1,131,184	1,253,000	1,449,500
Martin County	126,731	147,300	171,400
St. Lucie County	192,695	232,000	274,500
Indian River County	112,947	133,100	155,200
Okeechobee County	35,910	41,000	46,100
Osceola County	172,493	215,200	270,500
Orange County	896,344	1,061,600	1,264,400
Seminole County	365,196	436,100	513,000
Lake County	210,528	264,400	321,700
Sumter County	53,345	69,200	86,500
Turnpike Corridor	**7,173,753**	**7,996,200**	**9,183,700**

Source*: 2000 Florida Statistical Abstract*

2.1.2 Employment Growth

Table 2.2 illustrates the estimated employment growth along the five principal FIHS limited-access corridors. The primary source of employment data is the *2001 State Profile*, published by Woods and Poole Economics, in Washington, D.C. Employment growth typically reflects growth in population. However, in a few of the corridors, the employment growth rate exceeds the population growth rate, indicating that these areas are expected to draw employees from surrounding counties, thus increasing travel demand for commuter type trips in these areas. Additionally, some of the difference between the population and employment growth estimates may be attributed to different data sources.

The I-10 corridor 2020 employment growth is consistent with the population growth areas. The counties of Santa Rosa, Okaloosa, and Walton exhibit the greatest concentration of growth by 2020, where as the metropolitan areas of Tallahassee and Jacksonville increase at lower rates. The I-4 corridor is one of the corridors that will experience employment growth at a greater rate than population growth. The overall population growth along the corridor was estimated at 34 percent for the year 2020, where the employment growth along this corridor is expected to increase by 50 percent by the year 2020. The areas of employment growth along this corridor are centered in Orange, Osceola, and Seminole counties. The I–75 corridor exhibits a greater employment growth rate at 38 percent compared with a population growth rate of 25 percent by the year 2020. The greatest amount of employment growth along the corridor is estimated in the Hillsborough, Pinellas, Manatee, and Sarasota county areas, and in the southwest region in Collier and Lee counties.

The greatest concentration of employment growth along the I-95 corridor by the year 2020 is in Duval, St. Johns, and Clay counties. Martin County also has a high employment growth rate for 2020. Similar to the other facilities, the Turnpike's 2020 employment growth is centered around the larger metropolitan areas in Orange, Osceola, Okeechobee, and Seminole counties, as well as in Martin County.

Table 2.2 – Employment Growth

Employment Growth Forecasts on the I-4 Corridor (1999 – 2020)			
County	**1999 Employment**	**2010 Employment**	**2020 Employment**
Hillsborough County	699,310	855,920	1,001,560
Polk County	231,430	273,930	307,240
Orange County	710,660	924,520	1,132,080
Osceola County	62,530	87,120	106,940
Seminole County	179,490	252,450	311,720
Volusia County	176,840	208,730	234,600
I-4 Corridor	**2,060,260**	**2,602,670**	**3,094,140**

Employment Growth Forecasts on the I-10 Corridor (1999 – 2020)			
County	**1999 Employment**	**2010 Employment**	**2020 Employment**
Escambia County	169,860	197,730	223,820
Santa Rosa County	39,700	52,690	65,670
Okaloosa County	109,600	132,840	154,040
Walton County	14,990	20,340	24,980
Holmes County	5,520	6,400	7,230
Washington County	8,130	9,570	10,670
Jackson County	18,840	19,970	21,250
Gadsden County	17,290	18,700	20,160
Leon County	170,410	212,200	248,450
Jefferson County	4,440	4,750	5,040
Madison County	7,380	8,740	9,950
Suwannee County	14,880	17,410	19,460
Columbia County	23,410	27,560	31,560
Baker County	7,200	8,670	10,110
Duval County	560,480	653,010	738,550
I-10 Corridor	**1,172,130**	**1,390,580**	**1,590,940**

Table 2.2 (Continued)

Employment Growth Forecasts on the I-75 Corridor (1999 – 2020)			
County	**1999 Employment**	**2010 Employment**	**2020 Employment**
Miami-Dade County	1,230,650	1,406,900	1,551,060
Broward County	820,820	1,030,120	1,191,150
Collier County	132,350	176,320	212,160
Lee County	211,820	267,570	320,400
Charlotte County	52,570	72,210	87,590
Sarasota County	181,810	222,300	259,870
Manatee County	152,690	207,810	257,720
Hillsborough County	699,310	855,920	1,001,560
Pinellas County	541,800	618,310	676,700
Pasco County	100,650	128,620	154,660
Hernando County	39,490	51,500	62,920
Sumter County	12,090	14,630	16,690
Marion County	110,500	135,090	150,870
Alachua County	139,560	159,210	179,660
Columbia County	23,410	27,560	31,560
Suwannee County	14,880	17,410	19,460
Hamilton County	5,080	5,710	6,370
I-75 Corridor	**4,469,480**	**5,397,190**	**6,180,400**

Table 2.2 (Continued)

Employment Growth Forecasts on the I-95 Corridor (1999 – 2020)			
County	**1999 Employment**	**2010 Employment**	**2020 Employment**
Miami-Dade County	1,230,650	1,406,900	1,551,060
Broward County	820,820	1,030,120	1,191,150
Palm Beach County	612,660	783,440	929,560
Martin County	66,420	86,730	104,950
St. Lucie County	69,680	81,960	91,070
Indian River County	57,000	69,570	79,610
Brevard County	234,060	265,530	289,310
Volusia County	176,840	208,730	234,600
Flagler County	14,260	18,000	20,140
St. Johns County	50,570	65,560	82,410
Clay County	49,300	65,520	83,660
Duval County	560,480	653,010	738,550
Nassau County	21,790	26,790	32,020
I-95 Corridor	**3,966,529**	**4,763,870**	**5,430,110**

Table 2.2 (Continued)

Employment Growth Forecasts on Florida's Turnpike Corridor (1999 – 2020)			
County	**1999 Employment**	**2010 Employment**	**2020 Employment**
Miami-Dade County	1,230,650	1,406,900	1,551,060
Broward County	820,820	1,030,120	1,191,150
Palm Beach County	612,660	783,440	929,560
Martin County	66,420	86,730	104,950
St. Lucie County	69,680	81,960	91,070
Indian River County	57,000	69,570	79,610
Okeechobee County	13,930	18,200	21,930
Osceola County	62,530	87,120	106,940
Orange County	710,660	924,520	1,132,080
Seminole County	179,490	252,450	311,720
Lake County	84,420	103,400	116,750
Sumter County	12,090	14,630	16,690
Turnpike Corridor	**3,920,350**	**4,859,040**	**5,653,510**

Source: 2001 State Profile

2.1.3 Income Growth

The real per capita income is a measure of the average resident's standard of living and is one of the key variables influencing the amount and frequency of discretionary and recreational travel. Table 2.3 displays the projected growth in real per capita income shown in constant 1996 dollars for the counties along the study corridors. The income growth rates along the corridors are relatively similar to each other; however, when compared to the employment growth rates, they can yield quite different results.

Along the I-10 corridor, the per capita income growth rates for 2020 are higher in Escambia, Okaloosa, and Walton counties; however, Santa Rosa County does not reflect the same 2020 income growth rates. Additionally, rural counties, such as Holmes and Washington counties, where employment growth is not expected to be as significant, have higher 2020 income growth rates. With the exception of Volusia County, the I-4 corridor exhibits income growth rates consistent with employment forecasts. Volusia County's forecasted employment growth was 33 percent for the year 2020, but it has one of the highest per capita income growth rates along the corridor.

The I-75 corridor is anticipated to have high income growth rates by 2020 in the Sarasota and Manatee counties, which is coincidental with the 2020 employment growth. However, in the areas of Lee and Collier counties, which exhibited high 2020 employment forecasts, the income per capita will not increase at the same rate. Additionally, Sumter County, which showed a marginal employment growth rate, has a high income growth rate for 2020.

Along the I-95 corridor, the counties along the central-east coast of the state, including Brevard, Indian River, and Martin, will experience a higher 2020 income growth rate than the remainder of the corridor, which is inconsistent with the employment growth forecasts, except for Martin County. This inconsistency may be due to a greater amount of retirement income versus new employment income in these counties.

For the Turnpike corridor, Okeechobee County exhibits the greatest income growth along the corridor, consistent with a high employment growth rate for 2020. A similar situation occurs with Martin County; however, Sumter County, which exhibits lower employment growth for 2020, has a higher per capita income growth rate.

Based on the data presented, a trend emerges that indicates greater employment forecasts in the larger metropolitan areas creating a greater travel demand for commuter-type trips. In many of the rural and smaller coastal communities, a higher per capita income is forecasted, creating more of a demand for recreational and social-type trips along the study corridors.

Table 2.3 – Real Per Capita Income Growth

Real Per Capita Income Growth Forecasts on the I-4 Corridor (1999 – 2020)				
County	**1999 Income (1996 $)**	**2010 Income (1996 $)**	**2020 Income (1996 $)**	**Annual Growth Rate**
Hillsborough County	$25,977	$30,190	$34,067	1.48%
Polk County	$24,994	$25,965	$29,389	0.83%
Orange County	$25,892	$30,022	$33,958	1.48%
Osceola County	$19,396	$22,160	$24,709	1.30%
Seminole County	$28,322	$32,832	$37,126	1.48%
Volusia County	$21,685	$25,079	$28,361	1.46%

Real Per Capital Income Growth Forecasts on the I-10 Corridor (1999 – 2020)				
County	**1999 Income (1996 $)**	**2010 Income (1996 $)**	**2020 Income (1996 $)**	**Annual Growth Rate**
Escambia County	$21,588	$25,195	$28,833	1.57%
Santa Rosa County	$22,201	$23,759	$26,233	0.85%
Okaloosa County	$24,354	$28,332	$32,161	1.52%
Walton County	$16,721	$19,171	$21,803	1.43%
Holmes County	$14,773	$17,169	$19,634	1.57%
Washington County	$15,923	$18,607	$21,026	1.52%
Jackson County	$17,354	$18,964	$20,816	0.95%
Gadsden County	$16,965	$18,966	$21,108	1.14%
Leon County	$26,393	$30,293	$33,665	1.04%
Jefferson County	$18,953	$20,369	$21,882	0.70%
Madison County	$15,752	$18,284	$20,752	1.52%
Suwannee County	$18,302	$20,500	$22,478	1.09%
Columbia County	$18,675	$20,732	$22,804	1.04%
Baker County	$17,876	$19,581	$21,444	0.95%
Duval County	$26,429	$30,026	$33,279	1.23%

Table 2.3 (Continued)

Real Per Capita Income Growth Forecasts on the I-75 Corridor (1999 – 2020)				
County	**1999 Income (1996 $)**	**2010 Income (1996 $)**	**2020 Income (1996 $)**	**Annual Growth Rate**
Miami-Dade County	$23,618	$27,270	$30,660	1.42%
Broward County	$28,331	$33,358	$37,576	1.55%
Collier County	$42,011	$50,296	$58,021	1.81%
Lee County	$27,346	$31,696	$35,836	1.48%
Charlotte County	$23,499	$27,234	$30,786	1.47%
Sarasota County	$36,923	$45,517	$54,173	2.22%
Manatee County	$30,318	$37,484	$44,376	2.20%
Hillsborough County	$25,977	$30,190	$34,067	1.48%
Pinellas County	$30,456	$35,835	$40,429	1.56%
Pasco County	$22,459	$26,296	$30,014	1.60%
Hernando County	$21,401	$24,735	$28,228	1.52%
Sumter County	$16,393	$19,891	$23,290	2.00%
Marion County	$21,306	$24,760	$28,062	1.51%
Alachua County	$24,365	$27,913	$31,231	1.34%
Columbia County	$18,675	$20,732	$22,804	1.05%
Suwannee County	$18,302	$20,500	$22,478	1.08%
Hamilton County	$13,964	$15,416	$16,901	1.00%

Table 2.3 (Continued)

Real Per Capita Income Growth Forecasts on the I-95 Corridor (1999 – 2020)				
County	**1999 Income (1996 $)**	**2010 Income (1996 $)**	**2020 Income (1996 $)**	**Annual Growth Rate**
Miami-Dade County	$23,618	$27,270	$30,660	1.42%
Broward County	$28,331	$33,358	$37,576	1.55%
Palm Beach County	$39,841	$45,604	$51,328	1.37%
Martin County	$39,854	$46,491	$53,051	1.57%
St. Lucie County	$21,185	$24,058	$26,903	1.28%
Indian River County	$36,195	$42,149	$47,841	1.53%
Brevard County	$23,509	$27,515	$31,256	1.57%
Volusia County	$21,685	$25,142	$28,436	1.48%
Flagler County	$21,182	$24,533	$27,720	1.47%
St. Johns County	$36,293	$37,943	$41,266	0.65%
Clay County	$23,231	$25,951	$29,660	1.31%
Duval County	$26,429	$30,026	$33,279	1.23%
Nassau County	$25,253	$25,877	$27,442	0.41%

Table 2.3 (Continued)

Real Per Capita Income Growth Forecasts on Florida's Turnpike Corridor (1999 – 2020)				
County	**1999 Income (1996 $)**	**2010 Income (1996 $)**	**2020 Income (1996 $)**	**Annual Growth Rate**
Miami-Dade County	$23,618	$27,270	$30,660	1.42%
Broward County	$28,331	$33,358	$37,576	1.55%
Palm Beach County	$39,841	$45,604	$51,328	1.37%
Martin County	$39,854	$46,491	$53,051	1.57%
St. Lucie County	$21,185	$24,058	$26,903	1.28%
Indian River County	$36,195	$42,149	$47,841	1.53%
Okeechobee County	$18,336	$22,619	$26,679	2.16%
Osceola County	$19,396	$22,160	$24,709	1.30%
Orange County	$25,892	$30,022	$33,958	1.48%
Seminole County	$28,322	$32,832	$37,126	1.48%
Lake County	$22,019	$25,573	$28,966	1.50%
Sumter County	$16,393	$19,891	$23,290	2.00%

Source*: 2001 Woods & Poole Economics, Inc.*

2.2 System Geometric Characteristics

Before developing an ITS framework, it is necessary to understand the existing and future geometric features of the study roadway network facilities. This section will provide an overview of the existing area types, lane configurations and interchanges, and discuss the issues associated with each geometric component. Additionally, this section will present the future, programmed, and planned geometrical improvements for coordination with future ITS deployments.

2.2.1 Area Types

One of the more important characteristics affecting travel demand, roadway performance, and ITS deployment technologies is the area type of a facility. Figure 2.1 illustrates the corridor area types.

The following summarizes how segments were classified in this technical memorandum. The division of area types was simplified for the purposes of ITS-related applications and needs.

Metropolitan Areas – Metropolitan areas include urbanized areas and transitioning areas.

Urbanized areas are the 1990 urbanized areas designated by the United States Bureau of Census as well as the surrounding geographical areas as agreed upon by FDOT, the MPOs, and the FHWA, commonly called the FHWA urbanized area boundaries. The over or under 500,000 classifications distinguish urbanized areas with a population over or under 500,000 based on the 1990 United States' Census.

Transitioning urbanized areas are the areas outside urbanized areas, but within the MPO planning boundaries. These areas are planned to be included within the urbanized areas within the next 20 years.

Urban Areas – Urban areas include urban places and communities.

Urban areas are places with a population of at least 5,000 and are not included in urbanized areas. The applicable boundary encompasses the 1990 urban area as well as the surrounding geographical area as agreed upon by FDOT, local governments, and the FHWA. The boundaries are commonly called FHWA urban area boundaries and include areas expected to have medium density development before the next decennial census.

Communities are incorporated places outside urban and urbanized areas, or unincorporated developed areas having a population of 500 or more identified by local governments in their local government comprehensive plans and located outside of urban or urbanized areas.

Rural Areas – Rural areas are areas not included in a transportation concurrency management area, an urbanized area, a transitioning urbanized area, an urban area, or a community.

As illustrated in Figure 2.1, the majority of I-10 is rural with small urban segments located in Pensacola, Crestview, DeFuniak Springs, and Tallahassee. A larger segment of the facility is classified as metropolitan as it traverses the Jacksonville/Duval County area. The entire length of I-110 falls within the urbanized area of Pensacola.

Almost the entire I-4 corridor is considered to lie within metropolitan and urban areas with a few rural segments in the eastern Hillsborough County and Polk County areas, and along the northern most portion of I-4 as it approaches I-95.

The I-75 corridor is primarily rural but varies as it traverses the large metropolitan areas in Miami-Dade, Broward, Sarasota, Manatee, and Hillsborough counties. It becomes urban as it traverses the small urban areas located in the southwest and central portion of the state.

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.

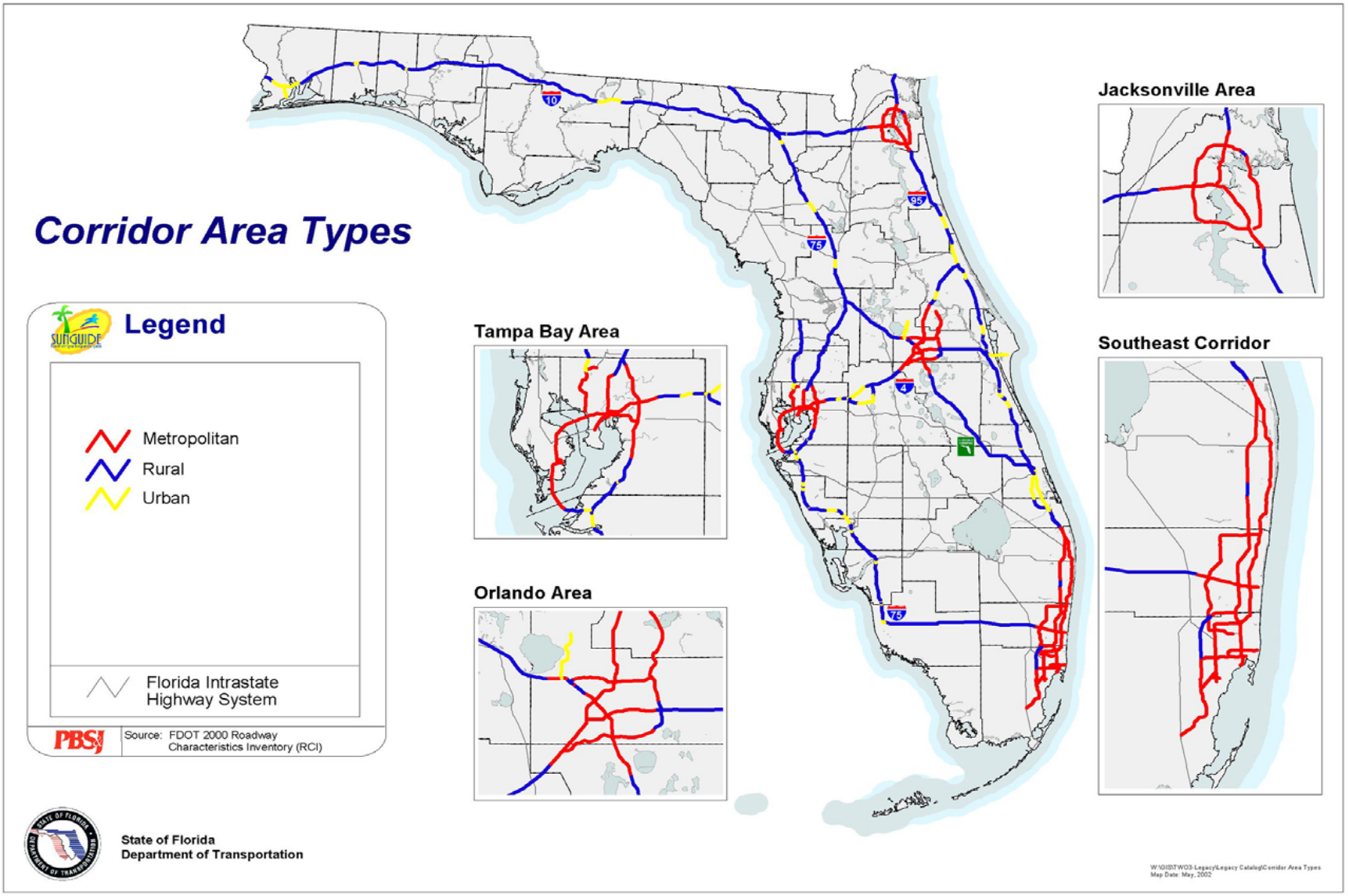
The Turnpike facilities vary in area type classifications. The Turnpike's mainline is primarily a metropolitan facility in the southeastern portion of the state. As it enters Martin and St. Lucie counties, it changes to an urban facility. From there, as the facility turns west towards the center of the state, the mainline becomes rural until it traverses the Orlando area, where it is classified as metropolitan. As it travels northward towards I-75, it becomes rural once again. SR 869 (Sawgrass Expressway), SR 528 (Bee Line Expressway), and SR 417 (Central Florida Greeneway) are all metropolitan facilities.

As the population continues to grow around the state, the rural portions of the facilities will become more urbanized and the metropolitan areas will encroach into the rural areas. With the population and employment growth and area type changes, two basic types of growth will surround the corridors:

- Suburban expansion from the large metropolitan and urban centers; and
- Development surrounding the corridor interchanges.

Congestion has become commonplace as suburban growth moves further outward from the urban cores into the rural areas. Due to financial and physical constraints, many local city and county governments cannot build adequate transportation facilities or arterial roads to accommodate the growth; therefore, commuters are often reliant upon the interstate and Turnpike facilities as convenient routes to commute into the urban cores. If facilities are constructed to accommodate the suburban growth, the capacity of the facility is short-lived as growth is continually expanding along the new corridors.

Figure 2.1 – Corridor Area Types



Additionally, as development occurs along the interchanges, more traffic is generated by these developments, adding trips on an already congested intrastate facility. To aid in remedying these on-going mobility problems, ITS measures can assist in improving the flow of traffic along these facilities. ITS coupled with increased transit usage, freeway, or arterial high occupancy vehicle (HOV) lanes, and/or bus lanes can assist in alleviating congestion problems and improve travel times for intrastate travelers.

2.2.2 Existing Lanes and Interchanges

Other important characteristics that affect the operation of a facility are the number of general travel lanes and the density of interchanges. While most of the study corridors are currently four-lane facilities, several roadways meet the FDOT maximum lane policy for single occupancy vehicles on FIHS interstates and highways at six general-use lanes (GULs). Additional HOV or auxiliary lanes can be added.

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. In Escambia County, I-110 has only four lanes along its entire corridor.

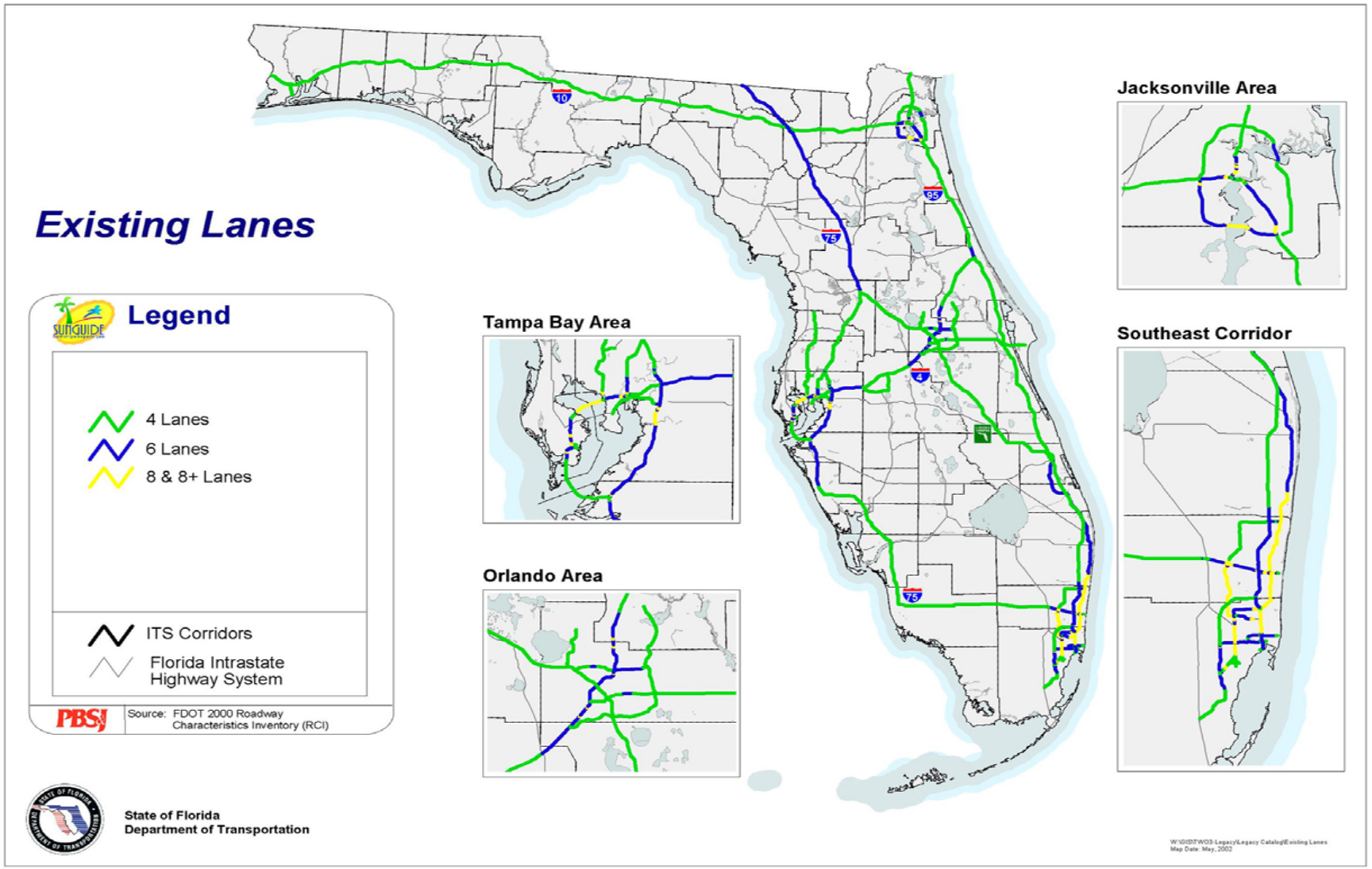
I-4 consists mainly of four GULs. Sections in Hillsborough, Polk, Orange, Seminole, and Osceola counties have six or more lanes.

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 four lanes. I-275 is primarily four to six lanes with some segments having eight lanes.

Similar to the other major interstate facilities, I-95 consists mainly of four-lane segments in rural areas, but expands 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 four-lane facility, with one small six-lane section. Both I-395 and I-195 consist of six lanes.

All Turnpike facilities in this study are comprised of four lanes. Figure 2.2 illustrates the number of existing lanes.

Figure 2.2 – Existing Lanes



2.2.3 Interchange Density

Another key component of the system data is the location of the interchanges along the study area. Due to complex weaving and merging patterns created by exiting and entering traffic, areas near interchanges tend to generate a large number of vehicle crashes, especially in urban sections with a high density of interchanges. Currently, there are more than 518 interchanges on the study network. I-10 and I-75 are both long rural interstates with a low overall interchange density. The highest density of interchanges along the corridors occurs in Duval County, which has approximately one interchange every two miles along I-10, and Hillsborough County, which has about one interchange every four miles along I-75.

Several corridors with high interchange densities are the urban facilities such as I-275, I-395, I-195, and SR 9A. Each of these roadways has an interchange density of less than two miles per interchange. I-4 also has a somewhat high density of 2.2 miles per interchange. Its highest interchange densities are located within the urban areas of Hillsborough and Orange counties.

I-95 has the greatest density of interchanges, which is not surprising considering the extent of urbanized areas along the corridor. The urban areas in Miami-Dade, Duval, Broward, and Palm Beach counties' contain a major portion of I-95's interchanges. I-95 in Miami-Dade County exhibits the greatest interchange density in the state, averaging over a half-mile per interchange.

All Turnpike facilities contained within the study network have very low densities. Access locations along these facilities are strictly regulated to minimize potential delays and congestion. Table 2.4 identifies the length and number of interchanges located on the study corridors and Figure 2.3 illustrates the interchange locations.

Table 2.4 – Existing Interchanges

I-10	Length	Interchanges
Baker	25.46	5
Columbia	20.69	3
Duval	21.67	10
Escambia	16.51	6
Gadsden	33.63	4
Holmes	21.22	2
Jackson	33.17	5
Jefferson	19.48	3
Leon	22.23	4
Madison	32.96	4
Nassau	0.71	0
Okaloosa	24.56	2
Santa Rosa	25.92	4
Suwannee	25.52	3
Walton	27.50	2
Washington	23.96	2
Total	**362.68**	**59**

I-110	Length	Interchanges
Escambia	**6.94**	**6**

I-4	Length	Interchanges
Hillsborough	25.59	14
Orange	24.67	22
Osceola	7.89	4
Polk	32.02	10
Seminole	14.14	5
Volusia	28.02	7
Total	**135.21**	**62**

Table 2.4 (Continued)

I-75	Length	Interchanges
Alachua	35.19	7
Broward	45.41	10
Charlotte	22.01	5
Collier	63.50	4
Columbia	30.45	4
Miami-Dade	5.44	3
Hamilton	28.75	3
Hernando	11.47	1
Hillsborough	39.87	12
Lee	34.14	9
Manatee	20.57	7
Marion	38.28	6
Pasco	20.39	3
Sarasota	42.62	9
Sumter	29.00	5
Suwannee	3.66	1
Total	**470.86**	**89**

I-275	Length	Interchanges
Hillsborough	23.27	17
Manatee	5.33	2
Pinellas	24.49	17
Total	**60.70**	**36**

SR 91 (Turnpike)	Length	Interchanges
Broward	25.97	12
Miami-Dade*	43.85	21
Indian River	17.33	0
Lake	23.79	1
Martin	20.29	1
Okeechobee	7.15	0
Orange	24.91	5
Osceola	58.64	3
Palm Beach	44.53	7
St. Lucie	34.97	2
Sumter	10.75	2
Total	**264.48**	**54**

* Including the HEFT

Table 2.4 (Continued)

SR 528 (Bee Line Expressway)	Length	Interchanges
Orange	35.74	14
Brevard	12.96	3
Total	**8.38**	**17**

SR 869 (Sawgrass Expressway)	Length	Interchanges
Broward	**23.81**	**11**

SR 417 (Central Florida Greeneway)	Length	Interchanges
Orange	33.71	12
Osceola	2.91	3
Seminole	12.19	0
Total	**5.10**	**15**

I-95	Length	Interchanges
Brevard	72.69	13
Broward	25.29	18
Miami-Dade	13.67	20
Duval	37.10	32
Flagler	18.73	1
Indian River	19.20	2
Martin	24.97	3
Nassau	12.23	2
Palm Beach	46.02	22
St. Johns	34.86	5
St. Lucie	27.26	5
Volusia	45.80	8
Total	**382.07**	**132**

I-595	Length	Interchanges
Broward	12.86	12

I-195	Length	Interchanges
Miami-Dade	4.42	4

I-395	Length	Interchanges
Miami-Dade	1.29	3

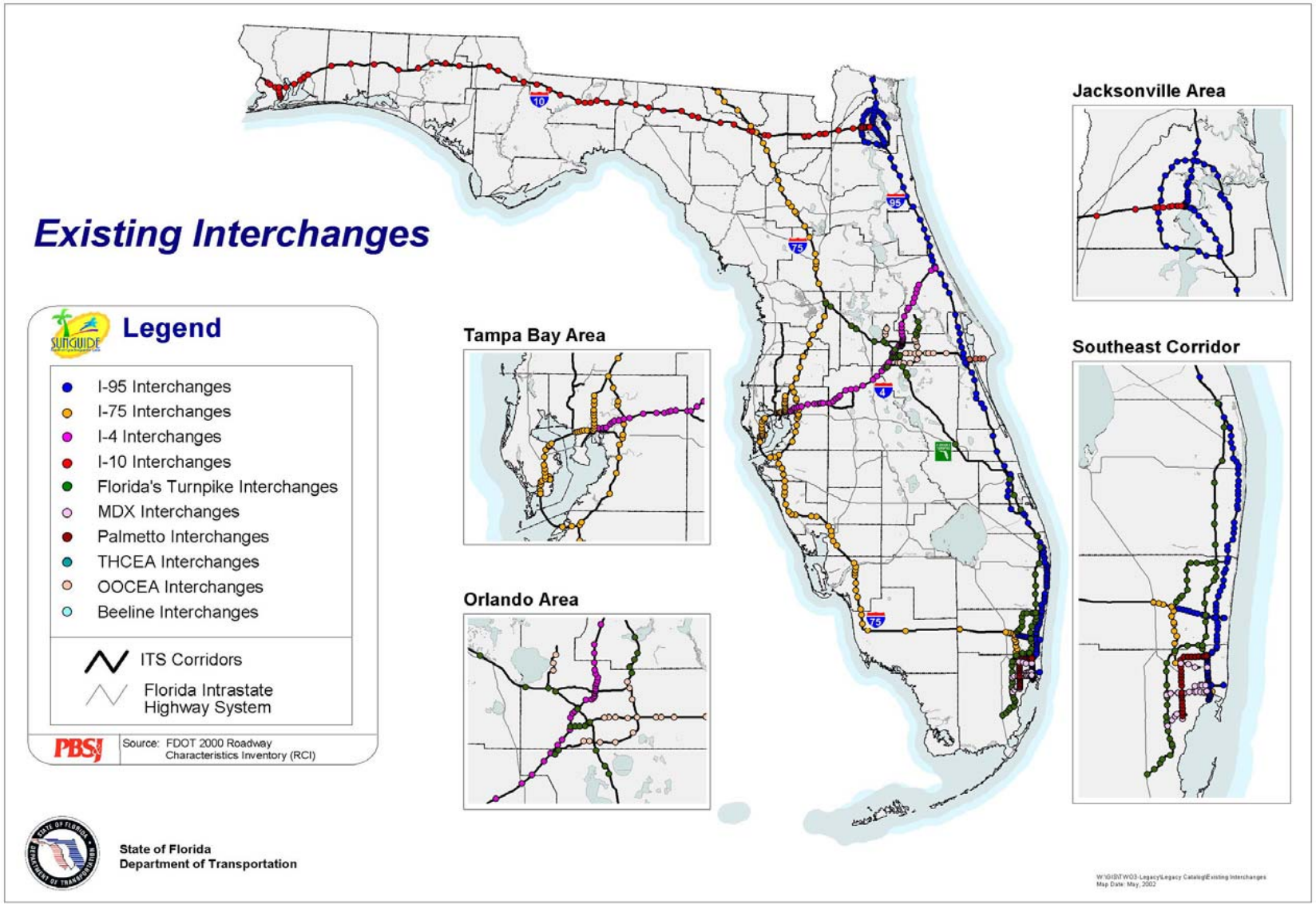
Table 2.4 (Continued)

I-295	Length	Interchanges
Duval	35.51	14

SR 9A	Length	Interchanges
Duval	13.39	9

Source: FDOT's Transportation Statistics (TranStat) Office

Figure 2.3 – Existing Interchanges



2.2.4 Programmed, Planned, and 2025 FIHS Cost-Feasible Plan Capacity Improvement Projects

It is important to identify the programmed, planned, and cost-feasible plan improvements (construction only) so 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 2.4 through 2.6 illustrate the programmed, planned and 2025 cost-feasible improvements for the corridors in each FDOT district.

Programmed projects are identified as capacity projects that are programmed in FDOT's Adopted Five-Year Work Program (FY 01/02 to 05/06). These projects are short-term (construction only) projects that have been identified as priorities by the MPOs and/or FDOT and typically cannot be modified, as the project is nearing completion of the production process.

Planned projects (construction only) are those contained in the second five years of FDOT's *Ten-Year FIHS Cost-Feasible Plan*. These projects typically represent priorities for inclusion in the next cycle of the work program adoption. The *Ten-Year FIHS Cost-Feasible Plan* addresses state-managed funds only and is not adopted by any state or local agencies. Projects may or may not be modified prior to inclusion in the Adopted Five-Year Work Program.

2025 FIHS Cost-Feasible Plan projects are those construction projects that have not been included in the Adopted Five-Year Work Program or the *Ten-Year FIHS Cost-Feasible Plan*. They represent a statewide-managed program of improvement priorities for the FIHS. These projects are not funded but have been identified as cost-feasible based on long-term revenue estimates. These projects also represent a prioritized list of projects for inclusion in the next development cycle of the *Ten-Year FIHS Cost-Feasible Plan*. These projects may or may not be modified prior to inclusion in the *Ten-Year FIHS Cost-Feasible Plan* or the Adopted Five-Year Work Program.

As identified in the programmed, planned, and cost-feasible plan improvement maps for each corridor, the I-10 corridor has only a few interchange modification projects identified as programmed. A short segment of roadway widening is also identified in the Tallahassee area. A few additional ITS projects and roadway widening projects are identified in the cost-feasible plan for the Pensacola, Tallahassee, and Jacksonville areas; however, no improvements are identified in the ten-year plan for the I-10 or I-110 corridor.

The programmed, planned, and cost-feasible plan maps also identify several programmed and cost-feasible plan improvements for the I-4 corridor, with very few planned projects. Several roadway widening and interchange projects for the corridor are included in the programmed improvements. A section of I-4 in Polk County is scheduled for widening from four to six lanes, in addition to a portion of I-4 located in the northern Seminole and southern Volusia county areas. Included in the cost-feasible plan is an ITS project located along the Polk County portion of I-4 and more roadway widening projects are identified in the northern Volusia County area as the corridor approaches I-95.

Figure 2.4 – Programmed Capacity Improvements

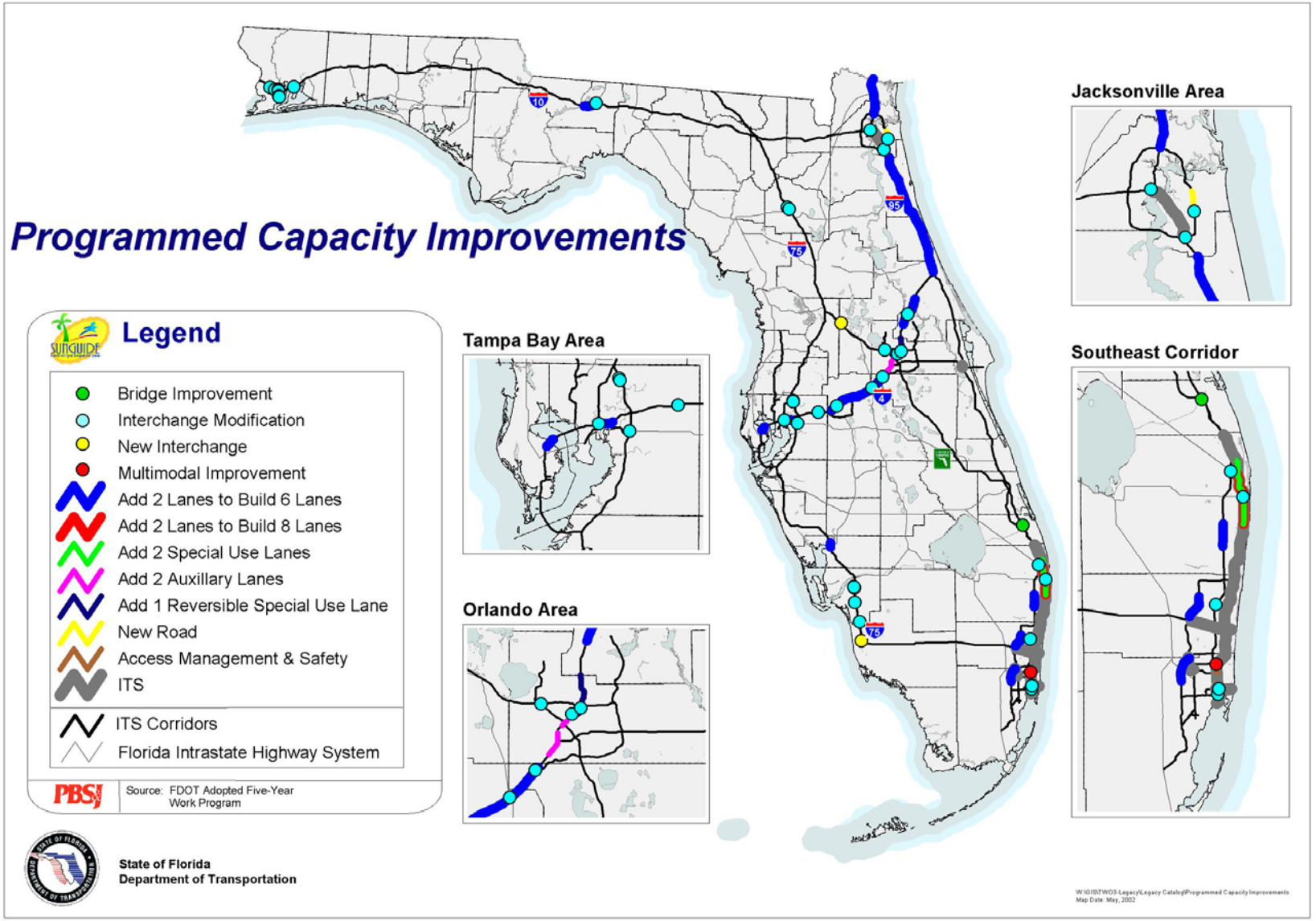


Figure 2.5 – Planned Capacity Improvements

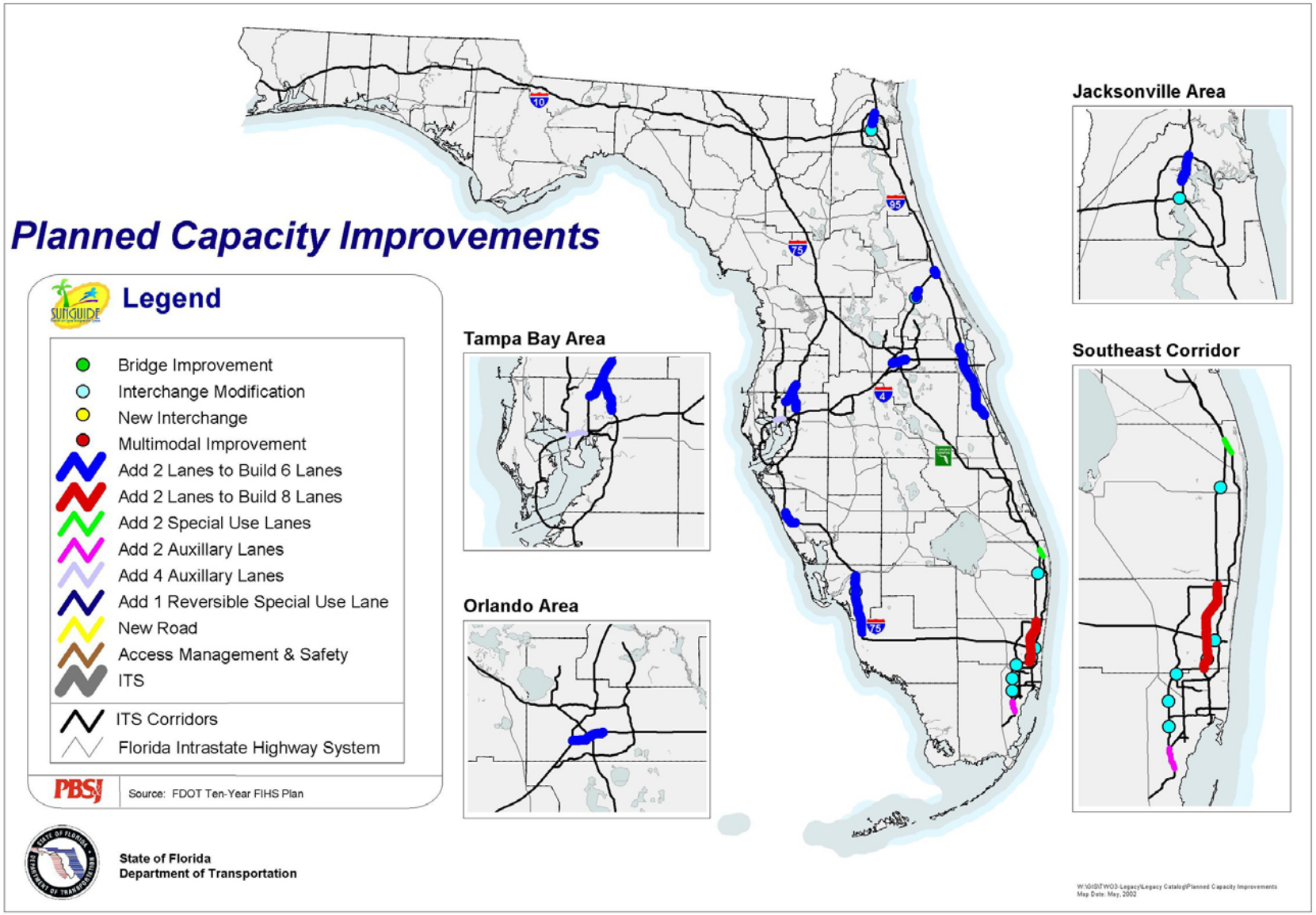
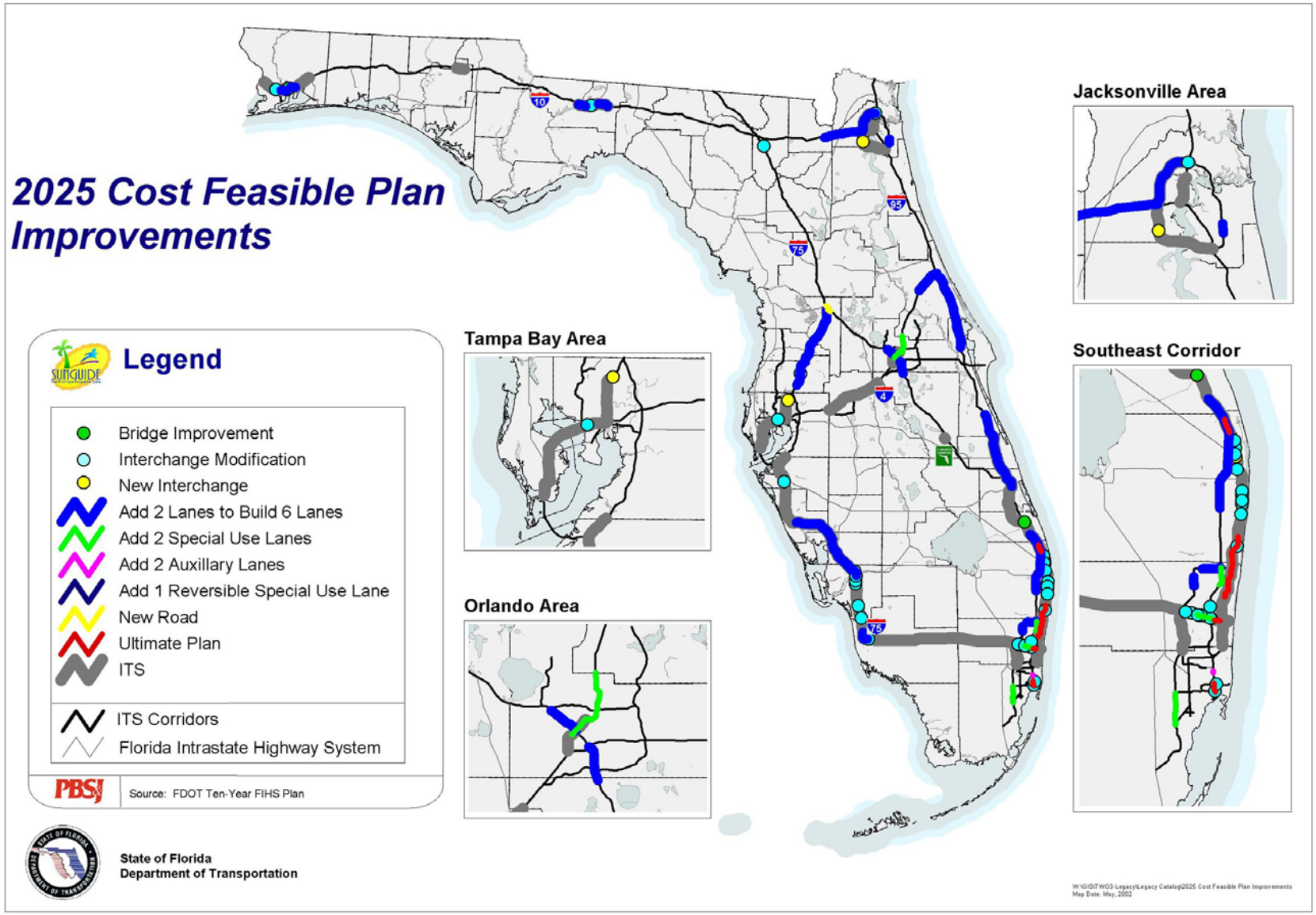


Figure 2.6 – *2025 FIHS Cost-Feasible Plan* Improvements



Along the I-75 corridor, several interchange modifications are programmed along the southwest portion of the corridor and in the Tampa and Gainesville areas. A significant portion of the interstate in Lee and Collier counties is planned for expansion from four to six lanes and similar expansion is planned for sections in Sarasota, northern Hillsborough, and southern Pasco counties. As identified in the cost-feasible plan improvement map, a large portion of the corridor from southern Pasco County to the Turnpike is planned for widening from four to six lanes. Similarly, the portion of I-75 from northern Lee County to Sarasota County is planned for widening and several interchange modifications are identified. Additionally, ITS incident management improvements are slated for a significant portion of the corridor from the Hillsborough/Manatee County line to the Collier/Broward County line. I-275 has a four to six-lane improvement programmed and ITS improvements for the facility are identified in the *2025 FIHS Cost-Feasible Plan*.

Several ITS projects are programmed along the I-95 corridor in the southeast portion of the state, in addition to several multi-modal and interchange modifications. Much of the corridor is programmed for widening from four to six lanes in the segment from north of I-4 in Volusia County to the Duval County line. Additionally, in the Jacksonville area, roadway widening is programmed for the I-95 corridor from north of SR 9A to Georgia's state line. An ITS project is programmed along the corridor from I-10 southward to I-295. As identified in the planned improvements, several interchange modifications are planned along the corridor. The cost-feasible plan illustrates a significant portion of the corridor slated for ITS improvements from the Miami-Dade County line to St. Lucie County. Several interchange modifications are also planned along the same segment from St. Lucie County to I-4. A large portion of the I-95 facility is planned for widening from four to six lanes.

No programmed or planned improvements are identified for I-295; however, in the cost-feasible plan, an ITS project and a new interchange are planned. A widening project from four to six lanes is also identified on I-295 from I-10 to I-95 north. ITS improvements are programmed along I-195, I-395, and I-595, and several interchange modifications are identified in the cost-feasible plan for I-595 in Broward County.

Along the Turnpike's mainline, several interchange modifications and small widening projects have been programmed in the southeast portion of the facility, and in the northwest portion a new interchange is programmed. A roadway-widening project for the entire extent of the Turnpike in Broward County is planned and the cost-feasible plan improvements reveal roadway-widening projects in the Palm Beach, Martin, and St. Lucie county areas and for small portions of the facility in the Orlando area. On both the Homestead Extension of Florida's Turnpike (HEFT) and the Sawgrass Expressway, roadway-widening projects from four to six lanes are programmed. Several interchange modification projects and auxiliary lane projects are planned for the HEFT and continuous expansion of the Sawgrass toll facility is planned in the *2025 FIHS Cost-Feasible Plan*. No programmed projects are identified for the Bee Line Expressway or Central Florida Greeneway; however, a roadway-widening project is planned in the *Ten-Year FIHS Cost-Feasible Plan* for the Bee Line Expressway.

These construction projects and their associated production phases will be considered when identifying ITS needs, developing ITS priorities, and establishing an implementation schedule for future ITS deployments.

2.3 Existing and Future Travel Demand

The existing travel demand was based on performance measure data for the year 2000 obtained from the Roadway Characteristics Inventory (RCI) provided by FDOT's Transportation Statistics Office (TranStat). Travel demand was also analyzed for the forecast years 2010 and 2020. The forecasted demand data was derived from the 2000 Decision Support System (DSS) program based on the FIHS RCI database.

2.3.1 Annual Average Daily Traffic (AADT)

Figures 2.7 through 2.9 depict the annual average daily traffic (AADT) volumes for the roadways within the study corridors for the base year 2000 and the forecasted years 2010 and 2020, respectively. Table 2.5 summarizes the AADT volumes for the study corridors by county for each of the analysis years.

Based on year 2000 statistics, the I-10 corridor has an AADT of 24,782 vehicles per day (vpd). The average traffic volumes for the years 2010 and 2020 are 35,438 vpd and 49,929 vpd. This is a forecasted 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. Their respective traffic volumes may more than double by the year 2020. The remainder of the I-10 corridor will see small but steady annual increases in travel demand.

The I-4 corridor has an AADT of 91,013 vpd 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. The largest projected area of growth for the corridor is the Orlando/Orange County area. Travel demand is expected to more than double by the year 2020 to 310,284 vpd. Seminole County also is 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 levels of service (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.

Figure 2.7 – Existing 2000 AADT

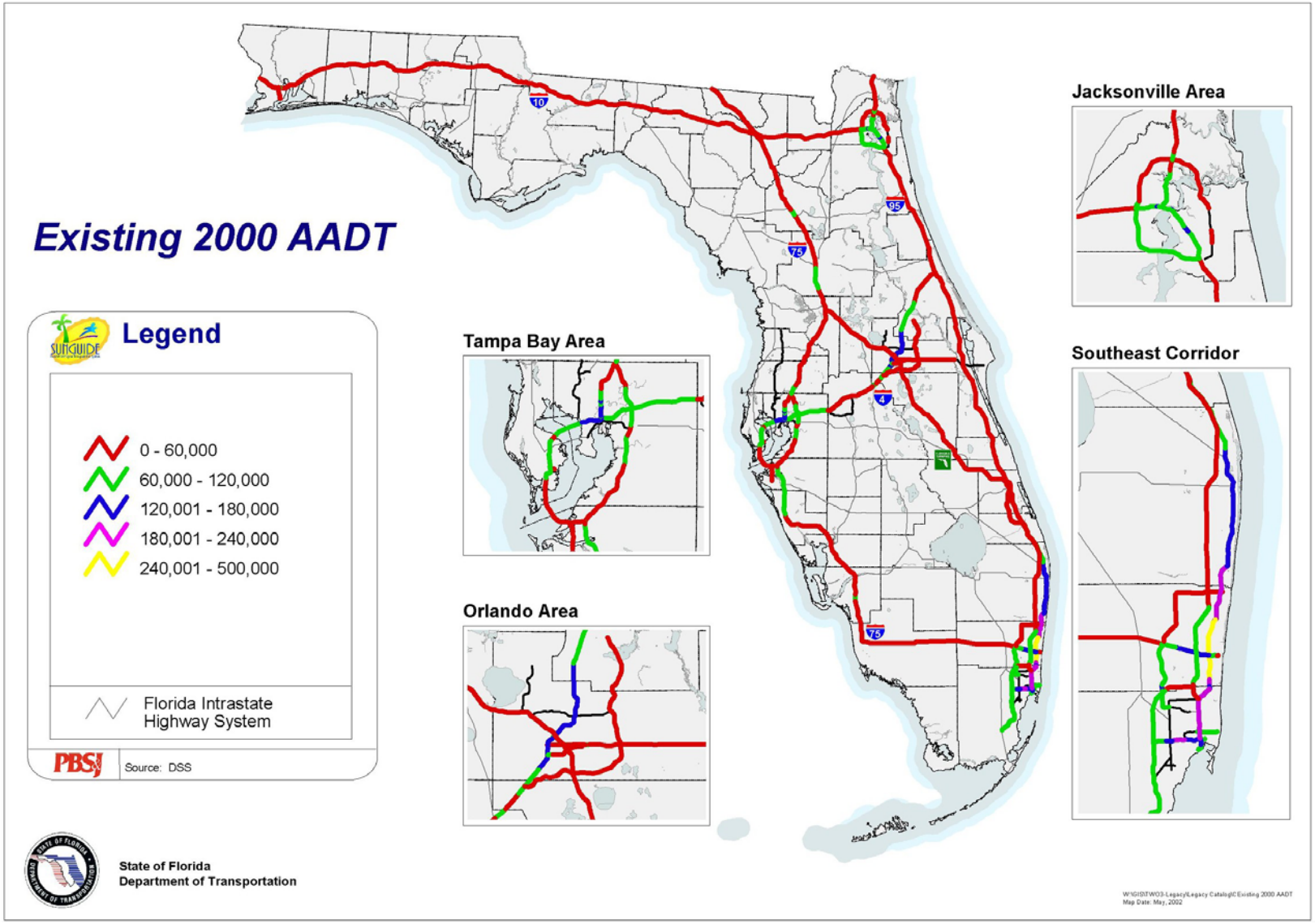


Figure 2.8 – Projected 2010 AADT

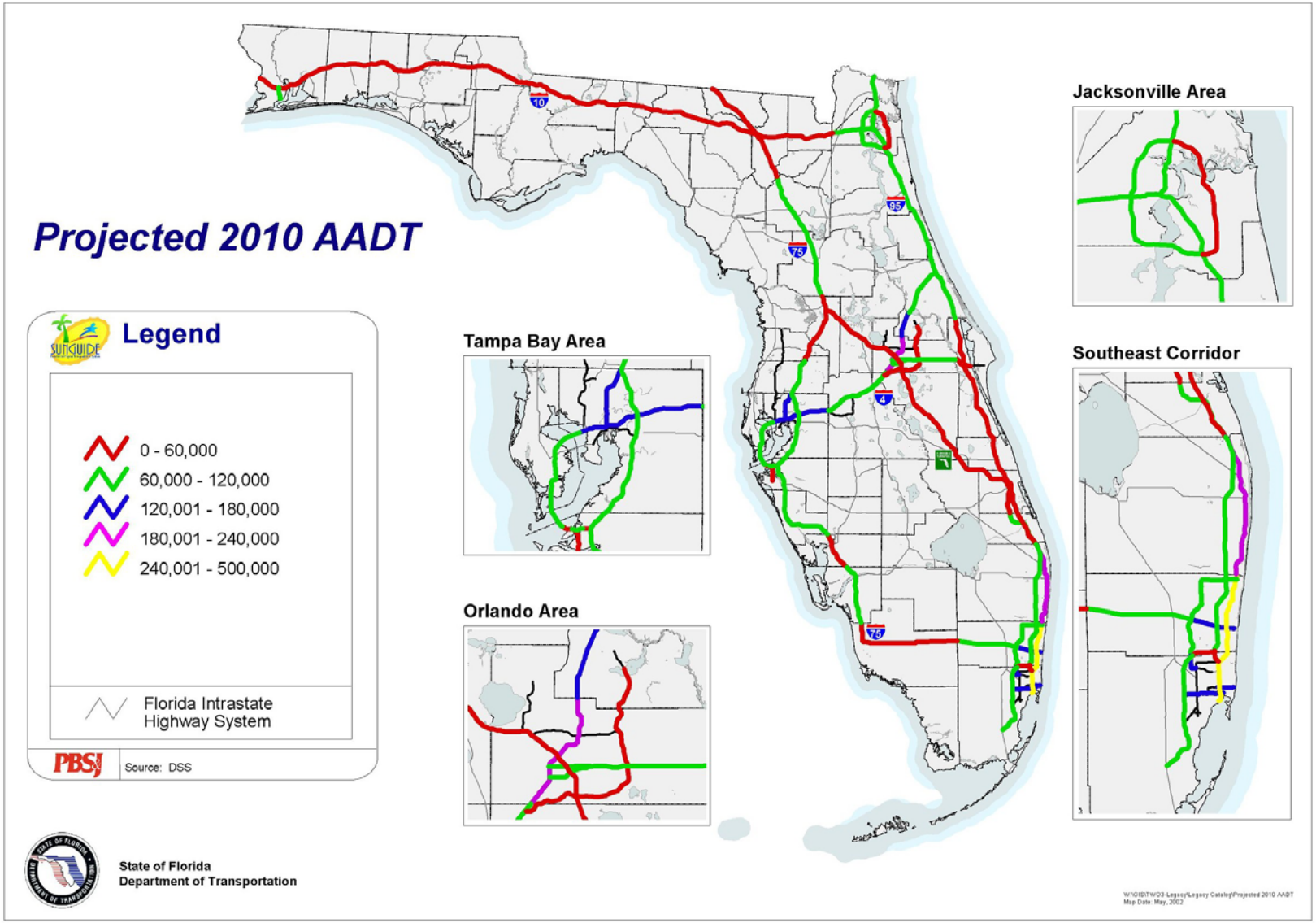


Figure 2.9 – Projected 2020 AADT

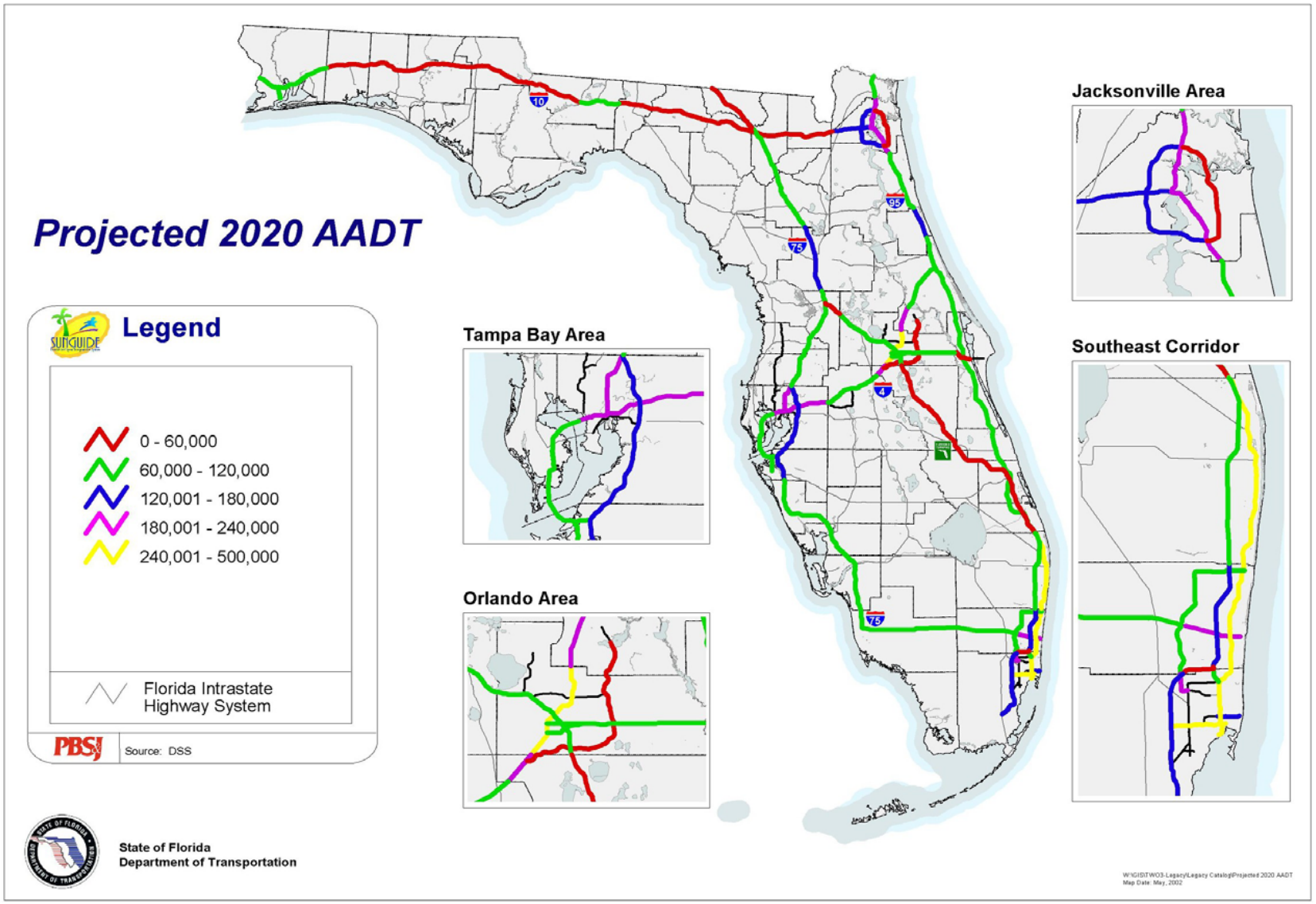


Table 2.5 – Annual Average Daily Traffic (AADT) by County

I-10	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Baker	21322	30528	42628
Columbia	17893	27113	40176
Duval	83907	116881	159087
Escambia	35192	55117	75363
Gadsden	28800	30214	41711
Holmes	18540	22730	31583
Jackson	17901	26322	36898
Jefferson	21309	31976	45200
Leon	30610	47144	67023
Madison	18761	26405	36703
Nassau	27000	39136	55285
Okaloosa	24858	25125	35623
Santa Rosa	21040	45071	68771
Suwannee	19757	28585	40831
Walton	16273	24753	36915
Washington	16126	23336	32982

I-110	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Escambia	50700	71956	98388

I-4	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Hillsborough	120500	148135	202509
Orange	148508	214289	310284
Osceola	71726	119562	206270
Polk	57333	82900	117493
Seminole	100112	156008	230863
Volusia	47900	71379	102600

Table 2.5 (Continued)

I-75	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Alachua	49518	69604	96377
Broward	73588	80167	111142
Charlotte	35917	57405	89328
Collier	30970	47610	77743
Columbia	36897	55644	82453
Miami-Dade	94625	139901	193414
Hamilton	29324	41631	57650
Hernando	36250	58769	94180
Hillsborough	66875	101175	138312
Lee	53850	80844	118785
Manatee	66250	95485	134912
Marion	53984	82613	124600
Pasco	44600	65593	92454
Sarasota	55305	81274	113673
Sumter	40242	59258	90047
Suwannee	27500	39787	56832

I-275	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Hillsborough	126643	166300	227341
Manatee	36091	45817	64735
Pinellas	71139	71945	96491

Table 2.5 (Continued)

I-95	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Brevard	39150	56878	82978
Broward	240706	359596	498541
Miami-Dade	172917	245508	339416
Duval	90732	168593	229473
Flagler	43771	71879	130791
Indian River	36050	56602	82227
Martin	50434	75111	110489
Nassau	44571	65785	92931
Palm Beach	137666	205039	296747
St. Johns	43252	67252	102066
St. Lucie	38249	59870	90289
Volusia	44733	67274	96699

I-195	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Miami-Dade	85889	120422	166484

I-395	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Miami-Dade	141174	175174	242180

I-295	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Duval	74794	110090	149844

SR 9A	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Duval	29137	39800	54172

I-595	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Broward	116707	163021	226011

Table 2.5 (Continued)

SR 91 (Turnpike)	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Broward	64588	91848	127338
Miami-Dade	41500	59345	82044
Indian River	19900	29591	42988
Lake	31000	47047	70815
Martin	22750	31996	47067
Okeechobee	19900	29619	43567
Orange	31550	48502	70229
Osceola	22400	33972	58609
Palm Beach	48700	62299	90163
St. Lucie	21733	32676	49278
Sumter	26200	39014	59285

SR 869 (Sawgrass)	Annual Average Daily Traffic (AADT)		
	2000	2010	2020
Broward	40770	66711	92487

Source: FDOT's TranStat Office

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 in 2000 to 2010 and 30 percent to 104,494 vpd in 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, but not as drastic as 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.

I-95 has an AADT of 81,852 vpd. It is projected to increase 35 percent to 124,949 vpd from 2000 to 2010 and 30 percent to 179,387 vpd from 2010 to 2020. Broward, Miami-Dade, and Palm Beach counties have the highest traffic volumes for this corridor at 240,706 vpd, 172,917 vpd, and 137,666 vpd, respectively. These volumes are forecasted to increase to 498,541 vpd, 339,416 vpd, and 296,747 vpd. I-95 will see the highest traffic volumes in the southeastern portion of the state followed closely by Duval County. The lowest AADT on the I-95 corridor is 36,050 vpd in Indian River County. Also contained in the I-95 corridor are I-195, I-395, I-295, and SR 9A. Each will almost double in traffic demand by the year 2020. However, I-395 and I-195 are expected to generate greater volumes than I-295 and SR 9A, continuing the trend of high population and travel demand growth in the southeastern portion of the state.

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: the SR 869 (Sawgrass Expressway), the SR 528 (Bee Line Expressway), and SR 417 (Central Florida Greeneway). 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.

2.3.2 Percent Heavy Vehicles

The daily percent (T_{24}) of heavy vehicles for the roadways within the study is illustrated in Figure 2.10 for the base year 2000. Table 2.6 summarizes the average percent of heavy vehicles by county.

Figure 2.10 – Existing Truck Percentages (T_{24}) Factor

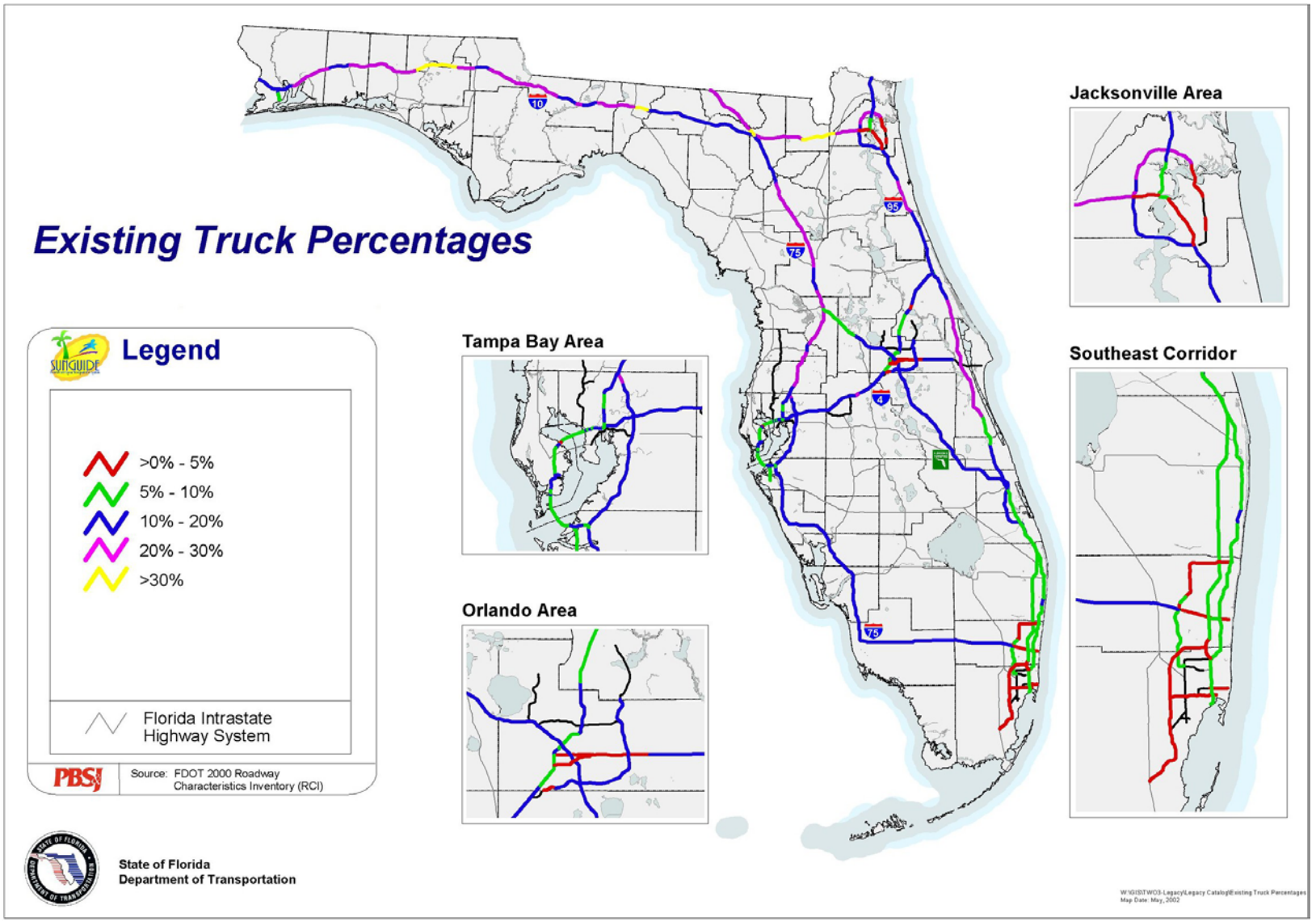


Table 2.6 – Average Percent Heavy Vehicles by County (T_{24})

I-10	2000 % HV
Baker	37.64%
Columbia	22.49%
Duval	10.52%
Escambia	13.07%
Gadsden	23.90%
Holmes	32.44%
Jackson	24.19%
Jefferson	26.85%
Leon	21.17%
Madison	18.64%
Nassau	39.97%
Okaloosa	22.67%
Santa Rosa	20.63%
Suwannee	17.68%
Walton	22.46%
Washington	32.76%

I-110	2000 % HV
Escambia	9.06%

I-4	2000 % HV
Hillsborough	13.09%
Orange	9.85%
Osceola	11.91%
Polk	18.32%
Seminole	8.64%
Volusia	14.99%

Table 2.6 (Continued)

I-75	2000 % HV
Alachua	22.44%
Broward	9.51%
Charlotte	17.99%
Collier	14.61%
Columbia	23.42%
Dade	7.17%
Hamilton	26.66%
Hernando	20.92%
Hillsborough	14.75%
Lee	14.50%
Manatee	12.99%
Marion	21.22%
Pasco	21.08%
Sarasota	16.25%
Sumter	23.03%
Suwannee	33.62%

I-275	2000 % HV
Hillsborough	10.07%
Manatee	7.07%
Pinellas	9.48%

I-295	2000 % HV
Duval	20.62%

I-95	2000 % HV
Brevard	19.95%
Broward	7.52%
Dade	7.15%
Duval	7.48%
Flagler	16.05%
Indian River	12.05%
Martin	15.31%
Nassau	13.34%
Palm Beach	9.43%
St. Johns	20.55%
St. Lucie	14.60%
Volusia	13.63%

I-295	2000 % HV
Duval	20.62%

I-195	2000 % HV
Dade	2.63%

I-395	2000 % HV
Dade	2.90%

I-595	2000 % HV
Broward	4.00%

SR 9A	2000 % HV
Duval	12.63%

Table 2.6 (Continued)

SR 91	2000 % HV
Broward	5.61%
Dade	3.92%
Indian River	12.53%
Lake	11.27%
Martin	7.60%
Okeechobee	12.53%
Orange	13.13%
Osceola	12.53%
Palm Beach	7.53%
St. Lucie	9.43%
Sumter	8.81%

SR 417	2000 % HV
Orange	10.67%
Osceola	12.53%
Seminole	6.90%

SR 528	2000 % HV
Brevard	13.76%
Orange	5.41%

SR 869	2000 % HV
Broward	2.53%

Source: FDOT TranStat Office

The T_{24} factor represents the average daily percent of heavy vehicle traffic occurring in the overall stream of traffic. The T_{24} is most useful in identifying the composition of vehicles traveling along a given section of roadway. It is important to note high truck percentage locations, as trucks are larger, heavier, and have very different operating characteristics than passenger vehicles. One truck can have the same effects on the roadway as several passenger cars. Therefore, a roadway segment containing a large percentage of trucks may experience deteriorated operating conditions and reduced effective capacity.

The Turnpike facilities in this study have relatively low T_{24} factors. This is due mainly to the costs and delays associated with toll payments. Other study facilities experiencing low T_{24} percentages are the urban corridors. Although these urban areas generally have direct access to ports and intermodal facilities, the volume of passenger cars is tremendously high, causing a lower overall percentage of trucks, not necessarily a lower volume. Rural sections of interstate facilities contain the highest T_{24} factors. These areas have a smaller volume of passenger car traffic while maintaining approximately the same volume of heavy vehicle traffic. Some of the highest percentages of trucks in the study are located on I-10 in Washington, Nassau, Baker, and Holmes counties, each with at least 30 percent heavy vehicle travel, and I-95, I-4, and I-75 rural segments.

2.4 High Accident Locations

To identify areas in need of potential safety improvements along the study corridor network, crash data for the year 1999 was collected and analyzed. The crash data was provided by the FDOT Safety Office and was derived from their annual crash database files. High accident locations are determined by calculating the safety ratio of a spot or segment location along a facility. Safety ratios above 1.00 indicate that the segment or spot locations experience vehicle collisions above average and, therefore, traffic safety at these locations may need to be improved. Figure 2.11 illustrates the high accident spot and segment locations for the study interstate corridors. The 1999 crash database is contained in Appendix A.

As illustrated in the figures, high accident locations appear on several of the study corridors throughout the state. However, in looking at the corridors more closely, the concentration of these locations becomes more evident. To understand why a particular location experiences a high crash rate, a more detailed analysis of the type and causes of the crashes is necessary to determine if they are primarily caused by physical roadway conditions, such as bad pavement or insufficient signing and marking, or if they are caused by driver errors such as speeding or following to closely.

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 interchange of I-10 and I-75 is also identified as a high accident location; however, the corridor does not exhibit any unusual accident rates until its terminus with I-95 located in the downtown Jacksonville 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.

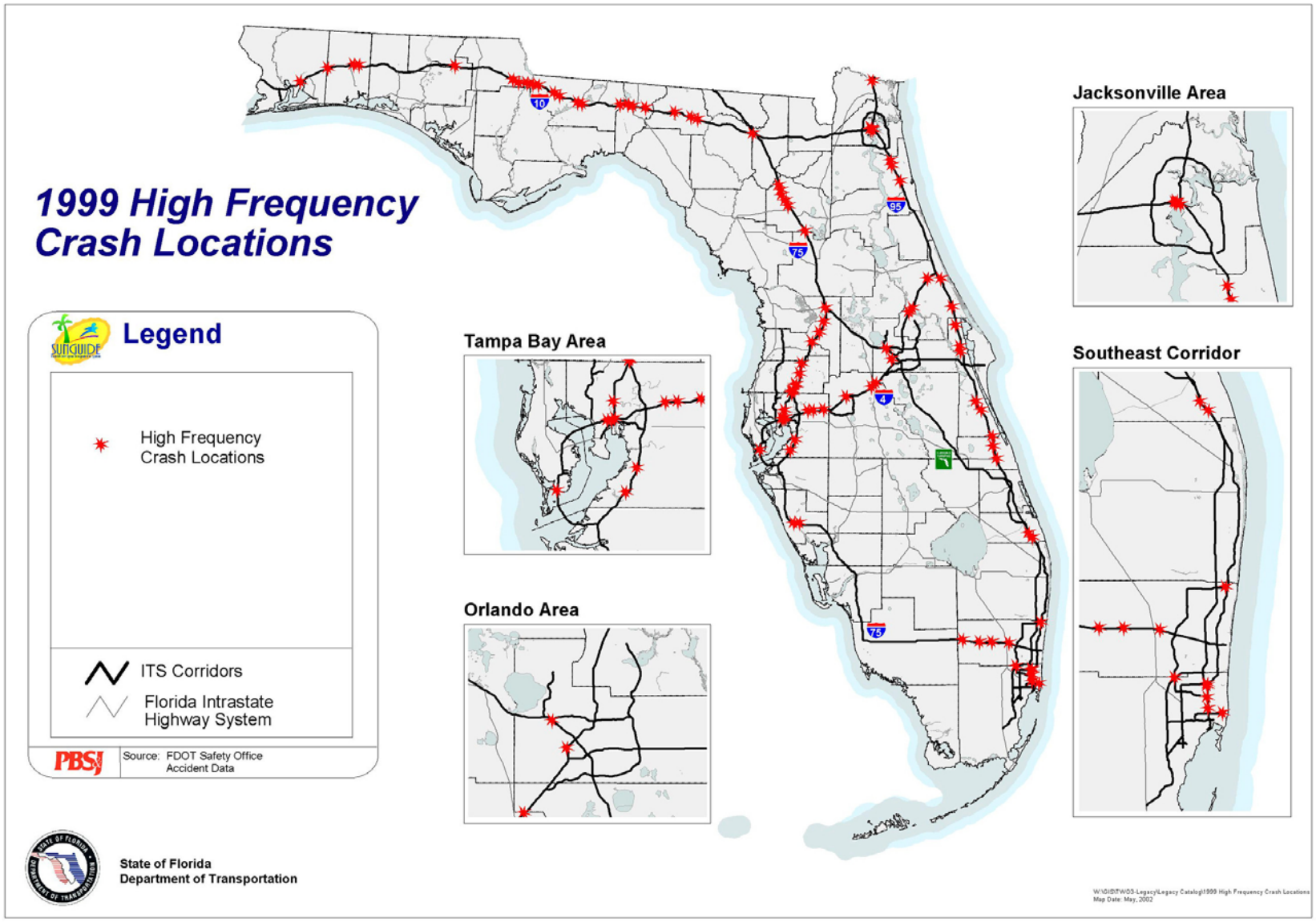
Several high accident locations are scattered throughout the I-4 corridor. Similar to the I-10 corridor, the area exhibiting the highest concentration of accidents is the interchange of I-275 and I-4 located in the downtown Tampa area.

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 remains relatively clear until the corridor enters Broward County.

In 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 County, St. Johns County, 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. The Turnpike's mainline and other Turnpike facilities experience relatively few high accident locations except at their interchanges with the I-95 and I-75 facilities.

ITS solutions can assist in reducing the number of crashes, thus saving time, money and lives.

Figure 2.11 – 1999 High Frequency Crash Locations



2.5 Major Activity Centers, Special Generators, and Tourist Attractions

Tourism is Florida's largest industry. According to Visit Florida, the official tourism promotion agency of the state of Florida, 48.7 million tourists visited the state of Florida spending an estimated $45 billion dollars in fiscal year 1998-99. For the year 2000, the number of visitors was estimated at 60 million, spending approximately $49 billion. Additionally, in 1998, 818,700 Florida citizens were employed in tourism related industries. Tourism also generates a significant amount of the tax revenue used to support state programs.

With this in mind, the provision of safe and efficient access to major tourist attractions, trip generators, and activity centers is important in maintaining and improving the state's economy.

With this goal in mind, 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 increase mobility to and around these major activities centers. Table 2.7 identifies several of the state's major activity centers, special generators, and tourist attractions. Figure 2.12 geographically illustrates the major activity centers. These attractions were selected based on the fact that they draw visitors from outside the state of Florida and from large regions within the state. Additionally, they generate a high number of trips on the intrastate network.

As illustrated in Table 2.7, the highest concentration of these tourist attractions is located in the central Florida region along the I-4, I-75, and I-95 corridors. Exit interviews, conducted by Visit Florida, indicated that the top destinations for air visitors surveyed were Dade and Broward counties and the Orange/Osceola County region. The top destinations of auto visitors surveyed were the Orange/Osceola County region and Tampa Bay and Volusia Counties. These findings reveal that the Orange/Osceola County region is a primary destination for both air and automobile travelers.

Additionally, most of the major theme parks are located along the I-4 corridor located 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.

Although not identified as a major tourist attraction in these tables, Florida's beaches are considered one of the state's major tourist attractions. Access to and information regarding Florida's beaches must also be considered when designing a transportation system for non-resident travelers.

Table 2.7 – Major Activity Centers

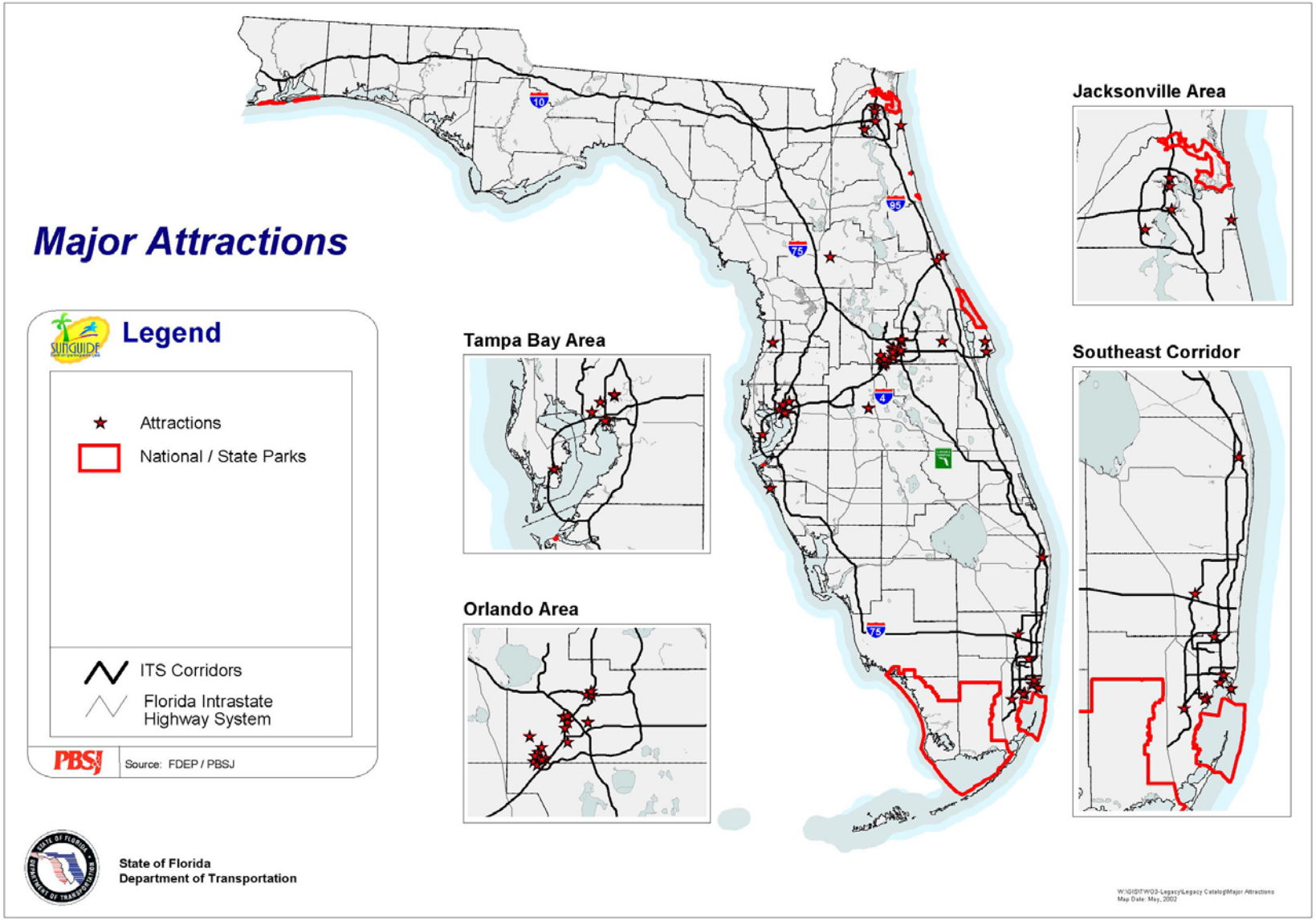
Name	Address	City	County	District	Type
Mote Marine Aquarium	1600 Ken Thompson Pkwy.	Sarasota	Sarasota	1	Aquarium
Cypress Gardens	2641 S. Lake Summit Dr.	Winter Haven	Polk	1	Attraction
Big Cypress National Park		Ochopee	Collier	1	Park
De Soto National Memorial		Bradenton	Manatee	1	Park
Adventure Landing	4825 Blanding Blvd.	Jacksonville	Duval	2	Attraction
Adventure Landing	1944 Beach Blvd.	Jacksonville Beach	Duval	2	Attraction
Anheuser-Busch Brewery	111 Busch Blvd,	Jacksonville	Duval	2	Attraction
Castillo de San Marcos National Monument		St. Augustine	St. Johns	2	Park
Ft. Caroline National Memorial		Jacksonville	Duval	2	Park
Ft. Matanzas National Monument		St. Augustine	St. Johns	2	Park
Timucuan Ecological and Historic Preserve		Jacksonville	Duval	2	Park
Alltel Stadium	One Alltel Stadium Place	Jacksonville	Duval	2	Sports
Jacksonville Zoo	8605 Zoo Pkwy.	Jacksonville	Duval	2	Zoo
Gulf Islands National Seashore		Pensacola	Escambia	3	Park
St. Vincent National Wildlife Refuge		Apalachicola	Franklin	3	Park
National Car Rental Center	2555 Panther Pkwy.	Sunrise	Broward	4	Sports
Rapids Water Park	6566 N. Military Trail	West Palm Beach	Palm Beach	4	Attraction
Adventure Landing	601 Earl St.	Daytona Beach	Volusia	5	Attraction
Church Street Station		Orlando	Orange	5	Attraction
Epcot	1510 N. Ave. of the Stars	Kissimmee	Orange	5	Attraction
Downtown Disney	Buena Vista Dr.	Lake Buena Vista	Orange	5	Attraction
Disney's Animal Kingdom		Lake Buena Vista	Orange	5	Attraction
Magic Kingdom		Lake Buena Vista	Orange	5	Attraction
Disney-MGM Studios		Lake Buena Vista	Orange	5	Attraction
Disney's Wide World of Sports	700 Victory Way	Lake Buena Vista	Osceola	5	Attraction
Disney's Blizzard Beach	1534 W. Buena Vista Dr.	Lake Buena Vista	Orange	5	Attraction
Disney's Typhoon Lagoon		Lake Buena Vista	Orange	5	Attraction
Gatorland	14501 S. Orange Blossom Trail	Orlando	Orange	5	Attraction
Kennedy Space Center		Cape Canaveral	Brevard	5	Attraction
Jungle Adventures	26205 E. SR 50	Christmas	Orange	5	Attraction
NASA		Cape Canaveral	Brevard	5	Attraction
Ripley's Believe It or Not	8201 International Dr.	Orlando	Orange	5	Attraction
Sea World	7007 Sea World Dr.	Orlando	Orange	5	Attraction

Table 2.7 (Continued)

Name	Address	City	County	District	Type
Universal Studios	1000 Universal Studios	Orlando	Orange	5	Attraction
City Walk	6000 Universal Studios	Orlando	Orange	5	Attraction
Disney's River Country		Lake Buena Vista	Orange	5	Attraction
Water Mania	6073 W. Irlo Bronson Hwy.	Kissimmee	Osceola	5	Attraction
Wet 'n Wild	6200 International Dr.	Orlando	Orange	5	Attraction
Wild Waters Water Park	5656 E. Silver Springs Blvd.	Silver Springs	Marion	5	Attraction
Canaveral National Seashore		Cape Canaveral	Brevard	5	Park
Florida Citrus Bowl Stadium	1610 W. Church St.	Orlando	Orange	5	Sports
TD Waterhouse Center	600 W. Amelia	Orlando	Orange	5	Sports
Daytona International Speedway	1801 W. International Speedway Blvd.	Daytona Beach	Volusia	5	Sports
Miami Seaquarium	4400 Rickenbacker Causeway	Key Biscayne	Miami-Dade	6	Aquarium
Parrot Jungle and Gardens	11000 SW 57th Ave.	Miami	Miami-Dade	6	Attraction
Vizcaya Museum and Gardens	3251 S. Miami Ave.	Miami	Miami-Dade	6	Cultural
Fairchild Tropical Gardens	10901 Old Cutler Rd.	Miami	Miami-Dade	6	Cultural
Biscayne National Park		Miami	Miami-Dade	6	Park
Pro Player Stadium	2269 Dan Marino Blvd.	Miami	Miami-Dade	6	Sports
American Airlines Arena	601 Biscayne Blvd.	Miami	Miami-Dade	6	Sports
Everglades National Park		Miami	Miami-Dade	6	Park
Miami Metro Zoo	12400 SW 152nd St.	Miami	Miami-Dade	6	Zoo
Florida Aquarium	701 Channelside Dr.	Tampa	Hillsborough	7	Aquarium
Adventure Island	10001 N. McKinley Dr.	Tampa	Hillsborough	7	Attraction
Ice Palace	401 Channelside Dr.	Tampa	Hillsborough	7	Sports
Tropicana Field	One Tropicana Dr.	St. Petersburg	Pinellas	7	Sports
Raymond James Stadium	4201 N. Dale Mabry	Tampa	Hillsborough	7	Sports
Busch Gardens	3605 E. Bougainvillea	Tampa	Hillsborough	7	Attraction
Weeki Wachee Springs Waterpark		Brooksville	Hernando	7	Attraction
Lowry Park Zoo	1101 W. Sligh Ave.	Tampa	Hillsborough	7	Zoo

Source: Visit Florida

Figure 2.12 – Major Attractions



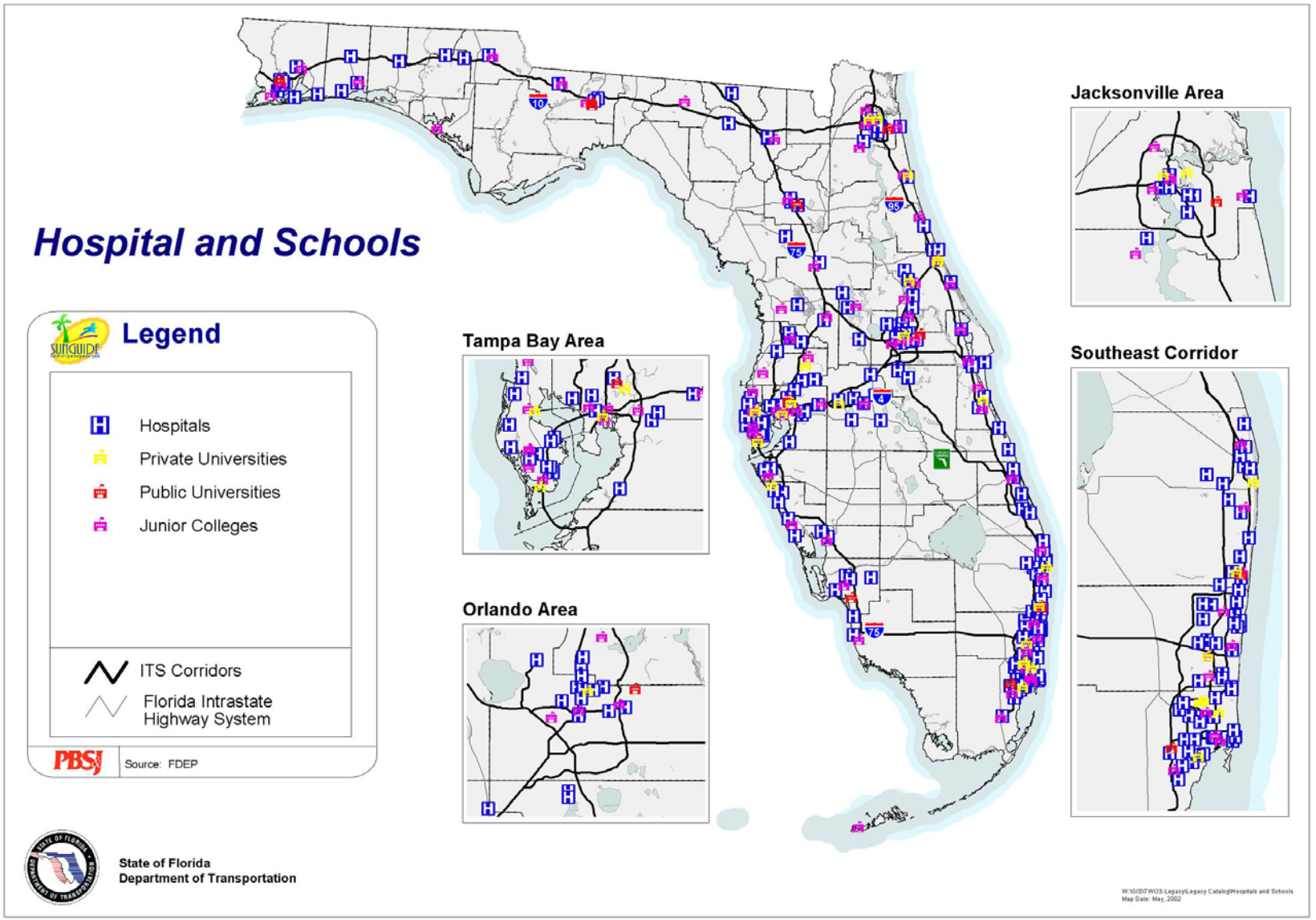
2.6 Major Hospitals and Educational Facilities

The identification of major hospitals and educational facilities is important in developing appropriate ITS solutions to meet local transportation and emergency needs. Congestion caused by crashes and other incidents have direct impacts on special trip generators such as hospitals and educational facilities. People requiring emergency medical treatment depend on emergency medical services to get them to hospitals and medical facilities. Congestion can pose potential life-threatening risks for individuals and ITS can provide efficient and timely information to dispatchers, drivers, and medical staff in order to avoid delays in treatments. Hospitals and other medical facilities are also key locations for evacuations during natural disasters and other catastrophes.

Educational facilities are also very important special trip generators. Colleges and universities tend to generate traffic at various times of the day due to flexible class schedules and activities. Sporting events and other special activities held on campus can also generate a large amount of vehicles and buses in the evening hours and weekends.

Additionally, educational facilities are often designated as emergency evacuation centers during natural disasters and other catastrophes. Therefore, it is important to denote their location when identifying ITS evacuation user services for the major corridor. Figure 2.13 identifies major hospitals and university or college level educational facilities. A list of these facilities is contained in Appendix B.

Figure 2.13 – Hospitals and Schools



2.7 Intermodal Issues for Transit

2.7.1 Bus Service

Although transit agencies predominately locate bus routes along arterial and collector streets to provide maximum accessibility for their customers, some utilize interstate facilities to provide more convenient and efficient service for their riders. These routes, termed express routes, are typically operated during morning and evening rush hours, using interstate facilities to move people more efficiently from the outskirts of an urban area to downtown employment centers. They typically have large headways and may only provide service along these routes once or twice a day.

Currently, there are 20 public transportation agencies in Florida. They include:

- Bay County Council on Aging;
- Broward County Transit;
- Central Florida Regional Transportation Authority (LYNX);
- Collier Area Transit;
- Escambia County Area Transit;
- Hillsborough Area Regional Transit Authority (HART or HARTline);
- Jacksonville Transportation Authority;
- Key West Department of Transportation;
- Lakeland Area Mass Transit;
- Tallahassee Transit (TALTRAN);
- Tri-County Commuter Rail Authority (TRI RAIL);
- Lee County Transit;
- Manatee County Area Transit;
- Miami-Dade Transit Agency;
- Palm Beach County Transportation Authority;
- Pinellas Suncoast Transit Authority;
- Regional Transit System;
- Sarasota County Area Transit;
- Spaces Coast Area Transit; and
- Volusia County Transit (VOTRAN).

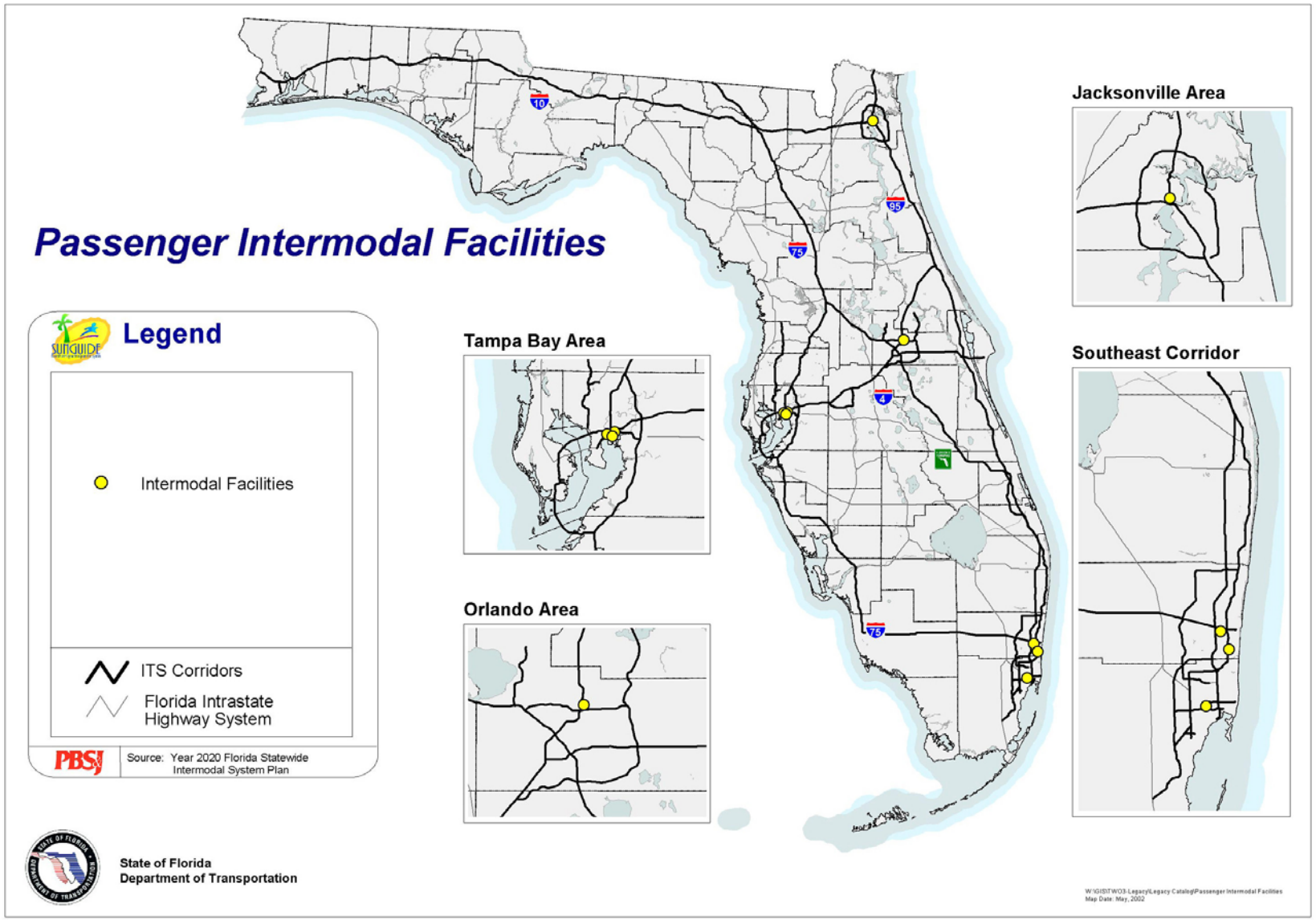
Of the 20 Florida transit agencies, only a few utilize the interstate study corridors for express route service. Broward County Transit has two routes that use only small portions of I-595. However, it provides service to 410 square miles of Broward County. LYNX operates mainly in the Orange County/Orlando area using small sections of I-4. Another transit agency utilizing the I-4 corridor is HART, or the HARTline, in Hillsborough County. HART also uses portions of I-275 and I-75. The Jacksonville Transportation Authority buses operate mainly in downtown Jacksonville; however, they operate on large sections of I-95 and I-10 on a daily basis. The Lakeland Area Mass Transit operates north and south of I-4; however, its service may soon include sections of I-4. The Pinellas Suncoast Transit Authority operates buses along sections of

I-275 in St. Petersburg and the Space Coast Area Transit utilizes sections of the Bee Line Expressway from I-95 to its eastern terminus and portions of I-95 in Seminole County. VOTRAN operates only in Volusia County, which currently has no express routes. However, they have recently teamed up with LNYX to provide the "No-Stress" Express along I-4. This express route runs along I-4 from Saxon Boulevard in Volusia County to downtown Orlando during the morning and evening peaks.

In addition to public transit agencies and local private bus companies, the Greyhound Bus Company provides both interstate and intercity travel throughout Florida and the nation. Greyhound currently has 137 terminals in the state of Florida, offering a variety of special rates and programs. One of these programs is Flightlink, which provides direct access to three of Florida's airports: Key West, Melbourne International, and Miami International Airports. Appendix C identifies the Florida Greyhound terminals.

In addition to the local and interstate transit facilities, six passenger intermodal facilities are located in several urban areas across the state. Figure 2.14 shows their approximate locations. These facilities allow passengers to transfer from various transportation modes to another including bicycle, automobile, bus, or rail. The Miami Intermodal Center also provides access to the Miami International Airport.

Figure 2.14 – Passenger Intermodal Facilities



2.7.2 Rail Service

There are several commuter rail facilities within the state. The largest is Amtrak. Amtrak provides intercity service throughout the state and nation. Amtrak's primary train routes within the state of Florida parallel several of the major corridors including:

- I-10 from the Alabama State line to I-95;
- I-75 from I-10 to I-4;
- I-4 from I-75 to I-95;
- I-95 from I-4 to I-10; and
- Florida's Turnpike from I-4 to Miami.

TRI RAIL is a commuter rail system servicing the majority of southeast Florida. TRI RAIL operates seven days a week from 18 stations along a 71-mile rail corridor. TRI RAIL is the only regional commuter rail system in Florida running parallel to I-95 servicing Palm Beach, Broward, and Miami Dade counties. It also provides access to Metrorail, which services Miami-Dade County only. Metrorail has 21 stations spaced close to a mile apart. The Jacksonville Transportation Authority operates the 2.5-mile elevated Skyway. This urban people mover system transports passengers through the downtown area and across the St. Johns River. Automated cars run every three to six minutes.

ITS solutions, combined with these multi-modal systems, will assist in improving mobility for both the commuter and non-resident travelers.

2.8 Intermodal Issues for Freight Movement

2.8.1 Overview

Freight movements are critical to Florida's economy. Florida has the 16th largest economy in the world with approximately $370 billion in gross state product. This economic activity is generated by a population of approximately 16 million people, 400,000 businesses, and 17,000 manufacturers. These groups rely on freight movements to keep Florida working and producing. Based on an analysis of the 1998 United States Bureau of the Census' *County Business Patterns*, long haul and short haul trucking makes $134 billion in wages to Floridians possible annually. Long haul movements are trips greater than 250 miles and short haul trucks movements are shorter than 250 miles. There are more than 4.4 million long haul truck movements per year in Florida. Therefore, it is necessary to document and track these types of movements and facilities along the interstate corridors. This section discusses truck and intermodal terminals, truck movements, and WIM stations to help create ITS solutions that are beneficial to truck travel within the state of Florida.

2.8.2 Truck and Intermodal Terminals

Truck terminals are facilities that service more than two hundred trucks per day. As seen in Figure 2.15, truck terminals are dispersed throughout the state. The portions of the state containing the largest number of these terminals are those with access to rail lines, highways, ports, airports, and other intermodal facilities. Therefore, the urban areas tend to have a larger number of truck terminals in order to accommodate the larger volume of truck traffic in the area.

Additionally, the state of Florida has several major air and seaports. According to FDOT's aviation web site, Florida has 19 commercial passenger service airports. Additionally, the Enterprise Florida web site indicates that there are 20 reliever airports and 60 general aviation facilities. Of the 19 commercial passenger service airports, 13 are international airports with the seven major airports located in Jacksonville, Orlando, Tampa, Southwest Florida, Palm Beach, Ft. Lauderdale, and Miami. The major facilities provide major freight and passenger movements within the state and the nation. For example, the Tampa International Airport and the Orlando International Airport lead the state and nation in freight and passenger movements, each seeing more than 19.6 million passengers and moving more than 385,000 tons of freight.

With 14 deepwater ports, all Florida businesses are within 90 miles of a seaport according to Enterprise Florida's web site. Seaports are also major generators of passenger and freight movements within the state. The Port of St. Petersburg, Port of Tampa, Port of Miami, and the Port of Canaveral are the only ports in the state that currently offer cruise services. The cruise industry generates a significant number of passengers every year and is expected to grow from 190,000 in 1997 to more than 750,000 passengers by the year 2002. Also, the Port of Tampa is the 10th largest bulk port in the United States. It generates more than 50.6 million tons of cargo. The majority of this freight is handled by CSX's local rail facilities and intermodal yard, while a portion is trucked along I-4, I-75, and I-275. Figures 2.16 and 2.17 depict the locations of the major airports and seaports throughout the state.

Figure 2.15 – Existing Truck Terminals

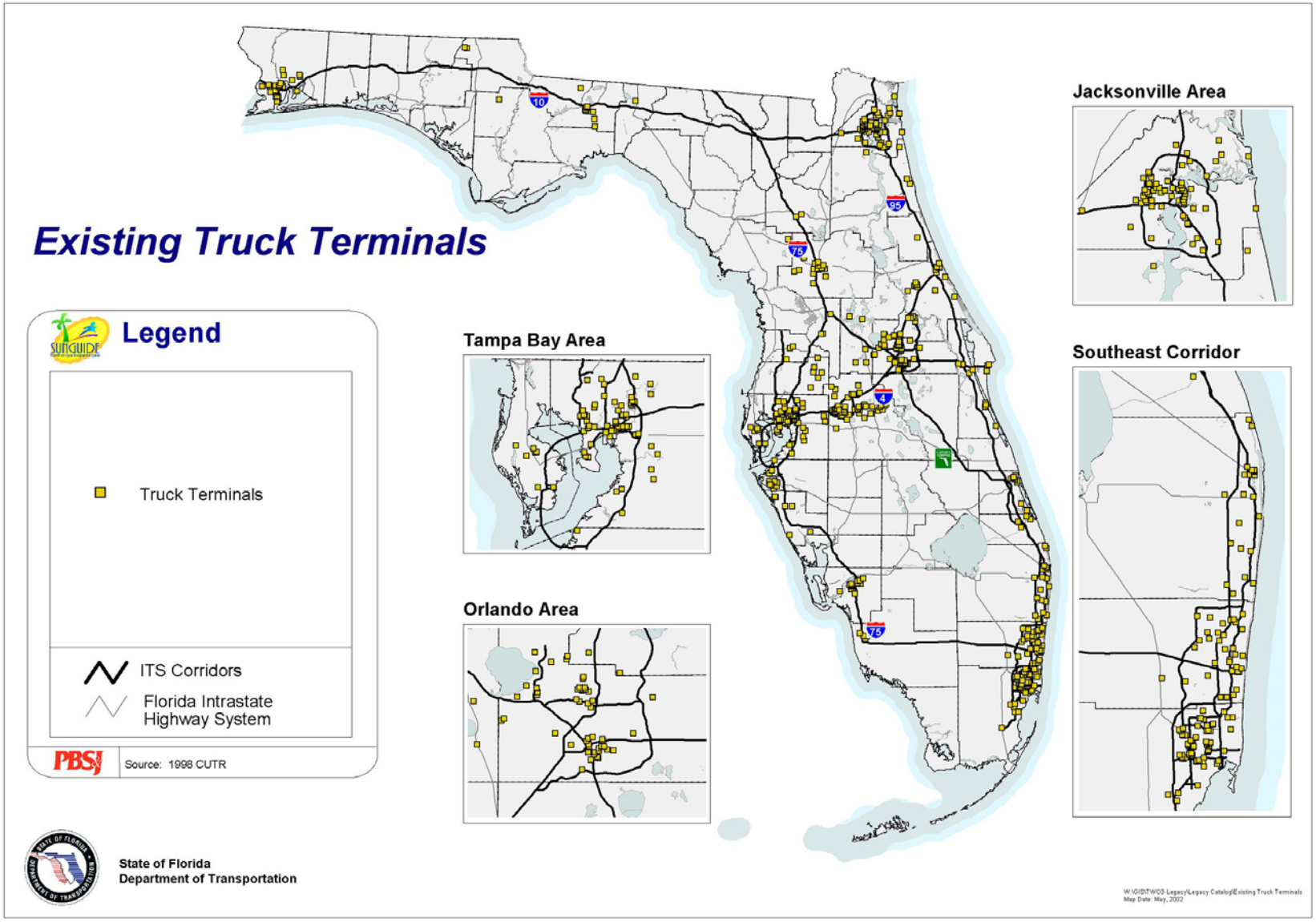


Figure 2.16 – Major Airports

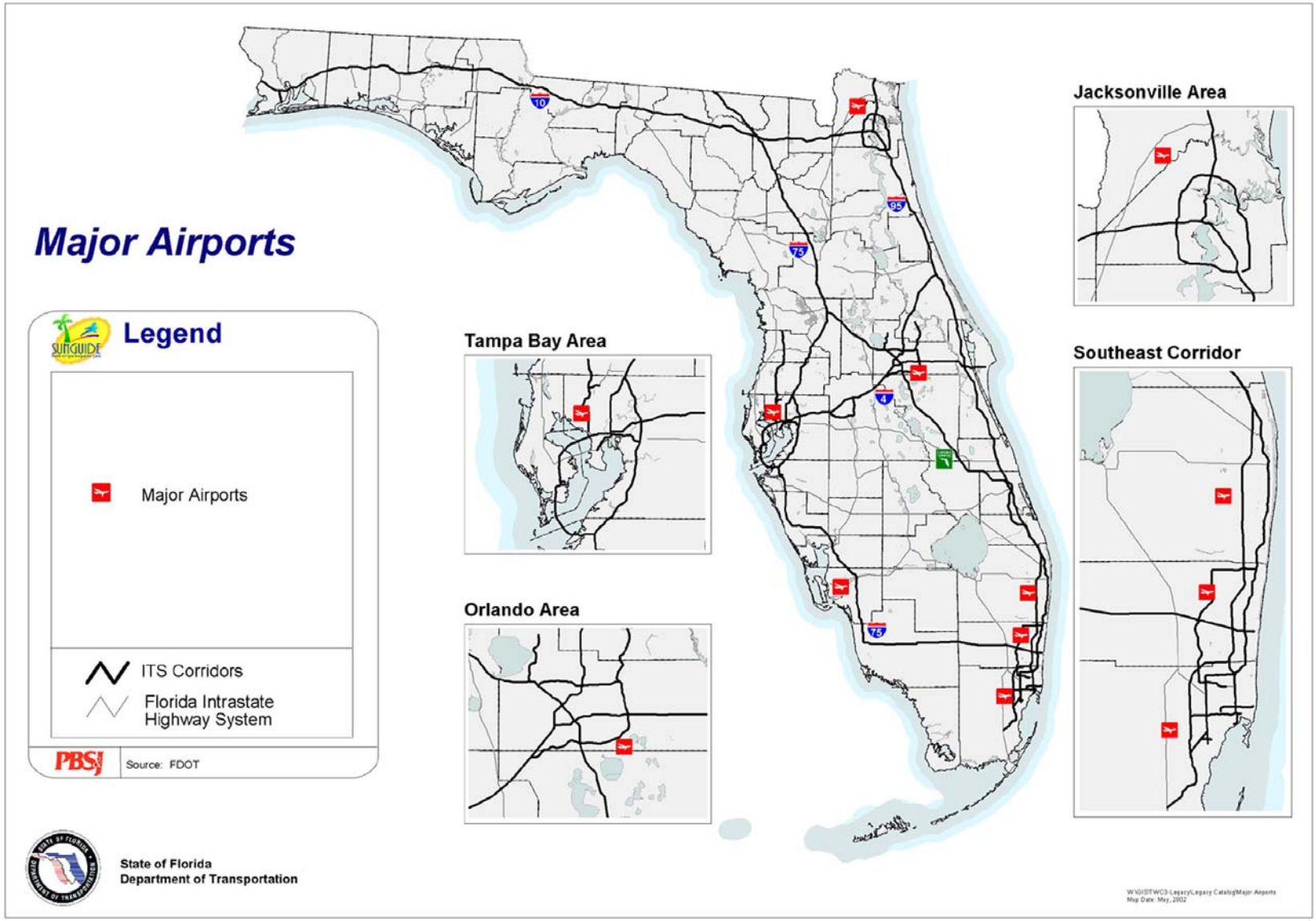
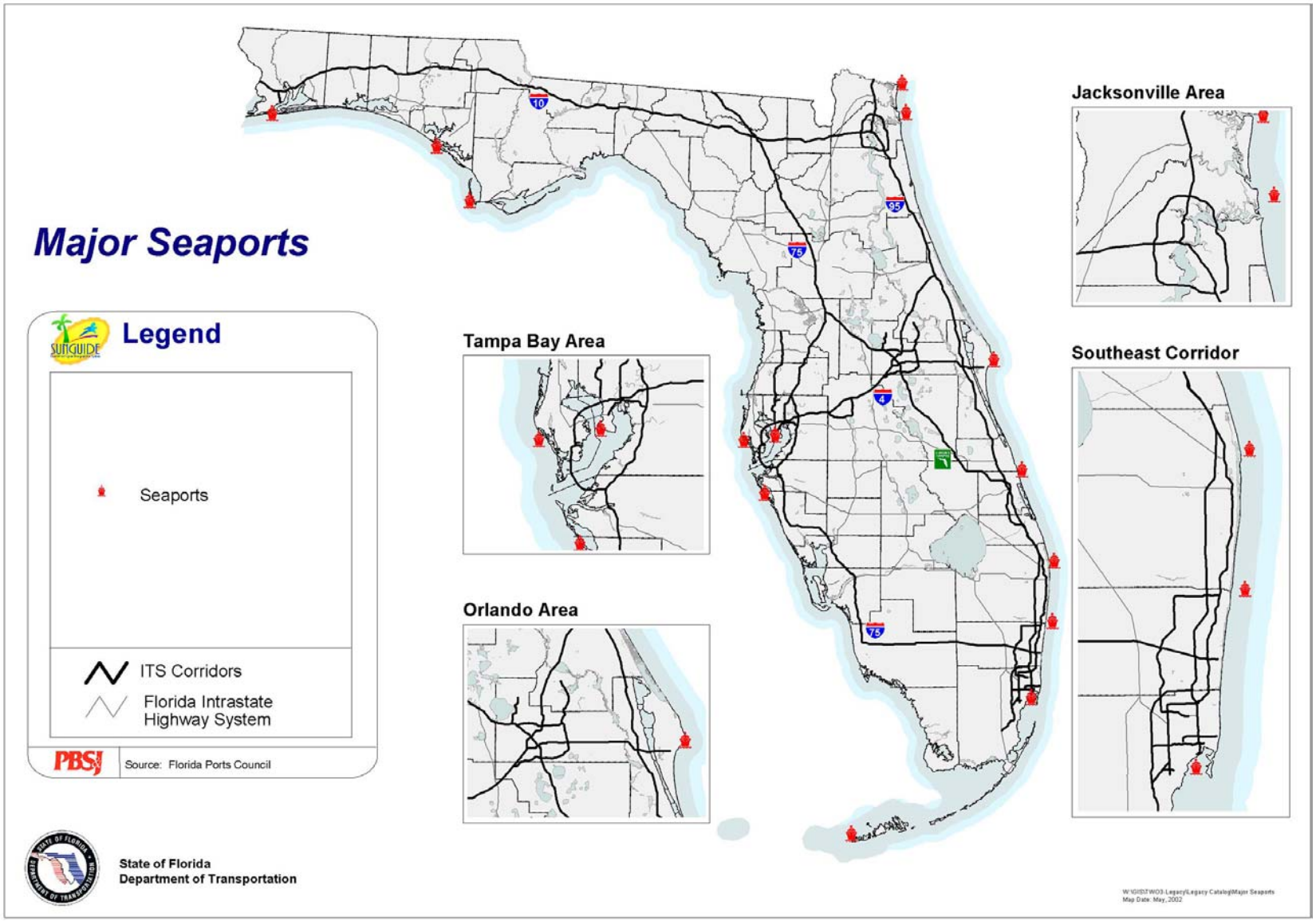


Figure 2.17 – Major Seaports



2.8.3 Truck Movements

Truck travel in Florida, according to year 2000 statistics, will increase steadily along interstates and major roadways as these facilities serve as conduits for freight movements throughout the state. Areas along the study corridors exhibiting the heaviest truck movements are located where interstates intersect with one another and where a roadway provides direct access to intermodal facilities. The following truck volumes are annual average daily forecasted truck volumes based on the FDOT 2001 RCI and 2001 DSS. The corridor with the highest overall average of truck use is I-295 with 15,429 trucks per day. The I-295 facility provides direct access to the Port of Jacksonville, I-95, and I-10 west. Trucks serving the numerous freight and intermodal facilities in Hillsborough, Polk, and Orange counties use I-4 to connect with major north-south corridors such as I-75, Florida's Turnpike, and I-95. The average truck volume along the I-4 corridor is currently more than 10,000 trucks per day. I-275 in Hillsborough County accommodates more than 12,000 trucks per day. This is due mainly to the large number of intermodal facilities located in the Tampa area and direct access to interstate facilities such as I-75 and I-4. Both I-95 and I-75 carry approximately the same number of trucks per day. Each averages greater than 7,000 trucks per day. I-10 is a rural interstate facility. Although it has a high T_{24} factor, the actual amount of trucks using the facility is low compared to I-75 and I-95 with only 5,724 trucks per day. The facilities with the lowest volume of trucks within the study network are the Turnpike corridors. They currently average less than 4,000 trucks per day.

As illustrated in Figures 2.18 through 2.20, the FDOT RCI and the 2001 DSS indicate that truck traffic will continue to grow steadily along all corridors within the study. Sections of I-95 in Broward and Palm Beach counties are anticipated to generate more than 28,000 trucks per day by the year 2020. Other areas of concern are Hillsborough, Orange, Polk, Osceola, and Seminole counties along the I-4 corridor. Each of these roadway sections is expected to generate an average of 20,000 trucks per day.

Figure 2.18 – 2000 Truck Volumes

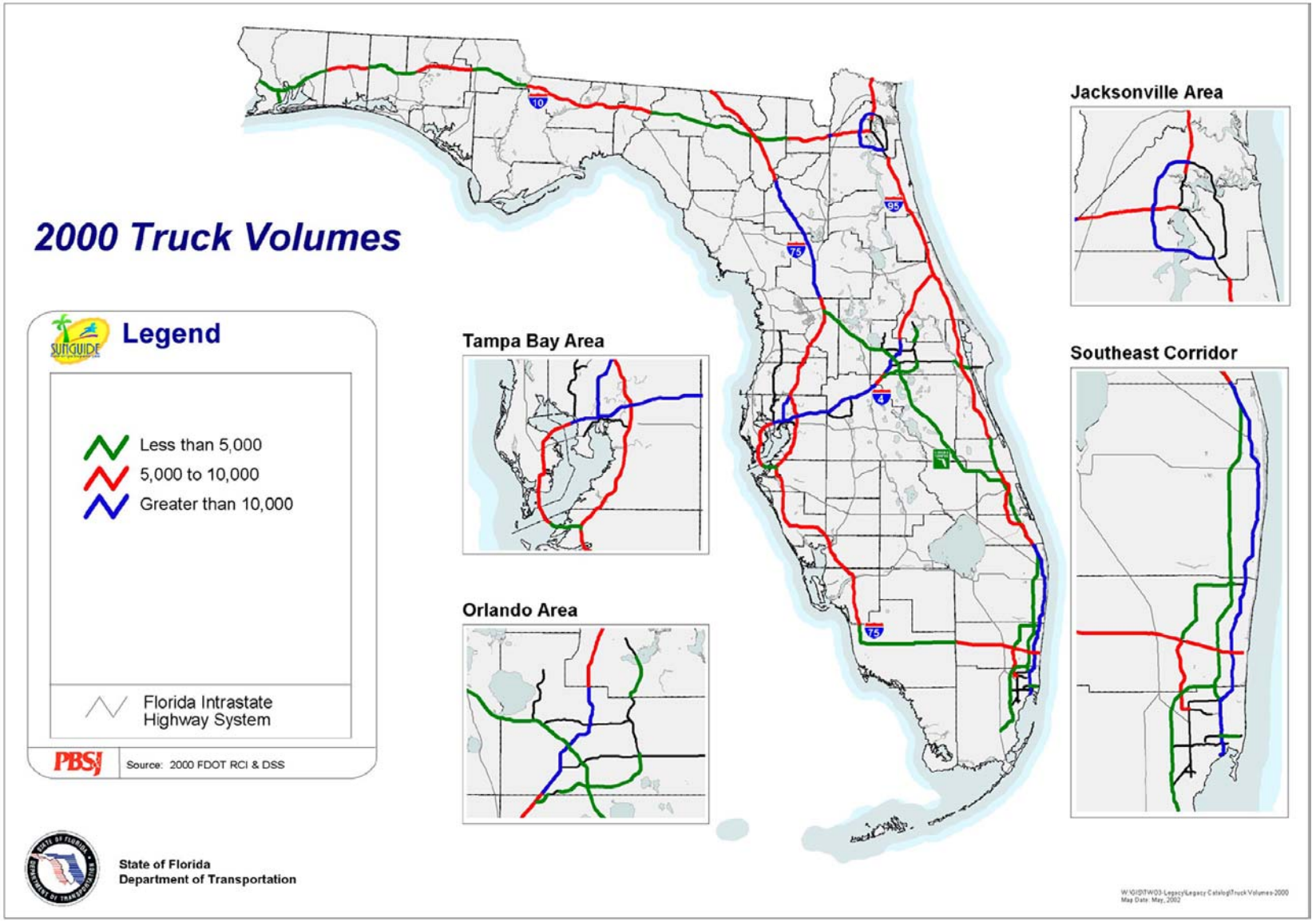


Figure 2.19 – 2010 Truck Volumes

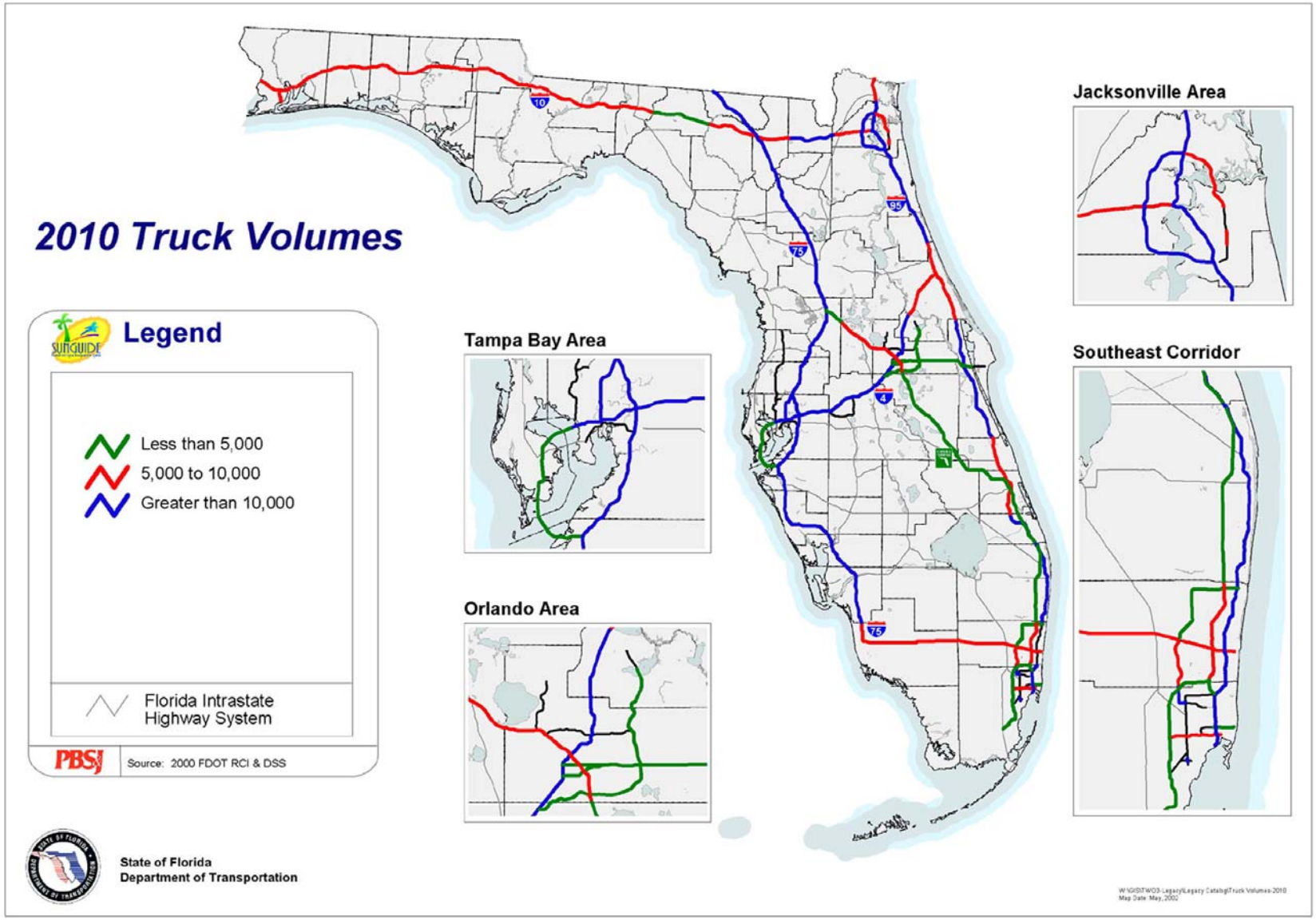
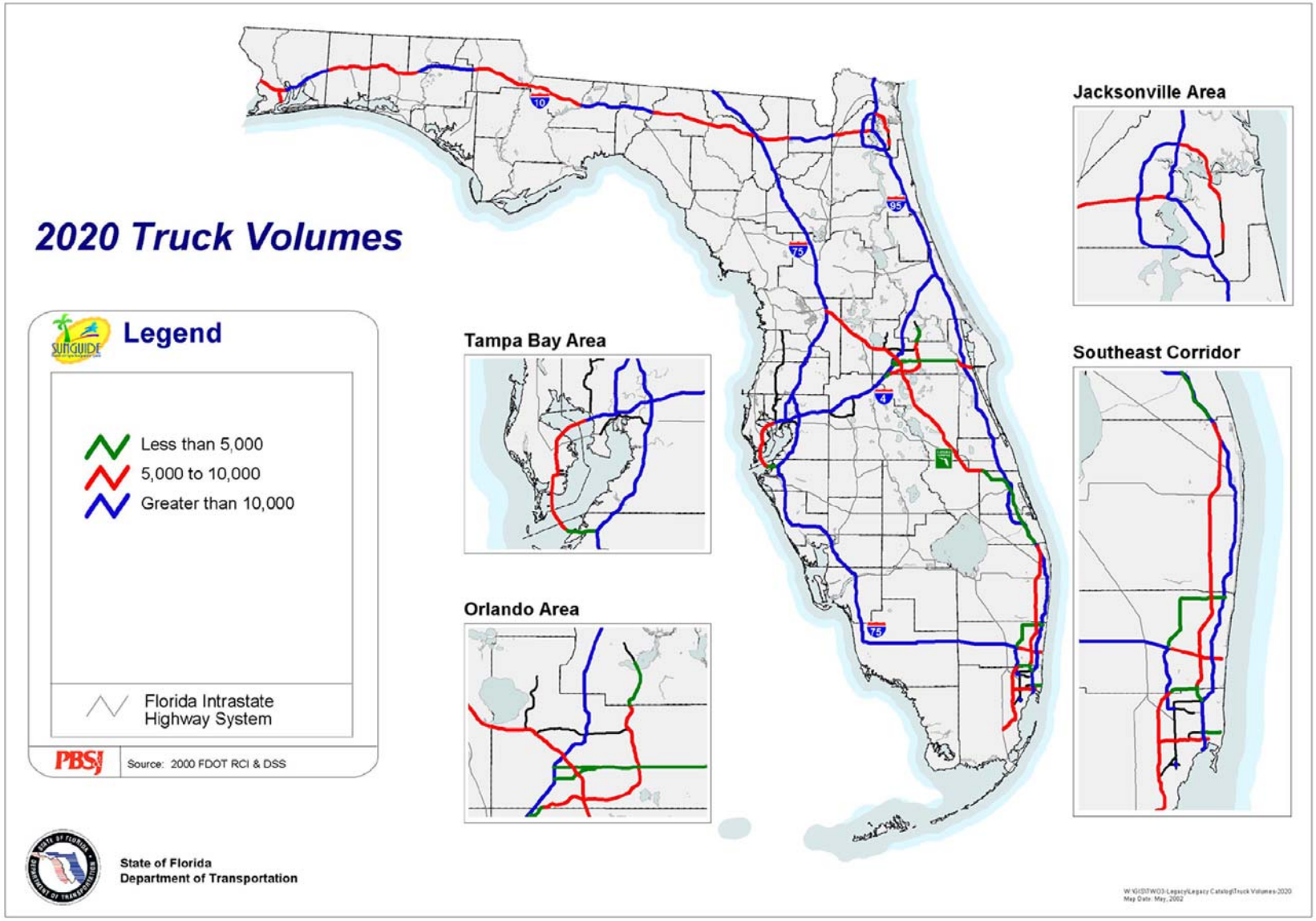


Figure 2.20 – 2020 Truck Volumes



2.8.4 Weigh-in-Motion (WIM) Stations

Currently, nine weigh stations are located on interstate facilities throughout the state. Six of the nine are WIM stations with four more WIMs programmed for implementation within the near future. It is the Motor Carrier Compliance Office's goal to convert the remaining static scales along the interstate facilities to WIMs. WIMs are beneficial in decreasing travel delays, reducing queuing on the interstate, and improving truck mobility by allowing trucks to approach and go through these stations at up to 45 mph, where they are electronically weighed and cleared. Alternate lanes are provided to 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 are the weave sections associated with the 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 2.8 and Figure 2.21 identify the locations of existing and planned WIMs along the intrastate facilities.

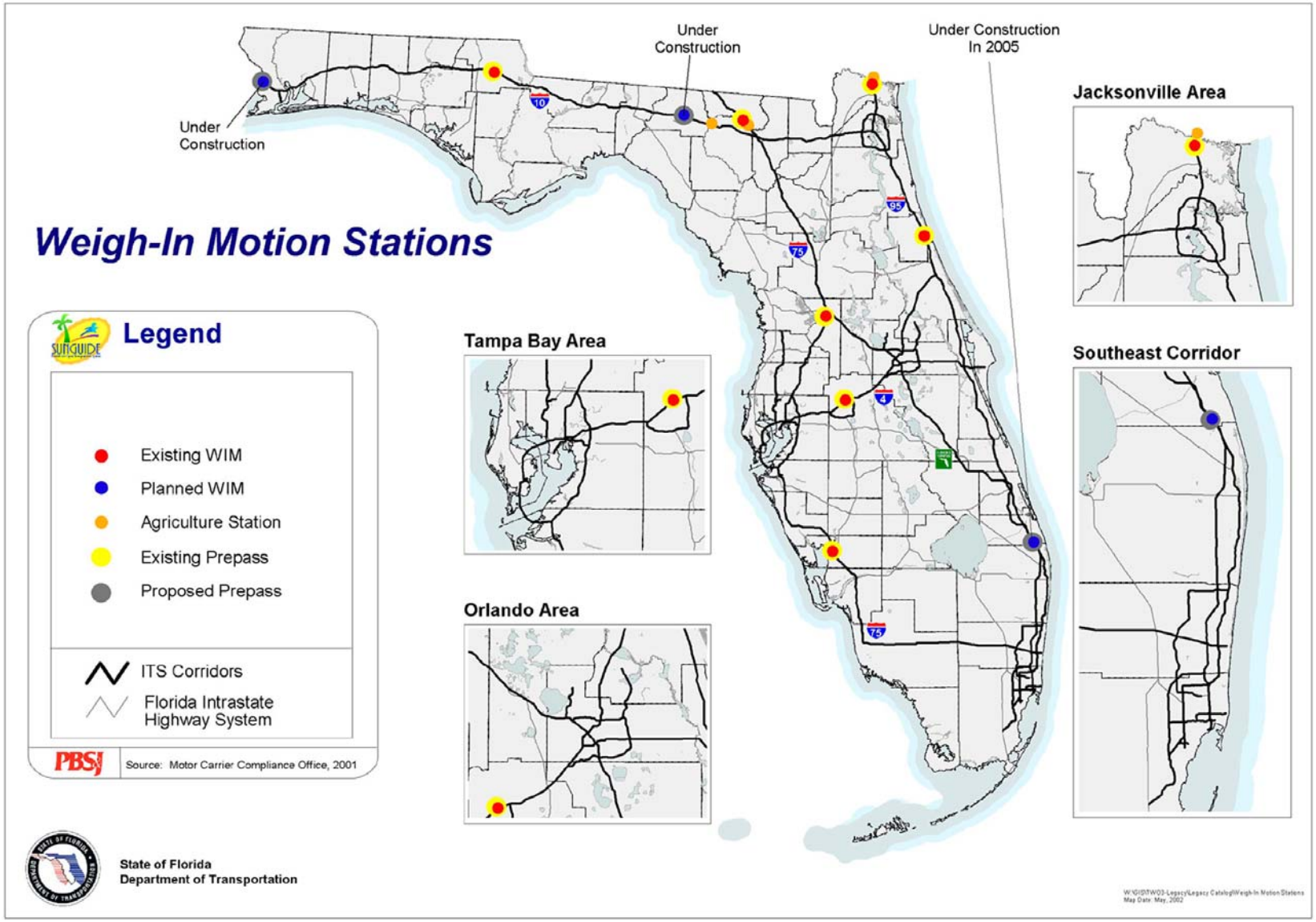
Table 2.8 – Weigh-in-Motion (WIM) Sites

Facility	County	Location	Status
I-10	Columbia	Ellaville	Planned (10/01)
I-10	Escambia	Pensacola	Planned (7/02)
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, 2001

CVO benefits from ITS are discussed further in the *Florida ITS Benefits* paper.

Figure 2.21 – Weigh-in-Motion (WIM) Stations



2.9 Evacuation Coordination Services

2.9.1 Emergency Diversion Routes

Emergency diversion routes were documented for the five principal FIHS limited-access facilities. These diversion routes were established to compliment the implementation of incident management systems (IMS). If the major corridors were closed due to an incident or natural disaster, the diversion routes would be marked with trailblazer signs to guide the detoured traffic around the incident and back to the major facility. The type and location of the trailblazer signs will be identified during the concept of operations phase of this study.

Where available, diversion routes for the major corridors were collected from the FDOT district offices and compiled in a statewide geographic information system (GIS) database. Several districts did not have diversion routes established for the major interstate corridors. In these instances, diversion routes were created for the purposes of this study. The methodology for creating the diversion routes included identifying continuous parallel facilities within a two- to three-mile distance from the study corridor that could be used as alternate routes in case of roadway closures along the primary facility. The emergency diversion routes for each corridor are contained in Appendix D of this report.

2.9.2 Reverse Lane Operational Plans

Florida has adopted an ITS strategy for evacuation coordination that involves the option of reversing general-use through lanes to create one-way facilities during an evacuation for a majority of the five principal FIHS limited-access corridors. 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, HAR, 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.

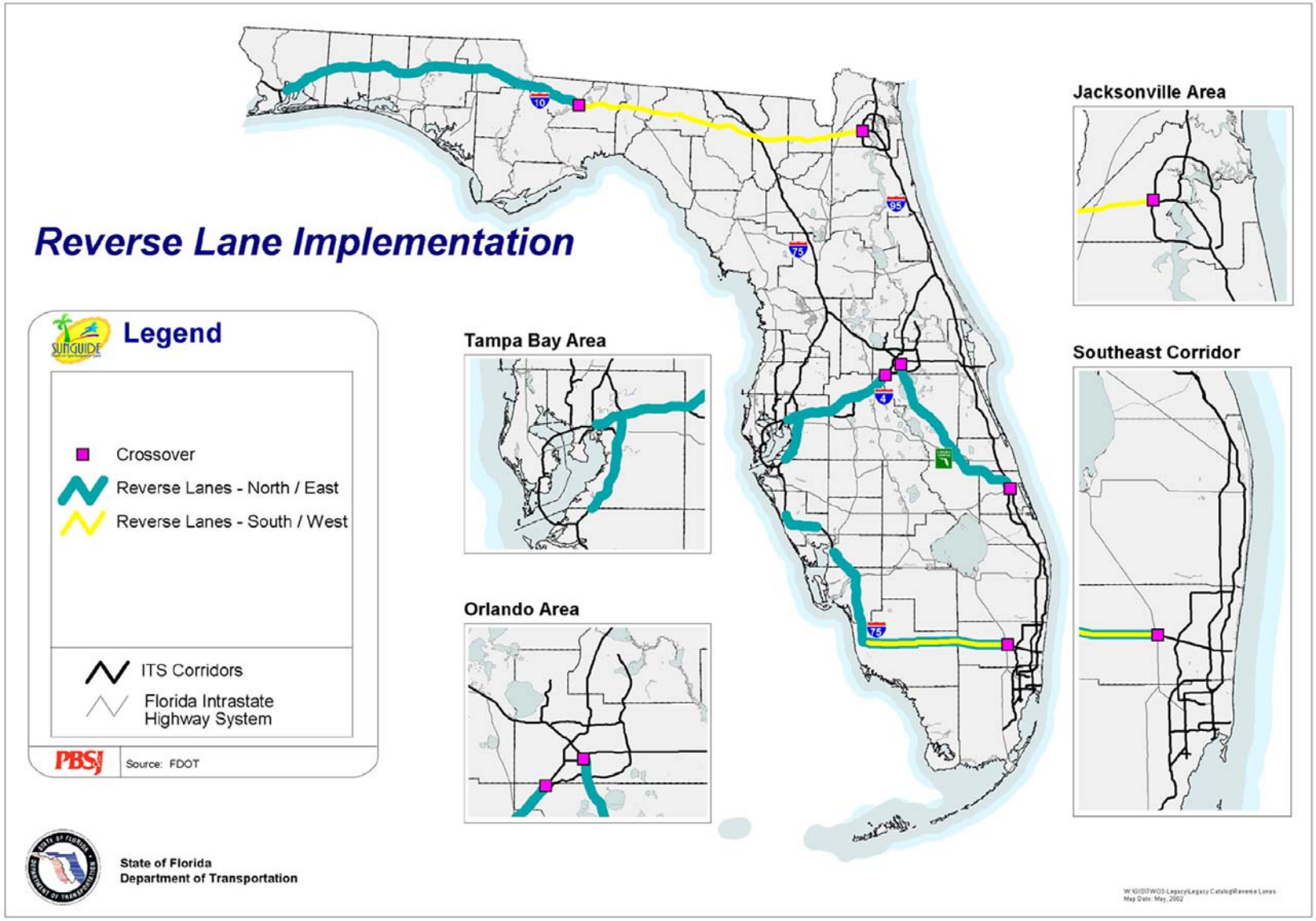
The Florida Highway Patrol (FHP) and FDOT are developing reverse lane operational plans for the five principal FIHS limited-access corridors; however, currently only seven locations have been documented and completed. The evacuation facilities and the type of plans are identified in Table 2.9 and shown in Figure 2.15.

Table 2.9 – 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

Figure 2.22 – Reverse Lane Implementation



2.10 Corridor Needs Assessment

This section will present a summary of multimodal transportation needs and issues documented in this technical memorandum. A more detailed discussion of the needs, issues, problems, and objectives is presented in *Technical Memorandum No. 2 – ITS Needs Model*. The corridor needs assessment presented in the *ITS Needs Model* will draw upon the data collection and analysis contained in this inventory of existing services and will be used to develop an initial concept of ITS deployments, or a "straw architecture" for the five principal FIHS limited-access corridors.

- Due to physical, environmental, and policy or financial constraints, construction of roadway capacity improvements cannot keep pace with forecasted travel demand.

- Population growth along the corridors is expected to increase at a faster rate in the suburban or transitional areas than in the urban areas.

- Employment and per capita income forecasts reveal an increase in commuter trips in the expanding metropolitan areas and more social and recreational trips in the rural areas.

- Interchange densities are greater along urban segments of the interstates, thus creating unsafe travel areas and potential crash situations.

- Several interchange modification improvements are programmed and planned along most of the major corridors and roadway widening projects are programmed and planned along all of the corridors, particularly in the rural areas, thus creating opportunities for leveraging ITS construction funding.

- The high volume of planned and programmed interstate construction can be mitigated with smart work zone management.

- Travel demand in the urban areas is anticipated to double by the year 2020.

- A high incidence of crashes occur at the major interstate-to-interstate interchanges and a direct correlation exists between rural interstate segments exhibiting high crash rates and interstate segments exhibiting high truck volumes.

- The highest concentration of tourist attractions within the state is located in the central Florida region along I-4, I-75, and I-95. Several public and private bus and rail transit agencies provide connection to and services along the major interstate corridors.

- The highest concentration of truck terminals and truck volumes occur along the corridors having direct access to airports, seaports, rail lines, and other intermodal facilities.

- WIM stations reduce queuing on the interstates and travel delays, while improving mobility for trucks.

- Districts 2, 4, 5, and 6 have established interoperable ITS programs and projects with operational traffic management centers (TMCs). Districts 1, 3, and 7 have identified several ITS programs for deployment and are in the process of implementing TMCs.

- Florida's Turnpike has recently upgraded their toll collection system to be interoperable with other expressway authority toll collection systems and is currently developing a more comprehensive ITS program,

- Road Ranger (RR) Service Patrols are located in the majority of the urban areas and also in a few rural areas.

3. Existing and Planned ITS Services

3.1 Existing, Programmed, and Planned Projects

A major objective identified in Florida's *ITS Strategic Deployment Prioritization Plan* was that each district develop an ITS infrastructure and initiate the development of or enhancement of a TMC focusing on the interstate highways. To that end, this section documents ITS activities along the interstate.

Information regarding existing, programmed, and proposed ITS projects was obtained from the FDOT districts, the *Adopted Five-Year Work Program*, and the *2025 Cost-Feasible Plan*. Figures 3.1 and 3.2 illustrate major ITS that currently exist in Florida and Figure 3.3 identifies projects in the *Ten-Year FIHS Cost-Feasible Plan*.

Also, as part of the *ITS Legacy Catalog*, TMCs were identified. The locations of these operational centers were physically identified for the purposes of coordinating/collocating the operations of future ITS deployments with the existing and planned operational centers and to evaluate the status of TMC deployments in each district.

The TMCs were derived from the *SITSA* and updated to reflect current conditions. The TMCs identified include FHP operational centers, FDOT district operational centers, emergency dispatch locations, transit operation centers, city and county traffic operational centers, and project specific TMCs. Table 3.1 identifies the TMC for each district by current status.

As identified in the table, in addition to the various agency operational centers, Districts 2, 5, 6, and 8 currently operate their own TMCs. Districts 4 and 7 currently have programmed TMCs and TMCs in Districts 1 and 3 are currently in the planning stages. Additionally, various project-related TMCs are operating within the districts and are maintained by or collocated with local or regional agencies.

Figure 3.1 – Florida's Major ITS

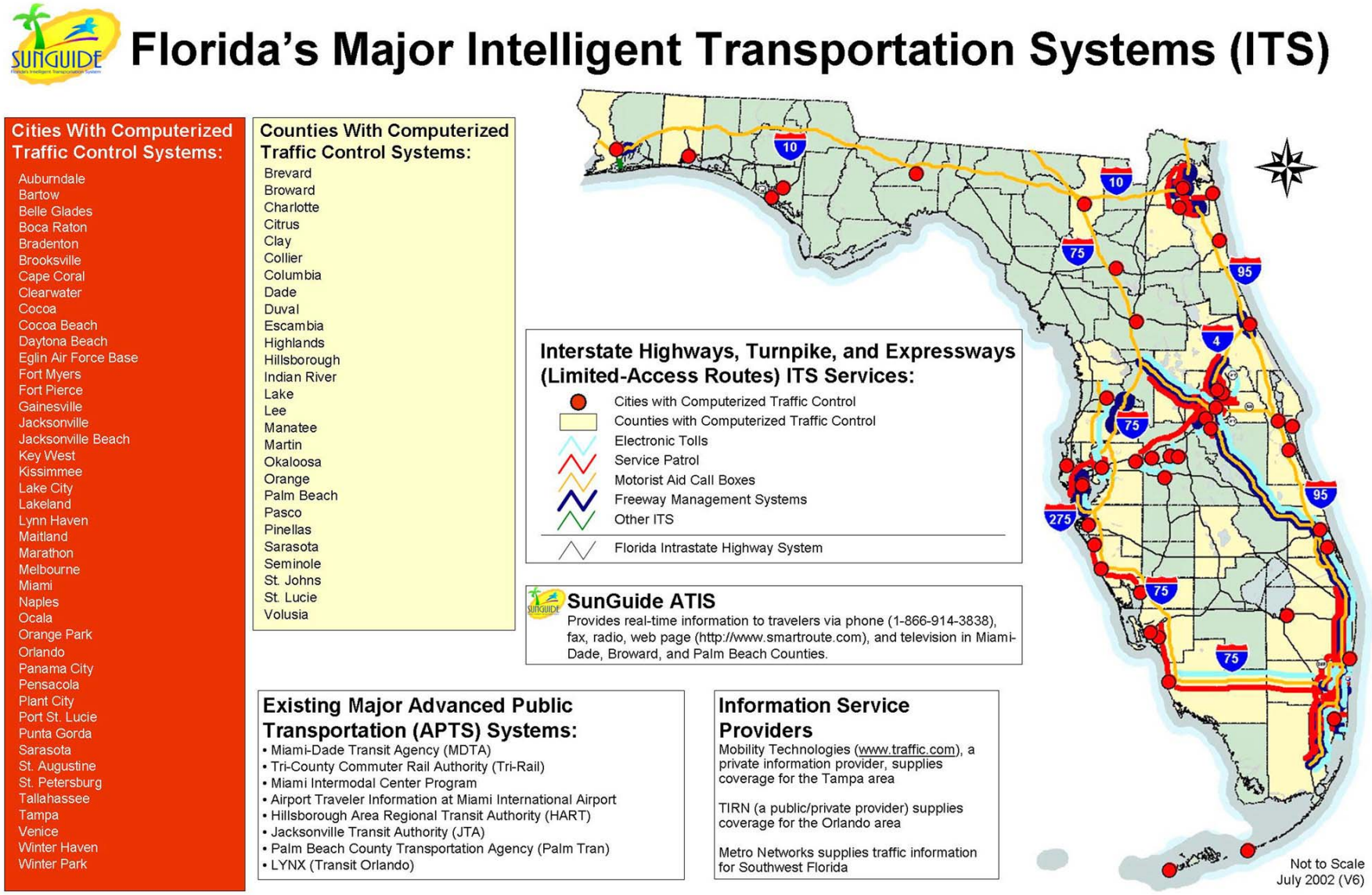


Figure 3.2 – Florida's Major ITS (Insets)

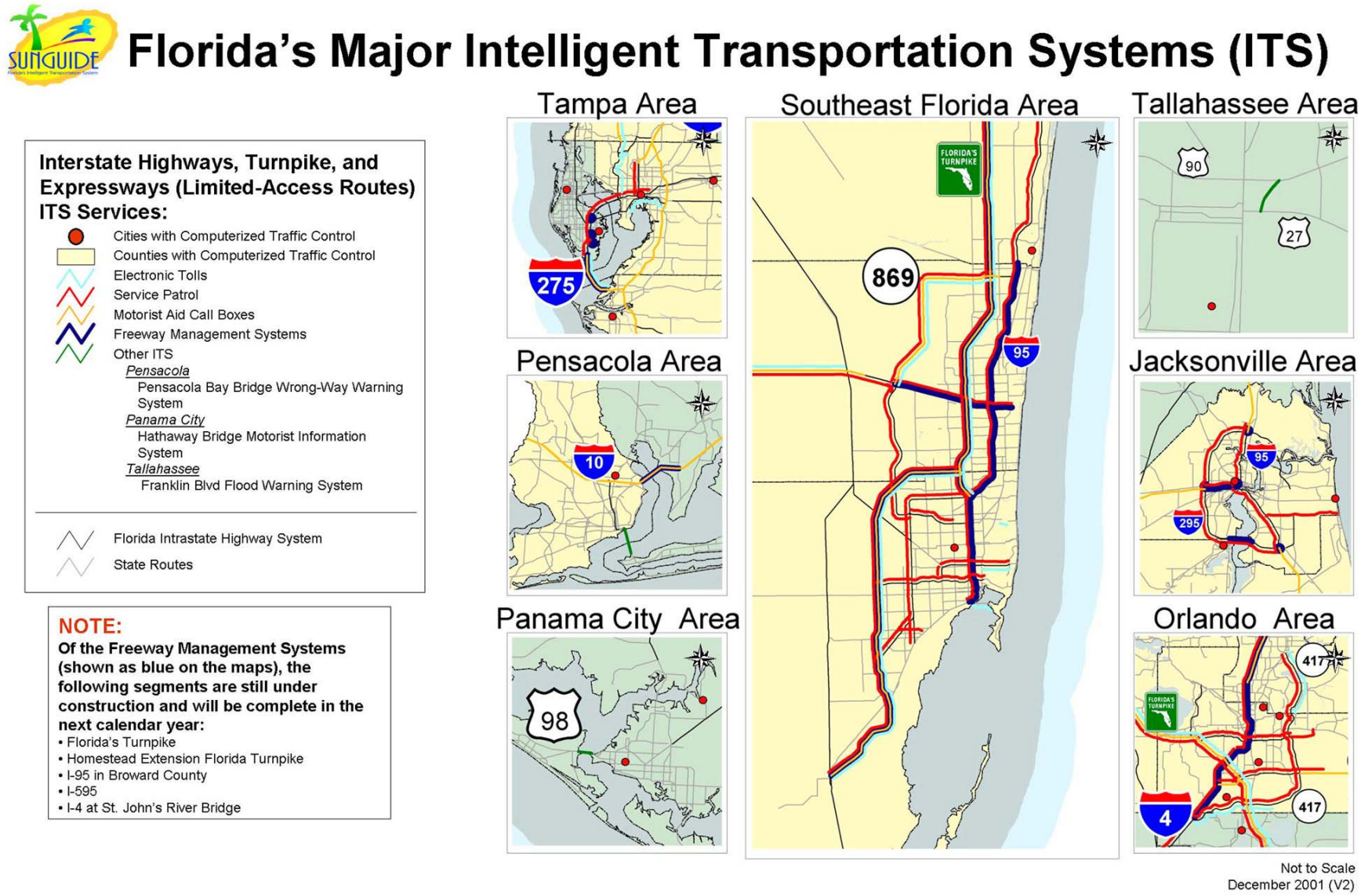


Figure 3.3 – Statewide *Ten-Year ITS Cost-Feasible Plan*

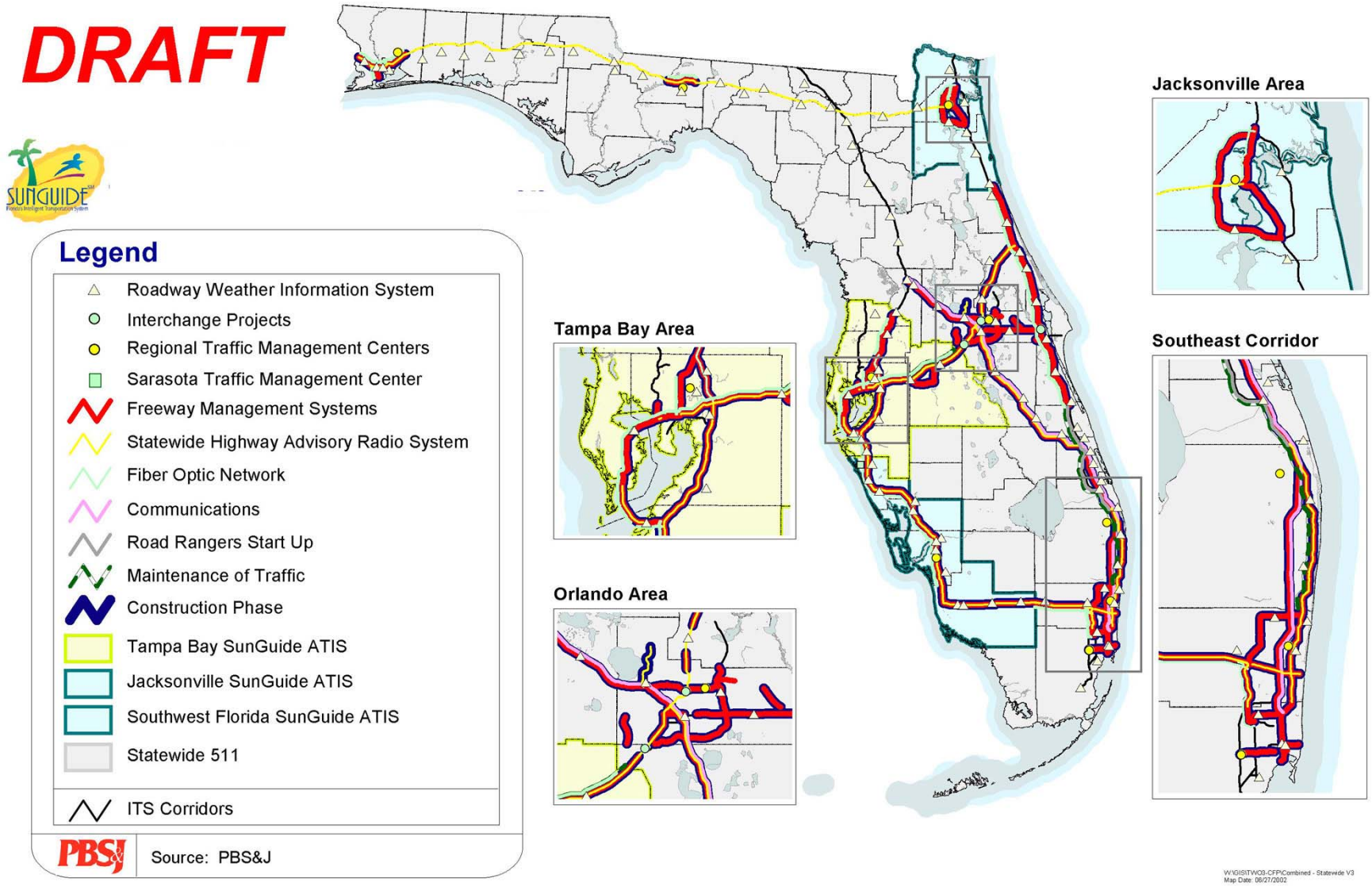


Table 3.1 – Traffic Management Centers (TMCs)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	EMC	1	CHARLOTTE COUNTY 911 DISPATCH	7474 UTILITIES ROAD PUNTA GORDA, FL 33982	33982
Existing	EMC	1	CITY OF PUNTA GORDA 911 DISPATCH	1410 TAMIAMI TRAIL PUNTA GORDA, FL 33950	33950
Existing	EMC	1	COLLIER COUNTY 911 DISPATCH	3301 EAST TAMIAMI TRAIL BUILDING J NAPLES, FL 33412	33412
Existing	EMC	1	LEE COUNTY 911 DISPATCH	14570 SIX MILE CYPRESS PKWY. FT.MYERS, FL 33912	33912
Existing	EMC	1	MANATEE COUNTY 911 DISPATCH	1112 MANATEE AVE WEST BRADENTON, FL 34205	34205
Existing	EMC	1	OKEECHOBEE COUNTY 911 DISPATCH	55 SOUTHWEST 3RD AVENUE OKEECHOBEE, FL 34205	34205
Existing	EMC	1	POLK COUNTY 911 DISPATCH	455 N. BROADWAY AVENUE BARTOW, FL 33830	33830
Existing	EMC	1	SARASOTA COUNTY 911 DISPATCH	1660 RINGLING BLVD SARASOTA, FL 34236	34236
Existing	TMC	1	CITY OF BRADENTON TRAFFIC CONTROL CENTER	1411 W. KNIGHT ST. BRADENTON, FL 32405	32405
Existing	TMC	1	CITY OF NAPLES TRAFFIC CONTROL SYSTEM	380 N. 13TH ST NAPLES, FL 34012	34012
Existing	TMC	1	CITY OF SARASOTA TRAFFIC CONTROL CENTER	P.O. BOX 1058 SARASOTA, FL 34230-1058	34230
Existing	TMC	1	CITY OF WINTER HAVEN TRAFFIC CONTROL CENTER	550 7TH ST N.W. WINTER HAVEN, FL 33883	33883
Existing	TMC	1	CHARLOTTE COUNTY TRAFFIC CONTROL CENTER	7000 FLORIDA ST PUNTA GORDA, FL 33950	33950
Existing	TMC	1	COLLIER COUNTY TRAFFIC CONTROL CENTER	2705 HORSESHOE DRIVE NAPLES, FL 34104	34104

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	1	LEE COUNTY TRAFFIC CONTROL CENTER	5650 ENTERPRISE PKWY FT.MYERS, FL 33905	33905
Existing	TMC	1	MANATEE COUNTY TRAFFIC CONTROL CENTER	1022 26TH AVE WEST BRADENTON, FL 34208	34208
Existing	TMC	1	SARASOTA COUNTY TRAFFIC CONTROL CENTER	100 CATTLEMEN ROAD SARASOTA, FL 34236	34236
Existing	TMC	1	CITY OF LAKELAND TRAFFIC CONTROL SYSTEM	E. ROSE ST LAKELAND, FL 33801-5042	3380
Existing	EMC	1	FHP TROOP F HEADQUARTERS	5203 53RD AVE EAST BRADENTON, FL 34203-0009	34203
Existing	TMC	1	DISTRICT HEADQUARTERS OFFICE	801 NORTH BROADWAY AVE BARTOW, FL 33830-1249	33830
Existing	TMC	1	DISTRICT URBAN AREA OFFICE	2295 VICTORIA AVE. SUITE 292 FORT MYERS, FL 33901	33901
Existing	TRNSI	1	LAKELAND AREA MASS TRANSIT (LAMTD) AGENCY	1212 GEORGE JENKINS BLVD LAKELAND, FL 33815	33815
Existing	TRNSI	1	LEE COUNTY TRANSIT (LEE TRAN) AGENCY	10715 E. AIRPORT ROAD FT. MYERS, FL 33907	33907
Existing	TRNSI	1	MANATEE COUNTY AREA TRANSIT (MCAT) AGENCY	1108 26TH AVE. EAST BRADENTON, FL 34208	34208
Existing	TRNSI	1	SARASOTA COUNTY AREA TRANSIT (SCAT) AGENCY	5303 PINCKNEY AVE. SARASOTA, FL 34233	34233
Existing	TMC	1	TRAFFIC OPERATIONS MONITORING CENTER (BARTOW)	801 NORTH BROADWAY AVE BARTOW, FL 33830-1249	33830
Planned	TMC	1	SARASOTA SATELLITE TRAFFIC MANAGEMENT CENTER	1840 61ST STREET SARASOTA, FL 34243-2233	34243

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Planned	TMC	1	FT.MYERS REGIONAL COMMUNICATION CENTER	4700 TERMINAL DRIVE FT.MYERS, FL 33907	33907
Planned	RTMC	1	FT.MYERS REGIONAL TRAFFIC MANAGEMENT CENTER	4700 TERMINAL DRIVE FT.MYERS, FL 33907	33907
Planned	TRNSI	1	COLLIER COUNTY TRANSIT AGENCY	2685 HORSESHOE DRIVE, SUITE #211 NAPLES, FL 34104	34104
Existing	EMC	2	ALACHUA COUNTY 911 DISPATCH	2621 SE HAWTHORNE ROAD GAINESVILLE, FL 32641	32641
Existing	EMC	2	COLUMBIA COUNTY 911 DISPATCH	263 N.W. LAKE CITY AVE LAKE CITY, FL 32055	32055
Existing	EMC	2	DUVAL COUNTY 911 DISPATCH	501 EAST BAY ST. JACKSONVILLE, FL 32052	32052
Existing	EMC	2	HAMILTON COUNTY 911 DISPATCH	3995 COUNTY RD 51 JASPER, FL 32052	32052
Existing	EMC	2	MADISON COUNTY 911 DISPATCH	901 SOUTHWEST PICKNEY MADISON, FL 32340	32340
Existing	EMC	2	NASSAU COUNTY OF 911 DISPATCH	50 BOBBY MOORE CIRCLE YULEE, FL 32097	32097
Existing	EMC	2	ST.JOHNS COUNTY 911 DISPATCH	4015 LEWIS SPEEDWAY ST. AUGUSTINE, FL 32095	32095
Existing	EMC	2	SUWANNEE COUNTY 911 DISPATCH	200 SOUTH OHIO AVENUE LIVE OAK, FL 32060	32060
Existing	TMC	2	CITY OF GAINESVILLE TRAFFIC CONTROL CENTER	P.O.BOX 409-17 GAINESVILLE, FL 32602	32602
Existing	TMC	2	CITY OF JACKSONVILLE TRAFFIC CONTROL CENTER	1007 SUPERIOR ST JACKSONVILLE, FL 32254	32254
Existing	TMC	2	CITY OF LAKE CITY TRAFFIC CONTROL CENTER	P.O.BOX 1687 LAKE CITY, FL 32056	32056

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	2	ST. AUGUSTINE TRAFFIC CONTROL CENTER	4020 LEWIS SPEEDWAY ST. AUGUSTINE, FL 32085	32085
Existing	TMC	2	CLAY COUNTY TRAFFIC CONTROL CENTER	5 ESTALANADE AVE MIDDLEBURG, FL 32043	32043
Existing	EMC	2	FHP TROOP B HEADQUARTERS (1)	2402 US 90 WEST LAKE CITY, FL 32055	32055
Existing	EMC	2	FHP TROOP G HEADQUARTERS/ TRAFFIC MANAGEMENT CENTER	7322 NORMANDY BLVD JACKSONVILLE, FL 32205	32205
Existing	TMC	2	DISTRICT 2 HEADQUARTERS OFFICE / LAKE CITY VIRTUAL TMC	1901 SOUTH MARION ST LAKE CITY, FL 32025-1089	32025
Existing	RTMC	2	JACKSONVILLE REGIONAL/TRAFFIC MANAGEMENT CENTER	2350 IRENE STREET JACKSONVILLE, FL 32204	32204
Existing	TRNSI	2	JACKSONVILLE TRANSPORTATION AUTHORITY (JTA) AGENCY	100 NORTH MYRTLE AVE POST OFFICE DRAWER"O" JACKSONVILLE, FL 32203	32203
Existing	TMC	2	GAINESVILLE REGIONAL TRANSIT AUTHORITY	100 SE 10TH AVE GAINESVILLE, FL 32602	32602
Existing	RTMC	2	JACKSONVILLE REGIONAL COMMUNICATION CENTER	921 NORTH DAVIS STREET BUILDING E JACKSONVILLE, FL 32209	32209
Existing	EMC	3	ESCAMBIA COUNTY 911 DISPATCH	1700 W.LEONARD ST. PENSACOLA, FL 32523	32523
Existing	EMC	3	GADSDEN COUNTY 911 DISPATCH	2135 PAT THOMAS PARKWAY QUINCY, FL 32351	32351
Existing	EMC	3	HOLMES COUNTY 911 DISPATCH	211 NORTH OKLAHOMA STREET BONIFAY, FL 32425	32425
Existing	EMC	3	JEFFERSON COUNTY 911 DISPATCH	171 INDUSTRIAL PARK MONTICELLO, FL 32344	32344

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	EMC	3	LEON COUNTY 911 DISPATCH	2825 MUNICIPAL WAY TALLAHASSEE, FL 32304	32304
Existing	EMC	3	OSKALOOSA COUNTY 911 DISPATCH	2110 PJ ADAMS PKWY CRESTVIEW, F L 32536	32536
Existing	EMC	3	SANTA ROSA COUNTY 911 DISPATCH	5755 EAST MILTON ROAD MILTON, FL 32570	32570
Existing	EMC	3	WALTON COUNTY 911 DISPATCH	72 NORTH 6TH STREET DE FUNIAK SPRINGS, FL 32433	32433
Existing	EMC	3	WASHINGTON COUNTY 911 DISPATCH	1293 JACKSON AVE BLDG 400 CHIPLEY, FL 32428	32428
Existing	EMC	3	FHP TROOP A HEADQUARTERS	6050 WEST U.S. 98 PANAMA CITY, FL 32401	32401
Existing	EMC	3	FHP TROOP H HEADQUARTERS	2100 MAHAN DRIVE TALLAHASSEE, FL 32308	32308
Existing	TMC	3	DISTRICT 3 HEADQUARTERS	U.S. HIGHWAY 90 EAST CHIPLEY, FL 32428-0607	32428
Existing	TMC	3	DISTRICT 3 URBAN AREA OFFICE	1101 GULF BREEZE PKWY SUITE # 15 GULF BREEZE, FL 32561	32561
Existing	TMC	3	FDOT CENTRAL OFFICE	605 SUWANNEE ST TALLAHASSEE, FL 32399-0450	32399
Existing	TRANSI	3	BAY COUNTY COUNCIL ON AGING TRANSIT AGENCY	1116 FRANKFURT AVENUE PANAMA CITY, FL 32401	32401
Existing	TRANSI	3	ESCAMBIA COUNTY AREA TRANSIT AGENCY (ECAT)	1515 WEST FAIRFIELD DR. PENSACOLA, FL 32501	32501
Existing	TRANSI	3	TALLAHASSEE TRANSIT (TALTRAN) AGENCY	555 APPLEYARD DR. TALLAHASSEE, FL 32304	32304
Existing	TMC	3	CITY OF TALLAHASSEE TRAFFIC CONTROL CENTER	CITY HALL, 300 SOUTH ADAMS ST. TALLAHASSEE, FL 32501	32501

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	3	ESCAMBIA COUNTY TRAFFIC CONTROL CENTER	1190 WEST LEONARD ST. PENSACOLA, FL 32521-0087	32521
Existing	TMC	3	CITY OF PENSACOLA TRAFFIC CONTROL CENTER	150 STUMPFIELD ROAD, PENSACOLA, FL 32503	32503
Existing	TMC	3	PANAMA CITY TRAFFIC CONTROL CENTER	P.O.BOX 15729 PANAMA CITY, FL 32406-5729	32406
Planned	TMC	3	TALLAHASSEE REGIONAL COMMUNICATION CENTER	131 GADSDEN ST TALLAHASSEE, FL 32301-1507	32301
Planned	RTMC	3	TALLAHASSEE REGIONAL TRAFFIC MANAGEMENT CENTER /SEOC	CAPITAL CIRCLE OFFICE COMPLEX TALLAHASSEE, FL 32301	32301
Programmed	TMC	3	PENSACOLA SATELLITE TRAFFIC MANAGEMENT CENTER	6025 OLD BAGDAD HWY MILTON, FL 32583-8970	32583
Programmed	RTMC	4	BROWARD COUNTY ITS OPERATIONS FACILITY	2300 W. COMMERCE BLVD. FT. LAUDERDALE, FL 33309	33309
Existing	EMC	4	BROWARD COUNTY 911 DISPATCH	2601 W. BROWARD BLVD. FORT LAUDERDALE, FL 33312	33312
Existing	EMC	4	INDIAN RIVER COUNTY 911 DISPATCH	4055 41ST AVENUE VERO BEACH, FL 32960-1808	32960
Existing	EMC	4	MARTIN COUNTY 911 DISPATCH	800 SE MONTEREY ROAD STUART, FL 32499-44507	32499
Existing	EMC	4	PALM BEACH COUNTY 911 DISPATCH	3228 GUN CLUB ROAD WEST PALM BEACH, FL 33406	33406
Existing	EMC	4	ST.LUCIE COUNTY 911 DISPATCH	4700 WEST MIDWAY ROAD FT.PIERCE, FL 34981	34981
Existing	TMC	4	BROWARD COUNTY TRAFFIC CONTROL CENTER	2300 W. COMMERCE BLVD FT. FORT LAUDERDALE, FL 33309	33309
Existing	TMC	4	ST. LUCIE COUNTY TRAFFIC CONTROL CENTER	3071 OLEANDER AVE FT.PIERCE, FL 34982	34982

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	4	MARTIN COUNTY TRAFFIC CONTROL CENTER	2401 SE MONTEREY ROAD STUART, FL 34996	34996
Existing	EMC	4	FHP TROOP L HEADQUARTERS	1299 WEST LANTANA ROAD LANTANA, FL 33465	33465
Existing	EMC	4	FHP TROOP K HEADQUARTERS	P.O. BOX 16007 WEST PALM BEACH, FL 33416	33416
Existing	TMC	4	DISTRICT 4 HEADQUARTERS	3400 W. COMMERCE BLVD FT. LAUDERDALE, FL 33309	33309
Existing	TRNSI	4	BROWARD COUNTY TRANSIT AGENCY (BCT)	3201 WEST COPANS RD. POMPANO BEACH, FL 33609	33609
Existing	TRNSI	4	TRI-COUNTY COMMUTER RAIL AUTHORITY (TRI-RAIL) AGENCY	800 N.W. 33RD ST. SUITE # 100 POMPANO BEACH, FL 33064	33064
Existing	TMC	4	PALM BEACH COUNTY TRAFFIC CONTROL CENTER	3201 ELECTRONICS WAY WEST PALM BEACH, FL 33407	33407
Planned	RTMC	4	PALM BEACH COUNTY ITS OPERATIONS FACILITY	I-95 AND PGA BOULEVARD	
Planned	TMC	4	TURNPIKE OPERATIONS CENTER (Pompano)	TURNPIKE OPERATION CENTER M.P. 65 POMPANO BEACH, FL 33069	33609
Existing	TRNSI	4	PALM BEACH COUNTY TRANSPORTATION AUTHORITY	3201 ELECTRONICS WAY WEST PALM BEACH, FL 33407	33407
Existing	EMC	5	FLAGLER COUNTY 911 DISPATCH	1001 JUSTICE LANE BUNNELL, FL 32110	32110
Existing	EMC	5	MARION COUNTY 911 DISPATCH	692 N.W. 30TH AVE OCALA, FL 34475	34475
Existing	EMC	5	ORANGE COUNTY 911 DISPATCH	6950 AMORY COURT WINTER PARK, FL 32792	32792

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	5	CITY OF DAYTONA BEACH TRAFFIC MANAGEMENT CENTER (TMC):	950 BELLEVUE AVE. DAYTONA BEACH, FL 32114-5108	32114
Planned	TMC	5	FDOT DISTRICT 5 DELAND OFFICE: VITRUAL TMC	719 S. WOODLAND BLVD. DELAND, FL 32720-6834	32720
Existing	EMC	5	DAYTONA BEACH POLICE DISPATCH AND COMMUNICATIONS CENTER: DASH SECONDARY CONTROL CENTER	990 ORANGE AVE. DAYTONA BEACH, FL 32114-4666	32114
Existing	TMC	5	SEMINOLE COUNTY TRAFFIC ACTION CENTER (SEMTAC)	140 BUSH LOOP SANFORD, FL 32773-6701	32773
Existing	TMC	5	CITY OF ORLANDO TRAFFIC MANAGEMENT CENTER (TMC):	35 W. CENTRAL AVE. ORLANDO, FL 32801-2403	32801
Existing	TMC	5	ORANGE COUNTY TRAFFIC OPERATIONS CENTER (OCTOC)	4400 JOHN YOUNG PKWY. ORLANDO, FL 32804-1939	32804
Existing	TRNSI	5	ORLANDO ORANGE COUNTY EXPRESSWAY AUTHORITY HEADQUARTERS	525 S. MAGNOLIA AVE. ORLANDO, FL 32801-3705	32801
Existing	TMC	5	DISNEY/REEDY CREEK IMPROVEMENT DISTRICT FACILITY ASSEST MANAGEMENT CENTER (FAMC)	3401 VISTA BLVD. LK. BUENA VISTA	32821
Existing	EMC	5	BREVARD COUNTY 911 DISPATCH	700 PARK AVENUE TITUSVILLE, FL 32780-4095	32780
Existing	EMC	5	SEMINOLE COUNTY 911 DISPATCH	100 BUSH BLVD. SANFORD, FL 32773	32773
Existing	EMC	5	SUMTER COUNTY 911 DISPATCH	219 E. ANDERSON ST. BUSHNELL, FL 33513	33513
Existing	EMC	5	VOLUSIA COUNTY 911 DISPATCH	59 KEYTON ROAD DAYTONA BEACH, FL 32124	32124
Existing	EMC	5	FHP TROOP D HEADQUARTERS	5200 EAST COLONIAL DRIVE ORLANDO, FL 32807-1815	32807

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	5	DISTRICT URBAN AREA OFFICE	133 S. SEMORAN BLVD ORLANDO, FL 32807	32807
Existing	RTMC	5	ORLANDO REGIONAL TRAFFIC MANAGEMENT CENTER	133 S. SEMORAN BLVD ORLANDO, FL 32807	32807
Existing	TRNSI	5	SPACE COAST AREA TRANSIT (SCAT) AGENCY	401 S. VARR AVE COCOA, FL 32922	32922
Existing	TRNSI	5	VOLUSIA COUNTY TRNSIT AGENCY (VOTRAN)	950 BIG TREE ROAD SOUTH DAYTONA, FL 32119	32119
Existing	TMC	5	VOLUSIA COUNTY TRAFFIC MANAGEMENT CENTER	123 W. INDIANA AVE DELAND, FL	32720
Existing	TMC	5	BREVARD COUNTY TRAFFIC OPERATIONS CENTER	580 MANOR DRIVE MERRITT ISLAND, FL	32952
Existing	TMC	5	CITY OF MELBOURNE TRAFFIC OPERATIONS CENTER	2725 JUDGE FRAN JAMIESON WAY MELBOURNE, FL	32940
Existing	TMC	5	OCALA TRAFFIC MANAGEMENT CENTER	137 NW 4TH AVE OCALA, FL	34475
Planned	TMC	5	TURNPIKE OPERATIONS CENTER (TURKEY LAKE)	TURKEY LAKE PLAZA M.P. 263, BLDG 5315 P.O.BOX 613069 OCOEE, FL 34761	34761
Existing	TMC	5	WINTER PARK TRAFFIC OPERATIONS CENTER	133 S. SEMORAN BLVD. ORLANDO, FL 32807	32807
Existing	TRNSI	5	CENTRAL FLORIDA REGIONAL TRANSPORTATION CENTER (LYNX)	445 W. AMELIA ST. SUITE # 800 ORLANDO, FL 32801-1128	32801
Existing	TMC	5	ORLANDO REGIONAL COMMUNICATION CENTER	133 S. SEMORAN BLVD. ORLANDO, FL 32807	32807
Existing	EMC	6	MIAMI-DADE COUNTY 911 DISPATCH	5680 S.W. 87TH AVE. MIAMI, FL 33173	33173

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	EMC	6	MONROE COUNTY 911 DISPATCH	3103 OVERSEAS HIGHWAY MARATHON, FL 33050	33050
Existing	EMC	6	MIAMI-DADE COUNTY TRAFFIC CONTROL CENTER	7100 N.W. 36TH ST MIAMI, FL 33166	33166
Existing	EMC	6	FHP TROOP E HEADQUARTERS	1011 NW 111th AVE MIAMI, FL 33172	33172
Existing	RTMC	6	DISTRICT HEADQUARTERS OFFICE / MIAMI REGIONAL TRAFFIC MANAGEMENT CENTER	1000 N.W. 111th Avenue MIAMI, FL 33172	33172
Existing	TRNSI	6	MIAMI-DADE TRANSIT AGENCY (MDTA)	111 N.W. FIRST ST., SUITE # 910 MIAMI, FL 33128	33128
Existing	TMC	6	SUNGUIDE SMART ROUTE TRAFFIC OPERATION CENTER	1111 PARK CENTER BOULEVARD MIAMI, FL 33138	33138
Planned	TMC	6	MIAMI-DADE EXPRESSWAY AUTHORITY	3790 NW 23RD ST MIAMI, FL 33142	33142
Programmed	RTMC	6	MIAMI REGIONAL TRAFFIC MANAGEMENT CENTER	1000 N.W. 111TH AVENUE MIAMI, FL 33172	33172
Existing	TRNSI	6	TRI-COUNTY COMMUTER RAIL AUTHORITY (TRI-RAIL) AGENCY	1200 SOUTHEAST 11TH AVENUE, HIALEAH, FL 33172	33172
Existing	EMC	7	PINELLAS COUNTY 911 DISPATCH	10750 ULMERTON ROAD LARGO, FL 33779	33779
Existing	EMC	7	PASCO COUNTY 911 DISPATCH	8744 GOVERNMENT DRIVE NEW PORT RICHEY, FL 34652	34652
Existing	EMC	7	HILLSBOROUGH COUNTY 911 DISPATCH	P.O.BOX 3371 TAMPA, FL 33601	33601
Existing	EMC	7	HERNANDO COUNTY 911 DISPATCH	18990 CORTEZ BLVD. BROOKSVILLE, FL 34603	34603
Existing	TMC	7	HERNANDO COUNTY TRAFFIC MANAGEMENT CENTER	20 N. MAIN STREET BROOKSVILLE, FL	34601

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	EMC	7	CITRUS COUNTY 911 DISPATCH	3425 W. SOUTHERN ST. LECANTO, FL 34460	34460
Existing	TMC	7	HILLSBOROUGH COUNTY TRAFFIC CONTROL CENTER	601 E. KENNEDY BLVD. TAMPA, FL 33602-4156	33602
Existing	TRANSI	7	HILLSBOROUGH COUNTY TRANSIT (HARTLINE) OPERATIONS CENTER	4301 21ST AVE. E. TAMPA, FL 33605-2311	33605
Existing	TMC	7	CITY OF TAMPA TRAFFIC CONTROL CENTER	306 E. JACKSON ST. TAMPA, FL 33602-5208	33602
Existing	TMC	7	CITY OF ST. PETERSBURG TRAFFIC CONTROL CENTER	1744 NINTH AVE. N. ST. PETERSBURG, FL 33605-3802	33605
Existing	EMC	7	ST. PETERSBURG POLICE STATION (I-275 DMS) CONTROL CENTER	1300 1ST AVE. N. ST. PETERSBURG, FL 33705-1509	33705
Existing	TMC	7	SUNSHINE SKYWAY TOLL PLAZA CONTROL CENTER	7195 34TH ST. S. ST PETERSBURG, FL 33711-4902	33711
Existing	TMC	7	PINELLAS CO. TRAFFIC MANAGEMENT CENTER	22211 US 19 N BLDG10 CLEARWATER, FL 33756	33756
Existing	TRANSI	7	PINELLAS SUNCOAST TRANSIT AUTHORITY (PSTA)	14840 49TH ST. N. CLEARWATER, FL 33762	33762
Existing	TMC	7	CITY OF CLEARWATER TRAFFIC CONTROL CENTER	112 S. OSCEOLA AVE. CLEARWATER, FL 33756-5103	33756
Existing	TMC	7	FDOT DISTRICT 7 HEADQUARTERS	11201 N. MALCOLM MCKINLEY DR. TAMPA, FL 33612-6403	33612
Existing	EMC	7	FHP TROOP C HEADQUARTERS	11305 N. MALCOLM MCKINLEY DR. TAMPA, FL 33612-6403	33612
Existing	TMC	7	PASCO COUNTY TRAFFIC CONTROL CENTER	7530 LITTLE ROAD NEW PORT RICHEY, FL	34643
Existing	TMC	7	PLANT CITY TRAFFIC CONTROL CENTER	P.O.BOX C PLANT CITY, FL	33564

Table 3.1 (Continued)

STATUS	NOTE	DISTRICT	DESCRIPTION	LOCATION	ZIP CODE
Existing	TMC	8	SUNPASS TOLL OPERATIONS CENTER	7941 GLADES ROAD BOCA RATON, FL 33434	33434
Programmed	RTMC	8	POMPANO TURNPIKE REGIONAL TRAFFIC MANAGEMENT CENTER	TURNPIKE OPERATION CENTER M.P. 65 POMPANO BEACH, FL 33069	33609
Existing	RTMC	8	TURKEY LAKE TURNPIKE REGIONAL TRAFFIC MANAGEMENT CENTER	TURKEY LAKE SERVICE PLAZA M.P. 263, BLDG 5315 P.O.BOX 613069 OCOEE, FL 34761	34761
Programmed	TMC	8	TURNPIKE DISTRICT OFFICE	TURNPIKE MILE POST 263 OCOEE, FL 34746	34746

Source: FDOT

3.2 Communications Networks

3.2.1 Microwave Tower Locations

FDOT has deployed a microwave wireless communications system along the interstate and Turnpike corridors for the motorist aid call box system. Microwave tower structures are spaced sporadically along the study corridors, providing connectivity. This system is a digital DS-3 system, with a bandwidth capacity equivalent to 28 T-1 circuits (28*1.5436 Mbps = 43.22 Mbps). Presently, a policy has not been established that allows for part of this capacity to be shared with FDOT districts for communications to support ITS applications. Figure 3.4 illustrates the tower locations.

3.2.2 Proposed Fiber Optic Network (FON)

FDOT is currently considering a public-private partnership for the development of a 2200-mile fiber optic network (FON) along the five principal FIHS limited-access corridors. The agreement would provide right-of-way to a lessee in exchange for the provision of a 48-strand FON. At this point in time, FDOT cannot fully commit to the implementation of the fiber project.

3.3 Telemetry Traffic Monitoring Sites (TTMS)

In addition to the existing and proposed communications network, FDOT collects continuous traffic data through its TTMS. TTMS are automatic traffic recorders that are permanently placed at specific locations throughout the state to record the distribution and variation of traffic flow. Figure 3.5 illustrates TTMS locations. Florida's continuous count program is comprised of over 200 sites. FDOT also coordinates with local jurisdictions to obtain additional data from their permanent count stations, expanding the FDOT's database to over 300 sites.

Inductive loop detectors are embedded in the roadway to read traffic data. A single loop is necessary to collect traffic volume data and speed data in free-flow conditions. Two loops and an axle sensor are required to collect vehicle classification data and two loops with a weight sensor are used to collect weight data. Two loops are also required to collect speed data under stop-and-go conditions. The data is transmitted from and to the FDOT TranStat Office primarily via telephone lines. A few sites use cellular dial-up services. FDOT's goal is to integrate the TTMS data collection system with existing and planned ITS deployments to maximize the cost-efficiency of communications networks and data archiving services.

Figure 3.4 – Microwave Tower Locations

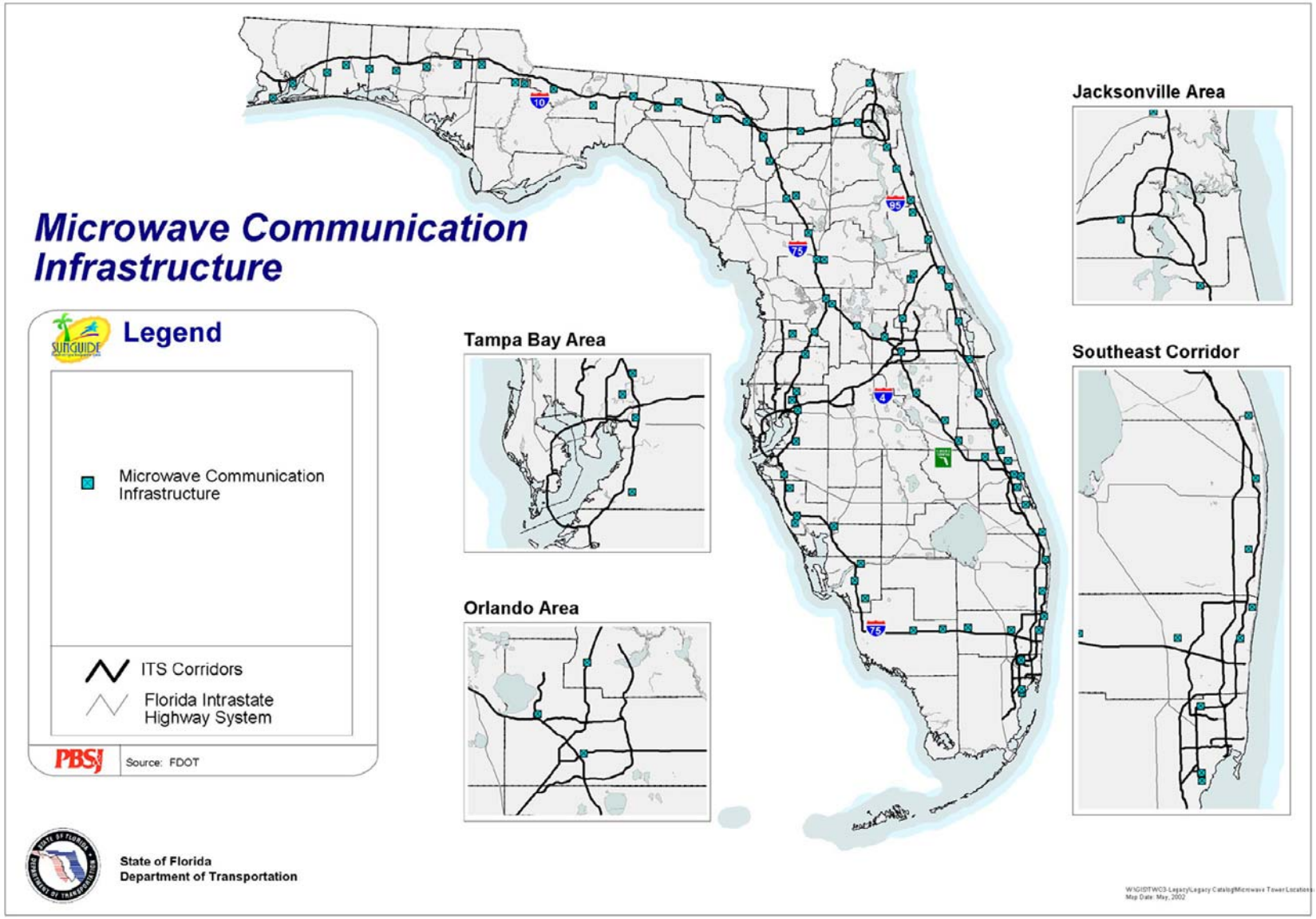
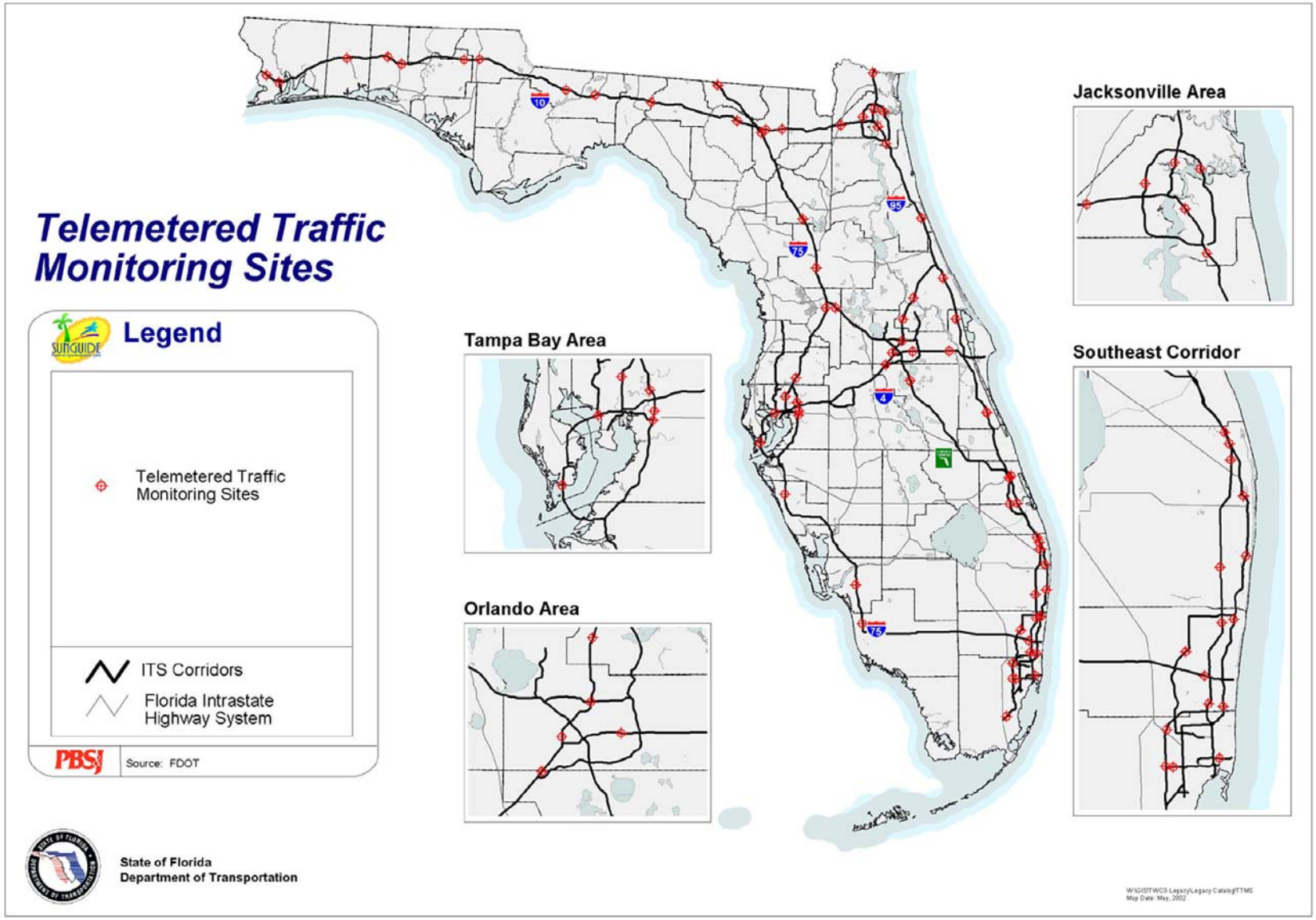


Figure 3.5 – Telemetered Traffic Monitoring Sites



3.4 Institutional Agreements

A critical element of the ITS inventory is identifying existing institutional agreements among agencies addressing ITS services or deployments. These agreements can extend over local, regional, and statewide jurisdictions and usually fall into three categories:

- Planning or study of ITS services;
- Construction, design, operation, and management of ITS; and
- Exchange of data collected by ITS.

Several of these types of agreements currently exist along the corridors. These agreements are outlined below.

3.4.1 District Two

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 operations 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.

3.4.2 District Three

Memorandum of Understanding (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, operations, and maintenance of the advanced traffic management system (ATMS) and fiber optic communications plant. District 3 will design and construct the FON and plant ATMS, 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 Florida Fiber Network (FFN).

3.4.3 District Four

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 ITS Operations Center will monitor and operate the changeable message signs (CMS) for I-95 and I-595, the Broward County signal system, and will be expandable for other ITS services implemented in the county.

3.4.4 District Five

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 variable message signs (VMS) and CCTV cameras.

I-4 Surveillance and Motorist Information System (SMIS) – I-4 SMIS currently provides traffic surveillance, incident management, and traveler information along 39 miles of I-4 from U.S. 192 to north of Lake Mary Boulevard. I-4 SMIS is a partnership between FDOT District 5, the City of Orlando, Seminole County, Orange County, and LYNX. District 5 operates and maintains I-4 SMIS, including the primary control center at the FDOT Regional Freeway Management Center. As with DASH, District 5 headquarters in Deland has a dial-up connection to review data and control the VMS and CCTV cameras, if required. The City of Orlando operates the secondary control center at its TMC. Real-time data from the I-4 SMIS are used by the City of Orlando, Seminole County, and Orange County to adjust signal timings to accommodate conditions along its I-4 express bus routes and provide traffic information to its riders. District 5 and LYNX are co-sponsoring a service patrol (I-4 Highway Helpers) along portions of I-4 near Orlando (from Lake Mary Boulevard to Fairbanks Avenue). The Orlando Police and Fire Department and the FHP, which is collocated at the FDOT Freeway Management Center, use I-4 SMIS data to dispatch response vehicles to verified incident locations. Agreements also have been reached with ABC, Fox, and NBC affiliates for broadcasting of the CCTV images.

I-4 SMIS Between FDOT and the Orlando Orange County Expressway Authority (OOCEA) – An additional agreement has been initiated between FDOT District 5 and OOCEA to share the FON on SR 408 between SR 436 and I-4 and to maintain and operate the OOCEA data feeds as part of the I-4 SMIS. District 5 will operate and maintain the OOCEA data feeds from the Orlando Regional Traffic Center and will agree to train the OOCEA data feeds operator in exchange for the use of the fiber optic communications on SR 408 as installed and maintained by the OOCEA.

Similar agreements are also being initiated for the OOCEA portions of SR 528 (Bee Line Expressway) and the Turnpike between SR 408 and SR 429.

Orlando Regional Computerized Signal System MOU – This regional computerized signal system is a computerized signal control system that covers Seminole, Orange, and Osceola counties. This agreement was initiated in August of 1999, and stipulates that District 5 will provide information on diverted traffic from I-4. The Cities of Orlando, Kissimmee, Winter Park, and Maitland, in addition to Orange and Seminole counties and the Disney/Reedy Creek Improvement District will develop signal control plans to accommodate traffic diversion from I-4.

Integration of ITS in Volusia County – A program is currently planned in District 5 that 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. The plans will include the development of a Volusia County ITS architecture that will include the physical architecture, a 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.

3.4.5 District Six

MOU for SunGuide℠ 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℠ ATIS services for the tri-county area. The eight agencies involved include:

- FDOT –
  - District 4;
  - District 6; and
  - Florida's Turnpike;
- MPO for the Miami Urbanized Area;
- Miami-Dade County;
- Broward County MPO;
- Broward County;
- MPO of Palm Beach County;

- Tri-County Commuter Rail Authority; 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 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, Florida's 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 metropolitan planning 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 (East-West Expressway) 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.

3.4.6 District Seven

Operations and Maintenance Agreement for I-275's DMS System – This agreement, executed in June of 1999 between FDOT District 7 and the City of St. Petersburg, addresses the installation, maintenance, and operations 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 and construction engineering inspection for 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 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.

3.4.7 District Eight (Florida's Turnpike District)

***SunPass*™/E-Pass Interoperability Agreement between FDOT's Turnpike District and OOCEA** – An agreement has been initiated for the sharing of electronic toll data between the ***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 system will remain separate, but interoperable.

3.4.8 Statewide

Motorist Aid Call Boxes – A statewide motorist aid system using roadside call boxes has been deployed along the entire study network at one-mile intervals with the exception of a small segment of I-4. 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 – RR Service Patrols are currently operating along the study interstate facilities primarily in the large urbanized areas. District 3 currently has no service patrols in operation. In most districts, FDOT is responsible for funding, operating, and maintaining the RR Service Patrols. In District 5, a partnership has been created between District 5, LYNX, and private companies for the funding of the program. Most districts contract with private tow truck companies to provide the service.

Copies of these institutional/organizational agreements are included in Appendix E of this report.

Currently, many of the existing agreements are between FDOT and a local entity for the installation, operations, and maintenance of ITS. However, with the implementation of ATIS, the I-4 SMIS and the Volusia integration system, a trend is emerging towards more regional, inter-jurisdictional, and interoperable ITS and agreements. Counties, cities, and other transportation agencies are starting to realize the financial and general public user benefits of sharing data, devices, and communications systems and of integrating ITS services to provide a more interoperable, seamless ITS to better serve the travelers needs.