Regional Freight and Goods Movement Facilities Profile

Central Florida Regional Freight Study

technical report

prepared for

MetroPlan Orlando

FDOT District 5, Lake-Sumter MPO, Space Coast TPO, and Volusia TPO

prepared by

Cambridge Systematics, Inc.

with

HDR Engineering, Inc.
Canin Associates
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CAMBRIDGE SYSTEMATICS

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Executive Summary

The Central Florida region, which includes Orange, Osceola, Seminole, Lake, Sumter, Brevard, and Volusia Counties, is home to vibrant and growing population and local and regionally significant businesses supported by a multimodal transportation system. This Regional Goods Movement profile, one of a series of reports being prepared for the Central Florida Freight, Goods, and Services Mobility study provides an inventory of the highway, rail, air, water, and space transportation system in the 7-County study region and describes the freight-supported land use that supports users of that system. In addition to providing an inventory of physical transportation infrastructure, the profile also explores the behavior and operations of transportation service providers such as the individual railroads and trucking and logistics companies, along with reporting current operating conditions and challenges for goods movement in the region. The information presented in this report helps lay a foundation for the analysis of existing and future freight flows and the capability of the system to support regionally significant businesses such as tourism and the consumer market, high-and low-tech manufacturing, warehousing and distribution, construction, and services and associated freight growth. A Regional Goods Movement Needs Assessment will build upon the initial issues identified.

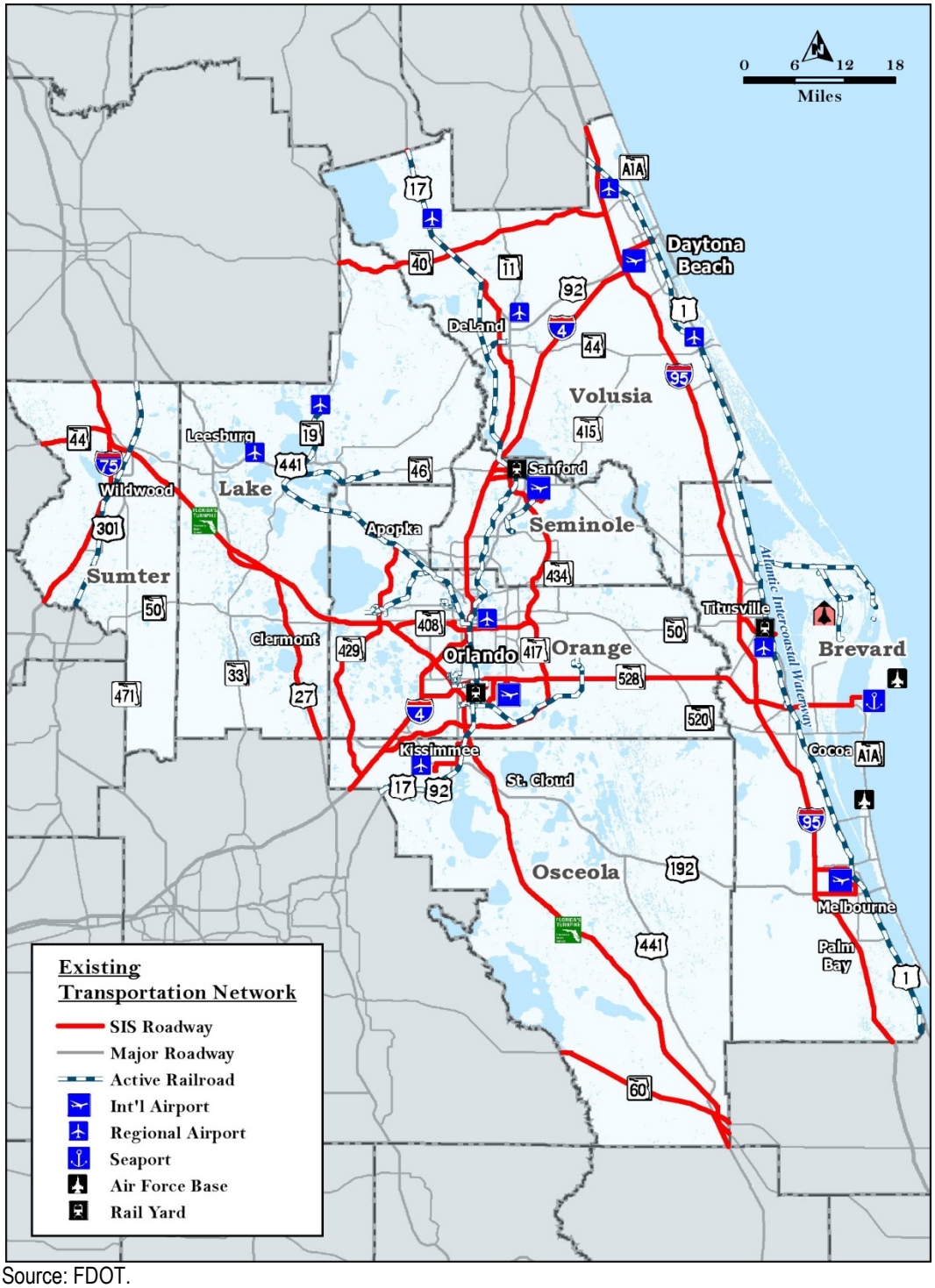
THE MULTIMODAL FREIGHT TRANSPORTATION SYSTEM IN CENTRAL FLORIDA

- More than 17,900 centerline miles of roadways of which approximately 520 miles are interstates or other toll expressways and approximately 1,094 miles are principal arterials carrying nearly 200 million tons of goods annually. Trucks hauling goods share these roadways with commuters as well as tourists and other visitors to the region
- A Class I railroad – CSXT– operating 2,800 miles (1,508 route miles) of track in Florida and carrying more than 9 million tons of local freight annually; the Florida East Coast Railway (FEC), a Class 2 railroad that operates approximately 115 miles of track within the study area and interchanges with both CSXT and Norfolk Southern Railway (NS) in Jacksonville; and the Florida Central Railroad (FCEN), a Class 3 railroad that operates approximately 66 miles of track in the study area and interchanges with CSXT in Orlando.
- One deepwater port, Port Canaveral, which handles more than 3 million tons of freight annually plus Space Florida, a major spaceport on the east coast
- Facilities handling air cargo in the region include Orlando International Airport (MCO), Orlando-Sanford International, Melbourne International, and

Daytona Beach International that together handle more than 190,000 tons of domestic and international air freight annually.

The efficient movement of goods depends on a well functioning transportation infrastructure. Businesses and customers depend on trucks and highways, railroads and airplanes to connect them to markets and grow the regional economy. Inventorying the freight transportation system in Central Florida and identifying areas of strength and weakness will help planners develop and maintain a system to support economic development. Figure ES.1 displays the Region's multimodal goods movement system.

Figure ES.1 Central Florida Freight Study Multimodal Freight Transportation Network



Source: FDOT.

DEFINING THE ROLE OF EACH TRANSPORTATION MODE

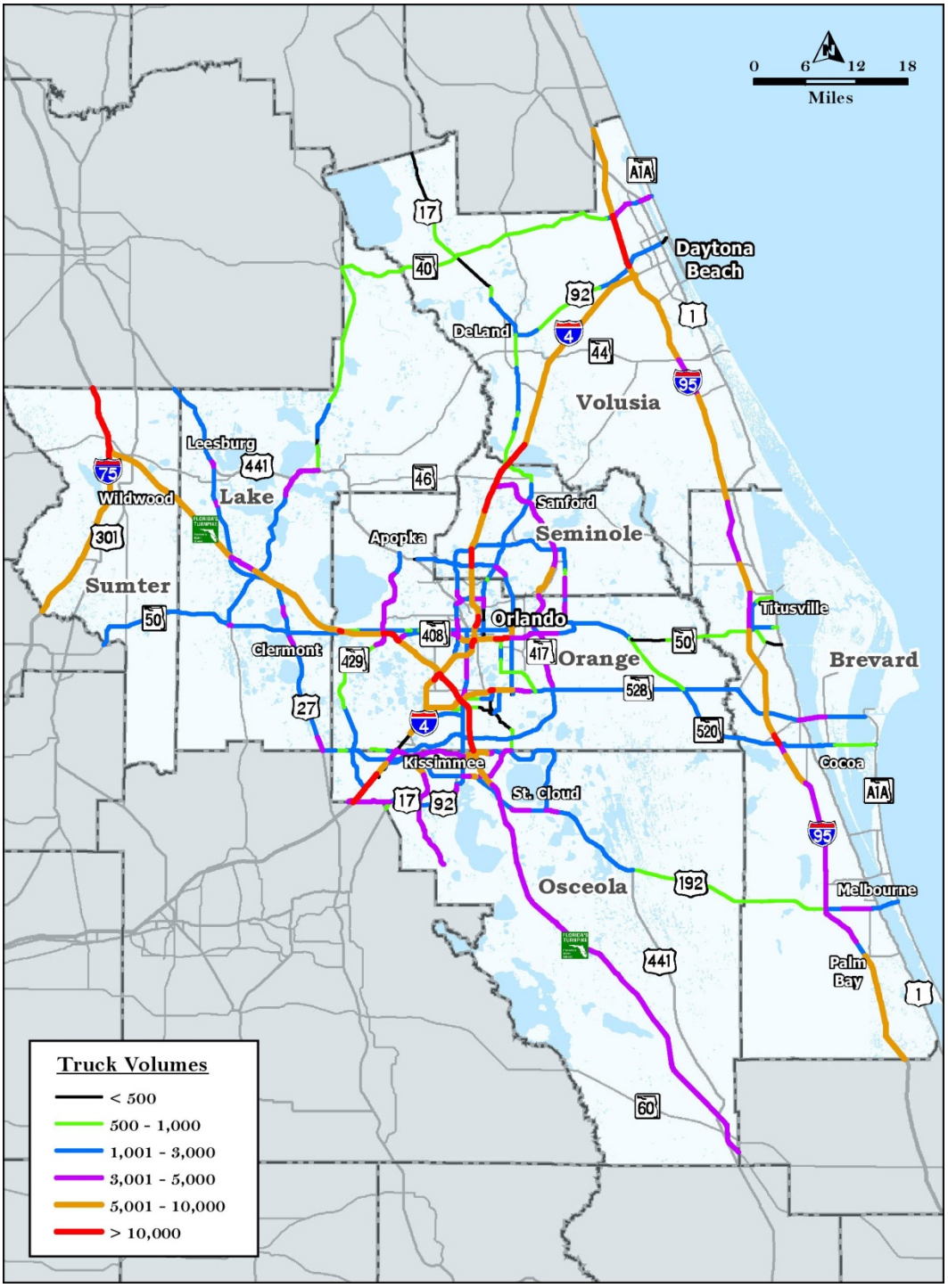
Four main modes of transportation: trucks, trains, ships, and airplanes are available to freight users in Central Florida.[1] These transportation modes utilize the existing freight infrastructure including the region's highways, rail network, airports, seaports, and support facilities (such as truck to rail transloading facilities and freight-oriented land use). Shippers and receivers generally decide on the appropriate mode to use with consideration for time, cost, convenience and flexibility, and reliability. While some modes have advantages for cost because of the high volume of commodities that can be carried by a single vehicle (i.e. rail or ship) tradeoffs may come in the timeliness of delivery and lack of flexibility at the receiving end. Alternatively, other modes (such as airplanes) may carry much lower volumes of goods on each flight but are much more likely to be able to assure timely delivery at much higher costs.

Generally the most flexible mode of freight transport in the United States, trucks are the dominant mode in Central Florida. Shippers can utilize trucks not only for short, medium, and long haul truck trips, but also to provide the "last mile" link in the transportation chain, connecting commodities carried by other modes from intermediate destinations, such as seaports or rail terminals, warehouses, distribution centers, or manufacturing plants to their final destinations.

Highways–Truck movement in Central Florida relies on the interstate system, state and U.S. highways, and local roadways. Freight trucks utilize the entire roadway system, whether it is providing access to residential areas for garbage collection or local warehousing and distribution functions and play a critical role connecting Central Florida's businesses and consumers. In 2010, 191 million tons or 95 percent of the total freight tonnage moving into, out of, within and through the region was transported by truck. The current designated SIS highway network carries 55 percent of total traffic and more than 70 percent of all truck traffic and the study area's roadway system experiences traffic volumes (including trucks) in excess of 98 million vehicle miles per day. The major truck corridors in the region include I-4, the Florida Turnpike, north-corridors I-75 and I-95, and east-west corridors SR 528 and SR 408, all carrying in excess of 10,000 trucks per day on many segments (Figure ES.2).

[1] Although Spaceport is described in this report as a separate mode (within the seaports section), the discussion is mostly focused on the landside transportation connections to support space travel as opposed to the freight operations of space vehicles themselves

Figure ES.2 Average Annual Daily Truck Traffic (AADTT)
2011



Source: FDOT

Note: Data reported for freight corridors identified in Section 2.

Rail – Central Florida has a freight rail network comprised of Class I (CSXT), Class II (FEC) and Class III (Florida Central) railroads. Only the existing CSXT A-line and the Florida Central line services the urban population center of the region. Rail carries about 9 million tons of freight annually within the region (close to 5 percent of the total freight tonnage).

Air – The region's air cargo airports, including Orlando International Airport (MCO), Orlando-Sanford International Airport (SFB), Melbourne International Airport (MLB) in Brevard County, and Daytona Beach International Airport (DAB) collectively have 18 on-airport cargo buildings with over 800,700 square feet of space for sort and consolidation activity. These airports handle more than 190,000 tons of domestic and international air freight annually, most of it loaded in the bellies of passenger carriers. The most prominent airport for air cargo in the region, Orlando MCO reported service by 27 separate airlines, connecting directly with 84 domestic destinations and 33 international destinations in 2011.

Seaports and Spaceport – Port Canaveral, the regions' only Seaport, largely deals in bulk and breakbulk cargo, with just a small proportion of containers. In 2010, the Port handled about 3.2 million tons of bulk and breakbulk cargo, with over 60 percent accounted for by petroleum products.[2] International waterborne freight through Port Canaveral accounts for about 1 percent of the total freight tonnage moving through the Central Florida region. Central Florida businesses are also served by several alternative seaports including Jacksonville, Tampa, Miami, Port Everglades, and the Port of Savannah in Georgia. Space Florida, one of the premier spaceports in the United States, hosts dozens of space launch activities annually for NASA, as well as private companies, United Launch Alliance and SpaceX, among others at the Kennedy Space Center, Cape Canaveral Air Force Station, and Space Florida Spaceport.

Freight-Dependent Land Use – Freight-dependent land uses are defined in this study as those that support businesses whose operations include a major role for the movement of goods on the regional transportation system. This might denote land accommodating manufacturing activities, warehousing and distribution, or power generation (industrial land uses); or might include the extraction of gravel or petroleum products (mining land uses) and use of the transportation system to move those products to market. In Central Florida, with a major economic focus on the services industry, freight-dependent land uses might also include accommodating retail and office uses (which would include, for example, deliveries of consumer products to hotels, resorts, or large regional shopping centers). Within the seven county study region are over 100,000 acres of industrial, retail/office, and mining land. Within the industrial category, the most commonly recognized freight-dependent land use, there are several industrial land clusters in the seven county study area, including the Landstreet area west of Orlando International Airport, Silver Star Road and the Lockhart

[2] Port website

area (U.S. 441 and SR 414) in Orange County, and the area adjacent to Melbourne International Airport in Brevard County.

ISSUES AND DEFICIENCIES ON THE MULTIMODAL GOODS MOVEMENT SYSTEM

One of the key drivers of goods movement demand is population growth, which, despite the recent recession is expected to continue in the Metropolitan Orlando area for the foreseeable future.[3] Growing populations tend to consume more products and will require increased trucks, railcars, ships, and airplanes to deliver products to stores, homes, and businesses throughout the region. Likewise, growing industries will demand more incoming products to support their operations, and will produce a greater amount of goods for export and more waste that will need to be collected and disposed. This report provides a description of the existing freight infrastructure (including roads, rail, air cargo facilities, seaports/spaceport, and freight-dependent land capacity) and lays the foundation for the analysis of the capability of the system to support anticipated freight growth. A future year commodity flow evaluation will be prepared under a forthcoming task. Based on the modal evaluation, several initial issues emerge, which will help to inform the needs assessment and future evaluation of freight facilities.

Capacity and Operational Issues

The increasing growth and development of the region will require continued infrastructure improvements. Capacity issues are generally concentrated on the region's highway system and would most affect the movement of goods by truck. Figure ES.3 displays the core of the study region's highway system currently operates at a LOS D, E, or F, a deficient level of service that indicates severe capacity constraints, notably on key freight routes such as I-4, I-95, and SR 408. Overwhelmingly, the major capacity concern for shippers and carriers of freight in the region is Interstate 4. Although there are several major and minor projects programmed to improve capacity in the near future, capacity issues may impact the efficient movement of goods in the region.

For the non-highway modes, there does not appear to be major capacity challenges under current conditions. For rail, the transition of CSXT freight traffic from the "A" line to the "S" line, currently underway, may present some operational challenges for rail shippers and will be described in the next section. Air cargo demand in the region is adequately met by current infrastructure capacity with access to the airports reported to be very good to excellent, particularly when compared to competing gateway airports, Atlanta-Hartsfield

[3] http://www.orlandoedc.com/Data-Center/demographics.shtml

International and Miami International. However, some freight forwarders who serve the airports did report congestion issues on some roadways immediately outside the airport area. Port Canaveral has identified projects to expand its turning basin and main shipping channel to accommodate ever larger ships but currently is not experiencing capacity issues. Since the freight transportation system in Central Florida is intermodal, however, capacity impacts to the truck transportation system (which is linked to the rail network, seaports, and airports in many supply chains) will affect the movement of goods across modes.

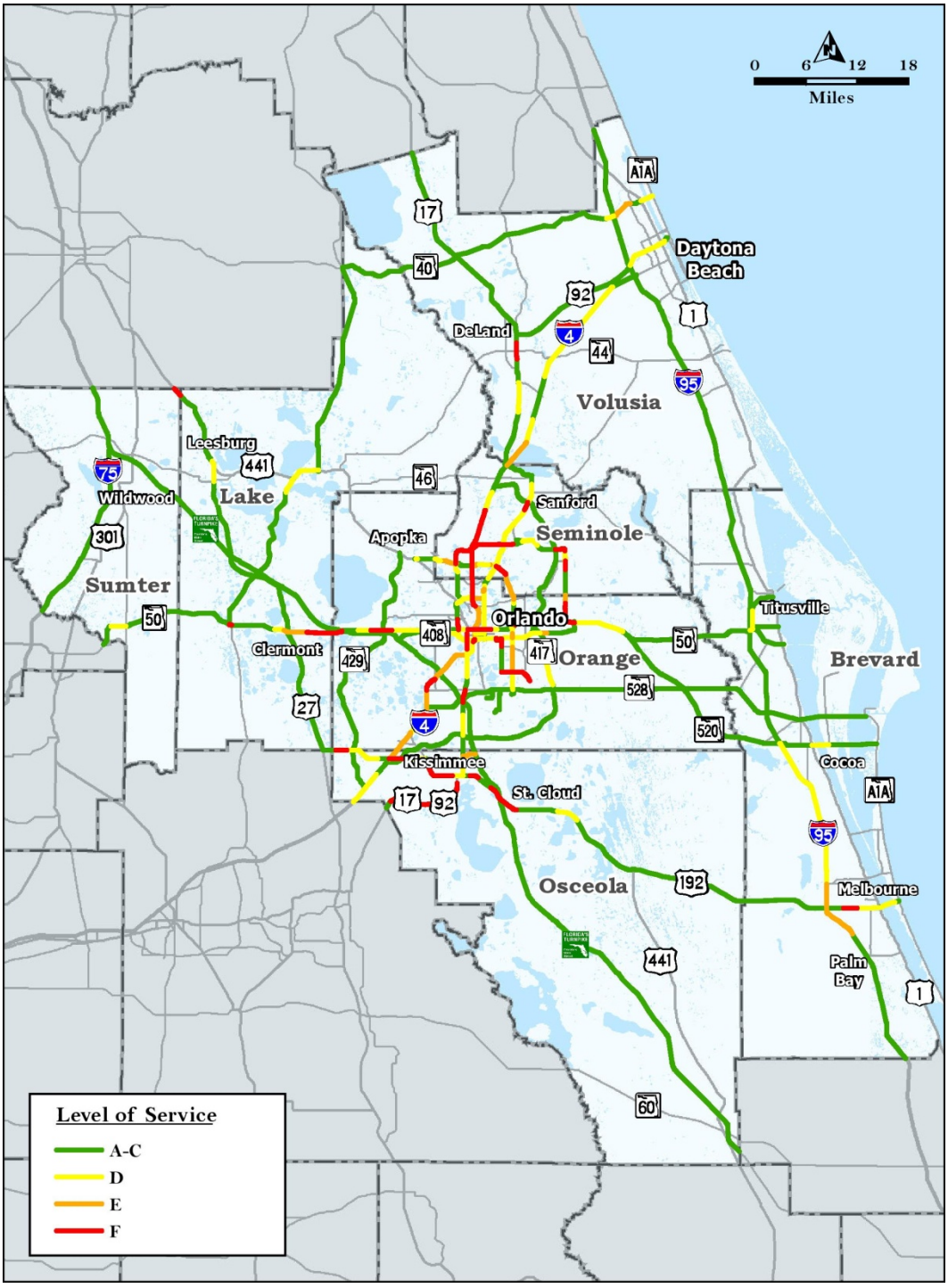
The trucking representatives interviewed for the study generally reported generally good operating conditions on the region's major highway facilities however, they did identify bottleneck issues, not necessarily associated with highway capacity including: short-entrance ramps onto interstates which create merging hazards; excessive merging and weaving required along major freeways; insufficient turning radii on major arterials; numerous at-grade crossings on major freight corridors; and lack of sufficient staging areas in and around freight terminals. Other operational constraints include routing challenges for trucks on certain routes due to "functionally obsolete" or "structurally deficient" structures, which account for approximately 10% of all structures in Brevard, Orange, Osceola and Seminole counties and approximately 20% of all structures for Lake, Sumter and Volusia counties. Up to half of all "functionally obsolete" or "structurally deficient" structures in the study area may be restrictive to some truck movements. This is especially an issue for oversize/overweight loads in the region.

Interviews with overweight and over-dimensional trucking companies identified additional challenges with the Central Florida roadway network, including: roundabout intersections not typically designed for over sized trailers, mast arm signalized intersections providing limited vertical clearance, time of day permitting restrictions that may not permit certain moves to use the interstate, and toll plazas at the toll ramps limiting certain loads from utilizing the toll road system, almost a necessity in many parts of the study area.[4]

For rail, the major operational issue which may affect goods movement flows in the region is the shifting of a portion of the current rail freight traffic on CSXT "A"-line to the CSXT "S"-line and a relocated rail terminal facility in Winter Haven, Florida (from Taft) to help accommodate SunRail commuter passenger service. This shift may cause challenges, not only for shippers along the A-line who may have to relocate but also for existing shippers along the S-line who may experience greater volumes of truck traffic on the region's roadways as a result of the new service. The relocation of the rail terminal from Taft (to Winter Haven, in Polk County) may lead to longer truck trips on some of the study area's major highway freight corridors to access customers within the study area.

[4] Based on interviews with oversize/weight carriers

Figure ES.3 Average Daily Level of Service
2011



Source: FDOT

Note: Data reported for freight corridors identified in Section 2.

Expanding Infrastructure to Target New Markets

Although many of the non-highway modes such as rail, seaports, and airports under current conditions, many of the infrastructure owners and providers have expressed interest in expanding their markets and developing facilities to access new markets and accommodate additional freight demand. For example, for air cargo in the region, currently much of the freight forwarder traffic originating or terminating in Central Florida does not utilize the region's air cargo facilities, rather is transported to Atlanta-Hartsfield International and Miami International Airport for domestic or overseas shipment due to several factors including: greater range, frequency, and capacity at the competing airports, block space arrangements with carriers (i.e., guaranteed pre-purchased space on aircraft), a greater concentration of support services, and less seasonality/fluctuations of lift capacity. Orlando International Airport (MCO) is currently targeting Asian and Middle-Eastern markets for direct service, and is directly marketing to several carriers, including: China Air, ANA, Japan Airlines, China Eastern, Cathay Pacific, Air China, Qatar Airways, and Emirates, which may help promote growth in local and regional air cargo from the airport.

Port Canaveral is also actively working to diversify its business, from expanding bulk facilities (i.e. a recently opened petroleum tank farm) to exploring opportunities for expanding its handling of containers.[5] The Port is currently undergoing a project to widen its shipping channel from 400 to 500 feet (scheduled for opening in 2013) and is planning to widen and deepen the west turning basin (WTB) and entrance to nearly 1,800 feet (39 feet deep) by reworking bulkheads, utilities, and roads and dredging the basin to accommodate larger ships and a more diverse cargo. The Port has also expressed concerns to the Florida Department of Transportation (FDOT) and other regulatory agencies, such as the Army Corps of Engineers, that state route 401 (the movable bridge over the barge canal), the route by which much of the port traffic travels, may not meet future growth needs at the Port and is not necessarily a reliable access point for Port operations. Spaceport, also located at Cape Canaveral is anticipating substantial growth into the future, mostly due to the expansion of private space service providers such as SpaceX and the United Launch Alliance and is working to identify additional growth opportunities on the site for manufacturing, research and development, and greater launch capacity.

Community Impacts

Goods movement is essential to supporting the region's economy and quality of life. However, growth in goods movement activities (from manufacturing to

[5] The Port is interested in further expanding the capacity of its petroleum tank farm to 32 tanks but the expansion would require land acquisition. There is a long term goal of a pipeline running from the port to the Orlando International Airport.

truck traffic) also gives rise to negative community impacts. In addition to safety and air quality concerns, freight activities can cause excessive noise and vibration along significant goods movement corridors. As population continues to grow and expand outside the urban core, especially in the northern and western portions of the study region, so will commercial centers, leading to more widespread dispersion of freight-intensive impacts such as truck traffic.

Safety issues are probably the most visible impact associated with freight activities, largely related to increasing truck traffic and the risk of truck accidents. Although in the study region there was a *reduction* in truck-involved crashes of about 36 percent between 2006 and 2010, the fact remains that truck-involved crashes are often more severe, and the probability for injury, fatalities and personal property damage is greater. In addition, the clearance time of truck-involved crashes is likely to be longer, leading to increased delay for all system users.

The freight sector is also associated nationally with increasing pollution, especially emissions of criteria pollutants (and is a particularly significant source of NOx and particulate matter (PM) due to the prevalence of diesel engines), air toxics, and greenhouse gases. This includes emissions from both mobile sources such as trucks, and stationary sources such as rail yards. Truck traffic is a significant contributor to damaging emissions and emissions mitigation strategies must address truck emissions. Newer equipment and advanced fuels are tools to reduce the emissions arising from truck traffic. However, these technologies can be costly and may lead to decreased fuel efficiency and other engine maintenance concerns, leading the private sector to be slow in adoption. There is a strong interest in the trucking industry to shift toward alternative fuels – both for the environmental benefits and the economic benefit of lower fuel costs from certain alternatives.[6]

Research in recent years has continued to explore the health effects related to the freight sector, especially PM, and concerns about toxic "hot spots" is often an issue when region's explore expansion of freight transportation facilities. Although Central Florida is currently an attainment area under United States Environmental Protection Agency standards (EPA), the threat of negative regulatory effects of non-attainment coupled with the negative health consequences for residents proximate to freight facilities make air quality impacts a growing concern for the region.

The Regional Goods Movement Profile represents a baseline of existing conditions in the MetroPlan Orlando, Volusia, Space Coast, and Lake-Sumter Metropolitan Planning Association (MPO) and Transportation Planning Organization (TPO) Regions and it will serve as input into the Regional Goods Movement Needs Assessment.

[6] Interviews with several carriers

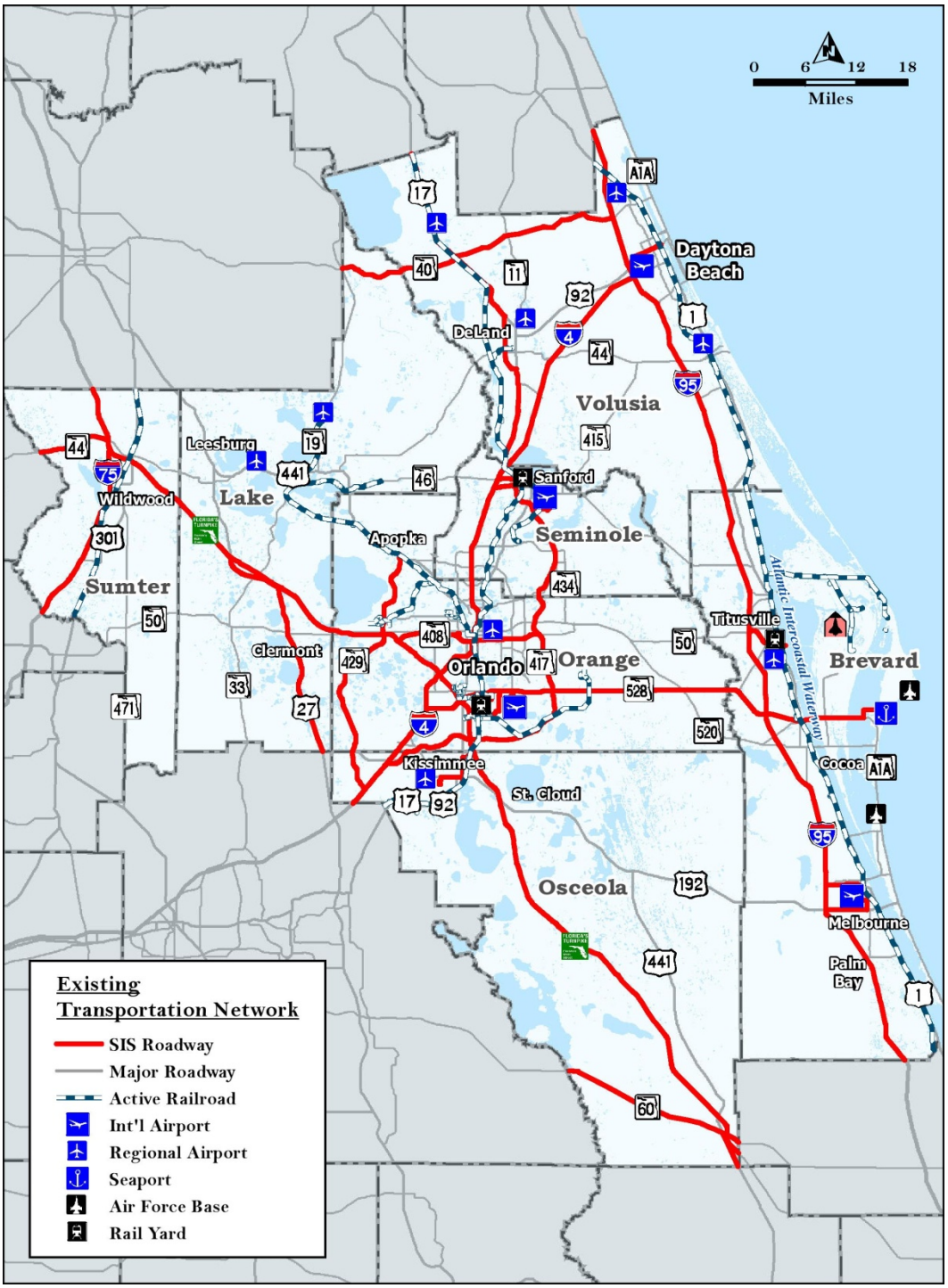
1.0 Introduction

1.1 OVERVIEW

MetroPlan Orlando along with project partners, Lake-Sumter Metropolitan Planning Association (MPO), Space Coast Transportation Planning Organization (TPO), Volusia TPO, and the Florida Department of Transportation (FDOT) initiated a Regional Freight, Goods, and Services Plan to develop a "next generation" system-level overview of freight movement in the greater Orlando region. The plan, an update of the 2002 Freight, Goods, and Services Mobility Strategy, seeks to provide a better understanding of the existing and emerging freight, industry, and logistics trends that are affecting goods movement into, out of, through, and within the study area. The study will also identify critical freight system bottlenecks and policies, projects, and strategies to enhance regional mobility, improve regional economic competitiveness, and mitigate community and environmental impacts. The study area was expanded from the 2002 3-County MetroPlan Orlando study area (Orange, Osceola, and Seminole Counties) to include the counties in the Lake-Sumter MPO region (Lake and Sumter Counties), Space Coast TPO region (Brevard County), and Volusia TPO (Volusia County) to provide for a more comprehensive assessment of regional freight flows and transportation infrastructure that connects businesses, residents, and customers throughout Central Florida.

An key initial component of the study, the Regional Freight and Goods Movement Facilities Profile, provides a description of the existing freight infrastructure including roads, railroads and rail yards, intermodal facilities, air cargo facilities at the region's airports, Port Canaveral seaport, the Space Florida Spaceport, and the existing land use system to support freight-oriented activity and describes issues, challenges and trends for each of the modes. The profile lays the foundation for the analysis of freight system demand (i.e. current and future commodity flows) and will provide MetroPlan Orlando and its partners with a framework and clear direction on how to more effectively integrate freight issues into regional transportation planning and programming activities. Figure 1.1 displays the multimodal freight transportation system for the study region.

Figure 1.1 Central Florida Freight Study Multimodal Freight Transportation Network



Source: FDOT.

Data Sources

A variety of data sources was used to compile the report, including previous reports and studies conducted by MetroPlan Orlando and the surrounding MPOs, FDOT, IHS Global Insight's TRANSEARCH commodity flow database, the Surface Transportation Board (STB), the Journal of Commerce's Port Import Export Reporting Service (PIERS), the Bureau of Transportation Statistics (BTS), Federal Highway Administration (FHWA), and others, and substantiated by interviews with public and private sector stakeholders. Forthcoming phases in this Regional Freight, Goods, and Services Plan will provide a more detailed assessment of current and future freight transportation system needs by exploring demographic and economic trends and growth, logistics trends and operations patterns, and potential physical, operational, and institutional constraints to the movement of freight in Central Florida.

1.2 TRANSPORTATION SYSTEM USERS AND MODES

As noted above, four main modes of transportation: trucks, trains, ships, and airplanes are available to freight users in Central Florida.[7] These transportation modes utilize the existing freight infrastructure including the region's highways, rail network, airports, seaports, and support facilities (such as truck to rail transloading facilities and freight-oriented land use). Shippers and receivers generally decide on the appropriate mode to use with consideration for time, cost, convenience and flexibility, and reliability. While some modes have advantages for cost because of the high volume of commodities that can be carried by a single vehicle (i.e. rail or ship) tradeoffs may come in the timeliness of delivery and lack of flexibility at the receiving end. Alternatively, other modes (such as airplanes) may carry much lower volumes of goods on each flight but are much more likely to be able to assure timely delivery at much higher costs.

Generally the most flexible mode of freight transport in the United States, trucks are the dominant mode in Central Florida accounting for about 95 percent of all freight tonnage in 2010 (Table 1.1). Shippers can utilize trucks not only for short, medium, and long haul truck trips, but also to provide the "last mile" link in the transportation chain, connecting commodities carried by other modes from intermediate destinations, such as seaports or rail terminals, warehouses, distribution centers, or manufacturing plants to their final destinations. Rail is the second most common mode in the region, transporting nearly 4 percent of total freight tonnage. International waterborne freight through Port Canaveral follows, accounting for 1 percent of the tonnage. The remaining share of the region's tonnage, less than 1 percent, is air cargo.

[7] Although Spaceport is discussed in this report as a separate mode (within the seaports section), the discussion is mostly focused on the landside transportation connections to support space travel as opposed to the freight operations of space vehicles themselves

Table 1.1 Summary of Regional Freight Flows by Weight
2010, Tons in Thousands

Direction	Truck	Rail[a]	Air	Air-Truck	Water	Total
Inbound	28,695	8,530	42	50	620	37,936
Intraregional	20,529	-	-	31	-	20,560
Outbound	22,568	480	13	63	18	23,142
Through	119,460	N/A[b]	-	38	1,142	120,640
Total	191,252	9,010	55	182	1,780	202,278

Source: 2010 FDOT Trade and Logistics dataset and 2009 full Surface Transportation Board (STB) Waybill dataset.

[a] The base year for the rail data is 2009.

[b] Through rail moves were not included due to the inability to estimate it with the full Surface Transportation Board (STB) Waybill dataset. Therefore, the total through tonnage shown here likely underestimates actual through tonnage due to the lack of through rail data.

Often times, a single mode will not meet the needs of shippers, necessitating the use of more than one mode of freight transportation. Shippers utilize complex supply chains to send and receive their product while maximizing efficiency. An in-depth discussion of logistics patterns in Central Florida is provided in a forthcoming Logistics Profile.[8] One example of the use of multiple modes in a regional supply chain involves the delivery of consumer products (such as furniture)[9] from overseas manufacturers to local retail outlets. In this case, there are several major steps in the supply chain, with shippers utilizing several different modes:

- Product is packed in a container at an overseas manufacturing plant and trucked to a seaport terminal for loading onto a ship
- Container travels across the ocean to the container terminal at a west coast port
- Container is offloaded directly onto an intermodal train (using on-dock rail) destined for a rail terminal in Jacksonville
- Container is offloaded from the train onto a truck at a truck-rail intermodal terminal and transported to a distribution center (DC) in the Orlando area
- At the distribution center, the product in the container is offloaded and repacked into a smaller truck for delivery to a local store or direct customer

[8] The Logistics Profile is based primarily on interviews conducted with shippers and carriers during the early portion of the study

[9] Based on shipper interviews

The efficient movement of goods depends on a well functioning transportation infrastructure. Businesses and customers depend on trucks and highways, railroads and airplanes to connect them to markets and grow the regional economy. Inventorying the freight transportation system in Central Florida and identifying areas of strength and weakness will help planners develop and maintain a system to support economic development.

1.3 ORGANIZATION OF THE REPORT

This report provides a profile for each of the freight modes. The evaluation of the space transportation-oriented facilities is included in the Seaport/Spaceport section. Although pipelines are utilized in the region for transporting liquid bulk materials (such as certain petroleum products), pipelines as a mode are not included in this evaluation. For potential pipeline access issues related to operations from other modes (such as air or spaceport operations) those issues are described in the context of those sections. Each modal profile consists of a summary of modal demand, an inventory of modal infrastructure and service providers and discussion of key challenges and issues.

Section 2.0—Highway Profile

Section 3.0—Regional Freight Rail System

Section 4.0—Air Cargo Profile

Section 5.0—Seaport and Spaceport Profile

Section 6.0—Freight-Dependent Land Use

Section 7.0—Findings and Conclusion

1.4 KEY FINDINGS

Based on the modal evaluation, several key initial findings emerge, which will help to inform the needs assessment and future evaluation of freight facilities.

Highway

- The current designated SIS system carries 55 percent of total traffic and more than 70 percent of all truck traffic on the State Highway System, almost all rail freight, 89 percent of all interregional rail and bus passengers, more than 99 percent of all commercial air passengers and cargo, and virtually all waterborne freight and cruise passengers.
- The region is served by more than 17,900 centerline miles of roadways of which approximately 520 miles are interstates or other toll expressways and approximately 1,094 miles are principal arterials. The roadway system experiences traffic volumes (including trucks) in excess of 98 million vehicle miles per day.

- In 2010, 191 million tons or 95 percent of the total freight tonnage moving into, out of, within and through the region is transported by truck. Of that share 62 percent is through traffic, 15 percent is inbound and 12 percent and 11 percent respectively is outbound and intraregional traffic.
- Based on volume, the leading regional truck commodities are non-metallic minerals, clay, concrete, glass and stone, and warehoused (i.e. consumer) goods accounting for nearly three quarters of the total truck tonnage. Food and petroleum products also play a major role, accounting for an additional 15 percent.
- Overall the trucking community reports good operating conditions on the region's major highway facilities however, some operational constraints or bottlenecks were reported including short-entrance ramps onto interstates which create merging hazards; excessive merging and weaving required along major freeways; insufficient turning radii on major arterials; numerous at-grade crossings on major freight corridors; and lack of sufficient staging areas in and around freight terminals.
- According to data from FDOT, the following state road segments have poor pavement conditions: I-95 from SR 46 to SR 528 in Brevard County and US 17-92 from I-4 Ramps to CR 4047 (Marsh Road) in Volusia County, however, the segment of I-95 from SR 46 to SR 528 has programmed improvements to widen the freeway.
- The number of "functionally obsolete" or "structurally deficient" structures (such as bridges) in the study area is approximately 10% of all structures in Brevard, Orange, Osceola and Seminole counties and approximately 20% of all structures for Lake, Sumter and Volusia counties. Up to half of all "functionally obsolete" or "structurally deficient" structures in the study area may be restrictive to some truck movements.
- A review of the crash history for a 5-year period between 2006 and 2010[10] for all roads in the study area reveals that the number of truck-involved crashes in 2010 are approximately 36 percent less than in 2006, compared to a reduction of 4 percent for all crashes. The greatest concentration of crashes involving trucks occurs in the following areas: US 17-92/441 between SR 50 & Orange/Osceola County Line and SR 423 (John Young Pkwy) between SR 50 and SR 408.
- Overwhelmingly, the major capacity concern for shippers and carriers of freight in the region is Interstate 4. Many users choose to avoid I-4 except in the early morning hours and use toll roads with transponder equipped vehicles to get around the region.

[10] FLHSMV Traffic Crash Statistics Report 2010.

Rail

- Central Florida has a freight rail network comprised of Class I (CSXT), Class II (FEC) and Class III (Florida Central) railroads. Only the existing CSXT A-line and the Florida Central line services the urban population center of the region. Operational changes are expected to occur in the near future with a portion of the current rail freight traffic re-routed to the CSXT S-line and a relocated rail terminal facility in Winter Haven, Florida (from Taft) as a result of initiation of the SunRail passenger service on the CSXT A-line. Currently, there are approximately 15-20 trains per day operating on the CSXT A-line including Amtrak passenger trains.
- Previous studies reported that approximately 42% of the truck traffic in/out of the CSXT Taft facility was destined for the study area market with additional truck traffic passing through the study area. Consequently, it is expected that the relocation of the rail terminal facility will require longer truck trips on some of the study area's major highway freight corridors.
- Within Florida, FEC annually moves approximately 30 million tons of freight, including 100,000 carloads of aggregate from its rock distribution centers in Miami, Fort Pierce, Cocoa, Daytona, St. Augustine, and Jacksonville, as well as 170,000 new automobiles from its Miami automobile facility. Other important commodities moved by the FEC include: lumber, cement, chemicals, paper products, food products (including orange juice and pulp), primary metal products, machinery, bulk freight, and farm products.
- Several stakeholders indicate reliability concerns with rail and many users utilize trucks that could otherwise utilize rail. One of the major obstacles to making rail freight more competitive with highway modes is the lack of any significant backhaul out of Florida.

Air

- The region's air cargo airports, including Orlando MCO, Orlando-Sanford International, Melbourne International Airport in Brevard County, and Daytona Beach International collectively have 18 on-airport cargo buildings with over 800,700 square feet of space for sort and consolidation activity. These airports handle more than 190,000 tons of domestic and international air freight annually, most of it loaded in the bellies of passenger carriers.
- The most prominent airport for air cargo in the region, Orlando MCO reported 27 separate airlines, providing direct service to 84 domestic destinations and 33 international destinations in 2011. MCO is currently targeting Asian and Middle-Eastern markets for direct service, and is directly marketing to several carriers, including: China Air, ANA, Japan Airlines, China Eastern, Cathay Pacific, Air China, Qatar Airways, and Emirates.
- Air cargo demand in the region is adequately met by current infrastructure capacity. Access to the airports is reported to be very good to excellent,

particularly when compared to competing gateway airports, Atlanta-Hartsfield International and Miami International. Some freight forwarders serving the airports report issues arising once drivers leave the immediate Airport environs including: eastbound access to I-4 via Tradeport Drive and Taft Vineland Road, at-grade railroad crossings near the airport, congestion at the SR 528 toll both near the junction of SR 436, and the lack of an interchange between the SR 417 Beltway and the Florida Turnpike.

- Freight Forwarder traffic originating or terminating in study area is often transited to Atlanta-Hartsfield International and Miami International Airport versus the region's airports due to several factors, including: greater range of destinations, frequency, and capacity at the competing airports, block space arrangements with carriers (i.e., guaranteed pre-purchased space on aircraft), greater concentration of support services, and less seasonality/fluctuations of lift capacity.

Seaports and Spaceport

- Port Canaveral, the regions' only Seaport, largely deals in bulk and breakbulk cargo, with just a small proportion of containers. In 2010, the Port handled about 3.2 million tons of bulk and breakbulk cargo, with over 60 percent accounted for by petroleum products.[11] International waterborne freight through Port Canaveral accounts for about 1 percent of the total freight tonnage moving through the Central Florida region
- The Port is actively working to diversify its business, from expanding bulk facilities (i.e. a recently opened petroleum tank farm) to exploring opportunities for expanding its handling of containers.[12] The Port is currently undergoing a project to widen its shipping channel from 400 to 500 feet (scheduled for opening in 2013) and is planning to widen and deepen the west turning basin (WTB) and entrance to nearly 1,800 feet (at a depth of 39 feet) by reworking bulkheads, utilities, and roads and dredging the basin.
- Spaceport is expecting substantial growth in the future, mostly from private space service providers such as SpaceX and the United Launch Alliance (a joint venture between Lockheed Martin and Boeing). Much of the equipment for launches (including the rocket itself, payload, fuel, and other specialized electronics) comes from California, Texas, Utah, and Alabama.

[11] Port website

[12] The Port is interested in further expanding the capacity of its petroleum tank farm to 32 tanks but the expansion would require land acquisition. There is a long term goal of a pipeline running from the port to the Orlando International Airport.

Freight-Dependent Land Use

- Major existing industrial development clusters are located along the I-4 corridor at key transportation hubs, along the Florida Central Railroad alignment, and some activity along the FEC/I-95 coastal route including the Spaceport.
- The Freight Villages plan (developed as part of the 2002 study) proposed agglomerations of industrial land to capitalize on transportation access for businesses.
- The potential for development of industrial land in the region may be impacted by the planned Winter Haven Integrated Logistics Center (ILC), located in Polk County. Based on interviews, some shippers may find it necessary to relocate to be closer to the ILC from the existing areas along CSXT's "A" line. Restrictions for freight movement along the "A" are expected as a result of the SunRail passenger rail project.
- The study area includes several locations where multiple truck route options do not exist (e.g. Colonial Drive west of Orlando) and increases the likelihood of conflicts between residential traffic and goods movement activities in those areas when trucks have to travel on local routes that may not be designed to accommodate them.

2.0 Highway Profile

2.1 INTRODUCTION

Freight in the seven-county study area is transported via four major modes – highway, rail, water and air. Of these modes, highways (and trucks) play an especially important role as both the dominant mode for moving freight into, out of and through the region and by providing door to door service for the region's businesses and consumers. Businesses and customers depend on trucks and highways for pick-up and delivery operations and trucks and highways provide connections to and among every other mode of transport, along with warehouses, distribution centers, manufacturing plants, and other freight hubs. They act as a critical link in the Central Florida supply chain and economic lifeline, yet they are vulnerable to interruptions, breakdowns and service failures due to the growing and competing demands of other daily users that must share the same highway system.

The region is served by more than 17,900 centerline miles of roadways of which approximately 520 miles are interstates or other toll expressways and approximately 1,094 miles are principal arterials. The roadway system experiences traffic volumes (including trucks) in excess of 98 million vehicle miles per day.[13] In 2010, a majority of all freight (95 percent or more than 191 million tons) that moved across the region was hauled by truck,[14] highlighting the importance of highway facilities to the region's economy and the quality of life for its residents.

This chapter inventories and describes the operating conditions of the region's highway network from a freight perspective. Data is presented on the major routes connecting the commercial and industrial centers within the region to external markets, the condition of highway infrastructure and traffic operations, location of intermodal connectors and truck-involved crashes. This chapter also provides a preliminary discussion of existing and future challenges on the region's highway system. A more detailed analysis on deficiencies and needs will be provided in the forthcoming Regional Goods Movement Needs Assessment report.

[13] FDOT, Reports of Highway Mileage and Travel (DVMT) 2010.

[14] IHS Global Insight's TRANSEARCH data.

Sources of Information

This profile makes use of a variety of sources to detail the current status of the study area highway network, including the Central Florida Regional Planning Model (CFRPMv5.0), data from FDOT (2011 Roadway Characteristics Inventory Database), information gleaned from interviews and surveys and various previous reports. The main sources of information include:

Truck Volume Data. FDOT's count data and level of service tables were used to quantify truck volumes, percentages, and levels of service.

Highway Facilities Inventory Data. Data sources used to identify and characterize the region's freight highway system were obtained from FDOT and Federal Highway Administration.

Field Interviews and Surveys. Interviews were conducted with carriers and shippers throughout the region, including local shippers, receivers, regional and national long-haul carriers, freight expeditors, and regional and national manufacturing and retail shippers. Some of the firms interviewed with a key interest in regional trucking and Central Florida's highway system are listed below:

- Lowe's Regional Distribution Center – Osceola County
- Rooms to Go Regional Distribution Center – Polk County
- Publix Regional Distribution Center – Polk County
- Service Trucking – Lake County
- McTyre Trucking – Orange County
- CKS Packaging – Orange County
- FedEx Freight – Orange County
- Florida Rock/Vulcan – Orange County
- Carroll Fulmer – Lake County
- DHL – Orange County
- Orlando Health – Orange County
- Disney – Orange County
- Sysco – Orange County
- Orange County Convention Center – Orange County
- Orange-Orange County Expressway Authority (OOCEA) – Orange County
- Florida's Natural – Polk County
- Waste Pro – Seminole County
- Waste Management – Orange County

2.2 REGIONAL FREIGHT HIGHWAY NETWORK

This section describes the various elements of the study area's highway freight system. It provides an inventory of the current highway infrastructure network, describes its key components, and discusses how the system is performing.

Highway Inventory

The currently adopted Long Range Transportation Plan (LRTP) for each of the counties in the study area call for an expansion of the centerline miles within the study area by an additional 1,000 by 2035.[15] The freeway/tollroad network in the study region includes I-75 and I-95 that run north-south along the periphery of the study area while I-4 and Florida's Turnpike run northeast-southwest and northwest-southeast through the region. This core network carries the majority of the trucks circulating within the region as well as those hauling goods into and out of the region.

The study region's roadway system is organized into hierarchical categories and is shown in Figure 2.1. As of 2010, this system consisted of 17,935 total miles[16], distributed as follows:

- **Interstates –** 222 miles of multi-lane access-controlled divided highways that connect the region to other major cities in Florida and beyond.
- **Other Freeways and Expressways –** 298 miles of other access-controlled divided highways (including toll facilities) that provide critical connections between important residential, commercial, and industrial areas with the rest of the region and with the Interstate Highway System (IHS).
- **Other Principal Arterials –** 1,094 miles of streets and highways that carry high volume of traffic and connect the major regional urban activity centers.
- **Minor Arterials –** 93 miles of arterial streets that augment the principal arterial system.
- **Collectors –** 2,168 miles of streets (1,922 miles of major collector streets and 246 miles of minor collector streets) providing traffic circulation within residential neighborhoods, commercial developments, and industrial areas and access to the arterial street system.
- **Local –** 13,218 miles of local streets that provide direct access to all properties.

The above categories of roadway facilities are further described below:

Strategic Intermodal System (SIS) – Florida's Strategic Intermodal System (SIS) is a transportation system that is made up of facilities and services of statewide

[15] 2035 CFRPMv5.0 from FDOT D-5.
[16] FDOT, Reports of Highway Mileage and Travel (DVMT) 2010.

and interregional significance. Although in the Central Florida Region the SIS is predominantly composed of a highway network, it contains all forms of transportation for moving both people and goods, including linkages that provide for smooth and efficient transfers between modes and major facilities (including ports, airports and rail terminals). The SIS was established to efficiently serve the mobility needs of Florida's citizens, businesses, and visitors; and help Florida become a worldwide economic leader, enhance economic prosperity and competitiveness, enrich quality of life, and reflect responsible environmental stewardship.

Statewide, the current designated SIS is a network of high-priority transportation facilities which includes the state's largest and most significant commercial service airports, spaceport, deepwater seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways and highways; and carries more than 99 percent of all commercial air passengers and cargo, virtually all waterborne freight and cruise passengers, almost all rail freight, 89 percent of all interregional rail and bus passengers, and 55 percent of total traffic and more than 70 percent of all truck traffic on the State Highway System.

Interstate Highway System (IHS) – The system of access controlled freeways in the region nationally designated as part of the IHS and included within the National Highway System (NHS). Key interstate routes include I-4, which bisects the region from west to east; I-75, which runs north-south on the western periphery of the study region; I-95, which runs north-south on the eastern periphery of the study region. The IHS is part of the FDOT Strategic Intermodal System (SIS).

Other National Highway System and Non-Interstate Strategic Highway Network (STRAHNET) – The other NHS routes and Non-Interstate STRAHNET routes in the region, not including IHS routes, includes toll facilities as well as other roads important to the nation's economy, defense, and mobility. These routes provide connections to the interstate system. These other NHS routes and Non-Interstate STRAHNET routes are also part of the FDOT SIS network.

Florida State Roads and Local Roads – These routes include other primary and minor highways owned and operated by FDOT or local governments that are not part of the NHS. In many cases, these roads provide the "last mile" connection to shippers and receivers across the region. There are three types of important roads in this category:

- *Collectors and Distributors* – One-way roads adjacent to interstate highways or expressways designed to manage the traffic flows onto and off of the main lanes of the freeway. They protect the main through lanes from excessive merging and weaving activity.
- *Other Principal Arterials (Local Counties)* – This important system of streets and highways (outside of the categories already described) serve the region's major activity centers, tend to have very high-traffic volumes, and

accommodate both through and intraregional travel. They provide access to freight generating facilities and to major retail centers.

Strategic Intermodal System (SIS) Connectors – SIS connectors are short roadway segments that link airport, seaport, bus, rail terminal and intermodal facilities to the SIS/NHS network. They tend to carry lower traffic volumes at slower speeds than the rest of the SIS/NHS and are therefore often designed to lower standards.[17] Because of their key freight role, however, they are often used by large and heavy trucks. Those with design deficiencies or are in poor condition can slow freight movement or damage goods in transit. The FDOT District 5 identifies 14 freight-related intermodal connectors in the study region which are listed, along with their associated freight transportation facilities in Table 2.1.[18] These freight/intermodal facilities and intermodal connectors are shown in Figure 2.2.

This regional highway system is planned, maintained and managed by a number of statewide, regional, and local agencies including FDOT, county and municipal governments. In addition, there are three toll agencies operating facilities in the study region including:

- **Florida's Turnpike Enterprise (FTE) –** FTE, part of the FDOT, manages and operates the Florida's Turnpike (SR 91) and also portions of toll roads in Seminole County, Orange County, Osceola County and Brevard County including SR 417 (The Seminole Expressway/Central Florida GreeneWay/Southern Connector Extension), SR 429 (Daniel Webster Western Beltway) and SR 528 (Martin B. Andersen Beachline Expressway).
- **Orlando-Orange County Expressway Authority (OOCEA) –** OOCEA manages and operates a majority portion of the toll roads within the City of Orlando and Orange County which include SR 408 (Spessard Lindsay Holland East-West Expressway), SR 414 (John Land Apopka Expressway), SR 417 (Central Florida GreeneWay), SR 429 (Daniel Webster Western Beltway) and SR 528 (Martin B. Andersen Beachline Expressway).
- **Osceola Parkway Toll Road –** Osceola Parkway is a partially tolled arterial road in Osceola County.
- **Seminole County Expressway Authority (SCEA) –** FTE is responsible for the toll roads (SR 417 and planned Wekiva Parkway) in Seminole County while SCEA plays an important role in the planning process for future toll roads within the Seminole County.[19]

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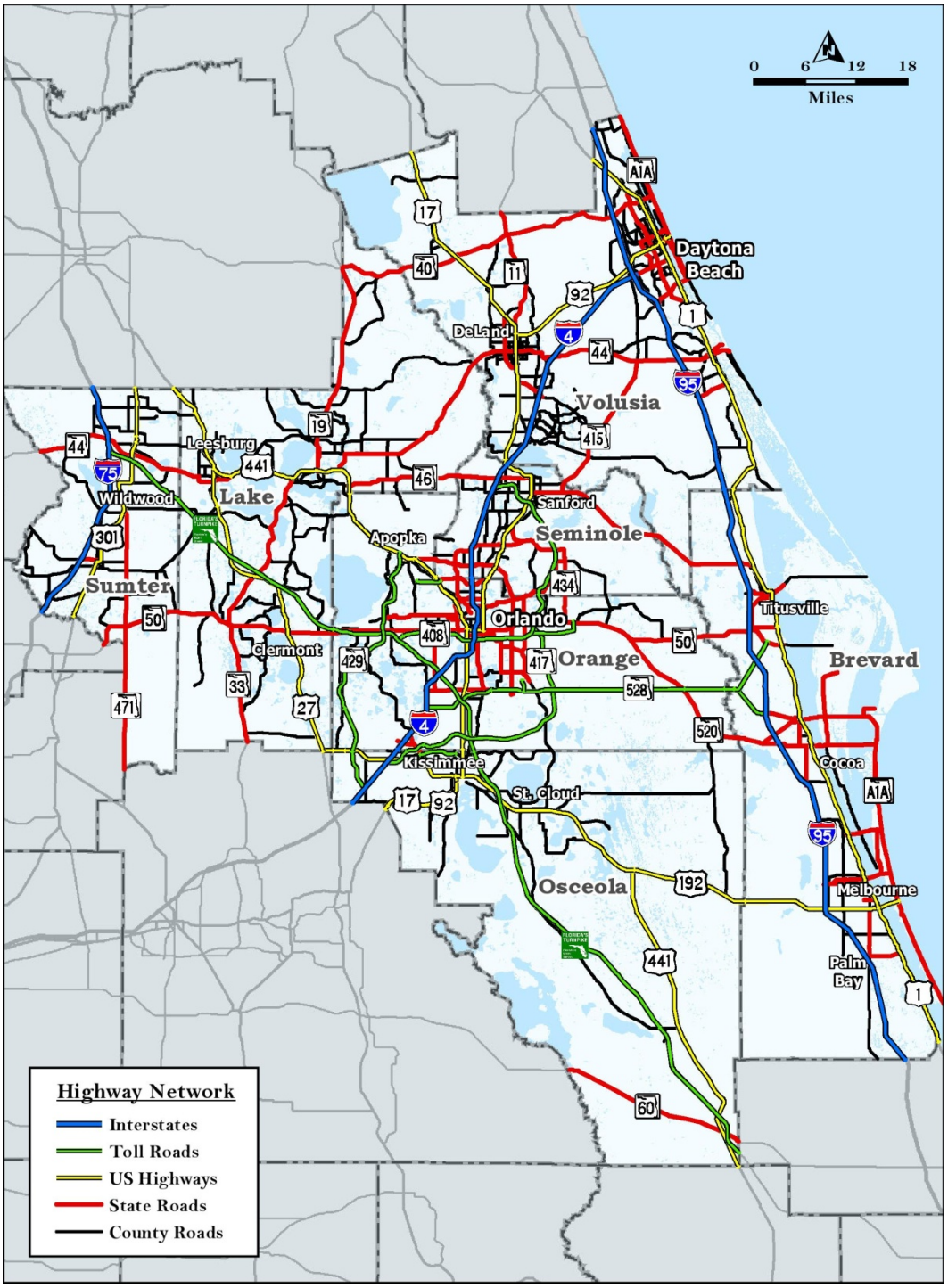
[17] http://ops.fhwa.dot.gov/freight/freight_analysis/nhs_intermod_fr_con/chap_2.htm., accessed 8/20/10.

[18] Official SIS Intermodal Connector Listing: http://www.dot.state.fl.us/planning/sis/, accessed 6/2/12.

[19] http://www.seminolecountyfl.gov/bcc/scea/index.aspx

Figure 2.1 Study Region Highway Network



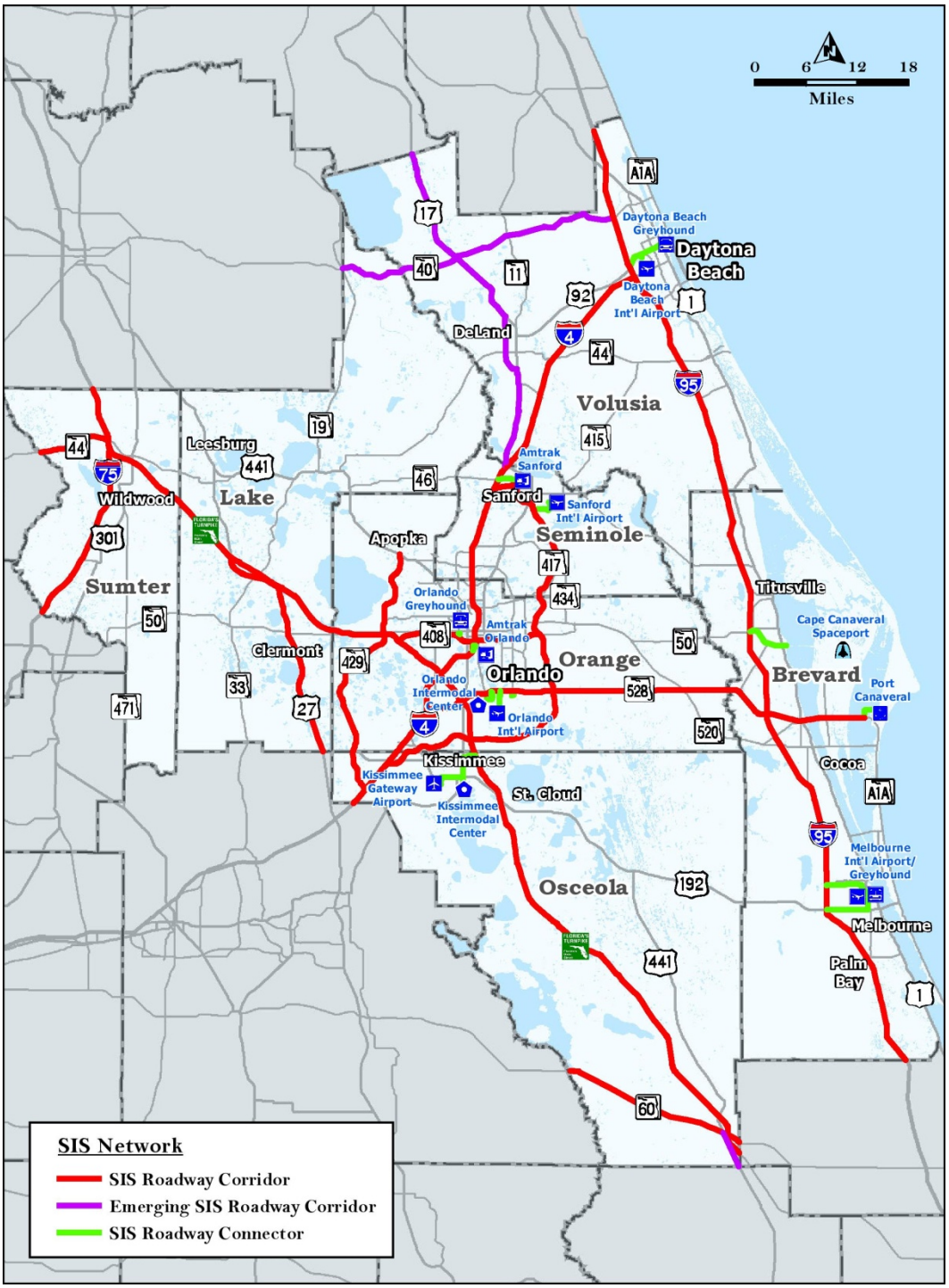
Source: FDOT.

Table 2.1 Listing of SIS and Emerging SIS Intermodal Connectors

Freight Facility	SIS or Emerging SIS roadway segment
SIS Intermodal Connectors	
Port Canaveral	SIS corridor (SR 528) directly to southern port terminals
	SR 528 to SR 401 to northern port terminals
Orlando International Airport	SR 528 to Airport Boulevard to airport property line
	SR 528 to Tradeport Drive (air cargo) to intersection with Boggy Creek Road
Kissimmee Gateway Airport	Florida Turnpike (SR 91) to Osceola Parkway to U.S. 17/92 to U.S. 192 to Hoagland Boulevard to 5th Street to the airport entrance
Cape Canaveral	I-95 to SR 50 to Columbia Boulevard (SR 405) to Kennedy Space Center entrance
	SR 528 to SR 401 to Cape Canaveral Air Force Station entrance
Orlando Greyhound Bus Terminal	SR 408 to N John Young Parkway to Business Center Blvd to entrance
Orlando Amtrak Station	I-4 to Kaley Avenue to Division Avenue to Columbia Street to Sligh Boulevard to entrance
Sanford (Auto Train) Amtrak Station	I-4 to SR 46 to Persimmon Avenue to entrance
Emerging SIS Intermodal Connectors	
Daytona Beach International Airport	I-95 to U.S. 92 (International Speedway Boulevard) to Midway Avenue to entrance
Melbourne International Airport	I-95 to U.S. 192 to Airport Boulevard to NASA Boulevard to entrance and exit at Air Terminal Parkway
Orlando-Sanford International Airport	SR 417 to Lake Mary Boulevard to entrance
Daytona Beach Greyhound Bus Terminal	I-95 to U.S. 92 to Ridgewood Avenue to entrance
Melbourne Greyhound Bus Terminal	I-95 to Eau Gallie Boulevard to Sarno Road to Apollo Boulevard to NASA Boulevard to entrance
Kissimmee Intermodal Center	Florida's Turnpike (SR 91) to Osceola Parkway to U.S. 441 (Orange Blossom Trail) to Broadway Avenue to E. Dakin Avenue to entrance
Orlando CSXT Intermodal Freight Terminal	SR 528 to Boggy Creek Road to Landstreet Road to Atlantic Avenue to entrance

Source: FDOT.

Figure 2.2 SIS and Emerging SIS Intermodal Connectors



Source: FDOT.

Hazardous Materials Routes

Presently, there are no Hazardous materials (HazMat) routes in the study region.[20] In the state of Florida, the only identified hazardous materials restricted routes are located in the Tampa Bay region which are in the vicinity of downtown Tampa and the Crosstown Parkway.

Primary and Other Freight Corridors

The 2002 *Freight, Goods and Services Mobility Strategy Plan* initially identified 11 "primary" freight corridors based upon the volume of truck traffic handled on an average daily basis (>5 percent trucks). This list was later expanded based upon interviews with trucking companies and their drivers who identified 12 "other" local and regional connections that serve as lower volume freight corridors and connections to intermodal centers.

To help validate the list of primary freight routes from the previous study under current conditions, truck volume data was again reviewed to identify roadways (see Table 2.2) within the study area that carry significant truck volumes (>3,000 trucks per day). All of the highways previously identified as "primary" freight routes remained on the list and showed a growth in freight traffic above the 2002 levels. It is noteworthy that several of the "other" freight corridors identified by truck drivers in the 2002, not because of truck volume but due to the important connections they serve, are now in 2012 identified as "primary" freight corridors due to the high volume of trucks now using these roadways. Similarly, the recent interviews with regional freight handlers, shippers, carriers and receivers have identified other important freight routes which have been added to the list as "other" freight corridors. Figure 2.3 shows the freight corridors identified in Table 2.2.

Highway System Characteristics

Highway facilities, even within the same highway classification group (interstates, state roads, etc.) can vary significantly in attributes such as capacity and condition. The level of truck activity impacts both the capacity and condition on highway facilities. To gain a more thorough understanding of the region's highway system in general, and the impacts of truck movements in particular, an inventory of key characteristics of the highway network was conducted. The general characteristics explored in this inventory include:

- Number of lanes;
- Pavement condition; and
- Bridge condition.

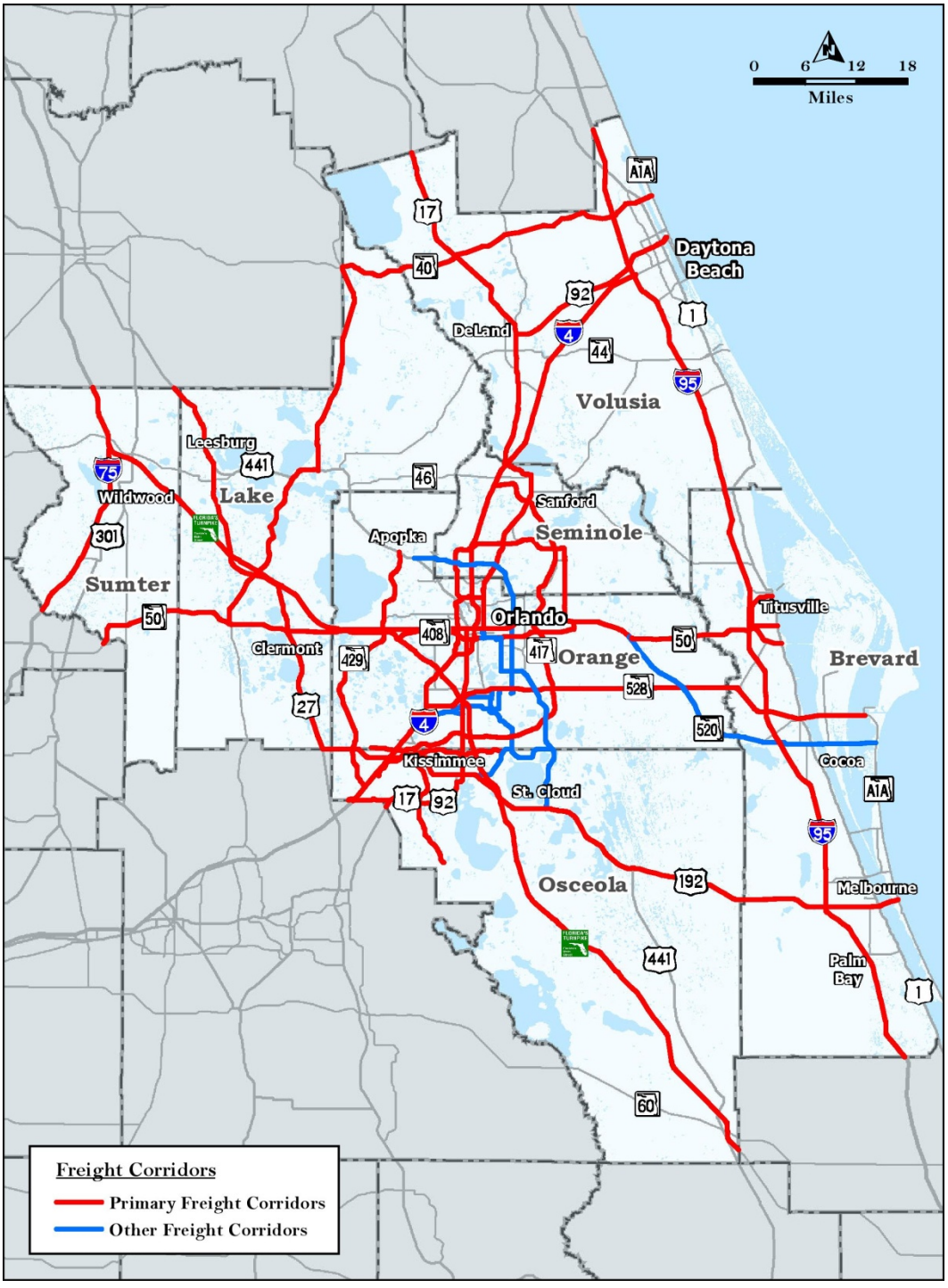
20 http://www.fmcsa.dot.gov/safety-security/hazmat/national-hazmat-route.aspx, accessed 6/3/12.

Table 2.2 Primary Freight Corridors
High Truck Volume Routes

Primary Freight Corridors (High Truck Volume Routes)			
Roadway	Truck Volume	Truck Percentage	AADT
I-4*	20,193	19.7	102,500
Florida's Turnpike*	14,496	15.1	96,000
I-75*	13,028	19.3	67,500
I-95*	11,622	15.6	74,500
SR 528*	10,639	12.4	85,800
SR 408*	10,575	9.4	112,500
SR 417*	6,622	12.4	53,400
Poinciana Boulevard	5,434	20.9	26,000
US 192**	5,408	10.4	52,000
Osceola Parkway**	5,247	10.6	49,500
SR 436 (Semoran Boulevard)**	5,202	10.1	51,500
US 27**	4,453	14.6	30,500
SR 423/John Young Parkway*	4,356	9.9	44,000
SR 434*	4,056	20.8	19,500
Osceola Polk Line Road (CR 532)	3,825	20.9	18,300
SR 429*	3,686	11.7	31,500
SR 19	3,427	7.7	44,500
SR 40 (Granada Blvd)	3,384	9.4	36,000
US 17/92*	3,306	5.8	57,000
SR 50*	3,192	15.8	20,200
Other Freight Corridors (Identified by Drivers and Trucking Companies)			
Roadway	Truck Volume	Truck Percentage	AADT
Tradeport Drive	2,270	13.2	17,200
SR 520**	1,670	5.3	31,500
Landstreet Road**	1,388	17.8	7,800
Central Florida Parkway	1,330	3.5	38,000
Boggy Creek Road**	1,330	12.2	10,900
SR 15 (Narcoossee Road, Hoffner Avenue, Conway Road, Lake Underhill Road, South Street, Anderson Street)**	1,298	4.4	29,500
Taft Vineland Road**	804	4.9	16,400
SR 405 (NASA Causeway)**	708	4.4	16,100

Source: FDOT District 5. *Identified as primary freight corridors in the 2002 study. **Identified as other freight corridors by truck drivers and the steering committee in the 2002 study. Corridors without * or ** are new for 2012.

Figure 2.3 Freight Corridors Map



Source: FDOT, Interviews.

Number of Lanes

The more lanes a roadway has, the greater its capacity to handle higher traffic volumes and safely accommodate the shared usage of both automobile and truck traffic. Shared usage can be more of an issue when there are fewer lanes due to differing vehicle operating requirements such as deceleration, acceleration and merging. Figure 2.4 illustrates the number of lanes (in each direction) on the major roadways in the study region for year 2011. Interstates and toll roads have the greatest capacity within the study area, with the highest lane capacities provided within the urbanized area. Improvements to the existing roadway network in the study area are identified in the latest Long Range Transportation Plan (LRTP) for MetroPlan Orlando, Volusia TPO, Lake-Sumter MPO and Space Coast TPO. The improvements completed/planned/programmed between year 2005 and year 2035 are shown in Figure 2.5.

Table 2.3 summarizes the list of planned/programmed improvements for interstate roadways/toll roads/highways within study area that handle significant truck volumes.

Pavement Condition

The International Roughness Index (IRI) is a measure used to classify pavement conditions. IRI measures the cumulative deviation from a smooth surface in inches per mile – in other words, the sum of all the up-and-down road imperfections, from potholes to barely noticeable bumps or road roughness that a vehicle encounters while traveling one mile. The ranges of values correspond to the pavement condition as follows (IRI is reported in inches per mile): very good (0 to 85); good (86 to 110); fair (111 to 140); poor (141 to 175); very poor (more than 175).

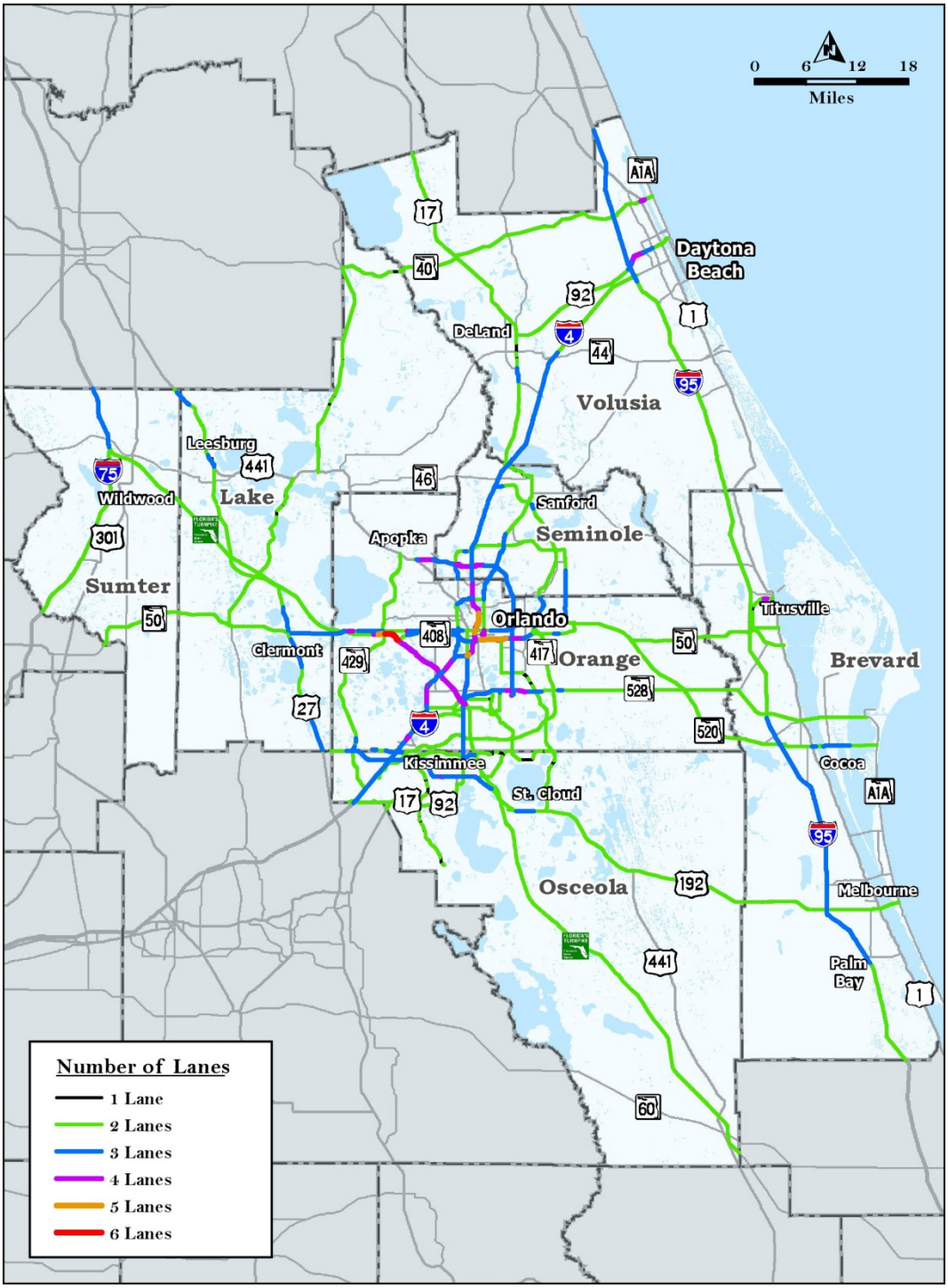
Pavement conditions are constantly changing as repairs are made and as wear and tear accumulate over time. The conditions reported below are based on 2011 data, therefore specific conditions may have changed at the time of this report. Figure 2.6 illustrates the pavement condition on the major roadways in the study region. All vehicles cause a certain amount of damage to roadway pavements. In general, trucks, due to their greater per-axle loads, cause more roadway damage than automobiles. It is important to note that proper distribution of weight across axles helps to minimize the impact of additional weight on pavement and is a greater factor in determining the extent of damage than the absolute weight of a load.

The life of a pavement is related to the magnitude and frequency of axle loads, particularly the heavy-axle loads associated with trucks. Maintaining good pavement conditions on truck-intensive corridors is generally more costly than on those corridors used primarily by passenger vehicles, due to the type of materials or thickness of the roadway bed. Conversely, poor pavement conditions can impact vehicles using the roadway by reducing highway speed (capacity) or even, in extreme cases, by causing damage to vehicles and/or the

goods being shipped within them. Therefore, there is both a public- and private-sector cost associated with pavement damage. Table 2.4 displays pavement conditions on the Region's major freeways (both interstates and toll expressways) and Table 2.5 displays pavement conditions on the Region's major highways. Figure 2.6 displays the information summarized in Tables 2.4 and 2.5. As of 2011, the following state road segments have poor pavement conditions:

- I-95 from SR 46 to SR 528 in Brevard County (this segment of I-95 has planned and programmed improvements for widening from 4 to 6 lanes); and
- U.S. 17-92 from I-4 Ramps to CR 4047 (Marsh Road) in Volusia County.

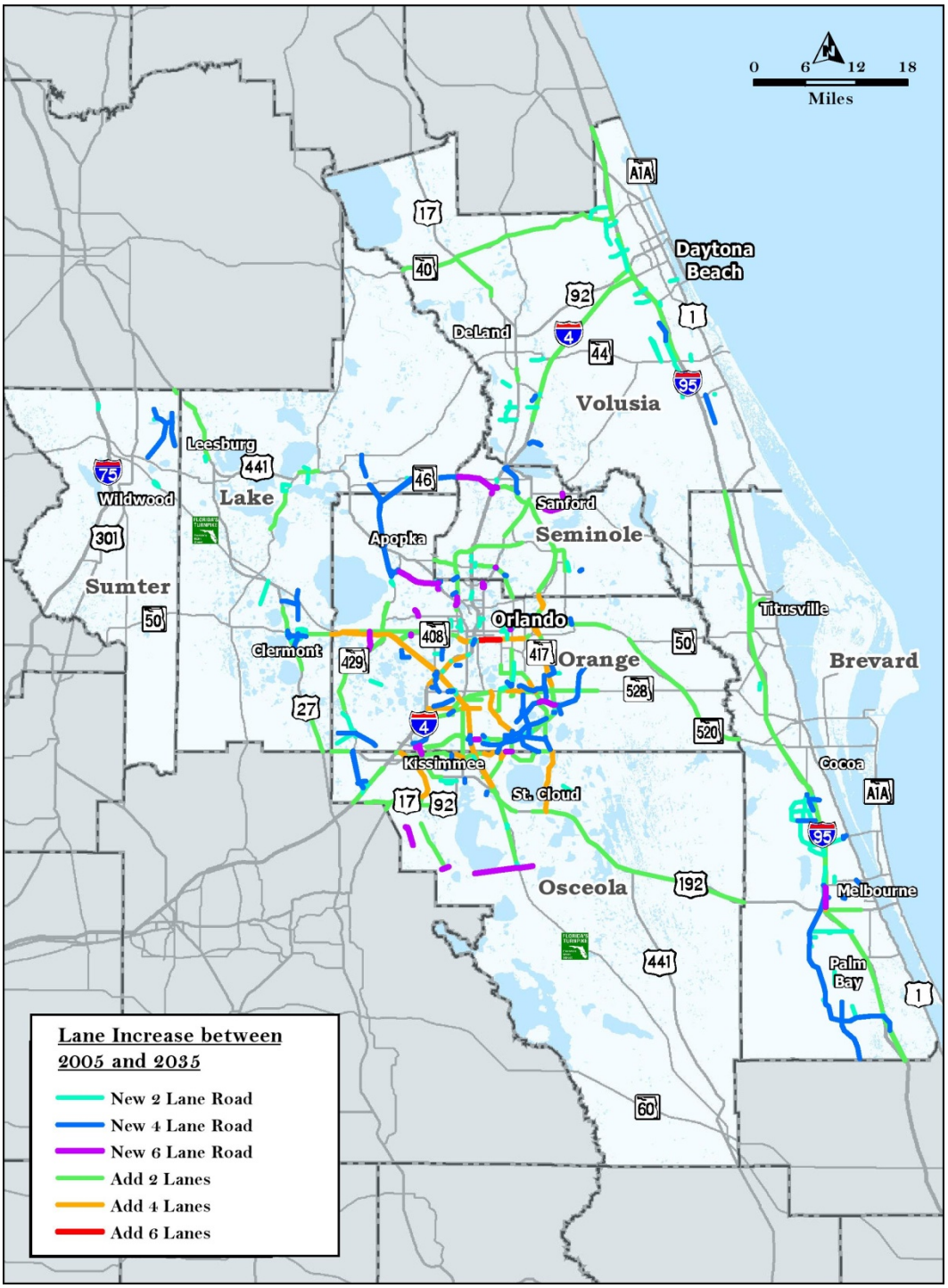
Figure 2.4 Number of Lanes
By Direction, 2011



Source: FDOT.

Note: Data reported for freight corridors identified in Figure 2.3.

Figure 2.5 Increment in Number of Lanes between 2005 and 2035



Source: FDOT.

Note: Data reported for freight corridors identified in Figure 2.3.

Table 2.3 List of Planned/Programmed Improvements for Major Freight Roadways

Roadway	From	To	Improvement	Source
Florida's Turnpike	Minneola Interchange		New Interchange	Lake-Sumter MPO 2035 LRTP
Florida's Turnpike	C-468 Interchange		New Interchange	Lake-Sumter MPO 2035 LRTP
Wekiwa Parkway (SR 429/SR 46)	Seminole County Line	Orange County Line	State New 4 Lane Road	Lake-Sumter MPO 2035 LRTP
SR 46	U.S. 441	Orange County Line (connect to SR 429)	Statewiden Road (2 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
SR 50	U.S. 27 (Clermont Interchange)		New Interchange (urban)	Lake-Sumter MPO 2035 LRTP
U.S. 27 (SR 25)	Lake Louisa Road	Boggy Marsh Road	State widen Road (4 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
I-75 (SR 93)	C-466		New Interchange (Mainline)	Lake-Sumter MPO 2035 LRTP
U.S. 27/U.S. 441	Lake Ella Road	MLK JR Boulevard	Statewiden Road (4 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
U.S. 27/U.S. 441	Avenida Central	Lake Ella Road	Statewiden Road (4 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
U.S. 441/SR 500	Perkins Street	SR 44	Statewiden Road (4 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
SR 50 / SR 33	CR 565 (Villa City Road)	CR 565 (Montevista)	New 4 Lane Road	Lake-Sumter MPO 2035 LRTP
U.S. 441	SR 44	SR 46	Statewiden Road (4 to 6 lanes)	Lake-Sumter MPO 2035 LRTP
SR 19	CR 561	CR 48	Statewiden Road (2 to 4 Lanes)	Lake-Sumter MPO 2035 LRTP
I-4	2.8 miles South of Polk/Osceola County Line	Volusia/Seminole County Line	Ultimate Configuration for General and Special Use Lanes	MetroPlan 2030 LRTP
SR 15/600/U.S. 17/92	Shepard Rd	Lake Mary Boulevard	Widen to 6 lanes	MetroPlan 2030 LRTP
SR 15/600/U.S. 17/92	Intersection @ SR 436		New Interchange	MetroPlan 2030 LRTP
SR 50	SR 429/Western Expy.	Good Homes Rd	Widen to 6 lanes	MetroPlan 2030 LRTP
Sand Lake Rd/John Young Pkwy	John Young Pkwy	Presidents Dr.	Widen to 6 Lanes and Flyover at John Young Pkwy	MetroPlan 2030 LRTP
SR 15/Narcoossee Road/Hoffner Avenue	Lee Vista Boulevard	Conway Road	Widen to 4 lanes	MetroPlan 2030 LRTP
SR 423/John Young Pkwy	Shader Road	Edgewater Dr.	Widen to 6 lanes	MetroPlan 2030 LRTP
SR 434/Forest City Road	SR 423/John Young Pkwy.		Widen to 6 lanes	MetroPlan 2030 LRTP

Roadway	From	To	Improvement	Source
SR 500/600/U.S. 17/92	Poinciana Boulevard	S of CR 535	Widen to 4 lanes	MetroPlan 2030 LRTP
SR 434	Montgomery Road	CR 427	Widen to 6 lanes	MetroPlan 2030 LRTP
SR 436	Red Bug Lake Road		New Interchange	MetroPlan 2030 LRTP
SR 500/U.S. 192	Aeronautical Boulevard	Buddinger	Widen to 6 lanes	MetroPlan 2030 LRTP
SR 500/U.S. 192	Eastern Ave	CR 532	Widen to 6 lanes	MetroPlan 2030 LRTP
U.S. 17/92	Polk/Osceola Co. Line	Poinciana Boulevard	Widen to 4 lanes	MetroPlan 2030 LRTP
SR 50	E. Old Cheney Hwy.	SR 520	Widen to 6 lanes	MetroPlan 2030 LRTP
SR 15/600/U.S. 17/92 and Lee Road Extension	Norfolk Avenue	Monroe St.	Construct medians/improve intersections/extend road	MetroPlan 2030 LRTP
	SR 15/600/U.S. 17/92	Denning Dr.		
John Young Pkwy.	Pleasant Hill Road	Portage St.	Widen to 6 lanes	MetroPlan 2030 LRTP
Taft-Vineland Road Ext.	Central Florida Parkway	John Young Parkway	New 4 lanes	MetroPlan 2030 LRTP
Boggy Creek Road	Osceola County Line	SR 417	Widen 2-4	MetroPlan 2030 LRTP
U.S. 192	Lake Co. Line	Secret Lake Dr	Widen 4-6	MetroPlan 2030 LRTP
Narcoossee Road	SR 417	SR 528	Widen 4-6	MetroPlan 2030 LRTP
Boggy Creek Road	Jetport Dr.	SR 417	Widen 2-4	MetroPlan 2030 LRTP
John Young Parkway	Parnell	Orange County Line	New interchange, 6 lane approaches	MetroPlan 2030 LRTP
Osceola Parkway	John Young Parkway	Orange Blossom Trail	Widen 4-6	MetroPlan 2030 LRTP
Poinciana Blvd	Crescent Lakes Way	Pleasant Hill Rd	Widen 2-4	MetroPlan 2030 LRTP
Narcoossee Road	U.S. 192-441	Orange County Line	Widen 4-6	MetroPlan 2030 LRTP
Osceola Parkway	Orange Blossom Trail	Florida Turnpike	Widen 6+ to 8+	MetroPlan 2030 LRTP
Osceola Parkway	Florida Turnpike		New interchange	MetroPlan 2030 LRTP
Poinciana Boulevard	U.S. 192	one mile N of Old Tampa Hwy	Widen 4-6	MetroPlan 2030 LRTP
CR 532 (Osceola Polk Line)	CR 545	U.S. 17-92	Widen 2-4	MetroPlan 2030 LRTP
SR 91/Florida's Turnpike	Southport Connector	U.S. 192/St. Cloud	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 91/Florida's Turnpike	U.S. 192/St. Cloud	U.S. 441/Orange Blossom Tr.	Widen 4-8 lanes	MetroPlan 2030 LRTP
SR 91/Florida's Turnpike	SR 417/Greeneway		New interchange	MetroPlan 2030 LRTP

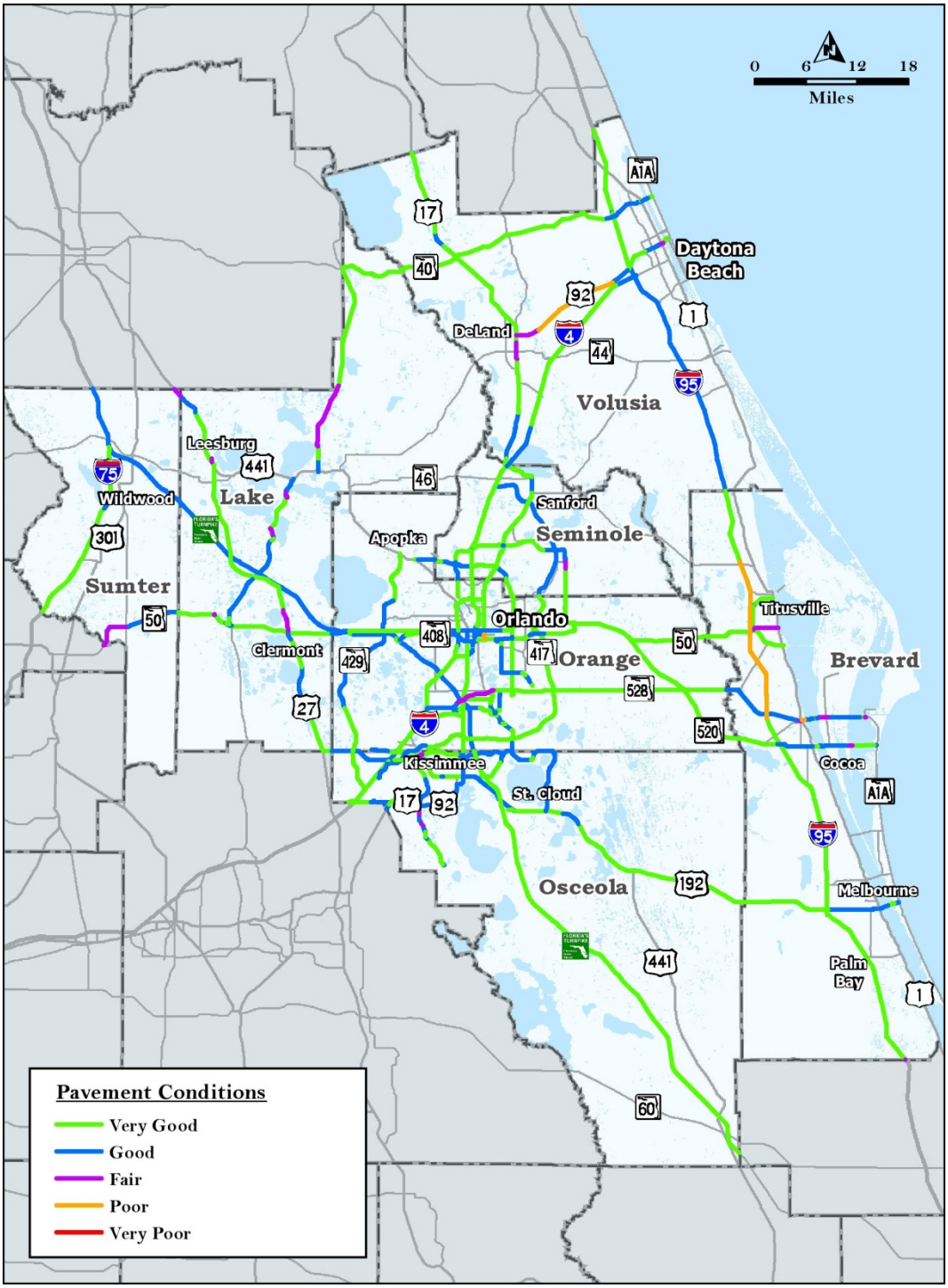
Roadway	From	To	Improvement	Source
SR 91/Florida's Turnpike	SR 482/Sand Lake Road		New interchange	MetroPlan 2030 LRTP
SR 417/Seminole Expwy	SR 426/Aloma Ave	I-4	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 528/BeachLine Expwy	I-4	John Young Pkwy.	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 528/BeachLine Expwy	I-4	John Young Pkwy.	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 528/BeachLine Expwy	John Young Pkwy.	SR 91/Florida's Turnpike	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 408/East-West Expwy	SR 91/Florida's Turnpike	SR 50/W. Colonial Dr. ramps	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 408/East-West Expwy	John Young Pkwy.	I-4	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 408/East-West Expwy	I-4	Anderson St.	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 408/East-West Expwy	Anderson St.	Conway Rd	Widen 10-12 lanes	MetroPlan 2030 LRTP
SR 408/East-West Expwy	Conway Rd	Goldenrod Rd	Widen 8-10 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 536/World Center Dr.	SR 91/Florida's Turnpike	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 91/Florida's Turnpike	SR 528/BeachLine Expwy	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 528/BeachLine Expwy	Curry Ford Road	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	Curry Ford Road	SR 408/East-West Expwy	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 408/East-West Expwy	SR 50/Colonial Dr.	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 408/East-West Expwy	SR 50/Colonial Dr.	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	SR 50/Colonial Dr.	University Boulevard	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	University Boulevard	SR 426/Aloma Avenue	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 417/Greeneway	University Boulevard	SR 426/Aloma Avenue	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 429/Wekiva Pkwy.	SR 414/John Land Apopka Expwy	U.S. 441/Orange Blossom Tr.	New 4 lane toll road	MetroPlan 2030 LRTP
SR 429/Wekiva Pkwy.	U.S. 441/Orange Blossom Tr.	Lake County Line	New 4 lane toll road	MetroPlan 2030 LRTP
SR 429/Wekiva Pkwy.	Lake County Line	I-4	New 6 lane toll road	MetroPlan 2030 LRTP
SR 429/Western Beltway	Seidel Road	SR 91/Florida's Turnpike	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 429/Western Beltway	SR 91/Florida's Turnpike	West Road/Clarcona-Ocoee Road	Widen 4-6 lanes	MetroPlan 2030 LRTP
SR 528/BeachLine Expwy	Tradeport Road	SR 436/Semoran Boulevard	Widen 6-8 lanes	MetroPlan 2030 LRTP

Roadway	From	To	Improvement	Source
(Tradeport Road to)				
SR 528/BeachLine Expwy (Tradeport Road to)	SR 436/Semoran Boulevard	Goldenrod Road	Widen 6-8 lanes	MetroPlan 2030 LRTP
SR 528/BeachLine Expwy	BeachLine Mainline Toll Plaza	McKelly Road	Widen 4-6 lanes	MetroPlan 2030 LRTP
Southport Connector	Southport Road	SR 91/Florida's Turnpike	New 6 lane toll road	MetroPlan 2030 LRTP
Southport Connector	SR 91/Florida's Turnpike	Canoe Creek Road	New 6 lane toll road	MetroPlan 2030 LRTP
Osceola Pkwy.	SR 417/Southern Connector	SR 535/Vineland Road	Widen 4-6 lanes	MetroPlan 2030 LRTP
Osceola Pkwy.	SR 535/Vineland Road	John Young Pkwy.	Widen 4-6 lanes	MetroPlan 2030 LRTP
I-95	Malabar Rd	Indian River County	Widen Freeway (4 to 6 lanes)	Space Coast TPO 2035 LRTP
I-95	Volusia County	SR 406	Widen Freeway (4 to 6 lanes)	Space Coast TPO 2035 LRTP
I-95	St. Johns Heritage Parkway Interchange (North)		New Interchange (urban)	Space Coast TPO 2035 LRTP
I-95	St. Johns Heritage Parkway Interchange (South)		New Interchange (urban)	Space Coast TPO 2035 LRTP
South Street (SR 405)	Existing 4 lane section	SR 50	Widen Road (2 to 4 Lanes)	Space Coast TPO 2035 LRTP
U.S. 192	St Johns Heritage Parkway	Wickham Rd	Widen Road (4 to 6 lanes)	Space Coast TPO 2035 LRTP
U.S. 192	Wickham Rd	Dairy Road	Widen Road (4 to 6 lanes)	Space Coast TPO 2035 LRTP
I-95	Viera Blvd		New Interchange (urban)	Space Coast TPO 2035 LRTP
I-4	SR 44	I-95	Widen to 6 Lanes	Volusia TPO 2035 LRTP
I-95	SR 421		Interchange Improvement	Volusia TPO 2035 LRTP
I-95	I-4		Systems Interchange	Volusia TPO 2035 LRTP
I-95	SR 400 (Beville Rd)	SR 44	Widen to 6 Lanes	Volusia TPO 2035 LRTP
I-95	Brevard County Line	SR 44	Widen to 6 Lanes	Volusia TPO 2035 LRTP
U.S. 17	SR 40	Ponce DeLeon Blvd	Widen to 4 Lanes	Volusia TPO 2035 LRTP
I-95	U.S. 1		Interchange Improvement	Volusia TPO 2035 LRTP
U.S. 92	I4	CR 415 (Tomoka Farms Rd)	Widen to 6 Lanes	Volusia TPO 2035 LRTP
SR 40	I-95	Breakaway Trail	Widen to 6 Lanes	Volusia TPO 2035 LRTP
SR 40	Cone Road	SR 11	Widen to 4 Lanes	Volusia TPO 2035 LRTP

Roadway	From	To	Improvement	Source
SR 40	SR 11	U.S. 17	Widen to 4 Lanes	Volusia TPO 2035 LRTP
SR 40	U.S. 17	Lake County Line	Widen to 4 Lanes	Volusia TPO 2035 LRTP

Source: Study area LRTPs.

Figure 2.6 Pavement Conditions
2011



Source: FDOT.

Note: Data reported for freight corridors identified in Figure 2.3.

Table 2.4 Pavement Condition – Interstates and Toll Expressways

Roadway – County	Very Good	Good	Fair	Poor	Very Poor
FL Turnpike	50%	50%	-	-	-
Lake	-	100%	-	-	-
Orange	1%	99%	-	-	-
Osceola	100%	-	-	-	-
Sumter	-	100%	-	-	-
I-4	85%	15%	-	-	-
Orange	92%	8%	-	-	-
Osceola	81%	19%	-	-	-
Seminole	100%	-	-	-	-
Volusia	72%	28%	-	-	-
I-75	71%	29%	-	-	-
Sumter	71%	29%	-	-	-
I-95	59%	25%	-	16%	-
Brevard	74%	-	-	26%	-
Volusia	36%	64%	-	-	-
SR 408	41%	59%	-	-	-
Orange	41%	59%	-	-	-
SR 417	58%	42%	-	-	-
Orange	93%	7%	-	-	-
Osceola	-	100%	-	-	-
Seminole	-	100%	-	-	-
SR 429	50%	50%	-	-	-
Orange	42%	58%	-	-	-
Osceola	100%	-	-	-	-
SR 528	59%	31%	10%	-	-
Brevard	-	100%	-	-	-
Orange	76%	12%	12%	-	-

Source: 2012 FDOT Roadway Characteristics Inventory (RCI).

Table 2.5 Pavement Condition Major Highways

Roadway – County	Very Good	Good	Fair	Poor	Very Poor
SR 50	76%	18%	7%	–	–
Brevard	60%	4%	36%	–	–
Lake	98%	2%	–	–	–
Orange	80%	20%	–	–	–
Sumter	–	62%	38%	–	–
U.S. 1	58%	38%	4%	–	–
Brevard	66%	32%	2%	–	–
Volusia	47%	47%	6%	–	–
U.S. 17/92	59%	31%	5%	5%	–
Orange	95%	5%	–	–	–
Osceola	9%	91%	–	–	–
Seminole	89%	11%	–	–	–
Volusia	48%	33%	9%	9%	–
U.S. 192	66%	34%	–	–	–
Brevard	60%	40%	–	–	–
Lake	100%	–	–	–	–
Orange	–	100%	–	–	–
Osceola	69%	31%	–	–	–
U.S. 27	75%	21%	5%	–	–
Lake	76%	21%	3%	–	–
Sumter	–	–	100%	–	–
U.S. 301	81%	18%	1%	–	–
Sumter	81%	18%	1%	–	–

Source: 2012 FDOT Roadway Characteristics Inventory (RCI).

Bridge Condition

The National Bridge Inventory documents the conditions of bridges on all public roads, regardless of their ownership. Bridges are rated as either "not deficient," "functionally obsolete," or "structurally deficient." A bridge rated "functionally obsolete" or "structurally deficient" is not necessarily unsafe, rather, it typically has an older design that lacks modern safety features such as adequate shoulder space, an appropriate railing system, or other features.[21] Figure 2.7 displays each of the functionally obsolete and structurally deficient bridges in the study region.[22] While there are a significant absolute number of functionally obsolete and structurally deficient bridges in the region, as a percentage of all bridges, the number is relatively low (see Table 2.6).

The number of "functionally obsolete" or "structurally deficient" structures is approximately 10% of all structures in Brevard, Orange, Osceola and Seminole counties and approximately 20% of all structures in Lake, Sumter and Volusia counties, including some key freight routes such as SR 528, I-75, and I-4.

In general, structurally deficient structures tend to be more restrictive to truck movements than functionally obsolete bridges. In addition, if a functionally obsolete structure also has underclearance issues[23], it will impact truck traffic. About half of all "functionally obsolete" or "structurally deficient" structures in the study area may be restrictive to some truck movements.

[21] http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter7.cfm accessed 6/3/12.

[22] 2011 FHWA NBI data.

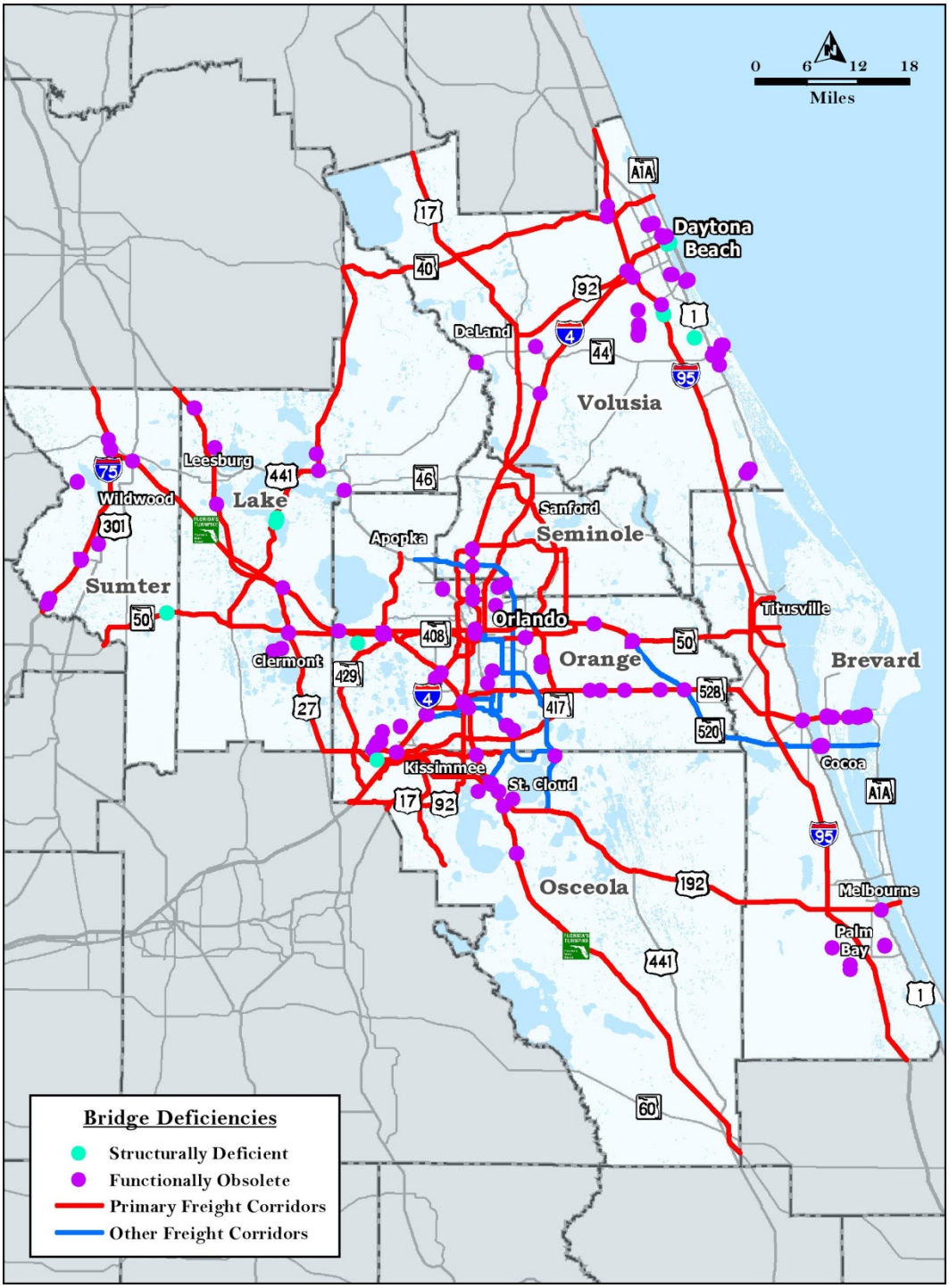
[23] An appraisal rating of 3 or less for Item 69 – Underclearances in NBI data.

Table 2.6 Bridge Conditions

	Bridge Status							
	Structurally Deficient		Functionally Obsolete					
County	Total	Restrictive to Truck Movements	Total	Restrictive to Truck Movements	Not Deficient	Total	Percent Deficient or Obsolete	Percent Restrictive to Truck Movements
Brevard	-	-	18	9	165	183	9.8%	4.9%
Lake	1	1	8	5	36	45	20.0%	13.3%
Orange	2	2	31	20	268	301	11.0%	7.3%
Osceola	-	-	16	4	188	204	7.8%	2.0%
Seminole	-	-	23	11	275	298	7.7%	3.7%
Sumter	1	1	10	5	51	62	17.7%	9.7%
Volusia	4	4	29	7	151	184	17.9%	6.0%
Total	8	8	135	61	1134	1277	11.2%	5.4%

Source: FHWA NBI.

Figure 2.7 Functionally Obsolete and Structurally Deficient Bridges in the Study Region
2011



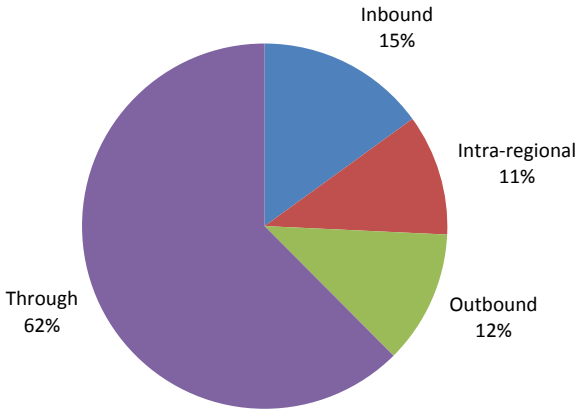
Source: FDOT, FHWA NBI.

2.3 REGIONAL HIGHWAY FREIGHT TRAFFIC AND EQUIPMENT

Trucking is the most flexible of all the freight modes due to the ability to connect users in almost any location; utilize flexible timing schedules for pick-up and delivery operations; and handle nearly any type of commodity due to the diversity in equipment. Highways and trucks are essential to goods movement and are a critical element to providing linkages between modes. In Central Florida, trucks are responsible for the greatest volume of tonnage handled and the largest number of trips. They also handle the broadest range of commodities, ranging from raw materials to semi-finished goods to consumer products. In some cases, they are responsible for the entire freight "move" via door-to-door service. In other cases, they are part of intermodal trip chains, collecting cargo and delivering to ports, rail yards, airports, and warehouse/distribution centers. Every freight shipper or receiver that is not located on a navigable waterway or active rail line or within an air cargo apron (and many that are) is dependent on trucking. Shippers that use railroads, ports, pipelines and airports also rely on trucking to reach customers throughout the study region and the U.S.

In 2010, 191 million tons or 95 percent of the total freight tonnage moving into, out of, within and through the region is transported by truck. Of that share 62 percent is through traffic, 15 percent is inbound and 12 percent and 11 percent respectively are outbound and intraregional traffic (see Figure 2.8).

Figure 2.8 Direction of Truck Freight Flows by Weight
2010



Source: 2010 FDOT Trade and Logistics dataset.

Of the 81 million tons of inbound, outbound, and intraregional traffic (excludes through), more than 71 million tons of freight, was hauled by truck (88 percent of the total).[24] **Table 2.7** provides a comparison of modal share for the top 10 commodities moving in the region. Except for coal, each of the leading tonnage commodities depends heavily on trucking. Notable is the fact that warehoused goods and clay, concrete, glass and stone, which are used in construction, are almost totally dependent on truck transport. The implications of this are that as population growth spreads throughout the region, the demand for these goods and the trucks that transport them will also grow. Hence, truck traffic will grow at a faster place in the areas experiencing the most growth. Also notable is the volume of petroleum products shipped by truck, which in many regions of the United States is more prominently carried by pipeline.

Table 2.7 Regional Share of Tonnage by Mode, *Inbound, Outbound, and Intraregional*
2010, Tons in Thousands

STCC2	Commodity	Truck Tons	Rail Tons	Air Tons	Air-Truck Tons	Water Tons
14	Non-Metallic Ores and Minerals	83%	16%	-	-	1%
32	Clay, Concrete, Glass, Stone Prod	97%	2%	0%	-	1%
50	Warehoused Goods	99%	-	-	1%	-
20	Food and Kindred Products	91%	9%	0%	-	0%
29	Petroleum or Coal Products	99%	1%	0%	-	0%
28	Chemicals or Allied Products	77%	15%	0%	-	8%
11	Coal	0%	100%	0%	0%	0%
24	Lumber or Wood Products	98%	2%	0%	-	0%
27	Printed Matter	98%	0%	0%	-	1%
01	Farm Products	97%	3%	0%	-	-
	All Others	75%	23%	1%	0%	0%
Total		88%	11%	0%	0%	1%

Source: 2010 FDOT Trade and Logistics dataset and 2009 full Surface Transportation Board (STB) Waybill dataset.

Table 2.8 further breaks down the volume of trucked freight by commodity. Based on volume, the leading regional truck commodities are non-metallic ores and minerals and clay, concrete, glass, and stone products and warehoused (i.e., consumer) goods.

[24] MetroPlan Commodity Flow Analysis. Note: through traffic flows by commodity were not available from the available data.

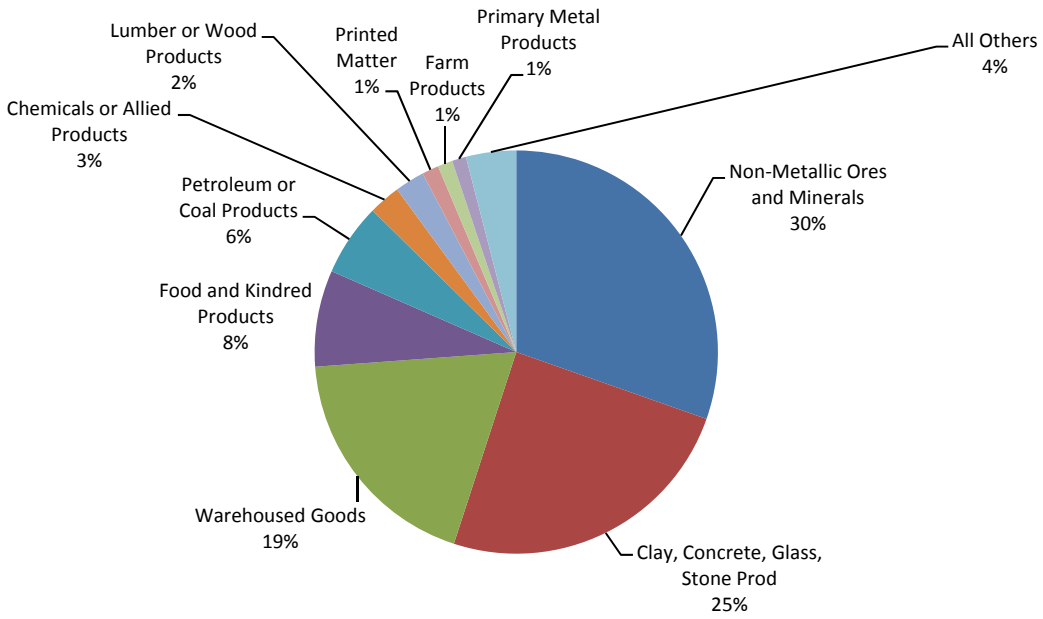
Table 2.8 Regional Commodities Handled by Truck, *Inbound, Outbound, and Intraregional, 2010 – Tons in Thousands*
2010

STCC2	Commodity	Truck Tons
14	Non-Metallic Ores and Minerals	21,811
32	Clay, Concrete, Glass, Stone Prod	17,681
50	Warehoused Goods	13,512
20	Food and Kindred Products	5,549
29	Petroleum or Coal Products	4,172
28	Chemicals or Allied Products	1,838
24	Lumber or Wood Products	1,709
27	Printed Matter	966
01	Farm Products	853
33	Primary Metal Products	813
	All Others	2,888
Total		71,791

Source: 2010 FDOT Trade and Logistics dataset.

Figure 2.9 shows that these top three truck commodities account for nearly three quarters of the total truck tonnage. Food and petroleum products also play a major role, accounting for an additional 15 percent. All of these products represent key economic sectors within the region, illustrating the importance of truck transport to the regional economy.

Figure 2.9 Proportion of Truck Commodities by Weight
Inbound, Outbound, and Intraregional, 2010 – Tons in Thousands



Source: 2010 FDOT Trade and Logistics dataset.

Annual Average Daily Truck Traffic (AADTT)

The most common measure of truck volume is annual average daily truck traffic (AADTT). AADTT refers to the average number of trucks using a given roadway segment per day and it indicates the level of freight demand being placed on the various regional highway facilities. Figures 2.10 and 2.11 show AADTT information as point counts at specific count locations and volume ranges. The data indicate that the highest volumes of truck traffic occur on roadways that already experience a high level of overall traffic, with the highest truck volumes on I-4, Florida's Turnpike, I-75, and I-95. Even though the overall volume of trucks is highest on the most heavily traveled corridors, the percentage of trucks as a component of the daily traffic is higher on corridors outside of the urban core. This trend also corresponds with information from drivers who intentionally avoid the I-4 corridor and the Orlando urban area during peak periods and correlates to the location of major freight distribution and warehouse properties which are predominantly outside of the I-4 corridor area.

Highway Level of Service (LOS)

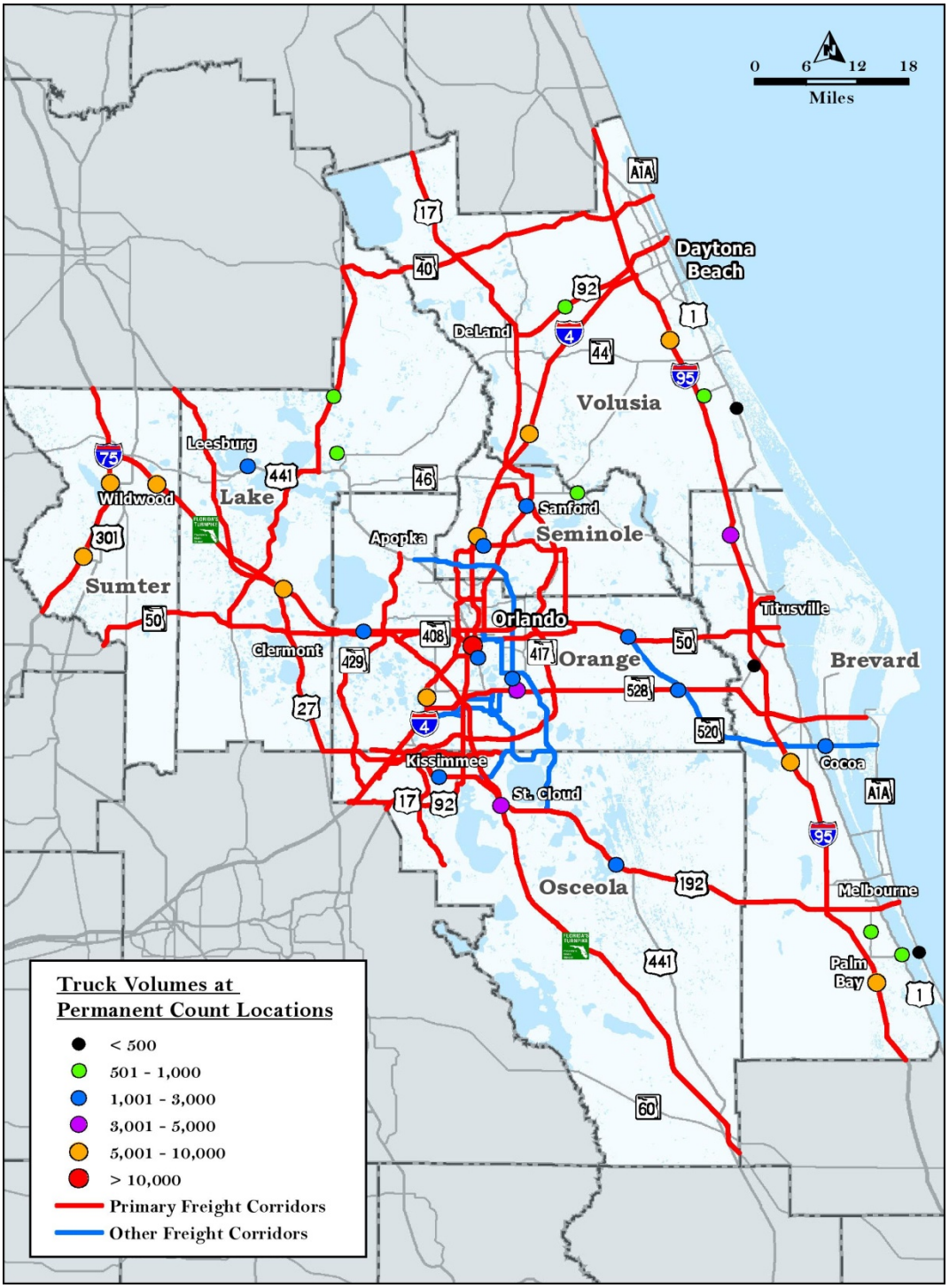
LOS is a qualitative service rating estimated by comparing the level of traffic volumes to the overall capacity of the highway. The capacity of a highway is determined by examining a number of factors such as the percentage of trucks in the vehicle mix, the grade of the highway, the percentage of no-pass zones for

two-lane highways, widths of lanes and shoulders, curves, frequency of traffic signals, and several other factors. In general:

- LOS A indicates free flow conditions with virtually no delays;
- LOS B indicates near free flow conditions and a slight decline in maneuverability;
- LOS C indicates average delays and some difficulty in passing or changing lanes;
- LOS D indicates longer delays and moderate difficulty in passing or changing lanes;
- LOS E indicates conditions at or near capacity with moderate to long delays and high levels of difficulty in passing or changing lanes; and
- LOS F indicates a breakdown in vehicular flow. Highway flow is unstable and long delays typically result from quickly developing queues.

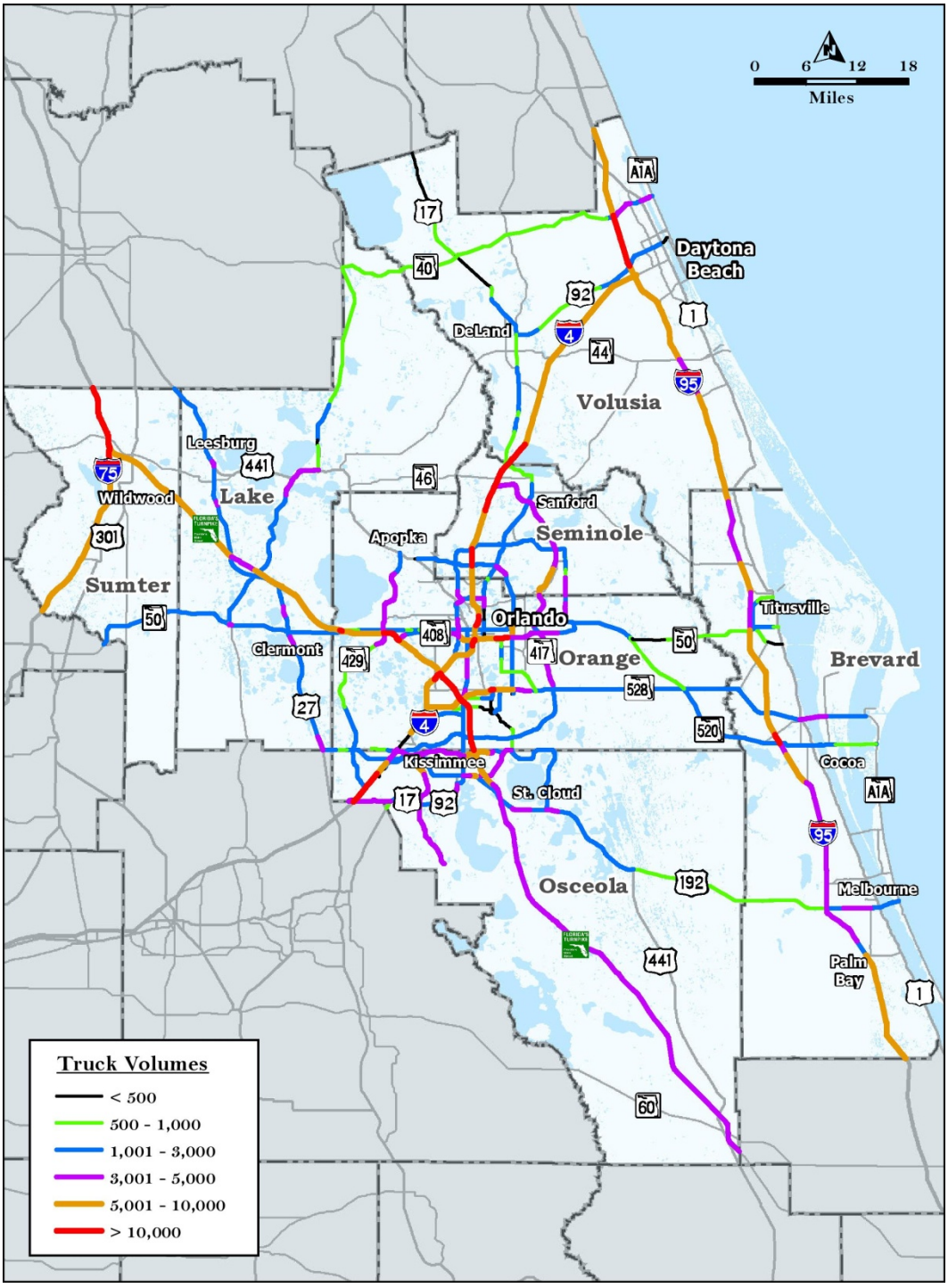
As shown in Figure 2.12, the core of the study region's highway system for most part currently operates at a LOS D, E, or F. This indicates a generally high level of congestion throughout the region.

Figure 2.10 Truck Counts at Permanent Count Locations
2011



Source: FDOT.

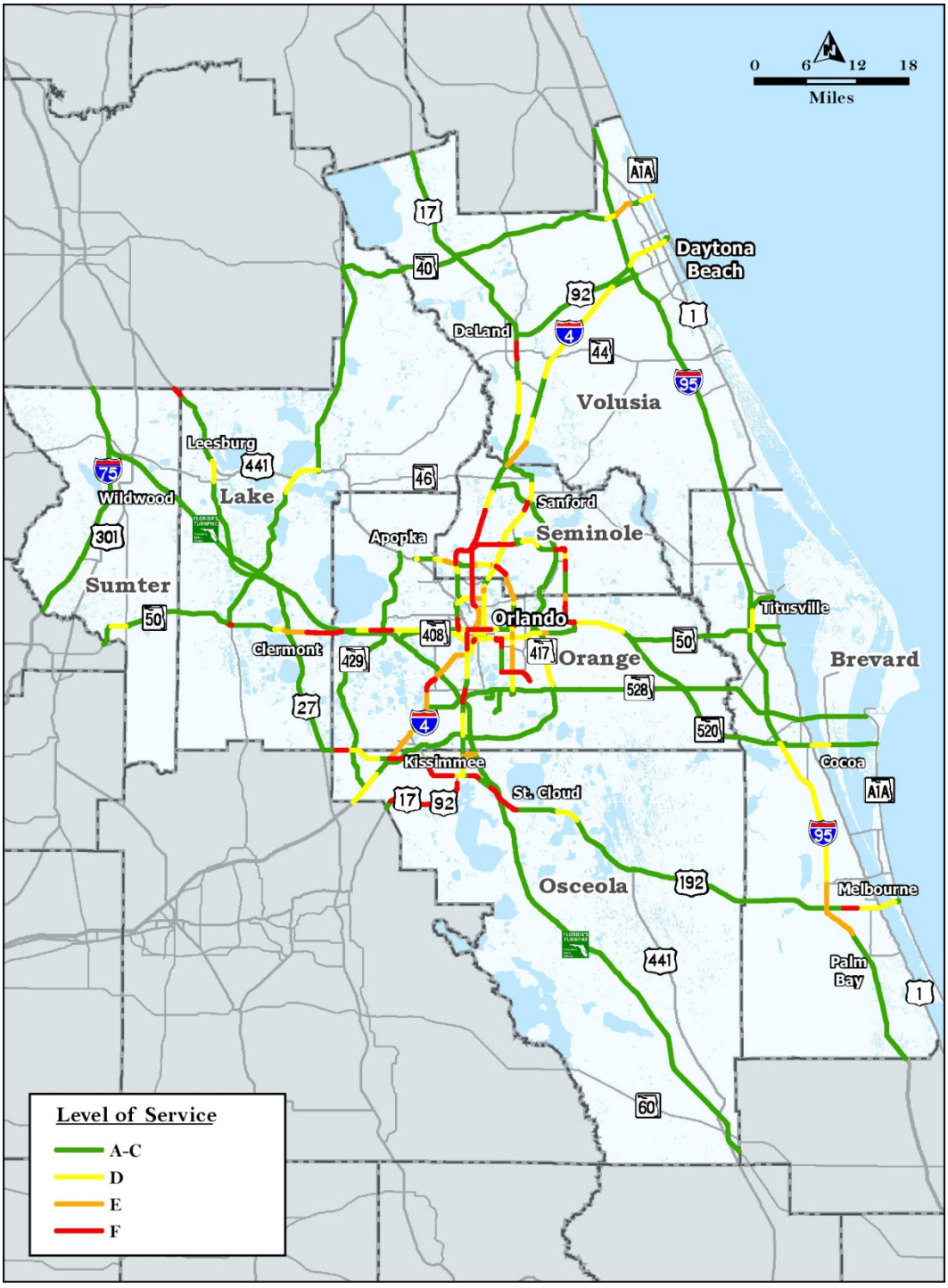
Figure 2.11 Average Annual Daily Truck Traffic (AADTT)
2011



Source: FDOT.

Note: Data reported for freight corridors identified in Figure 2.3.

Figure 2.12 Average Daily Level of Service
2011



Source: FDOT.

Note: Data reported for freight corridors identified in Figure 2.3.

Commercial Vehicle Safety

Total daily vehicle miles traveled (DVMT) over the region's roads has decreased approximately 1 percent from 2006 to 2010 (from 99 million miles to 98 million miles).[25] A review of the crash history for a 5-year period between 2006 and 2010[26] for all roads in the study area reveals that the number of truck-involved crashes in 2010 (2,050) are approximately 36 percent less than in 2006 (3,218). However, the number of total crashes on all roads in the study area in 2010 (36,615) are approximately 4 percent lower than in 2006 (37,976). This also means that the proportion of truck-involved crashes to total crashes has decreased from 8.5 percent in 2006 to 5.6 percent in 2010 on all roads in the study area. These trends are evident in Figure 2.15-2.17, which highlight the total number of crashes, fatalities, and injuries, respectively, on the study region's roadways between 2006 and 2010. For example, while the number of total crashes (Figure 2.13) remains fairly constant, the number of truck-involved crashes decreased. This pattern is repeated for fatalities (Figure 2.14) and for injuries (Figure 2.15).

The study region has a lower incidence of commercial vehicle crash fatalities than does the state of Florida as a whole. While the study region accounted for about 18 percent of overall DVMT in the state of Florida[27], it accounted for approximately 15 percent of total commercial vehicle crash related fatalities[28]. Reducing the number of crashes, injuries and fatalities is very important to the study region. Per the National Safety Council estimates, for year 2010, the motor vehicle crashes cost residents and businesses in the study region approximately $3.0 billion in wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employers' uninsured costs.[29]

[25] FDOT, Reports of Highway Mileage and Travel (DVMT) 2006 and 2010.

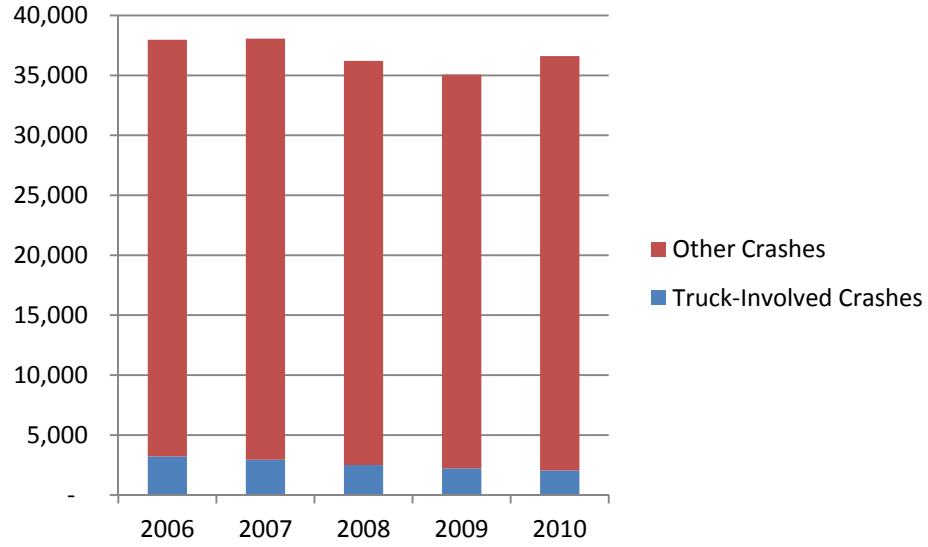
[26] FLHSMV Traffic Crash Statistics Report 2010.

[27] FDOT, Reports of Highway Mileage and Travel (DVMT) 2010.

[28] FLHSMV Traffic Crash Statistics Report 2010.

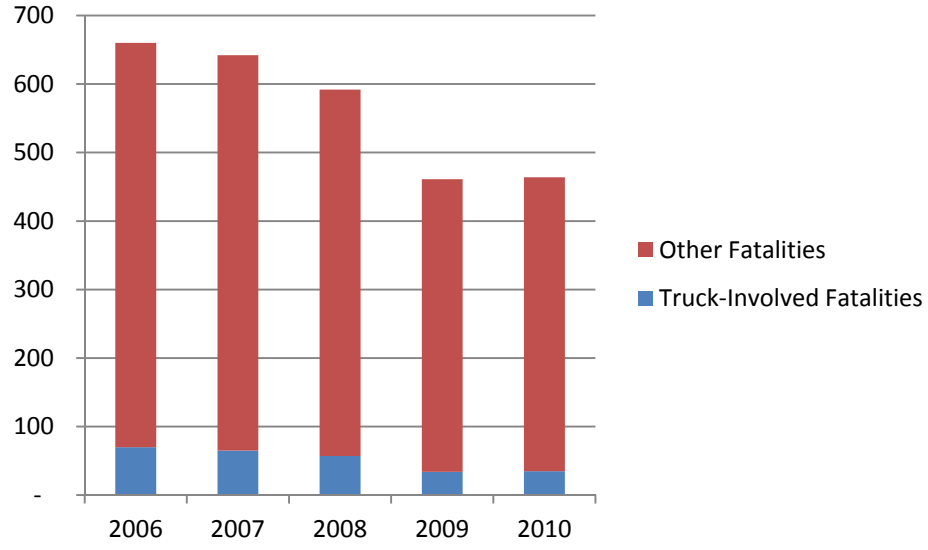
[29] "Estimating the Costs of Unintentional Injuries, 2010," National Safety Council.

Figure 2.13 Study Region Crashes



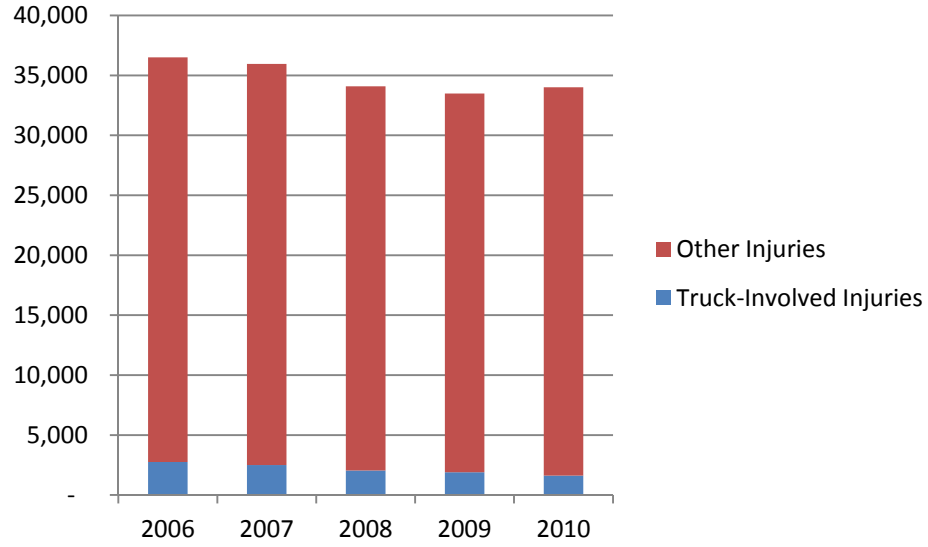
Source: FLHSMV Traffic Crash Statistics Report 2010.

Figure 2.14 Study Region Crash-Related Fatalities



Source: FLHSMV Traffic Crash Statistics Report 2010.

Figure 2.15 Study Region Crash-Related Injuries



Source: FLHSMV Traffic Crash Statistics Report 2010.

Locations on the state highway network that have relatively high truck-crash rates are shown in Figure 2.16 and displays the cumulative number of truck-involved crashes from the years 2006 through 2010 per every 0.1 mile roadway segment. Roadway segments with more than 20 truck-involved crashes are highlighted in red. The greatest concentration of crashes involving trucks has occurred in the following areas:

- U.S. 17-92/441 between SR 50 and Orange/Osceola County Line; and
- SR 423 (John Young Pkwy) between SR 50 and SR 408.

The section of U.S. 17-92/441 between SR 50 and the Orange/Osceola County Line that currently exists as a 6-lane with a two-way left turn lane is being modified as median-divided roadway and will significantly help improve the safety on this section. Interviews with trucking companies also identified the U.S. 17-92/ U.S. 441 corridor (through Orange County) as an area where drivers are advised to avoid, especially during peak hours and between midnight to 3 AM due to the high percentage of nightclubs and bars along this corridor. Their concern is to avoid potential crashes and costly liability and several companies are monitoring driver routes to manage this risk.

Commercial Vehicle Parking

Trucks require short-term parking for staging when they arrive early to their delivery destination and longer-term parking to comply with Federal hours-of-service regulations. Safety regulations imposed by the Federal Motor Carrier Safety Administration (FMCSA) limit the number of hours a driver can operate a truck in a 24-hour period and specify minimum off-duty requirements when operating a truck. To comply with these regulations, drivers need parking

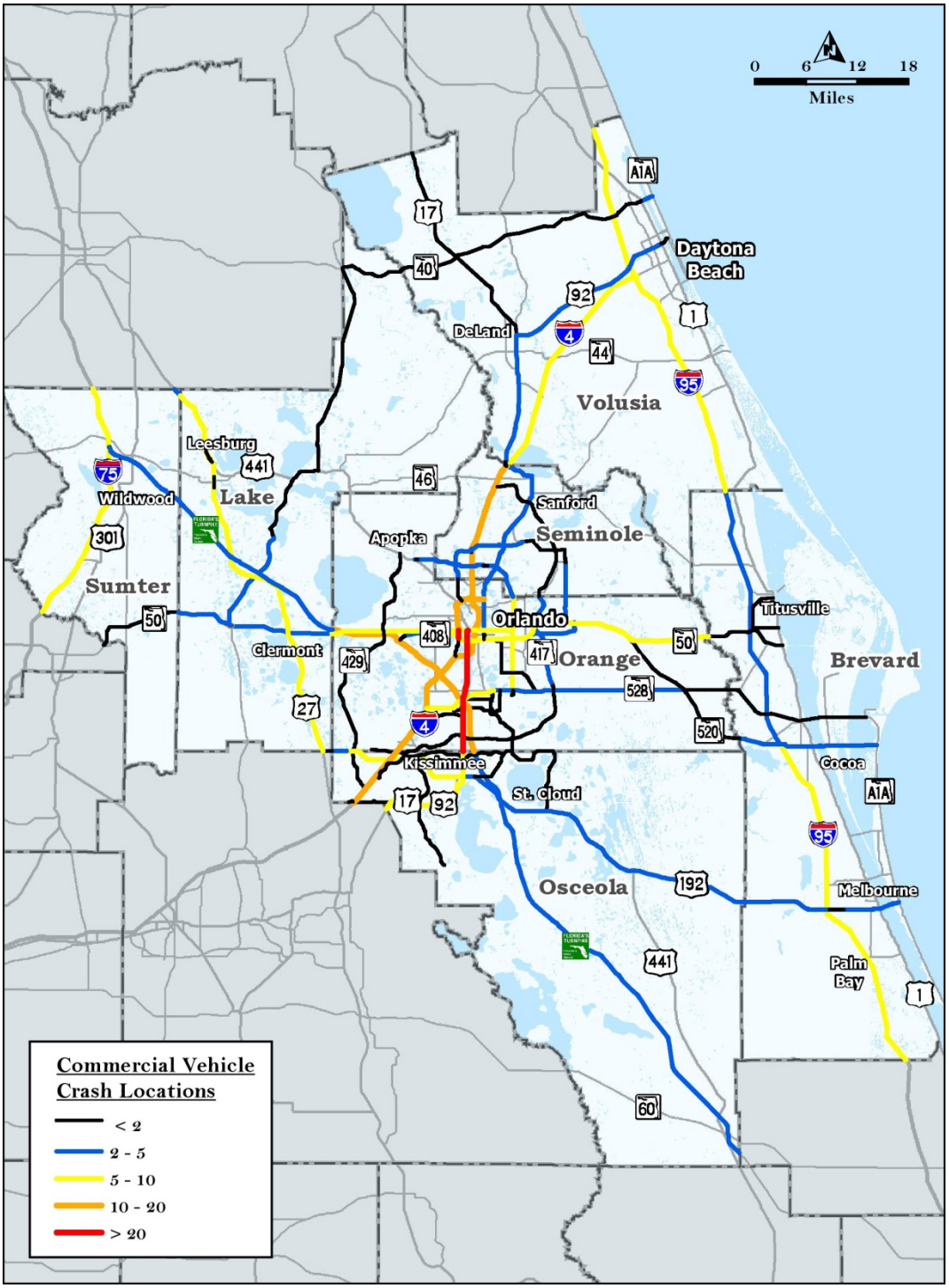
facilities along their routes to stop and rest. While full-service facilities (usually private and requiring a highway exit) can provide local economic benefits relative to public or "concessioned" roadside limited-service truck stops, the latter play an important role in improving safety and mitigating negative local impacts at highway exits by enabling combination trucks to remain on limited access highways. For example, roadside truck stops can reduce congestion on local roads and reduce air pollutant "hot spot" emissions by localizing pollutants away from residential and commercial areas. Figure 2.17 identifies the locations of existing truck parking facilities (including private truck stops[30]) and rest areas in the study region.

Shortage of parking facilities can lead to undesirable truck parking along roadways, interstate ramps and non-designated facilities or sites. In addition, parking areas often serve as critical staging points as trucks attempt to avoid highly congested peak periods on the interstates and adhere to federally regulated hours of service requirements.[31] As truck traffic increases and spreads geographically, so will the need for additional parking facilities. Specifically, truck traffic will increase significantly in the northern and western portions of the region as these areas experience population growth, and there are currently few truck parking facilities available. Insufficient truck parking can create safety hazards for the motoring public as well as the truck driver as the trucks are forced to park in non-designated areas. In addition, it increases concerns about the security of the driver and the cargo and makes it more difficult for trucks to find staging areas when trying to avoid congested conditions or fulfill the hours of service requirements.

[30] Origin-Destination Study, FDOT Systems Planning Office, April 2007.

[31] The Federal Motor Carrier Safety Administration (FMCSA) administers hours of service regulations for tractor trailer drivers participating in interstate commerce. In general, drivers of property carrying trucks (non-passenger) are limited to no more than 11 hours of consecutive service following a ten hour rest period.

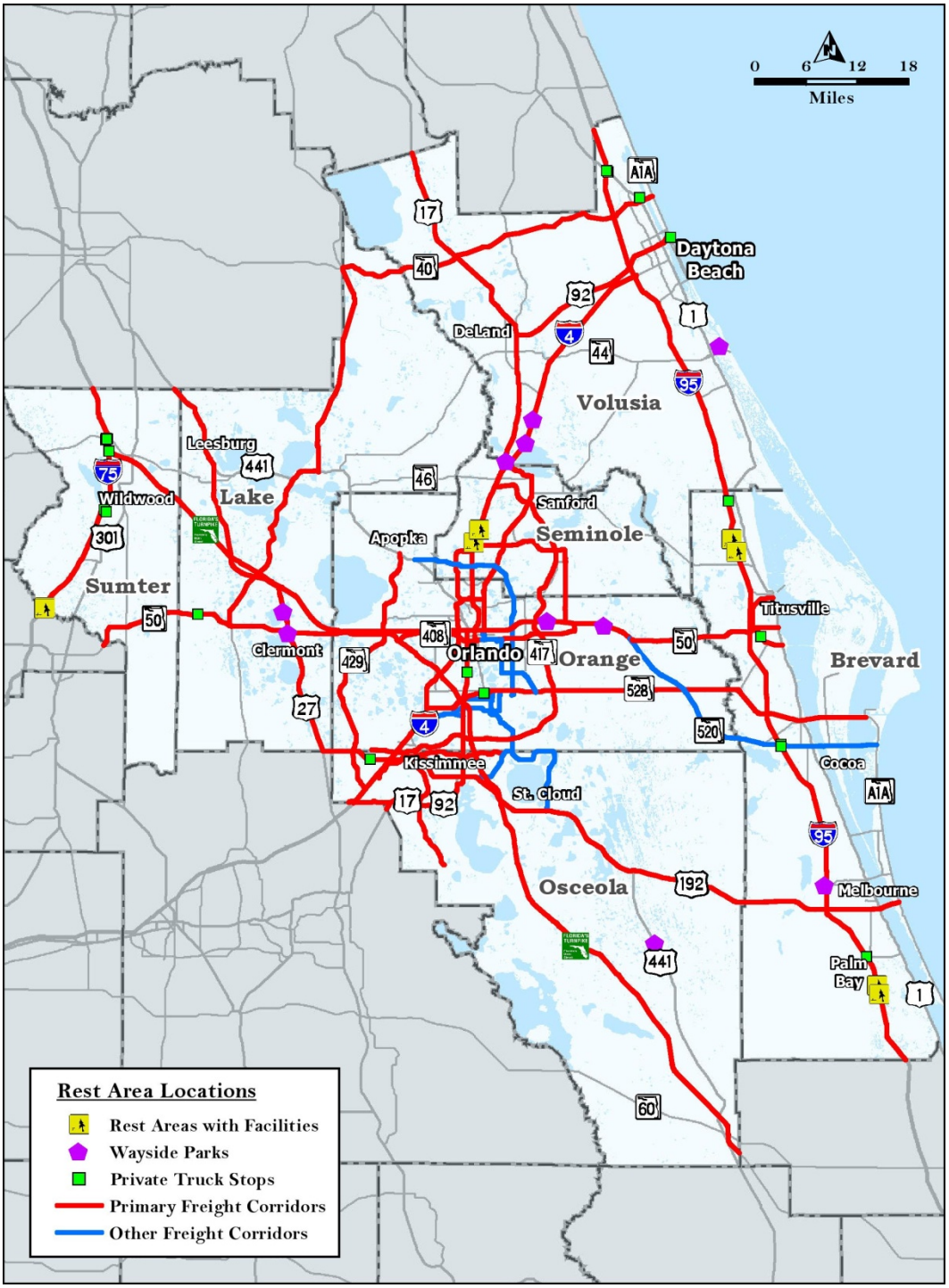
Figure 2.16 Commercial Vehicle Crash Locations on State Roads *2006-2010*



Source: FDOT, FLHSMV Traffic Crash Statistics Report 2010.

Note: Data reported for freight corridors identified in Figure 2.3.

Figure 2.17 Truck Parking Facilities and Rest Area Locations



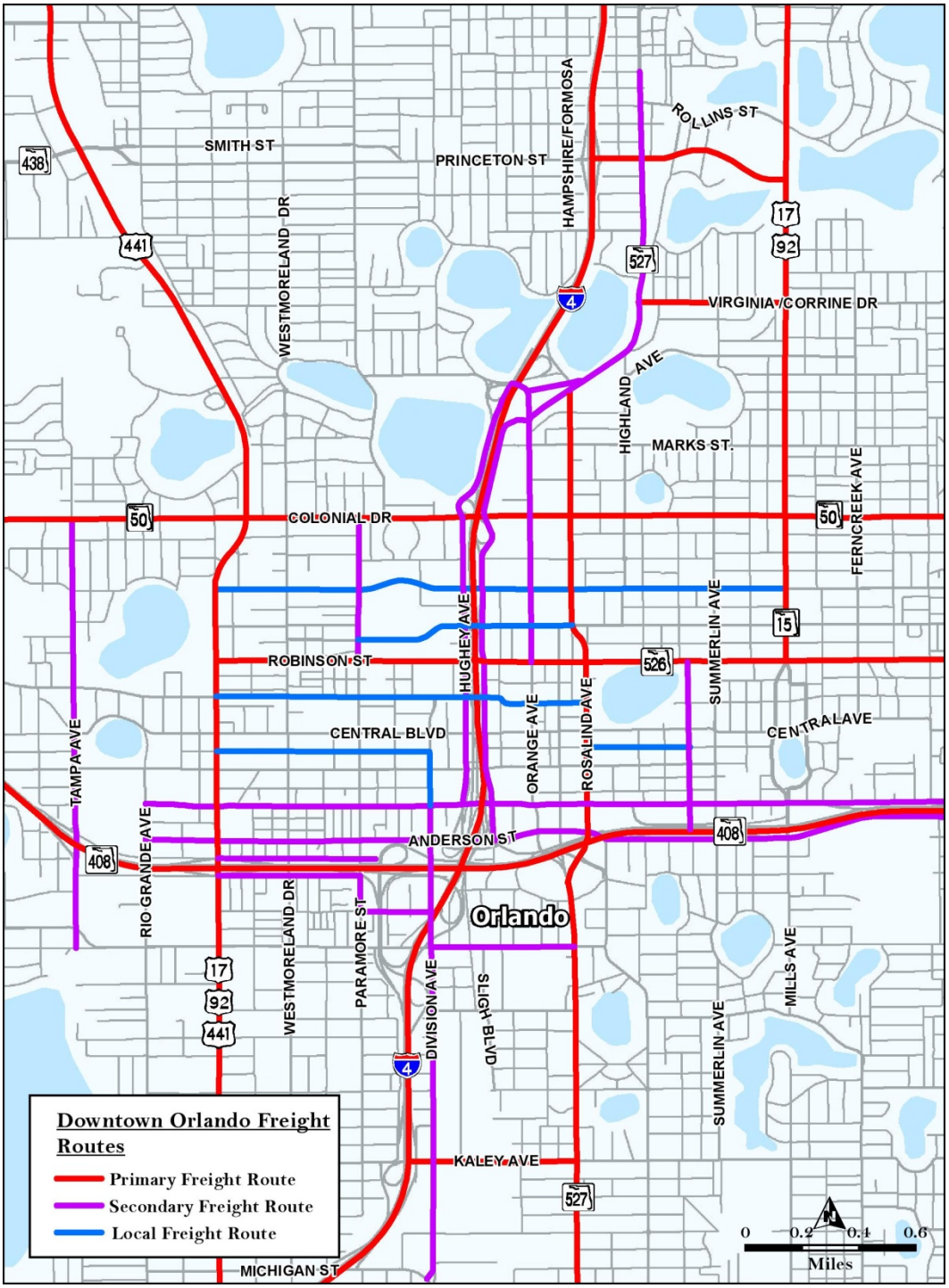
Source: FDOT, Origin-Destination Study, FDOT Systems Planning Office, April 2007.

Truck Parking in Urban Areas

Goods and services to the study area will continue to be predominantly via truck traffic and hence the efficient movement of freight is very critical. The Downtown Orlando Transportation Master Plan completed by the City of Orlando in November 2006 provides an overview of the regional freight flows, the infrastructure that supports it and also proposes designated truck routes based on set criteria. Figure 2.18 displays the identified freight routes for downtown Orlando. The report also details the design and traffic operations requirements for the identified truck routes. Example truck parking zone policies and practices from other cities are listed below:

- Baltimore –Truck zones for the metro area. At zone boundaries, alternate through truck routes are indicated. Enforcement has been an issue.
- Boston – The Back Streets Program designates sites that have convenient access to highway or rail as prioritized for preservation for industrial uses. The City also had instituted a nighttime truck ban on through trucks and on certain routes. This ban was eventually lifted due to political and industry misgivings.
- New York City – Truck route mapping tool. Considering implementation of a web-based mapping tool to allow truck drivers to identify optimal routes with respect to size/weight characteristics and destination. New York has also adopted plug-in power for idling trucks to reduce fuel consumption/emissions and truck parking pricing strategies. 7:00 a.m.-6:00 p.m. = $2.00 for one hour, $5.00 for two hours, etc. Businesses are able to purchase debit cards with memory chips for drivers and average time idling at a spot dropped from five hours to 90 minutes through the program.
- Seattle – Time-of-day restriction on trucks entering the City. Trucks can only operate during off-peak hours within the City.
- Portland, Oregon – Angled Parking Permit Program. Allows for angled loading and unloading at areas throughout the City with properly displayed permits, rather than the previous prohibition. Portland has also designated industrial infrastructure for future investment and upgrades to better accommodate deliveries.
- San Francisco, California – Curbside management. Separates curbside parking into general commercial use and truck-only areas and trucks with six or more vehicles. All loading zones have 30-minute time limits and some have parking meters charging 75 cents for 30 minutes. The policy has had issues with weak compliance.

Figure 2.18 Freight Routes in Downtown Orlando



Source: Downtown Orlando Transportation Plan, City of Orlando

2.4 CHALLENGES

The region's highway system faces numerous challenges in meeting the ever growing demand of both passenger and freight highway users. Meeting these demands and managing the shared use of the system is critical to the future economic competitiveness and quality of life in the region. While regional freight stakeholders generally view the highway network as good and report that they are able to overcome and work around any difficulties present in the system, several challenges to truck freight operations were noted. A summary of challenges is presented below. A more in-depth analysis of the region's freight highway needs will be presented in the Regional Goods Movement Needs Assessment report.

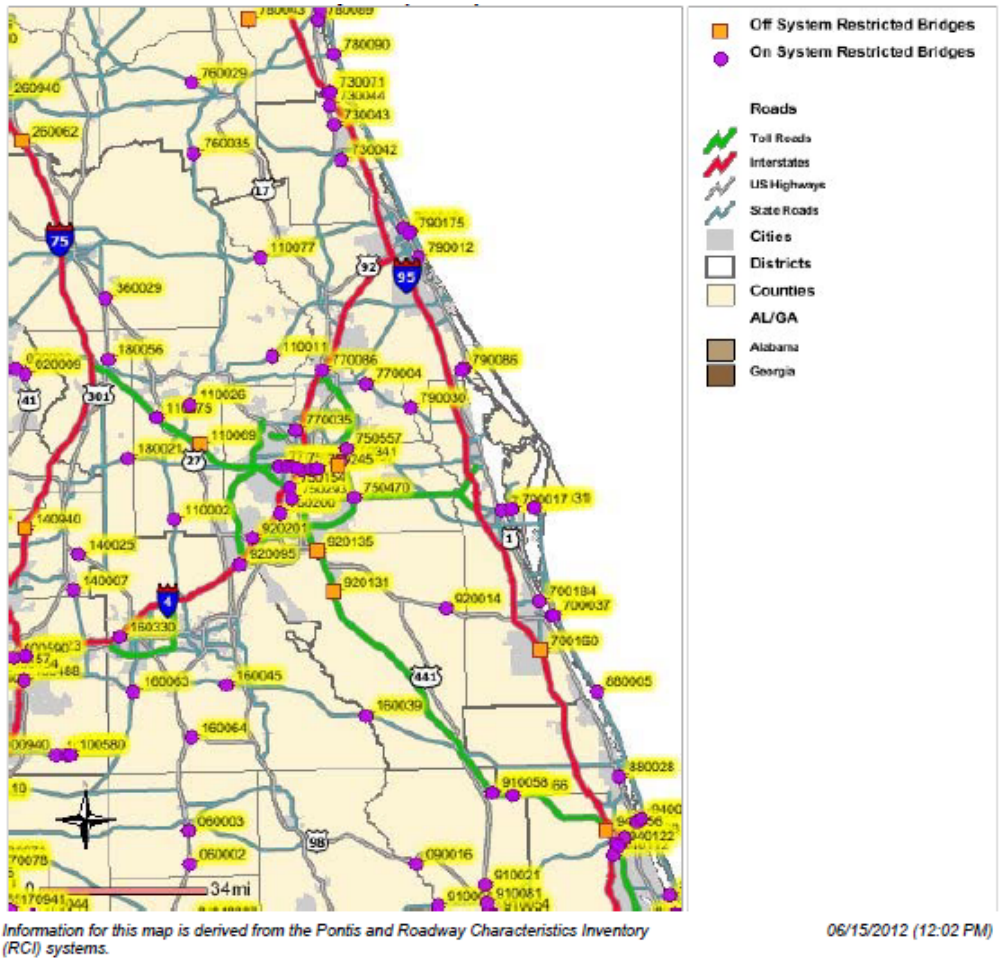
Capacity Constraints

Overwhelmingly, the major capacity concern and impact to over the road freight users is Interstate 4 and was identified by both trucking companies and freight delivery drivers throughout the region during the course of this study. Many companies choose to avoid I-4 except in the early morning hours, rather utilizing toll roads with transponder equipped vehicles to get around the region. The increasing growth and development of the region will require continued infrastructure improvements. In addition, the planned construction to I-4 will have a major impact to freight as the freeway will become less reliable and be susceptible to lane closures during the off peak hours that would otherwise be available for freight traffic.

Permitted Loads

Deficient bridge and roadway conditions do have a major impact on the routing and movement of over dimensional and over-weight loads. While these moves represent a very small percentage of all highway freight that moves through the Central Florida region, the bridge and route restrictions have a significant impact on the time and cost and can impose additional impacts to the motoring public. Figure 2.19 displays a screenshot from FDOT that indicates the large number of load-restricted bridges in the study area.

Figure 2.19 Example overweight bridge restriction map for the Central Florida (Crane Map #3), FDOT, 2010



Source: FDOT maintenance office web site.

Overweight and over-dimensional loads require vehicle permits through the FDOT. The state has expedited the permit process through on-line permitting forms as well as making interactive weight and size restriction maps available through the FDOT maintenance office web site. Interviews with overweight and over-dimensional trucking companies identified several of the challenges with the Central Florida highway network, including:

- Roundabout intersections not typically designed for over sized trailers.
- Mast arm signalized intersections providing limited vertical clearance. Some moves require removing or swinging the mast arms in order to clear the intersection.
- Time of day permitting restrictions may not permit certain moves to use the interstate and other roadways best suited to accommodate over sized loads.

- Toll plazas at the toll ramps limiting certain loads from utilizing the toll road system which is desirable for over dimensional loads.
- Signage located in the median at intersections.

Specific areas of concern in the region highlighted by users include:

- Radebaugh Way Bridge on I-4 (limited vertical clearance).
- Orange Blossom Trail eastbound ramp to I-4 limited radius.
- Most toll ramp entry plazas in the region.
- Bridges to Port Canaveral.

Operational Bottlenecks

Overall the trucking community reports good operating conditions on the region's major highway facilities and for the most part, they are able to service their customers from these major routes. However, some operational constraints or bottlenecks were reported. These include short-entrance ramps onto interstates which create merging hazards; excessive merging and weaving required along major freeways; insufficient turning radii on major arterials especially in the freight intensive east region; numerous at-grade crossings on major freight corridors; and lack of sufficient staging areas in and around freight terminals.

Policy Barriers and Industry Trends

Stakeholders were asked to identify any policy barriers that they perceive as impacting their business or policies that would help to improve freight operations. Most of these impacts were noted as not of local origin but rather those affecting the overall industry such as:

- Driver hours of service regulations (these limits can impact long haul carriers and distribution centers servicing the panhandle of the state. These also impact service industry drivers such as cement mix trucks that may need to make multiple runs on time sensitive projects such as a big building foundation or concrete bridge – once the job starts the cement must keep pouring continuously which may require drivers to extend beyond the regulated hours of service).
- Vehicle weight restrictions (impact trucks that "weigh out" before they "cube out" such as truck hauling citrus produce) putting more trucks on the road and increasing transport costs.
- Toll roads are attractive from a safety, convenience and reliability perspective but are costly to use. Nearly all major carriers that operate in the Orlando urban area report that they use toll roads, especially to avoid I-4, but identify this as a significant cost.

Safety

Safety is equally important to the private freight industry and the traveling public. Primary safety concerns related to truck traffic include crashes and the movement of hazardous material. The fact remains that truck-involved crashes are often more severe, and the probability for injury, fatalities and personal property damage is greater. In addition, the clearance time of truck-involved crashes is likely to be longer, leading to increased delay for all system users.

Air Quality

Air quality is a significant concern to the region. Poor air quality gives rise to increased health costs for residents, increased costs for businesses for mitigation and loss of worker productivity, and increased restrictions regarding Federal funding. Truck traffic is a significant contributor to damaging emissions and emissions mitigation strategies must address truck emissions. Newer equipment and advanced fuels are tools to reduce the emissions arising from truck traffic. However, these technologies can be costly and may lead to decreased fuel efficiency and other engine maintenance concerns, leading the private sector to be slow in adoption. There is a strong interest in the trucking industry to shift toward alternative fuels – both for the environmental benefits and the economic benefit of lower fuel costs from certain alternatives. Community Impacts

Goods movement is essential to supporting the region's economy and quality of life. However, truck traffic also gives rise to negative community impacts. In addition to safety and air quality concerns, truck traffic can cause excessive noise and vibration along significant freight corridors and damage to roads, including pavement wear and tear and curb damage. Much of the community impact of truck traffic has been confined to the more freight intensive regions surrounding ports and industrial areas leading to environmental justice concerns. As population continues to grow outside the urban core, especially in the northern and western portions of the region, so will commercial centers, leading to more widespread dispersion of truck traffic and the associated impacts.

3.0 The Regional Freight Rail System

3.1 INTRODUCTION

The study area is served primarily by three common carriers – CSX Transportation (CSXT), Florida East Coast Railway (FEC) and the Florida Central Railroad (FCEN) – and two private carriers, the NASA Railroad and Orlando Utilities Commission Railroad. The railroads are of varying size and service territory and perform different functions in the study area. Figure 3.1 (Study Area Rail System) displays the routes/location of these rail carriers in the study area. Figure 3.2 shows the intermodal facilities. Figure 3.3 shows the industries (along the rail network) that are directly serviced by the railroads.

3.2 REGIONAL FREIGHT RAIL NETWORK AND TRAFFIC

CSX Transportation (CSXT)

This Class I railroad operates approximately 21,000 route miles and serves 23 states east of the Mississippi River, the District of Columbia and the Canadian provinces of Ontario and Quebec. CSXT, Florida's largest railroad, operates more than 2,800 miles (1,508 route miles) of track in Florida. CSXT serves most of the State's major urban areas and provides national Class I network connections for many of Florida's short line railroads. CSXT's primary base of operations in Florida is Jacksonville with important yards throughout the State. Both of CSXT's major north-south lines, the "A Line" and the "S Line," terminate in central Florida. The names derive from former Atlantic Coast Line and Seaboard Air Line Railroad routes. CSXT provides vital connections to Florida's short line railroads and in many cases is the only connection for the short line.

Three CSXT rail lines are located in the study area. Two of them are principal lines while the other is a branch line. The S-Line is one of the principal lines that run from Callahan to Tampa in the western end of the study area. The other principal line is the A-line that runs from Jacksonville to Tampa through the central portion of the st**u**dy area. The branch line, the Aloma Subdivision, or Aloma Spur, runs east and south from Sanford to its terminus near SR 434 in Winter Springs.

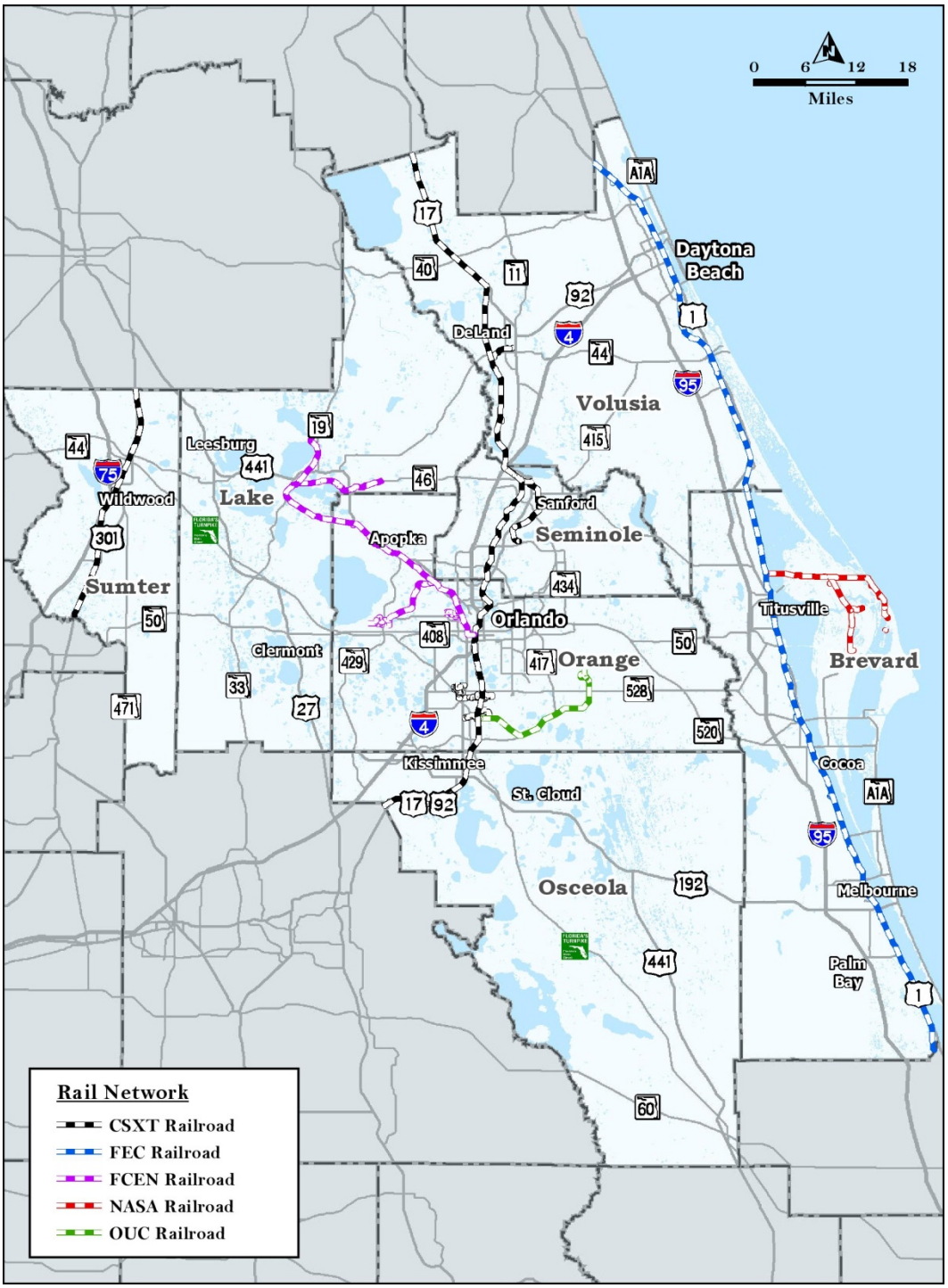
The CSXT "A"-line (Jacksonville to Tampa) Line –103 miles of this line is located in the study area. The A-line is basically a single-track railroad with approximately seven miles of double track in the immediate Orlando area

running from Winter Park to Orlando. Passing sidings also exist in Deland, Debary, Sanford, Longwood, Orlando, Taft, and Kissimmee. Operations over the line are governed by a traffic control system with the exception of the double-track section through Orlando where trains run with the current of traffic governed by block signals. This line is also used by Amtrak for passenger service, which runs approximately four trains day through downtown Orlando.

The A-line through Downtown Orlando currently accommodates daily intermodal trains between Jacksonville-Taft/Taft-Jacksonville, Tampa-Jacksonville/Jacksonville-Tampa; manifest trains between Waycross-Taft/Taft-Waycross and occasional OUCX coal trains to the Stanton power station.[32] There is a current transfer option from Taft Yard to the Florida Central in downtown. Most freight movements occur at night.

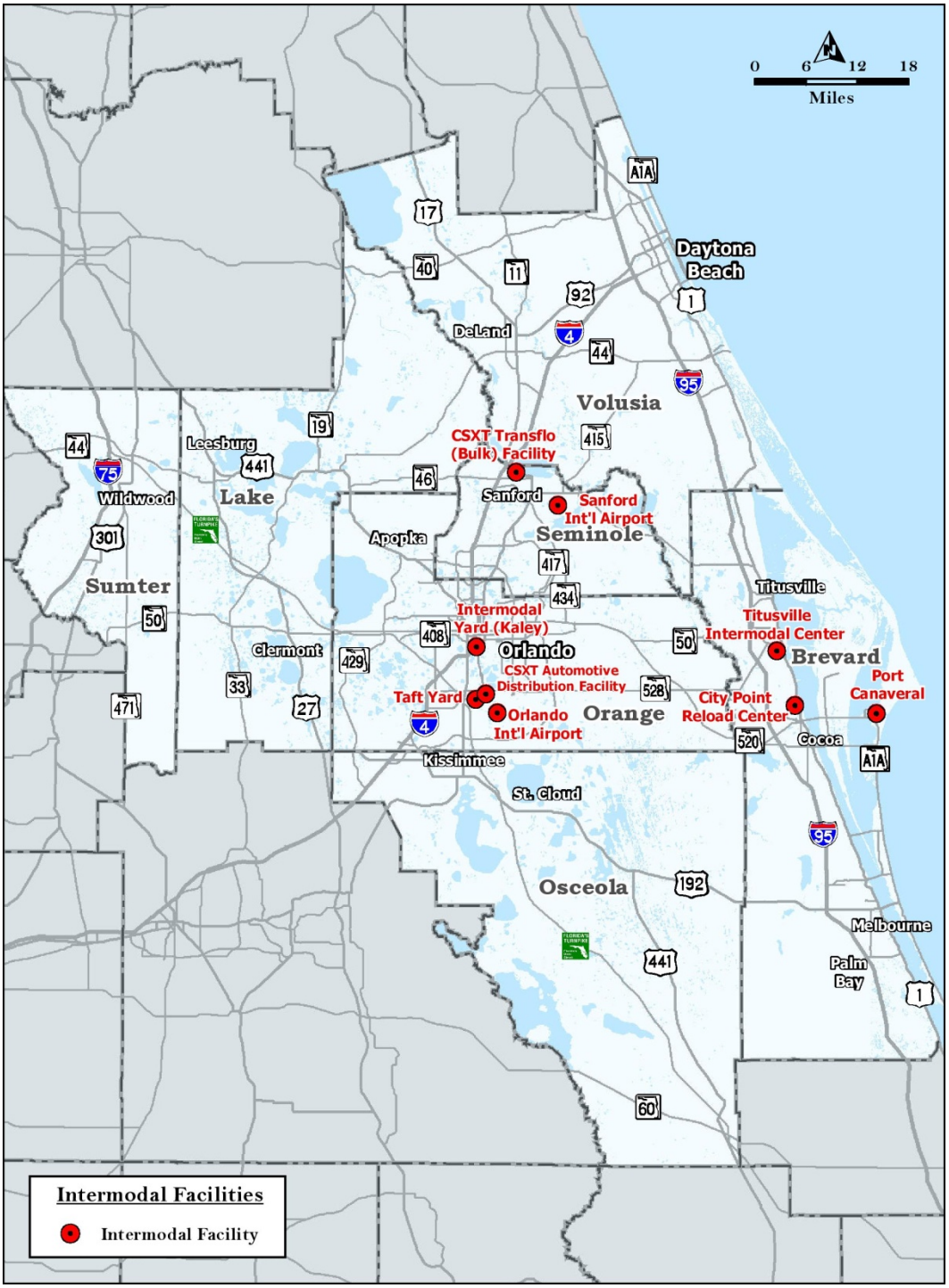
[32] A 61.5 mile section of the A-line between DeLand and Poinciana was purchased by FDOT to allow for the construction and operation of the SunRail commuter rail service expected to begin in 2014.

Figure 3.1 Study Area Rail Network



Source: FDOT.

Figure 3.2 Study Area Intermodal Facilities



Source: FDOT.

Other trains operate in the Orlando region but do not run through Orlando's downtown including the Amtrak Auto Trains (Lorton, Virginia to Sanford, Florida) and the occasional Conrad Yelvington rock trains out of Sanford's Rand Yard. Autorack trains Louisville-Taft and Taft-Waycross traverse the S-Line and access Taft Yard from the south end. Currently, there are approximately 15-20 trains per day operating on the CSXT A-line including Amtrak passenger trains.

A 61.5 mile section of the A-line between DeLand and Poinciana was purchased by FDOT to allow for the construction and operation of the SunRail commuter rail service. Construction on Phase I of SunRail includes double-tracking, signal improvements, stations and an operations control center. The 31-mile first phase of SunRail will serve 12 stations, linking DeBary to Orlando. Phase II will service five additional stations, north to DeLand and south to Poinciana. SunRail commuter rail service is expected to begin in 2014.

S-line (Callahan to Tampa Line) –28 miles of this line are located in the study area. The S-line is currently a single-track railroad with a second track from Wildwood to Coleman. As part of the A-line purchase by FDOT and operation of the SunRail commuter rail service, a portion of the current freight traffic that uses the A-line will be shifted over to the S-line. CSXT has taken steps to accommodate this shift with the planned relocation of the Taft Intermodal yard operation to a new site in Winter Haven, FL. The planned move will enable CSXT to move initially 7 to 8 trains per day over to the S-line. The S-line today operates approximately 16-18 trains per day. Improvements are planned for the S-line to increase the capacity including double track and sidings to provide additional track capacity.

Aloma Subdivision Line – This CSXT branch line is just over 10 miles long and serves local industries in the Sanford area. The industries include several in the industrial park at the Orlando-Sanford International Airport.

CSXT's principal Florida commodities include nonmetallic minerals, chemicals and allied[33] products, coal, and miscellaneous mixed shipments (intermodal). Nonmetallic minerals include phosphates from Central Florida's Bone Valley and crushed construction rock. CSXT moves hundreds of thousands of imported and domestic automobiles annually to and from Florida. In addition to the automotive facilities located within the study area, CSXT has larger automobile facilities located at Jacksonville (three facilities), Tampa, and Palm Center (Miami). CSXT also operates an expedited service that delivers fresh Tropicana Orange Juice from Bradenton and Fort Pierce (received at Jacksonville from FEC) to distribution centers in New Jersey, Ohio, and California.

Florida Seaports Served: Port of Tampa, Port of Jacksonville.

[33] The term "allied" generally encompasses similar items or products within a particular Standard Transportation Commodity Code (STCC) category

Florida East Coast Railway (FEC)

The Florida East Coast Railway (FEC) operates along the east coast of the state and passes through the study area in Volusia and Brevard Counties. The FEC is a Class 2 railroad and an intrastate carrier with its main line running from Jacksonville to Port of Miami. It interchanges with both CSXT and Norfolk Southern Railway (NS) in Jacksonville. The railroad operates over 351 miles of track (approximately 115 miles of track within the project study area) and provides carload service and moves commodities such as aggregate (crushed rock), automobiles, bulk liquids, building materials, orange juice and electronics. The Titusville Intermodal Center (by NS) is located along the FEC line.

Within Florida, FEC annually moves approximately 30 million tons of freight, including 100,000 carloads of aggregate from its rock distribution centers in Miami, Fort Pierce, Cocoa, Daytona, St. Augustine, and Jacksonville, as well as 170,000 new automobiles from its Miami automobile facility. Other important commodities moved by the FEC include: lumber, cement, chemicals, paper products, food products (including orange juice and pulp), primary metal products, machinery, bulk freight, and farm products.

Florida Seaports Served: Port of Palm Beach, Port Everglades, and Port of Miami.

Florida Central Railroad (FCEN)

The Florida Central Railroad (FCEN) is a Class 3 railroad and is part of the Pinsly Railroad Company along with Florida Midland Railroad and Florida Northern Railroad. It is located in the heart of central Florida and operates approximately 66 miles of track and directly serves industries in Orlando, Toronto, Plymouth, Zellwood, Mt. Dora, Tavares, Eustis, Umatilla, Ocoee, and Winter Garden. All interchanges are made with CSXT in Orlando, Florida.

The 66 miles of track operated by the railroad are comprised of a 41-mile main track between Orlando and Umatilla and branches from Tavares to Sorrento (11 miles) and from Forest City to Winter Garden (14 miles). The FCEN network is located entirely in the project study area. In 2003, Pinsly partnered with CSXT, with funding from FDOT, to construct a new rail spur to serve the Florida Auto Auction in Winter Garden. FCEN's rail service to the auction facility makes possible rail shipment of automobiles via CSXT's Taft Yard in Orlando to CSXT's national network.

The Florida Central Railroad operation is highly dependent upon CSXT operations on the A-line. FCEN trains interchange with CSXT in Taft. The FCEN runs trains 5 days per week to Taft but reportedly carries no intermodal traffic. FCEN has significant transload operations with transload facilities located at Amelia Street, Apopka and Tavares and use 3rd party carriers for the transload operation. The FCEN moves approximately 5000 loads per year (2012) with 90 percent of the traffic inbound and only 10 percent outbound. The major commodities moved on the FCEN include food (Frito Lay, Coca Cola), metal

scrap, and chemicals (including CO2 and plastic pellets). During the peak of operations in 2005-06, nearly 50 percent of the commodities were construction related. Currently, construction related materials make up roughly 10 percent of the commodities moved on FCEN.

Within the Central Florida region there is discussion of expanding commuter rail operations to utilize the FCEN rail to connect Tavares and Lake County to Orlando and interface with the SunRail service unofficially referred to as the Orange Blossom Express. FCEN did not identify the potential for passenger rail service to have an impact on their freight operation which could use available track capacity outside of the peak periods of potential commuter rail service.

NASA Railroad

This small rail line is owned by the United States Government and serves the Kennedy Spaceport and connects to the Florida East Coast Railway at Jay Jay, just north of Titusville.

OUC Railroad

The Orlando Utilities Commission (OUC) Railroad connects the OUC power plant in east Orlando with CSXT railroad just south of Taft. Coal is delivered to the power plant several times per week (6 times per week in a sample provided by CSXT for train traffic operating between Taft-Sanford). These trains are not expected to be re-routed from the CSXT A-line with the operation of SunRail passenger service.

Railroad Crossings

A summary list of railroad crossings within the 7-County study area by county and by railroad is presented in Table 3.1. The highway rail crossings were identified from the FDOT Rail Highway Crossing Inventory.

Table 3.1 Railroad Crossings

	Number of Railroad Crossings							
Railroad/County	Brevard	Lake	Orange	Osceola	Seminole	Sumter	Volusia	Total
CSXT	-	-	129	26	66	39	52	312
FEC	86	-	-	-	-	-	75	161
FCEN	-	92	142	-	-	-	-	234
NASA	2	-	-	-	-	-	-	2

OUC	-	-	38	-	-	-	-	38
Total	88	92	309	26	66	39	127	747

Source: FDOT Rail Highway Crossing Inventory.

Regional Intermodal Facilities

There are five rail intermodal or rail terminal facilities in the project study which includes:

- CSXT Taft Intermodal Terminal (Orlando located in Taft).
- CSXT TDSI (Total Distribution Services, Inc.) Automotive Distribution (Orlando located in Taft).
- CSXT TRANSFLO Facility (Sanford).
- FEC/NS Intermodal Facility (Titusville).
- FEC City Point Reload Center.

Many of these facilities, along with the new CSXT Integrated Logistics Center in Winter Haven, Florida, are described in further detail below.

CSXT Taft Intermodal Rail Terminal

In 2006, CSXT operated 4-7 trains per day into the Taft rail terminal which includes both intermodal trains and automotive trains. Trains enter the rail terminal from the CSXT A-line for both the intermodal and automotive operations for new car delivery and used car remarket which primarily involves turnover of the rental car fleets in Orlando. The Taft yard is approximately 200 acres and has two distinct operations for intermodal trains and the automobile trains. The areas of the terminal which are designated for these operations are highlighted in Figure 3-3. Intermodal containers and trailers are moved with reach stackers to the intermodal yard. The volume of intermodal containers into and out of the Taft yard is approximated by the number of primary lifts per month over the period between 2002-2006 (latest publicly available data). During this period the intermodal yard handled approximately 87,000 containers per year (see Table 3.2).

Figure 3.3 Taft Intermodal and Automotive Rail Terminal Facility

Source: Google.

Table 3.2 Average 2002-2006 Monthly Primary Lifts (Taft Intermodal)

Period (Month)	Lifts	Peak Month Factor
Period 1	6,301	1.36
Period 2	7,021	1.22
Period 3	8,700	0.98
Period 4	7,056	1.21
Period 5	6,671	1.28
Period 6	7,464	1.15
Period 7	5,757	1.49
Period 8	6,154	1.39
Period 9	8,141	1.05
Period 10	6,919	1.24
Period 11	8,058	1.06
Period 12	8,860	0.97
Average Annual Lifts	87,102	

Source: CSXT.

Trailers are moved via truck from the yard to a variety of destinations throughout the region. An intermodal truck origin and destination survey was conducted in 2006 to examine primary destinations for intermodal traffic to and from the Taft yard and is shown in Table 3.3. As expected, the majority of intermodal moves (39 percent) are to the Orlando area. Importantly, there are

freight intensive businesses immediately adjacent to the Taft intermodal yard which use drayage operators to move containers between the intermodal yard and their warehouse/distribution functions.

Table 3.3 Summary of Trucking Destinations from Taft Facility

Jurisdiction	Percentage of Total Destinations from Taft
Orlando	39%
Tampa	12%
Lakeland	6%
Ft. Myers	5%
Clearwater	4%
Bradenton	4%
Kissimmee	2%
St. Petersburg	2%
Largo	1%
Groveland	1%
Outside of Top 10	24%
Total	100%

Source: CSXT.

CSXT TDSI Automotive Ramp

TDSI is a CSXT Corporation subsidiary that offers additional vehicle-handling services through a network of automobile distribution facilities, storage locations and facilities providing service to Eastern, Gulf and Southeastern ports. The TDSI operation in Orlando is co-located with the Taft rail terminal facility and is shown in Figure 3.4.

Figure 3.4 CSXT Autotrain Unloading at Taft, Florida

CSXT TRANSFLO Facility (Sanford)

TRANSFLO is a subsidiary of CSXT Corporation and the largest rail-to-truck transloading network in North America specializing in transfer of products between railcars, trucks and containers. Products handled at these facilities typically include chemicals, dry bulk, ethanol, food grade products, plastics and waste materials. The TRANSFLO facility in Sanford is located near the Amtrak station. This Sanford facility receives approximately 25-30 railcars per month which are typically combined with manifest trains (which generally include mixed rail car types and diverse cargo) destined to the Taft yard. From the Taft yard, the liquid and dry bulk train cars trained back to the Sanford Transflo

facility. The majority of the business at this facility is rail to truck with the only truck to rail outbound product being used motor oil that is sent back to refineries in the north (out of state). Materials may dwell on at the Transflo facility for 15-30 days and will dwell in the rail car. Trains bring rails cars to this facility 2-3 times per week on average.

Figure 3.5 CSXT Transflo Facility in Sanford, Florida

Source: Google.

FEC/NS Intermodal Facility (Titusville)

Norfolk Southern (NS) opened a new intermodal terminal in Titusville, FL in 2009. This terminal is strategically located, allowing for easy-access to the Orlando and Tampa markets via SR 528. With this new intermodal terminal, NS is able to offer a highly reliable, truck-like service between Titusville and Chicago, Atlanta, and Los Angeles as a result of capacity and efficiency improvements along these routes. Access to Titusville is via the Florida East Coast Railroad's (FEC) rail line.

CSXT Winter Haven Rail Terminal Facility and Integrated Logistics Center

The recent acquisition of the 61.5 miles of the CSXT A-line by FDOT for SunRail included the provision to relocate all or a portion of the intermodal and automotive operations from Taft to Winter Haven, Florida (located in Polk County, adjacent to the study area). The proposed Rail Terminal Facility in Winter Haven, FL represents a physical and functional relocation of the existing container and new automobile arrival operations located in Taft as well as the

new automobile arrival and distribution operation in Tampa, Florida. At buildout (coincident with opening of the SunRail commuter rail service), this facility is anticipated to employ approximately 200 persons and yield a volume of trucking operations of a magnitude approximately equivalent to that occurring at the existing Taft operation.

Rail Served Properties

The intermodal facilities described above are among more than 640 non-residential, tax assessable properties along rail spurs, rail connectors and sidings within the study area (Table 3.4). This analysis was conducted based on data from the property appraiser's database and the rail network for the region and was limited to exclude rail mainline segments as well as properties that were not within 100' of the rail spur/connector or siding or that were incompatible land uses. This summary provides a general estimation of the current land area in the region with reasonable or good rail access, approximately 37,300 acres. As expected, Orange County currently has the highest total land area with rail access which includes both the CSXT Taft and Sanford Transflo facilities as well as the industrial park areas in the Silver Star, Apopka and Winter Garden areas.

Table 3.4 Rail Served Properties within Study Area

County/Railroad Line Type/Parcel Land Use	Parcel Count	Sum of Acres
Brevard	56	1,151
Acreage Not Zoned for Agriculture	4	425
Agricultural	2	5
Industrial	31	458
Public/Semi-Public	12	245
Retail/Office	7	17
Lake	12	176
Acreage Not Zoned for Agriculture	1	6
Industrial	6	50
Public/Semi-Public	4	111
Retail/Office	1	8
Orange	420	25,932
Acreage Not Zoned for Agriculture	33	1,026
Agricultural	22	6,238
Industrial	203	3,473
Other	13	174
Public/Semi-Public	70	14,265
Retail/Office	79	757

County/Railroad Line Type/Parcel Land Use	Parcel Count	Sum of Acres
Osceola	13	1,881
Agricultural	1	531
Industrial	8	150
Public/Semi-Public	4	1,200
Seminole	39	843
Acreage Not Zoned for Agriculture	1	7
Industrial	19	121
Public/Semi-Public	13	265
Retail/Office	6	450
Sumter	29	6,040
Acreage Not Zoned for Agriculture	1	12
Agricultural	5	5,672
Industrial	7	311
Public/Semi-Public	8	18
Retail/Office	8	27
Volusia	72	1,349
Acreage Not Zoned for Agriculture	1	30
Agricultural	11	1,061
Industrial	34	195
Other	1	6
Public/Semi-Public	11	47
Retail/Office	14	11
Grand Total	641	37,372

Source: County property appraiser's database and the rail network for the region.

3.3 CHALLENGES

Similar to highways, the region's rail system faces numerous challenges in accommodating future freight and passenger growth and maintaining market share for local shippers and long distance service of key commodities. Central Florida has a fairly limited freight rail network and only the existing CSXT A-line and the Florida Central line services the urban population center of the region, where much of the growth is expected over the next several decades.

Capacity and Operational Issues

- Operational changes are expected to occur in the near future with the initiation of the SunRail passenger service on the CSXT A-line. As a result a

portion of the current rail freight traffic will be re-routed to the CSXT S-line to the relocated rail terminal facility in Winter Haven, Florida (from Taft). Earlier studies determined approximately 42% of the truck traffic in/out of the Taft facility was destined for the study area market with additional percentages to destinations requiring truck traffic to pass through the study area. Consequently, it is expected that the relocation of the rail terminal facility will require longer truck trips on a portion of the study area highway network utilizing the major highway freight corridors.

- According to discussions with the railroad, the moving of their intermodal focus and freight business development from CSXT's A-line to the S-line and Winter Haven site may attract additional development opportunities on the southern fringes of the study area, however existing rail shippers along the A-line may find it challenging to either relocate and/or reconfigure their existing supply chains to accommodate rail service in the new area.
- The Florida Central railroad is highly dependent upon freight traffic to the Taft interchange hub. The change in freight operations to the Taft interchange may impact the timing and reliability of freight utilizing the Florida Central railroad.

Several stakeholders currently indicate that their reliability concerns with rail and the lack of competitive rail service providers makes usage of rail less attractive to many study area business that could use rail but choose to use trucks. One of the major obstacles to making freight more competitive with highway modes is the lack of any significant backhaul out of Florida. Opportunities to create industries that may utilize rail for the export of materials or goods would enable rail to operate more competitively and provide a higher level of service to this region.

4.0 Air Cargo Profile

4.1 INTRODUCTION

The study area is served by four commercial service airports with reported air cargo activity, including both dedicated all-cargo carrier operations, as well as commercial passenger carrier belly cargo. These airports include:

- Orlando International Airport (MCO)
- Orlando-Sanford International Airport (SFB)
- Daytona Beach International Airport (DAB)
- Melbourne International Airport (MLB)

Orlando International is a designated Florida Strategic Intermodal System (SIS) airport, while Orlando-Sanford International is classified as an Emerging SIS airport. In total, these four airports provide scheduled service to 84 domestic and 33 international cities with direct, non-stop flights.

In addition to these four commercial service airports, there are several General Aviation (GA) airports that serve private and corporate aviation demand within the region. Unique among these is Leesburg International Airport (LEE), located approximately one-hour (drive-time) to the northwest of Orlando. Unlike other typical GA airports, Leesburg International Airport offers U.S. Customs and Border Protection inspections, with a U.S. Customs Officer on duty daily from 8:30am until 5:00pm. This capability allows LEE to handle both international and domestic air cargo, should demand warrant it. Currently, the Airport does not have any air cargo activity, and will not be addressed in detail in this section (which catalogues current activity in the study area). However, LEE's future potential to host air cargo activity will be addressed in subsequent sections relating to projected regional air cargo demand.

4.2 AIR CARGO SERVICE PROVIDERS

Air cargo services within the study area are provided by a segmented group of air carriers, both all-cargo and passenger carrier, that provide differing services based upon wide ranging customer demands. The air carrier types include:

- Integrated express carriers;
- All-cargo carriers (scheduled and ad-hoc charter); and

- Commercial service passenger carriers.

The following sections will provide a brief overview of the air carrier types that provide the region's air cargo services, their approximate service levels, and markets served.

Integrated Express Carriers

Integrated express carriers move customer material door-to-door, providing shipment pickup, transport (via air or truck), and delivery. Integrated express operators within the study area include FedEx, UPS, and DHL, and to a certain extent U.S. Postal Service (USPS). Express companies provide next day or second day, document, and small package services to the customers they serve. Integrated express carriers operate using a hub-and-spoke system similar to the passenger airline system. The hub is focal point of the integrated express carrier network since it provides connections to each market in the integrator's system. Each day of operations, flights from around the U.S. arrive at the hub where packages are offloaded, sorted in the hub to the appropriate destination market, and then reloaded onto the appropriate aircraft. Traditional integrated express service focuses on the small-volume, infrequent shipper or higher volume shippers moving product to multiple destinations. The small shipper "retail" air cargo market includes individual, private and business-to-consumer (B-to-C) shippers. However, integrated express carriers are well established in the "wholesale" market (i.e., third party logistics), catering to larger freight movements demanded by manufacturing and distribution operations.

All integrated express air movements within the study area are conducted at MCO, and trucked or couriered to customers in surrounding counties. Each of the integrated express carriers consolidates express air cargo from the study area, which effectively constitutes the MCO catchment area for express air cargo. For FedEx and UPS, this area has been identified as:

- North to Ocala.
- South to Lake Wales.
- East to Melbourne, Cocoa Beach, Daytona Beach.
- West to Lakeland.

The DHL Worldwide Express catchment area for MCO is slightly larger due to fewer aircraft in their network, thus requiring larger catchment areas for each airport station (i.e., spoke) served. The DHL catchment area for MCO is as follows:

- Northeast to Jacksonville.
- Southeast to Melbourne/Palm Bay.
- West to Tampa.
- South to Sebring.

All-Cargo Carriers

All-cargo carriers operate both scheduled and ad-hoc charter aircraft from one airport to another, and are highly reliant on the air freight forwarding industry to market, broker and handle freight off-airport. Due to their airport-to-airport service structure, scheduled all-cargo carriers are typically concentrated in large, high volume market airports; unlike the integrated express carriers, scheduled all-cargo carrier geographic coverage is limited. Note that some all-cargo carriers that operate scheduled routes do so exclusively for the integrated express carriers as either feeder routes, or in some cases, as trunk-line routes (i.e., station-to-hub routes). This is the case with MCO all-cargo carrier ABX Air, which operates a scheduled B767 to Cincinnati-Northern Kentucky International Airport, under contract with DHL.

Ad-hoc charter activity consists of unscheduled all-cargo carrier operations that move goods from airport-to-airport based strictly on shipper needs. Ad-hoc shipments tend to be oversized freight, specialized or sensitive cargo (i.e., military equipment or high value technology), or emergency supply chain shipments for just-in-time manufacturing operations. Within the study region, MLB has the highest level of ad-hoc charter operations. These freight movements include widebody charters (B747, AN225, C-5, and C-17 aircraft) driven by Department of Defense, State Department, Dyncorp, and local technology firms (including GE, Northrop-Grumman, Rockwell Collins, Harris). These flights averaged a once a month pace in 2011 and are expected to increase to 2 to 3 per month through 2013.

Commercial Service Passenger Carriers

Commercial service passenger carriers are scheduled passenger airline operators that use cargo space in the bellies of their aircraft to move cargo airport-to-airport. An airline's aircraft fleet is a significant factor in determining the size and amount of cargo the airline can accommodate. A domestic airline with a fleet of narrow-body and regional jets cannot accommodate large, bulky shipments. However, airlines operating wide-body aircraft (typically on international or transcontinental routes), such as the B747, B777, and A340, have containerized lower decks (which allow speed in loading and offloading) and generally are capable of handling large, bulky shipments. Simply put, the larger the aircraft on a route, the greater the capacity to move cargo; thus international routes operating wide-body aircraft tend to move the majority of commercial passenger carrier freight.

It is estimated that 50 percent of U.S. international air cargo traffic (inbound and outbound) is moved in the bellies of passenger aircraft.[34] Within the study area, this percentage rises to over 98 percent due to the high level of international

[34] Florida Air Cargo System Plan, 2010, Recent IATA reports.

wide-body lift provided by passenger carriers out of MCO and SFB.[35] Commercial passenger carrier lift, primarily to European, and increasingly Latin American destinations, drives the vast majority of the region's international air trade. Most scheduled international all-cargo flights operate from integrated express carrier hubs (e.g., Memphis, Louisville, Cincinnati) or are centered at large international gateways (e.g., Atlanta, Miami, New York).

Within the U.S. domestic air cargo market – a market dominated by the integrated express carriers – commercial passenger carriers account for only an estimated 15 to 20 percent of air cargo volume. Within the study area this percentage is even lower; domestic air cargo traveling on commercial passenger carriers equates to just over 11 percent of total domestic air cargo tonnage within the region, with nearly all of that traffic handled at MCO.

The air cargo market share of commercial passenger carriers, particularly on domestic routes, has declined significantly in the past decade due to multiple factors. Chief among these are the security measures and restrictions brought about by the September 11 terrorist attacks, and the subsequent requirement for 100 percent screening of all passenger carrier air cargo. These security regulations led to secure shipper certification requirements that effectively eliminated small and infrequent shippers from the passenger carrier cargo market, and drove them to the integrated express carriers.

The increasing use of smaller 50- and 70-seat regional jets on longer routes also served to limit the amount of belly space available on domestic routes, thus reducing system capacity. The final factor in the decline of domestic passenger carrier cargo was the awarding of USPS air contracts to FedEx, which effectively pulled most U.S. mail off passenger carriers. These three factors have combined to produced a shift of domestic air cargo away from passenger carrier lift toward integrated express carriers, and to a certain extent, time definite trucking.

Freight Forwarders

Freight forwarding companies act as brokers, or intermediaries, between the shipper and the carrier (all-cargo, commercial passenger or ad-hoc charter). The air carrier will provide airport-to-airport service only, with the carrier's responsibility beginning once the cargo is tendered at the origin airport, and ending once the cargo is offloaded at the destination airport. The forwarder will coordinate all other aspects of the freight movement, including pickup at the shipper's facility, securing space on an aircraft, freight consolidation (if the forwarder deems it necessary), customs and security clearance, destination airport pickup, and final delivery to the receiver. From the perspective of the air carrier, the freight forwarder is the shipper, not the actual owner of the freight (i.e., the forwarder's customer).

[35] Bureau of Transportation Statistics T-100 data.

In addition to using air carriers to move freight from airport-to-airport (commercial passenger carriers and all-cargo airlines), freight forwarders also often rely on third-party less-than-truck load (LTL) motor carriers to move consignment airport-to-airport. This is often referred to as road feeder service (RFS). RFS from the study area is common to both Atlanta and Miami in order to take advantage of the abundant lift available at these gateway airports.

Nearly all major international freight forwarders have a presence in the study area, with offices and warehouses centered around MCO. These international forwarders include:

- DHL Global Forwarding.
- Hellman Worldwide.
- Panalpina.
- Kuehne & Nagel.
- DB Shenker.
- Expeditors.
- Ceva Logistics.
- AIT Worldwide Logistics.

The forwarders listed above are supplemented by multiple domestic, regional, and niche forwarders. Forwarder market areas are defined by individual customers rather than large population or industrial centers. They tend to view their market area on a large regional basis versus a specific metro area, and thus all the air transportation asset in a region are utilized based on cost, availability, and origin-destination points. In the case of Orlando area forwarders, these air assets include Atlanta-Hartsfield International Airport and Miami International Airport. Lift at these airports is often used by Orlando-based forwarders, and likewise, Atlanta and Miami freight may be trucked to MCO for air transit if cost and capacity warrants.

4.3 REGIONAL AIR CARGO FACILITIES AND ACTIVITY

The following sections provide an overview of the study area's four active air cargo airports, and include summaries of:

- Air cargo facility inventory.
- Air cargo activity synopsis (volume and direction).
- Air cargo commodity summary.

The specific activity at each airport will be discussed in individual airport profiles presented later in this chapter.

Air Cargo Facilities

As detailed in Table 4.1, the region's air cargo airports have 18 on-airport cargo buildings with over 800,700 square feet of space for sort and consolidation activity. These buildings boast 282 truck docks that facilitate the efficient pickup and delivery of air cargo. Adjacent to these buildings, is over 316,500 square yards of dedicated air cargo ramp space. With the recent shutdown and demolition of MCO's perishable center (refrigerated facility), only SFB has perishable storage capabilities.

Table 4.1 Dedicated Air Cargo Facilities by Airport

Airport	Air Cargo Ramp ((Sq. Yards)	Air Cargo Buildings	Air Cargo Building (Sq. Feet)	Air Cargo Building Truck Docks	Refrigerated Storage (Sq. Feet)
Orlando International	237,450	14	630,440	253	-
Orlando-Sanford International	34,580	1	45,000	9	6,000
Melbourne International	44,500	2	120,000	19	-
Daytona Beach International	-	1	5,300	1	-
Total	316,530	18	800,740	282	6,000

Source: Airport Provided Data, Florida Air Cargo System Plan.

Table 4.2 presents the U.S. Customs and USDA clearance services available at each airport. All airports have onsite customs capabilities, while only MCO has onsite USDA inspection capabilities. Note that all airports have Foreign Trade Zones on-airport.

Table 4.2 Customs/Foreign Trade Capabilities

Airport	Foreign Trade Zone	Onsite U.S. Customs	Onsite USDA
Orlando International	Yes	Yes	Yes
Orlando-Sanford International	Yes	Yes	No
Melbourne International	Yes	Yes	No
Daytona Beach International	Yes	Yes	No

Source: Airport Provided Data, Florida Air Cargo System Plan.

The air cargo lift providers by type for each airport are presented in Table 4.3. Only MCO offers air cargo lift from each distinct type of carrier; integrated express, all-cargo, ad-hoc/charter, domestic, and international passenger carriers.

Table 4.3 Cargo Lift Providers by Airport

Airport	Integrated Express	Scheduled All Cargo	Charter All Cargo	Domestic Passenger	International Passenger
Orlando International	Yes	Yes*	Yes	Yes	Yes
Orlando-Sanford International	No	No	No	Yes	Yes
Melbourne International	No	No	Yes	Yes	No
Daytona Beach International	No	No	No	Yes	No

Source: Airport Provided Data, FAA T-100 Data. Note: *Scheduled all-cargo carriers operate contract routes for integrated express carriers.

Air Cargo Activity

Table 4.4 and Table 4.5 presents the 2011 air cargo tonnage by market (domestic versus international) and direction (outbound versus inbound). As expected, MCO air cargo volume constitutes the vast majority of tonnage moved at the region's airports. This is due to the operation of all three integrated express operators at the Airport, coupled with the large amount of international widebody lift.

Table 4.4 2011 Air Cargo Tons by Airport and Market

Airport	Domestic	International	Total	Percent of Total
Orlando International	142,839	44,228	187,067	98.10%
Orlando-Sanford International	-	3,022	3,022	1.60%
Melbourne International	99	430	529	0.30%
Daytona Beach International	108	-	109	0.10%
Total	143,046	47,680	190,726	100%
Percent of Total	75.00%	25.00%	100%	

Source: Airport Provided Data, FAA T-100 Data.

As illustrated in Table 4.5, the study area, in total, is an inbound (or import) market. Just over 57 percent of total air cargo traffic is inbound.

Table 4.5 2011 Air Cargo Tons by Direction

Airport	Outbound	Inbound	Total	Percent of Total
Orlando International	79,512	107,555	187,067	98.10%
Orlando-Sanford International	1,319	1,703	3,022	1.60%
Melbourne International	303	226	529	0.30%
Daytona Beach International	59	49	108	0.10%
Total	81,193	109,534	190,727	100%
Percent of Total	42.60%	57.40%	100%	

Source: Airport Provided Data, FAA T-100 Data.

4.4 AIR CARGO COMMODITIES

The following tables present the commodity types moved in and out of the study area by market (domestic versus international). Table 4.6 details 2011 domestic air cargo tonnage by commodity using STCC2 codes. Due to the heavy level of domestic integrated express carrier traffic, it is not surprising that mail and express traffic accounts for over 54 percent of total domestic air volume.

Table 4.6 2011 Domestic Air Cargo Tons by Commodity

STCC2	Commodity	Tons	Percent of Total
43	Mail, Express or Other Contract Traffic	77,574	54.20%
46	Miscellaneous Mixed Shipments	16,385	11.50%
28	Chemicals or Allied Products	14,950	10.50%
35	Machinery, excluding Electrical	8,160	5.70%
37	Transportation Equipment	5,943	4.20%
36	Elec Machinery, Equip, Supplies	4,997	3.50%
27	Printed Matter	2,764	1.90%
1	Farm Products	2,494	1.70%
39	Misc Products of Manufacturing	2,206	1.50%
34	Fabricated Metal Products	2,071	1.40%
20	Food and Kindred Products	1,170	0.80%
26	Pulp, Paper or Allied Products	987	0.70%
32	Clay, Concrete, Glass, Stone Prod	869	0.60%
38	Instruments, Photo/Opt Goods, Etc	747	0.50%
23	Apparel or Fin Textile Products	696	0.50%
30	Rubber or Misc Rubber Prods	363	0.30%
9	Fresh Fish	307	0.20%
33	Primary Metal Products	160	0.10%
25	Furniture or Fixtures	67	0.00%
22	Textile Mill Products	61	0.00%
24	Lumber or Wood Products	48	0.00%
31	Leather or Leather Products	15	0.00%
29	Petroleum or Coal Products	11	0.00%
Total		143,046	100%

Source: TRANSEARCH, Cambridge Systematics.

International air cargo tonnage by commodity and direction is presented in Table 4.7. This data was pulled from USA Trade Online, Harmonized System (HS) Port-level Database provided by the U.S. Census Bureau, and presented in NAICS codes (North American Industry Classification System). The top-five

international air trade commodities transiting the region's airports (machinery, fish, optic/medical instruments, vegetables, and electronics) account for nearly 52 percent of the total.

The total value of air imports into region for 2011 is estimated to be $932.0 billion, while air exports are estimated at $833.2 billion. This equates to an average value of $32,707 per import ton, and $43,437 per export ton. Additional detail on air cargo in the context of overall commodity flows is included in a separate document on regional commodity flows for all modes.

Table 4.7 2011 International Air Cargo Tons by Commodity and Direction

NAICS Commodity	Import	Export	Total	Percent of Total
84 Machinery, Nuclear Reactors, Boilers, Etc.; Parts	7,037	3,517	10,554	22.10%
03 Fish, Crustaceans and Aquatic Invertebrates	4,154	111	4,265	8.90%
90 Optic, Photo Etc, Medic Or Surgical Instrments Etc	1,872	1,819	3,691	7.70%
07 Edible Vegetables and Certain Roots and Tubers	2,647	835	3,482	7.30%
85 Electric Machinery Etc; Sound Equip; Tv Equip	1,458	1,206	2,663	5.60%
04 Edible Animal Prods, Dairy Prods Nesoi	1	2,185	2,185	4.60%
87 Vehicles, Except Railway Or Tramway, and Parts	1,444	681	2,125	4.50%
06 Live Trees, Plants, Bulbs Etc.; Cut Flowers Etc.	57	1,924	1,981	4.20%
30 Pharmaceutical Products	1,185	509	1,694	3.60%
39 Plastics and Articles Thereof	620	806	1,427	3.00%
38 Miscellaneous Chemical Products	446	603	1,050	2.20%
73 Articles Of Iron Or Steel	512	444	956	2.00%
98 Special Classification Provisions, Nesoi	834	5	838	1.80%
27 Mineral Fuel; Bitumin Subst; Mineral Wax	447	198	645	1.40%
40 Rubber and Articles Thereof	489	126	614	1.30%
29 Organic Chemicals	218	356	574	1.20%
33 Essential Oils Etc; Perfumery, Cosmetic Etc Preps	254	318	572	1.20%
94 Furniture; Bedding Etc; Lamps Nesoi Etc;	366	86	452	0.90%
62 Apparel Articles and Accessories, Not Knit Etc.	422	23	445	0.90%
49 Printed Books, Newspapers Etc; Manuscripts Etc	170	202	372	0.80%
69 Ceramic Products	306	62	368	0.80%
01 Live Animals	300	29	329	0.70%
83 Miscellaneous Articles Of Base Metal	175	145	319	0.70%

NAICS Commodity	Import	Export	Total	Percent of Total
61 Apparel Articles and Accessories, Knit Or Crochet	183	131	314	0.70%
36 Explosives; Pyrotechnics; Matches; Pyro Alloys	297	5	303	0.60%
All Others	2,604	2,857	5,461	11.50%
Total	28,497	19,183	47,680	100.00%
Percent of Total	59.80%	40.20%	100.00%	

Source: USA Trade Online, Harmonized System (HS) Port-level Database; Airport Analytics.

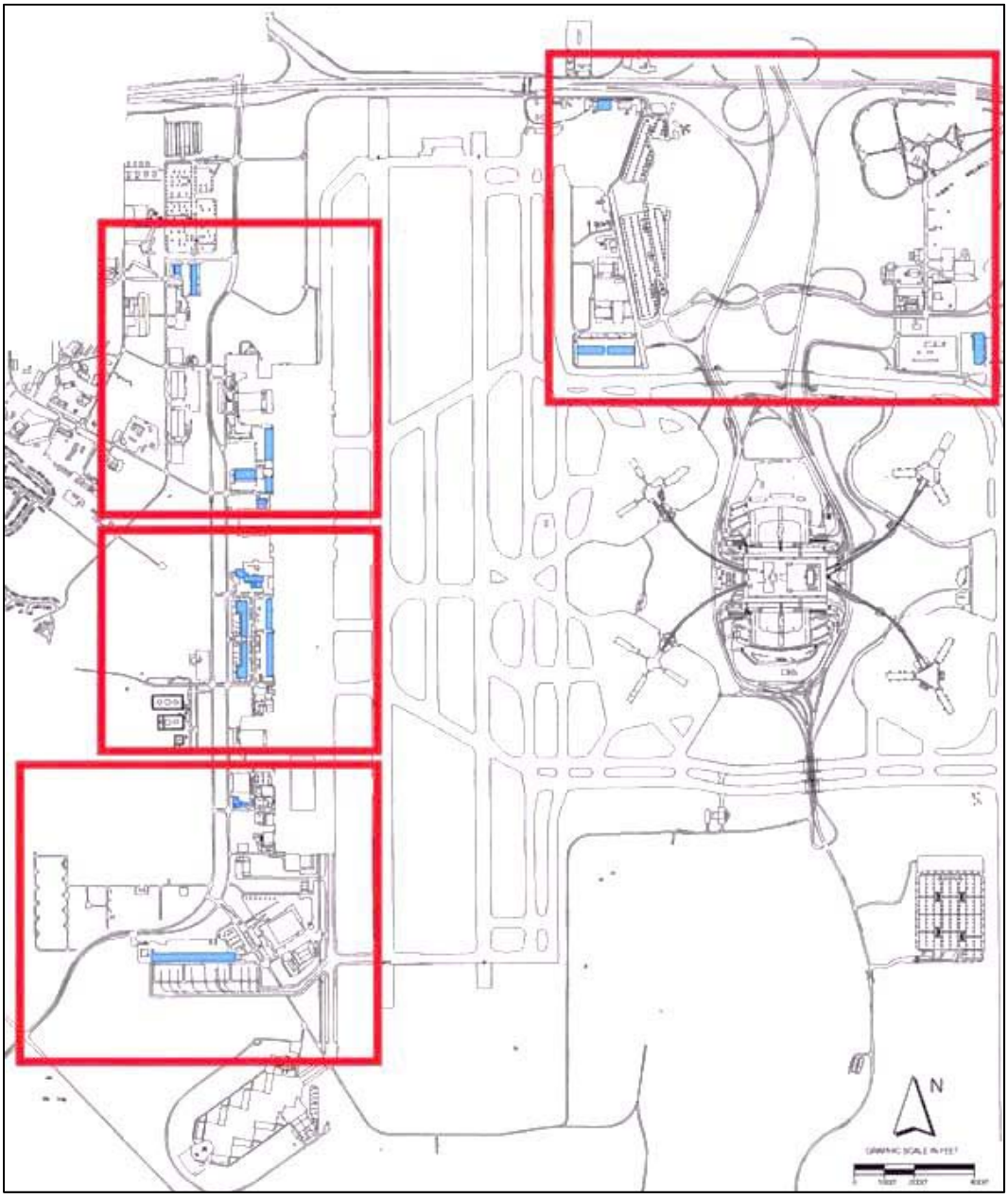
4.5 REGIONAL AIR CARGO AIRPORT OVERVIEW

The following sections provide a more detailed overview of the current air cargo facilities, access, and service levels of each of the four commercial service airports in the study area.

Orlando International Airport

There are four separate areas on the Airport which accommodate air cargo activity. These areas are: the passenger airline cargo facility located off Bear Road on the north side of the Airport, the two areas on the west side of Runway 36L along Tradeport Drive (which include UPS and DHL), and the FedEx and USPS facilities located on the west side of the end of Runway 36L on the south portion of Tradeport Drive. These areas along Tradeport Drive constitute the Orlando Tradeport. Figure 4.1 illustrates the location of each of these facilities.

Figure 4.1 MCO Air Cargo Facility Location



Source: Orlando International Airport, http://www.orlandoairports.net.

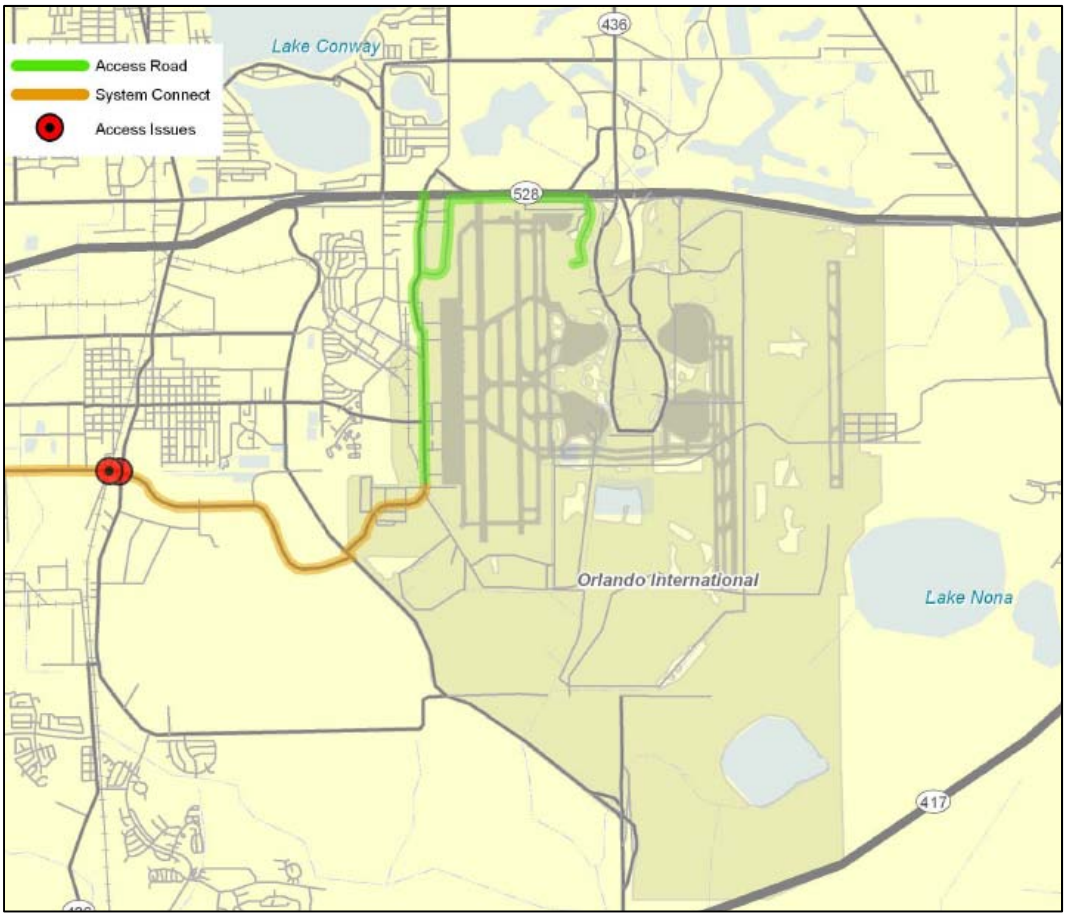
Orlando Tradeport, a 1,400 acre fully integrated cargo center located on Airport property, is a master planned facility with design criteria geared toward intermodal transportation capacity and direct airside access. The Tradeport provides 140 acres of cargo ramp that can be accessed directly by truck (through-the-fence access), or via truck dock through air cargo sort/staging facilities. There is currently over 500,000 square feet of cargo warehouse space, with aircraft parking available for up to 27 all-cargo wide body aircraft parked in two

rows. Additionally, Orlando Tradeport offers a 205-acre Foreign Trade Zone #42. In total, the Airport has 14 cargo buildings with 253 truck docks, providing access to 630,440 square feet of building space and 237,450 square yards of dedicated air cargo ramp.

4.1.1 Access

MCO is surrounded by SR 528 to the north, which connects to the Florida Turnpike to the west and SR 417 to the east and south of the Airport. There are several roadways providing access to the Airport's air cargo areas from these thoroughfares. Tradeport Drive is a north–south four lane road, on the western most edge of Airport property that provides access to FedEx, UPS, DHL, and several commercial passenger carrier cargo facilities. Airport Boulevard is the main loop road to the passenger terminals, and connects to SR 436 at the junction of the SR 528. Bear Road connects Airport Boulevard with Tradeport Drive and parallels SR 528. As illustrated in Figure 4.2, Tradeport Drive and Bear Road provide the primary access to MCO's air cargo facilities.

Figure 4.2 MCO Air Cargo Access Routes



Source: Florida Air Cargo System Plan, FDOT.

Air carriers and freight forwarders that were consulted with as a part of this Study typically rated access to MCO cargo facilities as very good to excellent, particularly when compared to their experience with congestion at Miami International and Atlanta-Hartsfield International. Primary issues arise once drivers leave the immediate Airport environs, and these include:

- Eastbound access to I-4 via Tradeport Drive and Taft Vineland Road: Taft Vineland narrows from a four lane thoroughfare to a two lane roadway. In addition, an at grade railroad crossing can hinder traffic flow.
- SR 528 toll both near the junction of SR 436 contributes to traffic congestion at peak times.
- SR 417 does not have an interchange with the Florida Turnpike. An interchange at this location will make truck access to points south more direct.

4.1.2 Service Levels

In 2011, 27 separate airlines, providing direct service to 84 domestic destinations and 33 international destinations, reported air cargo activity at MCO. Table 4.8 details the airline, airline type, and tonnage by direction with a summary by airline type in Table 4.9.

Table 4.8 2011 MCO Air Cargo Tons by Carrier and Direction

Airline	Airline Type	Outbound	Inbound	Total	Percent of Total
FedEx	All-Cargo Scheduled	29,574	36,590	66,164	35.40%
United Parcel Service	All-Cargo Scheduled	14,880	25,517	40,397	21.60%
Virgin Atlantic	International Passenger	6,997	12,580	19,577	10.50%
ABX Air (DHL)	All-Cargo Scheduled	7,855	7,988	15,843	8.50%
TAM Brazilian Airlines	International Passenger	4,268	5,060	9,328	5.00%
British Airways	International Passenger	3,350	3,381	6,731	3.60%
Southwest Airlines	Domestic Passenger	3,016	3,108	6,124	3.30%
Lufthansa Airlines	International Passenger	1,592	3,024	4,616	2.50%
Delta Air Lines	Domestic Passenger	1,761	2,577	4,338	2.30%
ASTAR (DHL)	All-Cargo Scheduled/Charter	2,280	399	2,679	1.40%
Air France	International Passenger	696	1,353	2,049	1.10%
Continental Airlines	Domestic Passenger	508	1,470	1,978	1.10%
Aer Lingus	International Passenger	545	1,237	1,782	1.00%
Air Transport International	All-Cargo Charter	530	1,031	1,561	0.80%
U.S. Airways	Domestic Passenger	363	569	932	0.50%
Mountain Air (FedEx)	All-Cargo Schedule	359	319	678	0.40%
JetBlue Airways	Domestic Passenger	166	366	532	0.30%

Airline	Airline Type	Outbound	Inbound	Total	Percent of Total
Evergreen International	All-Cargo Charter	187	279	466	0.20%
Frontier Airlines	Domestic Passenger	273	77	350	0.20%
United Airlines	Domestic Passenger	47	181	228	0.10%
Alaska Airlines	Domestic Passenger	45	158	203	0.10%
Air Canada	International Passenger	115	30	145	0.10%
Sun Country Airlines	Domestic Passenger	16	101	117	0.10%
National Air Cargo	All-Cargo Charter	4	88	92	0.00%
Capital Cargo International	All-Cargo Charter	62	29	91	0.00%
American Airlines	Domestic Passenger	5	35	40	0.00%
Martinair Holland	All-Cargo Charter	18	8	26	0.00%
Total		79,512	107,555	187,067	100%

Source: Greater Orlando Aviation Authority.

Table 4.9 2011 MCO Air Cargo Tons by Carrier and Direction *Summary*

Airline Type	Outbound	Inbound	Total	Percent of Total
All-Cargo Scheduled	54,948	70,813	125,761	67.20%
International Passenger	17,563	26,665	44,228	23.60%
Domestic Passenger	6,200	8,642	14,842	7.90%
All-Cargo Charter	801	1,435	2,236	1.20%
Total	79,512	107,555	187,067	100%

Source: Greater Orlando Aviation Authority.

Orlando-Sanford International Airport

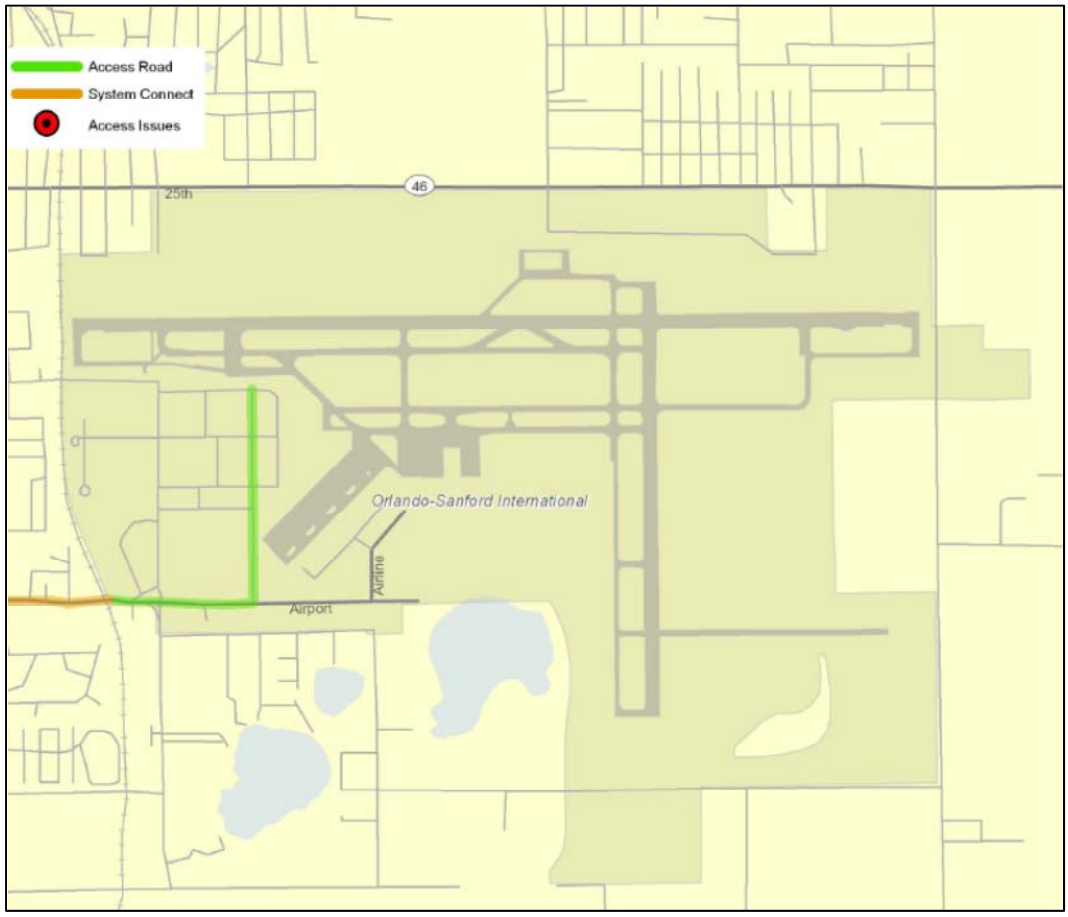
SFB has one dedicated 45,000 square foot air cargo building with nine truck docks; it is 60 percent occupied. Within the air cargo building is a 6,000 square foot refrigeration unit for the handling of perishables; it is the only permanent on-airport perishable facility in the study region. The building can be expanded by an additional 20,000 square feet, should demand warrant. There are 34,500 square yards of combined dedicated air cargo and multi-use ramp space that can be used for air cargo operations. The Airport operates the cargo facility and handles all cargo as a service for the carriers; the cargo facility does not make money for the Airport.

4.2.1 Access

The cargo facility is located on Carrier Avenue and is accessed primarily from East Airport Boulevard, and does not interfere with any passenger terminal

vehicular traffic. Officials at SFB are satisfied with the current road configuration and access to the cargo facility; they did not identify any current areas of concern. As illustrated in Figure 4.3, East Airport Boulevard connects with SR417 to the west.

Figure 4.3 SFB Air Cargo Access Routes



Source: Florida Air Cargo System Plan, FDOT.

Note: No access issues were identified in the Florida Air Cargo System Plan at this location

4.2.2 Service Levels

All cargo activity at SFB is handled by the international passenger carriers that operate at the Airport. These carriers are charter operations and operate on a seasonal basis, thus cargo volume is cyclical, mirroring passenger flows. Seasonal peaks start in early July, and extend through October; there is limited international traffic December through April. Marketability of cargo service suffers due to peaks and ebbs of passenger service; the schedule inconsistency of lift makes it difficult for forwarders to plan regular moves from the Airport.

Table 4.10 details the airline, airline type, and tonnage by direction. Note that all traffic in 2011 was international traffic with over 99 percent of the Airport's air trade to-and-from Europe, and USA Jet providing ad-hoc service to Canadian destinations.

Table 4.10 2011 SFB Air Cargo Tons by Carrier and Direction

Airline	Airline Type	Outbound	Inbound	Total	Percent of Total
Britannia Airways	Passenger Charter	512	1,169	1,681	51.40%
Thomas Cook Airlines	Passenger Charter	757	496	1,252	45.50%
Icelandair	Passenger Charter	51	21	71	2.70%
USA Jet Airlines	All-Cargo Charter	-	18	18	0.40%
Total		1,319	1,703	3,022	100%

Source: Orlando-Sanford International Airport, FAA T-100 Data.

Melbourne International Airport

There are two air cargo buildings at MLB totaling 120,000 square feet. The smaller of the two is approximately 15,000 square feet with seven truck-docks and is located on the air cargo ramp east of the passenger terminal. Delta Airlines is the primary tenant of this building. The larger of the two is approximately 105,000 square-feet with 12 truck-docks and is also located to the northeast of the passenger terminal. This building does not sit directly on the air cargo ramp; it is connected to airside via an access road. MLB's air cargo ramp is 44,500 square yards and is located to the east of the terminal, south of the approach end of Runway 27L.

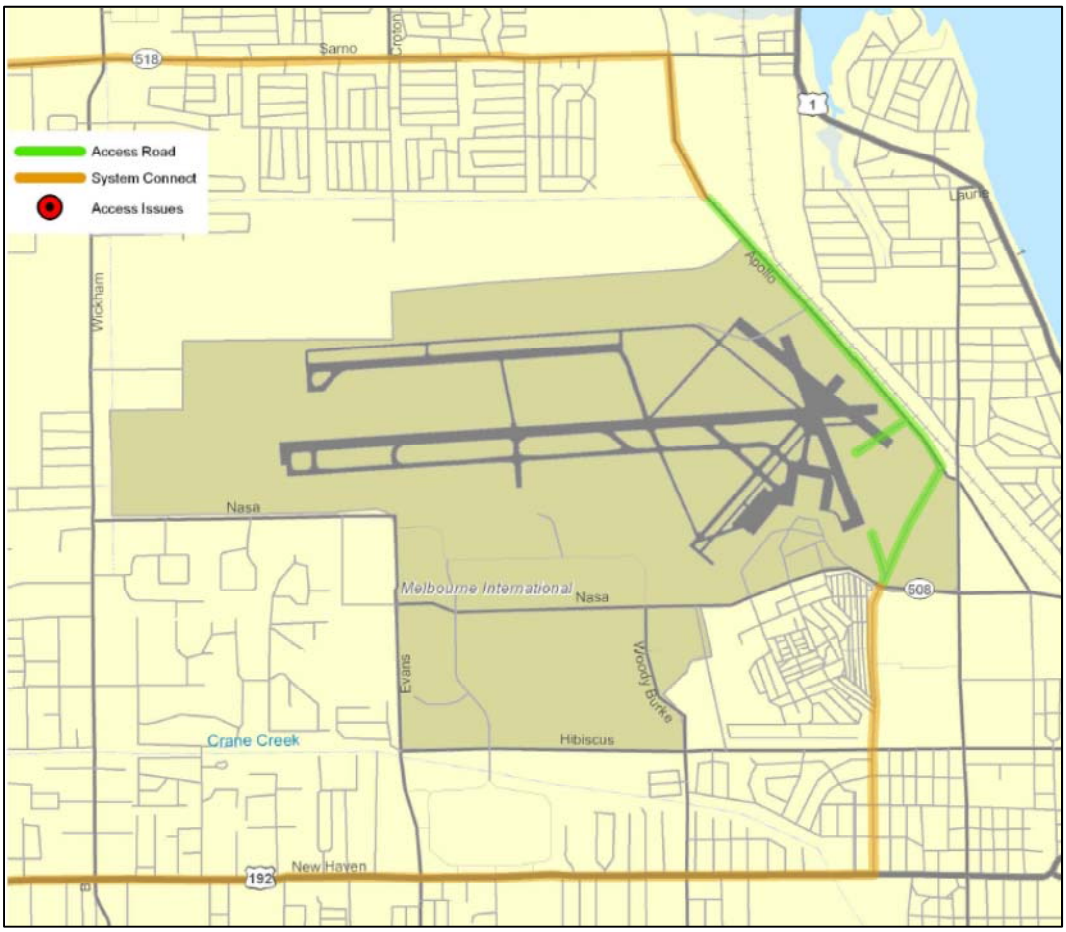
Liberty Aerospace, Inc. (U.S. subsidiary of the European manufacturer of the Liberty XL2 general aviation aircraft) leases approximately one third of MLB's larger air cargo building for its North American headquarters. The building is also home to several trucking companies and a freight forwarder.

Access

The smaller air cargo building is located on Ed Foster Road accessed via Airport Boulevard. The larger air cargo building is located on Air Cargo Place and is accessed via Apollo Boulevard. Trucks arriving and departing to the south will co-mingle with passenger traffic on Airport Boulevard until they reach NASA Boulevard where passenger traffic will turn east to the Airport terminal entrance. However, truck traffic is not considered heavy enough to cause congestion issues. Traffic arriving and departing to the north will use Apollo Boulevard. Airport management pointed out that much of the truck traffic to and from the Airport is not air cargo related, but driven by the businesses operating on the Airport. I-95 is approximately 5-miles to the west of the airport and is accessed

by U.S. 192 to the south, or Sarno Road to the north. Figure 4.4 illustrates the primary access to MLB's air cargo facilities.

Figure 4.4 MLB Air Cargo Access Routes



Source: Florida Air Cargo System Plan, FDOT.

Note: No access issues were identified in the Florida Air Cargo System Plan at this location

Service Levels

MLB has limited scheduled cargo capacity (passenger carrier or all-cargo). Delta operates an MD-80 narrowbody to Atlanta, and U.S. Airways operates regional jets to Charlotte. Both aircraft types have limited belly capacity. There is, however, a considerable amount of widebody ad-hoc charter activity (B747, AN225, C-5, and C-17 aircraft) driven by DoD, State Department, and local technology firms (including GE, Northrop-Grumman, Rockwell Collins, Harris). B747 activity averages one flight every 2 months, but is ramping up to 2 per month, while an AN225 (a Russian built and operated widebody cargo aircraft) is operating at the Airport once every 2 months. Private cargo on Military aircraft

will occasionally use MLB versus nearby Patrick AFB due to operating efficiencies at the Airport.

Table 4.11 details the airline, airline type, and tonnage by direction. Note that over 81 percent of MLB cargo is international due to all-cargo charter activity.

Table 4.11 2011 MCO Air Cargo Tons by Carrier and Direction

Airline	Airline Type	Outbound	Inbound	Total	Percent of Total
Delta Airlines	Domestic Passenger	61	29	90	17.00%
U.S. Airways	Domestic Passenger	0.1	9	9	1.70%
Kalitta Air	All-Cargo Charter	148	188	336	63.50%
Antonov Company	All-Cargo Charter	94	-	94	17.80%
Total		303	226	529	100%

Source: Melbourne International Airport, FAA T-100 Data.

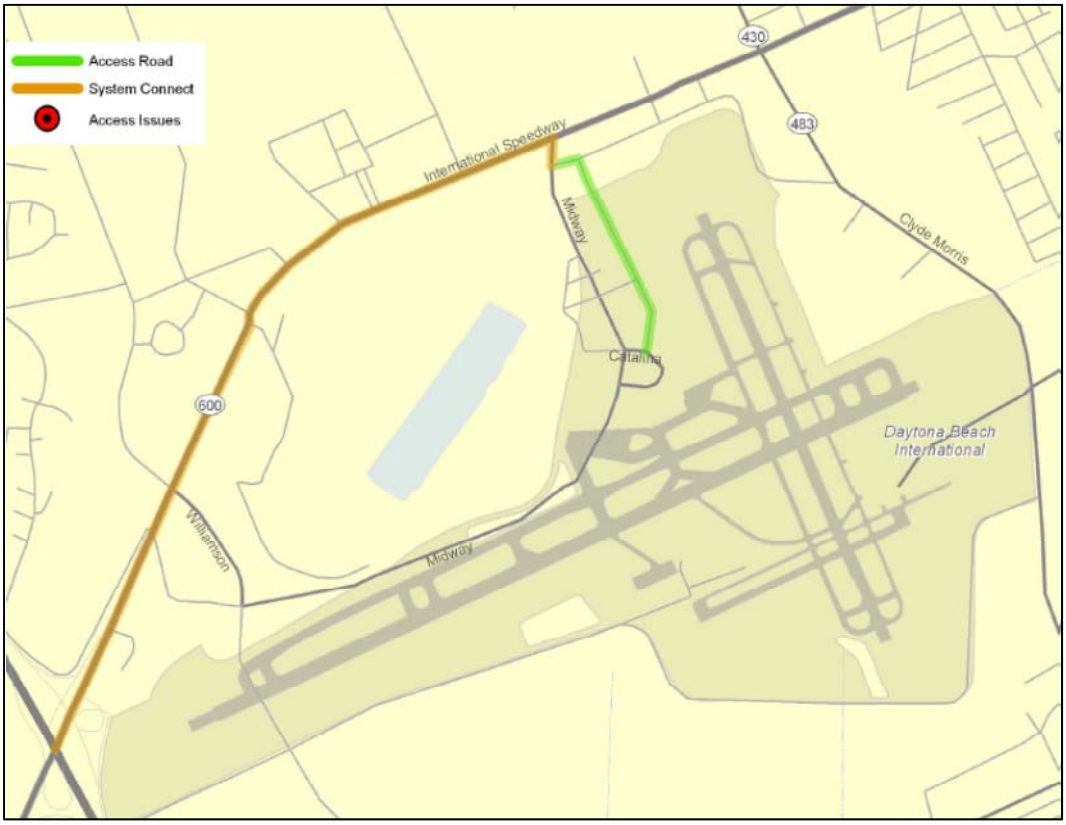
Daytona Beach International Airport

DAB has a 5,300 square foot cargo building, of which Delta currently occupies 2,300 square feet. The Airport does not have any dedicated ramp space for cargo operations, but there is multi-use ramp space available for ad-hoc cargo operations if needed.

Access

The DAB cargo facility is accessed from Richard Petty Boulevard to Coral Sea Avenue, and maintains a separate route from passenger traffic. As illustrated in Figure 4.5, I-95 is located just to the west of the Airport and is connected via U.S. 92.

Figure 4.5 DAB Air Cargo Access Routes



Source: Florida Air Cargo System Plan, FDOT.

Note: No access issues were identified in the Florida Air Cargo System Plan at this location

Service Levels

As detailed in Table 4.12, Delta Airlines moves over 95 percent of the Airport's air cargo, with U.S. Airways accounting for the rest. There is no reported all-cargo charter activity.

Table 4.12 2011 DAB Air Cargo Tons by Carrier and Direction

Airline	Airline Type	Outbound	Inbound	Total	Percent of Total
Delta Airlines	Domestic Passenger	58	45	103	95.20%
U.S. Airways	Domestic Passenger	1	4.2	5	4.80%
Total		59	49	108	100%

Source: Daytona Beach International Airport, FAA T-100 Data.

4.6 CHALLENGES

Air cargo demand in the region is adequately met by current infrastructure and capacity. Access to the airports is reported to be very good to excellent, particularly when compared to competing gateway airports, Atlanta-Hartsfield International and Miami International.

Capacity and Operational Issues

- Both MCO and SFB freight forwarders, as well as airport officials, report excellent working relationships and responsiveness of the U.S. Customs service. While direct service to Europe via MCO and SFB commercial passenger carriers drives the region's international traffic, lift to Latin American markets is minimal (though growing), and direct Asia/Pacific Rim traffic is currently non-existent. MCO is currently targeting Asian and Middle-Eastern markets for direct service, and is directly marketing to several carriers, including: China Air, ANA, Japan Airlines, China Eastern, Cathay Pacific, Air China, Qatar Airways, and Emirates.
- Freight Forwarder traffic originating or destined for the study area often transit Atlanta-Hartsfield International and Miami International Airport versus the region's airports due to several factors, including:
  - Greater range of destinations, frequency, and capacity at the competing airports;
  - Block space arrangements with carriers (i.e., guaranteed pre-purchased space on aircraft);
  - Greater concentration of support services; and
  - Less seasonality/fluctuations of lift capacity.

Despite the use of alternate gateways for study area air cargo, MCO forwarders and cargo handlers report that the Airport's available lift is well utilized. SFB reports that their capacity is underutilized, primarily due to the seasonal nature of their operations. The primary themes encountered during consultation with the regions' airports, air cargo carriers, and forwarders include:

- I-4 congestion near tourist attractions and north to SFB.
- Westbound egress from Tradeport Drive constricts to two-lanes at Taft Vineland Road prior to reaching the Florida Turnpike.
- The MCO on-airport tug road connecting the passenger carrier cargo facilities on Bear Road to the aircraft at the passenger terminal is somewhat long and is in need of repair. The bumps in the road often cause freight to shift or fall off the tugs and cause damage. In addition, Airport security will often conduct checkpoints along the Road, causing unnecessary delay.

- The TSA is discussing possible restriction of through the fence operations at MCO (i.e., disallowing direct truck access to the aircraft ramp). This would impact UPS operations and would mean a full unload, tug to cargo building, and through the building reload of cargo onto drayage and courier trucks. A full redesign/rebuild of the cargo building would be required, and cost time and operational efficiency.
- New shipping and import/export regulations are increasingly burdensome to freight forwarders and are hampering the efficiency of their operations.
- Security regulations and secure shipper requirements are driving smaller and infrequent shippers from commercial passenger carriers to the integrated express carriers.
- Outbound capacity to Latin American destinations (particularly Brazil) is limited; tourists returning to Latin America purchase significant amounts of consumer goods in Orlando that occupies much of the belly space on return flights.
- Seasonality of lift[36], coinciding with tourist traffic, affects the ability to market air cargo capacity, particularly out of SFB.

[36] This relates to heavier traffic during the summer months, largely related to charter services, and without those services, air traffic can drop off dramatically.

5.0 Seaport and Spaceport Profile

5.1 INTRODUCTION

Seaports are a crucial part of both the import and export economy of the State of Florida as a whole and the Orlando region more specifically. In Florida, there are a total of 15 seaports with one (Port Canaveral) actually located within the study area. In 2011, waterborne international trade moving through these ports topped $80 billion, an increase of almost 20 percent from 2010. Exports accounted for about 52 percent of the value of the state's total international trade and the state ranked fourth among the nation's top exporting states. Port operations in the state of Florida continue to be a major contributor to the overall competitiveness of the economy and creating and supporting high-paying, attractive jobs for residents. According to a recent Florida Department of Transportation study, every $1.00 invested in seaports in the state, yields $6.90 to the states' economy.[37]

Evaluating the movement of goods (imports and exports) into, out of, through, and within the study area through the ports is a key focus of this study. Port Canaveral, located in Brevard County plays a major role in providing access to international goods for businesses throughout Central Florida. Historically, Port Canaveral has played a key role in linking some of Central Florida's major industries including housing construction and agriculture. The port also plays a very prominent role in the export of automobiles and heavy equipment and a very active cruise industry serving the entertainment centers in Central Florida.[38] Port Canaveral's importance in supporting the flows of petroleum products, and bulk cargos such as imported cement, aggregates, and lumber will continue to grow, especially as the economy and housing markets recover.

Continued growth in freight volumes and expansion into new markets for Port Canaveral (including the new petroleum tank farm) is putting greater stress on the regional transportation system serving the port. There are few major highways that provide direct access to Port Canaveral and even within the Port area there are unique routing challenges which will be described in this section. With the growth in traffic on all the access routes, travel time and cost will increase, service reliability will decrease, and the ability of the system to recover from emergencies and service disruptions will become severely taxed, as well as make more difficult for the port to compete for new business. Identifying

[37] Florida Seaport Charting our Future, Fast Facts 2012

[38] Port website

strategies to manage and improve the access to the port area will be critical to maintain competitiveness and improve access to markets.

Following the introduction, this profile examines the Region's port system demand as well as demand between the study region and key Florida ports outside the study region. An individual port profile of Port Canaveral is provided along with brief summaries of the other ports serving the Orlando market, followed by a discussion of challenges for the port system. The section also includes a discussion of Spaceport operations and their unique role in the regional goods movement system.

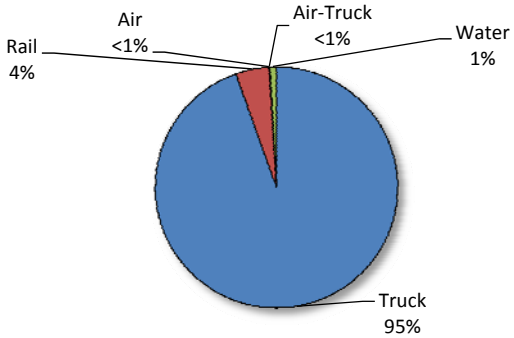
Sources of Information

Numerous prior studies have been conducted on the Region's ports and this profile draws on several of them, including the Port Canaveral Master Plan (2007-2027) and the Florida Seaport Five Year Plan and 2012 Priority Seaport Projects. It also makes use of commodity flow data and forecasts from PIERS, previously utilized and reported in the Florida Trade and Logistics Study, information gleaned from stakeholder interviews and site visits; and individual port web sites. Sources of specific data and information are provided throughout the profile.

5.2 SEAPORT SYSTEM DEMAND

Port Canaveral currently deals largely in bulk and breakbulk cargo, with just a small proportion of containers. In 2010, the Port handled about 3.2 million tons of bulk and breakbulk cargo, with over 60 percent accounted for by petroleum products. International waterborne freight through Port Canaveral accounts for about 1 percent of the total freight tonnage moving through the Central Florida region (Figure 5.1) and Brevard County is the only county in the study region with any originating or terminating waterborne tons.

Figure 5.1 Mode Share by Weight – All Directions
2010 (Exclusive of through rail tons)

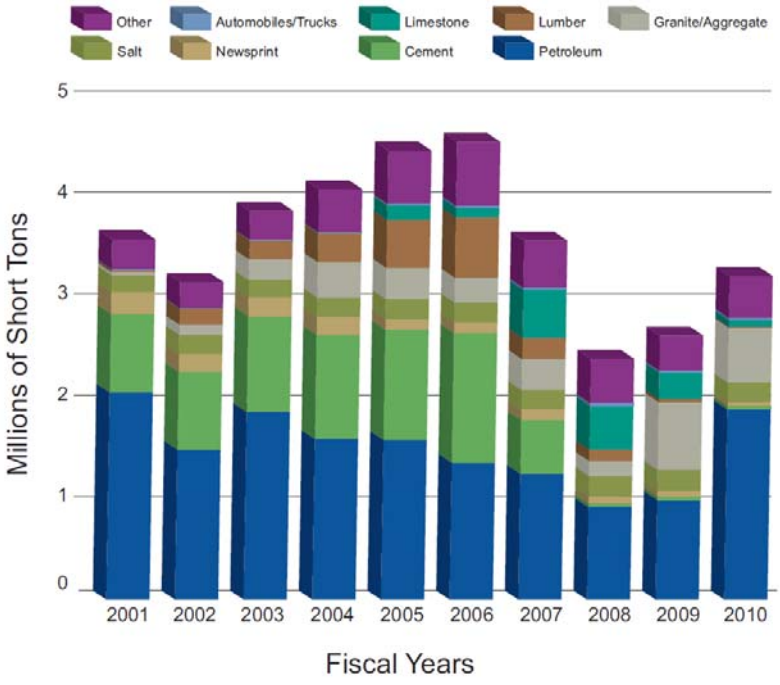


Source: Current Regional Freight and Goods Flow Profile, Central Florida Regional Freight Study, 2012.

Top Commodities Moving Through the Port

Figure 5.2 shows the major commodities moving inbound and outbound from Port Canaveral between 2001-2010. As shown in the figure, petroleum plays the largest role in Port cargo tonnage, followed by granite/aggregate.

Figure 5.2 Port Canaveral FY 2010 Cargo Tonnage



Source: Port website.

According to recent data from PIERS, about 38 percent of Port Canaveral's imported cargo tons are destined for counties within the study region, consisting mostly of granite, sand, and aggregates. About 11 percent of Port Canaveral's exports originate in the study region with the major commodities including general cargo, automobiles, and trucks.

Table 5.1 shows the total international waterborne tonnage that originates or terminates in the study area and handled through Port Canaveral and key ports in Florida and the Southeast, including the Port of Jacksonville (Jaxport), Tampa, Miami, Port Everglades, and Savannah (in the State of Georgia). Port Canaveral handles very little in containerized tonnage and to bring certain products into the Orlando market cargo such as consumer products and household goods often shipped using containers, shippers often utilize ports with great container capacity, such as the Port of Tampa or Jacksonville. After Port Canaveral, Jaxport provides the next highest volume of imports to the region (by tonnage), with major commodities including auto parts and furniture.

Table 5.1 Inbound/Outbound Waterborne Tonnage to the Study Area (through each Port) in 2010

Port	Imported to Study Area	Percent of Ports' Total Imports to Study Area	Top Commodities Inbound to Study Area through Port	Exported from Study Area	Percent of Ports' Total Exports from Study Area	Top Commodities Outbound from Study Area through Port
Port Canaveral	619,809	38.4%	Granite, Sand, Chemicals	17,772	10.7%	Autos, General Cargo, Trucks
Jacksonville	59,708	0.5%	Auto Parts, Furniture	126,050	2.6%	Autos, Grocery Products, Household Goods
Tampa	44,466	0.8%	Gypsum (Used in Plaster and Cement), Fertilizer, Furniture	9,997	0.2%	Autos, Trucks
Miami	33,282	1.1%	Ceramics, Furniture	30,832	0.9%	Household Goods, General Cargo
Port Everglades	25,006	0.4%	Auto Parts, Wood Products	19,873	0.5%	Autos, Grocery Products
Savannah (Georgia)*	40,938	0.2%	Furniture, General Cargo	21,117	0.1%	Autos, Live Plants, Scrap Metal

Source: PIERS, AAPA (for Savannah total tonnage).

Several of the interviewees for this project, reported the use of other Florida and Southwest ports to serve their operations in Central Florida, including the Port of Jacksonville, Tampa, Everglades, Miami, and Savannah. For example, a major furniture manufacturer and distributor in Polk County reported receiving about 50 percent of their furniture inventory from Asia, brought in to the United States principally through Jaxport and transported to the Orlando region by truck.[39] A large waste collection company in the region reported sending recyclables out of the Country through the Ports of Tampa, Miami, or Everglades using 53' foot tractor-trailers.

[39]This manufacturer reported about 12,000 total containers brought into Florida ports in 2011.

5.3 INFRASTRUCTURE PROFILE

This section provides a summary profile for Port Canaveral in the study area as well as more brief descriptions of four of the major ports in the State that serve the Orlando market, mostly for containerized cargo.

Port Canaveral

In 2010, Port Canaveral ranked sixth in the State of Florida for both the tonnage and value of imports and exports in FY 2010-2011 with over 3.2 million tons, worth nearly $5 billion dollars. The Port is located in Brevard County on the Atlantic Coast of Florida. In 2010-2011 imports accounted for about 59 percent of waterborne flows at the port, 3 percent of the flows for exports, and 38 for domestic cargo (i.e., bound for other ports in the United State). For foreign trade, imports accounted for over 95 percent of flows. This imbalance in favor of imports means that the regions served by the Port experience an outflow of dollars as residents and businesses pay for the goods received.

The imbalance of imports to exports also results in some landside inefficiencies. In general, this imbalance means that trucks and railcars that arrive at the port with cargo are not always able to leave the port with cargo, resulting in more empty truck or rail car miles. The degree to which this happens depends in large part on the type of commodity hauled. Liquid bulk tankers, auto carriers, and trucks hauling cement, limestone, and other aggregates (major commodities for Port Canaveral) must generally haul the same commodity inbound and outbound thereby increasing the probability of being empty in one direction.

Number of Berths, Maximum Length, and Depth at Berth

Port Canaveral has nine dedicated cargo berths ranging from 400-1,000 ft long, with depths ranging from 35-40 ft. (MLW).

Highway and Rail Infrastructure Serving the Port

Port Canaveral is served by several major highways, connecting the Port area to Central Florida as well as markets to the north and south. Direct connections to major highways include State Routes 528 and 520, and the port is located in close proximity to U.S. 1, I-95, the Florida Turnpike, and I-4. Port Canaveral is not directly served by any rail line, however there is private terminal access connections to the Florida East Coast Railway and connections between the Port and the Class I rail network at Norfolk Southern's Titusville terminal (about 25 minutes south of the Port by truck).[40]

[40] Port Canaveral website and follow-up discussion.

Figure 5.3 Port Canaveral Transportation Connections

Source: Port website.

Other Infrastructure

In addition to cranes, conveyers and other specialized loading and offloading equipment, the Port also has on site warehousing and other storage facilities. These facilities include those for cement, petroleum, and slag storage and the largest cold storage facility on the east coast with 9 million cubic feet of dockside freezer space. In 2010, a petroleum terminal with a 117-million-gallon-capacity tank farm located in the Ports' north cargo area was opened.

Current/Priority Projects

Port Canaveral is actively seeking a diversification of its business, from expanding bulk facilities (like the tank farm) to exploring opportunities for growing its container trade. The Port is currently undergoing a project to widen its shipping channel from 400 to 500 feet scheduled to begin construction in 2013 and is planning to widen and deepen the west turning basin (WTB) and entrance to nearly 1,800 feet (39 feet deep) by reworking bulkheads, utilities, and roads and dredging the basin.[41] The Port is currently seeking regulatory approval from the Army Corps of Engineers, EPA, and other agencies and permitting/design is

[41] The State of Florida in August 2012 committed $24 million to complete ht project which is expected to be completed in 2014. http://www.portcanaveral.com/general/news/releases/08092012.php

expected to be complete at the end of 2012. The channel widening project is necessary to bring in larger ships (including cruise ships, tankers, and other freight carrying vessels). About 70 percent of the project remains unfunded and the Port is seeking accelerated funding.

The port is also developing two new cargo berths (5/6 and 8) on the north side of the harbor, which, when complete will add about 1.4 million tons of new cargo capacity (the Port loaded/offloaded about 3.3 million tons of cargo in 2010). Annual throughput includes containerized cargo, bulk products (including aggregate), and other general cargo. Based on the 2010 tonnage, this would increase cargo capacity over 40 percent.

Cruise Traffic and Terminals

A major focus of Port Canaveral's operations is the cruise terminal operations. Connections with the port include the Victory Casino, Carnival Cruise Lines, Disney Cruise Line, and Royal Caribbean International and the Port is home to six ships from Carnival, Disney, and Royal Caribbean. In 2011, Canaveral initiated construction a new $60 million dollar cruise terminal, completed in August 2012 with new parking facilities and waiting areas for passengers. Canaveral accommodates about 3 million passengers annually (2010) and is projected to accommodate over 5 million by 2015.[42]

Other Ports Serving Central Florida

As described above, many of the goods that originate or terminate in the study region are handled at ports outside the study region, such as the Port of Tampa, Jacksonville, or Everglades. Many of these ports specialize in handling certain types of product (such as project cargo, containers, or vehicles). The Port of Savannah (in Georgia) is one of the largest ports in the United States and serves import and export customers throughout the east coast, including the Orlando region.

Shippers' choice of ports often depends on a myriad of factors beyond simply the port with the closest access to markets including tariffs at the port, existing contracts with ocean carriers, and the number of ship calls to a particular region. The final truck or rail trip can often be the shortest and least expensive portion of the overall trip from foreign (or domestic) origin or destination. Additionally, as described in the truck profile, there are routing considerations to access warehousing and distribution facilities throughout the Orlando region that may not be best served by Port Canaveral. For example, shippers transporting goods to the western part of the study area (i.e. Lake County) may find it more convenient and less costly to transport to the Port of Tampa. At each port in the

[42]Florida Seaports Charting our Future: A Five Year Plan to Achieve the Mission of Florida's Seaports, Florida Seaport Transportation and Economic Development Council

region that serves the Orlando market, goods are transported to and from the region mostly by truck, with rail connections available. The following provides a brief description of each of the major port facilities in Florida that serve the study area.

The Port of Jacksonville (about 150-175 miles from the study region) is the largest port in Florida (by 2010 total foreign trade) and handled nearly 12 million tons of cargo and over 800,000 TEU's[43] in 2010. The port is also one of the largest auto handling ports in the United States.[44] Both importers to and exporters from the Orlando area utilize Jaxport's scale and access to overseas markets not served from Port Canaveral. Disney recently reported that they will be shifting many of their Central Florida imports to Jaxport, much of it previously shipped through Savannah.[45] Jaxport's main shipping channel is currently 40 feet. Trucks can access Jaxport from the Orlando region via I-4/I-95 or via U.S. and state highways such as U.S. 17/92 or U.S. 301 to access I-95 or I-75/I-10.

The Port of Tampa located about 80-100 miles from the Orlando region is another major port in Central Florida that handled about 11 million tons of cargo in 2010 (compared to about 3 million for Port Canaveral) and about 40,000 TEUs. The Port of Tampa plays a role in providing shippers container access to the Orlando market. Tampa's port is the "closest" U.S. Port to the Panama Canal and has a current shipping channel depth of 43 feet. Trucks can access the Port of Tampa from the Orlando region directly via I-4 or connecting on SR 50 and I-75 or SR 60.

Port Everglades, in the Fort Lauderdale area (about 225 miles from the study region) is a major container port in the state on the scale of Jaxport. In 2010, Everglades handled nearly as many containers (about 800,000 as Jaxport) and about 11 million import and export tons. The shipping channel at Port Everglades is about 45 feet. Trucks can access Port Everglades from the Orlando region via I-95 and/or the Florida Turnpike.

The Port of Miami (about 250 miles from the study region) in 2010 handled about 6 million import and export tons. It has the deepest channel in the region, by far at 50 feet and can accommodate the largest ships. The Port of Miami is also a major container port, handling almost 850,000 TEUs in 2010 (more than both Port Everglades and Jaxport) and provides another option for shipping containerized cargo to and from the Orlando region. Access to the Port from Orlando is via I-95 and/or the Florida Turnpike.

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[43] Twenty-foot equivalent units are generally the representative measure of containerized cargo handling. One standard 40' ocean container equals two TEU's.

[44] Port website

[45] http://www.jaxport.com/about-jaxport/newsroom/news/jaxport-welcomes-disney-products-be-shipped-through-trapac-container-ter

5.4 PORT CANAVERAL CHALLENGES

Use of Port Canaveral by local shippers is expected to grow into the future and the Port is working to expand and diversify its operations to accommodate existing and perspective customers. The following issues and solutions (including infrastructure) will be key to the port realizing its growth potential. [46]

- The primary focus for Port Canaveral is the channel widening project necessary to accommodate larger (next generation) ships—such as larger cruise ships, tankers, and general cargo ships. With the funding support received from the State of Florida in August 2012, the project is expected to begin construction in 2013, with completion in Fall 2014.
- The Port is looking to establish container feeder service from Freeport (Bahamas) and transshipping from Miami and Charleston (to help remove trucks from the roads) but will require additional cranes to accommodate potential demand.
- The Port expects growth in aggregate and similar products from overseas sources (from ports such as Freeport) which the port can currently accommodate, however expected ships carrying slag ash may pressure available pier space.
- During the previous year, the Port handled record tonnage of petroleum, largely due to the new tank farm constructed in 2010. The Port is interested in expanding the handling of petroleum and the capacity of the tank farm to 32 tanks, however this expansion would require additional land acquisition. There is a long term goal of a pipeline running from the port to the Orlando International Airport. Opportunities at the Port for growth in the petroleum commodity arose in 2004 from hurricanes that decimated other fuel sources in Central Florida.
- Port Canaveral would be interested in improved rail access and port staff are tracking opportunities for bulk cargo to the port carried by rail. There is currently no rail bridge across the intercoastal waterway. Rail needs at the Kennedy Space Center (discussed in next section) may help promote projects that would improve access to both Spaceport and Port Canaveral
- The Port has held discussions with FDOT and other agencies (such as the Army Corps of Engineers) on the SIS connector roadway, SR 401 and potential deficiencies of that (movable) bridge. Recently, the military stopped ferrying loads exceeding design capacity of the bridge, however the Port has concerns that the bridge may not meet future growth needs and is not necessarily a reliable access point for Port operations

[46] Many of the challenges were identified through outreach efforts for the Florida Seaport System Plan with Port Canaveral and FDOT District 5

5.5 SPACEPORT FACILITIES

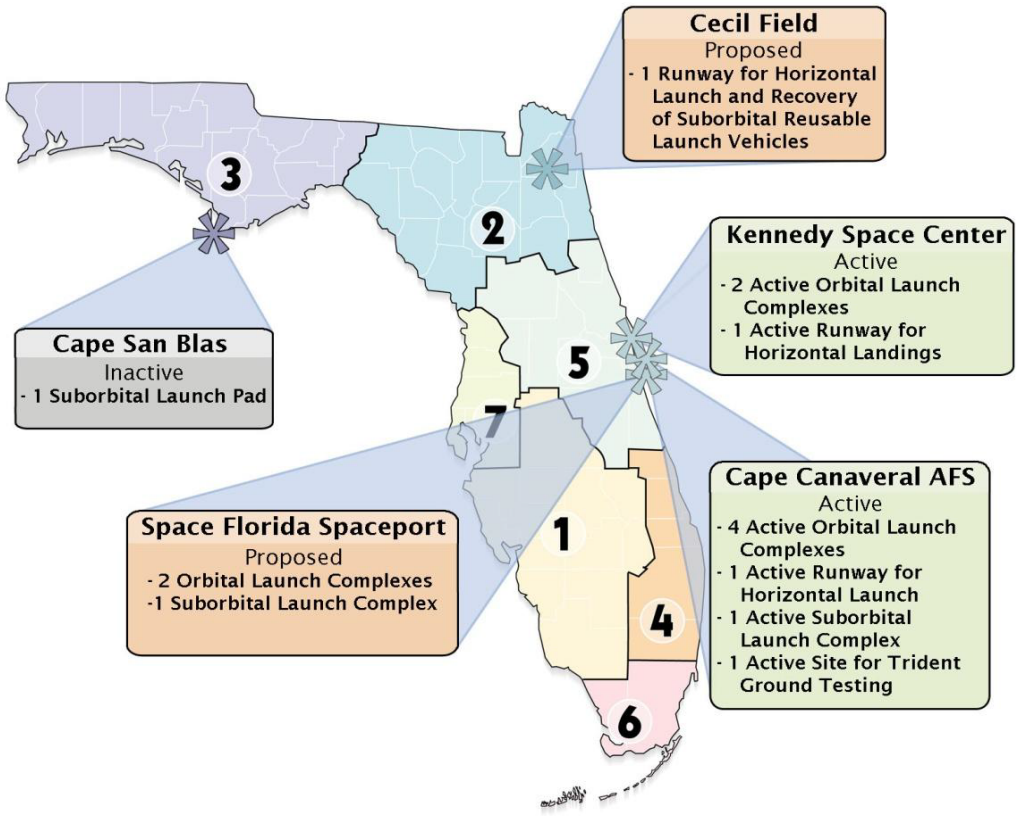
The Florida Department of Transportation's (FDOT) designation for spaceports includes operating spaceports handling commercial or military freight payloads on Florida's SIS system. The property located in Brevard County is collectively called Cape Canaveral Spaceport and includes Kennedy Space Center, Cape Canaveral Air Force Station, and the Space Florida Spaceport, with Space Florida acting as the State's economic development agency.

The Spaceport area has all the powers of a County or municipality such as bonding authority, ability to tax, own property and construct roads. Anything considered "spaceport territory" falls under this authority including Kennedy Space Center, Cape Canaveral Air Force Station, as well as facilities outside the Orlando region including Cape San Blas and Cecil Field in northern Florida. Spaceport falls into free trade zone 136 in Florida which includes Port Canaveral, Melbourne International Airport, Space Coast Regional Airport, Spaceport Commerce Park and Tate Industrial Park.[47] Within the FTZ is a Commercial Launch Zone (CTZ) which allows commercial aerospace businesses associated with the zone the ability to locate anywhere within the State of Florida and still take advantage of the zone's incentives.

The Spaceport area's transportation system is eligible for FDOT funding, however many of the roads are controlled by one of the Federal organizations with jurisdiction over the site, such as the Air Force or NASA. Users at Spaceport have access to the region's transportation system include air, truck, water, and rail. Figure 5.4 displays the existing spaceport infrastructure in Florida divided into three categories: existing spaceports, proposed spaceports, and statewide spaceport infrastructure.

[47] Spaceport Master Plan, 2010

Figure 5.4 Spaceport locations in Florida



Source: Spaceport Master Plan, 2010

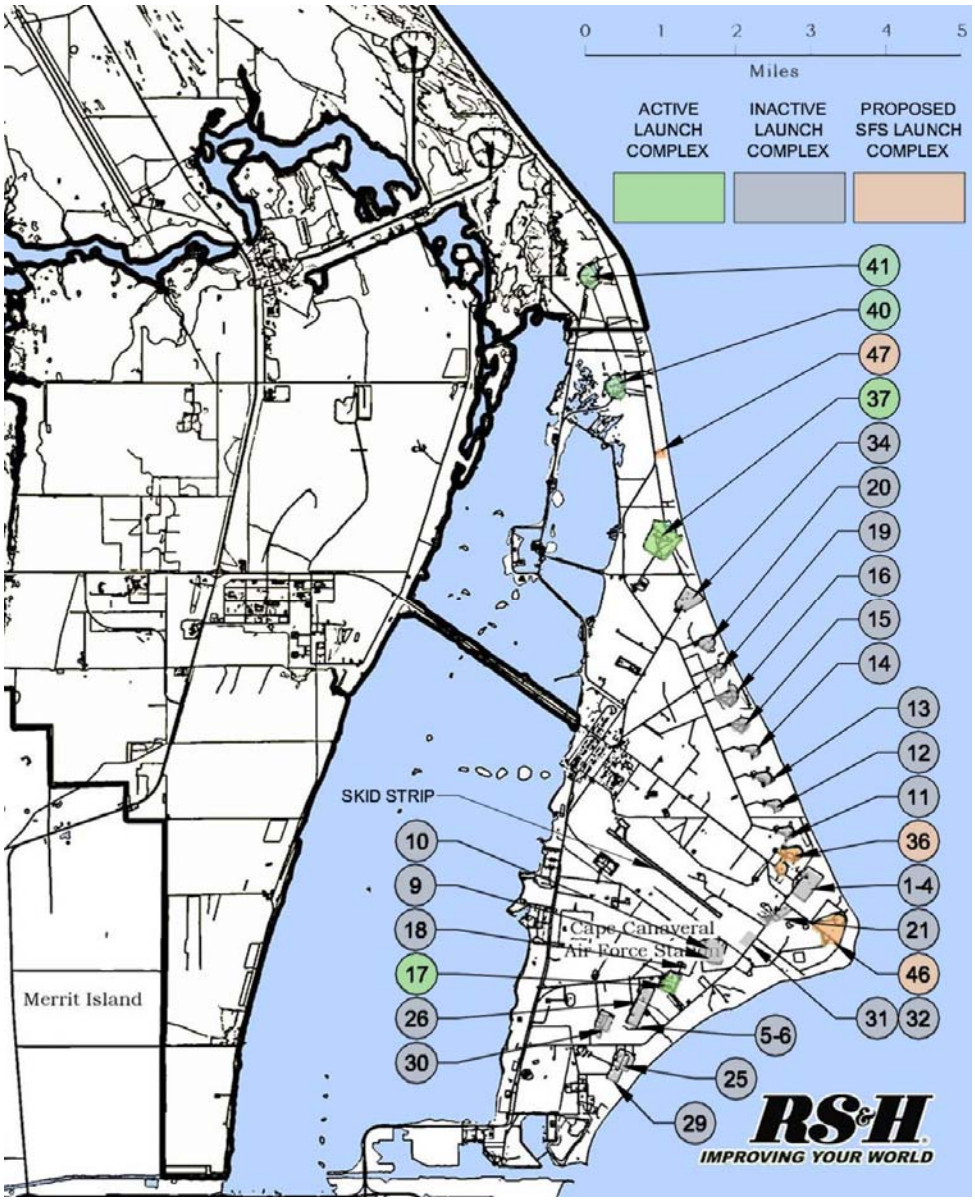
Kennedy Space Center

For more than 40 years the John F. Kennedy Space Center (KSC), in Florida, has been the home to NASA's launch complexes. The Kennedy Space Center site is located on Merritt Island, directly east of Titusville. The use of Kennedy Space Center as home to NASA's Launch Service Program affects the freight transportation system in the region in unique ways. For many years until its retirement in 2011, the Space Shuttle program provided a means for NASA to perform many missions to space, including servicing the international space station. The Shuttle Landing Facility (SLF) on Merritt Island serves as the primary landing and recovery site for the space shuttle orbiter and includes a runway, control tower, and a hangar used to support Reusable Launch Vehicles (RLV), operated by Space Florida. NASA and Space Florida are currently evaluating alternatives to expand the use of the SLF and the related infrastructure in light of the shuttle program ending. Some potential opportunities being explored include Aviation test programs and research and development opportunities. NASA is currently working on an Area Development plan for the SLF future use.

Cape Canaveral Air Force Station

The Cape Canaveral Air Force Station (CCAFS) is an installation of the Air Force Space Command's 45th Space Wing (45 SW), headquartered at Patrick Air Force Base on the southern tip of the Cape. Some of the launch vehicles that have operated from CCAFS include: rockets from the Athena, Atlas, and Delta programs with Delta II (soon to be retired), Delta IV, and Atlas V as current launch vehicles. Figure 5.5 displays the launch complex for the CCAFS.

Figure 5.5 CCAFS Launch Complex Status Map – 2009



Source: Spaceport Master Plan, 2010

The key infrastructure at Spaceport, which provides the opportunity for space launches, is the launchpad. It acts like a runway for airports providing available launch capacity. Spaceport currently has three active launch pads and two inactive pads. They are pursuing additional customers to activate the remaining pads and build the business at the facility. Within the Spaceport area there are several key launch complexes which serve both institutional (i.e., government) and private users. Several of these complexes including complex 37, 40, and 41 are playing (and are expected to play) a much more prominent role in space operations in the near term.

Space Launch Complex 37 and 41 (SLC-37 and SLC-41)

Space Launch Complexes 37 (SLC-37) and 41 (SLC-41) are operated by the United Space Alliance (a joint venture between Lockheed Martin and Boeing) to launch Boeing's Delta IV EELV (Evolved Expendable Launch Vehicles) and the Atlas V rockets, respectively.

Space Launch Complex 40 (SLC-40)

SLC-40 was recently refurbished to support the launch of Space Exploration Technologies' (SpaceX) Falcon 9 series of rocket, the launch vehicles for the Dragon spacecraft, a reusable automated cargo vehicle developed by SpaceX to transport cargo to and from the International Space Station. The transportation needs associated with these operations will be described in the next section. Figure 5.6 displays the Falcon 9 on the launch pad at SLC-40.

Figure 5.6 Falcon 9 on SLC-40 at CCAFS

Source: Spaceport Master Plan, 2010

Space Florida Spaceport

Space Florida is currently coordinating with the 45th Space Wing to utilize SLC-36 and SLC-46 as commercial launch sites, with SLC-36 being developed as a liquid vehicle launch site and SLC-46 being developed as a solid launch vehicle site. SLC-47 is licensed to Space Florida to support the Super Loki and University Rocket Programs. Space Florida will continue to coordinate with the Air Force and CCAFS to determine if any excess facilities may become available for commercial use.

Highway and Rail Infrastructure Serving Spaceport

The Cape Canaveral area (including Spaceport) is served by several major highways, connecting the area to Orlando as well as markets to the north and south. In addition to I-95 which provides access to points north and south, several highways including SR 50 and SR 528, provide for spaceport access from Orlando via SR 405 (to Kennedy Space Center) and 401 (to Port Canaveral), respectively. Rail has been used for very heavy shipments in the past (such as for the space shuttle launch vehicle) and the Kennedy Space Center does have a rail connection to Titusville. With the retirement of the shuttle program and little alternative demand, the rail connection may require maintenance for regular operations. This may be necessary for carrying next generation NASA launch vehicles in the near to long term. The Space Center and NASA recently repaired a railroad bridge in Titusville, presumably to support future operations.[48] There is little market for rail use at the site currently. [49]

Apart from using rail for very heavy shipments, shippers also have the option of utilizing the Tom Bigby Intercoastal Waterway, however demand for this mode has also been limited.[50] Currently at Spaceport, the majority of vehicles/payloads for launches arrive at the facility fully assembled from manufacturing facilities from areas throughout the United States including Alabama, California, Colorado and Texas. Currently, the majority of launch vehicles (heavy payloads) are coming in on barge from Alabama or via truck from California.[51] Other inbound products to support space launch operations include satellites flown in on C-17/Russian Antonov planes and fuel (including convoys of liquid oxygen, Hydrogen, Helium) all generally brought in by truck.

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[48] Interview with Spaceport staff

[49] SpaceX reported using rail recently for a very large load but not intend to continue its use due largely to their product needs. The NASA Shuttle came in on special railcar but no other provider uses large enough engines to require it

[50] Spaceport staff indicated that this is used about 8-10 times/year

[51] SpaceX noted that their first stage Rocket for the Falcon is about 100 feet long and weighs about 56,000 lbs. The load is hauled by a tractor trailer from Texas

For launch prep several truck/day will arrive at the site including a convoy of fuel tankers (8-10). Other products such as mechanical equipment, pumps, ordnance are brought in by truck via FedEx, UPS or another carrier.

5.6 SPACEPORT CHALLENGES

The Spaceport area is currently undergoing a major shift in the type of user of its facilities. Historically, space launches have been almost an exclusively government market and Spaceport is working to identify additional opportunities for expansion and diversification. Spaceport is expecting substantial growth over the next five years, mostly due to private sector expansion (through organizations such as the United Launch Alliance and SpaceX). Infrastructure both on and off the Spaceport property will be key to accommodating that growth. The following critical issues were identified by Spaceport itself as well as SpaceX that will be further evaluated in subsequent phases of this study:

- For shipments of the large rockets or rocket parts, oversize loads require permitting, which in Florida is sometimes a challenging process.
- As a part of the Spaceport Master Plan Study in 2002, a "Space Hardware Corridor" was identified that highlighted routes and chokepoints that large form space cargo typically utilized to travel into Florida from outside the region. That study identified interstate 10 (in the northern part of the State) and interstate 95 as primary routes to transport these goods to the region. A recent update to the Master Plan in 2010 identified chokepoints on the corridor that had not yet been addressed including the connection between I-95 and SR-50 in Brevard County.
- FDOT has designated a number of projects that will lead to the widening of I-95 from four to six lanes, in Brevard County, where the Cape Canaveral Spaceport is located. The Space Coast TPO has designated the widening of I-95 as its #1 priority among SIS projects.
- Maintaining access to the Cape from SR 401 and SR 405 is also a major priority for Spaceport
- One of the major on-site infrastructure constraints to growth is the launch pad capacity where Spaceport is working with government agencies and the private sector to develop and maintain pads for future launches and equipment types.

6.0 Freight-Dependent Land Use

Freight-dependent land uses are defined in this study as those that support businesses whose operations include a major role for the movement of goods on the regional transportation system. This might denote land accommodating manufacturing activities, warehousing and distribution, or power generation (industrial land uses); or might include the extraction of gravel or petroleum products (mining land uses) and use of the transportation system to move those products to market. In Central Florida, with a major economic focus on the services industry, freight-dependent land uses might also include accommodating retail and office uses (which would include, for example, deliveries of consumer products to hotels, resorts, or large regional shopping centers). Interviews conducted for this study with the Orange County Convention Center, Disney, and the Hyatt Regency confirms this link. The land use data from each of the study area counties in the Florida Geographic Data Library (FGDL) reports the following uses aggregated within each of the three freight-dependent land use categories:[52]

- Industrial land includes: light and heavy manufacturing, food processing, warehouses and DCs, mineral processing
- Retail/Office land includes: department stores, regional shopping malls, hotels, airports, tourist attractions
- Mining land includes: mining, petroleum and gas lands, subsurface mining

One of the key freight-dependent land use categories (and most commonly recognized) is industrial land. There are several industrial land use clusters in the seven county study area. Orange County has approximately 45 percent of the Industrial land acreage in the study area, followed by Brevard County with 17 percent. Lake, Volusia and Seminole Counties together share approximately 30 percent of the market with the remaining 7 percent in Osceola and Sumter Counties. Orange County and Seminole facilities are generally more constrained by existing land development so growth potential may be higher in counties with fewer constrained sites such as Lake County, Sumter County, and Osceola County. **Table 6.1** displays the existing acreage for freight-dependent land uses in the study region.

[52] http://www.fgdl.org/metadataexplorer/explorer.jsp

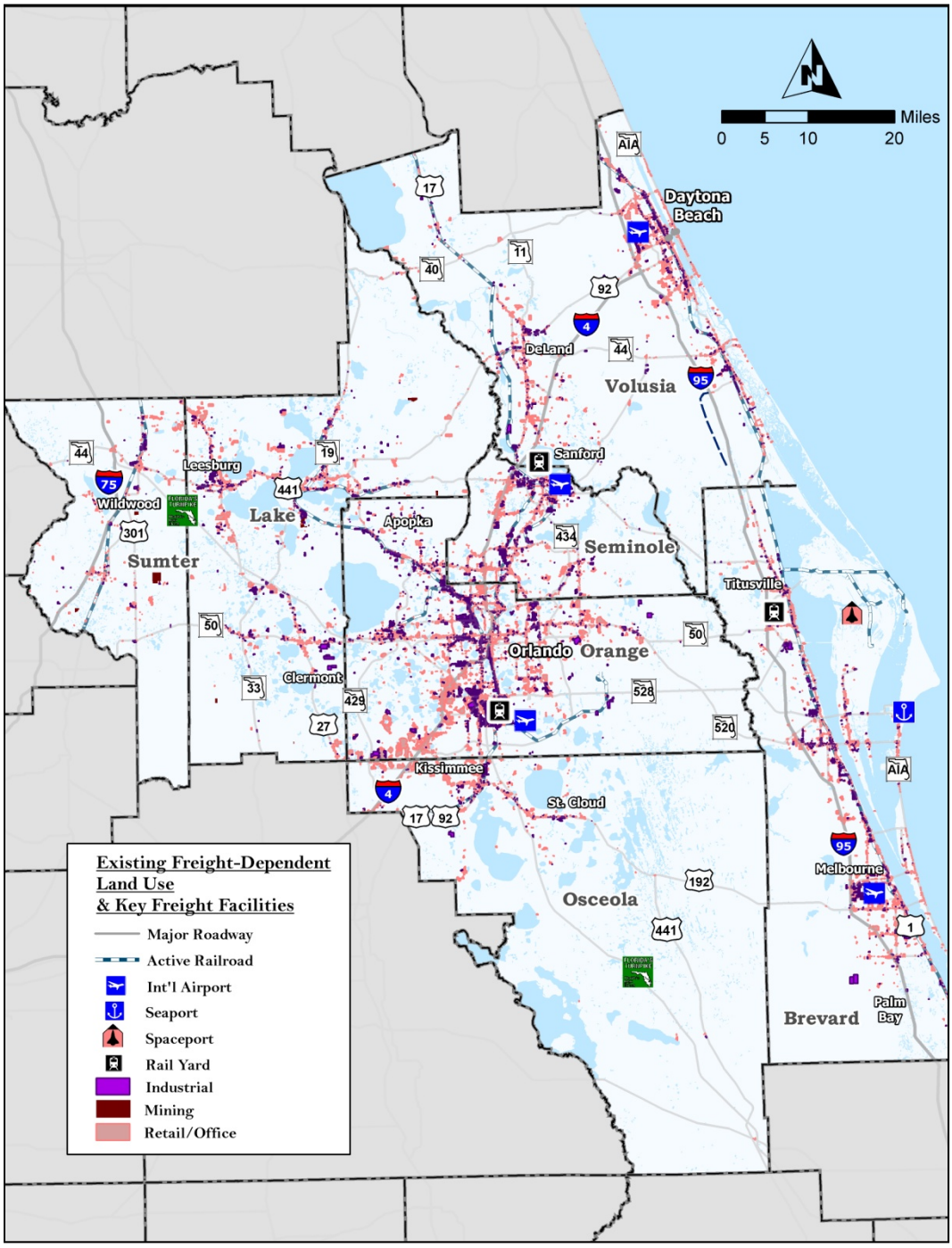
Table 6.1 Existing Acres of Commercial and Industrial Uses

Acres	Industrial	% of Total	Retail/Office	% of Total	Mining	% of Total
Orange	12,569	44%	26,291	36%		0%
Brevard	4,736	17%	11,276	15%		0%
Lake	3,527	12%	9,522	13%	770	44%
Volusia	3,058	11%	11,760	16%		0%
Seminole	2,630	9%	6,739	9%	8	0%
Osceola	1,073	4%	5,679	8%		0%
Sumter	854	3%	2,328	3%	992	56%
Total	28,447	100%	73,595	100%	1770	100%

Source: FGDL 2010 Parcel data for FDOT District 5.

The largest industrial acreage agglomeration in the study area is the Landstreet area west of Orlando International Airport (shown in purple in Figure 6.1). Following that, the next largest clusters of existing industrial acreage are Silver Star Road and the Lockhart area (U.S. 441 and SR414) in Orange County, adjacent to Melbourne International Airport in Brevard County, and the American Industrial Center in Seminole County at State Road 434. Retail/office clusters current exist west of the Landstreet area, and along many of the major highways in the study area including the Florida Turnpike, I-4, and U.S. 17/92 corridors.

Figure 6.1 Freight-Dependent Land Use (Industrial, Commercial, Mining) within the Study Area



Source: FGDL 2010 Parcel data for FDOT District 5.

6.1 FREIGHT-DEPENDENT EMPLOYMENT

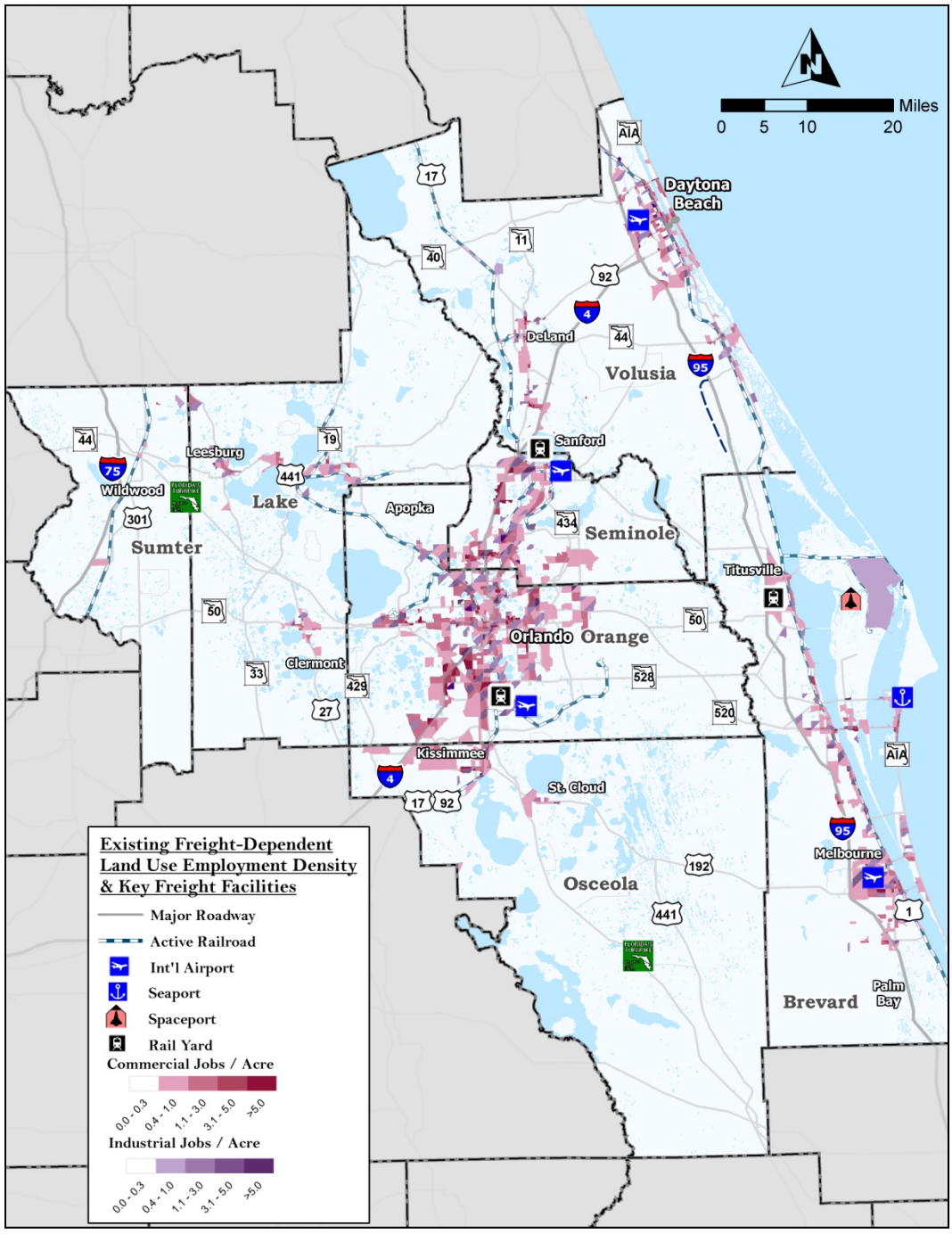
In addition to the greatest volume of industrial land, Orange County also includes the largest number of industrial jobs in the study area with about 95,000 (**Table 6.2**). Brevard County (which includes the Cape Canaveral seaport and spaceport facilities) is second among study region counties with 60,000 industrial jobs. Additional areas with a high count of industrial jobs include the area around the Sanford airport in Seminole County, along the FEC rail line in Volusia County, and the Leesburg area in Lake County, among others. Major warehousing and distribution facilities outside but proximate to the study area are located in Polk County and include the planned Intermodal Logistics Center in Lakeland. Several interviews with major shippers in the Lakeland area, such as Publix and Rooms to Go reported major clusters of industrial activity, as well as a distribution network that encompassed most of the study area (i.e. the Publix DC in Lakeland distributes to stores throughout Central Florida). **Figure 6.2** displays the relationship between land use and employment density within the study area.

Table 6.2 Existing Jobs and Population
2005 LRTP Data

Jobs	Industrial Jobs	Commercial Jobs	Service Jobs	School Enrollment	Hotel/ Motel Population	Population
Sumter	3,504	3,256	8,523	7,973	1,224	66,447
Osceola	9,604	22,118	45,697	62,673	76,381	243,501
Lake	19,808	24,283	57,493	45,836	7,220	263,642
Volusia	30,772	47,268	118,746	95,702	45,411	494,631
Seminole	34,917	56,760	122,811	95,788	4,896	422,630
Brevard	60,761	54,209	162,616	124,064	20,016	526,920
Orange	94,210	168,417	544,730	308,876	202,250	1,052,479
Total	253,576	376,311	1,060,616	740,912	357,398	3,070,250

Source: 2005 Zdata from FDOT 5 district-wide model.

Figure 6.2 Land Use and Employment Density



Source: 2005 Zdata from FDOT 5 district-wide model.

Population and employment centers within the study area are destinations for goods and services and many located along one of the region's major transportation corridors. Some examples of these centers of population and employment include the areas along Interstate 4 and Interstate 95. Other centers of commercial activity include the SR 50/East-West Expressway Corridor as well

as along US 441. The attractions area in the City of Orlando and Orange County including the Walt Disney World Theme Park and Resorts, Universal Studios, Sea World and other attractions and resorts is a major commercial destination.

The Villages, a large age-restricted community which crosses the borders of Lake, Sumter and Seminole Counties is a rapidly growing area that is another major destination for goods, especially consumer products. Because it is age-restricted, commuting to and from the community to work is minimal leaving road space available for good movement. In addition, this community (and many others like it) provides a path network for golf carts (a key mode of transportation for this demographic) which keeps additional traffic off of local streets. The continued growth by non-vehicular transportation options will help maintain paths for goods movement as well as improve safety, especially in an area with older drivers who may experience vision problems and slower reactions times. A Texas Transportation Institute study described how a network of low speed streets providing alternatives to high speed routes preferred by truck traffic may improve safety for all road users.[53]

6.2 FREIGHT VILLAGES

A key component of the 2002 Freight, Goods and Services Mobility Strategy Plan was the identification and promotion of several Freight Villages in Central Florida as an innovative approach to improving freight mobility and efficiency. The following description was provided in the 2002 Plan:

- **Freight Villages –** Clustering "[Warehousing and logistics]" activities in specific areas, providing sufficient infrastructure and by developing facilities based on specific code, provides the basis for the development of "freight villages."

Much like neo-traditional urban design techniques, that has provided the impetus for the successful emergence of "livable communities" within the Central Florida region, so too can proactive "WL" urban design techniques be used to create de-facto freight villages. The textbook case of a freight village is where:

1. All transportation modes are represented
2. Land prices are generally lower than general commercial properties
3. Adequate land is developable
4. Accessible to local arterials for local distribution

[53] Community Design and the Incidence of Crashes Involving Pedestrians and Motorists Aged 75 and Older. Dumbaugh et al. http://www.ssti.us/wp/wp-content/uploads/2012/06/commun-design-and-older-drivers-and-peds.pdf

5. Accessible to interstate routes and freeways for regional and national distribution
6. Accessible to a rail intermodal yard, directly tied to a Class I railroad main line
7. Accessible to an air cargo oriented airport (with frequent service to domestic and international cities)
8. Good access to a seaport offering a wide variety of materials handling options, including container, bulk, break-bulk and roll on-roll off (ro/ro).

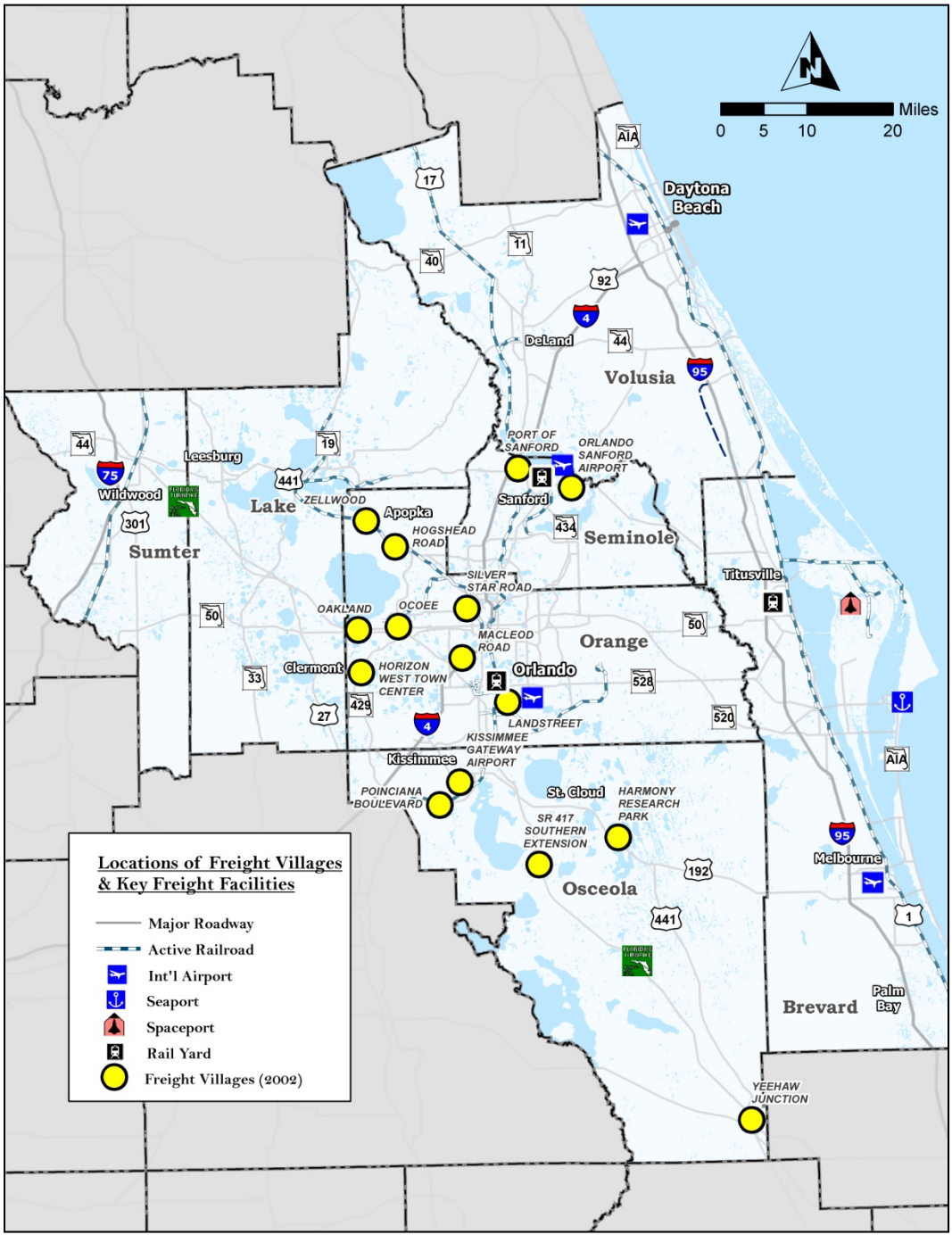
As part of the Freight Mobility technical report in the 2030 Long Range Transportation Plan potential Freight Villages were identified within the three MetroPlan Orlando counties. Many of these correspond to existing freight land use clusters within the three counties and several were new proposed locations based on transportation network opportunities. **Table** and **Figure 6.3** display the locations of the Freight Villages from the 2002 study, and their proximity to major freight transportation facilities in the study region.

Table 6.3 Proposed Freight Village Locations
From 2002 Study

Name	County	General Location
Boggy Creek Road	Orange	Southwest of Orlando International Airport (Boggy Creek Road at Ringhaver Dr)
Horizon West Towncenter	Orange	SR 429 at New Independence Pkwy Interchange
Landstreet-Vineland	Orange	U.S. 441 (S. OBT) at Turnpike
Oakland	Orange	West Colonial Drive (SR 50) at Turnpike
Ocoee	Orange	West Colonial Drive (SR 50) at SR 429
Hermit Smith-Hogshead Road	Orange	Hermit Smith at Hogshead Road (South of U.S. 441)
Taft	Orange	Orange Avenue (SR 527) at Landstreet Road
Zellwood	Orange	U.S. 441 (N. OBT) at Laughlin Road
SR 417 Southern Extension	Osceola	Turnpike south of Deer Run Road (Green Island DRI)
Kissimmee Gateway Airport	Osceola	West of Kissimmee Gateway Airport
Poinciana Boulevard	Osceola	Poinciana Boulevard at U.S. 17-92
Harmony Research Park	Osceola	U.S. 192 (east of Hickory Tree Road)
Yeehaw Junction	Osceola	SR 60 at Turnpike
Orlando-Sanford International Airport	Seminole	Southeast of Sanford International Airport (East Lake Mary Boulevard)
Port of Sanford	Seminole	East of Interstate 4 between SR 46 and U.S. 17-92

Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando.

Figure 6.3 Proposed Freight Village Locations
From 2002 Study



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando.

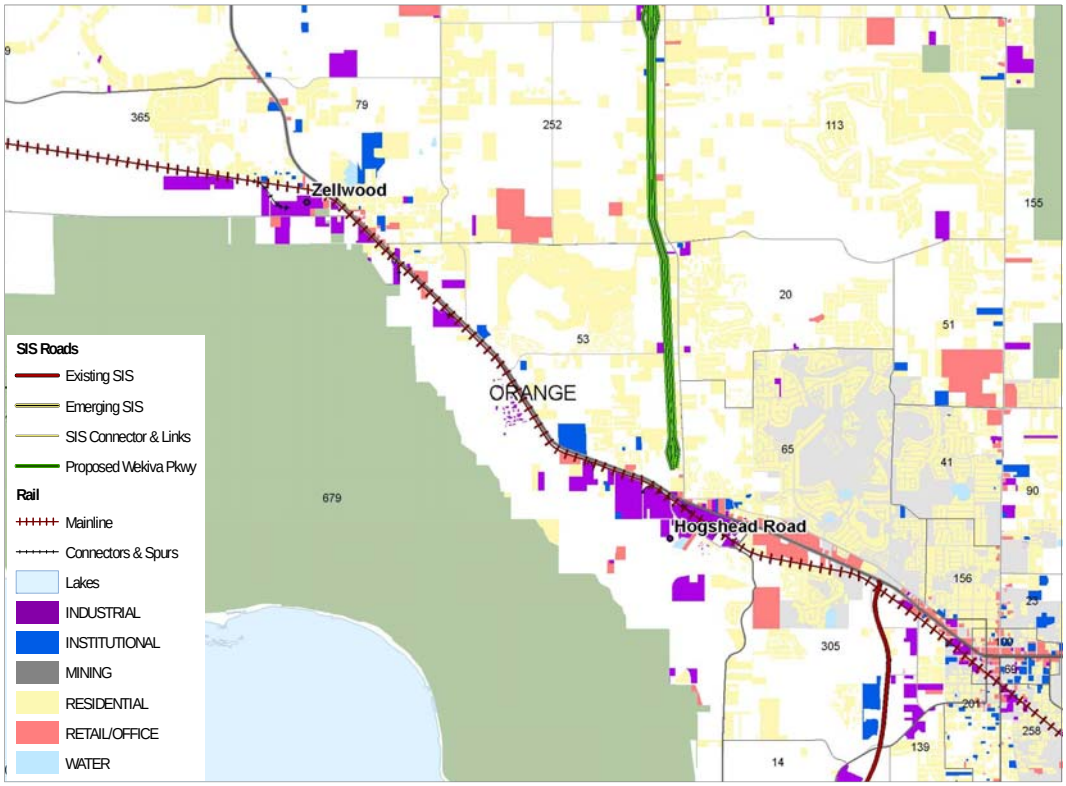
The following diagrams and text will examine the existing land uses (2010) and industrial jobs (2005 LRTP base year) for the purpose of evaluating the current state of the Freight Village proposed in the last MetroPlan Orlando LRTP update

(2030 horizon year).[54] For future tasks within this study update, the locations and application of Freight Villages may be further examined, especially in those areas not evaluated in the previous study (Lake, Sumter, Brevard, and Volusia Counties) based on existing and anticipated industrial growth, special generators, and transportation access. The 2002 freight mobility study also recommended that MetroPlan develop a unified "Warehousing and Logistics" zoning classification and this update may reevaluate the value of that recommendation and current implementation status.

Proposed Freight Villages in Orange County

The Zellwood and Hogshead proposed Freight Villages are located in Orange County adjacent to the Orlando Apopka Airport which is a general aviation airport and are along an active freight rail line. The Hogshead site is adjacent to the City of Apopka. Combined these areas had approximately 1,000 Freight jobs in 2005 at the time when the 2030 LRTP was developed.

Figure 6.4 Land Use around Zellwood and Hogshead Proposed Freight Villages

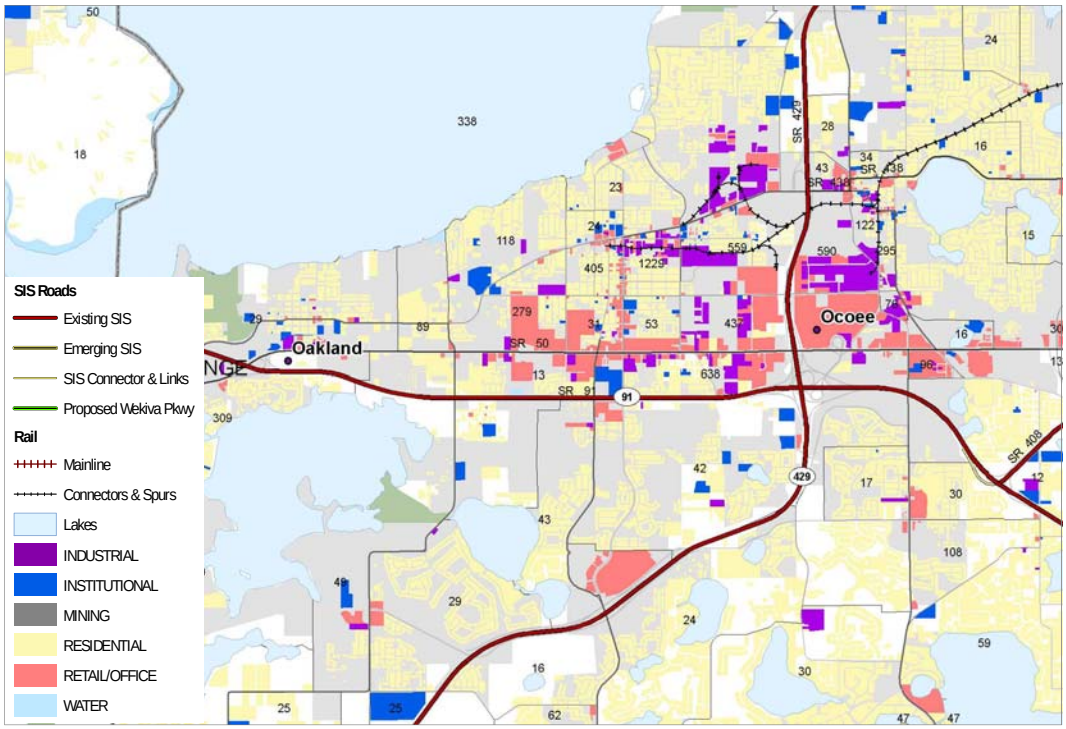


[54] 2005 base year data are currently being updated as part of the LRTP process but updated information was not available for this deliverable.

Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Oakland proposed freight village is located in the Town of Oakland in Orange County. It has a small amount of existing industrial acreage and approximately 300 industrial jobs with another 400 nearby. The area is located at an intersection of the Florida Turnpike and State Road 50. East of Oakland, the Ocoee proposed freight village is located in the City of Ocoee in Orange County. The existing land use shows industrial and commercial existing land use. The area has access to Florida's Turnpike, Expressways 408 and 429 and State Road 50. The area had more than 3,800 existing industrial jobs in 2005.

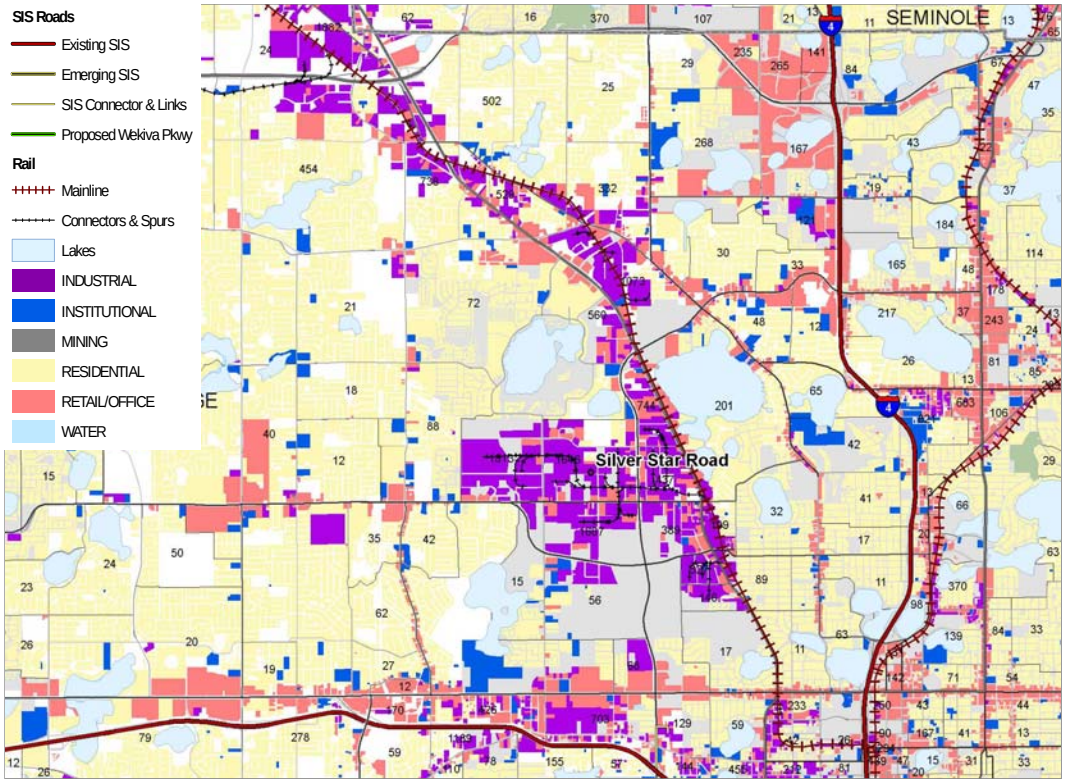
Figure 6.5 Land Use around Oakland Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Silver Star Road industrial cluster is the second-largest by acreage in the study area at approximately 1,800 acres. This proposed freight village contained over 7,000 industrial jobs. It has direct access to the Florida Central Railroad line and U.S. 441. Substantial industrial activity continues up the Florida Central Railroad/U.S. 441 Corridor going north.

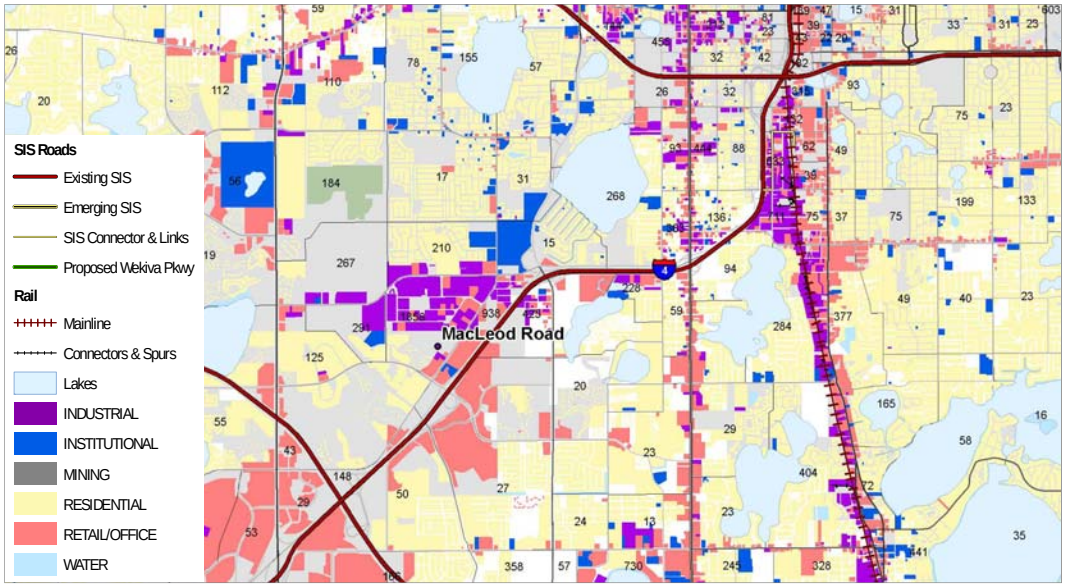
Figure 6.6 Land Use around Silver Star Road Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The MacLeod Road proposed freight village contained approximately 4,000 industrial jobs. It has access to Interstate 4 and is adjacent to the Florida Turnpike and the attractions area and the Millennia Mall.

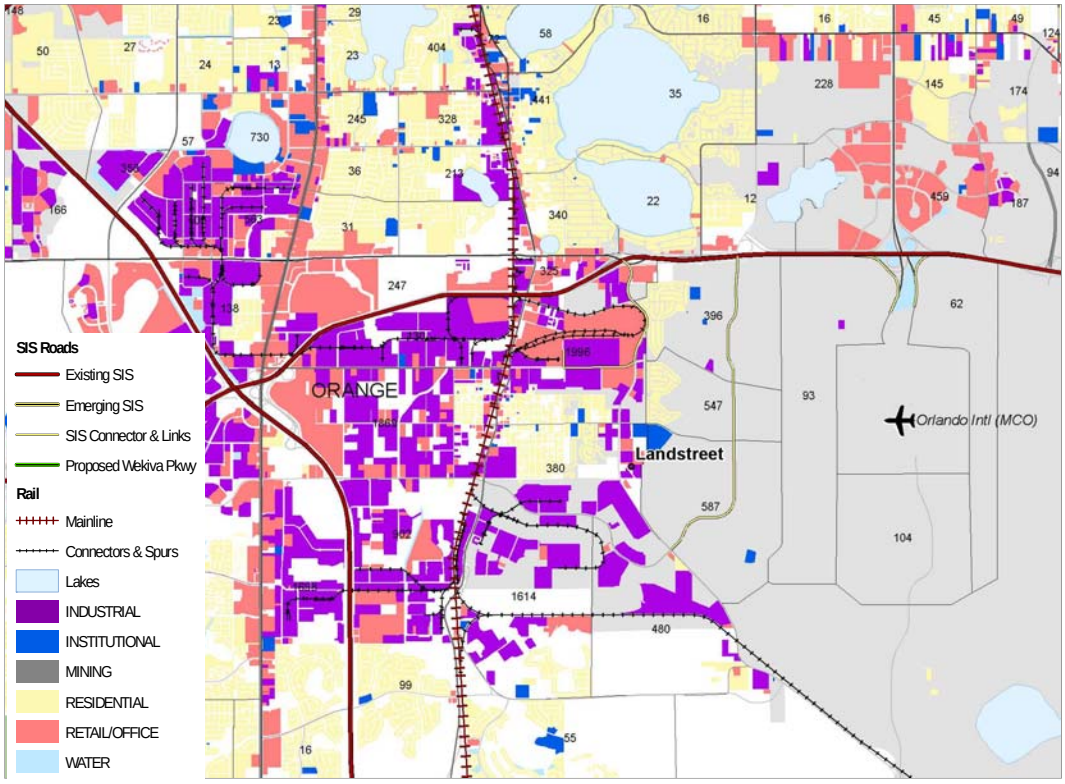
Figure 6.7 Land Use around MacLeod Road Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Landstreet Rd proposed freight village is adjacent to the Orlando International Airport and has freight and expressway access. In 2005 the area housed in the range of 15,000 industrial jobs.

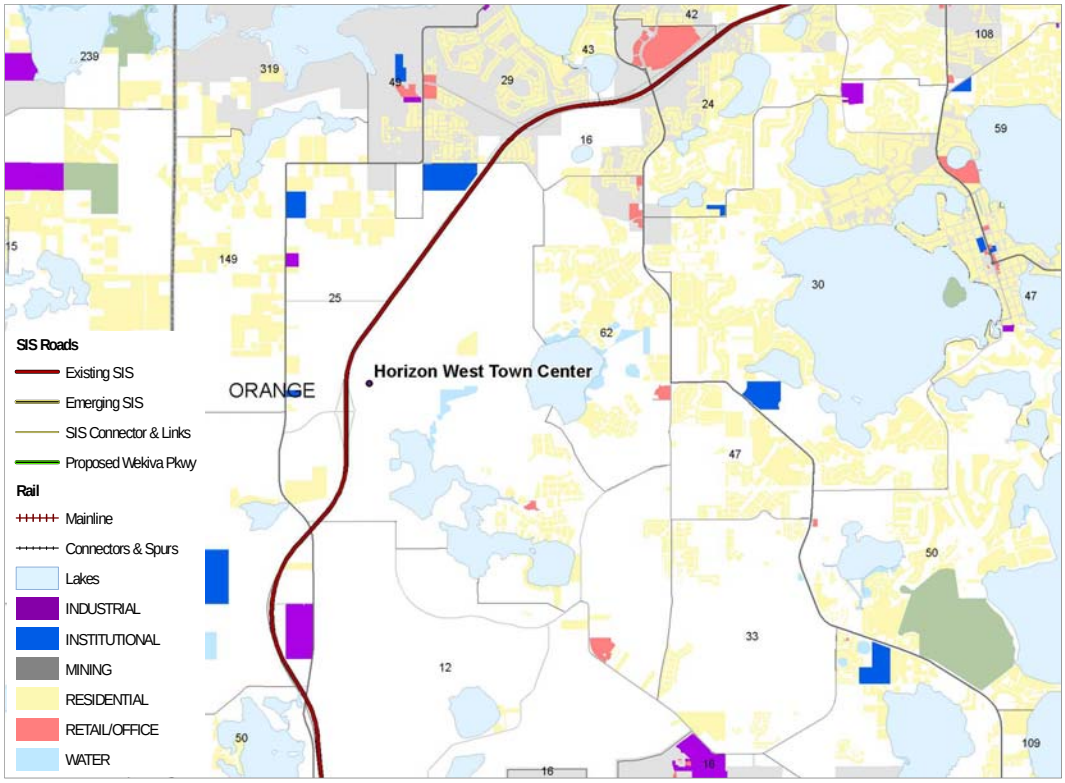
Figure 6.8 Land Use around Landstreet Road Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Horizon West Town Center proposed freight village is part of a mixed use Sector Plan in Orange County. Some of the residential "villages" in the sector plan have been constructed but the Town Center is largely unbuilt as of this writing and is currently undergoing a zoning code process. In 2005 the larger area contained a few hundred industrial jobs. This greenfield area still has the potential to implement innovative freight approaches that may be difficult in more constrained sites.

Figure 6.9 Land Use around Horizon West Town Center Proposed Freight Village

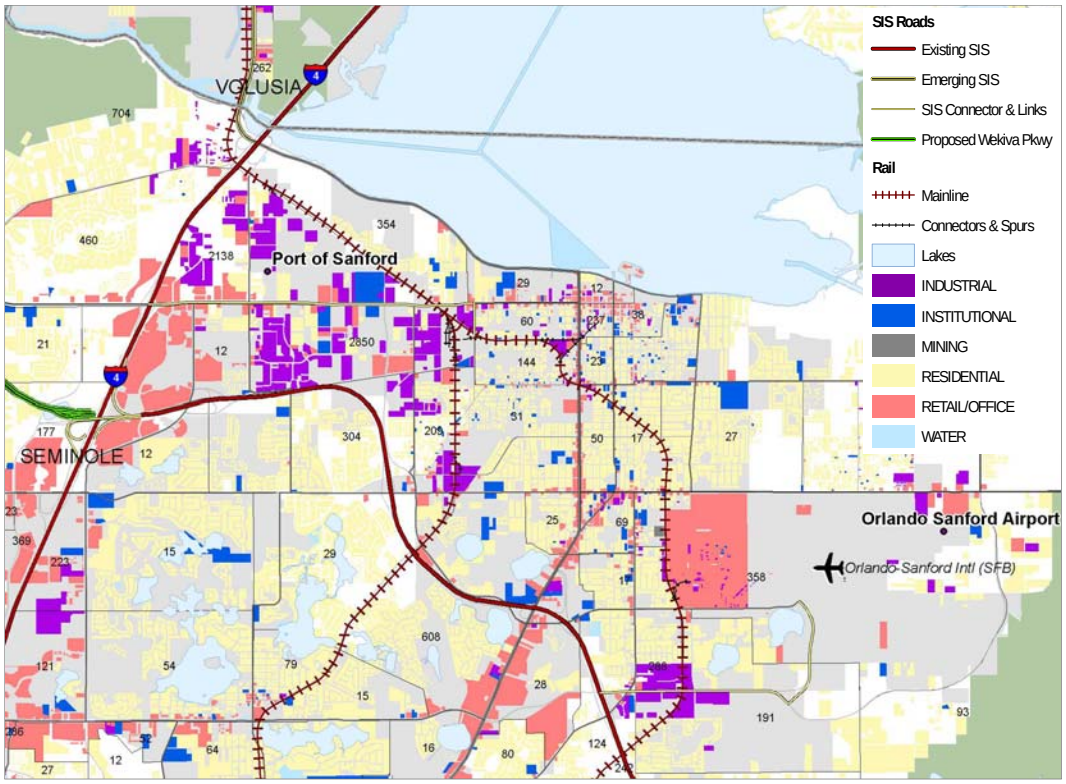


Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

Proposed Freight Villages in Seminole County

The City of Sanford contains the two freight villages proposed in Seminole County. The Port of Sanford has a substantial acreage of existing industrial users with 5,000 industrial jobs. This is also adjacent to their major retail outlet the Seminole Town Center.

Figure 6.10 Land Use around Port of Sanford Center Proposed Freight Village



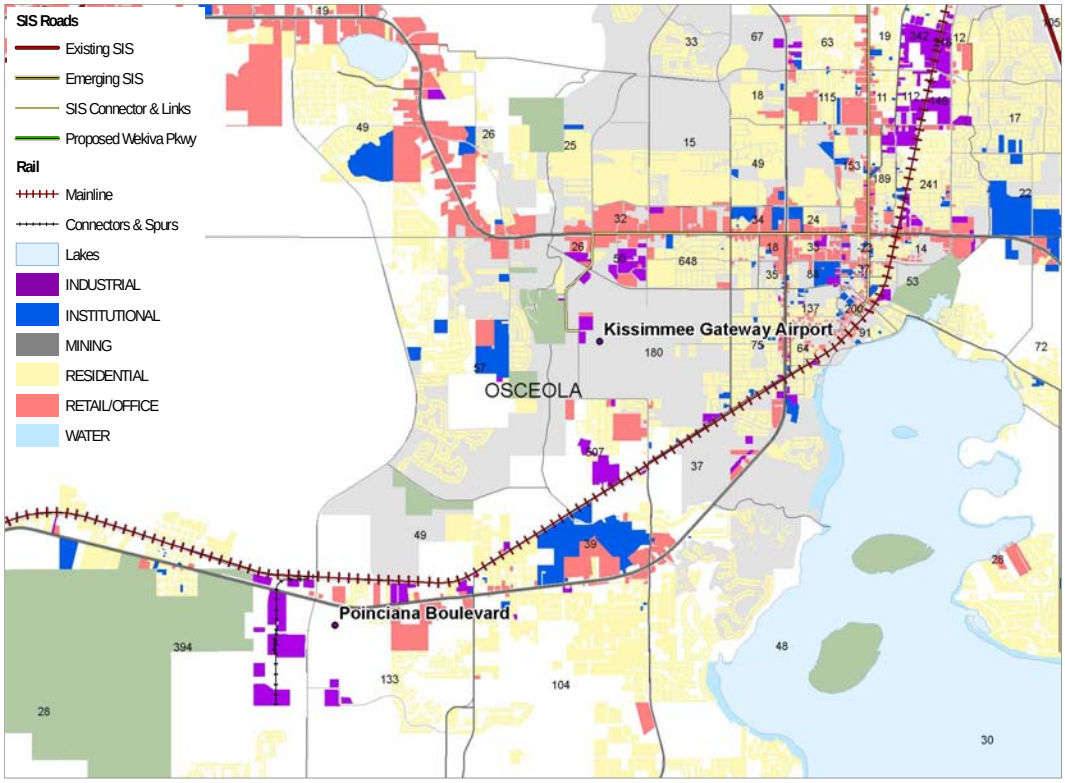
Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Orlando-Sanford International Airport has an attached commercial park which includes industrial uses. This area is not built out and has growth potential. Together the airport and the industrial uses in its environs contained a little over 500 jobs in 2005.

Proposed Freight Villages in Osceola County

The Kissimmee Gateway Airport proposed freight village is located within the City of Kissimmee. It currently has minimal dedicated industrial acreage. It is adjacent to an active rail line and to U.S. 441. The area has approximately 1,300 industrial jobs. Poinciana Boulevard proposed freight village has direct rail access to existing industrial uses and approximately 500 existing industrial jobs.

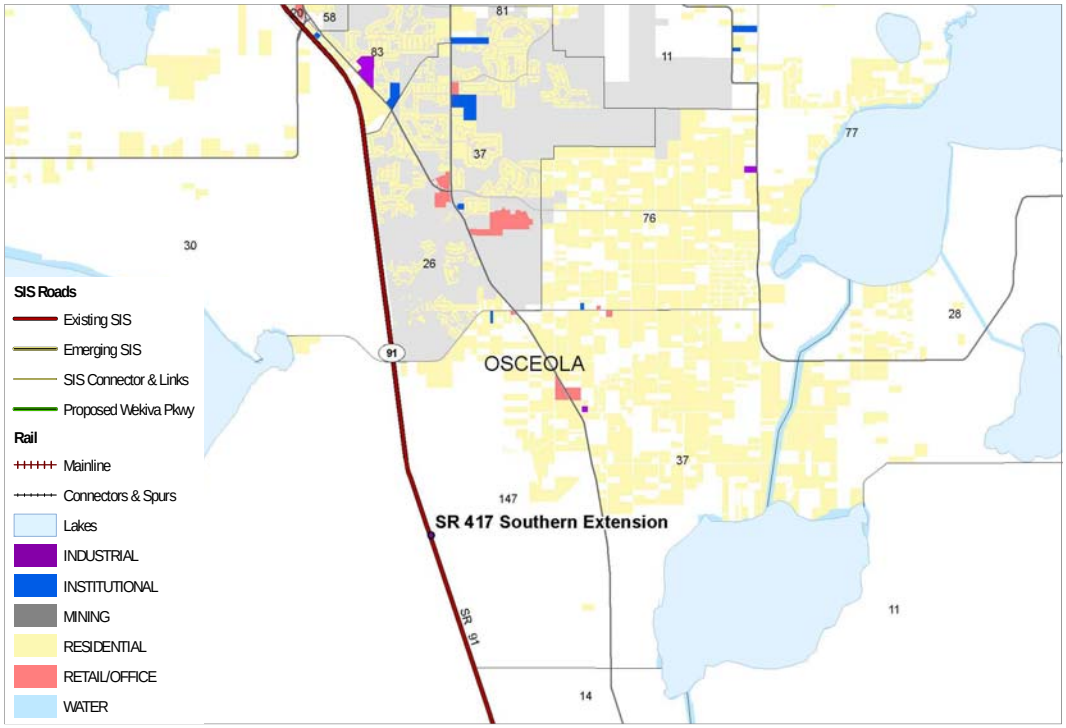
Figure 6.11 Land Use around Kissimmee Gateway Airport Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The SR 417 Southern Extension proposed Freight Village within Osceola County is not an existing freight cluster. It is a relatively unconstrained area south of existing residential development. There are proposed Developments of Regional Impact planned for areas around Lake Tohopekaliga to the west and is within the Osceola County urban growth boundary.

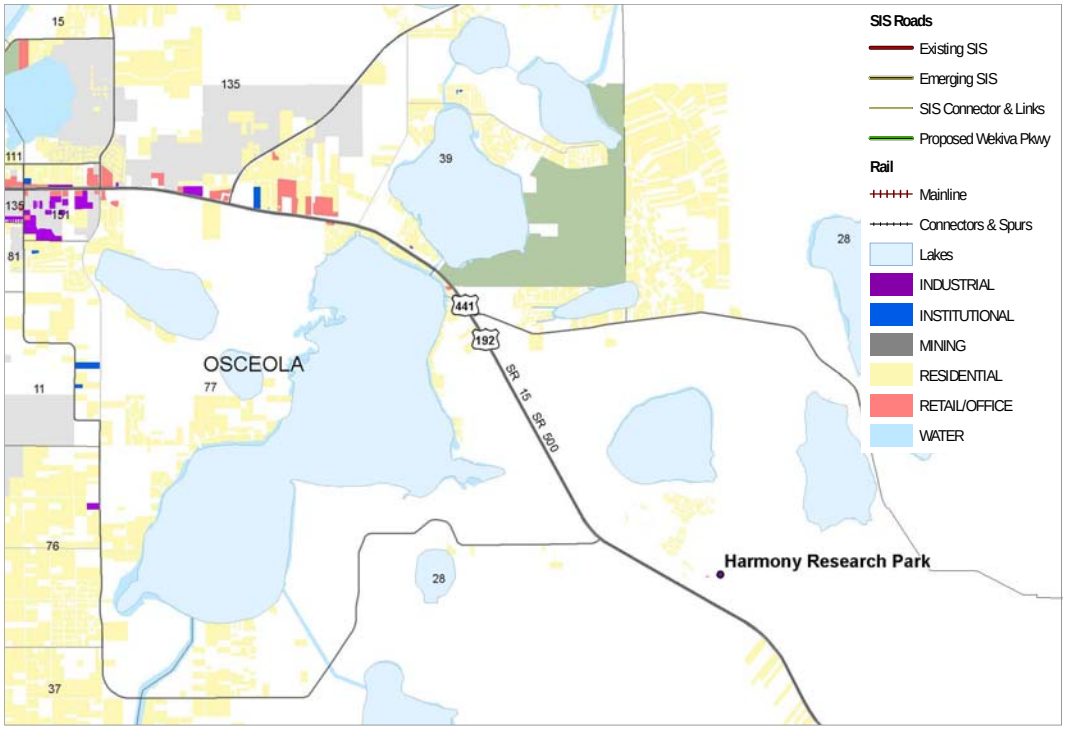
Figure 6.12 Land Use around SR 417 Southern Extension Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

Harmony Research Park proposed Freight Village is part of a mixed use development current under development in Osceola County. It has no significant existing industrial acreage.

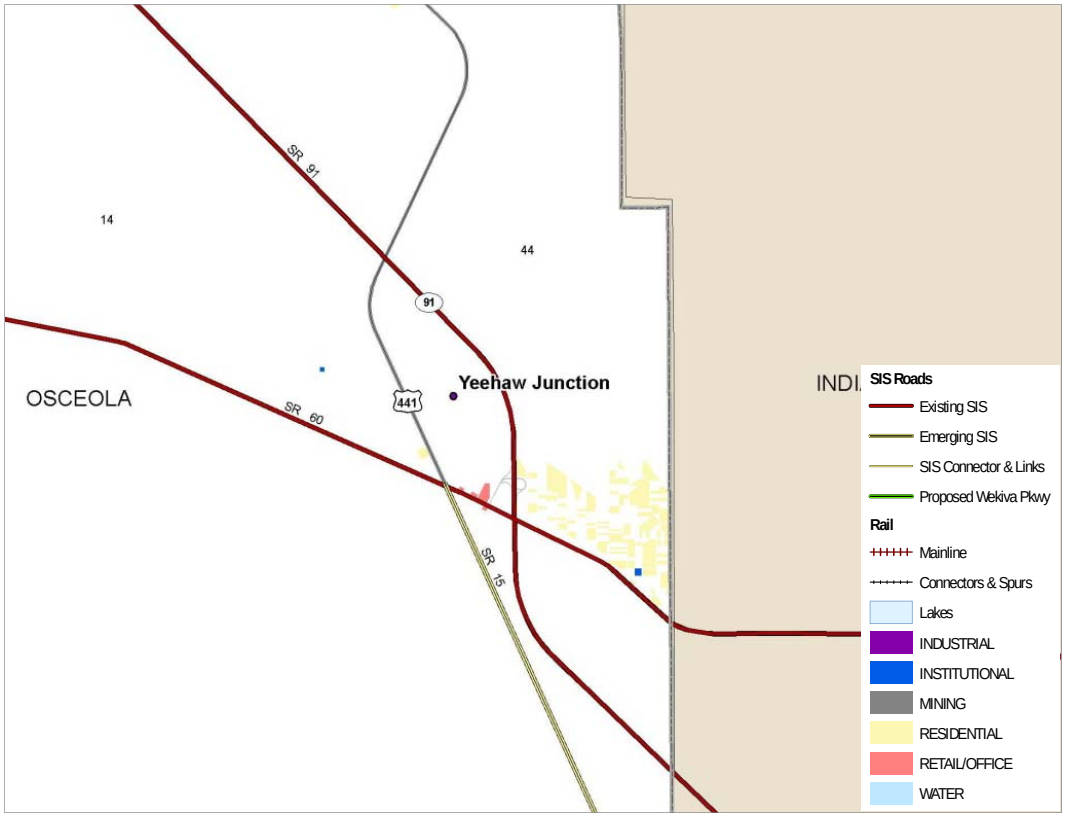
Figure 6.13 Land Use around Harmony Research Park Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

The Yeehaw Junction proposed freight village does not have substantial existing freight-oriented land uses. It does include a proposed "Transportation Distribution Center" in the 2025 Osceola County Comprehensive Plan. It is located at a junction of U.S. 441, State Road 60 (Polk County/ U.S. 27 to Vero Beach /I-95) and the Florida Turnpike (Orlando to Miami).

Figure 6.14 Land Use around Yeehaw Junction Proposed Freight Village



Source: 2002 Freight, Goods and Services Mobility Strategy Plan, MetroPlan Orlando, FGDL 2010 Parcel data for FDOT District 5.

6.3 CHALLENGES

A key component of the 2002 Freight, Goods and Services Mobility Strategy Plan was the identification and promotion of several Freight Villages in Central Florida as an innovative approach to improving freight mobility and efficiency. This plan is expected to confirm the efficacy of that strategy as well as identify opportunities to further promote industrial development and economic development in the region. Providing adequate transportation access to industrial and other freight-dependent land uses is a key element to promoting the attractiveness of those clusters and may help draw new shippers to the region. Major existing industrial clusters are located along the I-4 corridor at key transportation hubs, along the Florida Central Railroad alignment as well as some activity along I-95 including the Spaceport. Building on these clusters will require meeting certain challenges including:

- It is unclear how the Freight Village concept has promoted industrial development within the region.

- Newly restricted hours are anticipated for Freight Rail on the "A-line" because of the SunRail passenger rail project and passenger service is also proposed on the Florida Central Railroad.
- It is unclear how the planned Winter Haven Integrated Logistics Center (outside the study area counties) will shift industrial development patterns.
- Areas where alternate options to truck routes do not generally exist for multimodal and lower speed traffic (e.g. Colonial Drive west of Orlando) increase the likelihood of conflicts between residential traffic and goods movement.
- Limited existing East-West highway and rail connectivity within the region provides logistical challenges to some shippers.

7.0 Summary and Next Steps

The regional freight transportation system is multimodal and is comprised of:

- More than 17,900 centerline miles of roadways of which approximately 520 miles are interstates or other toll expressways and approximately 1,094 miles are principal arterials carrying nearly 200 million tons of goods annually.
- A Class I railroad – CSXT– operating 2,800 miles (1,508 route miles) of track in Florida and carrying more than 9 million tons of local freight annually; the Florida East Coast Railway (FEC), a Class 2 railroad that operates approximately 115 miles of track within project study area and interchanges with both CSXT and Norfolk Southern Railway (NS) in Jacksonville; and the Florida Central Railroad (FCEN), a Class 3 railroad that operates approximately 66 miles of track in the study area and interchanges with CSXT in Orlando, Florida.
- One deepwater port, Port Canaveral, which handles more than 3 million tons of freight annually plus Space Florida, a major spaceport on the east coast
- Air cargo facilities at Orlando International Airport (MCO), Orlando-Sanford International, Melbourne International, and Daytona Beach International that handle more than 190,000 tons of domestic and international air freight annually.

Anticipated growth on the regional transportation will likely result in increasing pressure on the regional transportation system in the following ways:

- **Capacity Constraints and Operational Issues:** The increasing growth and development of the region will require continued infrastructure improvements, especially on the highway system where several major truck corridors already experience high levels of congestion. Other key issues include routing challenges associated with deficient bridge structures and the relocation of the A-line rail traffic to the S-line which will likely affect shippers throughout the region.
- **Expanding Infrastructure to Target New Markets:** Infrastructure providers ranging from the railroads, airports, spaceport, and Port Canaveral all have expressed interest in expanding their markets and developing new facilities to accommodate additional freight demand. For example, Port Canaveral is seeking expanded container service as well as increasing shipment of petroleum products through its new tank farm.
- **Community Impacts:** Goods movement is essential to supporting the region's economy and quality of life. However, growth in goods movement activities (from manufacturing to truck traffic) also gives rise to negative community impacts. In addition to safety and air quality concerns, these

activities can cause excessive noise and vibration along significant freight corridors. As population continues to grow outside the urban core, especially in the northern and western portions of the region, so will commercial centers, leading to more widespread dispersion of freight-intensive impacts such as truck traffic.

- The Regional Goods Movement Profile represents a baseline of existing conditions in the MetroPlan Orlando, Volusia, Space Coast, and Lake-Sumter MPO Regions and it will serve as input into the Regional Goods Movement Needs Assessment. Existing and Future Commodity Flows will be explored in a separate report, in addition to Regional Logistics Patterns.