Airport Regional Transportation Industrial Development Analysis

FDOT District One
November 2020

FDOT DISTRICT 1

AIRPORT REGIONAL TRANSPORTATION INDUSTRIAL DEVELOPMENT ANALYSIS

Florida Department of Transportation | District 1

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Acknowledgments:

FDOT District 1
Freight & Seaports,
Modal Development Office
Intermodal Systems Development

Prepared by:

TranSystems
Orlando, FL

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I

Executive Summary

1. Executive Summary

The Florida Department of Transportation (FDOT) commissioned the Airport Regional Transportation Industrial Development Analysis (ARTIDA) in District 1 to gain a better understanding of existing and future infrastructure needs as air cargo and truck freight increase around local airports. ARTIDA identifies needed transportation facility improvements as a result of forecasted regional population growth; increased vehicle and truck volumes; and freight growth attributed to air cargo, truck freight, and rail freight. Facility improvements include specific projects that are both airside and off of the airport property that help improve cargo and traffic flows. The airports reviewed within this study include:

- Lakeland Linder International Airport (LAL) located in Lakeland, Florida;
- Punta Gorda Airport (PGD) located in Punta Gorda, Florida;
- Sebring Regional Airport (SEF) located in Sebring, Florida;
- Southwest Florida International (RSW) located in Fort Myers, Florida; and
- Winter Haven Regional Airport (GIF) located in Winter Haven, Florida.

ARTIDA focuses on the existing and future capabilities of shipping air cargo; however, a high level understanding was developed to determine impacts of increased freight on the transportation network surrounding each airport within a five mile radius. Each airport was evaluated as follows:

- Existing conditions were developed;
- Airport and airport tenant interviews were conducted;
- Air cargo, truck freight, rail freight, and population growth methodologies were developed;
- A traffic analysis was conducted through on-site observations, Google Speed, and LOS evaluation; and
- Transportation facility recommendations were developed.

Understanding the geography, physical characteristics, political characteristics, and traffic patterns around each airport is instrumental in determining how the area functions. Existing conditions were documented to provide an understanding of land usage and the transportation network as it exists today. Existing conditions were evaluated based on the following data points:

- Current and future land uses;
- Future industrial and existing vacant lands;
- Transportation facilities such as roads, airports, and railroads;
- Traffic crashes;
- Total vehicle and truck AADTs;
- Airside facilities;
- Existing tenants, focusing on tenants that ship freight; and
- Foreign Trade Zones.

Interviews were conducted to gain important qualitative insights from airport staff and their tenants. These interviews were imperative to understand how air cargo or freight moves in and out of the airport. They also helped to identify any transportation facility issues both on and off the airport property. Interviews with the airports and their tenants were conducted focusing on the following topics:

- Current cargo trends;
- Growth projections, if available;
- Potential new cargoes or current cargoes handled;
- Adequacy of airport facilities;
- Internal airport cargo movements and requirements; and
- Issues, constraints, congestion, or bottlenecks encountered on any off-airport connectors and intersections (regional transportation network).

Methodologies for growth were established to identify their impact on the surrounding network within each study area. Aviation growth was determined by using a compound annual growth rate specific to commercial service or general aviation airports. Truck freight growth was based on a compound annual growth rates from aviation cargo trends. County census data was used to build a compound annual growth rate for population growth that would impact the roadway network around each airport. Projections were established for 2020, 2030, and 2040.

Existing infrastructure needs, as well as existing bottlenecks of the roadway networks were identified for each airport through field observation of the main arterials surrounding each airport and documented using video footage. Google Traffic Speeds data was reviewed during peak hours, Monday through Friday, to assess potential bottlenecks near the airport. Level of service (LOS) analyses were prepared and reviewed for existing and future conditions.

Where applicable, rail service was reviewed based on operations, rail infrastructure, equipment, usage, and requirements for future expansion. SEF is currently the only airport with direct rail access. Other forms of railroad transportation that may be applicable include intermodal, containerized rail or transloading; however, either would require an initial truck movement between the airport and the intermediary rail facility.

Lastly, recommendations were developed for short, medium and long term infrastructure improvements. These improvements are detailed by airport and summarized within the conclusion.

2

Introduction

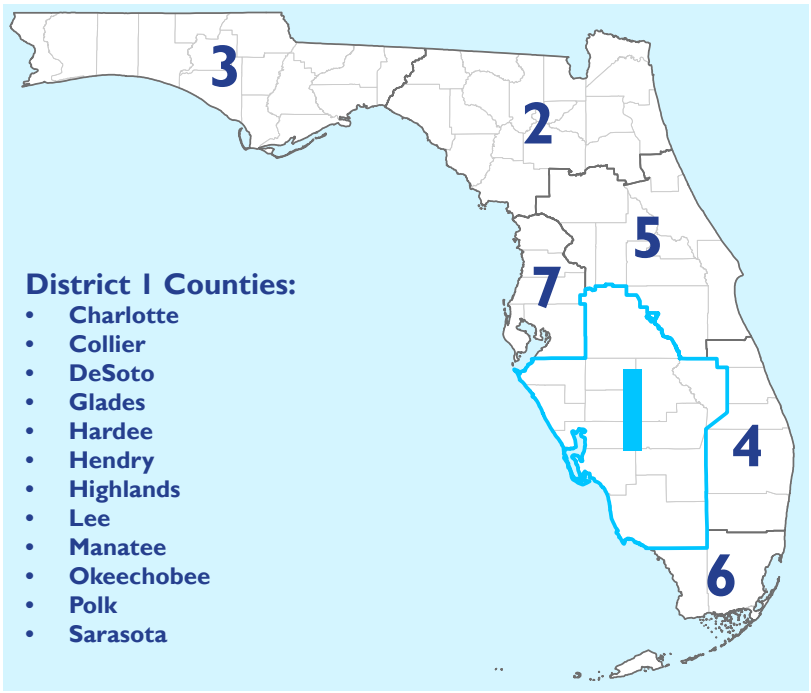
2. Introduction

2.1 Project Description

The Airport Regional Transportation and Industrial Development Analysis (ARTIDA) will assist the Florida Department of Transportation District 1 (FDOT D1) (Figure 1) in researching and identifying future capability and capacity improvements utilizing current and future expansion areas, existing infrastructure, and identification of new infrastructure and facilities to maximize freight movement and handling capabilities at five airports within the district. This study identifies transportation requirements as a result of forecasted growth to include specific projects on-and-off airport properties to improve cargo and traffic flow on existing roadways and airport connectors. Airports reviewed within this study include:

- Lakeland Linder International Airport (LAL) located in Lakeland, Florida;
- Punta Gorda Airport (PGD) located in Punta Gorda, Florida;
- Sebring Regional Airport (SEF) located in Sebring, Florida;
- Southwest Florida International (RSW) located in Fort Myers, Florida; and
- Winter Haven Regional Airport (GIF) located in Winter Haven, Florida.

Figure 1 - FDOT District Map



To accomplish the purpose of the study, several major tasks were completed. The study itself focuses largely on the existing and future capabilities of shipping cargo by air; however, a high level understanding was developed to determine the impacts of industrial parks within each scoped area on the transportation network.

1. Existing conditions data was collected for each study area within a 5 mile radius of the airport. This task focused on readily available documents developed by the airports, FDOT, and the Metropolitan Planning Organizations (MPO) such as:

   - Airport Master Plans;
   - FDOT 2019 Statewide Airfield Pavement Management Program;
   - MPO Transportation Improvement Programs (TIP);
   - MPO Long Range Transportation Plans (LRTP); and
   - AADT, Truck AADT, Truck Percentage data.

   Existing conditions of the surrounding transportation network within a five mile radius of each airport was assessed. This focused on the Strategic Intermodal System (SIS) connectors as well as main ingress and egress for each airport to those SIS connectors. Conditions of the roadway network were documented using two methods:

   - Existing infrastructure maintenance requirements as well as existing bottlenecks were identified for each airport by driving the main arterials surrounding each airport and documenting using video footage; and
   - Google Traffic Speeds data was reviewed during peak hours to assess locations of potential bottlenecks within the vicinity.

2. Interviews with the airports and their tenants were conducted. Questions were adjusted based on the airport or tenant; however, the interviews were catered towards the following topics:

   - Current cargo throughput (volumes, nature of cargoes, peak and non-peak periods);
   - Growth projections as applicable;
   - Potential new cargoes or current cargoes handled;
   - Adequacy of airport facilities;

- Internal airport cargo movements and requirements; and
- Issues, constraints, congestion, or bottlenecks encountered on any off-airport connectors and intersections (regional transportation network).

3. An aviation trend assessment was conducted to identify trends for cargo movement at varying airport sizes. Data collection focused on readily available documents developed by the FAA, FDOT, and industrial developers such as the following:

   - 2016 Florida Air Cargo Study (FACS);
   - Florida Aviation System Plan 2035 Update (Central Region);
   - Florida Aviation System Plan 2035 Update (Southwest Region); and
   - Florida Statewide Aviation Economic Impact Study (2019).

4. Roadways and intersections (critical connectors) that would be impacted by increased freight growth were identified. The follow-on activity was to analyze the truck and vehicular traffic projections resulting from airport-generated cargo and population growth in the region to determine the impacts on the regional surface transportation network. In order to determine the potential impact from freight growth, an existing conditions capacity analysis was conducted to determine level of service (LOS) information (2018). A capacity analysis was also prepared to project LOS in the future conditions section for planning horizon years 2020, 2030, and 2040. Within the report, data gathered will inform the reader of peak hour volume, LOS information, and percentage of truck traffic, all relative to the study areas.

5. Where applicable, rail service was reviewed based on operations, rail infrastructure, equipment, usage, and requirements for future expansion. SEF is currently the only study airport with rail access. Other forms of railroad transportation that may be applicable include intermodal, containerized rail or transloading; however, either would require an initial truck movement between the airport and the intermediary rail facility.

6. Finally, recommendations were developed for short, medium and long term infrastructure improvements. These improvements are detailed by airport and summarized within the conclusion.

3

Aviation Trend Analysis

3. Aviation Trend Analysis

As manufacturers continue to reduce labor costs and focus on just-in-time production, supply chain management is becoming increasingly more important to ensure that products arrive in a timely manner to meet consumer requirements. Air transport, while the most expensive cost per mile, is typically the fastest form of transportation. According to the International Air Transportation Association (IATA), air cargo represents less than 1% of world trade by volume, but 35% of the global trade by value.[1]

Air cargo is shipped in belly freight storage areas on commercial passenger flights or on cargo planes. Products that are shipped by air include items that are time sensitive or have a limited shelf life. Perishable goods, pharmaceuticals, live animal, e-commerce, and express delivery are just a few of the industries that heavily depend on air cargo transportation for fast and reliable transit.

Four studies were reviewed for this study and supplemented to provide an understanding of the national and state perspective on shipping cargo by plane. Documents reviewed are as follows:

- 2016 Florida Air Cargo Study (FACS);
- Florida Aviation System Plan 2035 Update (Central Region);
- Florida Aviation System Plan 2035 Update (Southwest Region); and
- Florida Statewide Aviation Economic Impact Study (2019).

3.1 National Perspective of Air Cargo

The FAA tracks revenue ton-miles (RTMs) for international, domestic, and combined air cargo figures. RTM is a metric defining the revenue received for the movement of one ton of goods over the distance of one mile. Growth and contraction within the air cargo industry typically tracks with the Gross Domestic Product (GDP), but it also depends on the volatility of fuel pricing, movement of real yields, and globalization. The FAA completed their most recent Aerospace Forecast for 2019-2039 which provides 2018 actual numbers as well as forecasted growth through 2039. In 2018, United States (US) air carriers flew 42.8 billion RTMs domestically and internationally, which was up 9.1 percent from 2017. Growth projections for 2019 account for an increase of 5.8 percent RTMs with an average annual growth rate of 3.3 percent between 2019 and 2039.

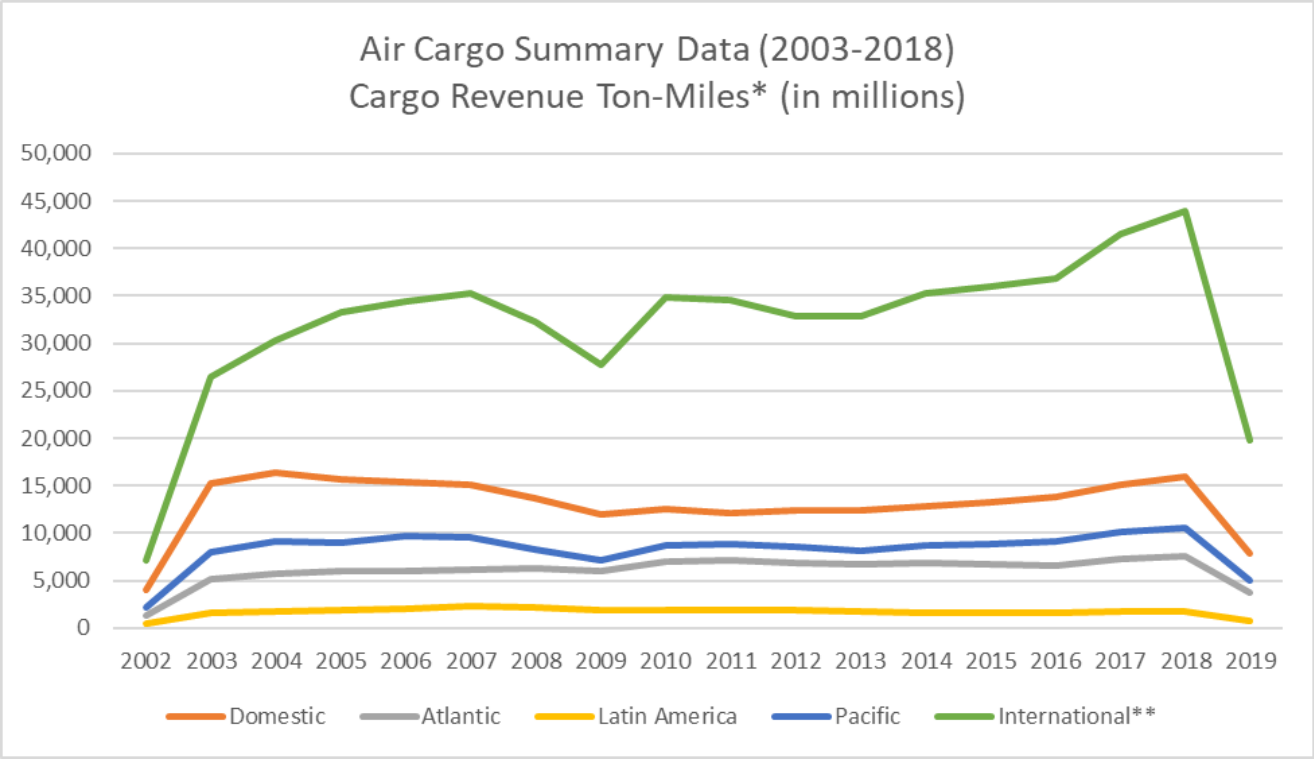
According to the FAA, domestic air cargo increased by 7.7 percent in 2018 to 15.8 billion RTMs. Annual projections for 2019 were expected to increase by 4.5 percent with an average annual rate of increase of 1.6 percent between 2019 and 2039.

International air cargo is differentiated into four regions consisting of Atlantic, Latin, Pacific, and 'Other International'. As a whole, international air cargo grew by approximately 10.0 percent in 2018, to 27.0 billion RTMs. Growth for international RTMs is forecasted to remain strong in 2019 at 6.6 percent based on the continuation of a robust global trade market. Between 2019 and 2039, international cargo RTMs are forecasted to increase an average of 4 percent per year, which is based in part on the projected growth in world GDP. Specified regions are anticipated to grow at varying percentages, 'Other International' is anticipated to grow at the fastest rate of 5.1 percent, Pacific is anticipated to grow at 4.3 percent, Atlantic is anticipated to grow at 3.1 percent, and Latin America is anticipated to grow at 0.8 percent.[2]

The Bureau of Transportation Statistics (BTS) compiles data of both freight and mail carried by US airlines in all service classes (scheduled and non-scheduled). US Air Cargo Summary - Cargo RTMs (in millions) provides a historical depiction of RTM between 2003 and 2018 (2019 data is incomplete).

1 https://www.iata.org/whatwedo/cargo/Documents/cargo-strategy.pdf
2 https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/FY2019-39_FAA_Aerospace_Forecast.pdf

Figure 2 - US Air Cargo Summary - Cargo RTMs (in millions)



**International traffic reported by carriers that do not have Atlantic, Pacific, or Latin America entities*

Source: Bureau of Transportation Statistics

3.2 State Perspective of Air Cargo

A major economic engine that helps to drive the Florida economy is the aviation industry. The 2019 Florida Economic Impact Study developed a methodology to calculate the total economic impact that aviation plays in Florida and each respective FDOT District.[3] Economic impacts are calculated based on aviation activities including revenue from aviation businesses within the airports, goods and services using aviation, and goods and services purchased by aviation companies. Total annual economic impacts in Florida from the aviation industry are estimated to be $175 Billion. Economic impacts for District 1 are estimated at $13 Billion, which represents approximately 17 percent of Florida's total aviation impacts.

The air freight industry is integral to the Florida economy as it creates jobs, moves goods, and increases tax revenue for the state. There are approximately 7,920 air freight personnel and 617,490 trade related personnel, totaling 625,410 jobs in Florida, while those jobs bring in $31.2 billion in income. Total sales for all air-freight related activities equaled $98.8 billion and the tax generated for the State equaled $4.1 billion. In 2014, commercial service airports carried 2,710,994 tons of cargo in and out of Florida.

Miami International Airport (MIA) is the leader in the Americas for international air cargo (based on shipped US tonnage) with over 100 passenger and cargo carriers that link to the Caribbean, Latin America, Europe, Asia, and the Middle East.[4] In 2014, MIA handled 79 percent of all air imports and 77 percent of all air exports to the Caribbean and Latin America. MIA is expected to grow from 2.31 million tons in 2018 to 4 million tons in 2040. From a capacity standpoint, MIA is the leader in Florida having more than 4,800 tons of daily lift capacity, which is approximately 70 percent of the statewide total.

Of the five airports in this study, only two provide commercial air passenger service (RSW and PGD). All five airports provide General Aviation (GA) services, which are all other air related services outside of commercial passenger service. GA airports play an important role in the movement of goods in Florida. GA airports have several advantages, including less air and ground congestion, shorter taxi times, ease of ground access, proximity to specific market areas, and less demanding ground support needs. In 2016, Florida GA air cargo carriers combined for over 5,000

3 https://www.fdot.gov/aviation/economicimpact.shtm
4 http://www.miami-airport.com/about_us.asp

air operations, with 3,800 tons of goods estimated to have been shipped. GA air cargo operations are expected to grow at a rate 0.52 percent annually between 2014 and 2034.[5] Agricultural products (340,900 tons) and meat/seafood (132,099 tons) are the largest quantities imported into Florida.

The FDOT Aviation Office, with the assistance of the Continuing Florida Aviation System Planning Process (CFASPP), administers and updates the Florida Aviation System Plan (FASP). The FASP is based on the framework that was set out in the FDOT Florida Transportation Plan (FTP), the statewide plan guiding Florida's transportation future, with the intent of providing a continued high-level of service to all users.

The FASP is a long-term planning process which culminates into a guiding document; the most recent version is the FASP 2035 Update. The documents assess all public-use airports in Florida to understand the relationships between the facilities and their users. Focusing on a holistic approach, the plan reviews the statewide anticipated future demands to assess the ability of the existing system. The plan is then used as a tool to maintain an efficient, safe and reliable system, evaluate future funding decisions by identifying facilities and services that are needed to meet future demand, and effectively expand capacity in those areas where it is most needed. In all, the intent is to focus on continued improvement of the state aviation system.

The FASP is a document that breaks down the state into nine regions. Regions relevant to the airports included in this study include the Central and Southwest. LAL, GIF, and SEF airports fall within the Central CFASPP. RSW and PGD airports fall within the Southwest CFASPP.

3.2.1 Central CFASPP

The Central Florida CFASPP Region (Central Region) covers an area of 4,400 square miles and is comprised of DeSoto, Hardee, Highlands, and Polk Counties. The Central Region is supported by the Heartland Regional Transportation Planning Organization (HRTPO) and the Central Florida Regional Planning Council (CFRPC).

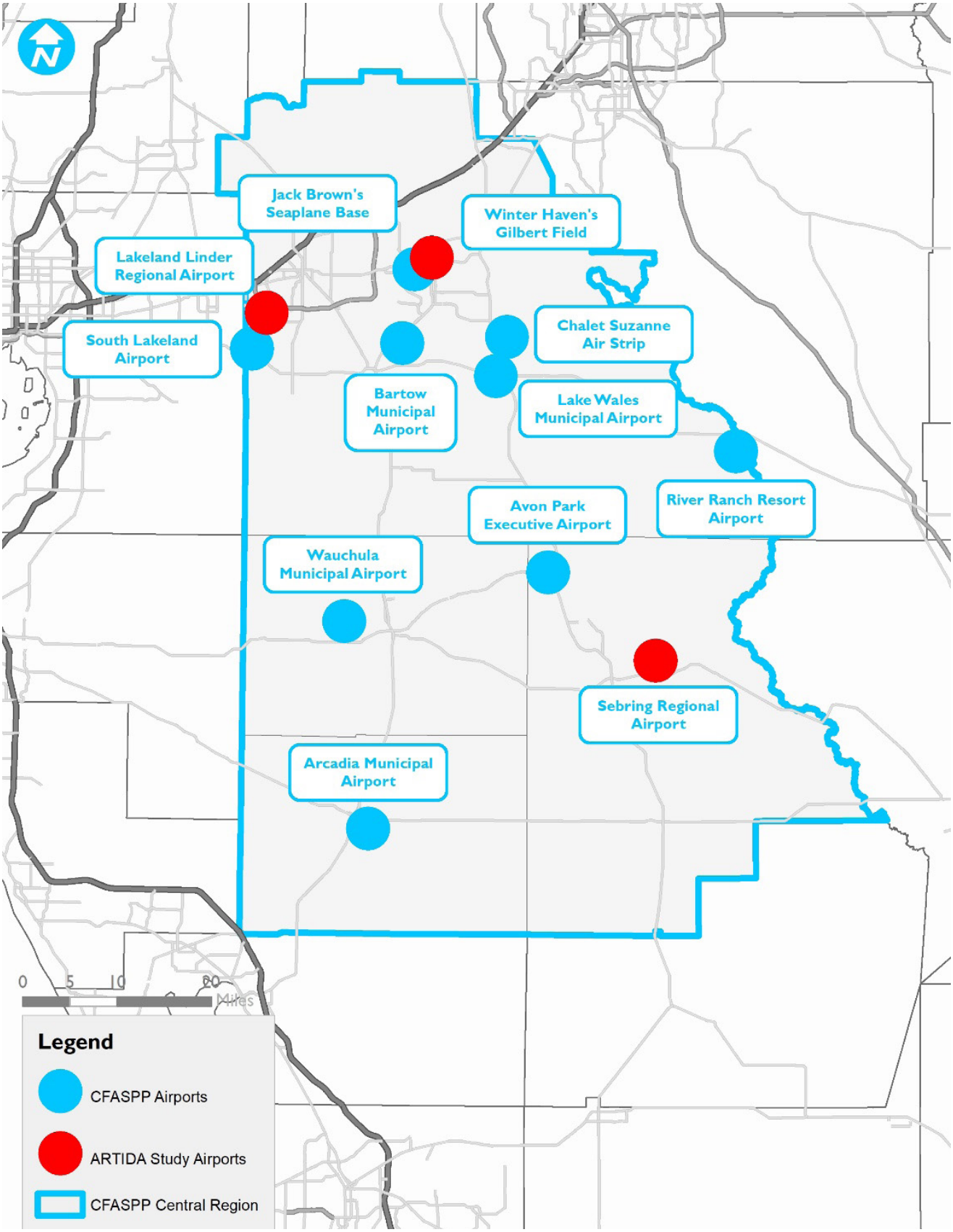
The Central Region has 12 GA airports, with LAL being the largest. Figure 3 depicts the airports in the region:

- Winter Haven's Gilbert Field;
- Jack Browns Seaplane Base;
- South Lakeland Airport;
- Bartow Municipal Airport;
- Chalet Suzanne Air Strip;
- Lake Wales Municipal Airport;
- River Ranch Resort Airport;
- Avon Park Executive Airport;
- Sebring Regional Airport;
- Wauchula Municipal Airport; and
- Arcadia Municipal Airport.

There are no commercial airports in the Central Region. Even with no commercial passenger service, 2014 economic impacts of the Central Region airports were $416 million in total output with $128 million of total payroll going to approximately 3,528 workers. The Central Region airports had approximately 682 based aircraft, 22 runways, and 429,157 total aircraft operations in 2016.

5 2016 Florida Air Cargo Study - https://www.fdot.gov/aviation/cargo.shtm

Figure 3 - CFASPP Central Region Airports



Intermodal connectivity is imperative to the movement of goods. Taking into consideration intermodal connectivity, FDOT designated key roadways, seaports, airports, and rail as a SIS. The SIS provides an opportunity prioritize federal funding for facilities that connect both goods and people to ensure that they will be well maintained and continuously improved. Currently, the Central Region does not have any SIS airports, seaports, or public transit facilities. However, there are SIS roadway and rail facilities that are heavily utilized within the region.

The SIS roadways in the Central Region are Interstate 4 (I-4), US 17, US 27, State Route (SR) 570, SR 60, SR 64, and SR 70. These facilities are pivotal to the movement of goods and people within the Central Region.

Railroad facilities in the Central Region, like the CSX Winter Haven Intermodal Container Transfer Facility (ICTF) in Winter Haven, are considered SIS. CSX is the only Class I rail operator and maintains the only SIS rail facility in the Central Region. Seminole Gulf Railway (SGLR), South Central Florida Express (SCXF), and the Florida Midland Railroad (FMID) are all short line, Class III rail operators that are not part of the SIS network (Figure 4).

Figure 4 - Central & Southwest Region Rail Lines

Source: FDOT 2018 Rail Plan

3.2.2 Southwest CFASPP

The Southwest Florida CFASPP Region (SW Region) is located within FDOT District 1 and is supported by HRTPO, Charlotte County-Punta Gorda (CCPG), Sarasota-Manatee, Naples-Collier and Lee County Metropolitan Planning Organizations. The SW Region covers a geography of approximately 7,100 square miles in parts of Charlotte, Collier, Glades, Hendry, Lee, Manatee, and Sarasota Counties. It has major facilities such as Port Manatee, I-75, two former CSX rail lines operated by SGLR and SCXF, and thirteen airports, which all contribute to the economy. In 2014, there were 2.7 million tons of cargo that passed through Florida Airports and approximately 40 percent of the nation's international cargo was shipped to Florida.

The SW Region has 13 GA airports, with LAL being the largest. Figure 5 depicts the location of airports in the region:

- Sarasota/Bradenton International Airport;
- Venice Municipal Airport;
- Buchan Airport;
- Punta Gorda Airport;
- Shell Creek Airport;
- La Belle Municipal Airport;
- Airglades Airport;
- Page Field;
- Southwest Florida International Airport;
- Immokalee Airport;
- Naples Municipal Airport;
- Marco Island Airport; and
- Everglades Airport

Of the 13 airports, there are ten GA airports and three commercial service airports. In 2014, the SW Region airports had a total revenue output of $5.9 billion, a total payroll of $1.7 billion, and employed approximately 61,000 citizens. In 2016, there were almost 1,500 based aircraft, approximately 22 runways, over 5.1 million enplanements, and over 600,000 operations. RSW is the SW Region's busiest airport, and is in the top 50 airports in the United States as it relates to passenger travel. Sarasota-Bradenton International Airport (SRQ) is the region's busiest airport for freight operations. However, RSW is the only airport designated as SIS in the SW Region currently. SRQ and PGD are designated as Emerging SIS facilities which means that they are of a certain size or they provides service to aviation-dependent industries within a 50 mile radius and are located in areas that expected to grow by 25 percent or more in the next 20 years.

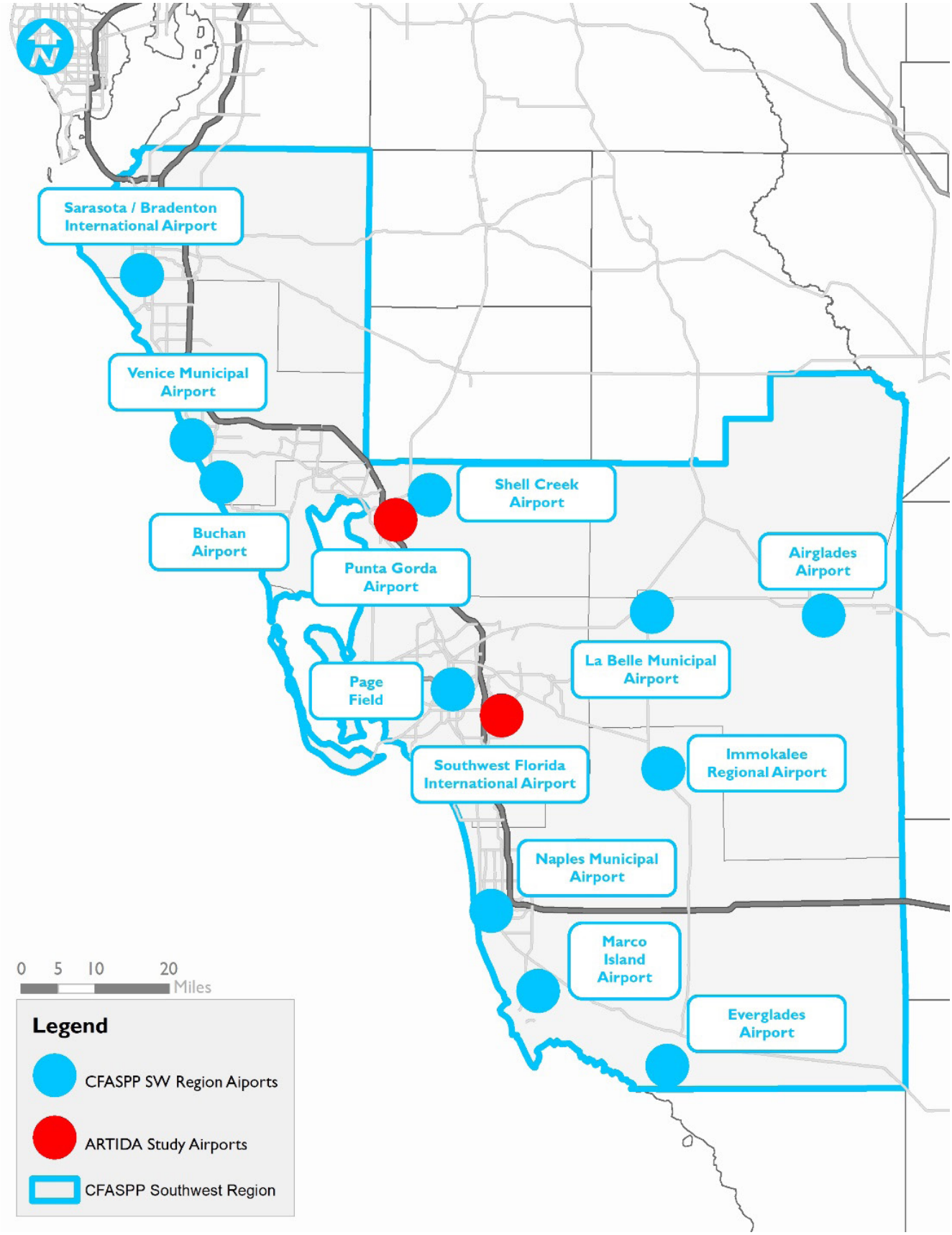
Roadways provide connectivity to all of the airports in the SW Region for cargo to reach its intermediary or final destination. The SW Region roadways that are designated as SIS are Interstate 75 (I-75), US 17, US 27, SR 29, SR 82, SR 80, SR 31, and SR 70. This infrastructure is important not only for the movement of goods, but for people to stay connected as well.

Port Manatee is a deep water seaport located on the Gulf of Mexico. It is the only port within FDOT D1 that holds the SIS designation. Port Manatee is one of Florida's largest deepwater seaports and is considered one of the closest ports in the US to the Panama Canal.

Lee Tran is the public transit service provider and operates bus and trolley services in Lee County. The Lee Tran Intermodal Center, located in Fort Myers, is the only SIS transit facility in FDOT D1.

Short line, Class III rail operators, SCXF and SGLR, are not part of the SIS network in the SW Region.

Figure 5 - CFASPP SW Region Airports



3.3 Non-Air Cargo Industrial Developments on or Near Airport Property

Land surrounding airports creates a unique opportunity for industrial development, low demand for residential development and accessibility to SIS connectors allow for industrial partners to locate manufacturing facilities and distribution centers on or near airport property. Airports that are located near or within a Foreign Trade Zone (FTZ) in particular provide benefits to industrial partners that they may not otherwise have access to.

Examples of successful Industrial Developments on or adjacent to airport property include, but are not limited to:

- Bartow Industrial Park, Bartow, Florida
- Chennault Park, located in Lake Charles, Louisiana;
- Cecil Commerce Center, located in Jacksonville, Florida; and
- Hillwood's Alliance Texas Mobility Innovation Zone, located in Alliance, Texas

Bartow Industrial Park is located in and around the Bartow Executive Airport on approximately 40 acres, with plans for future expansion to 70 acres. The industrial park is an intermodal facility with access to 8,000 feet of rail, airport runways, and a four lane highway. There are approximately 380,000 square feet of existing warehouses within the industrial park. The existing Bartow Airport Master Plan calls for an additional expanded 70 acres to be developed for the industrial park in the future.

Chennault Park is located adjacent to the Chennault International Airport property. Existing tenants for the industrial park include: Northrop Grumman, Landlocked Aviation Services, Citadel Completions, Louisiana Millwork (Masonite), Million Air, Bechtel, Habitat for Humanity, Luke's RV, and Tadlock LLC. The airport boasts the room for expansion; accessibility to the southern United States via rail, deepwater ports, and interstate highways; and low costs/incentives.[6]

Cecil Commerce Center is located adjacent to the Cecil Airport and consists of approximately 4,700 acres. The industrial park is located adjacent to the CSX mainline and is accessible to I-10, north of the industrial park. Existing tenants for the industrial park include: Bridgestone Americas Tire Operations, Engility, Saft America, Wood Group Pratt & Whitney, the Boeing Company, and others. The industrial park boasts its skilled labor force, regional growth, and its accessibility from multiple modes of transportation.[7]

Hillwood's Alliance Texas Mobility Innovation Zone is a 26,000 acre, master planned industrial, mixed-use, and residential development. The site is located within close proximity of a BNSF intermodal hub, the Alliance Airport, and interstate roadways. The Innovation Zone boasts its access to environment for NextGen mobility including drone deliveries, autonomous trucking, etc.[8]

Airports within the study including SEF, LAL, RSW, and PGD have followed similar approaches to promote industrial development within their regions. This creates business opportunity for the airport by becoming a landlord to businesses that reside within their industrial parks as well as growth and economic development for the region as a whole. These facilities, along with regional growth in commercial and industrial development have been reviewed to provide a more holistic approach on the impacts of the regional network. Examples for this type of growth include, but are not limited to:

- Skyplex, located in Lee County, Florida (Page 135);
- Interstate Airport Park, located in Charlotte County, Florida (Page 107);
- Airport Commerce Park, located in Lakeland, Florida (Page 45); and
- Sebring Regional Airport and Industrial Park Community Redevelopment Authority, located in Highlands County, Florida (Page 74).

6 Chennault Park https://chennault.org/chennault-park/
7 Cecil Commerce Center http://www.jaxcecilcommercecenter.com/
8 Hillwood's AllianceTexas Mobility Innovation Zone: https://www.alliancetexasmiz.com/

4

Forecasting Growth Methodology

4. Forecasting Growth Methodology

Growth projections can be developed based on variables attributed to differing goals and perspectives. Focusing on the diametric perspectives, the first perspective, often adopted by private ownership, tends to skew growth projections aggressively, in correlation with industry profit objectives, stock performance expectations, and other stakeholder considerations. The second, and that which has been adopted by this study, presents a conservative approach in its forecasting methodology. This conservative approach is used to reduce the likelihood of over-allocation of funding to areas of the roadway network where the realization of increased traffic is less than quantitative data, based on aggressive projections, and therefore, does not support additional spending.

Understanding current and future freight volumes for the airports in this study will help to plan for future facilities and infrastructure needs. The three ways freight moves to and from the five airports in this study are by airplane, truck, and rail. To understand how air cargo volumes will change, the 2016 Florida Air Cargo Study (FACS) was used to determine a standardized methodology, develop a baseline, and project future air cargo operations and volumes. The FACS growth rates were also used to project future freight volumes on specified roads around each facility. Truck freight growth focused on the Annual Average Daily Truck Traffic (AADTT), which is a standardized measure used identify the average daily truck volumes along a roadway. The Annual Average Daily Traffic (AADT) is a standardized measure that estimates average daily traffic volume on a roadway and were used with county population growth rates to forecast future volumes along the roadways. Forecasting rail growth was limited within this study as SEF is the only airport that has on-site rail access. Also, the transition to Precision Railroading by CSX limits a tenant's ability to add rail service or increase rail service without creating an agreement with CSX that meets their new operating model requirements, as described in Section 4.3.3.

Airports in Florida are categorized as commercial service or GA. Commercial service airports have scheduled air passenger services while GA airports consists of all other operations. Commercial service airports track air cargo operations in arrivals and departures of planes which is broken down into mail tonnage or freight tonnage. Larger airports, such as MIA, have dedicated air cargo operations and facilities that support maintenance and the transloading of goods.

In contrast, GA airports have either scheduled or ad-hoc (unscheduled) air cargo services. Most of the GA airports in Florida only maintain ad-hoc air cargo services. Four of the five airports within this study operate GA activities; of those, two have ad-hoc air cargo activity and no scheduled services at this time. Ad-hoc air cargo volumes are typically not tracked by Florida airports and air cargo operators are not required to report volumes to the FAA if they do not exceed operating revenues of at least $20 million. As a result, historical air cargo data is limited.

Methodologies to forecast growth differ between commercial service and GA airports and project future air cargo volumes at different rates. Table 1 shows the categories for each airport within this study and whether they have scheduled or ad-hoc air cargo services.

Table 1 - Airport Typologies

Airport	Scheduled Commercial Passenger Service	General Aviation Activity	Scheduled Air Cargo Service	Ad-Hoc Air Cargo Service
GIF	No	Yes	No	No
LAL	No	Yes	No	Yes
PGD	Yes	Yes	No	Yes
RSW	Yes	Yes	Yes	No
SEF	No	Yes	No	No

4.1 Aviation Growth

4.1.1 Commercial Service Air Cargo Growth Methodology

The 2016 FACS evaluated four air cargo forecasting methodologies and identified the Historic Growth Rate Methodology (HGRM) as the preferred option for growth. A compound annual growth rate (CAGR) for both air cargo operations and volumes were established. Air cargo operations volumes are based on the arrival and departure

of planes carrying cargo which are measured in pounds or short tons. The HGRM was justified as both reasonable and conservative and accounted for the 2008 global recession. The HGRM determined the CAGR for operations was 1.0 percent while the CAGR for air cargo volumes was 2.1 percent.

4.1.2 GA Air Cargo Growth Methodology

The 2016 FACS examined four growth methodologies for GA airports where the preferred forecasting tool was identified as the FAA's All-Cargo Carrier Domestics Revenue Ton Miles (RTM) methodology. This methodology is conservative and tied into the FAA's forecast for relevant geographies. The CAGR for GA airports was 0.52 percent per year from 2016 to 2032 based on the FAA RTM methodology. This growth rate was applied to both air cargo operations and estimated air cargo volumes for GA facilities. GA air cargo volumes are not tracked by airports and are not required by the federal government to be recorded unless they exceed operating revenues of $20 million. As a result, air cargo by volume is estimated by the plane types used at each airports and capacity of those planes.

4.2 Regional Roadway Network Growth

4.2.1 AADT Growth Methodology

To grow traffic volumes along the roadways near each airport, a population CAGR was applied to AADT to project increases into the future. Population growth was based on Census data from the county in which the airport is located between 2014 and 2018.[9] The four counties, Lee, Polk, Charlotte, and Highlands with their respective airports are shown in Table 2. The historical annual county population growth was used to develop a CAGR using a weighted average that placed more emphasis on the most recent years and was then applied to the AADT on the roadway network. This methodology assumes that there is a correlation between increased population and traffic trips.

Table 2 - County Population Weighted CAGR

	Lee County RSW		Polk County LAL / GIF		Charlotte County PGD		Highlands County SEF	
Year	Population	% Change	Population	% Change	Population	% Change	Population	% Change
2014	679,513	2.71%	634,638	1.83%	168,474	2.22%	98,236	0.63%
2015	701,982	3.31%	650,092	2.44%	173,115	2.75%	99,491	1.28%
2016	722,336	2.90%	666,149	2.40%	178,465	3.09%	100,917	1.43%
2017	739,224	2.34%	686,483	3.05%	182,033	2.00%	102,883	1.95%
2018	754,610	2.08%	708,009	3.14%	184,998	1.63%	105,424	2.47%
	Weighted CAGR	**2.40%**	**Weighted CAGR**	**2.90%**	**Weighted CAGR**	**2.07%**	**Weighted CAGR**	**1.99%**

4.2.2 Truck Freight Methodology

Truck traffic is anticipated to provide a "first mile" and "last mile" movement for all goods departing by airplane. For those goods that are manufactured on-site, or adjacent to each airport site, they are anticipated to receive raw material or work-in-process material by truck. Therefore, as industrial growth increases both on and off the airport sites, the surrounding roadway network is anticipated to experience an increase in truck traffic as well. Truck AADT on a select group of roads serving each study was increased by the commercial service growth rate or GA air cargo growth rate described in Sections 4.1.1 and 4.1.2 respectively.

4.2.3 Existing Roadway Level of Service Evaluation

Traffic operating conditions were evaluated for study area roadways that are most likely to be impacted by forecasted automobile and freight movement growth surrounding each of the five airports. Highway Capacity Software (HCS), version 7, was used to conduct roadway segment capacity analyses for those facilities at a planning level. The result of this analysis examines LOS for each study roadway segment. Per the Highway Capacity Manual (HCM), LOS is used to describe the operating characteristics of a road segment in relation to its capacity. LOS is defined as a qualitative measure that describes operational conditions and motorists perceptions within a traffic stream. The HCM defines

9 www.census.gov

six levels of service, LOS A through LOS F, with A being the best and F being the worst. LOS values of A-D are generally considered acceptable for urbanized areas such as the study locations. Conversely, LOS values of E and F are considered unacceptable.

To prepare this analysis, the 2018 AADT and truck AADT volumes were obtained from Florida Traffic Online for all study area roadways.[10] Additionally, to ensure that the capacity analyses reflected the traffic conditions of each study location, traffic characteristic data for each study roadway were analyzed from FDOT. This data included the peak design hour factors (K-Factors) and directional distribution factors (D-Factor). The AADT and traffic factors were used to calculate the peak hour volumes to be utilized in the LOS analysis. For the purposes of this analysis, peak hour volume is referenced as a generality and calculated based on the available data. Peak hour represents a morning or evening peak hour, or rush hour, for each study roadway.

4.2.4 Roadway Conditions Assessment Recommendations

A roadway conditions assessment was conducted via field inspections and utilization of Google Earth imagery to identify potential requirements for roadway improvement. Four roadway segments requiring improvement were identified located surrounding GIF, RSW, and SEF. Pavement conditions within the analysis were generally described as the following:

Alligator Cracking is damage to a roadway surface that forms longitudinal cracks, which are then connected by traversing cracks. These cracks are normally interconnected and can spread over a wide area of the roadway in a relatively brief time period. Alligator cracking is typically caused by issues being experienced in the underlying layers of the pavement due to factors including poor drainage and by continually over-loading the pavement. When asphalt develops cracks, water can penetrate the surface layer, ultimately destabilizing the foundation. Surface patching is a temporary solution to remedy this type of damage; however, eventual removal and replacement of the area will be required.

Rutting is the compression or displacement of one or more layers of pavement. It is caused when a layer is too weak for the loading that it experiences and a movement within the pavement layer occurs, creating a rut, or channel, in the pavement. Rutting occurs in high stress areas and is usually accompanied by pavement cracking. Rutting can be caused by a failure in the surface course, base course, or the subgrade. Reclaiming or milling off the surface course and overlaying with additional asphalt surface and full depth patching may resolve the pavement conditions, but a complete reconstruction may be necessary. *Fatigue cracking*, seen in the rutting areas, is caused by a failure of the surface course layer by continually over-loading the pavement, or fatiguing it. *Block cracking*, seen outside of the rutting areas, is caused when transverse cracks and longitudinal cracks intersect. Block cracking is usually caused by an inadequate compaction within the pavement layers or within the subgrade layer. If cracking is only observed in the surface layer, a mill and overlay can be utilized to repair the failing surface layer. If the cracks transverse through all layers, that indicates a poorly compacted subgrade where the subgrade will settle and the pavement will become unsupported causing cracking. If this occurs, a full pavement reconstruction will be required.

4.3 Rail Freight Growth

Intermodal and freight rail service provides a variety of benefits to the roadway network including reduced wear and tear from trucks on the road, lowered congestion, and enhanced efficiencies of cargo handling. The following is a review of variables and operating parameters that impact the eventual improvement of intermodal and freight rail service for the airports, surrounding industry, and the region.

4.3.1 Class I Rail Trends

The United States Surface Transportation Board defines Class I rail carriers as those who earn greater than $250 million in a year.[11] There are seven Class I rail carries in the United States with Florida having two of them: Norfolk Southern CSX. Florida rail shipments are strongly influenced by shipments of base chemicals, gravel aggregates, non-metallic bulk, miscellaneous food, and wood products. Otherwise, Florida rail shipments are dominated by southbound shipments of consumer products, building materials, coal shipments to power plants, and raw materials for the industrial markets.

Historically, Florida rail shipment patterns are highly imbalanced, with strong inbound southbound movements and much less actual volume northbound. Due to economic rail haul distances, the preponderance of the rail freight movements within the state are bulk commodities, similar to inbound shipments from out-of-state. Out-state rail shipments are highly oriented along the I-75 corridor to Atlanta and limited points beyond, including Chicago and Appalachian coal sources. Since 2012, the Florida economy has been recovering and looking towards 2025, when

10 https://tdaappsprod.dot.state.fl.us/fto/

11 https://prod.stb.gov/reports-data/economic-data/

shipping volumes are forecasted to increase.

4.3.2 CSX Railroad

CSX Corporation, based in Jacksonville, owns companies providing rail, intermodal, and rail-to-truck trans-load services; these are among the nation's leading transportation entities. Its principle operating company, CSX Transportation (CSXT) operates the largest railroad in the eastern United States with a 21,000-mile rail network linking commercial markets in 23 states the District of Columbia, and two Canadian provinces.

CSXT operates major rail lines in peninsular Florida, dubbed the A and S-Lines, as shown previously in Figure 4. The A-line runs through Jacksonville and Orlando, roughly following I-95 and I-4 into Polk County. The S-line runs through Baldwin and Ocala slightly west of the center of the state. The Two lines touch near the Florida-Georgia border, then split and intersect again only in north central Polk County. There they essentially merge in an east-west line between Auburndale and a spot just west of downtown Lakeland. Historically the mainline averaged between 10 and 20 million gross ton-miles of freight traffic per year. The line continues southeast to north of Lake Okeechobee then to West Palm Beach where it generally parallels I-95 southward to central Miami-Dade County and the Hialeah Yard, connecting to two branch lines serving rock pits and industrial customers.

4.3.3 Precision Railroading

Precision railroading is an operational system and a management philosophy that has been implemented by several publically traded Class I railroads including Canadian National, Canadian Pacific, CSX, Norfolk Southern, and Union Pacific. There are five major principles of precision railroaded that seek to improve the operating ratio and improve efficiencies:

- Improving customer service by prioritizing delivery of customer shipments on fixed point-to- point schedules while minimizing in-transit work events.
- Strict cost control across the organization.
- Monitor the use of each asset to optimize utilization of railcars and locomotive power.
- Operating safely remains a priority.
- Value, develop, and empower employees at all levels.[12]

The point-to-point system is intended to provide a simplified network, increased train speeds, reduced terminal dwell, improved locomotive utilization, and decrease the total number of railcars on the network. The overall intent is to reduce intermediate handling of railcars through strategic blocking that moves a railcar further, faster and allows overall longer trains. This is completed through asset trip planning over train trip planning.

With the implementation of precision railroading by the major carriers, adding additional freight has become a selective process as it must fit the new model of operation. While each requirement is not absolute, the dedication of intermodal freight rail services is a case-by-case basis decision by the railroad. The following are significant points of consideration in the determination of whether or not to pursue the establishment of a dedicated freight rail service:

- What product(s) are intended for arrival/departure by rail?
- Railcar type and owner requirements (if known).
- Site acreage requirement.
- Building size requirement (if any).
- Determination of whether product(s) are shipped and/or received by rail.
- Determination of freight payer.
- Estimated weekly and monthly railcar volumes.

4.3.4 Rail Opportunity for Airports and Industrial Tenants

CSX Warehouse Services connects industrial users with rail-served, independently owned warehouse sites to store a variety of commodities such as food, paper, metal, building materials and other consumer goods.[13]

There are two CSX intermodal container transfer facilities (ICTF) in the region. CSX Intermodal Tampa is located in Tampa, Florida (outside of FDOT District 1) and ships both domestic, 53 foot containers and international containers. CSX Winter Haven Intermodal Logistics Center (ILC) is located in Winter Haven Florida and ships primarily domestic, 53 foot containers.

SEF is the only airport that has existing rail service of the five airports described herein. Airports that do not have rail service would be required to use truck as an intermediary mode of transportation from the airport to either

12 https://www.freightwaves.com/news/railroad/precision-railroading-primer

13 https://www.csx.com/index.cfm/customers/value-added-services/product-transloading-and-distribution/

a transloading facility or an ICTF, in most cases outside of the 5 mile study area radius and thereby rail growth is not applicable for that airport. While both rail alternatives are plausible, they increase the number of times that the commodity must be handled, thereby relatively increasing logistics costs. Either alternative would require a case by case review to determine the logistics costs associated to alternative modes of transportation.

SEF has direct access to the CSX rail line and receives scheduled service three to four times per week. Railcars delivered per week is dependent on seasonality and can range from between 5 and 20 railcars per week. Rail growth at this airport was assumed to grow at the same rate as truck growth.

4.4 Qualitative Industrial Growth Area Analysis

This report identifies locations within each airport's study area that are suitable for industrial growth and land development opportunities. The potential industrial growth areas were selected based on a qualitative assessment of each airport's study area and are not factored into other growth projections for each airport within this report.

Identification of these areas with the potential for industrial growth were made based on the following assumptions: proximity to SIS infrastructure; favorable zoning and/or future land use designation for industrial uses; and the availability of vacant or minimally-developed land. This macro-level analysis is purposed to suggest areas potentially warranting further study should conditions favorable to industrial growth for both public and private stakeholders arise.

Relevant to all airports within this study, industrial partners, interested in locating near airports include those capable of transporting freight through general aviation practices, or those who are interested in serving the nearby region.

5

Lakeland Linder International Airport

5. Lakeland Linder International Airport

The largest airport in the Central Region, in terms of number of based aircraft and annual operations, is LAL. Over 240 aircraft that includes 42 jets / turbo propelled aircraft are based at LAL. It is considered the 112th busiest airport in the United States based on annual operations. Currently, LAL does not offer any scheduled passenger service, but does hold a Part 139 Certification, which is required by the FAA to establish scheduled service for planes with more than nine passenger seats and less than thirty-one total seats. LAL has an economic impact of over $574 million in the region, according to the Florida Statewide Aviation Economic Impact Study (2019). The 2019-2023 National Plan of Integrated Airport Systems (NPIAS) designates LAL as a National Reliever Airport. Reliever airports help relieve congestion when necessary from other airports. LAL relieves from both Tampa International Airport and Orlando International Airport.

The City of Lakeland owns and operates LAL. The board of directors for LAL airport is comprised of seven individuals including the mayor and six other elected board members. The airport director reports directly to the deputy city manager and is empowered to manage the staff and daily operations while the board works on policy.

Amazon Air began operations at LAL on July 23, 2020, when the first cargo flight arrived at the airport from Sacramento, California. The Amazon facility at LAL contains an onsite area for sorting outbound packages and a seven-jet hanger. At the time it began operations. Amazon's LAL facility is the companies' largest in the southeast.

LAL is home for the National Oceanic and Atmospheric Administration's (NOAA) Aircraft Operations Center (AOC). The AOC is under a division of NOAA called the Office of Marine and Aviation Operations (OMAO) which manages hurricane reconnaissance missions and are widely known as the "the hurricane hunters." These hurricane hunters fly planes directly into-and-around hurricanes to take measurements.

The Sun 'n Fun Fly-In annual event makes LAL its home. The weeklong event is held in March or April and raises funds to support aerospace and aviation education in Polk County. Each year the expo provides more than $430,000 in annual scholarships for students pursuing careers in the aerospace industry.

5.1 Study Area Physical Conditions Review

5.1.1 LAL Study Area

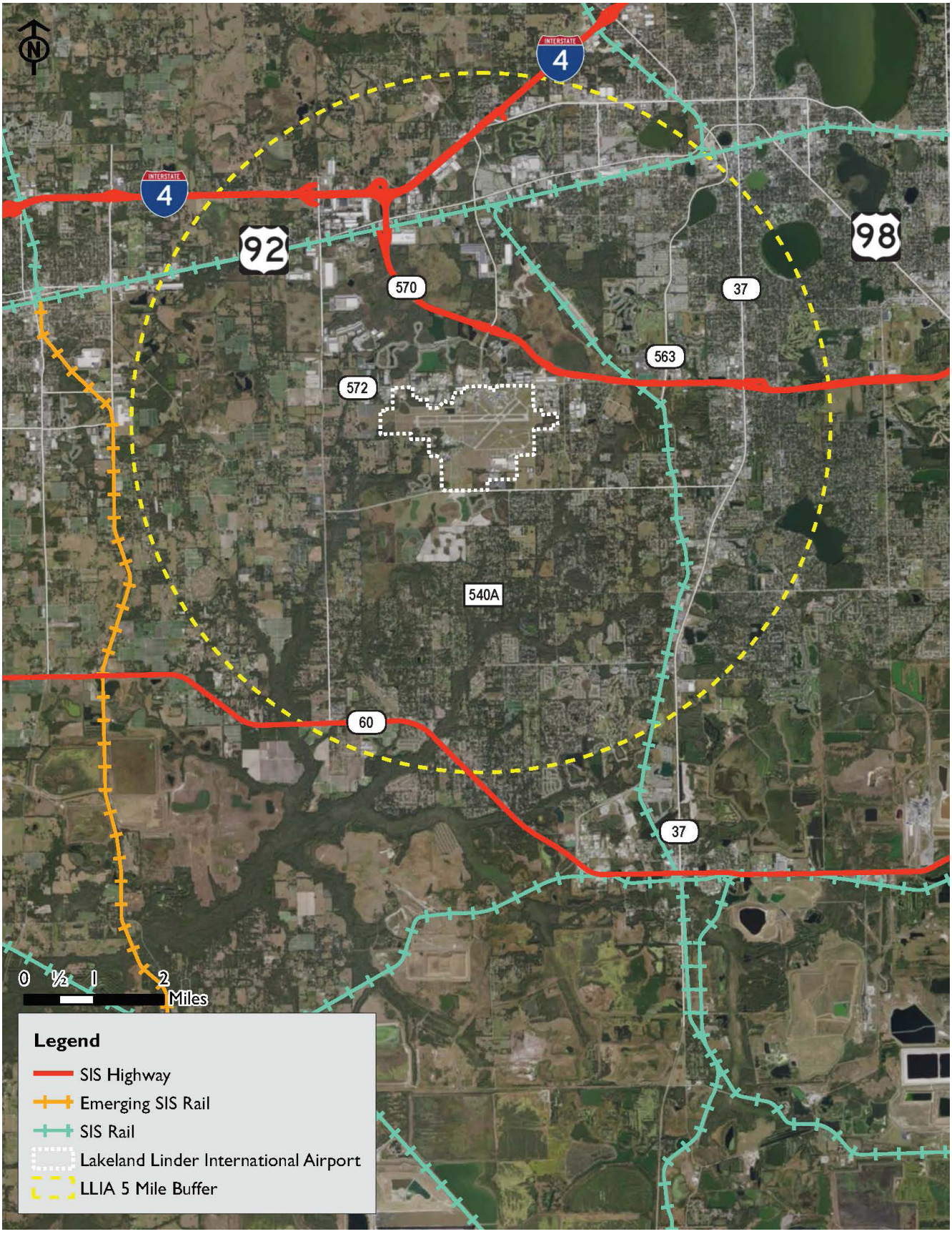
Figure 6 shows the LAL study area, which includes a five mile radius around airport. The study area is within both Hillsborough and Polk counties and includes the City of Lakeland. Major roadways within the study area include I-4, US 92, SR 570, SR 572, SR 563, SR 37, SR 540A and SR 60.

5.1.2 SIS Facilities

There are five SIS facilities in the LAL study area; I-4, SR 570, SR 60, and two CSX mainlines. A depiction of the SIS facilities are as shown in Figure 6 and described as follows:

- I-4 is located to the north of the airport and connects perpendicularly to SR 570;
- SR 570 connects to Airport Road, which ties into to Drane Field Road;
- To the south of the airport, SR 60 traverses marginally within the five mile buffer and would only serve alternative freight movements east and west, if needed; and
- An east-west rail line and a north-west rail line, both operated by CSX, run to the north and east of LAL, respectively.

Figure 6 - LAL Study Area SIS Facilities



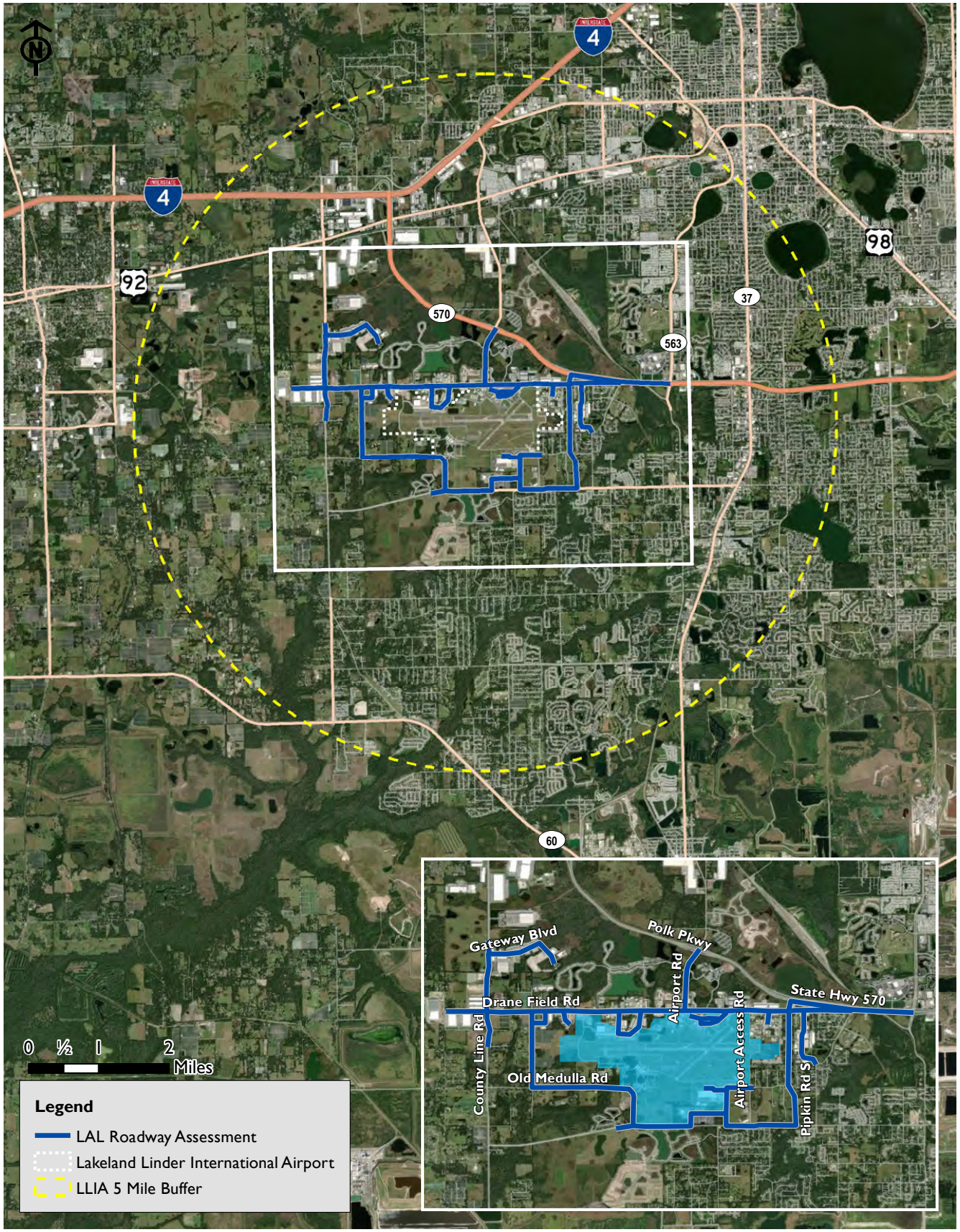
5.1.3 Roadway Infrastructure Assessment

Field observations of the roadway network were conducted on Tuesday, October 8th, 2019. The LAL study area was driven at approximately 3:00 PM in the afternoon. The route that was driven can be seen in Figure 7. Observations focused on existing conditions of the roadway infrastructure as well as identification of traffic congestion. Details from this assessment are as follows:

- At the time of the assessment, there were roadway improvements underway on Drane Field Road;
- Minor traffic delays were incurred along the route due to school bus traffic on Waring Road and a residential development, on Medulla Road, south of the airport.

Google Speed was reviewed for the roads near the airport. Roads that were reviewed as part of this analysis include Drane Field Road, Airport Road, Hamilton Road, Waring Road, South Pipkin Road, West Pipkin Road, County Line Road, and SR 570. Noticeable congestion occurred during evening peak hours on West Pipkin Road eastbound at the intersection of Pipkin Road South extending to Luma Road.

Figure 7 - LAL Roadway Assessment



5.1.4 Concrete Intersection Improvements

Within each study area, the existing conditions assessment identified intersections that should be further evaluated for a heavier duty pavement application. For LAL, there are four intersections that should be evaluated for concrete pavement application. Table 3 identifies the intersections and provides the rationale for why each was recommended. Recommendation criteria includes; facilities with high and growing truck volumes, proximity to existing and planned industrial land uses, and proximity/connectivity to SIS facilities.

Table 3 - LAL Concrete Pavement Intersection Recommendations

Intersections	Reason for Consideration for Concrete Pavement
County Line Road @ SR 60	Both SR 60 and County Line Road are 4-lane arterial facilities that have high truck AADT volumes with 3,740 and 2,245 trucks per day respectively on SR 60 and County Line Road at the intersection. Furthermore, SR 60 is a Strategic Intermodal System (SIS) Highway Corridor and County Line Road is a primary N-S truck route connection to I-4. SR 60 serves significant industrial land uses to the east and County Line Road serves significant industrial land uses to the north.
County Line Road @ Drane Field Road/ Rice Road	County Line Road is 4-lane arterial facility with high (2,686 vpd) truck AADT volumes. There is significant current and planned industrial growth east of County Line Road on Rice Road including Amazon, Publix will drive a steady increase in truck traffic at this intersection. An O'Reilly Auto Parts Distribution Center is located just north of the intersection at County Line Road and Drane Field Road. County Line Road is a primary N-S truck route connection to I-4, approximately 2.5 miles north of this intersection. Additional industrial development surrounding this intersection is identified in the future land use map.
County Line Road @ US 92 (New Tampa Hwy/E Baker St)	Both County Line Road and US 92 have high truck AADT volumes with 3,250 and 1,744 trucks per day respectively on County Line Road and US 92 at this intersection. There is significant industrial development just east and south of this intersection. County Line Road is a primary N-S truck route connection to I-4, approximately 1/2 mile north of this intersection. Additional industrial development south and west of this intersection is identified in the future land use map.
County Line Road @ I-4 EB and WB Ramp Intersections	Both I-4 and County Line Road carry high truck AADT volumes with 14,363 and 3,250 trucks per day respectively on I-4 and County Line Road at this interchange. Furthermore, I-4 is a Strategic Intermodal System (SIS) Highway Corridor and County Line Road is a primary N-S truck route connection to I-4. County Line Road serves significant existing industrial land uses to the south and additional industrial development south of I-4 is identified in the future land use map.

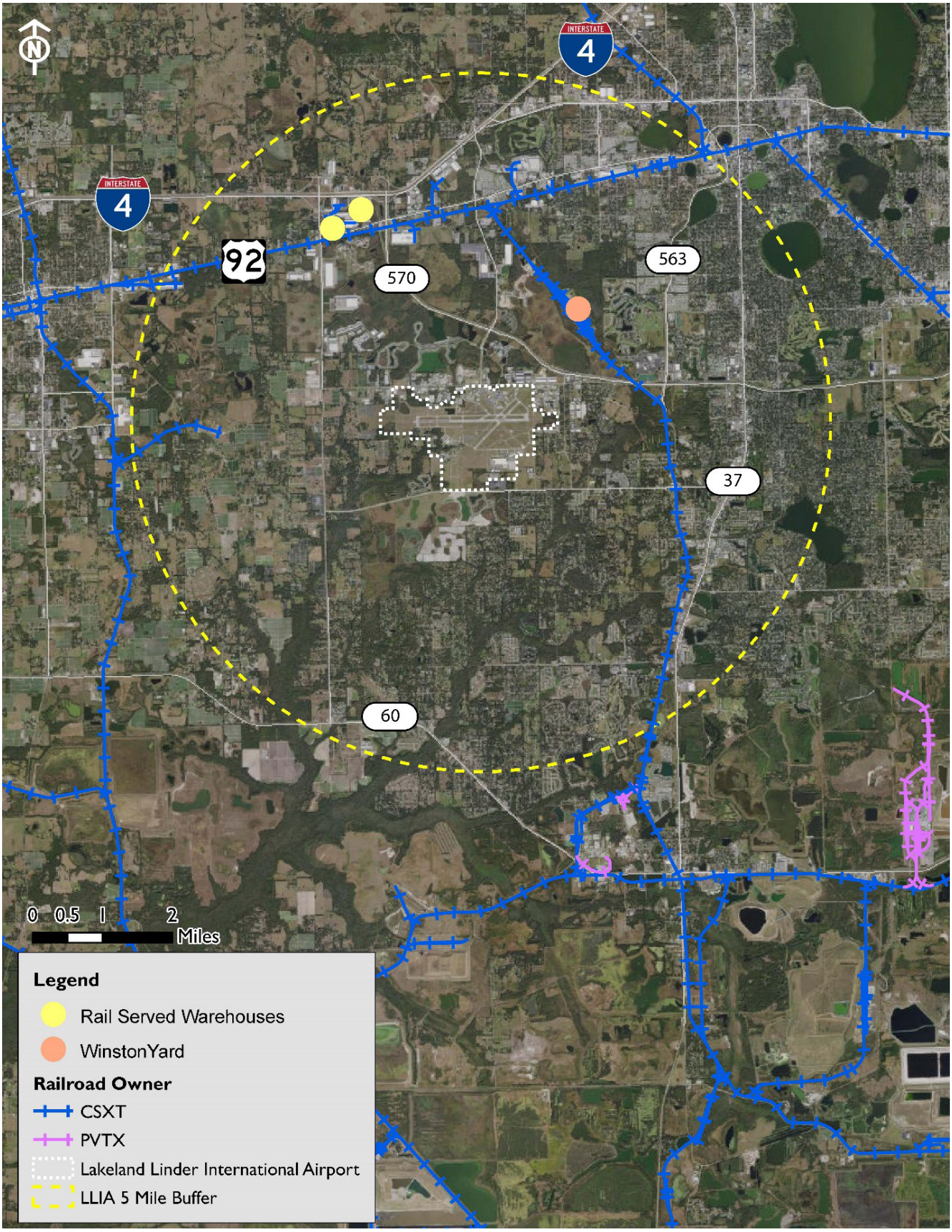
5.1.5 Rail

CSX is the only owner-operator of rail in the LAL study area. The CSX A Line is the east-west connector that runs just north of LAL. The Winston and Bone Valley Railroad runs north and south from Winston, Florida to Agricola, Florida and is east of the airfield. CSX Transportation also owns and operates a facility in Lakeland, Florida, Winston Yard. This is a flat switching yard with a car shop on-site (Figure 8).

CSX Intermodal Terminals owns and operates two intermodal railroad facilities in the region. CSX Central Florida ILC is located in Winter Haven, Florida approximately 26 miles from the airport and handles mainly 53 foot (domestic) containerized traffic. CSX Intermodal Tampa is approximately 26 miles from the airport and handles both domestic and international size container traffic.

If transloading and rail service is desired by any future tenant, there are two facilities that provide warehousing and transloading services with CSX rail access in the study area. This operation would require relationships and agreements to be built with both CSX and the warehousing company that has rail access.

Figure 8 - LAL Study Area Rail Facilities

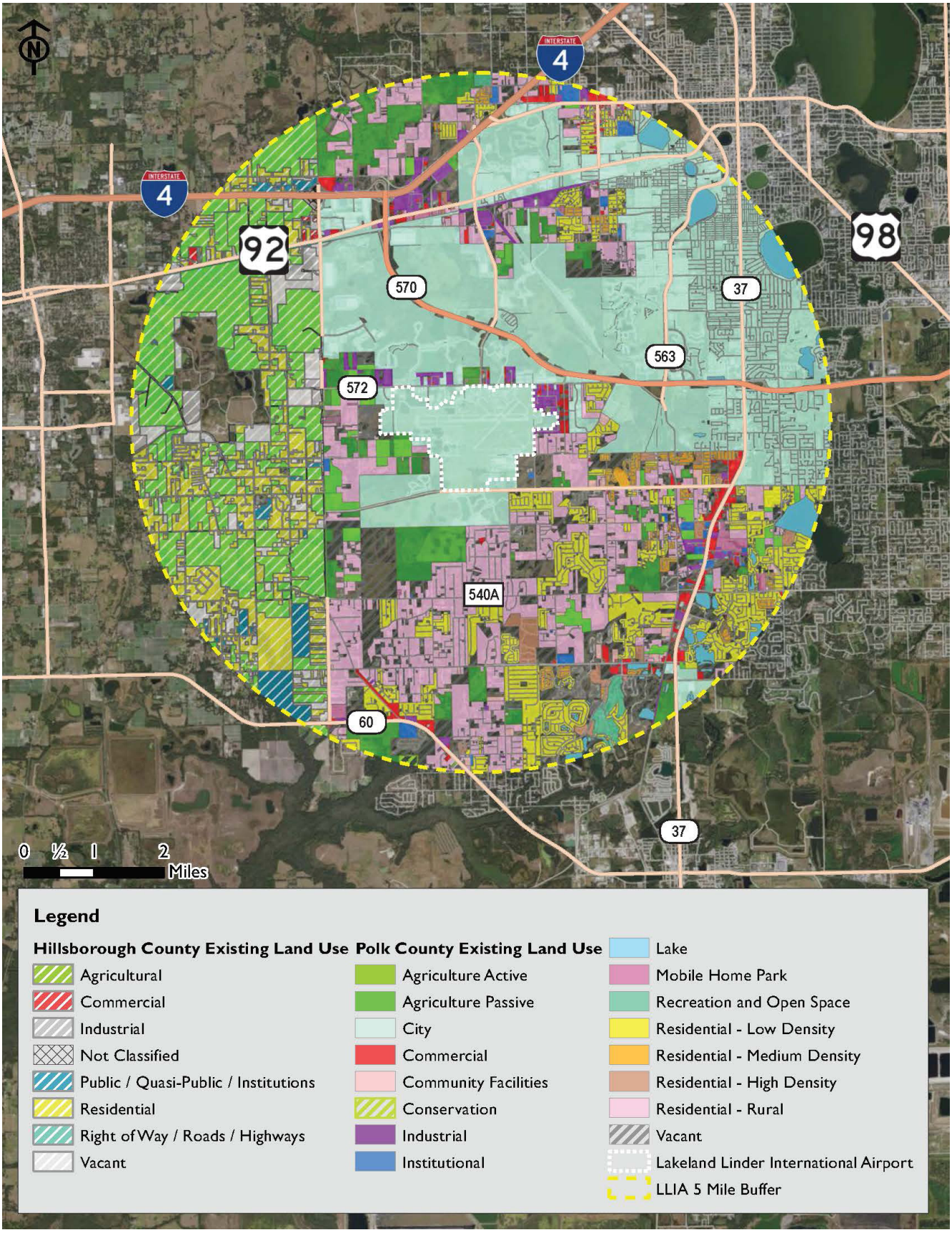


5.1.6 Existing Land Use

The airport, itself, is comprised of approximately 1,710 acres of land within its boundary zoned as municipality. This land is also classified as city owned land. As shown in Figure 9, there are existing industrial land uses on the northern perimeter of the airport, further north within close proximity to I-4 and US 92, and various locations to the East in Hillsborough County. General land uses surrounding the airport are as follows:

- Land to the north and east is primarily zoned City located in Polk County;
- Land to the south is primarily zoned Mobile Home Park and Low Density Residential in Polk County; and
- Land to the west is primarily zoned agricultural and residential in Hillsborough County.

Figure 9 - LAL Study Area Existing Land Use



5.1.7 Future Land Use and Vacant Parcels

The Future Land Use Map (FLUM) is established by local jurisdictions to plan where new develop can occur as shown in Figure 10. LAL and a large majority of the surrounding area remain as City for future land use. Industrial areas are located in close proximity to I-4 and US 92 north of the airport and in large clusters within Plant City and Hillsborough County areas. General land usage surrounding the airport is as follows:

- Land use to the north, east, and south is primarily City, Residential, and Commercial located in Polk County; and
- Land use to the west is primarily Residential, Industrial, and Mixed-Use located in Hillsborough County and Plant City.

Figure 11 provides a depiction of the vacant and industrial parcels within the study area. Vacant parcels are located throughout the study area with a strong focus of those parcels to the south of the airport.

Figure 10 - LAL Study Area FLUM

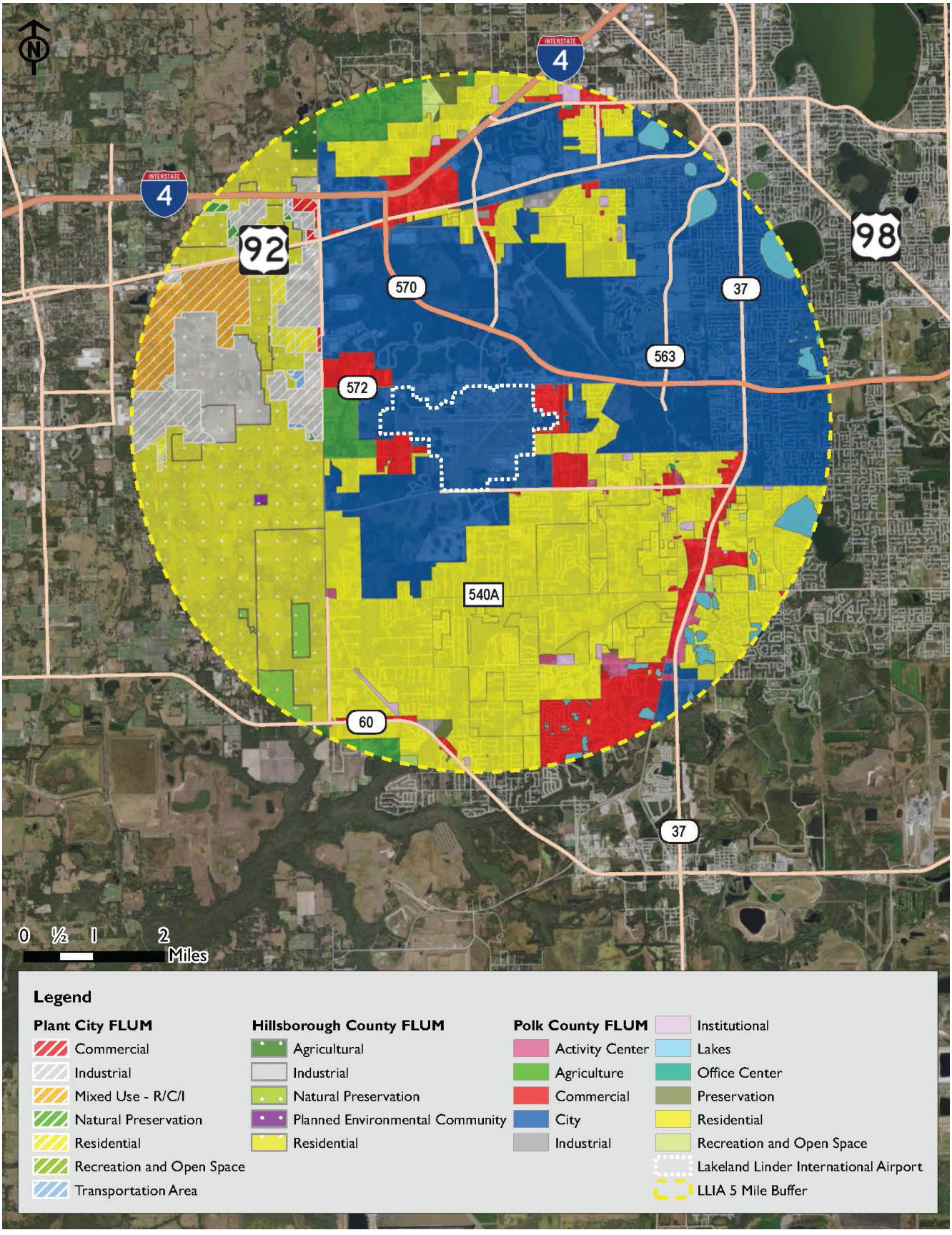
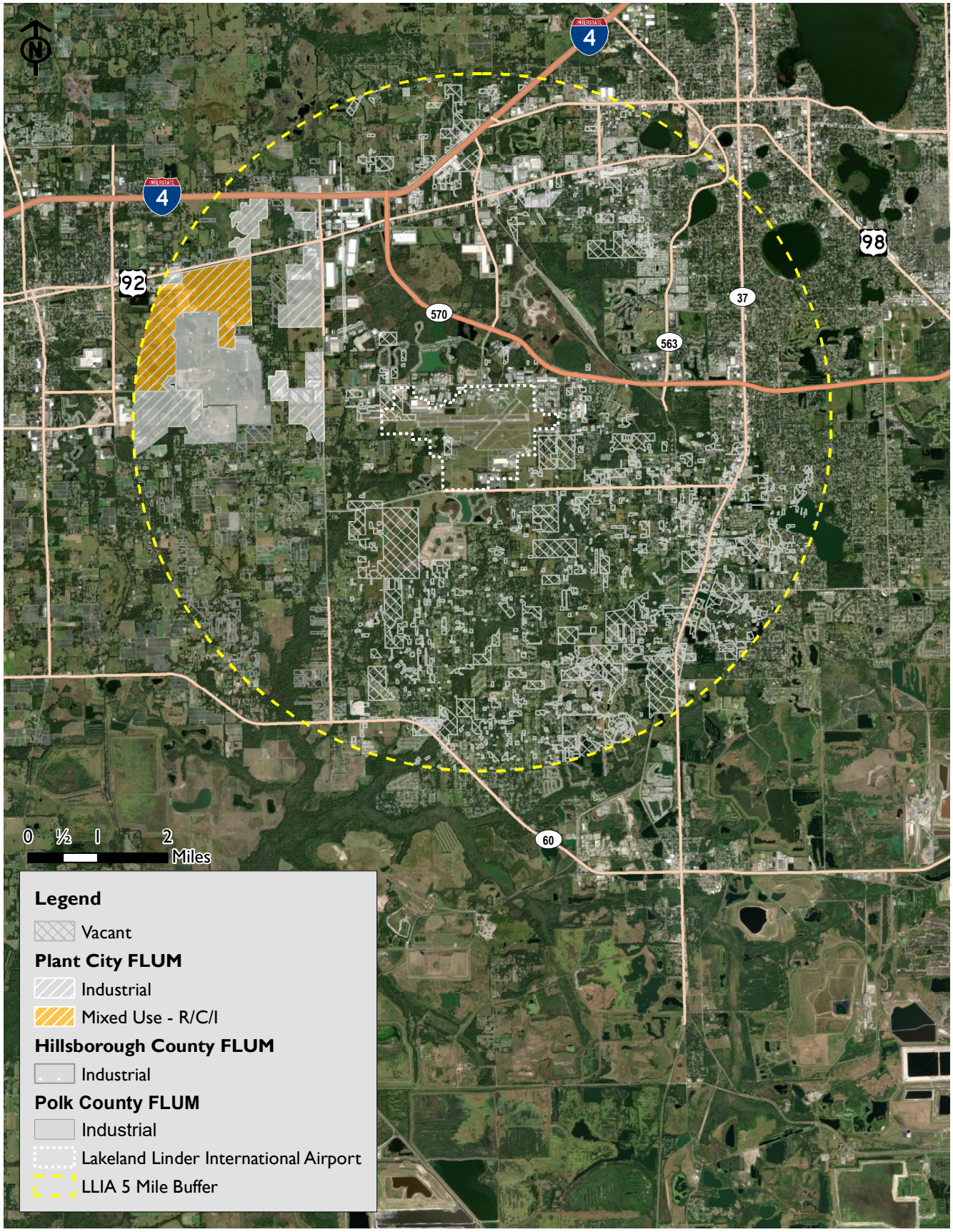


Figure 11 - LAL Study Area Vacant and Industrial Lands



5.2 Existing Traffic Data and System Performance

Data was collected from Florida Traffic Online[14] to determine the baseline AADT and truck volumes traveling within the LAL study area. The measurement of AADT provides basic empirical understanding of traffic conditions on a given roadway. The number is derived by dividing the total annual number of vehicles on a highway or road by 365 days. This information is collected by FDOT and made available publicly.

5.2.1 AADT and Truck AADT

The roadways that are travelled the most within the LAL study area are I-4, SR 570, SR 563, and SR 37 (Figure 12). I-4, carries the highest volumes with 135,500 AADT near its intersection with SR 570. SR 570 experiences its highest AADT of 35,400 trips per day near the intersection of Airport Road, a major access point for LAL. SR 563 has its highest AADT near SR 570 with 39,500 trips per day. Likewise, SR 376 has its highest AADT close to SR 570 with 41,500 trips per day.

LAL truck volumes were captured for the study area and follow similar patterns as AADT. The highest truck volumes are along the I-4 and SR 570 corridors (Figure 13). However, County Line Road and SR 60 tend to carry the highest truck percentages towards the southern side of the study area. An increase in traffic volumes is expected within the study area as a direct result of the new Amazon facility. For example, AADT projection data for Drane Field Road, provided by FDOT, reflects a current AADT of 13,700, and projections of 13,800 and 15,700 for 2021 and 2041, respectively. These AADT forecasts are conservative, compared to those utilized in this study to analyze future AADT and truck AADT conditions.

14 Source: https://tdaappsprod.dot.state.fl.us/fto/

Figure 12 - LAL Study Area AADT

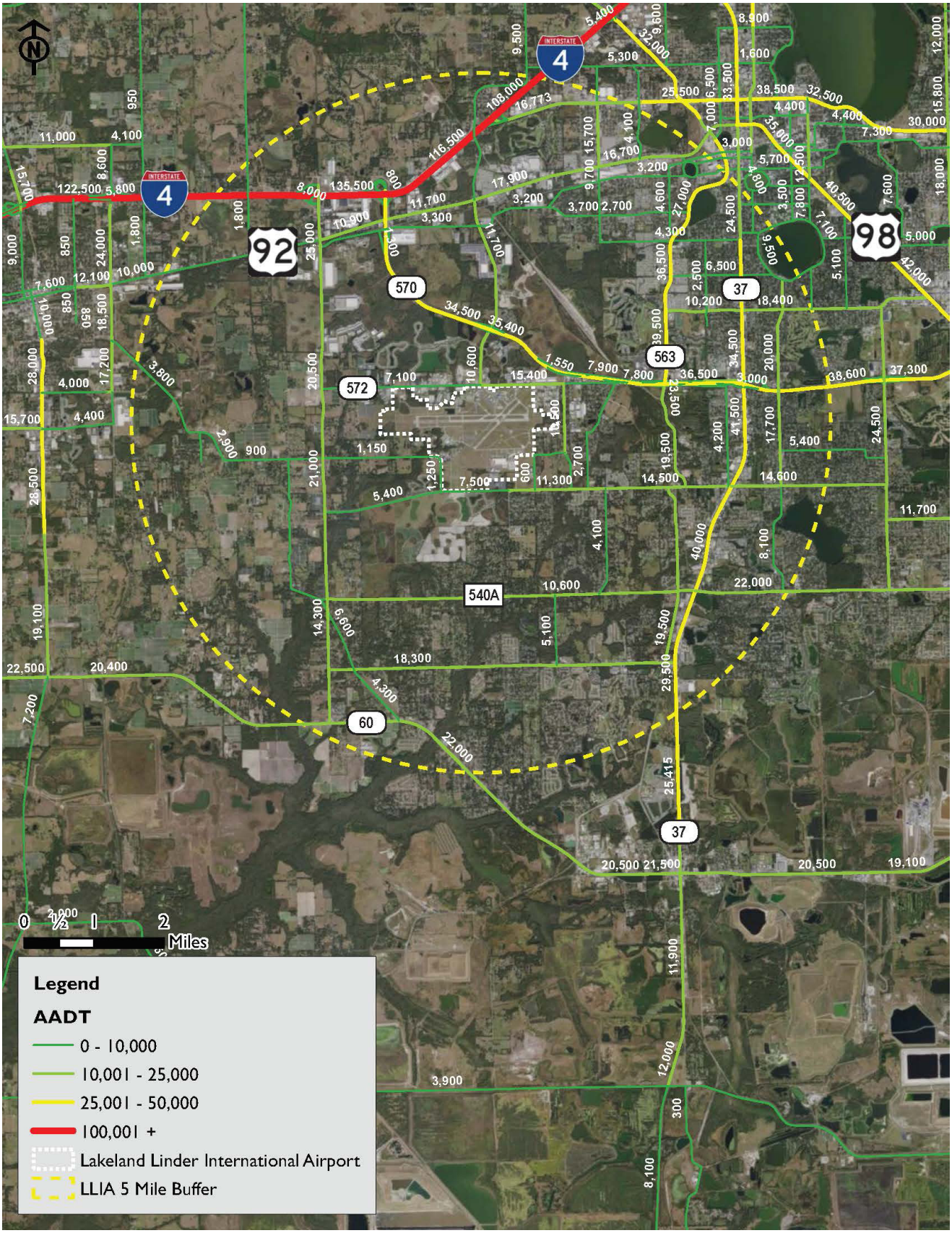
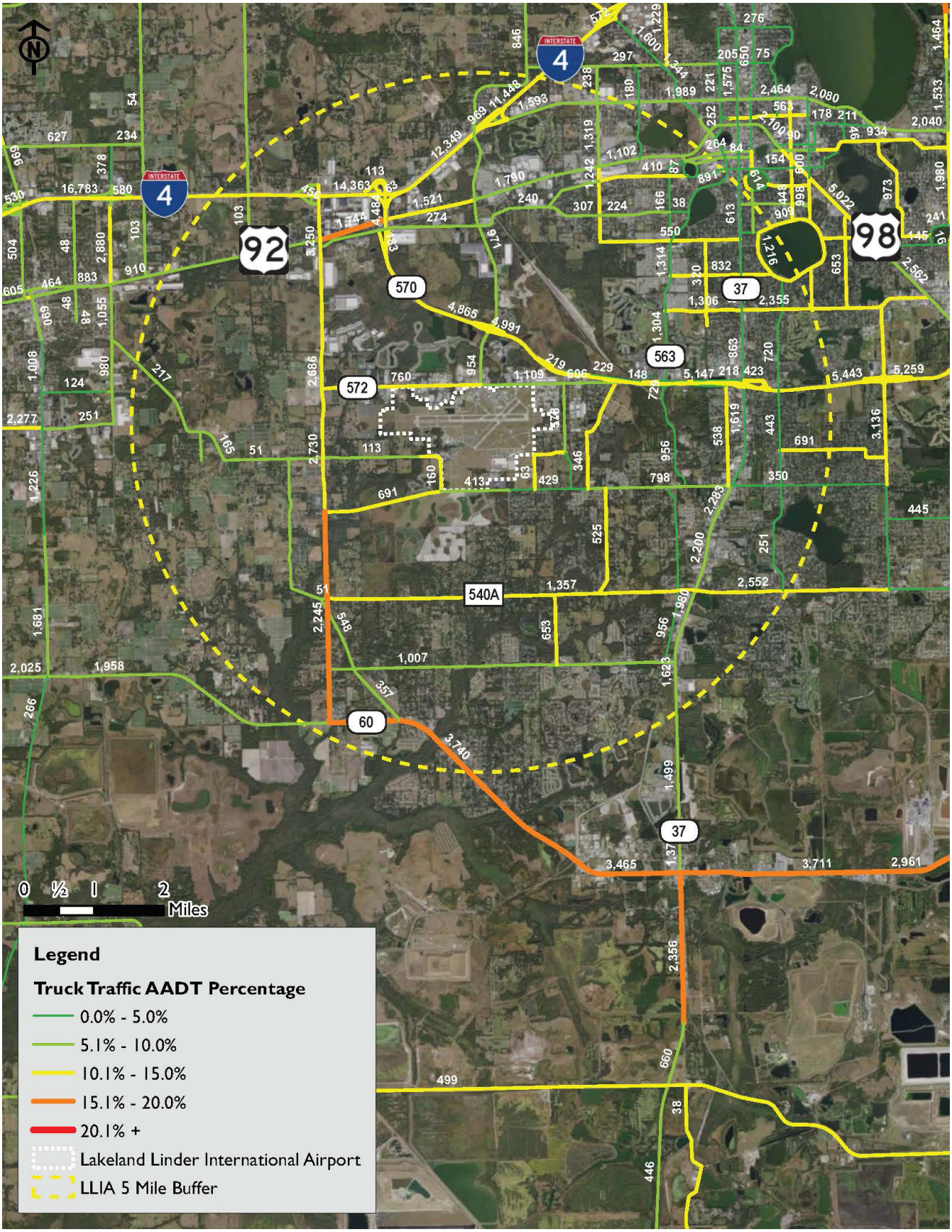


Figure 13 - LAL Study Area Truck Volumes



5.2.2 Crash Rates and Density

Vehicular crashes are depicted as both an area fie year crash rate and a crash density heat map (Figure 14 and Figure 15 respectively). The analysis shows that accidents occur frequently in-and-around intersections, especially if they are interchanges. The interchange of I-4 and SR 570 as well as the interchange at US 92 and SR 570 show the highest propensity of accidents in the study area. This is important as freight would likely use the I-4 corridor once it leaves LAL.

Figure 14 - LAL Study Area Crash Rate

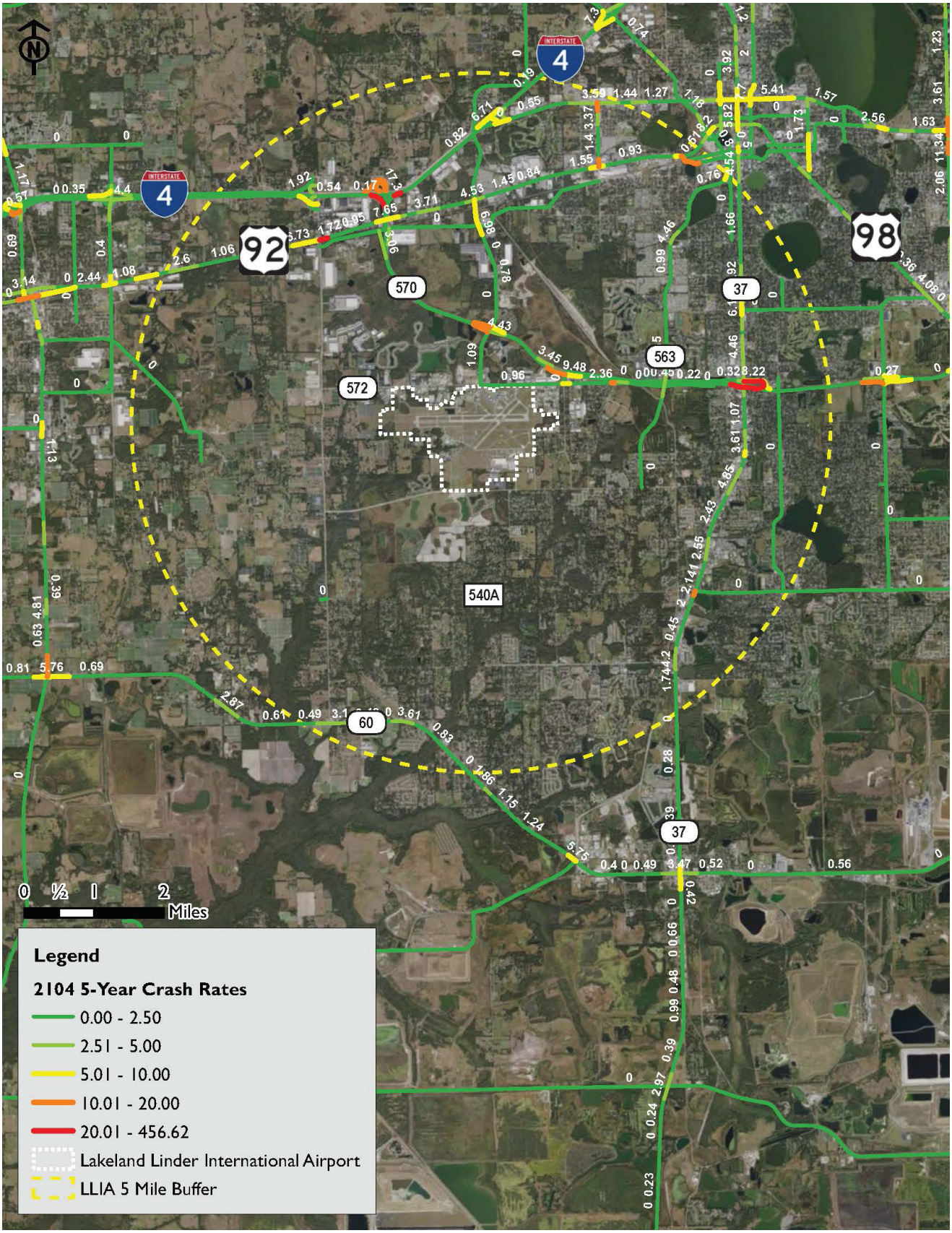
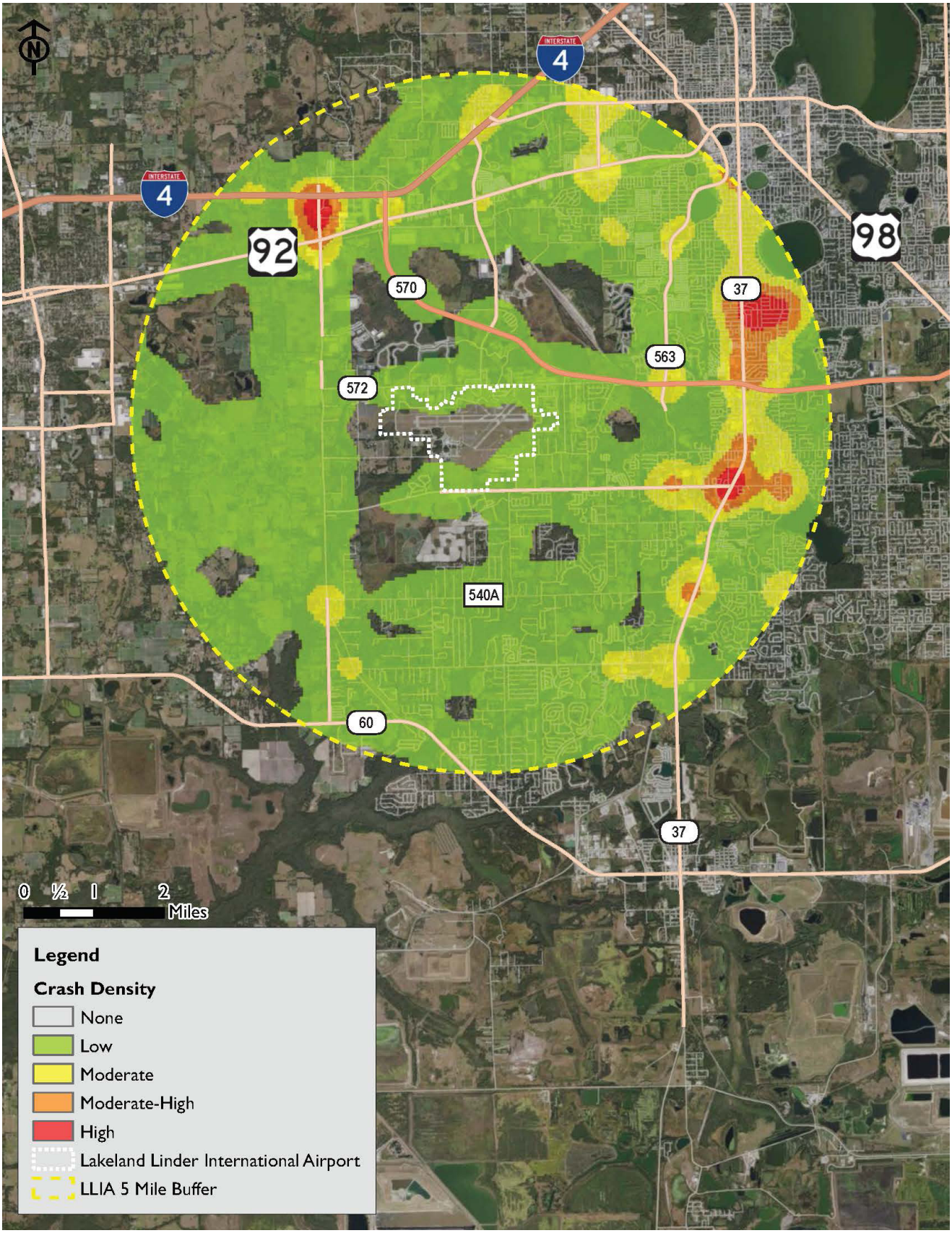


Figure 15 - LAL Study Area Crash Density



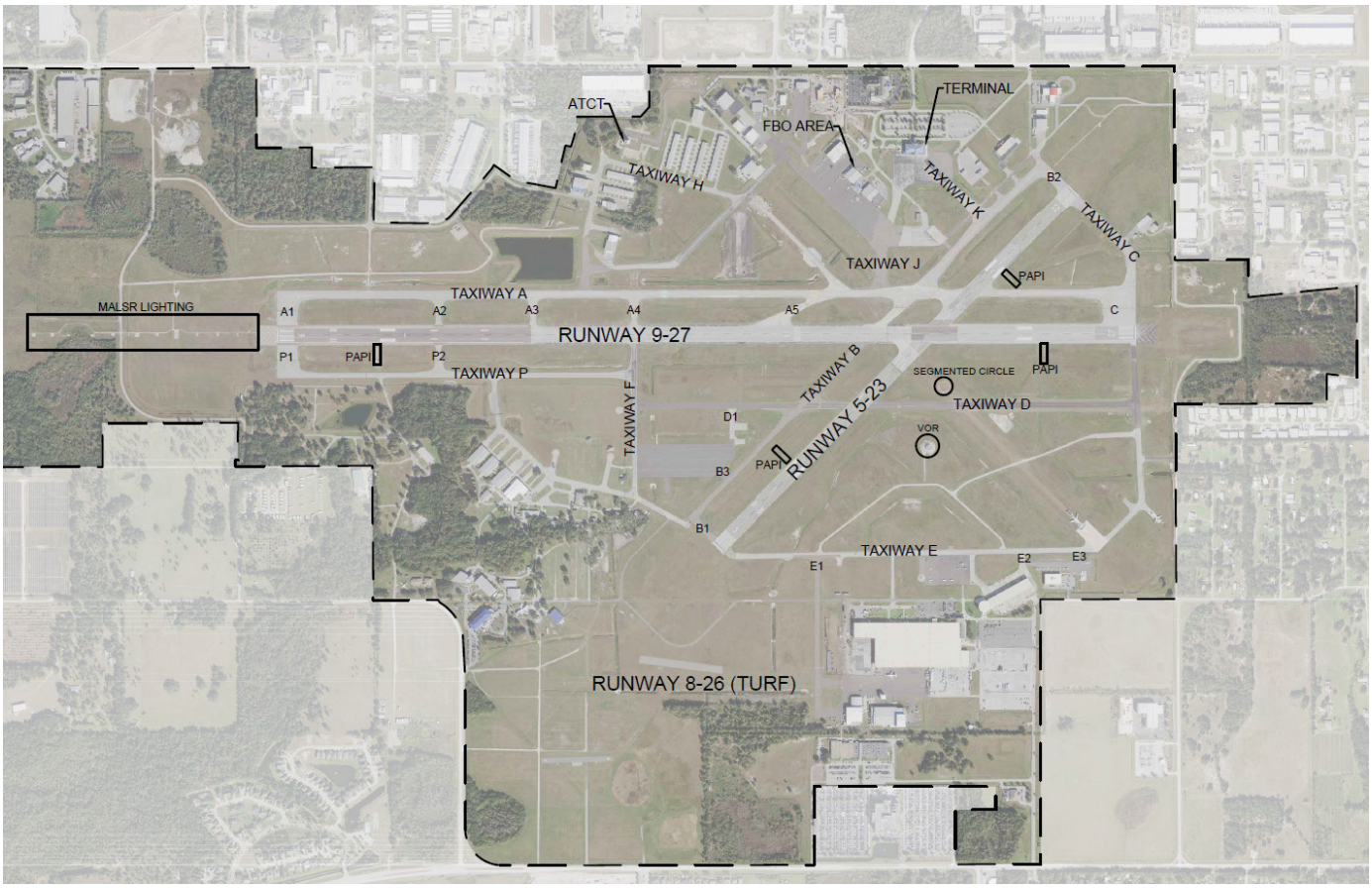
5.3 Existing Conditions & Master Plan Review

5.3.1 Geography and Airside Facilities

LAL is located approximately seven roadway miles south of the City of Lakeland in Polk County, Florida and sits on approximately 1,710 acres with an elevation of 142 feet above mean sea level (AMSL). The airport is roughly thirty-one miles east of Tampa and sixty-one miles southwest of Orlando.

Airside facilities at LAL consist of three runways, eleven taxiways, approximately five parking aprons, navigational aids (NAVAIDS), weather aids, and one Air Traffic Control Tower (ATCT) as show in Figure 16. LAL operates within a Class D Airspace and has an ATCT that operates between the hours of 6am and 10pm eastern standard time.

Figure 16 - LAL Facilities



Source: LAL 2018 Airport Master Plan

Table 4 shows limited characteristics for runways 9-27, 5-23, and 8-26. These characteristics can be used to identify what types of airplanes can be used to serve the airport. Runway 9-27 is the primary facility for the airfield. 8-26 is a smaller facility that is made of turf and requires pre-approval from LAL before it can be used.

Table 4 - LAL Runway Characteristics

Characteristic		Runway 9	Runway 27	Runway 5	Runway 23	Runway 8	Runway 26
Length & Width		8,499' x 150'		5,005' x 150'		2,205' x 60'	
Displaced Threshold		Yes	Yes	Yes	Yes	Yes	Yes
Marking (Condition)		Precision	Non-Precision	Non-Precision	Non-Precision	Concrete	Concrete
NAVAIDS		PAPI HIRL VOR ILS LOC RNAV MALSR	PAPI HIRL VOR RNAV	PAPI HIRL	PAPI HIRL	N/A	N/A
Surface Type		Asphalt (Grooved)		Asphalt (Grooved)		Turf	
Strength	Single Wheel	105k Lbs.		94k Lbs.		N/A	
	Dual Wheel	170k Lbs.		150k Lbs.		N/A	
	Dual Tandem	N/A		N/A		N/A	
	Double Dual Tandem	N/A		N/A		N/A	
Effective Gradient		0.1	0.1	0.2	0.2	N/A	N/A
Pavement Condition (2015)		Good		Good		Fair	

Taxiways are used by aircraft to navigate the airport once they depart a runway. Table 5 describes the taxiway facilities at LAL.

Table 5 - Taxiway Characteristics

ID	Location / Description	Type	Pavement Needs Work	Width	Distance to Runway
A	Parallel / North Side of 9-27	Asphalt	No	75'	400'
B	Parallel / West Side of 5-23	Asphalt	No	75'/50'	400'
C	East of Runway 23 and North of Runway 27	Asphalt	Yes	75'	Unknown
D	South of Runway 9-27	Asphalt	No	60'	Unknown
E	South East Portion of Airport	Asphalt	Yes	50'	Unknown
F	Perpendicular to 9-27	Asphalt	Yes	50'	Unknown
G	Perpendicular to Taxiway A	Asphalt	No	50'	Unknown
H	Perpendicular and North of Taxiway A	Asphalt	Yes	50'	Unknown
J	Perpendicular and North of Taxiway A	Asphalt	No	75'	Unknown
K	Perpendicular to Taxiway B	Asphalt	No	75'	Unknown
P	Parallel to Runway 9-27	Asphalt	No	50'	Unknown

Parking aprons are used by transient and based aircraft. LAL has two main parking aprons that are publicly accessible. One of the main aprons is run by the airport itself; Sheltair manages other apron. Sheltair is a fixed-base operator (FBO) that provides services such as fueling, maintenance, parking, tie downs, and other aeronautical services.

NAVAIDS and ATCT facilities are used to help pilots safely navigate aircraft on and to the airfield. NAVAIDS are either visual or instrument based, while ATCT facilities are categorized as communications, surveillance, or weather facilities. Figure 16 depicts the location of the NAVAIDS for each runway at LAL. Precision Approach Path Indicators (PAPI) provide visual vertical guidance to pilots during their approach to land. High Intensity Runway Edge Lights (HIRL) are used to help guide pilots as they approach the runway. Non-precision approaches that are available at LAL include Very High Frequency Omni-Directional Range (VOR) and Area Navigation (RNAV). There is one Instrument Landing System (ILS), one Landing System Localizer (LOC), and a Medium Intensity Approach Lighting System with Runway Alignment Lights (MALSR) on Runway 9.

The 2019 Statewide Airfield Pavement Management Program, developed by FDOT, determines the condition of pavements so that funding can be prioritized accordingly for assets. Figure 17 depicts the results of the pavement study for LAL. Within the study, FDOT recommends Minimum Service Pavement Conditions Index (PCI) for pavements based on the use of the transportation facility and the airport type as shown in Table 6. Maintenance and repair should be conducted to improve pavement conditions and to prevent critical PCI status, as set by the FDOT Recommended Minimum Service Level. Major construction is needed once the pavements reach the Critical PCI threshold. The study forecasts average pavement conditions generally if no improvements are to be made as shown in Table 7 which shows degradation over time.

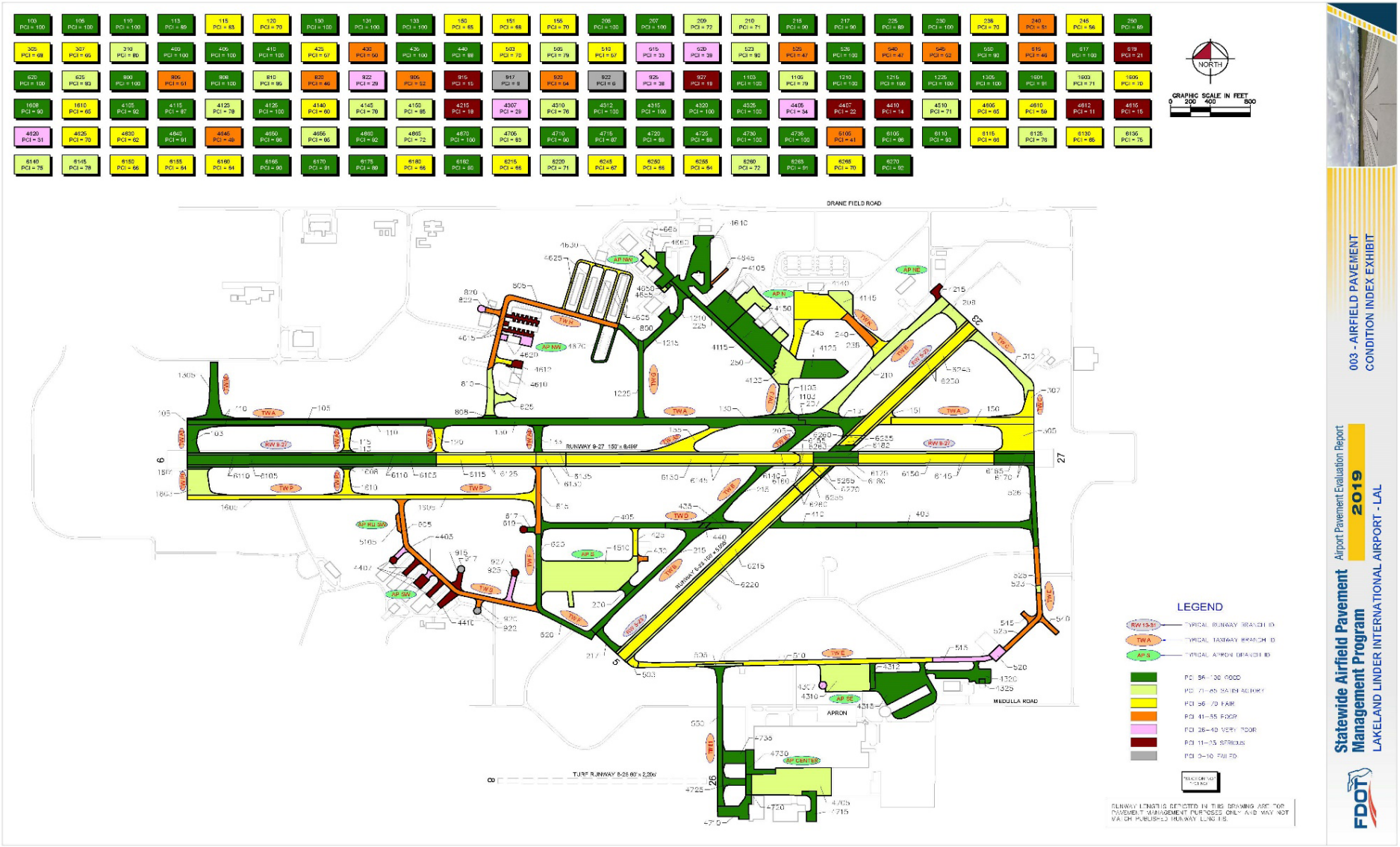
Table 6 - FDOT Airfield Recommended and Critical Service PCI Levels

Use	FDOT Recommended Minimum Service Level PCI			Critical PCI
	Primary Airports	Regional Reliever Airports	General Aviation Airports	
Runway	75	75	75	65
Taxiway	70	65	65	65
Apron	65	65	60	65

Table 7 - LAL Forecasted Pavement Conditions (Overall Area-Weighted PCI)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Runway	72	71	70	69	68	67	66	65	64	63
Taxiway	78	77	75	74	72	71	70	68	67	66
Apron	74	72	71	69	67	65	64	62	61	59

Figure 17 - LAL Pavement Condition



Source: FDOT 2019 Statewide Airfield Pavement Management Program

5.3.2 Roadway Access

LAL is approximately four miles south of I-4 and roughly twenty miles east of I-75, which are both designated as SIS corridors. Airport Road and Drane Field Road offer direct, local, and public access to LAL property.

Roads that serve LAL are all operating at a Level of Service (LOS) E or better. According to the CCPG 2040 Transportation Plan, less than 1 percent are operating at LOS B, 76 percent are operating at LOS C, 19 percent are operating at LOS D, and approximately 5 percent are operating at LOS E. None of the roads are failing at a LOS F.

5.3.3 Tenants

LAL holds approximately 36 percent of total GA based aircraft and supports approximately 31 percent of GA operations in the Central Region. Landside facilities allow businesses to operate and lease space from the airport, serving as a large revenue generator for LAL. Table 8 provides the list of airport tenants. Currently, the airport boasts over one million square feet of leasable space.

Table 8 - LAL Tenants

Tenants			
Skyspot Advertising	MK Homes Limited	Sheltair Aviation Services	Civil Air Patrol - Florida Wing
Lakeland Aero Club	My Jet Manager	Doherty's Toys Second LLC	JBS Equities
Express Air Medical Transport	Navigator Aircraft Mgmt. Group	King Sky Flight Academy	Lakeland Executive Hangars
RVA (Tower)	Foster's Aircraft Refinishing	International Aero Academy, Ltd	Lakeland Wings
CE Avionics	AutoGyro	Sunrise Aviation	Legend Health
Gulf Coast Avionics	Hicks Holdings, Inc.	Wild Air Aviation	Hilton Garden Inn
Mac Avionics	Grounz 4 Divorce, LLC	COL - Airport	Staybridge Inn
Globe Aero	EAA - Chapter 454	COL - Telecommunications	PECU
Neel Aviation	OX5 Club	Central Florida Aerospace Academy	John J. Jerue Truck Brokers
Aviation Interiors Inc	Quite Birdman	Polk State College West	JRW Company
Duncan Interiors	Silver Wings	Polk State College-East Aviation	NuAviation
RDI	The Ninety-Nines	Travis Career Academy - Aviation	Ferrera Tooling, Inc.
Aeromech	Women in Aviation	FAA FSDO Orlando Field Office	DKS Aviation
Dixie Jet & Rotor Services	Pilot Mall	FAA Southern Region	Hertz
Double M Aviation LLC	Draken International	COL - ARFF Station 7	Hallback's Bar & Grill
Lakeland Aircraft Maintenance	A&C Drafting and Design, Inc.	COL - LPD - Hangar	Publix (Flight Department)
Lance Aviation	Tom Evans Environmental, Inc.	Florida Fish and Wildlife Commission	Publix (IT and Customer Service)
Fixed Wing Aviation Maint. LLC	Knight Aviation	US Customs & Border Protection	Seaplane Pilots Association
GDS, LLC	Frank Tiano Enterprises	US Army National Guard	Merfish Pipe & Supply
Avocet	Sun 'n Fun International Fly-In Inc.	NOAA Aircraft Operations Center	PODS
On-Site Weight & Balance	Richard Hirsch DPE	Civil Air Patrol - S. Lakeland	Amazon

The following businesses provide Maintenance, Repair, and Overhaul (MRO) services at LAL:

- Avocet Aviation;
- Aeromech;
- Double M Aviation;
- Dixie Jet & Rotor Services;
- Fixed Wing Aviation;
- Lakeland Aircraft Maintenance; and
- Lance Aviation.

The majority of freight received by these businesses is likely received via USPS, FedEX, or UPS based on the nature of their work. Additional freight may be received by less than truck load (LTL) as necessary. More details regarding businesses that operate within the air freight industry are below:

Amazon Prime Air

Amazon has invested approximately $100 million in the City of Lakeland and LAL to construct a 223,000 square foot air cargo building along with two accessory buildings making up a combined 60,000 square feet, as shown in Figure 18. Phase 1 includes a 23,000 square foot facility. The facility is estimated to bring 800 to 1,000 jobs to the region. The lease falls under a 20 year contract for 47.2 acres which would include the construction of seven-jet cargo hangars, with an option to expand on an adjoining 62 acres. Renewal of the lease will could allow Amazon Air to remain at the facility for a total of 50 years.

Amazon has agreed to terms to pay the airport 85 cents per 1,000 pounds of cargo landed at the airport, and a 3-cent surcharge per fuel gallon.

LAL is required to upgrade the landing systems at the airport (from CAT 1 to CAT III), add five fuel tanks, and improve one of the runways. LAL will complete the improvements for CAT II requirements by June 2020 and CAT III requirements by November 2021. Additional improvements to the roadway infrastructure will include adding turn lanes at the intersection of Drane Field Road and Kidron Road.

US Customs and Boarder Protection (CBP) has an office on site, making LAL an international airport for international passenger flights. Additional agreements would be required with the federal government and LAL prior to handling international freight; however, there may be opportunity for Amazon to receive international freight as a national point of entry.

The Amazon facility at LAL, which opened July 2020, is intended to replace existing operations at Tampa International Airport. Flight plans call for approximately seven to eight flights per day, equaling the volumes previously experienced in Tampa.[15]

Based on an interview conducted with LAL airport on August 28, 2019, LAL currently estimates approximately 225 trucks per day and up to 15 airplanes per day during Amazon's peak periods (January, July, November, and December).

15 The Ledger: https://www.theledger.com/news/20190517/amazon-air-hub-coming-to-lakeland-with-1000-jobs-its-big-deal

Figure 18 - Amazon Intermodal Center 7349 Site

Neel Aviation International Exports

Neel Aviation is an aviation service company that serves an international clientele. They provide a service to the aviation community ensuring an efficient and cost-effective means to ship aircraft via container. This is a niche industry and the company does transport vehicles via trailer and container to and from their location at LAL.

5.3.4 Foreign Trade Zone

In an effort to promote economic activity, a FTZ is a physical location that is granted special privileges by the US Federal Government for the importation and exportation of merchandise to-and-from the United States of America. Although an FTZ site is physically located within the US, for customs purposes, the site is considered to be located outside of the Customs Territory of the United States and all merchandise entering the FTZ site is considered international commerce. This allows for tariffs on goods that are shipped into the US and then back out to either be delayed, reduced, or eliminated. LAL is located within the Foreign Trade Zone (FTZ) number 79 (Tampa Bay & I-4 Corridor).

The fact that LAL is located within FTZ 79 offers unique growth opportunity for businesses residing on LAL property or in the surrounding area by allowing them to move goods to and from other zones with reduced or modified taxes. Businesses seeking to move goods by air will seek industrial or commercial properties within the FTZ area. Developing land on and around the airport to be used for industrial/commercial uses will increase the general fund for Lakeland and those funds should be used for future airport improvements.

5.4 Facility Planned Improvements

LAL currently does not have any scheduled cargo services, but did have ad-hoc services with an available capacity of approximately 134,738 pounds in 2016.[16] Over the last 10 years, more than $200 million have been invested into infrastructure at LAL in part to expand on the capabilities, capacity, and offerings to the regional aviation community. Continued efforts to increase capacity will provide opportunity for future cargo growth on-site and within the region.

One example of these investments is the Airport Commerce Park which is a 15 acre site adjacent to LAL. Uses such as Light Industrial are permitted for immediate development. Utilities (water, sewer, power, roads) have already been installed. There is one outparcel that is suitable for retail along Drane Field Road as well.

5.4.1 Maintenance, Repair, and Overhaul Facilities

MRO and air cargo facilities in the region are under a greater demand based on distribution centers locating in close proximity to I-4 including Publix, Amazon, Saddlecreek, and Walmart. In order to accommodate these needs, LAL was awarded $4.69 million from the 2019 Florida Job Growth Grant Fund to develop hangars and expand MRO facilities.[17]

5.5 Roadway Planned Improvements

LAL falls within the boundaries of the Polk Transportation Planning Organization (PTPO). PTPO is responsible for developing a Long Range Master Transportation Plan (LRTP) that includes all federally funded or regionally significant projects within its boundaries. Projects in the LRTP are categorized based-upon fiscal constraints and compared against other transportation projects in the region. The PTPO Board of Directors adopted the Momentum 2040 (the PTPO LRTP) in December of 2015. Transportation projects that were pulled from Momentum 2040 that will help improve mobility around LAL when they are completed in the future are:

- Capacity Improvements on I-4 from the Hillsborough County line to the Osceola County Line;
- West Pipkin Road Widening (Medulla Road to Pipkin Road South);
- West Pipkin Road at Yates Road Intersection;
- West Pipkin Road Widening (Pipkin Road South to Harden Boulevard); and
- Drane Field Road at Waring Road Intersection.

Like the LRTP, the Transportation Improvement Program (TIP) is managed by PTPO. The TIP is a short range plan (five year forecast) for projects that have or will receive federal funding. TIP projects that will improve transportation facilities around LAL are:

- Drane Field Road at Don Emerson Drive – Roundabout (Federal Funding Year – 2021);

16 FACS http://www.florida-aviation-database.com/library/filedownload.aspx?guid=90cff320-313d-4c9f-a639-d63d538b467a

17 https://www.bizjournals.com/tampabay/news/2019/01/08/lakeland-airport-wins-state-grant-to-help-build.html

- Drane Field Road at Waring Road – Roundabout (Federal Funding Year – 2024);
- Lakeland Intermodal Center – (Federal Funding Year – Current); and
- Various projects along the Polk Parkway (Federal Funding Year Current to 2021).

In addition the above, and projected for letting in November 2020, the City of Lakeland will begin a project in January 2021 to widen County Line Road and make improvements to the railroad crossing at County Line Road and US 92.

5.6 Projected Growth

5.6.1 Aviation Freight Growth

Based on the 2016 FACS, there were 17 air cargo operations at LAL and the cargo volume was estimated to be 64,674 pounds. By using the CAGR of 0.52 percent, operations and volumes were projected for 2020, 2030, and 2040 as shown in Table 9. This will represent existing projected volume growth.

With Amazon increasing operations at LAL, a forecast has been created to add to the existing freight operations. Amazon currently uses Boeing 737s or Boeing 767s to move freight. The Boeing 767 can carry up to 116,000 pounds while the Boeing 737 can carry up to 46,000 pounds of air cargo. An average freight capacity of 81,000 pounds is used to estimate future volumes, as shown in Table 9.

Table 9 - LAL Air Cargo Projected Operations and Volumes

	Existing Operations		Forecasted Amazon		Combined	
Year	**Operations (Annually)**	**Volume (Pounds)**	**Operation (Annually)**	**Volume (Pounds)**	**Operation (Annually)**	**Volume (Pounds)**
2016	17	64,674	N/A	N/A	17	64,674
2020	17	66,030	3,539	286,659,000	3,556	286,725,030
2030	18	69,545	4,357	352,917,000	4,375	352,986,545
2040	19	73,247	5,363	434,403,000	5,382	434,476,247
	0.52% CAGR		2.1% CAGR			

5.6.2 Roadway Network Growth

Traffic operating conditions were evaluated for study area roadways that are most likely to be impacted by forecasted automobile and freight movement growth for LAL. Table 10 presents the LOS analysis results for these roadways. All roadways currently operate at an acceptable LOS.

Table 10 - LAL Existing Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2018				
				AADT	Truck AADT	Truck %	Peak Hour Volume	LOS
Drain Field Rd	County Line Rd to Pipkin Creek Rd	9.0	54.5	11,250	935	8.3%	1,015	**C**
Airport Rd	Drain Field Rd to SR 570	9.0	54.5	10,600	954	9.0%	955	**C**
S. Pipkin Rd	Drain Field Rd to W. Pipkin Rd	9.0	54.5	4,589	578	12.6%	415	**B**
W. Pipkin Rd	County Line Rd to S. Pipkin Rd	9.1	54.5	8,067	511	6.3%	735	**B**
County Line Rd	Drain Field Rd to W. Pipkin Rd	9.5	54.5	21,000	2,730	13.0%	1,995	**B**
SR 570	Old Tampa Hwy to Pipkin Creek Rd	9.0	57.7	35,150	4,928	14.0%	3,165	**B**

Vehicular traffic growth around LAL is projected to grow at a CAGR of 2.90 percent based on the population growth of Polk County. The roads in the study area that were evaluated for future LOS are shown in Table 11. SR 570 carries the most volume and is expected to do so in the future after the growth rate is applied as well.

With increases in air cargo from Amazon expected at LAL, projections for increased truck volumes are anticipated as well. Truck volume is projected to increase at 2.1 percent, the growth factor used for airports with scheduled air cargo services.

Roadway capacity analyses were conducted based on the 2020, 2030, and 2040 traffic projections. The differences in overall AADT and truck AADT growth results in varying truck percentages between 2020, 2030, and 2040 conditions. The results of the future conditions capacity analysis indicated that all study area roadways are expected to operate at acceptable LOS with the exception of Drain Field Road and Airport Road in 2040. Improvements to these facilities will be necessary to accommodate expected traffic demands by 2040.

Table 11 - LAL Future Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2020				2030				2040			
				AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
Drane Field Rd	County Line Rd to Pipkin Creek Rd	9.0	54.5	11,912	975	8.2%	C	15,854	1,200	7.6%	D	21,100	1,477	7.0%	E
Airport Rd	Drane Field Rd to SR 570	9.0	54.5	11,224	994	8.9%	C	14,938	1,224	8.2%	D	19,881	1,507	7.6%	E
S. Pipkin Rd	Drane Field Rd to W. Pipkin Rd	9.0	54.5	4,859	584	12.0%	B	6,467	615	9.5%	B	8,607	648	7.5%	C
W. Pipkin Rd	County Line Rd to S. Pipkin Rd	9.1	54.5	8,541	533	6.2%	C	11,368	656	5.8%	C	15,130	807	5.3%	D
County Line Rd	Drane Field Rd to W. Pipkin Rd	9.5	54.5	22,236	2,846	12.8%	B	29,594	3,503	11.8%	B	39,387	4,312	10.9%	C
SR 570	Old Tampa Hwy to Pipkin Creek Rd	9.0	57.7	37,218	5,137	13.8%	C	49,535	6,324	12.8%	C	65,927	7,785	11.8%	D

5.6.3 Rail Growth

LAL does not have on-site rail access and limited opportunities for shipment by rail surrounding the airport. If freight were to be transported by rail, it would occur outside of the study area and require transit by truck prior to rail access.

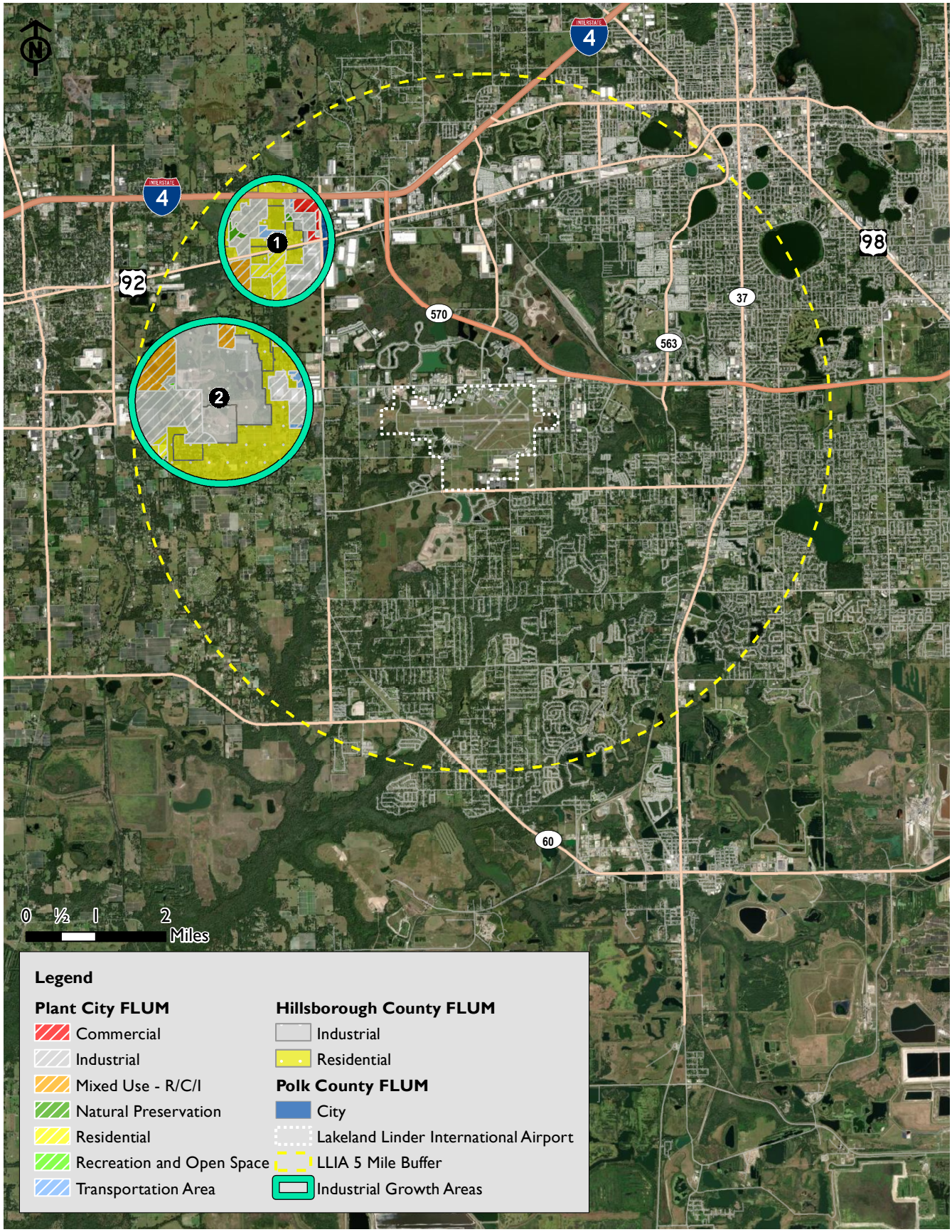
5.6.4 Qualitative Industrial Growth Area Analysis

Two locations have been identified within the LAL study area as suitable for industrial activity and growth, based on a review using the methodology described in section 4.4 of the report.

Proposed industrial growth area 1 is located northwest of the airport, as shown in Figure 19. The site runs north-south along the east side of County Line Road, from Drane Field Road, crossing US 92, north to I-4, and west approximately to Charlie Taylor Road. Future Land Use Maps all designate these properties for Industrial use. SR 570 (Polk Parkway) and I-4 are both SIS Highways within close proximity to the location. SIS rail is provided by CSX along US 92 as well as southwest of the site, at CR 574A. There is existing industrial development on the site at the intersection of US 92 and County Line Road. Industrial development is also present west of County Line Road, south to Drane Field Road. The location consists primarily of vacant land and some large-lot residential.

Proposed industrial growth area 2 is located west of LAL and directly southwest of industrial growth area one, shown below in Figure 19. CR 39B runs along the western perimeter of the site and provides access to US 92 to the north Sweetbay Distribution Center is currently located at the southern end of CR 39B. CR 574A bisects the property, running southeast from CR 39B. The industrial growth area then extends east to County Line Road. The location has CSX rail line running east into the property and terminating after crossing CR 574A. Both the Plant City and Hillsborough County Future Land Use Maps designate this area for Industrial use. The property is mostly vacant, but heavy industrial growth is now occurring at the intersection of County Line Road and Drane Field Road.

Figure 19 - LAL Industrial Growth Areas



5.7 Recommendations

Recommendations for LAL are focused on the airport site, the surrounding roadway network, and any on site rail improvements, if applicable. They are based on information from within this study and are categorized as short-term (1 to 5 Years), mid-term (6 to 9 years), and long-term (10 to 20 years), as shown in Table 12. Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan. Table 3 provides a rationale to improve intersections with concrete near industrial developments that carry high and growing truck volumes.

Table 12 - LAL Recommendations

Location	Improvement Recommendation	Identified Needs	Implementation Time Frame
LAL Airport Site Recommendations			
LAL	Industrial/commercial park marketing brochure	1 to 2 page brochure that promotes industrial / commercial lands in or near airport	Short-Term (1-5 Years)
LAL	FTZ Marketing Improvements	All FTZ materials from LAL point directly back to www.tampaftz.com Brand it with LAL.	Short-Term (1-5 Years)
LAL	Runway 9-27 & Runway 5-23	Major Reconstruction	Short-Term (1-5 Years)
LAL	Taxiways	Major Reconstruction	Short-Term (1-5 Years)
LAL	Apron	Major Reconstruction	Short-Term (1-5 Years)
LAL Roadway Network Recommendations			
Intersection of County Line Rd at Drane Field Rd	Intersection Improvements to include additional left turn lanes	Trucks from new development (O'Reilly Auto Parts Amazon, Publix) utilize this intersection	Short-Term (1-5 Years)
Intersection of Drane Field Rd at Kidron Road	Intersection Improvements to include left and/ or right turn lanes for all approaches	Existing congestion at intersection	Short-Term (1-5 Years)
Intersection of Drane Field Rd at Waring Road	Intersection Improvements to include additional turn lanes	Existing congestion at intersection	Short-Term (1-5 Years)
Airport Road from Drane Field Rd to Carillon Blvd	Widen Airport Road for 1/2 mile to tie into existing 4-lane section	Failing LOS by 2040	Long-Term (10-20 Years)
Intersection of Rice Rd and S Wiggins Rd	Intersection Improvements (additional turn lanes, investigate signalization or possible roundabout)	Expected traffic from major warehousing/light industrial development underway adjacent to intersection	Short-Term (1-5 Years)
Drane Field Road from Waring Road to County Line Road	Widen Drane Field Road to four lanes	Failing LOS by 2040	Long-Term (10-20 Years)
Intersection of Drane Field Rd at Hamilton Rd	Conduct periodic traffic analysis to identify potential bottleneck conditions	Long term access needs for airport	Mid and Long-Term
Intersection of Hamilton Rd at Old Medulla Rd	Conduct periodic traffic analysis to identify potential bottleneck conditions	Long term access needs for airport	Mid and Long-Term
LAL Rail Recommendations			
There are no recommendations for rail improvements within the LAL study area			

5.8 Conclusion

In an effort to attract more air cargo business, airport site recommendations focused, in part, on increased marketing of the Foreign Trade Zone. These marketing recommendations may help attract more air cargo operators or industrial/ commercial businesses by building on the existing work that LAL is already conducting. By expanding MRO facilities and working with companies like Amazon, LAL is already positioning itself to increase air cargo operations and

volumes. Continued coordination with their tenants and infrastructure maintenance and construction will be required to ensure continued efficient cargo handling. Moving forward, LAL will benefit from marketing new businesses and enhancing their current tenant relationships, who follow their vision for growth.

Similarly, collaboration will also be required with FDOT and local governments to ensure that the surrounding roadway network will provide adequate service levels for both truck and vehicular traffic. Several roadway recommendations were provided focusing on the movement of people and goods within the study area. Working with FDOT, LAL has the ability to promote advanced planning and construction of infrastructure for the roadway network. Continuous roadway network improvements around LAL will inspire confidence in businesses who wish to expand or serve the region with more air cargo and truck freight.

6

Sebring Regional Airport

6. Sebring Regional Airport

SEF is managed and operated by the Sebring Airport Authority (SAA). SAA was established by the Florida Legislature and operates through Chapter 189 of the Florida State Code. The SAA consists of six board members who manage a four person staff that consist of the Executive Director, Executive Assistant, Director of Finance, and the Property Maintenance Manager.

The 2019-2023 NPIAS designates SEF as a Public Use, Regional General Aviation Airport. SEF operates with approximately eighty-seven based aircraft on two runways, with total operations approximating 103,087 departures/arrivals annually. The primary supported GA activities for local and transient users include parachuting and ballooning, business flights, cargo, and agricultural spraying. The 2019 Florida Statewide Aviation Economic Study states that SEF creates 2,649 jobs with a total payroll of $111,457,000.[18] The total SEF economic output for the region is approximately $368,436,000.

Special events that occur near or at the airport are the "12 Hours of Sebring", a car race held at Sebring International Raceway, and the US Sport Aviation Expo, a three-day showcase for sport and recreational aircraft annually. The most recent US Sport Aviation Expo attracted over 13,000 attendees. Projected attendance for the upcoming "12 Hours of Sebring" is approximately 100,000.

6.1 Study Area Physical Conditions Review

6.1.1 SEF Study Area

Figure 18 provides a depiction of the SEF study area which includes a five mile radius around the airport. The study area is entirely in Highlands County, Florida. The City of Sebring is outside of the study area to the northwest. The study area includes US 98, US 27, and SR 66.

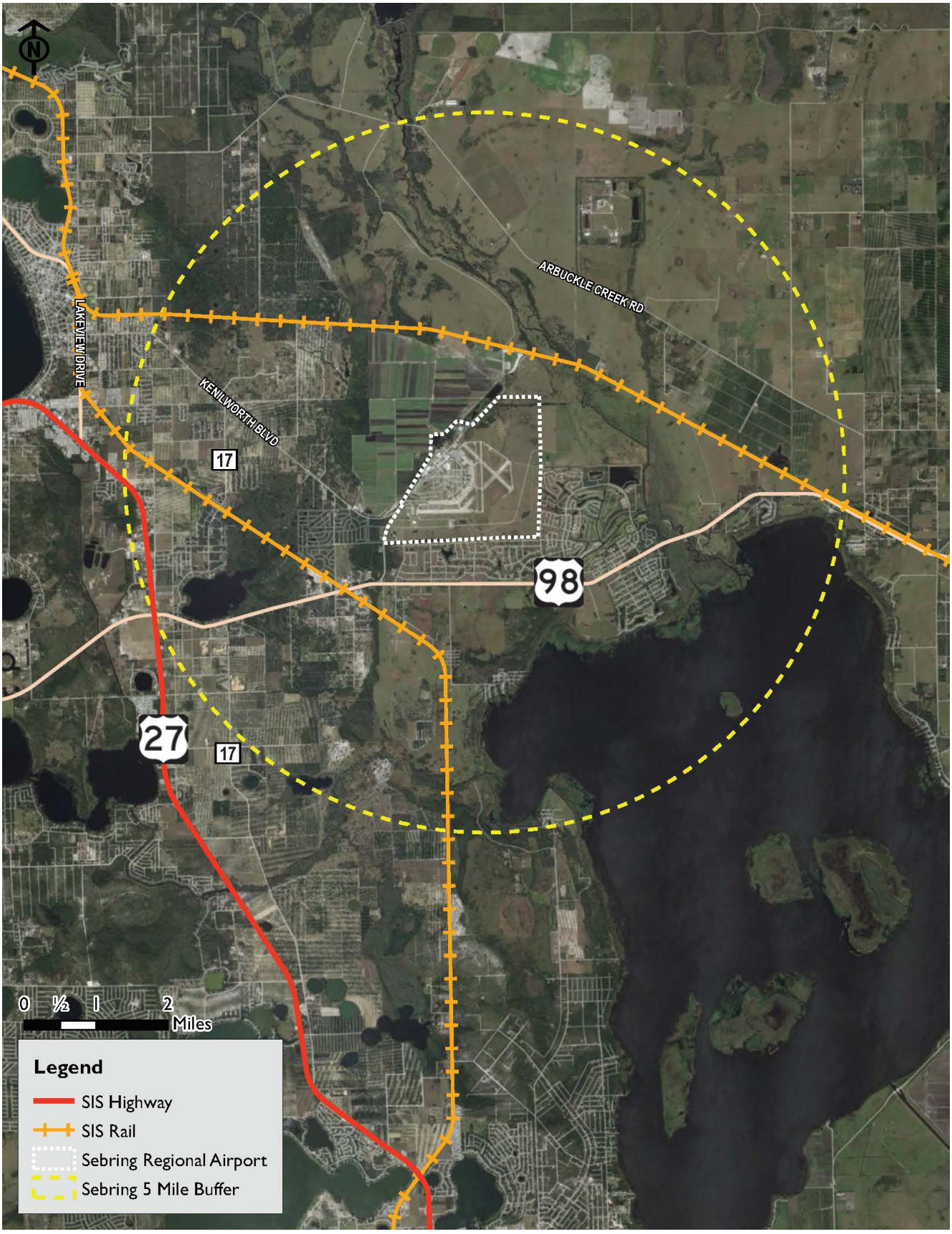
6.1.2 SIS Facilities

There are three SIS facilities within the SEF study area. Each SIS facility is shown in Figure 20 with more information below:

- US 27 is a highway that runs from Miami, Florida to Fort Wayne, Indiana;
- CSX Line is a SIS facility that runs to the north of SEF; and
- SCFX line is an emerging SIS facility that runs west and then south within the study area.

18 https://www.fdot.gov/aviation/economicimpact.shtm

Figure 20 - SEF Study Area and SIS Facilities



6.1.3 Roadway Infrastructure

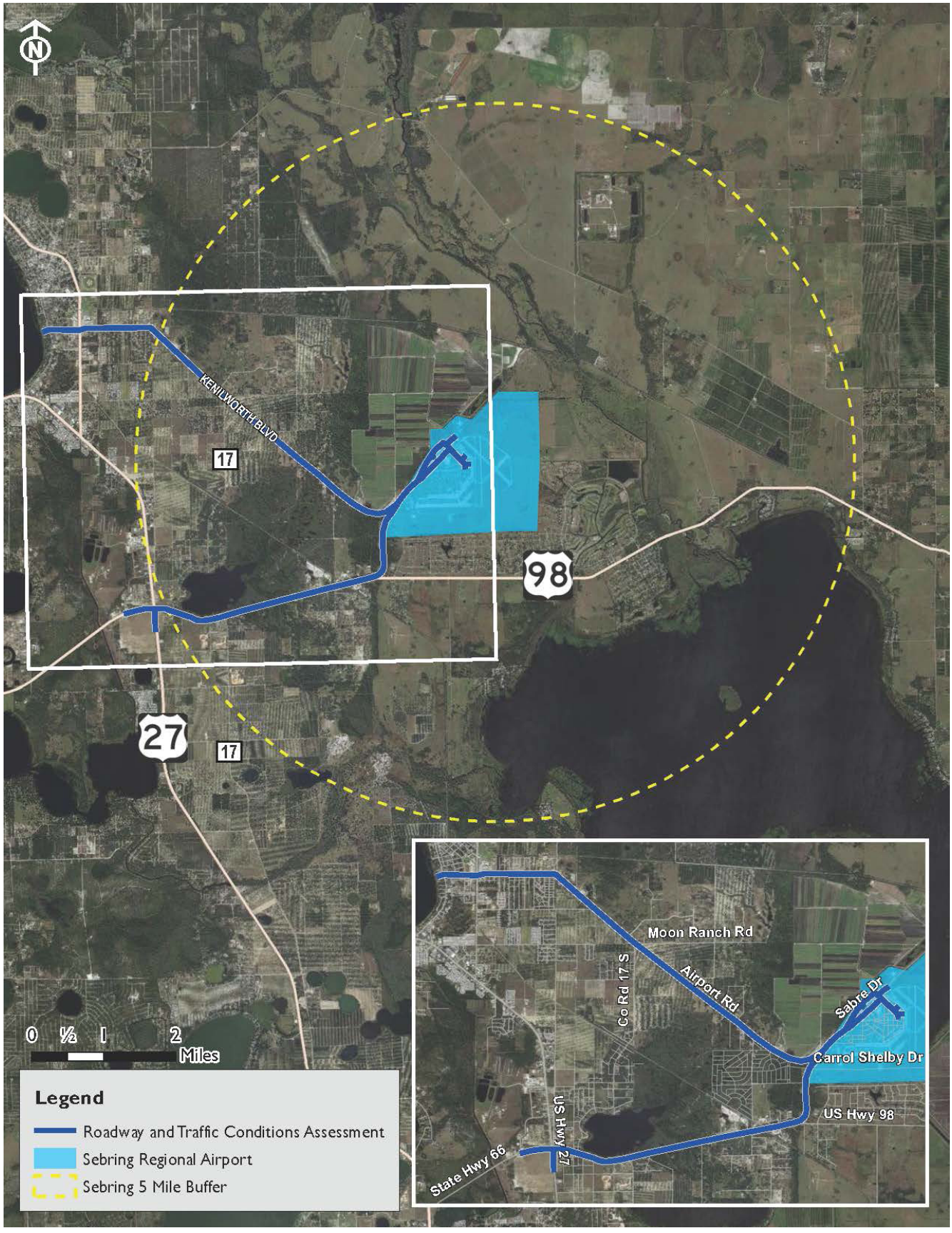
Field observations of the roadway network were conducted on Tuesday, October 8th, 2019 at approximately 11:30 AM within the study area. The route can be seen in Figure 22. Observations focused on existing conditions of the roadway infrastructure as well as identification of traffic congestion. Details from the assessment are as follows:

- The pavement along Webster Turn Drive at SEF is generally in poor condition as shown in Figure 21. There is moderate to severe alligator cracking and base failure on sections of the roadway; often indicating sub-base failure, poor drainage, and/or repeatedly being over-loaded. Appearances indicate that the pavement design is not strong enough for the truck traffic using the road;
- At-Grade Crossing on Webster Turn Drive has no warning lights or mast arms; and
- At-Grade Crossing on Boeing Avenue has no warning lights or mast arms.

Figure 21 - Webster Turn Drive

Google Speed was reviewed for the roads near the airport. Roads that were reviewed as part of this analysis include US 98, Kenilworth Boulevard, and Haywood Taylor Boulevard. There were no noticeable congestion issues in or around SEF during peak or off peak hours.

Figure 22 - SEF Roadway Assessment



Within each study area, there are intersections that should be further evaluated for a heavier duty application. For PGD, the intersection of US 17 and SR 74 (Bermont Road) should be evaluated for a concrete application. Table 22 provides a rationale to improve an intersection with concrete near industrial developments that carries high and growing truck volumes.

6.1.4 Concrete Intersection Improvement

Within each study area, the existing conditions assessment identified intersections that should be further evaluated for a heavier duty pavement application. For SEW, the intersection of US 98 and US 27 should be evaluated for a concrete pavement application. Table 13 provides the rationale to improve the intersection with concrete by examining facilities with high and growing truck volumes, proximity to existing and planned industrial land uses, and proximity/ connectivity to SIS facilities.

Table 13 - SEF Concrete Pavement Intersection Recommendations

Intersection	Reasons for Consideration for Concrete Pavement
US 98 and US 27	Both US 27 and US 98 have high truck AADT volumes with 3,822 and 1,620 trucks per day respectively on US 27 and US 98 at this intersection. US 27 is a Strategic Intermodal System (SIS) Highway Corridor that provides critical N-S mobility in central Florida. US 98 serves an important facility providing E-W mobility to area of Florida. The future land use map has identified additional industrial development just east of this intersection at the SEF Airport.

6.1.5 Rail

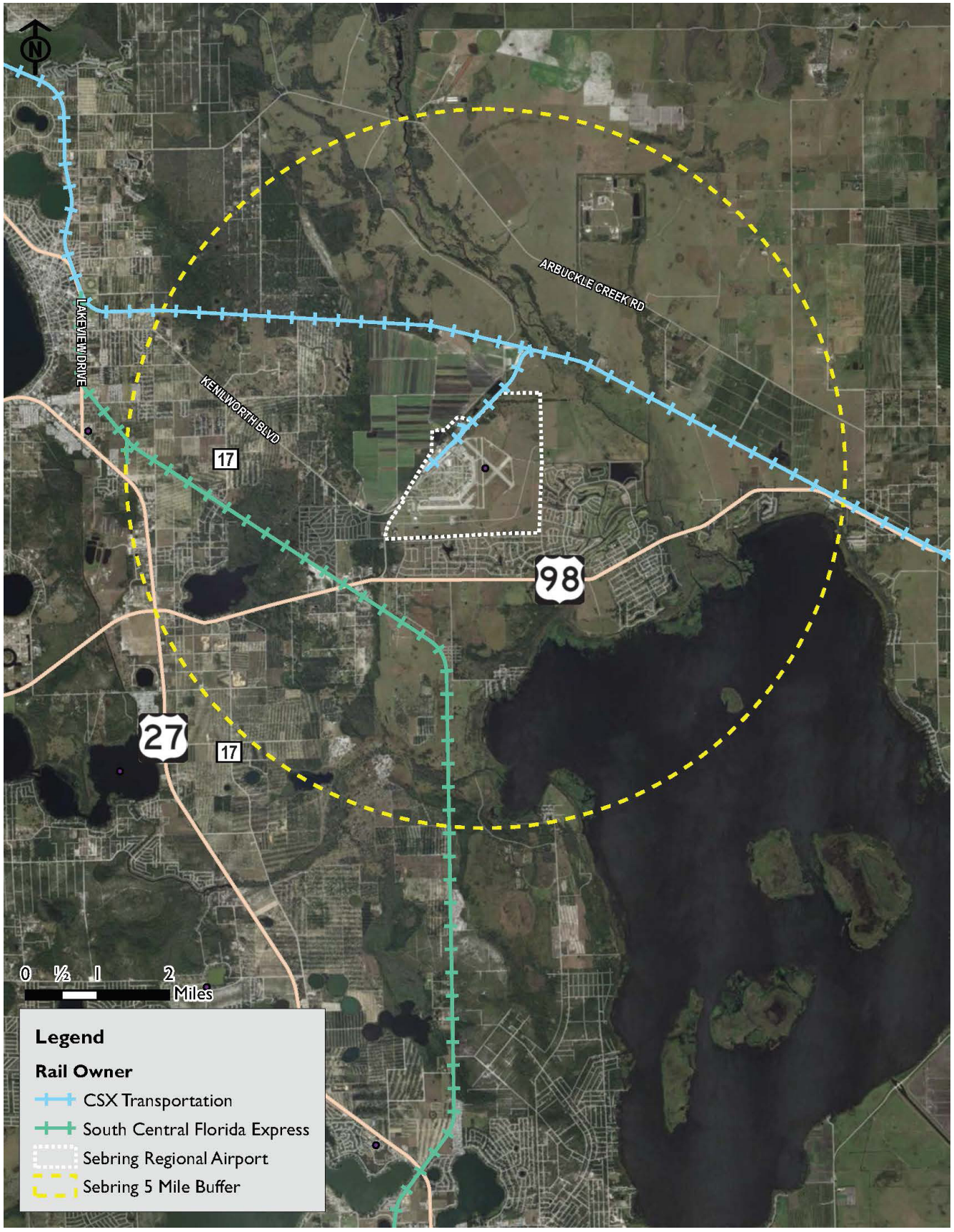
There are two rail lines in the SEF study area, CSX and SCXF (Figure 23). The CSX line is north of the airfield and runs from West Palm Beach to Auburndale. A rail spur from the CSX rail line connects to SEF on the northern perimeter of the airport. An alternatives analysis is currently underway to examine rehabilitation or reconstruction of the spur line.

SCXF is a Class III railroad with track running in Florida between Sebring and Fort Pierce. The US Sugar Corporation operates the SCXF line and is the only company in the US to ship sugar cane via rail. They serve approximately 26 customers along its route south of SEF.

CSX Intermodal Terminals owns and operates two intermodal railroad facilities in the region. CSX Central Florida ILC is located in Winter Haven, Florida approximately 50 miles from the airport and handles mainly 53 foot (domestic), containerized traffic. CSX Intermodal Tampa is in operations and is approximately 100 miles from the airport and handles both domestic and international size container traffic.

There are no facilities that offer warehousing and transloading services with CSX with rail access in the study area. If transloading and rail service is desired by any future tenant, an industrial partnership would be required with CSX or with an industrial developer.

Figure 23 - SEF Study Area Rail Facilities



6.1.6 Rail Crossings

Based on available GIS information provided by the Federal Railroad Administration (FRA), the at-grade crossing on Webster Turn Drive, located just south of Ulmann Drive, does not have an associated classified crossing ID or inventory report, which is likely attributed to the crossing location on a private facility road rather than on public right-of-way. This track is a spur connection to the CSX mainline, located east of the facility. It should be noted, that at this crossing, freight cars (as shown in Figure 24) are not properly stored at a safe sight-line distance from the at-grade crossing. This is a potential safety hazard, especially given the two sets of tracks at the crossing. In addition, current safety warning devices may be insufficient in providing crossing notice to oncoming traffic.

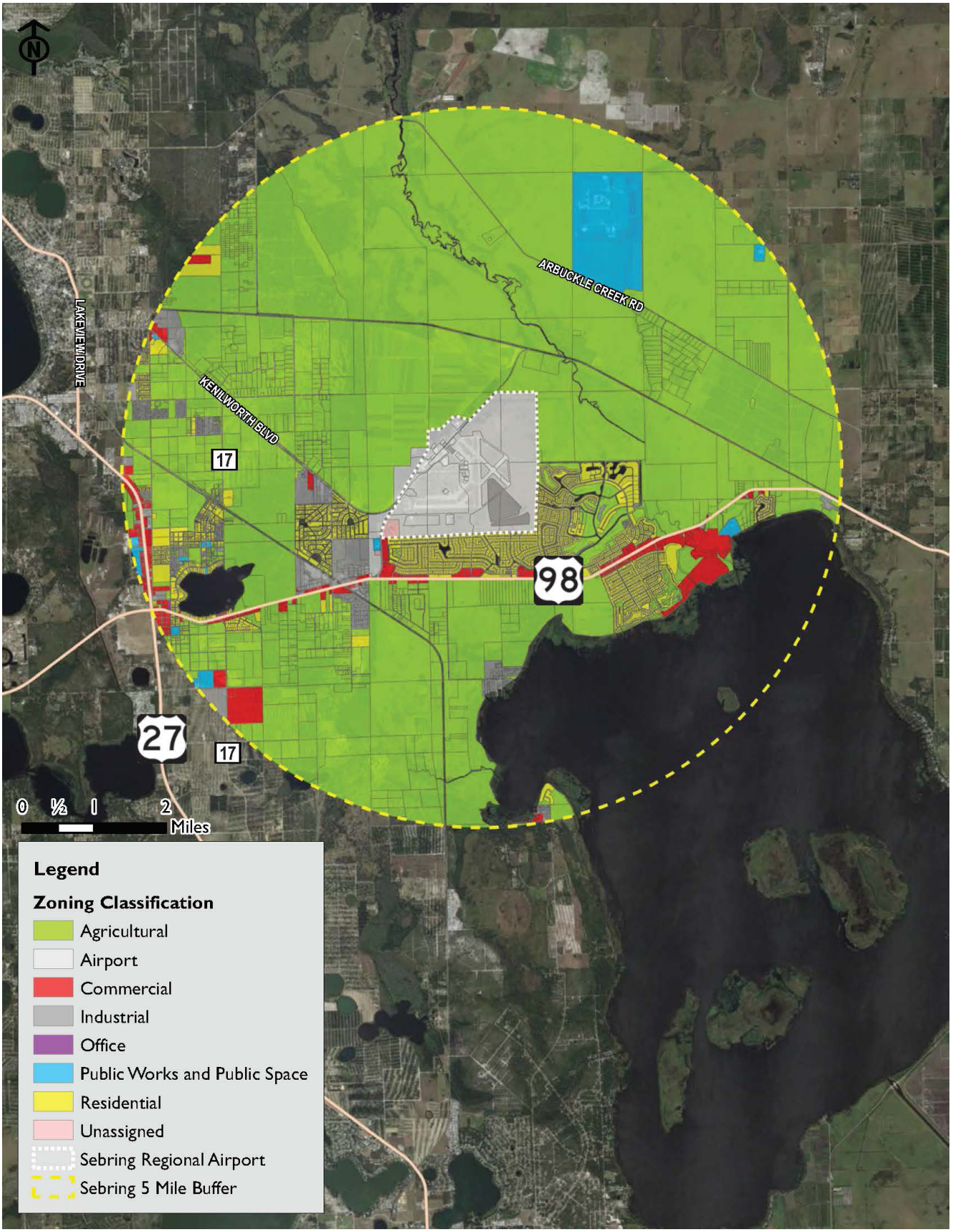
Figure 24 - Southbound Approach to Crossing at Webster Turn Drive and Ulmann Drive

6.1.7 Existing Land Use

The airport is comprised of approximately 1,768 acres of land within its boundary and zoned as industrial. As shown in Figure 25, there are existing industrial land uses scattered to the west of the airport and located south of the airport on Lake Istokpoga. General land uses surrounding the airport area are as follows:

- Area surrounding the airport is generally Agricultural;
- Land to the east, south, and west include Residential, Commercial, and Public Works and Public Spaces; and
- A large Public Works and Public Spaces zone is located northeast of the airport.

Figure 25 - SEF Study Area Existing Land Use



6.1.8 Future Land Use

Future land uses are depicted in Figure 26. SEF and the surrounding area are showing a change in zoning to Public with a small section of the property remaining industrial. Other industrial pockets are located to the west of the airport. General land usage surrounding the airport is as follows:

- A significant portion of the land use within the study area is anticipated to remain Agricultural.
- Land to the south of the airport is zoned Mixed Use; and
- Land to the west of the airport is generally zoned Medium Density Residential, Industrial, and Commercial/ Industrial Mixed-Use.

Figure 27 provides a depiction of the Industrial zoning and vacant parcels within the study area. Vacant parcels are located, in abundance, throughout the study area. The future Industrial zoning and vacant parcels line up fairly well on Kenilworth Boulevard and US 98.

Figure 26 - SEF Study Area FLUM

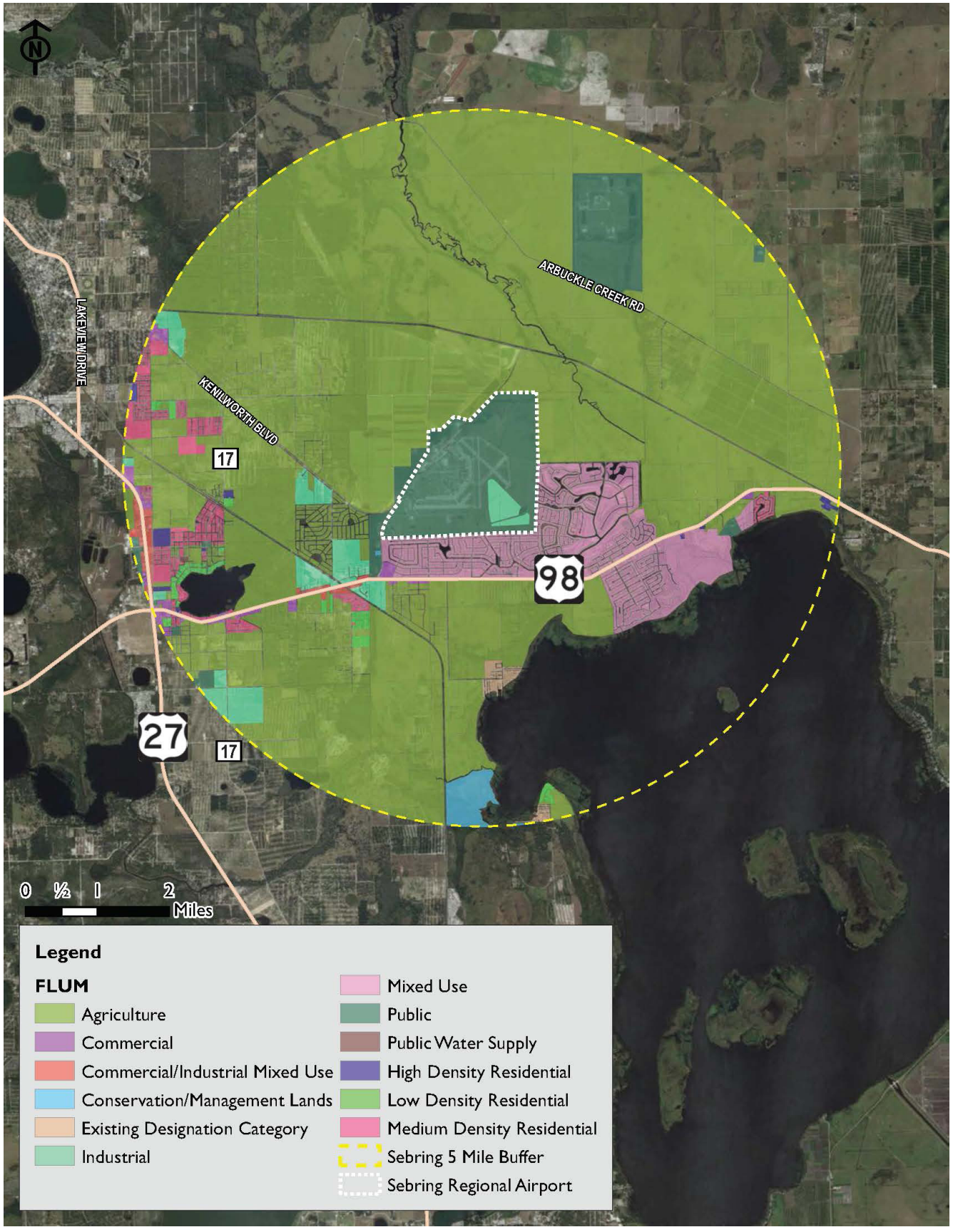
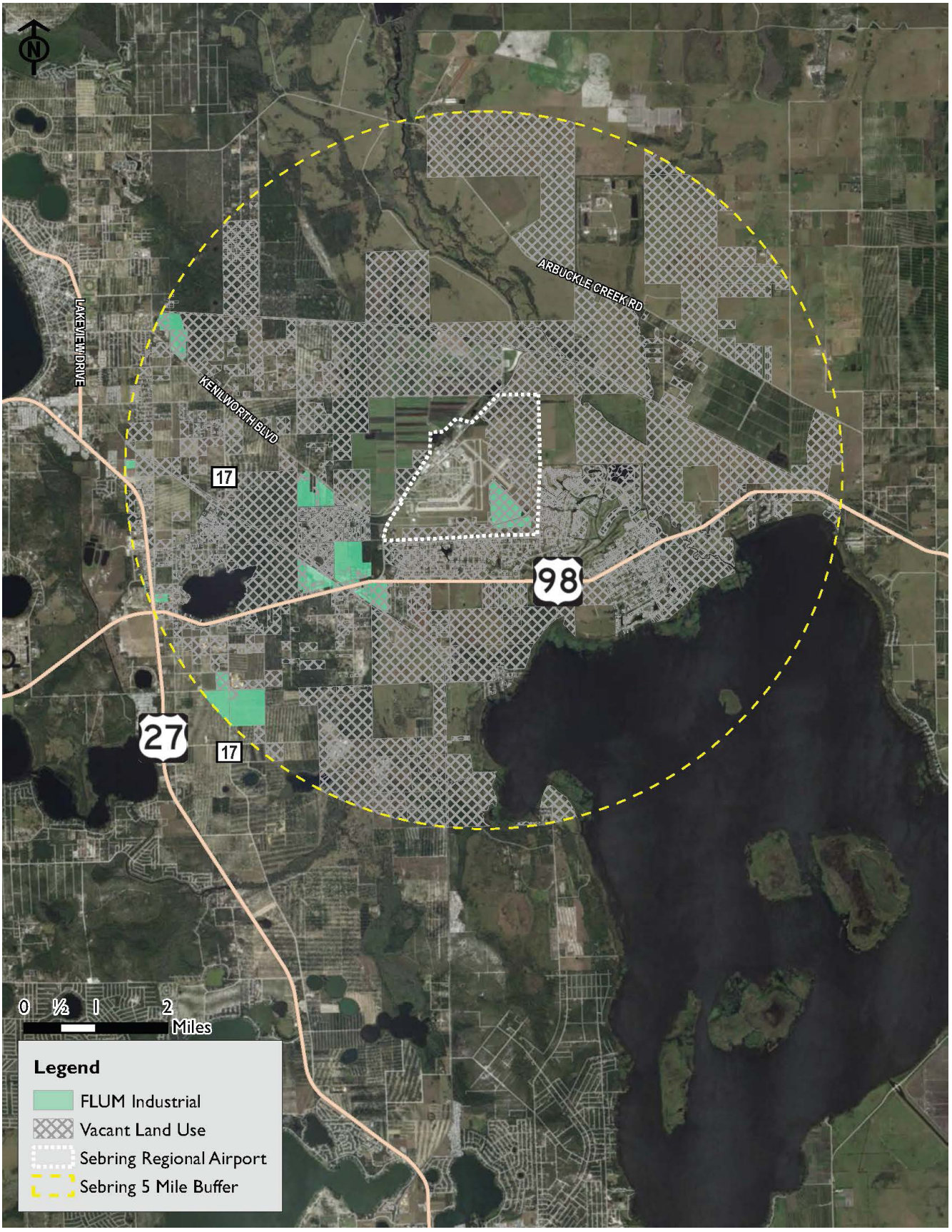


Figure 27 - SEF Study Area Industrial and Vacant Lands



6.2 Existing Traffic Data and System Performance

6.2.1 AADT and Truck AADT

Data was collected from Florida Traffic Online to determine the AADT and truck AADT within the SEF study area. The measurement of AADT provides basic empirical understanding of traffic conditions on a given roadway. The number is derived by dividing the total annual number of vehicles on a highway or road by 365 days. This information is collected by FDOT and made available publicly.

The roadways that are travelled the most within the SEF study area are US 98 and Kenilworth Boulevard. US 98 contains the highest traffic volume in the study area with a range between 6,700 and 9,700 vehicles per day, as shown in Figure 28. The other major airport connector road, Kenilworth Boulevard, had a range of 3,500 to 9,300 vehicles per day. Haywood Taylor Boulevard also provides access to SEF with 3,500 vehicles per day.

The SEF study area truck AADT, as shown in Figure 29, follows similar patterns to AADT. Truck volumes were greatest along the US 98 corridor, both in AADT and truck percentage within the SEF study area.

Figure 28 - SEF Study Area AADT

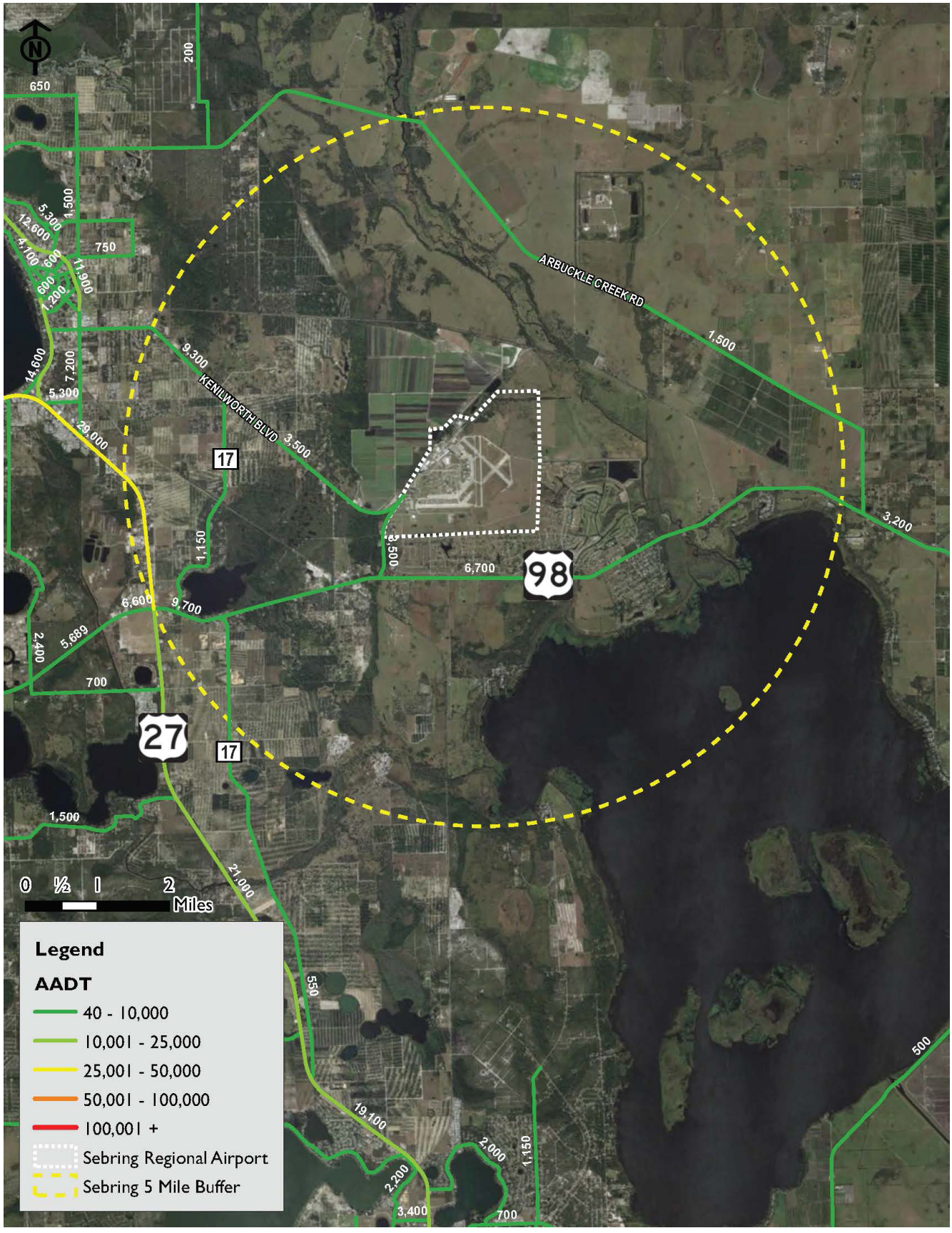
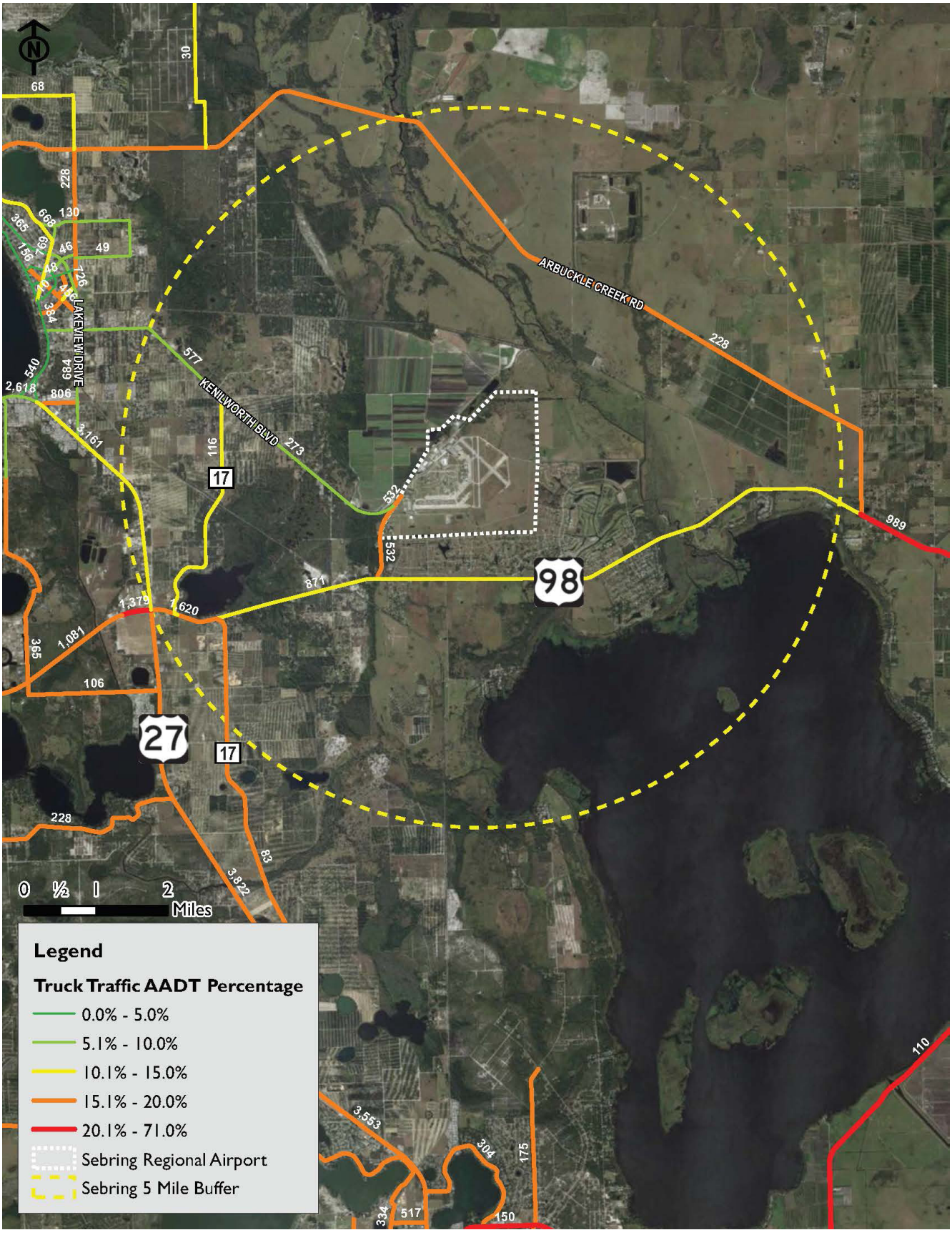


Figure 29 - SEF Study Area Truck AADT



6.2.2 Crash Rates and Density

Vehicular crashes are depicted for both an area crash rate, five year rate, and crash density, a heat map, in Figure 30 and Figure 31 respectively. The analysis shows that the crash rates are low within the SEF study area. The intersection of US 27 and US 98 does show an increased crash rate at the intersection near the western boundary of the study area.

Figure 30 - SEF Study Area Crash Rates

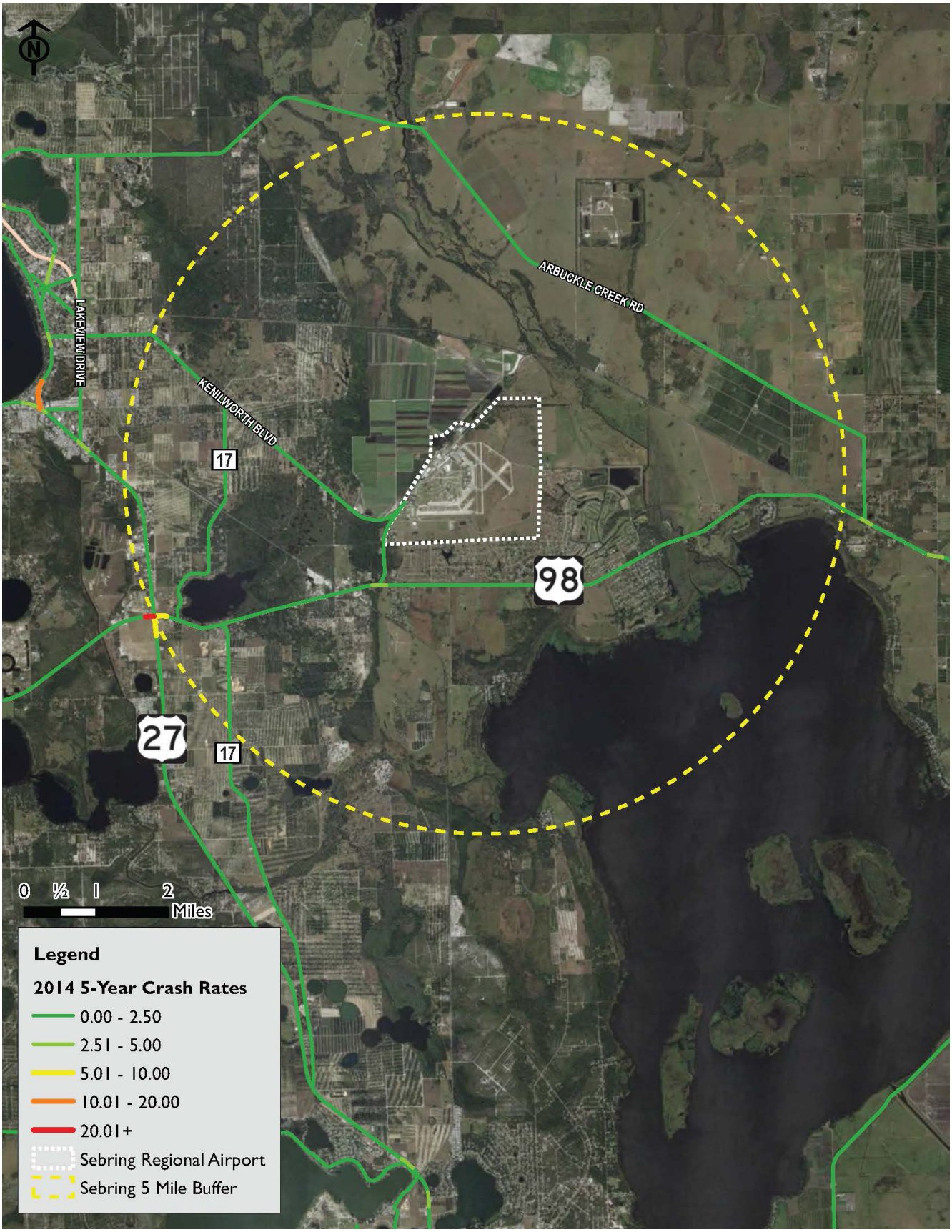
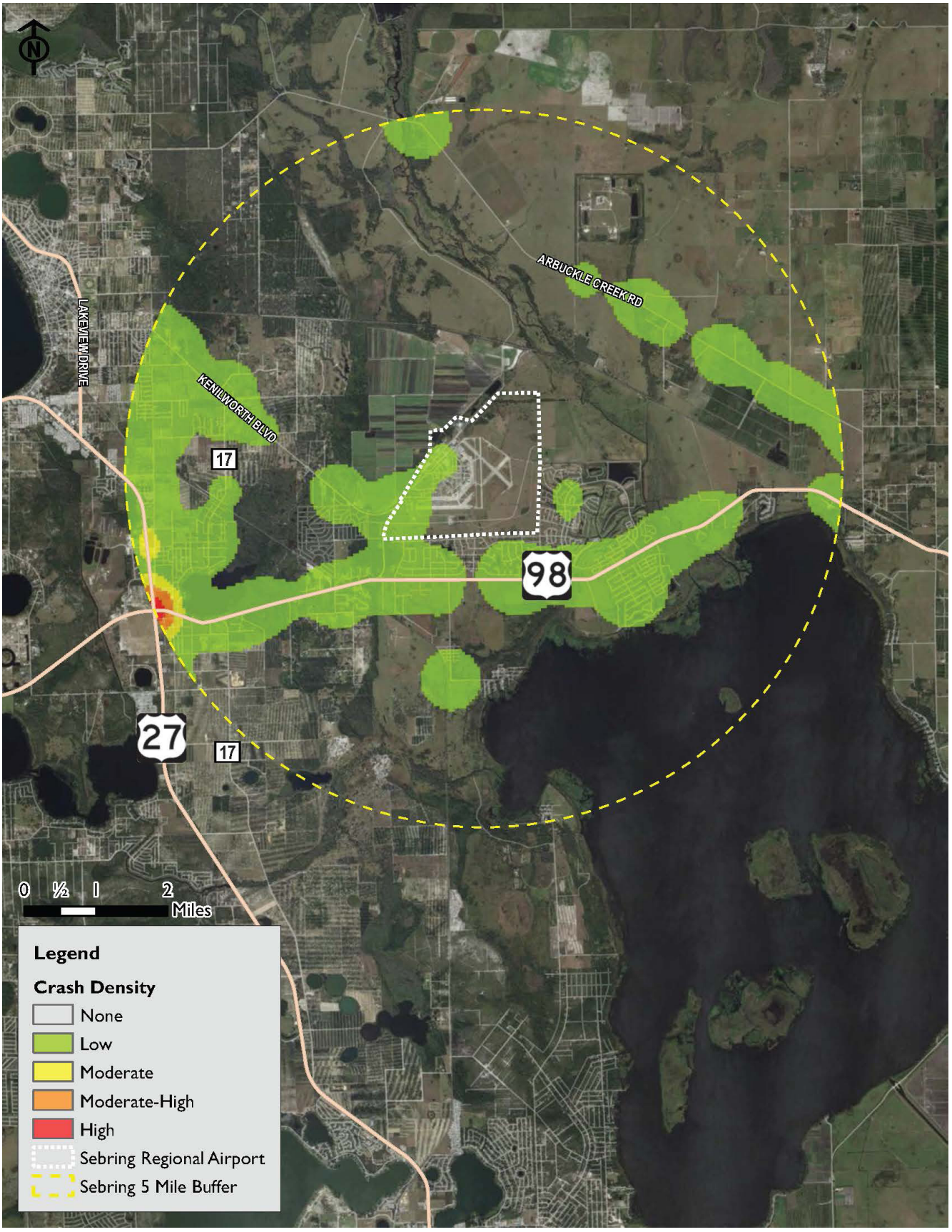


Figure 31 - SEF Study Area Crash Density



6.3 Existing Conditions & Master Plan Review

6.3.1 Geography and Airside Facilities

SEF is located in Highlands County, Florida, approximately eight miles southeast of the City of Sebring and 101 roadway miles southeast of the City of Tampa. The site is made up of approximately 1,768 acres and has an elevation of 61.6 feet AMSL. SEF has an Airport Reference Code (ARC) of D-II. ARC is an FAA design criteria that depicts what types of planes can land at certain airfields.

Airside facilities at SEF consist of two runways, five taxiways, two parking aprons, NAVAIDS, and weather aids. SEF operates within a Class E Airspace and is currently considered a non-controlled airport. The airport does have an ATCT, however it is only used during large events such as the "12 Hours of Sebring" and the US Sport Aviation Expo. As such, when the ATCT is not used, pilots provide situation and directional information via radio to other pilots in the controlled airspace. The largest aircraft SEF sees regularly is the Gulfstream IV, though the airport does see some 737's, lightly loaded.

The airfield consists of runways 1-19, the primary runway, and 14-32. Table 14 shows characteristics for each runway and Figure 30 shows the pavement conditions gathered in 2019 by FDOT. The airplane parking area, which consists of the most concrete by area at the airport, has a PCI rating of very poor. The hangar taxiways are also in poor condition and require maintenance or replacement as well.

Table 14 - SEF Runway Characteristics

Characteristic		Runway		Runway	
		1	19	14	32
Length & Width		5,234' x 100'		4,990 x 100'	
Displaced Threshold		No	No	Yes	No
Marking (Condition)		Non-Precision	Non-Precision	Visual	Visual
Approach Aids		RNAV GPS	RNAV RNP	RNAV GPS	RNAV GPS
Surface Type		Asphalt		Asphalt	
Strength	Single Wheel	26k Lbs.		26k Lbs.	
	Dual Wheel	50k Lbs.		50k Lbs.	
	Dual Tandem	N/A		N/A	
	Double Dual Tandem	85k Lbs.		85k Lbs.	
Effective Gradient		0.0 percent	0.0 percent	0.1 percent	0.1 percent
Pavement Condition (2015)		Good		Good	

The 2019 Statewide Airfield Pavement Management Program, developed by FDOT, determines the condition of pavements so that funding can be prioritized accordingly for assets. Figure 30 depicts the results of the pavement study. Within the study, FDOT recommends Minimum Service PCI for pavements based on the use of the transportation facility and the airport type as shown in Table 15. Maintenance and repair should be conducted to improve pavement conditions and to prevent critical PCI status, as set by the FDOT Recommended Minimum Service Level. Major construction is needed once the pavements reach the Critical PCI threshold. The study forecasts average pavement conditions generally if no improvements are to be made as shown in Table 16 which shows degradation over time.

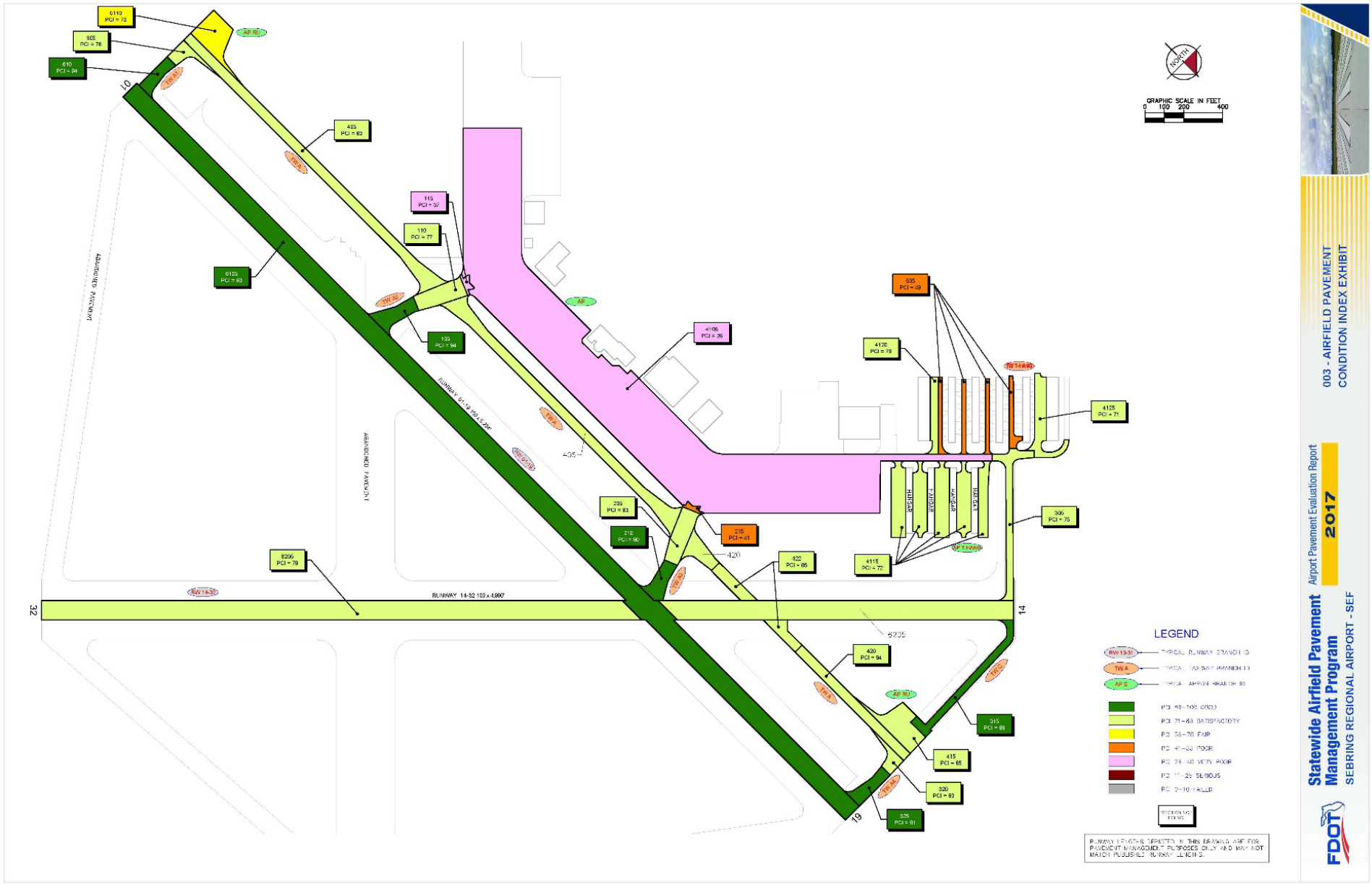
Table 15 - FDOT Airfield Recommended and Critical Service PCI Levels

Use	FDOT Recommended Minimum Service Level PCI			Critical PCI
	Primary Airports	Regional Reliever Airports	General Aviation Airports	
Runway	75	75	75	65
Taxiway	70	65	65	65
Apron	65	65	60	65

Table 16 - SEF Forecasted Pavement Conditions (Overall Area-Weighted PCI)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Runway	81	79	78	76	74	73	71	69	68	66
Taxiway	75	73	71	70	68	67	66	65	64	63
Apron	32	30	29	28	27	26	24	23	22	21

Figure 32 - SEF Pavement Conditions



Source: FDOT 2019 Statewide Airfield Pavement Management Program

6.3.2 Roadway Access

SEF is north of US 98 and can be locally accessed by Kenilworth Boulevard or Haywood Taylor Boulevard. Kenilworth Boulevard connects to SR 17, while US 98 connects to US 27 south and SR 17 to the north.

6.3.3 Tenants

The landside facilities include a GA terminal building, aircraft storage hangars, fuel farm, and automobile parking. SAA contracts with Volo Aviation who is the airport's FBO. Volo Aviation manages lease agreements for the hangars, manages the pilot lounge, and conducts the fueling operations for SEF. There are also privately built and owned hangars on site that Volo Aviation does not manage.

The GA terminal at SEF is approximately 18,450 square feet and it includes the airport administration offices. SEF has eight conventional hangars, eight T-hangars, and two five-unit consecutive rectangular hangars, that provide a storage capability of approximately 90 aircraft. Automobile parking is estimated at around 77 public spots at the GA Terminal, and roughly 140 spots for tenant use.

Sebring Commerce Park is roughly 1,300 acres located inside of the airport boundaries. Approximately 30 percent of the land is currently developed, and SAA sees this as a focus for growth. Landside facilities allow businesses to operate and lease space from the airport. The tenants provide revenue to SEF and the surrounding community by creating jobs and contributing to the overall economy. Table 17 shows the current tenants who conduct business at SEF.

Table 17 - SEF Tenants

Tenants		
Advanced Drainage Systems Inc	FLG Teardowns, Inc	Lockwood Aviation Bldg 22
Animal Control Board	Funder America	Lockwood Aviation Bldg 33
Bobby Ore Motorsports	Genpak LLC #916, 917 & 918	Metro Aviation
Carter Aviation Group, Inc	Global Engine Maintenance, LLC	Robert Summersill Inc.
Chateau Elan	Globalstar USA, LLC #735	Sebring Aviation/Alan Jay
CitraPac, LLC	Great Atlantic Aeroplane	Sebring Custom Tanning
Diversified CPC International	Gulf Coast Supply	Sebring International Raceway
Dr. Jim Drury	Heartland Cultural Alliance	Spencer Aircraft
DT Foods, Inc – Runway Café	Highlands Bowhunters	Florida Health Sciences Center, Inc.
EAA Heartland Chapter 1240, Inc	J.B. Aircraft Engines	Tecnam U.S. Inc.
E-Stone USA Corporation	Lockwood Aviation	Turf Care Supply Corp.
Eye In The Sky Rentals, LLC		

The following businesses provide MRO services at SEF:

- Carter Aircraft; and
- J.B. Aircraft Engines.

Below are a list of tenants that have the potential to play a role in the cargo industry at SEF.

CitraPac

CitraPac is a specialty manufacturer with a main focus of producing frozen fruit pearls. Other products that result from the development of the frozen fruit pearls include ground IQF CitrusPeel and Citrus Puree. Shipments of the product are sent directly to a home or business using UPS and most orders arrive to the customer within three days.

Diversified CPC International

Diversified CPC International designs, produces, and distributes specialty gases such as aerosol propellants, refrigerants, solvents, and foam blowing agents with six locations across the country, including their corporate headquarter.

In Sebring, Diversified CPC International exports butane, specialty fuels, and aerosol propellants to Barbados and South America. Butane arrives by rail, is repackaged, and departs by truck. An 800 foot rail spur was recently added to allowing for increased capacity for tanker railcars. The facility also has three tanks on site for butane storage.

E-Stone USA Corporation

E-Stone is a manufacturer, importer, and exporter of residential and commercial stone products such as tile, precast terrazzo, and concrete products. The company has been on site for approximately 12 years.

Funder America

Funder America is a composite wood product manufacturer. Their materials arrive by rail and depart by truck.

Genpak

Genpak is a manufacturer of polystyrene food containers and packaging for the food service industry. They currently have 20 facilities across North America including their facility at the SEF. Their Sebring location is located at the end of the CSX rail spur and has approximately 800 feet of railcar storage space.

Structural Plank Industries

Structural Plank Industries creates hollowcore planks, solid slabs, stairs and other precast concrete products. These products are shipped throughout the state of Florida for the construction industry. SEF provides a central location for Structural Plank Industries to have ease of access throughout the state.

Turf Care Supply

Turf Care Supply blends and packages a wide variety of turf care products including fertilizers, controlled release fertilizers, fertilizers for golf courses, combination products and granular control products. Products are sold through distributors and shipped through to their Northeast, Mid-Central, Mid-Atlantic, and Southern markets.

At their Sebring facility, Turf Care Supply relies heavily on rail to import goods and send outbound shipments via truck. Depending on the season, they receive 5 to 20 railcars per week and depart between 10 and 40 trucks per week.

6.3.4 Foreign Trade Zone

In an effort to promote economic activity, a FTZ is a physical location that is granted special privileges by the US Federal Government for the importation and exportation of merchandise to-and-from the United States of America. Although an FTZ site is physically located within the US, for customs purposes, the site is considered to be located outside of the Customs Territory of the United States and all merchandise entering the FTZ site is considered international commerce. This allows for tariffs on goods that are shipped into the US and then back out to either be delayed, reduced, or eliminated.

SEF is designated as FTZ 215, which encompasses the surrounding six counties. SEF is also in a Rural Enterprise Zone and is considered a Community Redevelopment Area. Both designations, FTZ and Rural Enterprise Zone, benefit their existing businesses, including international fuel not being subject to taxes.

6.4 Facility Planned Improvements

SEF does not have any scheduled cargo or ad hoc cargo services. However, SEF is the only airport in the nation that is a Community Redevelopment Agency (CRA). The CRA allows for unique economic development opportunities by using Tax Increment Financing to promote growth for airport and surrounding area. The CRA has $133.8 million in funding to improve four main activities around the airport:

- Industrial Park Development;
- Airport Infrastructure/Economic Development;
- Sebring International Raceway Infrastructure; and
- US Sport Aviation Expo Development.

Three important facility improvements are the apron projects and the rail spur upgrade described below:

- Runway expansion project planned (7,000 feet);
- Vintage World War II Apron upgrade will occur in three phases (50% funded); and
- 2 mile rail spur, full reconstruction for $5 million.

6.5 Roadway Planned Improvements

SEF is located in the Heartland Regional Transportation Planning Organization (HRTPO). HRTPO is responsible for developing a LRTP which includes all federally funded or regionally significant projects within its boundaries. Projects in the LRTP are categorized based off of fiscal constraints and compared against other transportation projects in the region. The HRTPO Board of Directors adopted an amendment to the 2040 LRTP in June of 2016. Below are a list transportation projects that are eligible for federal funding, derived from the 2040 LRTP, which will have impacts on SEF in the future:

- Widen US 98 from US 27 to east of Airport Road to four lanes, currently two lanes;
- Widen Kenilworth Boulevard from Lakeview Boulevard to Peters Road to four lanes, currently two lanes; and
- Widen US 98 from east of Airport Road to Okeechobee County Line to four lanes, currently two lanes.

The TIP is also managed by HRTPO. The TIP is a short-range, five year forecast, for projects that have or will receive federal funding. There is currently one project in the TIP that is near SEF:

- Design and partial Right-of-Way (ROW) acquisition for the widening of US 98 from US 27 to east of Airport Road. A Project Development and Environmental Study (PD&E) has been completed. The TIP shows funding for design in 2019, and partial Right of Way (ROW) funding programmed for 2024. There are no funds available for construction at the current time.

6.6 Projected Growth

6.6.1 Aviation Freight Growth

There are currently no documented air cargo operations at SEF according to FACS. All freight activity is based upon tenants leasing on airport property with freight arriving and departing by truck or rail. At this time, the transition to air cargo operations is not anticipated and additional review would be required if an existing or new tenant were to show interest in air cargo operations. As a result, no air cargo projections were made for SEF.

6.6.2 Roadway Network Growth

Traffic operating conditions were evaluated for study area roadways that are most likely to be impacted by forecasted automobile and freight movement growth for SEF. Table 18 presents the LOS analysis results for these roadways. All roadways currently operate at an acceptable LOS.

Table 18 - SEF Existing Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2018				
				AADT	Truck AADT	Truck %	Peak Hour Volume	LOS
US 98	County Rd 17 to Arbuckle Creek Rd	9.0	59.5	6,700	871	13.0%	605	B
Haywood Taylor Blvd	US 98 to Kenilworth Blvd	9.0	59.4	3,500	532	15.2%	315	A
Kenilworth Blvd	Haywood Taylor Blvd to Sebring Pkwy	9.0	59.4	6,400	328	5.1%	575	B

SEF vehicular traffic growth is projected to grow at a CAGR of 1.99 percent based on the population growth of Highlands County. The roads in the study area that were evaluated for future LOS are as shown in Table 19. US 98 and Kenilworth Boulevard carry the most vehicles on average.

SEF does not have scheduled or ad hoc air cargo operations where the majority of freight generated by tenants is shipped by truck or rail. Future freight projections for ad hoc airports were used to grow truck AADT at a CAGR of 0.52 percent. Table 19 provides freight projections for the three main roads used to access SEF within the study area, US 98, Haywood Taylor Boulevard, and Kenilworth Boulevard. US 98 has the highest volume of trucks within the SEF study area. Both Haywood Taylor Boulevard and Kenilworth Boulevard are also frequency used by trucks within the region as well.

Roadway capacity analyses were conducted based on the 2020, 2030, and 2040 traffic projections. The differences in overall AADT and truck AADT growth results in varying truck percentages between 2020, 2030, and 2040 conditions. The results of the future conditions capacity analysis indicated that all study area roadways are expected to operate at acceptable LOS for all future years.

Table 19 - SEF Future Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2020				2030				2040			
				AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
US 98	County Rd 17 to Arbuckle Creek Rd	9.0	59.5	6,969	880	12.6%	B	8,487	927	10.9%	C	10,336	976	9.4%	C
Haywood Taylor Blvd	US 98 to Kenilworth Blvd	9.0	59.4	3,641	538	14.8%	A	4,434	566	12.8%	A	5,399	596	11.0%	B
Kenilworth Blvd	Haywood Taylor Blvd to Sebring Pkwy	9.0	59.4	6,657	331	5.0%	B	8,107	349	4.3%	C	9,873	367	3.7%	C

6.6.3 Rail Growth

SEF is the only airport in this study that has a direct rail spur, operated by CSX that is used to move freight. Currently, there is discussion for a full reconstruction of the two mile spur at a cost of approximately $5 million dollars.

SEF receives approximately 15-20 rail cars per week during the peak season, between November and April, and 5-10 railcars outside of peak season between May and October. This railcar throughput equates to approximately 520 railcars per year at its lower limit. Typical freight is inbound raw materials for freight being produced on airport property. Growth for rail is assumed to increase at approximately the same rate as truck growth.

Table 20 - SEF Project Rail Car Growth

Year	Rail Cars Annually
2019	520
2020	790
2030	1,201
2040	1,826
0.52% CAGR	

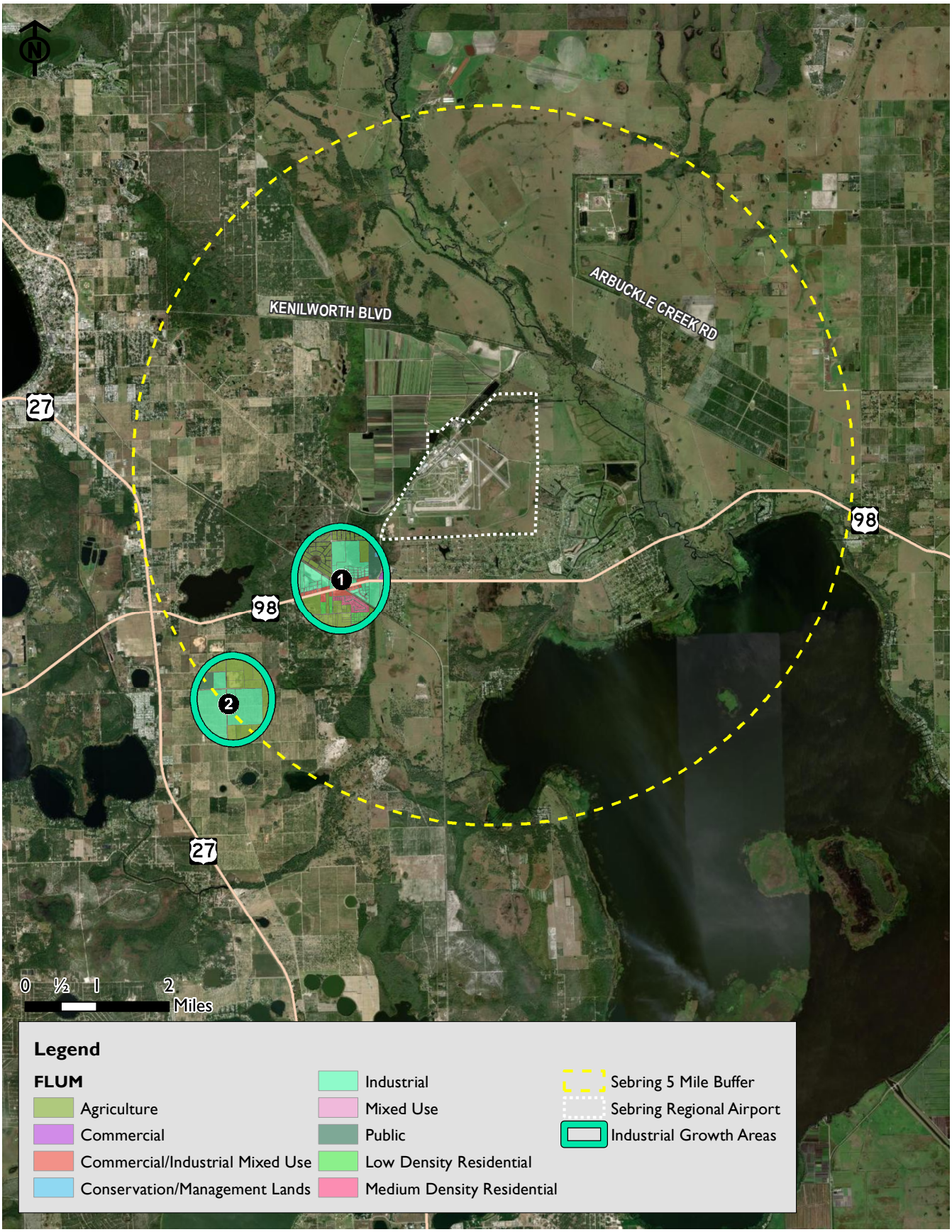
6.6.4 Qualitative Industrial Growth Analysis

Two locations have been identified within the SEF study area as suitable for industrial activity and growth, based on a review using the methodology described in section 4.4 of the report.

Proposed industrial growth area 1 is located southwest of the airport and is shown below in Figure 45. The property, bordered by US 98 to the south has some existing industrial development, and is currently zoned as such. The Future Land Use Map also designates this property for industrial use. Haywood Taylor Boulevard borders the property to the east. The site crosses the South Central Florida Express rail line and continues west along US 98. SIS facilities in the area include US 27 as well as CSX and South Central Florida Express rail lines.

Proposed industrial growth area 2 is located on the western extent of the study area as shown in Figure 45. Approximately a mile from US 27, this location is currently zoned for both Commercial and Industrial use; however, the future land use designates the property as strictly Industrial. CR 17 bisects the site, and provides access to US 98, approximately one mile north. Skipper Road and E Twitty Road forming the northern and southern boundaries, respectively. As mentioned, the site is a short distance to US 27, a SIS roadway. The South Central Florida Express SIS rail line runs east and north of the site. Portions of the land are currently used for citrus farming, with the remainder being nearly entirely vacant.

Figure 33 - SEF Industrial Growth Areas



6.7 Recommendations

Recommendations for SEF are focused on the airport site, the surrounding roadway network, and any on site rail improvements, if applicable. They are based on information from within this study and are categorized as short-term (1 to 5 Years), mid-term (6 to 9 years), and long-term (10 to 20 years), as shown in Table 21. Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan.

Table 21 - SEF Recommendations

Location	Improvement Recommendation	Identified Needs	Implementation Timeframe
SEF Airport Site Recommendations			
SEF	Air Traffic Control Tower	Expanded Service Hours	Short-Term (1-5 Years)
SEF	Runways	Major Construction	Mid-Term (5-10 Years)
SEF	Taxiways	Major Construction	Short-Term (1-5 Years)
SEF	Aprons	Major Construction	Short-Term (1-5 Years)
SEF Roadway Recommendations			
Intersection of US 98 and US 27	Intersection Improvements to include additional left turn lanes where feasible	Existing congestion at intersection	Short-Term (1-5 Years)
Intersection of Haywood Taylor Blvd and Kenilworth Blvd	Realign and improve intersection (potential roundabout)	Existing congestion at intersection	Mid-Term (5-10 Years)
Haywood Taylor Blvd from end of 4-lane section to Midway Dr Intersection	Widen Haywood Taylor Blvd to 4-lanes tie into existing 4-lane section	Existing narrowing from 4-lanes to 2-lanes causes bottleneck	Short-Term (1-5 Years)
Webster Turn Drive	Improve to safely accommodate two-way truck traffic	Roadway unable to handle two-way, heavy vehicle traffic, poor pavement condition, small intersections, and pavement reconstruction needed	Short-Term (1-5 Years)
SEF Rail Recommendations			
CSX Rail Spur	Full reconstruction of the 2 mile rail spur	Rail Line Improvements	Mid-Term (5-10 Years)
At-grade Crossing Webster Turn Drive, just south of Ulmann Drive	Work with yard operations at SEF to resolve improper freight car storage adjacent to the at-grade crossing.	Improper Freight Car Storage	Short-Term (1-5 Years)
	Consider enhancements to the safety warning devices/ infrastructure currently existing at the site. Repaint existing pavement markings – advance warning crossbucks marking, and stop bars. Consider painting dynamic envelope marking (indicates minimum clearance from track).	Inadequate Safety Equipment	Short-Term (1-5 Years)
	Reset "Do Not Stop On Tracks" signage – appears to have been struck by vehicle. Replace west approach W10-1 yellow grade crossing advance warning sign – appears to be missing.	Faulty Signage	Short-Term (1-5 Years)
	Repave crossing approaches & between tracks – pavement spalls along crossing panels. Consider an asphaltic plug joint between pavement and panels – it is a rubberized joint (similar to bridge expansion joint) to ease pavement deflection and prevent spalls at the crossing.	Inadequate Safety Equipment	Short-Term (1-5 Years)
	Consider replacement of crossing panels and ties. Rubber panels appear deteriorated and ballast/dirt covering the ties in the approaches. Recommend replacing rubber panels with concrete panels. Recommend tie replacement and track resurfacing with clean ballast.	Inadequate Safety Equipment	Short-Term (1-5 Years)
	Discuss with Owner about the status of the crossing – confirm this is a private road and does not need to be registered with the FRA. FRA inclusion may require a diagnostic review and additional safety requirements.	Policy Improvements	Short-Term (1-5 Years)

6.8 Conclusion

SEF actively markets a 2,000 acre business park on the outskirts of the airport, FTZ, Rural Economic Zone, local employment, community events, and capabilities as a multimodal logistics center that is served by air, truck, and rail. While there are currently no documented air cargo operations that exist at SEF, airside improvements such as improving pavements, should continue to facilitate aviation activities. If SEF attracts air cargo operations, increasing ATCT operations would allow for more efficient communications with pilots.

Continued collaboration with FDOT and local governments to maintain the surrounding roadway network is imperative for the movement of people for racing events at Sebring International Raceway and the movement of goods by truck to and from SEF. There are several roadway recommendations that will improve intersection operations and roadway capacity within the study area. Continuous roadway network improvements around SEF will inspire confidence for the existing and future businesses to locate within the SEF business park and promote economic stability for the region.

Of the airports that were evaluated within this study, SEF maintains a unique feature of a CSX rail spur that serves existing businesses on site. There are existing plans to reconstruct the rail spur which should are recommended to continue to progress. Additional recommendations focused on improvements to the on-site at-grade rail crossing on Webster Turn Drive. These recommendations are made to improve the existing infrastructure and increase safety operations for rail freight movements.

7

Punta Gorda Airport

7. Punta Gorda Airport

The Charlotte County Airport Authority (CCAA) is an independent special purpose district that operates and maintains PGD. Special purpose districts are local special purpose governments that function similarly to local general purpose governments like municipalities and counties as they:

- Act as a governing body with policy making power;
- Provide essential government services; and
- Operate in a limited geography.

Florida State Statute 332 is the enabling legislation for the CCAA. CCAA supports operations and maintenance through rental car revenues, parking fees, fuel sales, hangar leases, and building and land leases. The Authority consists of a board of five commissioners that are elected at-large in five separate districts by Charlotte County residents. The commissioners oversee a management team that consists of a Chief Executive Officer and a Chief Operating Officer who manage the day to day operations at PGD. Facility expansions and improvements are sought through a mixture of federal and state grants and reserves.

The 2019-2023 NPIAS designates PGD as a Primary, Small Hub Commercial Service airport. Small hubs accommodate between 0.5 and 0.25 percent of total US annual enplanements. PGD provides commercial passenger air service through Allegiant Air to approximately forty cities in the Midwest and East Coast. Currently, there are no scheduled cargo operations at PGD. Cargo operations are limited to unscheduled operations, and as such, there are no recorded volumes.

7.1 Study Area Physical Conditions Review

7.1.1 PGD Study Area

Figure 34 shows the PGD study area which is a five mile radius around airport. The study area is contained entirely in Charlotte County and includes a large portion of the City of Punta Gorda. The study area includes roadway facilities such as I-75, US 17, and US 41.

In addition to the PGD tenants noted later in this section, Cheney Brothers and Southeastern Freight Lines are located in close proximity to the airport, and within the defined PGD study area. Given their impact on local freight movement and the economy of the region, a brief description of each company is provided below for context.

Cheney Brothers

Cheney Brothers transports over 15,500 different products as a "Brand Line Distributor". From its Punta Gorda location, Cheney Brothers services southwest Florida, generally from Tampa to Fort Myers/Naples. The Punta Gorda facility totals 345,000 sq. ft., with plans to add an additional 82,000 sq. ft. in the future. This location consists entirely of truck operations, with approximately 200 trucks in the fleet. Cheney Brothers is located at 1 Cheney Way, Punta Gorda, directly southwest of the Punta Gorda Airport.

Based on a stakeholder interview conducted with Cheney Brothers as part of this effort, the company reports annual growth of 10 – 15 percent each year at its Punta Gorda location. Future growth, as projected by Cheney Brothers, is estimated at 15 – 20 percent per year. While these growth numbers are large from a company perspective, the expected impact on the local roadways is measurable, but likely not significant. Should Cheney Brothers realize this level of growth, an in-depth traffic analysis may be warranted.

Southeastern Freight Lines

Southeastern Freight lines is a privately-owned, regional "less-than-truckload" transportation services provider. The company provides next-day delivery services in the Southeast and Southwest United States. Southeastern Freight Lines has service centers in 13 states and Puerto Rico. A Southeastern service center/terminal is located at 9300 Piper Road in Punta Gorda, which is approximately 0.5 miles south of Punta Gorda Airport.

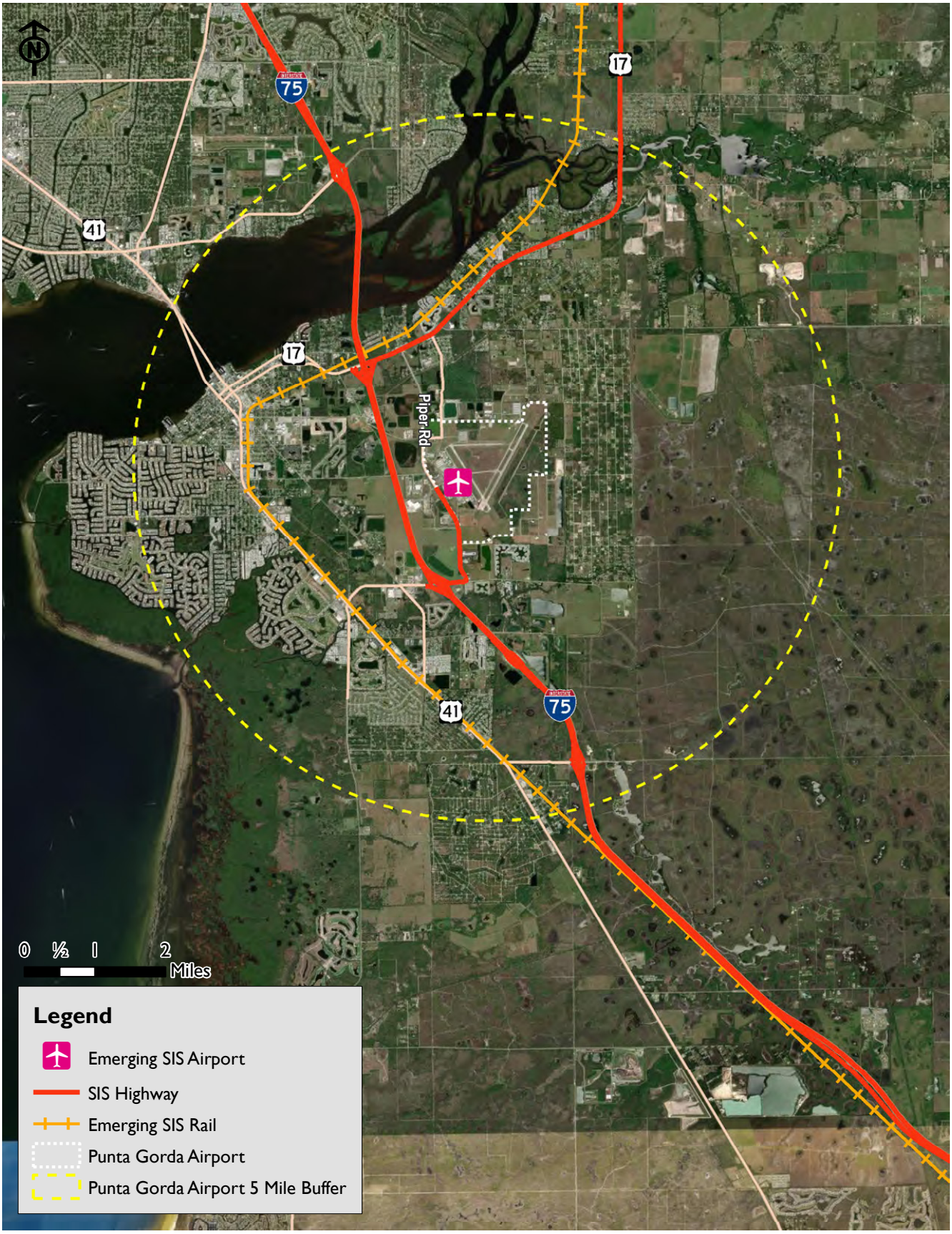
7.1.2 SIS Facilities

There are two existing SIS facilities and two emerging SIS facilities in the PGD study area. Both I-75 and US 17 are existing SIS facilities within the PGD study area. PGD and the SGLR rail line are considered emerging SIS facilities by FDOT. A depiction of the SIS facilities are as shown in Figure 34 and described as follows:

- I-75 is located west of the airport and offers access by connecting to US 17 or Jones Loop Road;
- US 17 is located north of the airport and has an interchange with I-75;

- PDG is an emerging SIS airfield in Florida; and
- The SGLR rail line coming from the north, continuing to the west of the airport, and proceeding south of the airport is also an emerging SIS facility.

Figure 34 - PGD Study Area SIS Facilities



**As of the last update of the FDOT SIS Atlas (July 23, 2020), the Piper Road extension has not been designated as part of the SIS network.*

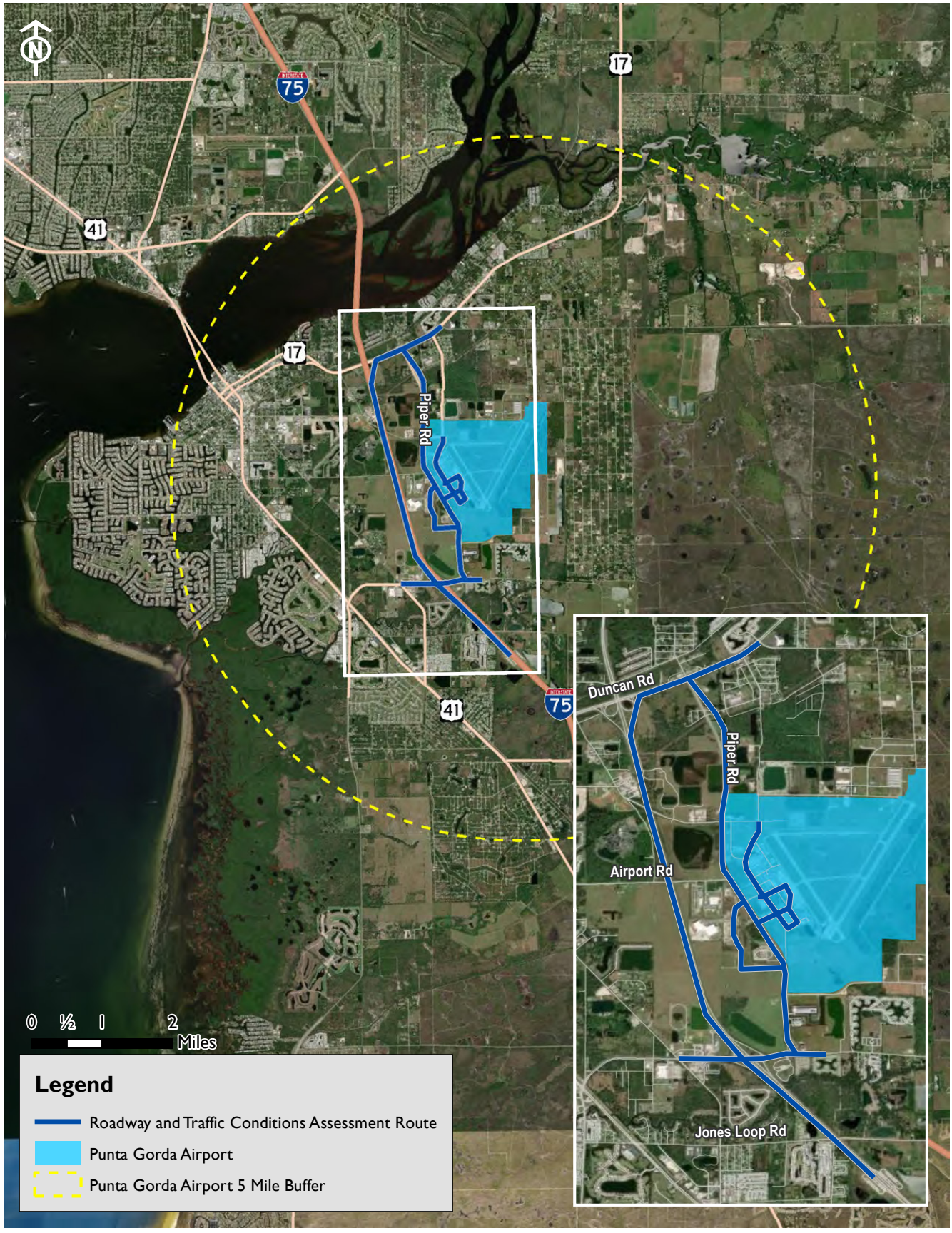
7.1.3 Roadway Infrastructure Assessment

Field observations of the roadway network were conducted on Tuesday, October 8th, 2019. The observations occurred at approximately 9:30 AM, within the PGD study area. The route that was driven can be seen in Figure 35. Observations focused on existing conditions of the roadway infrastructure as well as identification of traffic congestion. Details from the assessment are as follows:

- Traffic during assessment was extremely light
- Exit 17 on I-75 was used to enter on US 17
- Piper Road was then accessed from US 17
- Construction on Piper Road resulted in a two lane facility approximately between Airport Road and Jones Loop Road

Google Speed was reviewed for the roads near the airport. Roads that were reviewed as part of this analysis include I-75, Jones Loop Road, Piper Road, Airport Road, and US 17. There were no signs of congestion in and around PGD during peak or off peak hours.

Figure 35 - PGD Roadway Assessment



7.1.4 Concrete Intersection Improvement

Within each study area, the existing conditions assessment identified intersections that should be further evaluated for a heavier duty pavement application. For PGD, the intersection of US 17 and SR 74 (Bermont Road) and US 17 and Piper Road should be evaluated for a concrete application. Table 22 identifies the intersections and provides the rationale for why they were recommended. Recommendation criteria includes; facilities with high and growing truck volumes, proximity to existing and planned industrial land uses, and proximity/connectivity to SIS facilities.

Table 22 - PGD Concrete Rationale

Intersections	Reason for Consideration for Concrete Pavement
US 17 @ SR 74 (Bermont Road)	Both US 17 and SR 74 have high truck AADT volumes with 3,473 and 1,809 trucks per day respectively on US 17 and SR 74 at this intersection. US 17 is a Strategic Intermodal System (SIS) Highway Corridor that connects to I-75 (SIS Corridor) approximately 1 mile west of this intersection. SR 74 serves as a main E-W connection between SR 31 (SIS Corridor) and US 17/I-75. With trucks comprising more than 30% of the vehicles traveling on SR 74, this 2-lane roadway is an important regional truck facility.
US 17 @ Piper Road	With the Piper Road extension now complete, vehicles have direct access from the airport, along Piper Road, to SIS Highway Corridor US 17, or vice-versa. This omits the transition from Golf Course Boulevard to Piper Road for truck traffic. The intersection of Golf Course Boulevard and US 17 historically experienced 500 truck AADT. It is assumed that much of this truck traffic will now shift to the intersection of Piper Road and US 17.

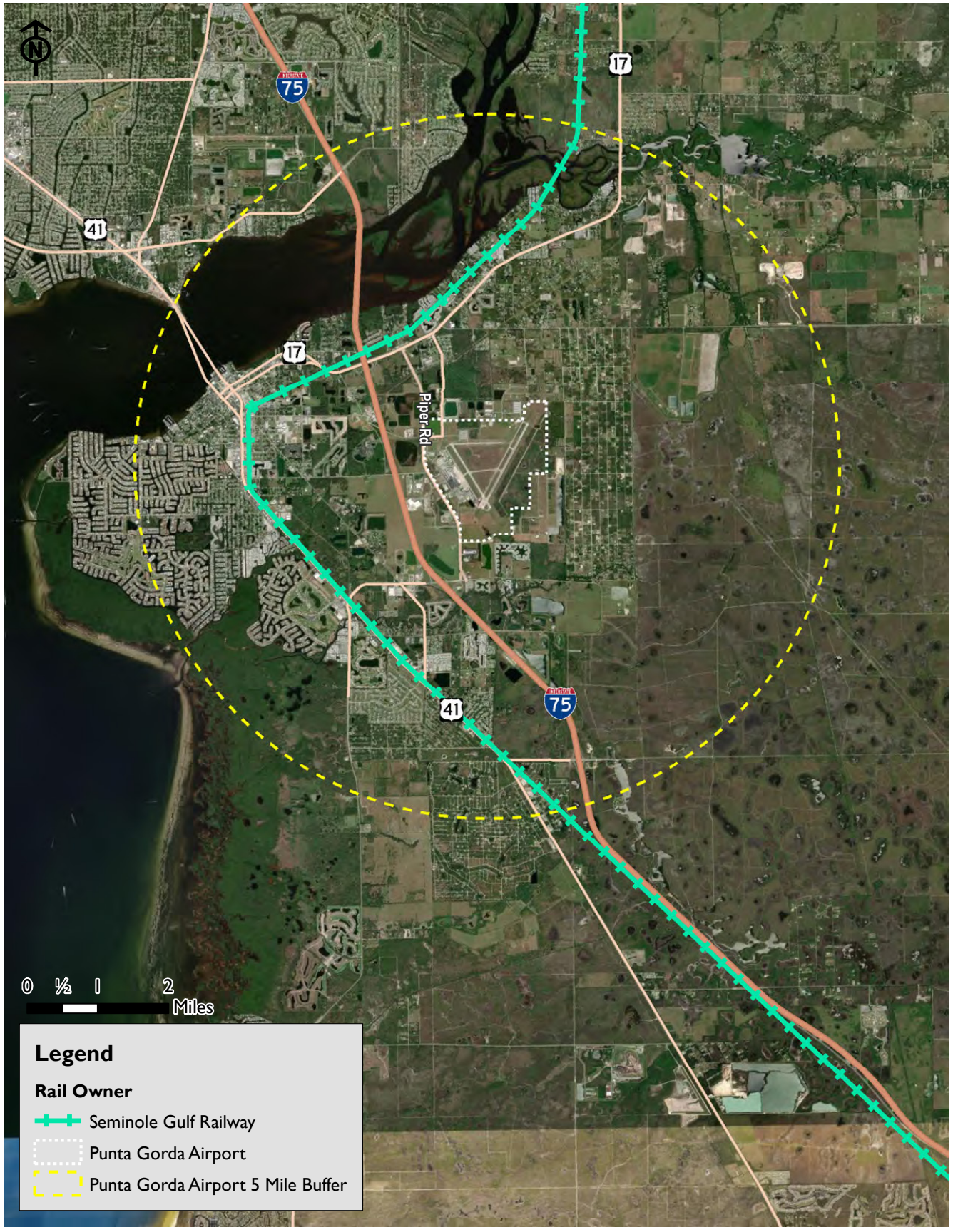
7.1.5 Rail

SGLR is a short line freight and passenger rail operator that runs service in the Southwest Region. The short line railroad operates and maintains its own equipment with a long term lease agreement with CSX, who maintains the ownership of the right-of-way. The rail line is considered an emerging SIS facility by FDOT, as depicted in Figure 36. The SGLR line runs north to south from Arcadia, Florida to North Naples, Florida. While PGD does not have direct access to a rail spur, it is located approximately two miles from the SGLR line at its closest point.

CSX Intermodal Terminals owns and operates two intermodal railroad facilities in the region. CSX Central Florida ILC is located in Winter Haven, Florida approximately 84 miles from the airport and handles mainly 53 foot (domestic), containerized traffic. CSX Intermodal Tampa is in operations and is approximately 102 miles from the airport and handles both domestic and international size container traffic.

There are no facilities that offer warehousing and transloading services with CSX with rail access in the study area. If transloading and rail service is desired by any future tenant, an industrial partnership would be required with CSX or with an industrial developer.

Figure 36 - PGD Study Area Rail Facilities

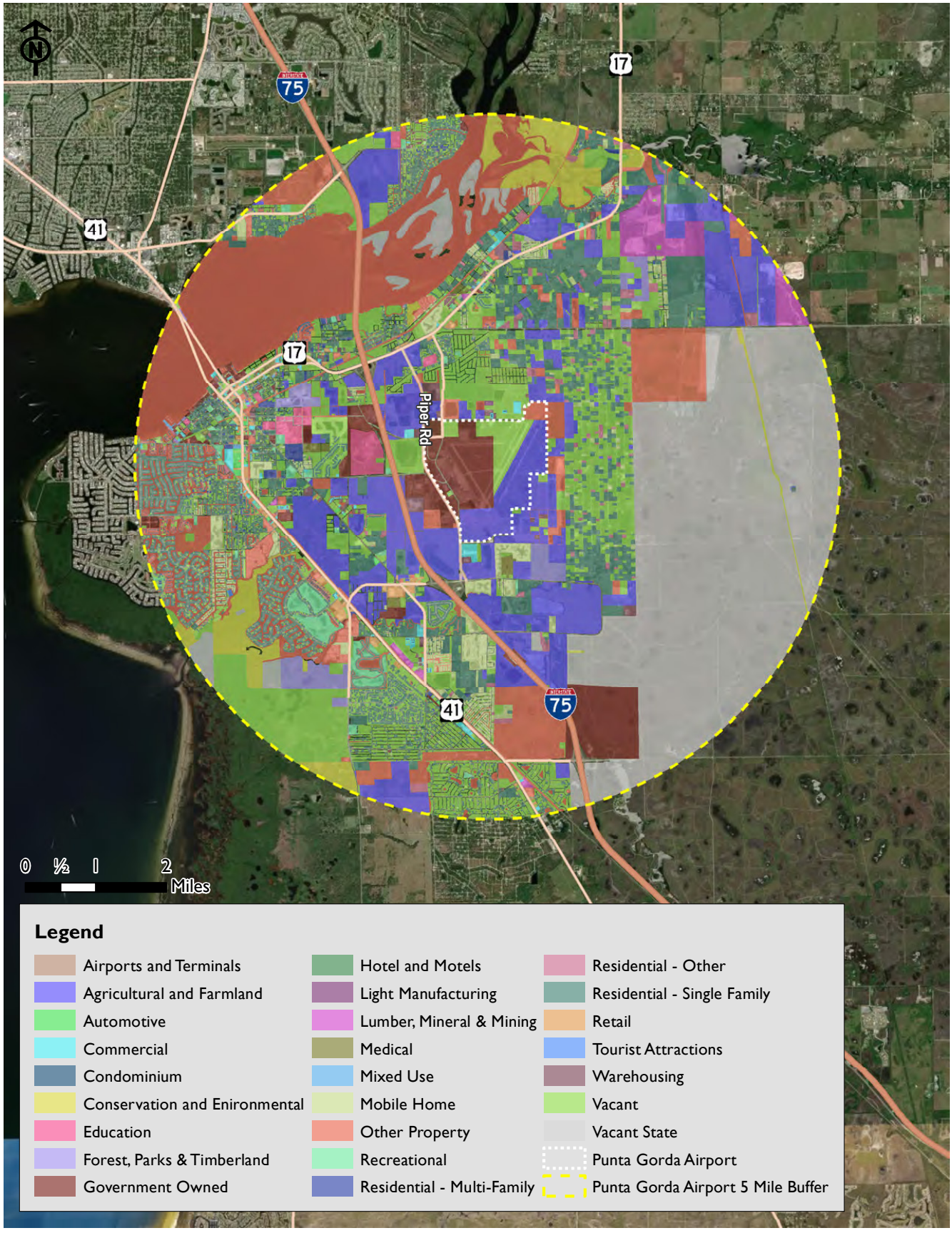


7.1.6 Existing Land Use

The airport is comprised of approxiamtely 1,878 acres of land within its boundary zoned as Government Owned, Vacant, and Agricultural/Farmland as shown in Figure 37. There are no industrial uses that exist within the PGD study area. General land uses surrounding the airport area as follows:

- Land to the north, east and south is primarily zoned very low density Residential and Agricutlural;
- Land to the west are primarily zoned Commercial; and
- Vacant lands are located throughout the study area, with "Vacant State" located to the west of the airport.

Figure 37 - PGD Existing Land Use



7.1.7 Future Land Use and Vacant Parcels

Future land uses are depicted in Figure 38. PGD and the surrounding area will transfer to a zoning of Enterprise Charlotte Airport Park. General future land usage surrounding the airport is as follows:

- Land to the north of the airport is primarily zoned Preservation, Low-Density Residential, DRI Mixed Use, Rural Estate Residential, and Agricultural;
- Land to the east of the airport is primarily zoned Rural Estate Residential and Resource Conservation;
- Land to the south of the airport is primarily zoned Resource Conservation, Low Density Residential, and Public Land Facilities;
- Industrial pockets exist near Taylor Road and US 41.
- Land to the west of the airport is primarily planned for a variety of uses such as Commercial, High Density Residential, and Public Lands and Facilities.

Figure 39 lines up both vacant lands and future industrial lands in an effort to show if they coincide. While there are certainly more vacant lands within the study area, vacant and future industrial line up when they are near.

Figure 38 - PGD Future Land Use

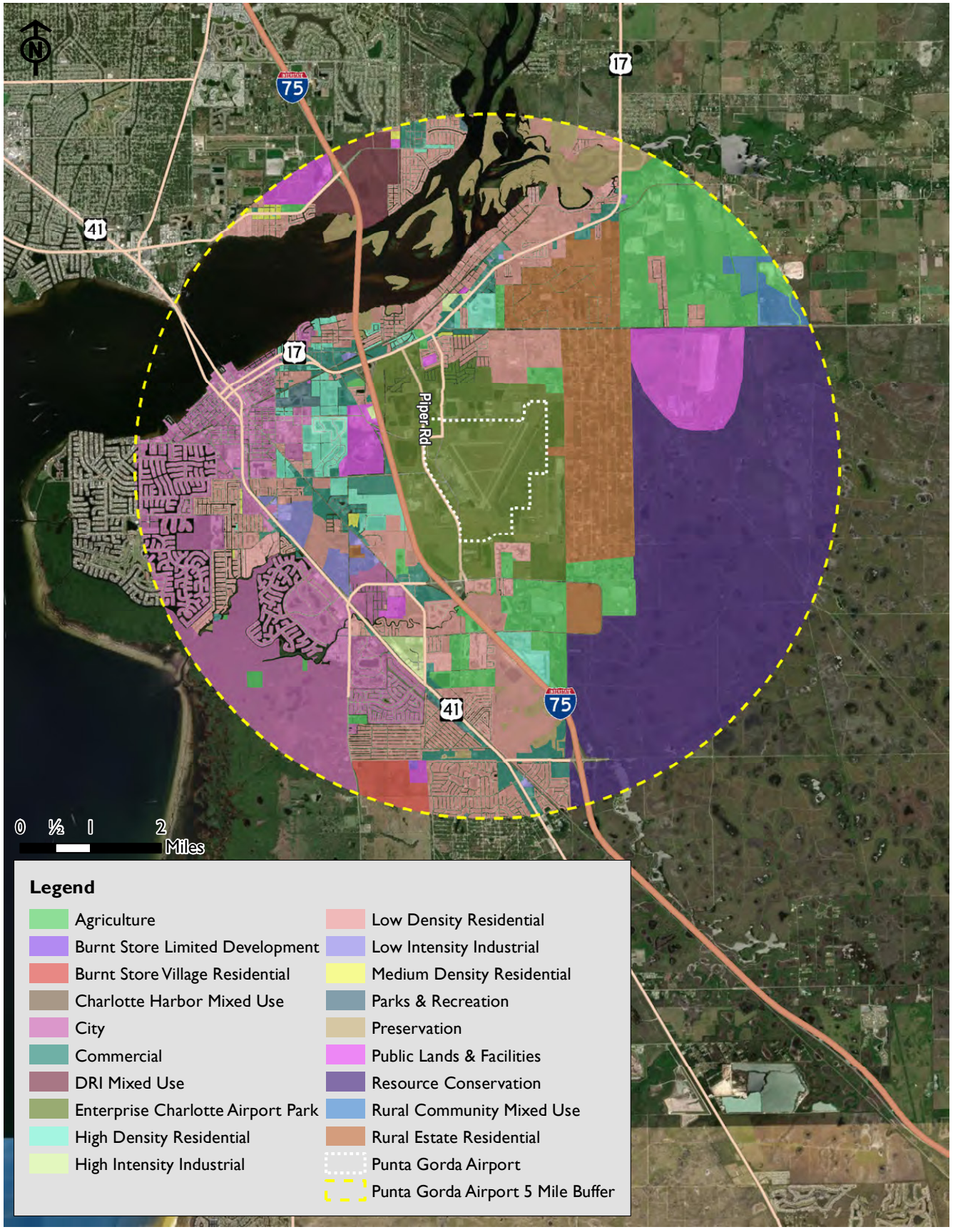
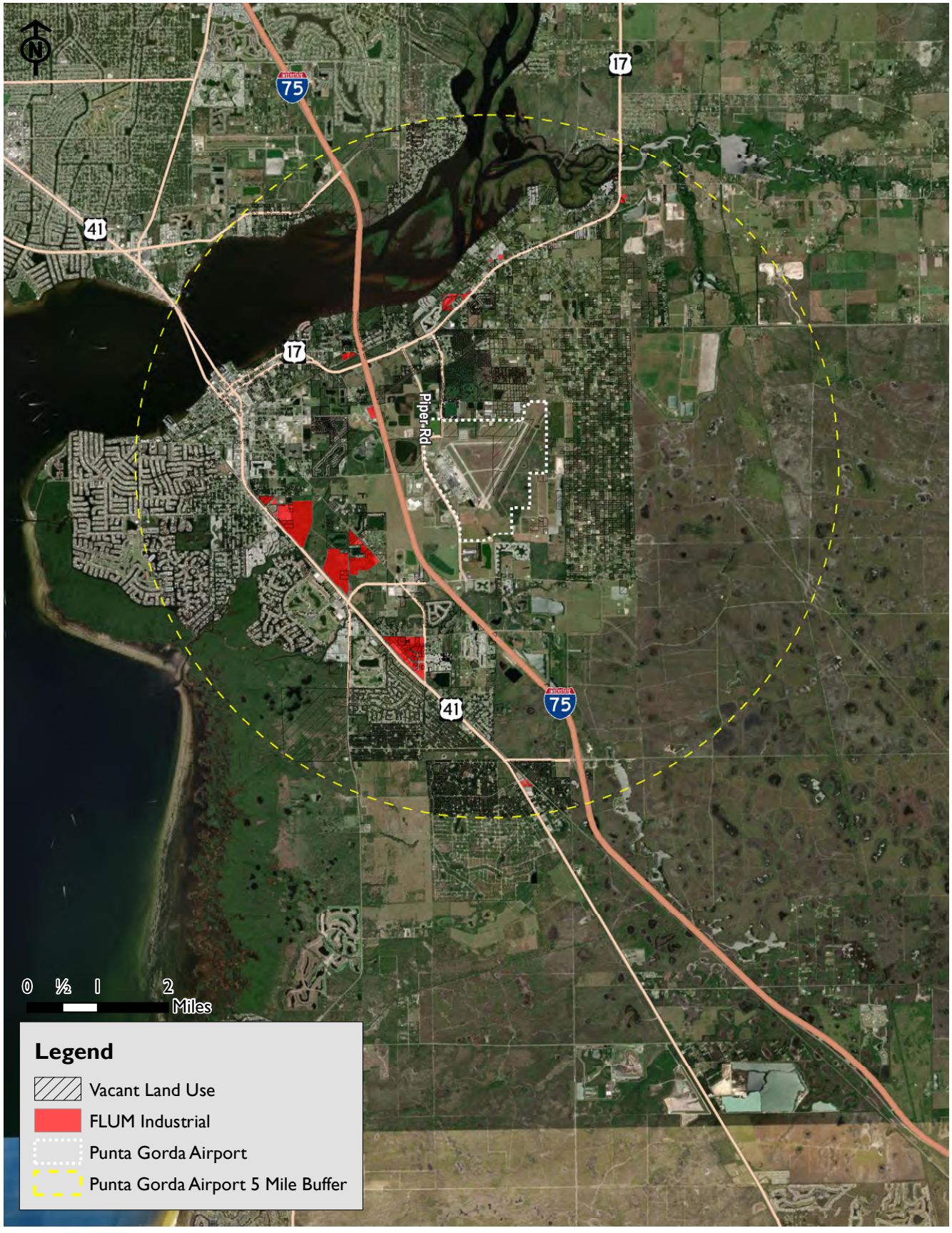


Figure 39 - PGD Vacant and Industrial Lands



7.2 Existing Traffic Data and System Performance

7.2.1 AADT and Truck AADT

Data was collected from Florida Traffic Online to determine the AADT and truck AADT within the PGD study area. The measurement of AADT provides a basic empirical understanding of traffic conditions on a given roadway. The number is derived by dividing the total annual number of vehicles on a highway or road by 365 days. This information is collected by FDOT and made available publicly in an effort to monitor congestion and depict where infrastructure improvements may be needed.

The roadways that are travelled the most within the PGD study area are I-75 and US 41. I-75 carries the highest traffic volumes which exceeds 63,000 vehicles per day between US 17 and Jones Loop Road. The next highest traffic volumes exist on US 41, between Jones Loop Road and Airport Road with over 30,000 vehicles per day. The third highest volumes exist on US 17, between I-75 and Bermont Road.

PGD area truck volumes were captured for the study area and follow similar patterns as the overall AADTs for the region. The highest truck volumes are along the I-75 and US 17 corridors as shown in Figure 40. Bermont Road carries a volume of over 1,800 trucks accounting for approximately 33 percent of the total daily trips on this road, the highest within the study area. US 41 carries just over 1,700 truck trips per day.

Figure 40 - PGD Study Area AADT

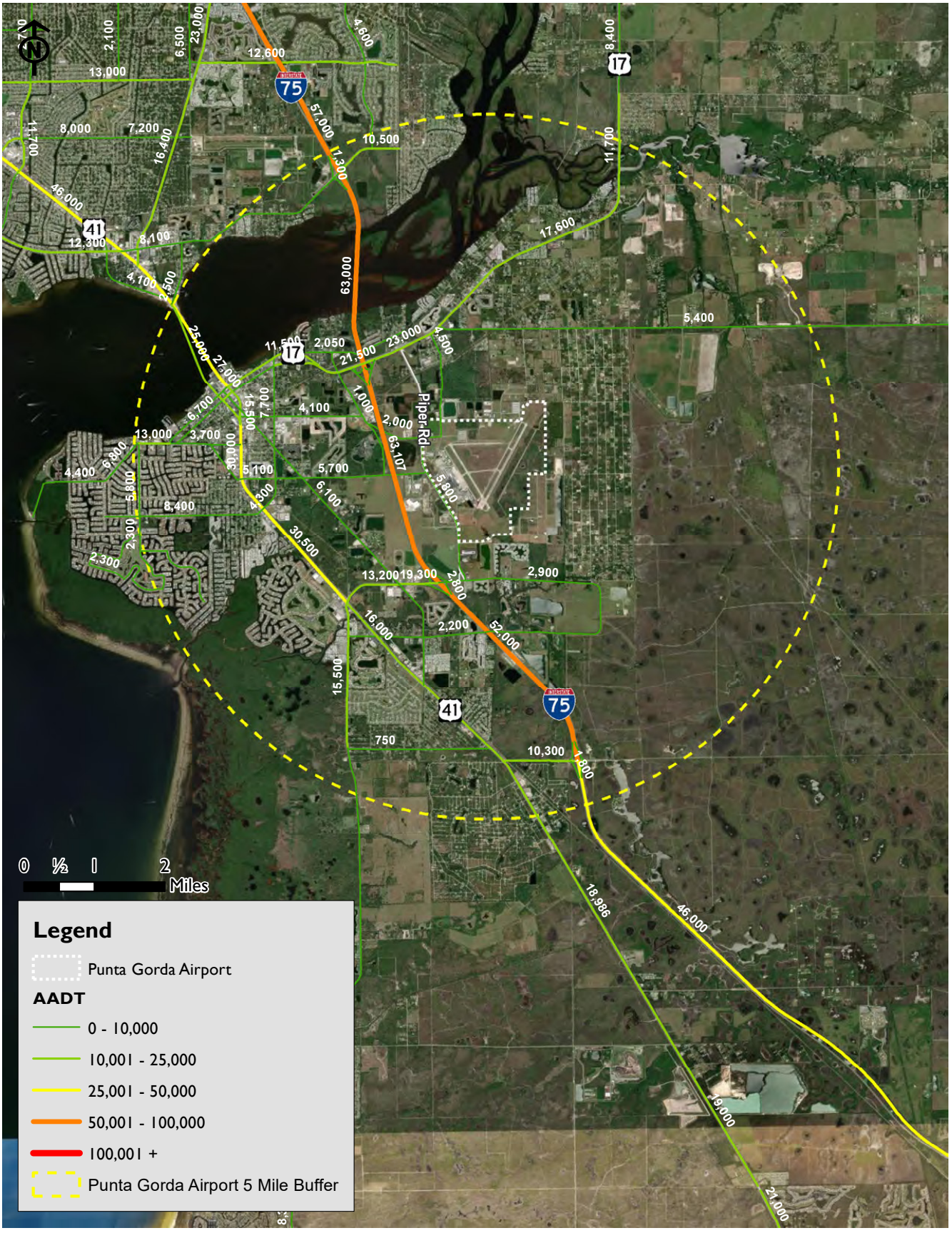
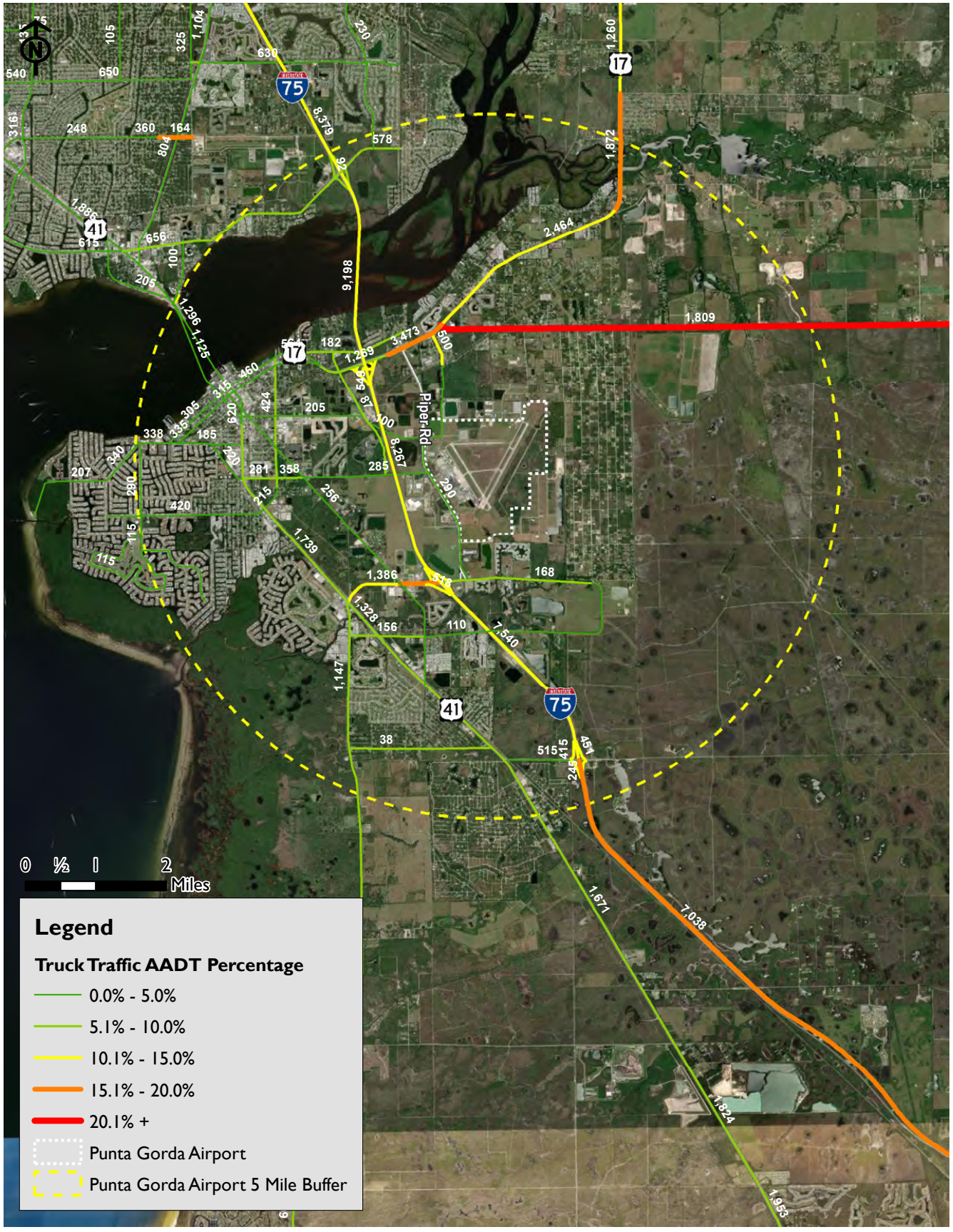


Figure 41 - PGD Study Area Truck Volumes



7.2.2 Crash Rates and Density

Vehicular crashes are depicted for both an area crash rate, five year rate, and crash density, a heat map, in Figure 42 and Figure 43 respectively. The analysis shows that accidents typically align along the major thoroughfares through the study area, while the crash rates are highest at the US 41 major intersections and at the I-75 interchanges.

Figure 42 - PGD Study Area Crash Rates

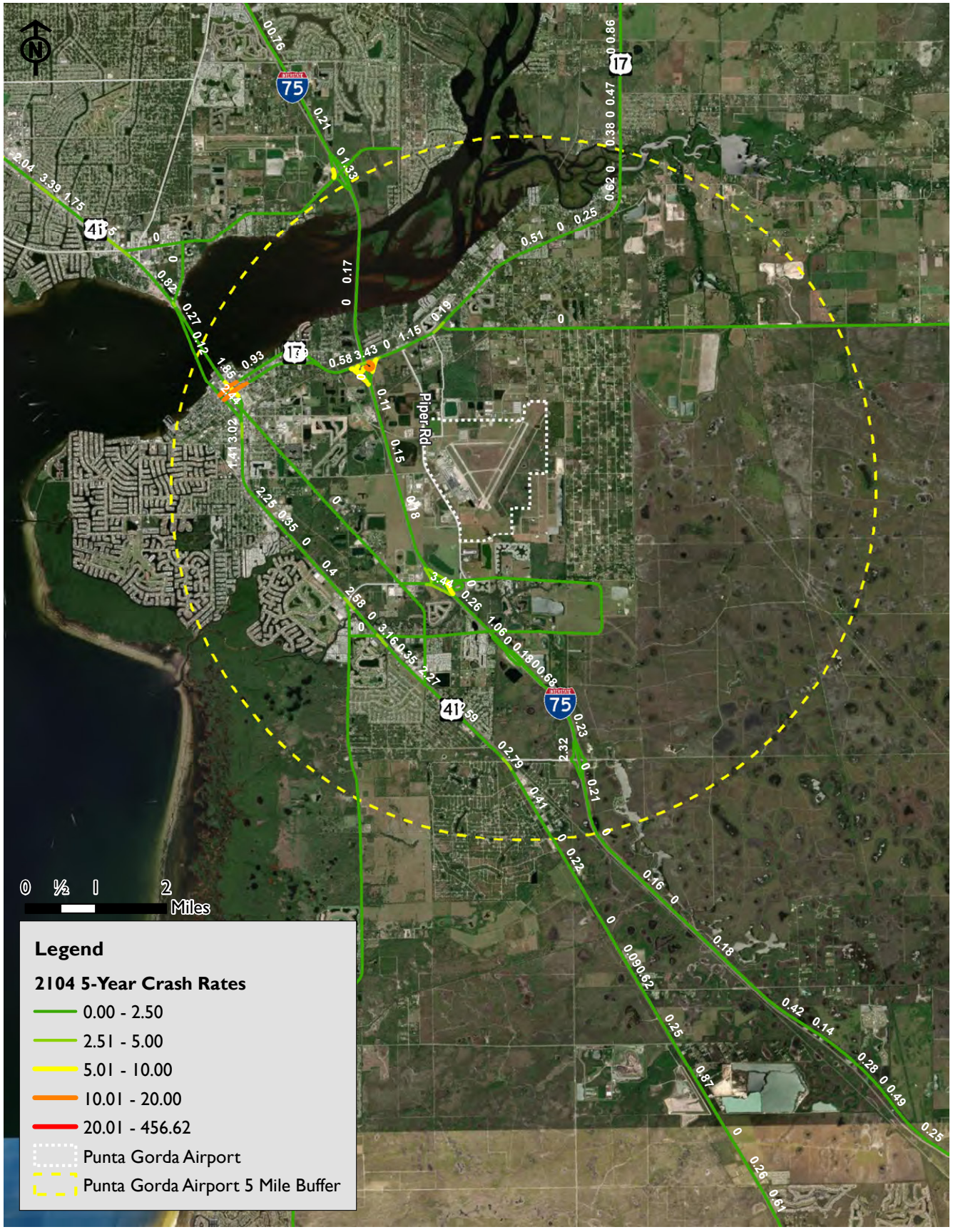
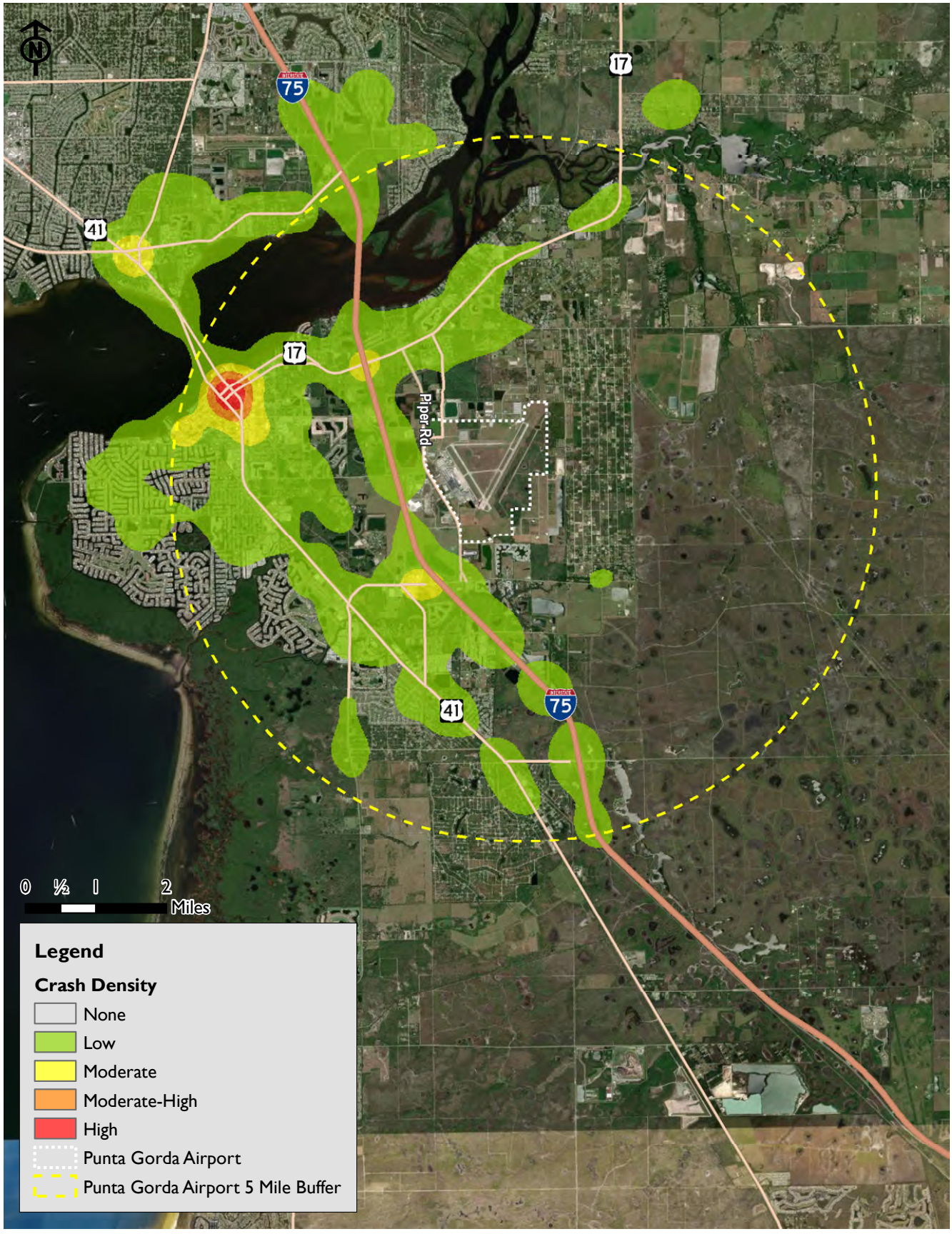


Figure 43 - PGD Study Area Crash Density



7.3 Existing Conditions & Master Plan Review

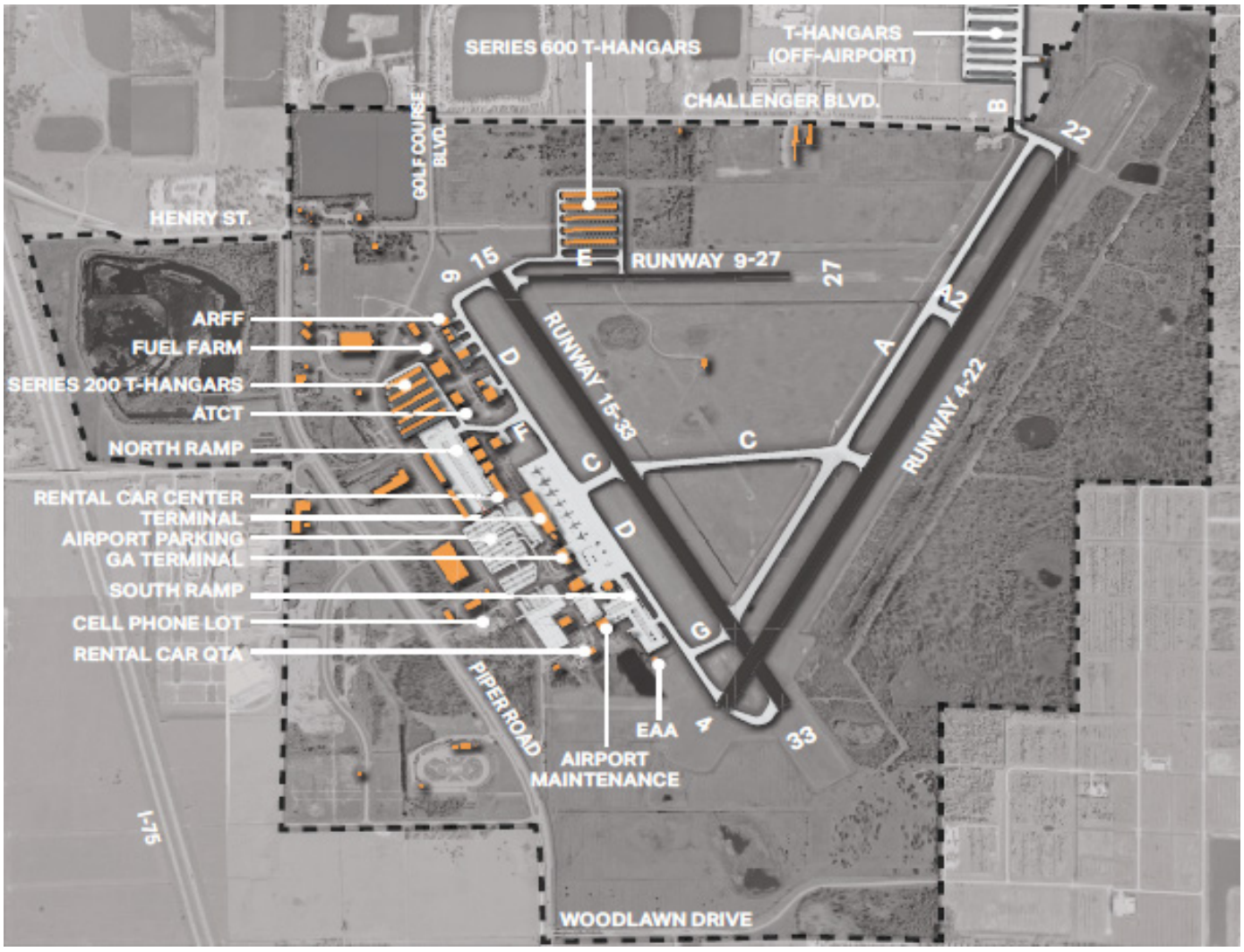
7.3.1 Geography and Airside Facilities

PGD is located in Charlotte County, Florida and is approximately three miles east of the City of Punta Gorda and 22 miles north of the City of Fort Myers, by truck. PGD encompasses approximately 1,878 acres of land and its elevation sits AMSL at approximately 26 feet.

PGD operates within a Class D Airspace and has an ATCT that operates between 7am and 9pm eastern standard time.

Airside facilities at PGD consist of three runways, seven taxiways, three parking aprons, various NAVAIDS, a multitude of weather aids, and one ATCT as shown in Figure 44.

Figure 44 - PDG Facilities



Source: 2018 PDG Master Plan Update

The airfield consists of runways 4-22, 15-33, and 9-27 and none have paved shoulders. 4-22 is the primary air carrier facility while 15-33 is a limited use air carrier facility. Simultaneous operations may not occur on 4-22 and 15-33 as they intersect towards the south of the airfield. The Runway Design Code (RDC) for 4-22 and 15-33 is C-III-4000 which accommodates Allegiant's aircrafts, the Airbus A319 and A320 aircraft for operations at PGD. Runway 9-27 is used for small, single-engine aircraft with an RDC of A-I-VIS. Characteristics of the runways are included in Table 23 and characteristics of the taxiway are included in Table 24.

Table 23 - PGD Runway Characteristics

Characteristic		Runway		Runway		Runway	
		4	22	15	33	9	27
Length & Width		7193' x 150'		5688' x 150'		2636' x 60'	
Displaced Threshold		0'	0'	561'	0'	0'	0'
Marking (Condition)		Precision	Non-Precision	Non-Precision	Non-Precision	N/A	N/A
Navigational Aids		REIL PAPI HIRL VOR ILS	REIL PAPI HIRL VOR	REIL PAPI HIRL	REIL PAPI HIRL	N/A	N/A
Surface Type		Asphalt (Grooved)		Asphalt		Asphalt	
Strength	Single Wheel	45k Lbs.		45k Lbs.		45k Lbs.	
	Dual Wheel	95k Lbs.		95k Lbs.		95k Lbs.	
	Dual Tandem	150k Lbs.		150k Lbs.		150k Lbs.	
	Double Dual Tandem	420k Lbs.		N/A		420k Lbs.	
Effective Gradient		0.03	0.03	0.08	0.08	0.11	0.11
Pavement Condition (2015)		Fair		Fair		Fair	

Table 24 - PGD Taxiway Characteristics

ID	Location / Description	ADG	TDG	Width	Distance to Runway
A	Parallel Taxiway for Runway 4-22	III	4	60'	400'
B	Access to "Through-the-fence" T-Hangars	II	4	50'	410'
C	Crossfield Taxiway connecting Taxiway A to the Terminal	III	4	60'	400'
D	Parallel Taxiway for Runway 15-33	III	4	50'	525'
E	Connection to North T-Hangars	II	3	30'	225'
F	Parallel to Taxiway D & General Aviation Apron Area	II	4	50'	N/A
G	Entrance / Exit Taxiway To Runway 33	III	4	50'	N/A

PGD has three aircraft parking aprons including the North Ramp, the Commercial Terminal Apron, and the South Ramp. The North and South Ramps are constructed of asphalt, while the Commercial Terminal Apron is constructed of concrete. Additional detail pertaining to each ramp are as follows and as shown in Table 25.

The North Ramp has positions to store up to 39 aircraft. However, it is currently inaccessible for aircraft parking due to the proximity of rental car facility operations.

The Commercial Terminal Apron is located adjacent to the Bailey Terminal, a 57,400 square foot facility that has six ground loaded gates. Seven aircraft can currently be stored on this apron. Expansion plans for this apron will increase

the footprint by approximately 105,000 square feet to accommodate 10 aircraft upon project completion.

The South Ramp can accommodate a total of 58 aircraft. This ramp has been allocated to support GA users of the airport.

Table 25 - PGD Parking Aprons

Name	Square Feet	Square Yard	Parking Positions Tie Downs
North Ramp	293,000	32,556	39
Commercial Terminal Apron	337,886	37,543	7
South Ramp	193,300	21,478	58

The 2019 Statewide Airfield Pavement Management Program, developed by FDOT, determines the condition of pavements so that funding can be prioritized accordingly for assets. Figure 45 depicts the results of the pavement study. Within the study, FDOT recommends Minimum Service PCI for pavements based on the use of the transportation facility and the airport type as shown in Table 26. Maintenance and repair should be conducted to improve pavement conditions and to prevent critical PCI status, as set by the FDOT Recommended Minimum Service Level. Major construction is needed once the pavements reach the Critical PCI threshold. The study forecasts average pavement conditions generally if no improvements are to be made as shown in Table 27 which shows degradation over time.

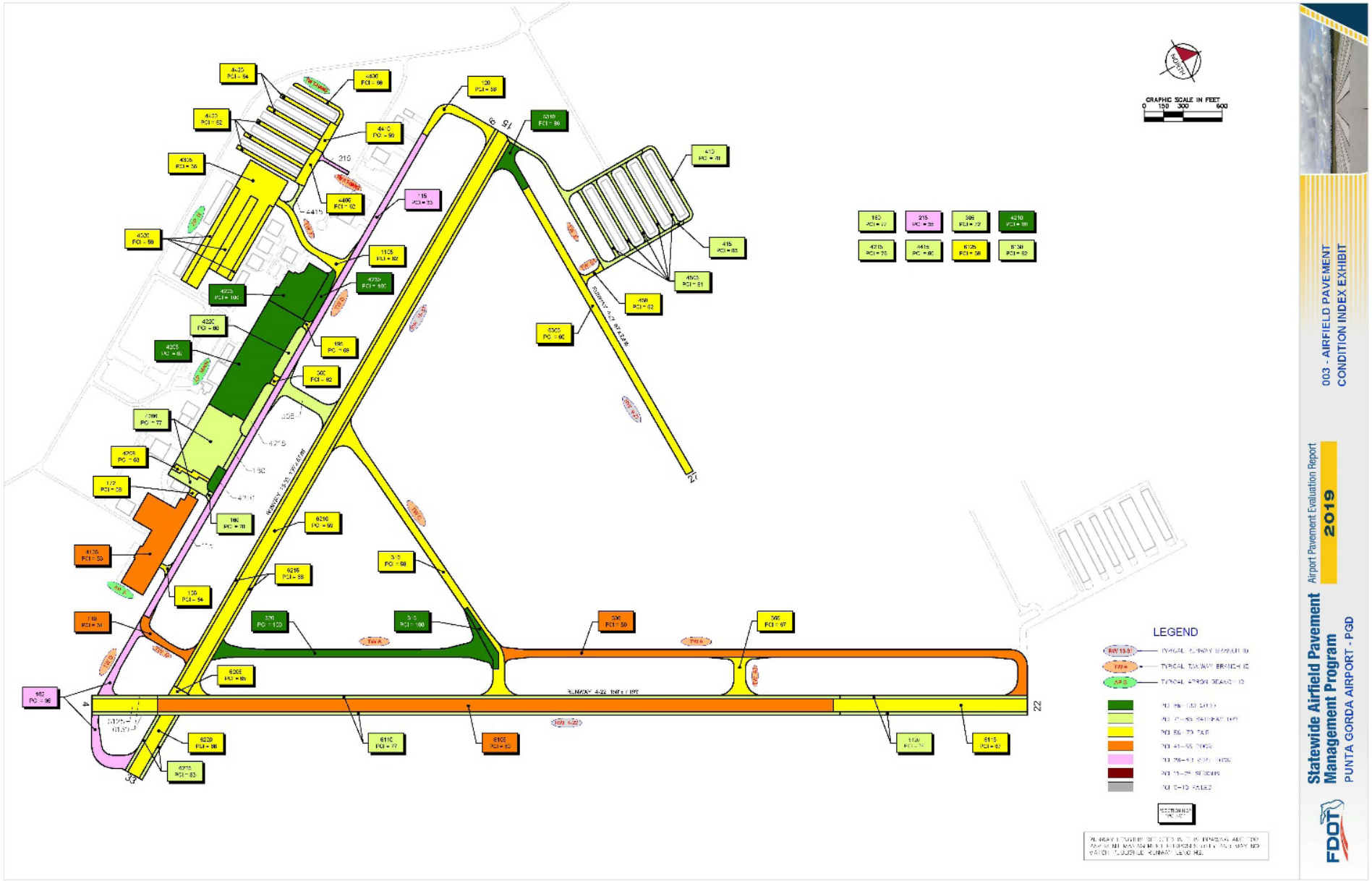
Table 26 - FDOT Airfield Recommended and Critical Service PCI Levels

Use	FDOT Recommended Minimum Service Level PCI			Critical PCI
	Primary Airports	Regional Reliever Airports	General Aviation Airports	
Runway	75	75	75	65
Taxiway	70	65	65	65
Apron	65	65	60	65

Table 27 - PGD Forecasted Pavement Conditions (Overall Area-Weighted PCI)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Runway	60	59	57	56	55	54	53	52	51	50
Taxiway	59	57	55	54	52	50	48	46	45	43
Apron	71	69	68	66	65	64	62	61	60	58

Figure 45 - PGD 2019 Pavement Conditions



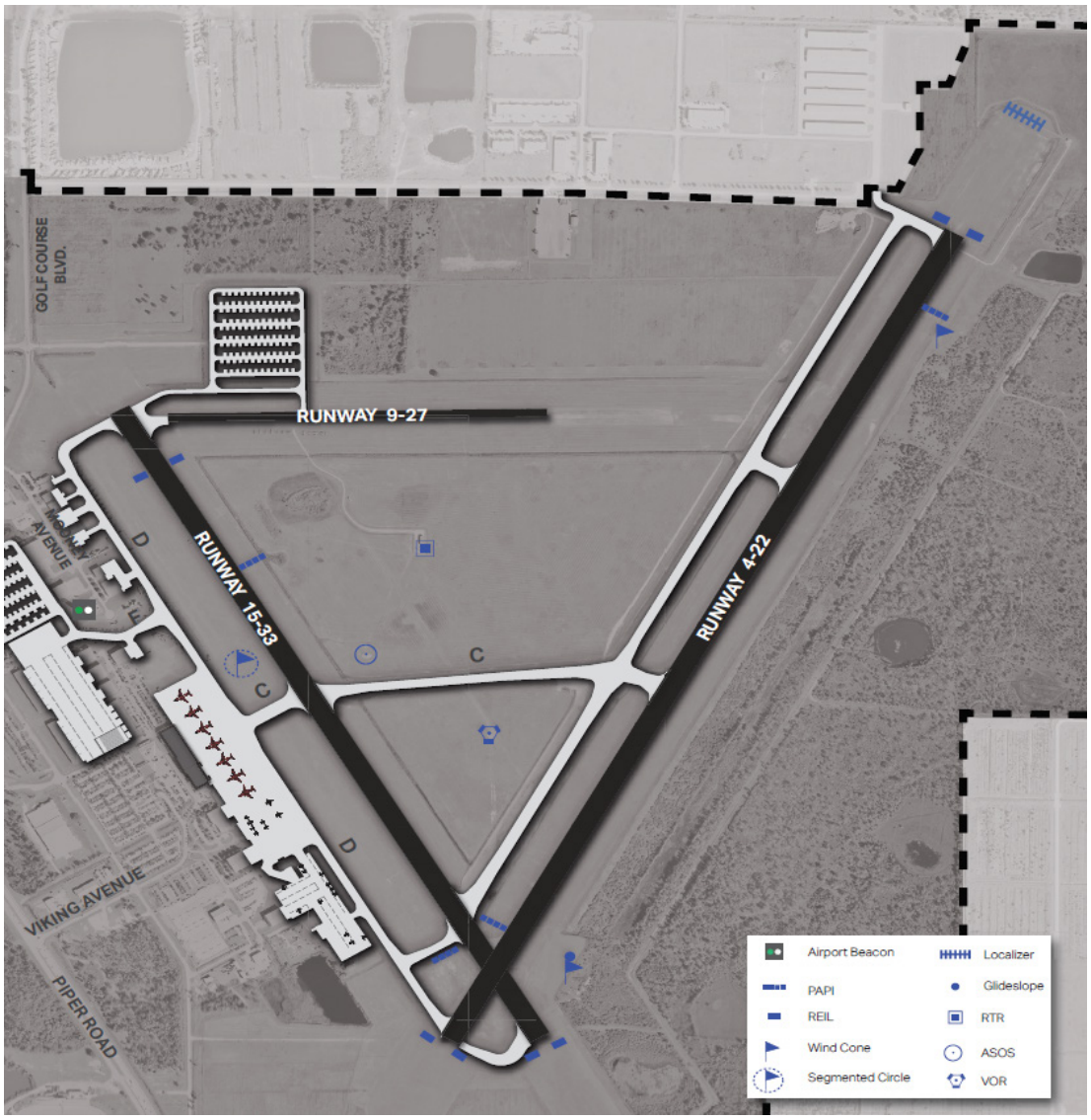
Source: FDOT 2019 Statewide Airfield Pavement Management Program

NAVAIDS and ATC facilities are used to help pilots safely navigate aircraft on and to the airfield. NAVAIDS are either visual or instrument based, while ATC facilities are categorized as communications, surveillance, or weather facilities. Table 23 shows NAVAIDS on each runway and Figure 46 shows their locations. Examples of NAVIDS at PGD include:

- Runway End Identifier Lights (REILs) help a pilot quickly determine the end of the runway;
- PAPI provides visual vertical guidance to pilots during their approach to land;
- HIRL and Medium Intensity Runway Edge Lights (MIRL) are guides that help pilots approach the runway;
- Non-precision approaches include VOR and RNAV with Required Navigation Performance (RNP); and
- Automated Surface Observation System (ASOS) is used to measure cloud cover and ceiling, visibility, wind speeds and direction, temperatures, and other weather needs. The ASOS is located north of Taxiway C and east of Runway 15-33.

Communication aids such as a remote transmitters and receivers are used for radio communications between pilots and the ATCT. An Airport Surveillance Radar (ASR) is used by PGD, but is not located on site. The ASR is stationed at Southwest Florida International Airport in Fort Myers.

Figure 46 - PGD NAVAIDS



Source: 2018 PGD Master Plan

7.3.2 Roadway Access

PGD is situated near both I-75 and US 17 and has direct local public access through Piper Road and Golf Course Boulevard. East Henry Street also provides access to Piper Road, north of the airport. Bermont Road would provide access from the east, connecting to Duncan Road which again links to Piper Road.

7.3.3 Tenants

Private pilots and flight training schools make up the largest tenants at PGD. In 2015, there were 342 GA aircraft segmented into 281 single-engine, 33 multi-engine, 16 jet, 10 helicopters, and two gliders. These 342 GA aircraft accounted for approximately 90 percent of the operations at PGD.

Hangars are owned by CCAA and leased to private individuals or businesses. Table 28 shows the current tenants at PGD, size of facility, and the nature of the business. There is approximately 479,400 total square feet of GA facilities at PGD.

Table 28 - PGD Tenants

Tenants			
Allegiant Air	Charlotte County Airport Authority	Experimental Aircraft Association	4-17 Southern Speedway & Events
Air Trek	AeroGuard Flight Training Center	Asphalt Construction	Various
Air Trek	Air Tours LLC	Halfacre Construction	Skyview Café
Coastal Biplane Tours	Harborside Aviation	Walt Bradshaw	The Junction
Air Cargo Carriers	Flight Fast Track	Dick Solar	Aviation Security Management
Aeronautical Services Inc.	LPC Aviation	Charlotte County Sherriff	FedEx
Arcadia Aerospace	APG Avionics	Gulf Coast Car Service	SuperTrak
Avionix	Worldwide Flight Services	Wahoo Fishing Products Inc	Gulf Machine Works
Sarasota Avionics & Maintenance	Gulf Contours	AmeriGas Storage Facility	
PSC Warbird Aviation	Civil Air Patrol	Pulsafeeder	

The following businesses provide MRO services at PGD:

- Air Cargo Carriers (Milwaukee Avionics and Instruments);
- APG Avionics;
- Arcadia Aerospace;
- Avionix;
- PSC Warbird Aviation; and
- Sarasota Avionics and Maintenance.

The majority of freight received by these businesses is likely received via USPS, FedEX, or UPS based on the nature of their work. Additional freight may be received by less than truck load (LTL) as necessary. More details regarding businesses that operate within the air freight industry at PGD are below:

Air Cargo Carriers

Air Cargo Carriers provides ad-hoc air freight services.

Allegiant Air

Allegiant Air is a certified DOT passenger air carrier that provides service to PGD. Their business model focuses on affordable and convenient airfares. The company flies scheduled and chartered airline operations throughout the US.

At PGD, freight arriving for Allegiant Air would be focused on facility operations, including fuel (by means of PGD, products for in-flight services, etc. These shipments are likely in the form of LTL and tanker vehicle. Past airlines at using PGD have shipped freight within their passenger services. Based on an interview with PGD, Allegiant is not conducting this service at this time but it may be an opportunity for additional revenue in the future.

Federal Express (FedEx)

FedEx has a facility at PGD and is a multinational courier deliver service company.

7.3.4 Foreign Trade Zone

PGD is located within FTZ 213. In an effort to promote economic activity, a FTZ is a physical location that is granted special privileges by the US Federal Government for the importation and exportation of merchandise to-and-from the United States of America. Although an FTZ is located within the US, for customs purposes, the site is considered to be located outside of the Customs Territory of the United States and all merchandise entering the FTZ site is considered international commerce. This allows for tariffs on goods that are shipped into the US and then back out to either be delayed, reduced, or eliminated.

The fact that PGD is located within FTZ 213 offers unique growth opportunity for businesses residing on PGD property or in the surrounding area by allowing them to move goods to and from other zones with reduced or modified taxes. Businesses seeking to move goods by air will seek industrial or commercial properties within the FTZ area. Developing land on and around the airport to be used for industrial/commercial uses will increase the revenues and those funds should be used for future airport improvements.

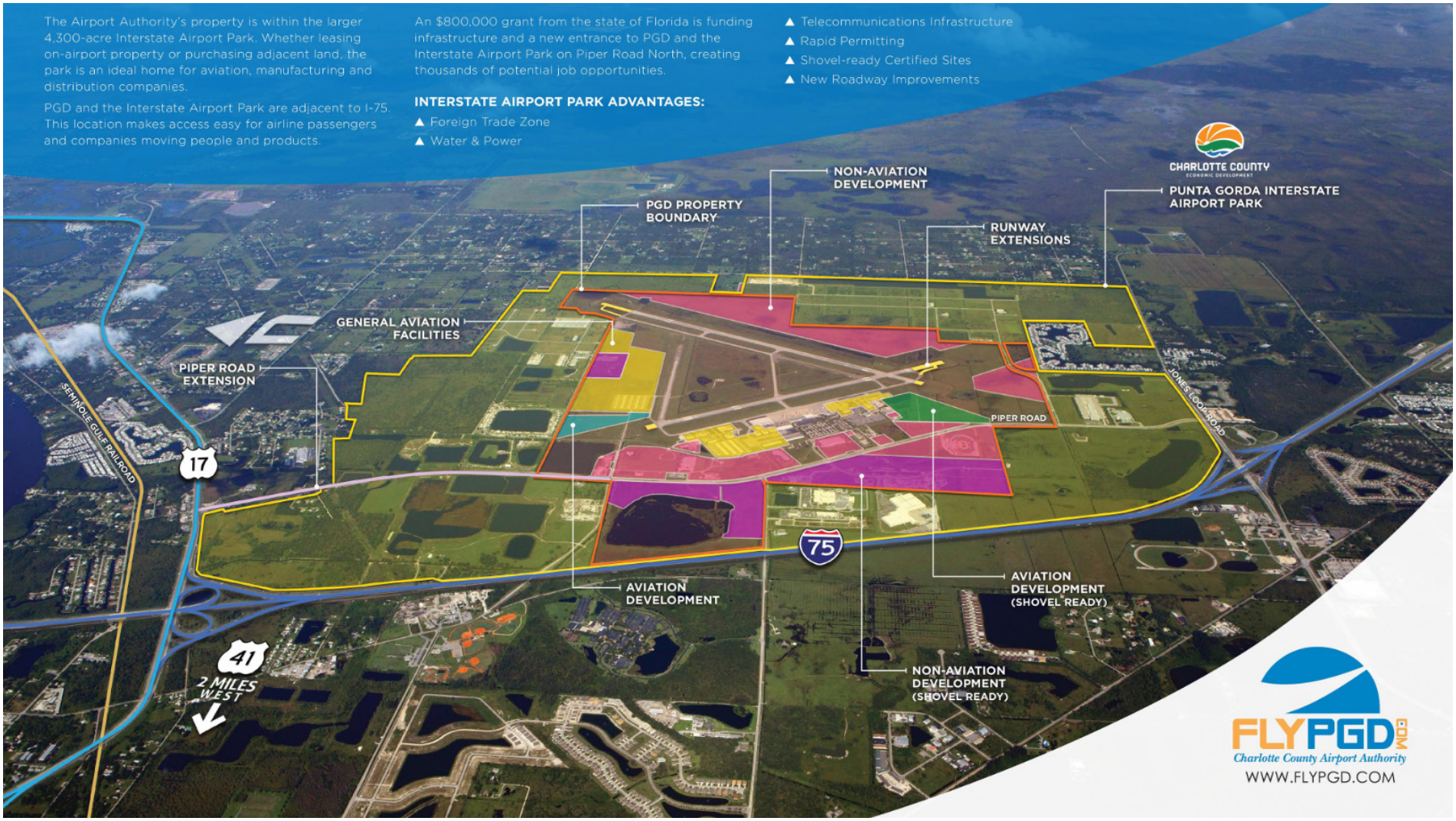
7.4 Facility Planned Improvements

PGD is surrounded by an Interstate Airport Park (IAP), which is also operated by the CCAA (Figure 47). The IAP is comprised of 4,300 acres that are ready for development and it offers advantages similar to a FTZ. Infrastructure (water, power, telecommunications, and transportation) has been put in place to accommodate new business growth. The IAP also offers shovel-ready sites with rapid permitting. The floor plans range from 10,000 to 100,000 square feet and are conveniently located near I-75. The State of Florida approved an $800,000 grant to improve infrastructure and a new entrance on Piper Road.

PGD currently does not have any scheduled cargo services, but did have ad-hoc services with an available capacity of approximately 62,677 pounds in 2016.[19]

19 FACS http://www.florida-aviation-database.com/library/filedownload.aspx?guid=90cff320-313d-4c9f-a639-d63d538b467a

Figure 47 - Interstate Airport Park



Source: FlyPGD.com

7.4.1 Maintenance, Repair, and Overhaul Facilities

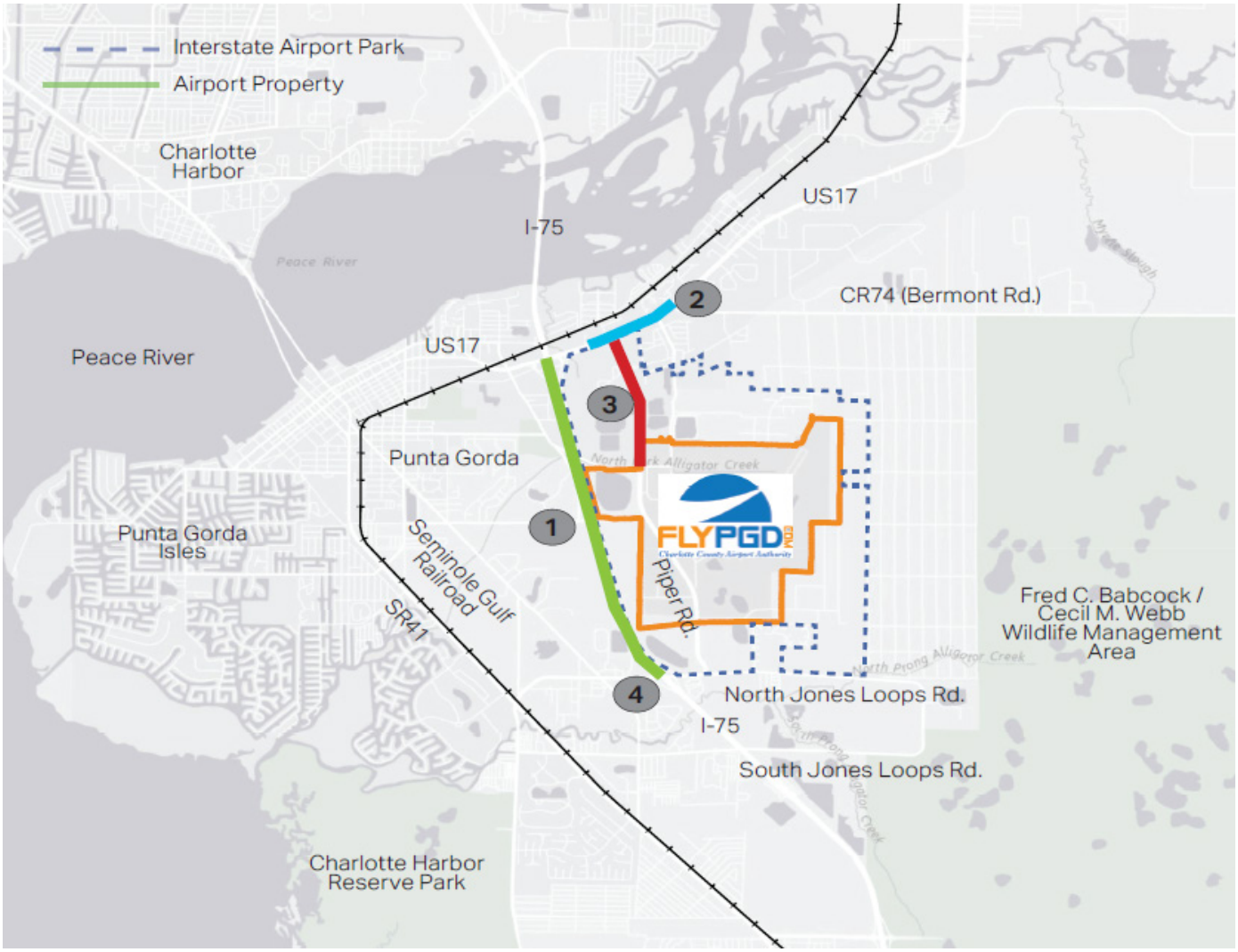
There are six GA MRO businesses at PGD, which all can be found on specific maintenance page developed by the airport.[20]

7.5 Roadway Planned Improvements

PGD resides within the Charlotte-Punta Gorda Metropolitan Planning Organization (MPO) boundaries. The MPO is responsible for developing a LRTP that includes all federally funded or regionally significant projects within its boundaries. Figure 48 illustrates four projects that were approved in the 2040 LRTP by the MPO:

- Project 1: Widen I-75 to six lanes (Jones Loop Road to US 17);
- Project 2: Widen US 17 to six lanes (Piper Road to CR 74/Bermont Road);
- Project 3: Extend Piper Road to US 17; and
- Project 4: Improve geometric design and signalization improvements on the I-75/Jones Loop Road Interchange.

Figure 48 - PGD Transportation Improvements



Source: 2018 PGD Master Plan Update

Project 1, which is a capacity enhancement project that widens I-75 from Jones Loop to US 17, has been completed. The MPOs TIP shows that the funds were already expended. Adding lanes along I-75, which is an important SIS facility in Florida, insures that the flow of vehicles and freight can continue to occur now and meet demands in the future.

Project 2, the widening of US 17 from Bermont to Piper Road is not listed in the TIP. However, there exists a $10 million dollar resurfacing project scheduled from Cooper Street to Bermont Road in 2024 in the TIP.

20 https://www.flypgd.com/maintain-my-aircraft/

Project 3, extending Piper Road to US 17, is budgeted in the CIP for 2018 and 2019. The Piper Road extension has recently been completed..

While project 4 is not listed in the TIP or the CIP, a Google Earth review reveals that new infrastructure (signals and pavement) were put in place to address geometric design and signalization improvements with project 1.

7.6 Projected Growth

7.6.1 Aviation Freight Growth

As of 2016, PGD was one of six commercial service airports in Florida that did not have scheduled air cargo service; however, ad-hoc freight was operational and was ranked 12th out of 39 in estimated volume in Florida. There were 14 ad hoc operations with an estimated cargo volume of 62,677 pounds that same year. Assuming PGD continues to operate similarly in the future, a CAGR of 0.52 percent was applied to operations and volumes were projected for 2020, 2030, and 2040 as shown in Table 29. Both operations and volumes are expected to increase approximately 13 percent between 2016 and 2040. Scheduled service is not anticipated at this time. If there were a transition to scheduled air cargo operations, a reassessment of future volume would be required.

Table 29 - PGD Ad Hoc Air Cargo Projected Operations and Volumes

Year	Operations (Flights Annually)	Volume (Pounds Annually)
2016	14	62,677
2020	14	63,991
2030	15	67,397
2040	16	70,985
0.52% CAGR		

7.6.2 Roadway Network Growth

Traffic operating conditions were evaluated for the study area roadways that are most likely to be impacted by forecasted automobile and freight movement growth for PGD. Table 30 presents the LOS analysis results for these roadways. All roadways currently operate at an acceptable LOS.

Table 30 - PGD Existing Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2018				
				AADT	Truck AADT	Truck %	Peak Hour Volume	LOS
Jones Loop Rd	Piper Rd to Alfred Blvd	9.5	53.5	2,900	168	5.8%	275	A
Piper Rd	US 17 to Jones Loop Rd	9.0	53.5	5,800	290	5.0%	520	A
Bermont Rd	Hwy 17 to Strasse Blvd	9.0	53.5	5,400	1,809	33.5%	485	A
US 17	I-75 to Washington Loop Rd	9.0	54.2	20,300	2,969	14.6%	1,825	B

PGD vehicular traffic growth is projected to grow at a CAGR of 2.07 percent based on the population growth of Charlotte County. The roads in the study area that were evaluated for future LOS are as shown in Table 31. US 17 carries the most volume with Piper Road and Bermont Road falling very close in second and third place respectively.

Table 31 provides a depiction of 2018 truck volumes and projections for 2020, 2030, and 2040 for roads near PGD within the study area. The CAGR of 0.52 percent was used for freight growth projections as PGD currently only has

ad hoc air cargo operations and there is no anticipated transition to air cargo operations in the immediate future.

Roadway capacity analyses were also conducted based on the 2020, 2030, and 2040 traffic projections. The differences in overall AADT and truck AADT growth results in varying truck percentages between 2020, 2030, and 2040 conditions. The results of the future conditions capacity analysis indicated that all study area roadways are expected to operate at acceptable LOS for all future years.

Table 31 - Projected PGD Future Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2020				2030				2040			
				AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
Jones Loop Rd	Piper Rd to Alfred Blvd	9.5	53.5	3,021	170	5.6%	A	3,708	179	4.8%	A	4,552	188	4.1%	A
Piper Rd	East Henry to Jones Loop Rd	9.0	53.5	6,043	293	4.8%	A	7,417	309	4.2%	A	9,103	325	3.6%	A
Bermont Rd	Hwy 17 to Strasse Blvd	9.0	53.5	5,626	1,828	32.5%	A	6,905	1,925	27.9%	B	8,475	2,028	23.9%	B
US 17	I-75 to Washington Loop Rd	9.0	54.2	21,149	2,999	14.2%	B	25,958	3,159	12.2%	B	31,861	3,327	10.4%	C

7.6.3 Rail Growth

PGD does not have on-site rail access and limited opportunities for shipment by rail surrounding the airport. If freight were to be transported by rail, it would occur outside of the study area and require transit by truck prior to rail access.

7.6.4. Qualitative Industrial Growth Analysis

Two locations have been identified within the PGD study area as suitable for industrial activity and growth, based on a review using the methodology described in Section 4.4 of the report.

Proposed industrial growth area 1 is located southwest of the airport and shown below in Figure 49. Piper Road and I-75 run parallel to one-another, bounding the site on the east and west, respectively. The Charlotte County jail and Cheney Brothers are located on the northern portion of the property, south of Airport Road. The Charlotte County Speedway sits on the eastern portion of the site, with access provided from Piper Road. With the exception of the aforementioned structures, the property is otherwise undeveloped. I-75, US-17, and Piper Road are all considered SIS roadway facilities, and the Seminole Gulf Railway, west of the site, is an emerging SIS rail facility. This property is included within the Enterprise Charlotte Airport Park on the Future Land Use Map

Proposed industrial growth area 2 (Figure 49) is located north of PGD. This tract of mostly undeveloped land is designated as part of the Enterprise Charlotte Airport Park in the Future Land Use Map. The property is bordered by Golf Course Boulevard (west) and Fairway Drive S (north). The Water's Edge RV Park is located at the southern boundary of the site. Minimally developed land is also available to the east, contiguous to this property, directly north of the airport. The site is located in close proximity to Piper Road, US 17, and I-75, all of which are designated as SIS facilities.

Figure 49 - PGD Industrial Growth Areas

7.7 Recommendations

Recommendations for PGD are focused on the airport site, the surrounding roadway network, and any on site rail improvements, if applicable. They are based on information from within this study and are categorized as short-term (1 to 5 Years), mid-term (6 to 9 years), and long-term (10 to 20 years), as shown in Table 32. Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan.

Table 32 - PGD Recommendations

Location	Improvement Recommendations	Identified Needs	Implementation Timeframe
PGD Airport Site Recommendations			
PGD	Runways	Major Construction	Short Term (1-5 Years)
PGD	Taxiways	Major Construction	Short Term (1-5 Years)
PGD	Aprons	Major Construction	Short Term (1-5 Years)
PGD Roadway Recommendations			
Intersection of Piper Road and Jones Loop Road	Intersection improvement (possible signalization or roundabout)	Existing congestion at intersection	Short-Term (1-5 Years)
I-75 and interchanges with US 74 at Jones Loop Rd	Improve signage/wayfinding to airport	Little signage/wayfinding those looking to access the airport	Short-Term (1-5 Years)
Golf Course Blvd at Viking Road	Intersection improvement (possible signalization or roundabout)	Existing four-way stop results in vehicle delay	Short-Term (1-5 Years)
Airport Rd at Viking Road	Intersection improvement (possible signalization or roundabout)	Existing four-way stop results in vehicle delay	Short-Term (1-5 Years)
Intersection of Airport Rd at Piper Road	Conduct periodic traffic analysis to identify potential bottleneck conditions at this primary airport access point	Long term access needs for airport	Mid and Long-Term
General	Evaluate impacts from realized growth at Cheney Brothers and other large distributors in the area to determine if additional traffic analysis is warranted	Traffic study	Mid and Long-Term
PGD Rail Recommendations			
There are no recommendations for rail improvements within the PGD study area			

7.8 Conclusion

Airside improvements for PGD are focused on air-side concrete improvements based on data from FDOTs Major Rehabilitation Exhibit, which states, almost the entire airfield require concrete reconstruction in 2020. This includes all runways, most taxiways, and the majority of aprons. All efforts at this time should focus on gathering the financial resources to complete the necessary rehabilitations to keep both passenger and air cargo operations moving forward.

Collaboration with FDOT should primarily focus on five roadway recommendations to maintain good vehicular and truck flow. Three of the recommendations are intersection improvements, one is improved signage, and one is a study to monitor traffic conditions. These roadway network improvements will ensure safe and efficient movement of people and goods for existing and future businesses so they can operate and improve the local economy.

8

SW Florida International Airport

8. Southwest Florida International Airport

RSW is owned by Lee County and operated by the Lee County Port Authority (LCPA). The LCPA is governed by the Board of Port Commissioners, consisting of the elected Lee County Commissioners. Each Port Commissioner appoints one member to the Airports Special Management Committee (ASMC) and also has one representative from neighboring Charlotte and Collier counties. The ASMC advises the Port Commissioners on all policy matters related to RSW

The 2019-2023 NPIAS designates RSW as a Medium Hub, Primary Commercial Service airport. Medium hub airports account for between 0.25 and 1 percent of total annual enplanements within the United States. RSW is the regions busiest airport in terms of passenger travel with approximately 15 different airlines offering services throughout North America and Germany. As of 2018, RSW was the second busiest single runway airport in the US.

RSW has limited GA activity with an estimate of 28 based aircraft on site by 2020.[21] The airport is also the only airport within the study to have scheduled air cargo activity on dedicated freight planes and widebody passenger aircrafts.

8.1 Study Area Physical Conditions Review

8.1.1 RSW Study Area

Figure 50 provides a depiction of the RSW study area which includes a five mile radius around the airport. RSW sits entirely in Lee County, Florida and is approximately one mile outside of Fort Myers. The RSW study area includes I-75, SR 82, Daniels Parkway, Treeline Avenue South, Terminal Access Road, Ben Hill Griffin Parkway, and Alico Road.

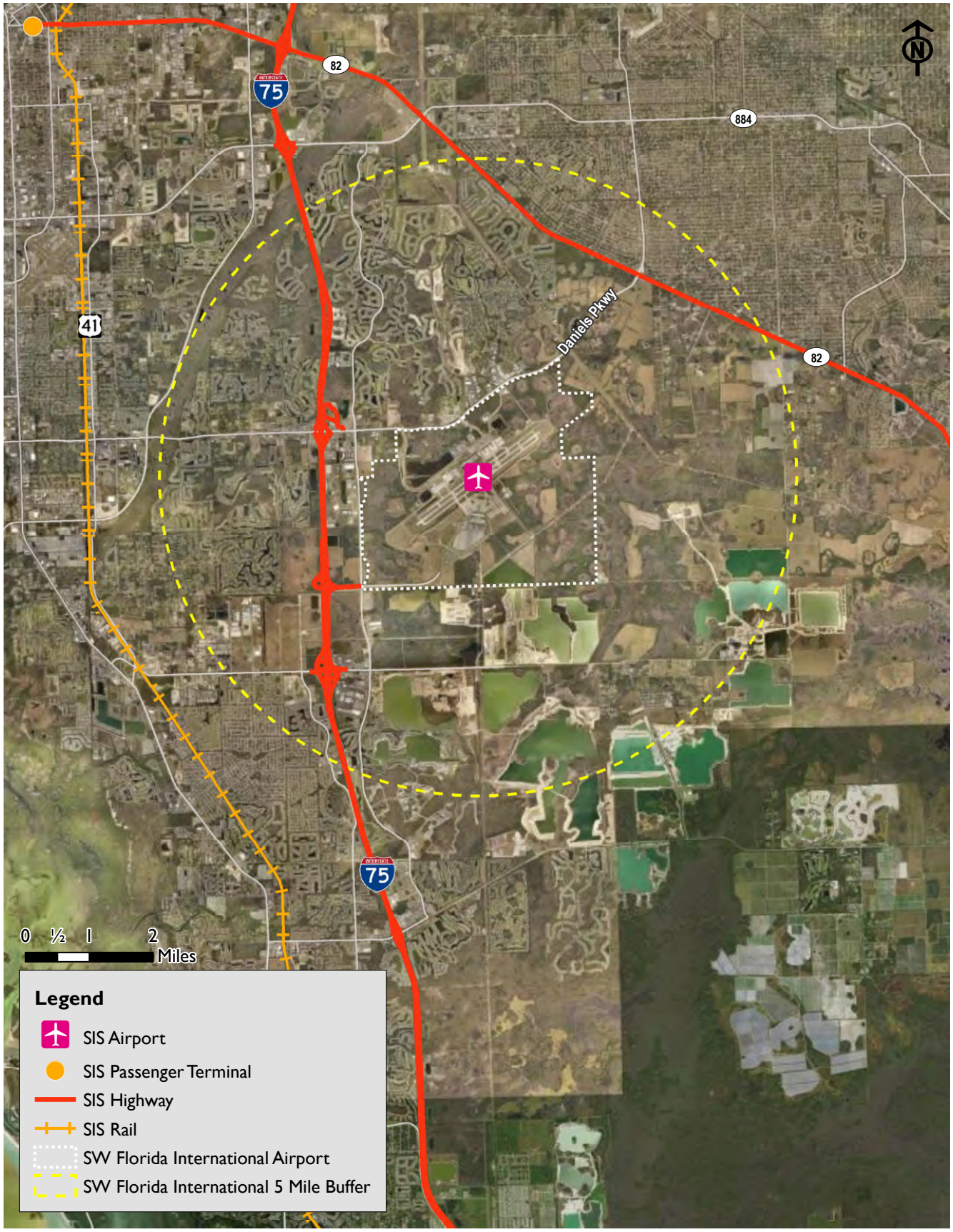
8.1.2 SIS Facilities

RSW, as a Florida SIS airport facility, is strategically located between two SIS highways. RSW sits approximately two miles east of I-75 and four miles west of SR 82. Figure 50 provides a depiction of the SIS facilities within the study area. Other SIS facilities surrounding the study area include:

- Lee County Port Authority Intermodal Facility
- SCFX SIS rail line

21 2004 RSW Airport Master Plan

Figure 50 - RSW Study Area and SIS Facilities



8.1.3 Roadway Infrastructure Assessment

Field observations of the roadway network were conducted on Tuesday, October 8th, 2019. The observations occurred at approximately 8:15 AM, within the RSW study area. The route can be seen in Figure 53. Observations focused on existing conditions of the roadway infrastructure as well as identification of traffic congestion. Details from the assessment are as follows:

- Traffic during the assessment was light for most of the routes;
- Daniels Parkway was observed to have moderate traffic conditions; and
- The pavement conditions at the intersection of Jetport Commerce Parkway and Jetport Loop Intersection at RSW are poor as shown in Figure 51. Moderate to severe alligator cracking and base failure are occurring on the left side of the roadway. Rutting has developed along the left wheel path of the roadway. Numerous pavement patches are present at the intersection. Finally, the pavement design appears that it is not strong enough for the truck traffic using the road.
- Pavement at the intersection of Paul J. Doherty Parkway and Chamberlin Parkway is in fair-to-poor condition (Figure 52). Moderate to severe alligator cracking is present in the pavement. Also, rutting is occurring along the right wheel path. There are numerous pavement patches on the roadway. Observations indicate that the pavement design is not strong enough for the truck traffic using the road.

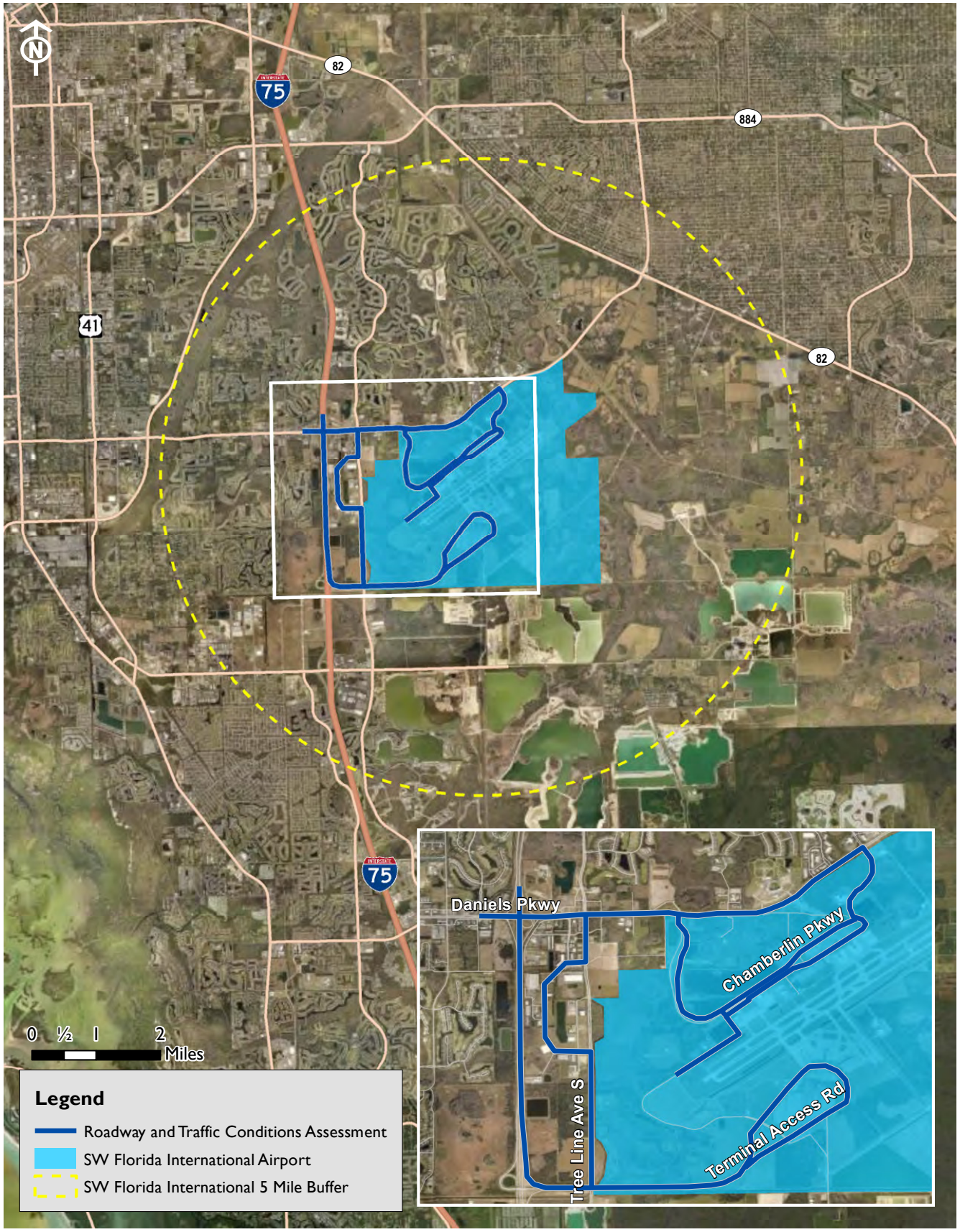
Figure 51 - Intersection of Jetport Commerce Parkway and Jetport Loop

Figure 52 - Intersection of Paul J. Doherty Parkway and Chamberlin Parkway

Google speed was reviewed for roads near the airport during peak periods. Roads that were reviewed as part of the analysis include Daniels Parkway, Treeline Avenue South, Terminal Access Road, Ben Hill Griffith Parkway, and Alico Road. Details from the review are as follows:

- Throughout the weekdays, during the AM peak periods, Daniels Parkway showed some heavy congestion.

Figure 53 - RSW Roadway Assessment



8.1.4 Concrete Intersection Improvement

Within each study area, the existing conditions assessment identified intersections that should be further evaluated for a heavier duty pavement application. For RSW, the intersection of Alico Road and Ben Hill Griffin Parkway should be evaluated for a concrete application. Table 33 identifies the intersection and provides the rationale for why it was recommended. Recommendation criteria includes; facilities with high and growing truck volumes, proximity to existing and planned industrial land uses, and proximity/connectivity to SIS facilities.

Table 33 - RSW Concrete Rationale

Intersections	Reason for Consideration for Concrete Pavement
Alico Road @ Ben Hill Griffin Pkwy	With 3,219 trucks per day, Alico Road has an AADT truck percentage of 43%. The high number of trucks on this roadway are primarily due to the two sand, gravel, and crushed stone plants and concrete plant located on Alico Road east of Ben Hill Griffin Pkwy. Alico Road provides a direct connection to I-75 (SIS Corridor) just west of the intersection. Alico Road is currently being widened to accommodate additional development east of Ben Hill Griffin Pkwy including the ITEC Business Park currently under construction. Additionally, the future land use map identifies Tradeport development north and east of this intersection which will likely result in additional truck traffic at this intersection.

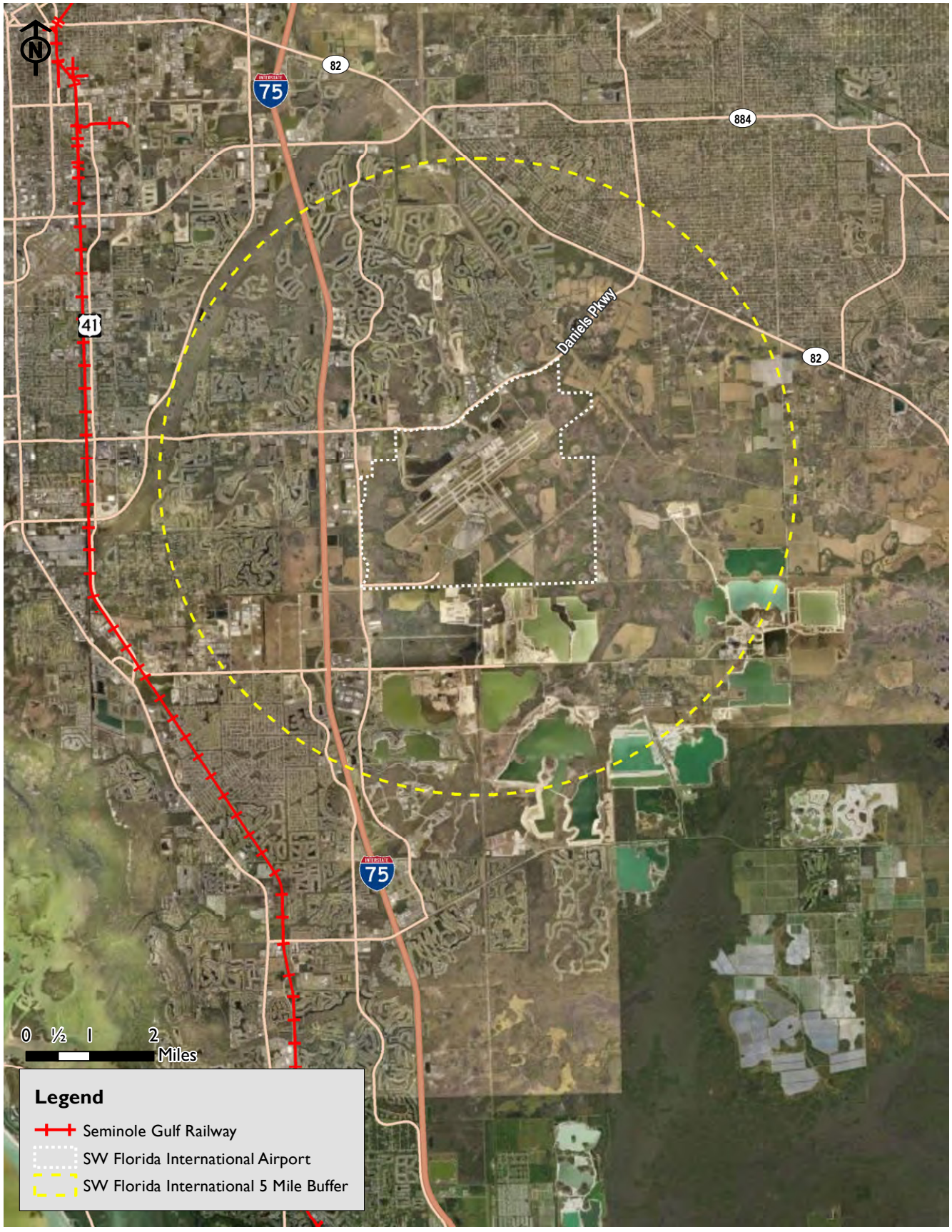
8.1.5 Rail

SGLR is a short line freight and passenger rail operator that runs service in the Southwest Region of Florida. SGLR operates and maintains its own equipment with a long term lease agreement with CSX, who maintains the ownership of the right-of-way. The rail line is considered an emerging SIS facility by FDOT, as depicted in Figure 54. The SGLR line is west of the study area and RSW does not have any direct access.

CSX Intermodal Terminals owns and operates two intermodal railroad facilities in the region. CSX Central Florida ILC is located in Winter Haven, Florida approximately 139 miles from the airport and handles mainly 53 foot (domestic), containerized traffic. CSX Intermodal Tampa is in operations and is approximately 114 miles from the airport and handles both domestic and international size container traffic.

There are no facilities that offer warehousing and transloading services with CSX with rail access in the study area. If transloading and rail service is desired by any future tenant, an industrial partnership would be required with CSX or with an industrial developer.

Figure 54 - RSW Study Area Rail Facilities

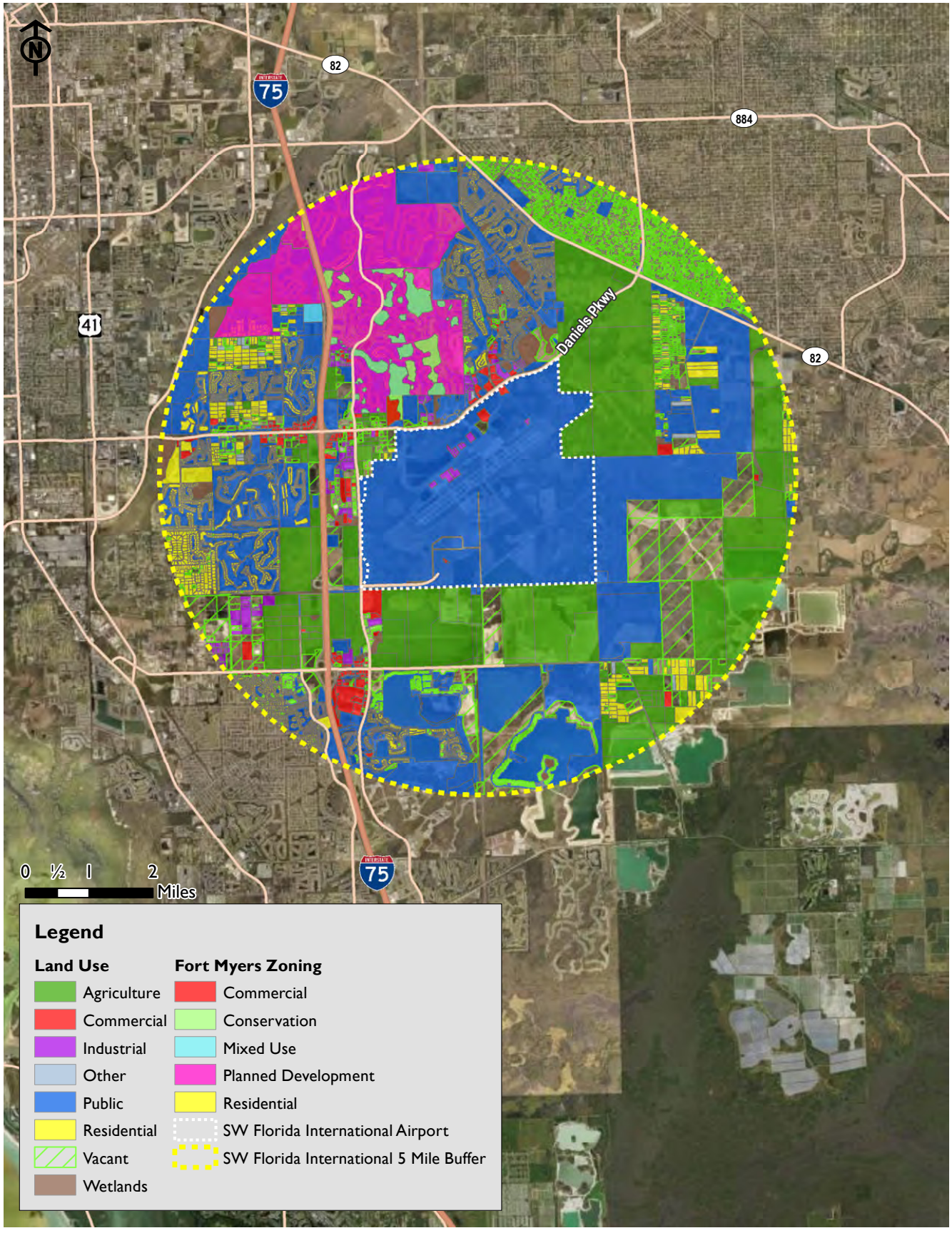


8.1.6 Existing Land Use

The airport is comprised of approximately 13,555 acres of land within its boundary and zoned as public. As shown in Figure 55, there are existing industrial land uses within the property limits of the airport and to the west of the airport. General land uses surrounding the airport are as follows:

- Land to the north generally includes Planned Development, Public, Wetlands, Agriculture, and Conservation;
- Land to the east generally includes Public, Agriculture, and Vacant;
- Land to the south generally includes Agriculture, Public, Commercial, and Residential; and
- Land to the west generally includes Agriculture, Public, Residential, Commercial, and Vacant.

Figure 55 - RSW Study Area Existing Land Use



8.1.7 Future Land Use

Future land uses are depicted in Figure 56. RSW and the surrounding area are showing a change in zoning to airport with wetlands still showing throughout the site. Industrial areas are more defined compared to the existing land use and are generally to the west of the airport. General land usage surrounding the airport is as follows:

- Land to the north of the airport is generally designated as Special Community, New Community, Central Urban, and Urban Community;
- Land to the east of the airport is generally designated as Conservation, Wetlands, and Density Reduction/ Groundwater Resource;
- Land to the south of the airport is generally designated as Tradeport, University Community, Wetlands, Density Reduction/Groundwater Resource, Suburban and Urban Community; and
- Land to the west is generally designated as Tradeport, Outlying Suburban, Rural, and Industrial development.

Figure 57 shows both Vacant and FLUM Industrial lands within the RSW study area. The majority of future Industrial is to the southwest of the airport while vacant is scattered throughout the study area.

Figure 56 - RSW Study Area FLUM

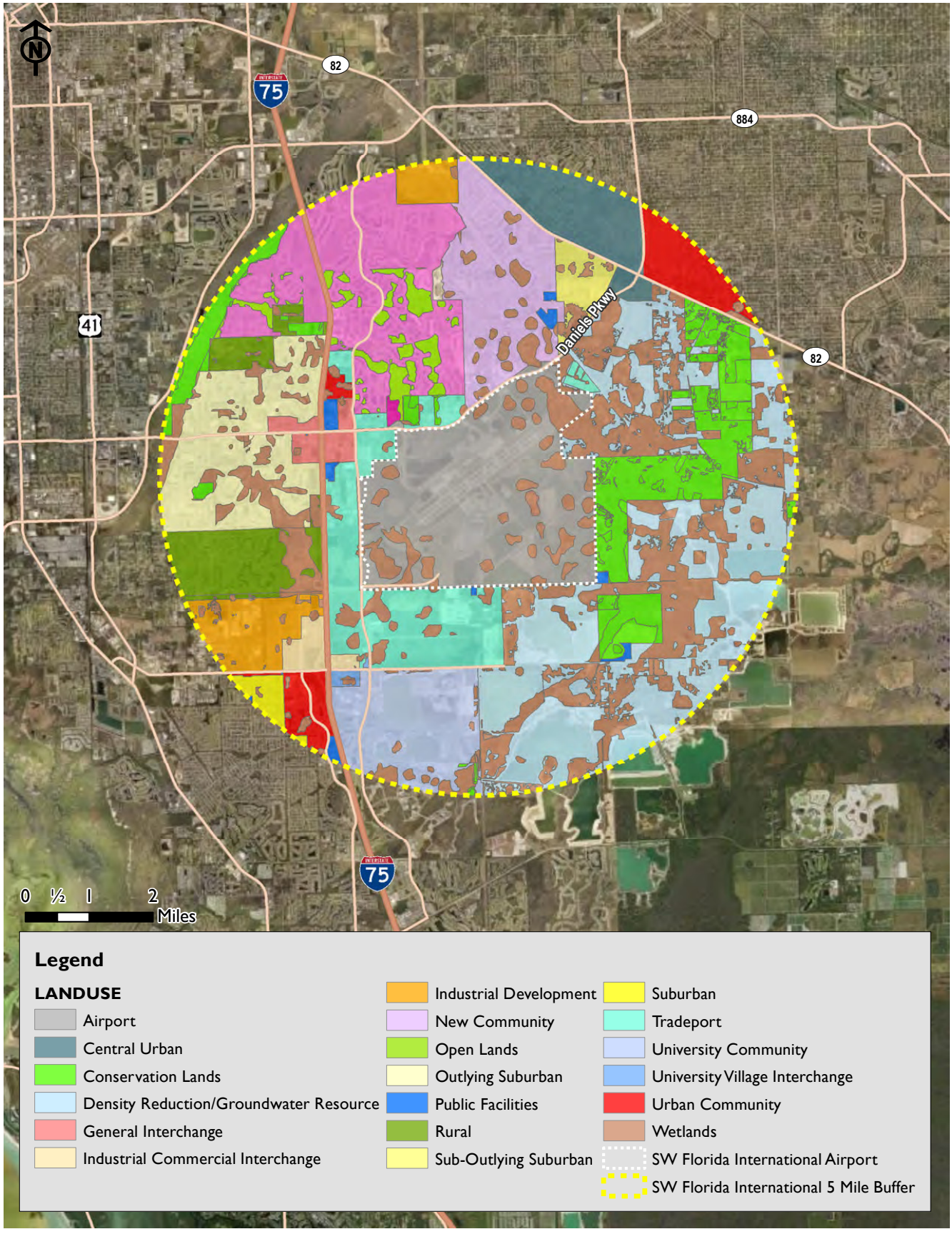
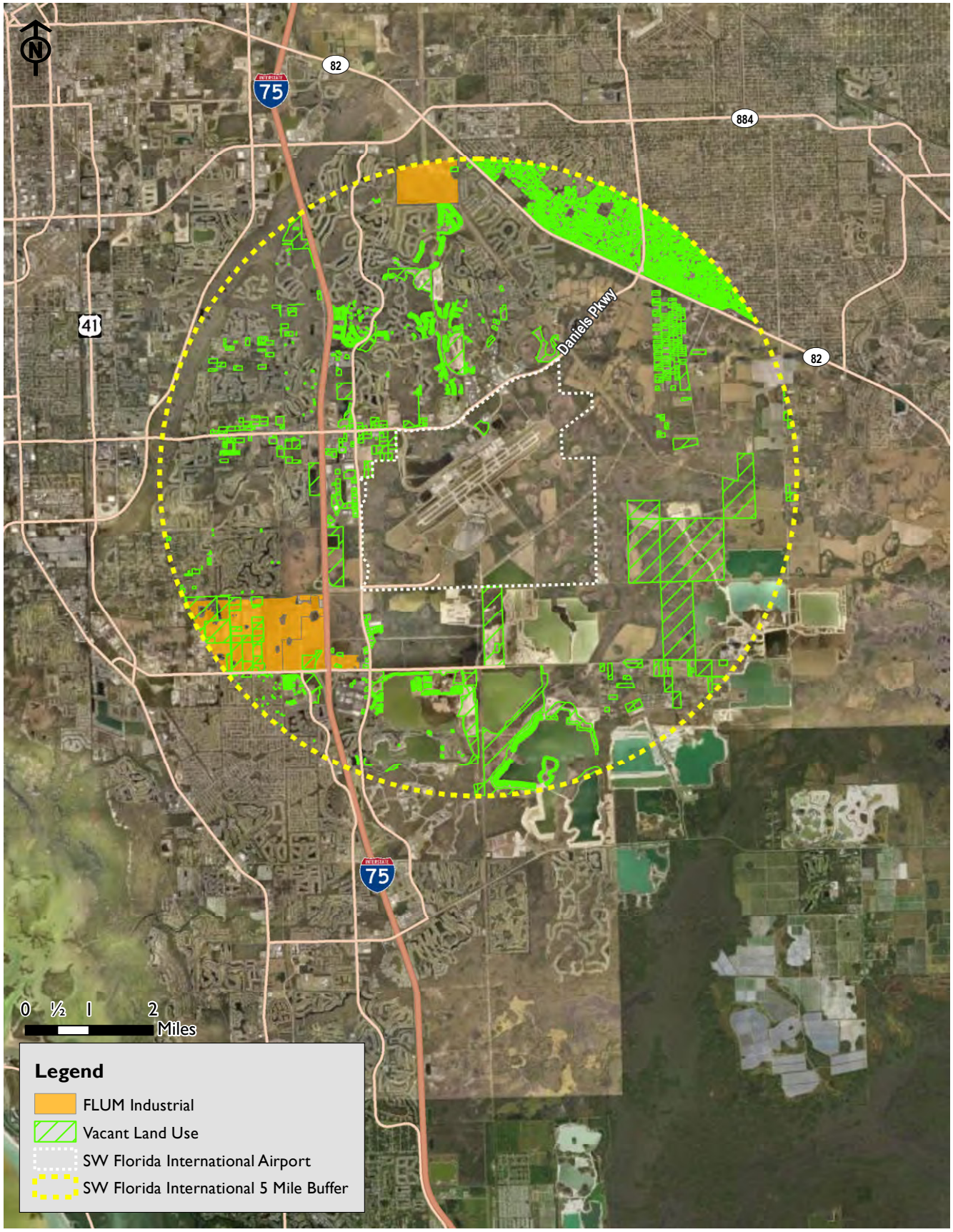


Figure 57 - RSW Vacant Lands with FLUM Industrial



8.2 Existing Traffic Data and System Performance

8.2.1 AADT and Truck AADT

Data was collected from Florida Traffic Online[22] to determine the baseline AADT and truck AADT within the RSW study area. The measurement of AADT provides basic empirical understanding of traffic conditions on a given roadway. The number is derived by dividing the total annual number of vehicles on a highway or road by 365 days. This information is collected by FDOT and made available publicly.

The roadway travelled the most within the RSW area is I-75, as shown in Figure 58. The second and third highest volumes in the study area occur along Daniels Parkway and Terminal Access Road respectively. Daniels Parkway connects from SR 82 to more of the urban areas within Fort Myers, and has access to the GA and freight side of RSW.

Figure 59 shows highest truck AADTs near RSW are along I-75. Daniels Parkway, west of I-75, has a truck AADT of approximately 4,856 trucks per day. Truck movements immediately surrounding the airport are limited and only make up approximately 0 to 5 percent of the overall traffic.

22 Source: https://tdaappsprod.dot.state.fl.us/fto/

Figure 58 - RSW Study Area AADT

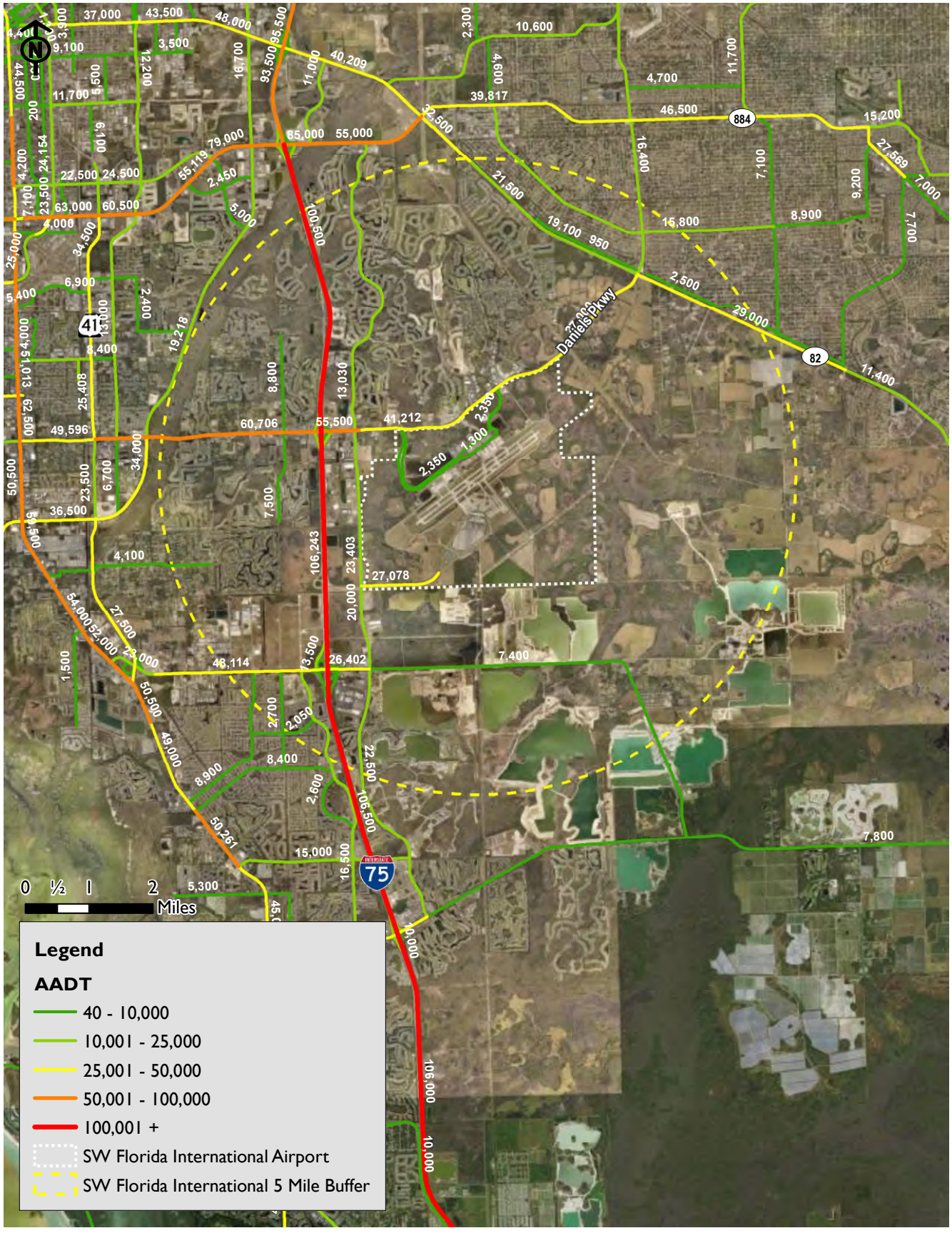


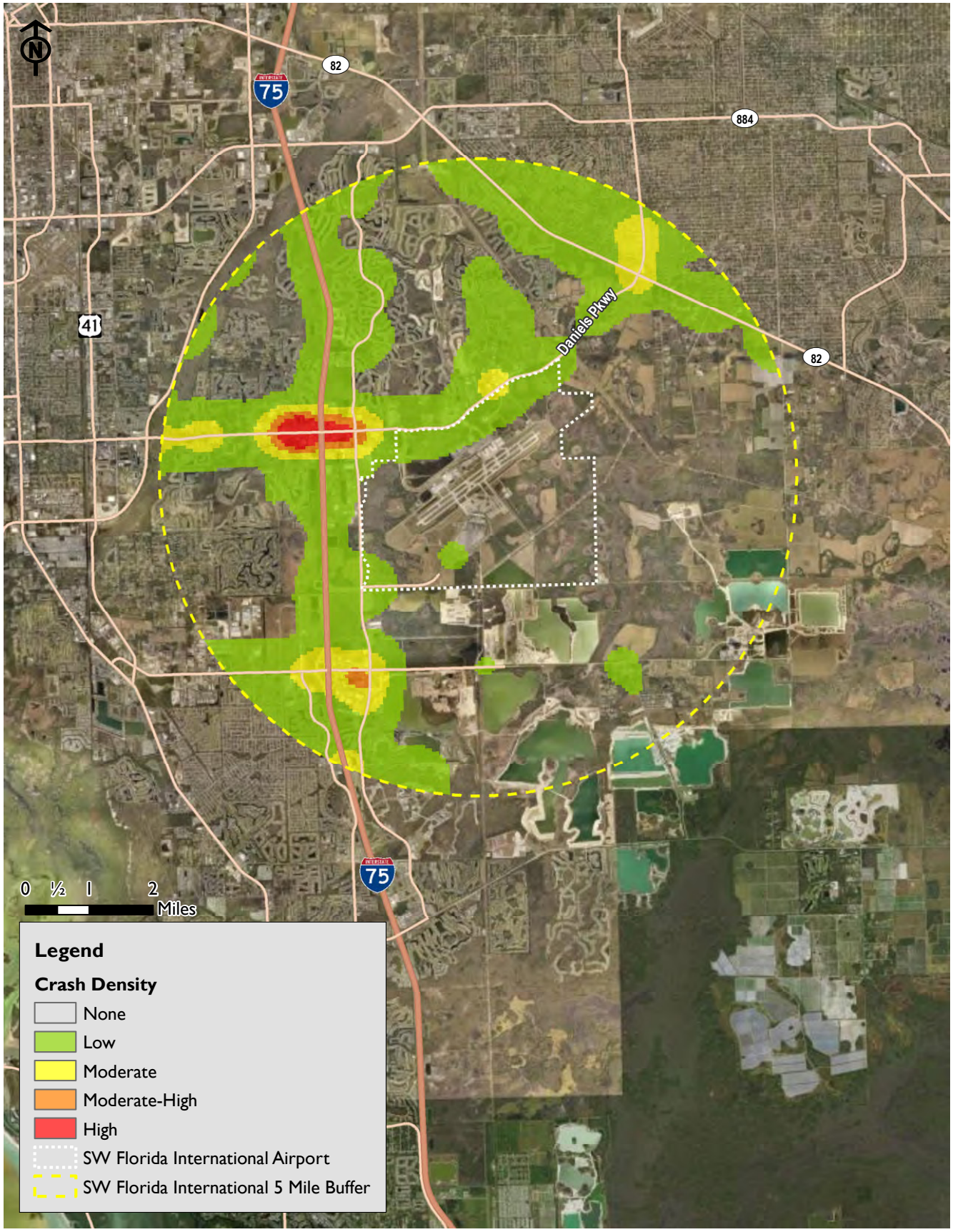
Figure 59 - RSW Truck Volumes

8.2.2 Crash Rates and Density

Vehicular crashes are depicted for both an area crash rate, five year rate, and crash density, a heat map, in Figure 60 and Figure 61 respectively. The analysis shows are low within the RSW study area. The highest density of crashes within the study area occur along I-75. Crash rates and the density of accidents are highest at the interchange of I-75 and Daniels Parkway.

Figure 60 - RSW Study Area Crash Rates

Figure 61 - RSW Crash Density



8.3 Existing Conditions & Master Plan Review

8.3.1 Geography and Airside Facilities

RSW is located in unincorporated Lee County, 16 miles southeast of Fort Myers, via the interstate. The site is made up of approximately 13,555 acres and has an elevation of 31 feet AMSL. RSW operates within a Class C Airspace and pilots must maintain two-way radio communication with the ATCT prior to entering the space. Aircraft that enter a Class C Airspace must be equipped with a Mode C transponder that automatically imprints aircraft altitudes on ATCT radars.

Airside facilities at RSW consist of one runway, 11 taxiways, three parking aprons, various NAVAIDS, and one ATCT. There are currently two main taxiways (A and B) and nine smaller taxiways that serve the Passenger Terminal, General Aviation, and Cargo aprons. Table 34 shows characteristics of the runways at RSW while Table 35 displays information about the taxiways.

Table 34 - RSW Runway Characteristics

Characteristic		Runway		Future Runway	
		6	24	6R	24L
Length & Width		12,000' x 150'		9,100' x TBD	
Displaced Threshold		Yes	Yes	TBD	TBD
Marking (Condition)		Precision	Precision	TBD	TBD
Approach Aids		PAPI HIRL VORTAC ILS LOC NDB GPS ALS	PAPI HIRL VORTAC GPS ALS	TBD	TBD
Surface Type		Grooved Concrete		TBD	
Strength	Single Wheel	30k Lbs.		TBD	
	Dual Wheel	190k Lbs.		TBD	
	Dual Tandem	430k Lbs.		TBD	
	Double Dual Tandem	840k Lbs.		TBD	
Pavement Condition (2019)		Satisfactory		TBD	

Table 35 - RSW Taxiway Characteristics

ID	Location / Description	Type	Pavement Needs Work
A	Main Taxiway (A1-A10)	Concrete	Yes
F	Main Taxiway (F1-F9)	Concrete	Yes
G	Taxiway (G1-G6)	Concrete	Yes
H	Taxiway	Concrete	No
J	Taxiway	Concrete	Yes
K	Taxiway	Concrete	No
L	Taxiway	Concrete	No

The three parking aprons at RSW each serve a different purpose and are shown in Table 36. Additional information pertaining to each apron is as follows:

- The Passenger Terminal Apron allows for commercial passenger aircraft enplanements and deplanements at the 380,915 square feet terminal building;
- The Cargo Apron can accommodate up to seven plans which can typically include MD-80, Boeing 757, and the Boeing 727 planes; and
- The GA Apron serves the FBO and maintenance hangar with approximately 30 tie-down spaces for parking.

Table 36 - RSW Parking Aprons

Apron	Square Yard	Parking Positions Tie Downs
Passenger Terminal	165,000	17 Gates that house Boeing 747s
General Aviation	26,000	25 to 30
Cargo	69,000	6 to 7

The 2019 Statewide Airfield Pavement Management Program, developed by FDOT, determines the condition of pavements so that funding can be prioritized accordingly for assets. Figure 62 depicts the results of the pavement study. Within the study, FDOT recommends Minimum Service PCI for pavements based on the use of the transportation facility and the airport type as shown in Table 37. Maintenance and repair should be conducted to improve pavement conditions and to prevent critical PCI status, as set by the FDOT Recommended Minimum Service Level. Major construction is needed once the pavements reach the Critical PCI threshold. The study forecasts average pavement conditions generally if no improvements are to be made as shown in Table 38 which shows degradation over time.

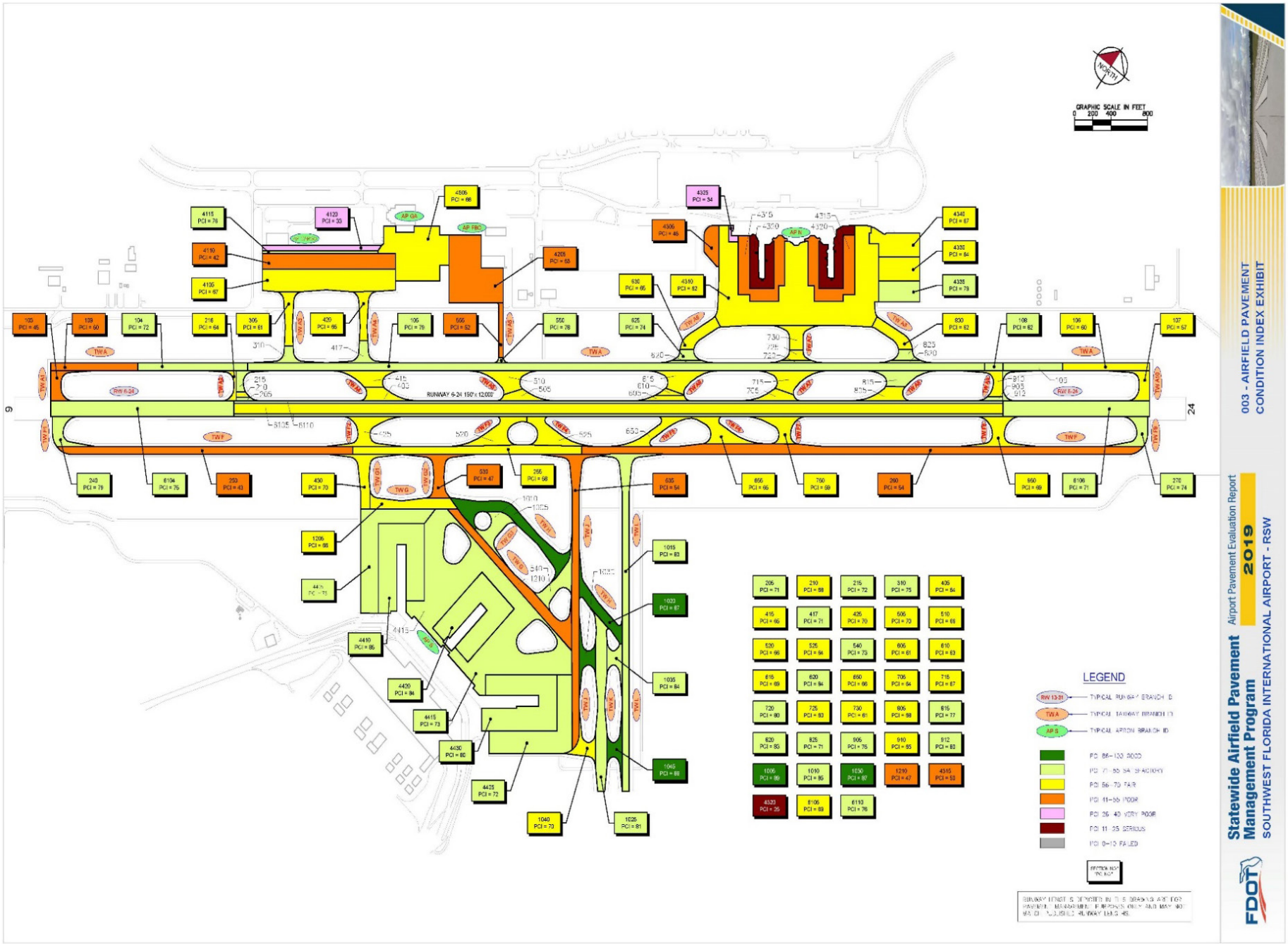
Table 37 - FDOT Airfield Recommended and Critical Service PCI Levels

Use	FDOT Recommended Minimum Service Level PCI			Critical PCI
	Primary Airports	Regional Reliever Airports	General Aviation Airports	
Runway	75	75	75	65
Taxiway	70	65	65	65
Apron	65	65	60	65

Table 38 - RSW Forecasted Pavement Conditions (Overall Area-Weighted PCI)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Runway	69	66	63	61	59	57	56	55	54	54
Taxiway	65	63	62	61	59	58	56	55	53	52
Apron	64	62	61	60	58	57	55	54	53	51

Figure 62 - RSW Pavement Conditions



Source: FDOT 2019 Statewide Airfield Pavement Management Program

8.3.2 Roadway Access

The GA facility is situated on the north side of the airport. Air cargo would enter or exit by either Chamberlin Parkway or Paul J. Doherty Parkway and then traverse along Daniels Parkway to either I-75 or SR 82. Daniels Parkway is largely a six lane, divided arterial which is surrounded by large tracks of vacant land or warehouses.

8.3.3 Tenants

On-site tenants at RSW are primarily dedicated to supporting passenger travel and include commercial airlines and food establishments. The FBO, PrivateSky Aviation Services, resides on-site offering hangar management, fuel services, and maintenance. Western Global Airlines currently operates at RSW chartering flights to pick-up and drop-off cargo for clients.

The airport has a 24,000 square foot facility dedicated to air cargo operations and a 15,500 square foot airline belly-freight building for cargo. This freight is taken off site to local warehouses Approximately 2.5 miles east of the airport where there are larger warehouse facilities that house operations, including FedEx. FedEx utilizes RSW's air cargo operating capabilities for their services.

8.3.4 Foreign Trade Zone

RSW is located entirely within FTZ number 213. In an effort to promote economic activity, a FTZ is a physical location that is granted special privileges by the US Federal Government for the importation and exportation of merchandise to-and-from the United States of America. Although an FTZ site is physically located within the US, for customs purposes, the site is considered to be located outside of the Customs Territory of the United States and all merchandise entering the FTZ site is considered international commerce. This allows for tariffs on goods that are shipped into the US and then back out to either be delayed, reduced, or eliminated.

FTZ 213 offers unique growth opportunity for businesses residing on RSW property or in the surrounding area by allowing them to move goods to and from other zones with reduced or modified taxes. Businesses seeking to move goods by air will seek industrial or commercial properties within the FTZ area. Developing land on and around the airport to be used for industrial/commercial uses will increase the general fund revenues and those funds should be used for future airport improvements.

8.4 Facility Planned Improvements

Both FedEx and USPS use RSW for dedicated air cargo services.[23] FedEx has two facilities about a mile and half away from RSW off of Treeline Ave South. USPS also has a facility located just northwest of the airport, next to I-75 and south of Daniels Parkway. RSW has approximately 4,400 acres of land that is readily available for development. For instance, Skyplex provides an opportunity for new development with 1,150 acres that is ready to go for uses such as Multi-Use Commercial, Light Industrial, and Aviation. [24] Skyplex has 280 acres zoned for aviation related uses and 870 acres zoned for non-aviation uses.

A new parallel runway, ATCT, and radar approach are airside facilities that will be updated. They are discussed more in the TIP section below. A review of the RSW 2020-2025 CIP was also undertaken to better understand the type of capital improvement planning being conducted by the airport in relation to air cargo. While a large number of planned projects are geared towards passenger travel, some improvements, such as runways and other common use areas may benefit both passenger and cargo operations.

8.5 Roadway Planned Improvements

RSW is located within the Lee County Metropolitan Planning Organization's (Lee MPO) jurisdictional boundaries. Lee MPO is responsible for developing the LRTP within its boundaries. Projects in the LRTP are compared against other transportation projects in the region in order to develop a fiscally constrained planning list, the Cost Feasible Plan. The Cost Feasible Plan determines which projects are eligible to receive federal funding over the long term. Below are transportation projects that made the Lee MPO Cost Feasible Plan which are within the five mile study area and will have impacts on RSW:

- Widen Alico Road from Airport Hall Road to the Alico Connector to four lanes, currently two lanes;
- Add Alico Connector as a new road to the network;

23 FDOT – Southwest Florida International Airport CFASPP Sheet - http://www.cfaspp.com/Airport/AirportList.aspx

24 https://www.skyplexrsw.com/

- Add Three Oaks Extension as a new road to the network; and
- Widen Daniels Parkway to six lanes, currently four lanes.

The TIP is also managed by Lee MPO. The TIP is a short range, five year forecast, for projects that have or will receive federal funding. Projects, within the RSW Study Area that are in the TIP and will benefit RSW are:

- SR 82 from Shawnee Road to Alabama Road – The section from Lee Boulevard to Shawnee Blvd has been completed and this project will continue to build out SR 82 from a two lane road to a six lane divided facility with a five foot sidewalk on the north and a 10 foot shared use path on the south;
- RSW Parallel Runway 6R/24L – Preliminary design/Geotech/Survey for a new runway, ATCT, and Radar Approach Control;
- Aviation Safety Project – Purchase ARFF Crash Vehicle;
- Pavement rehabilitation to RSW roads; and
- Pavement rehabilitation to airside roads.

8.6 Projected Growth

8.6.1 Aviation Freight Growth

RSW has scheduled air cargo service departing the airport. In 2014, there were 1,110 air cargo operations that carried 16,747 short tons of goods through RSW. Dedicated air cargo operations growth reaches 1,443 operations in 2040 while the volume increases from 16,747 short tons (33,494,000 pounds) in 2014 to 18,967 short tons (37,934,000 pounds) in 2040.

Table 39 - RSW Air Cargo Projected Operations and Volumes

Year	Operations (Flights Annually)	Volume (Pounds)
2014	1,110	33,494,000
2020	1,160	34,196,000
2030	1,294	36,016,000
2040	1,443	37,934,000
1.1% CAGR Operations; 2.1% CAGR Volume		

8.6.2 Roadway Network Growth

Traffic operating conditions were evaluated for the study area roadways that are most likely to be impacted by forecasted automobile and freight movements for RSW. Table 40 presents the LOS analysis results for five roadways surrounding RSW. All roadways currently operate at acceptable LOS.

Table 40 - RSW Existing Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2018				
				AADT	Truck AADT	Truck %	Peak Hour Volume	LOS
Daniels Pkwy	Terminal Ave S to SR 82	9.0	55.5	34,106	1,349	4.0%	3,070	C
Terminal Ave S	Daniels Pkwy to Terminal Access Rd	9.0	53.8	23,403	265	1.1%	2,105	B
Ben Hill Griffith Pkwy	Terminal Access Rd to Alico Rd	9.0	53.8	20,000	227	1.1%	1,800	A
Alico Rd	I-75 to Study Area Edge	9.0	54.1	16,901	1,372	8.1%	1,520	E
Terminal Access Rd	Terminal Access S to RSW	9.0	53.8	27,078	1,336	4.9%	2,435	B

Vehicular traffic growth near RSW is projected to grow at a CAGR of 2.40 percent based on the population of Lee County. The roads in the study area that were evaluated for potential future LOS are as shown in Table 41. Daniels Parkway carries the most volume of those roads that were examined, and Terminal Access Road carries the second highest traffic volume surrounding the airport.

Freight projections for the five main roads surrounding RSW and is estimated by using a CAGR of 2.1 percent. The three most utilized roads for freight near the airport are Daniels Parkway, Alico Road, and Terminal Access Road, however the high percentage of heavy vehicles on Terminal Access Road is likely buses and other passenger transportation vehicles rather than large trucks.

Roadway capacity analyses were also conducted based on the 2020, 2030, and 2040 traffic projections. Differences in overall AADT and truck AADT growth results in varying truck percentages. The results of the future conditions capacity analysis indicated that all study area roadways are expected to operate at acceptable LOS for all future years except for Alico Road, which will continue to operate at LOS E if no improvements are made. As mentioned above, the widening of Alico Road is included in the MPO's LRTP.

Table 41 - RSW Future Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2020				2030				2040			
				AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
Daniels Pkwy	Terminal Ave S to SR 82	9.0	55.5	35,763	1,406	3.9%	C	45,335	1,730	3.8%	C	57,468	2,130	3.7%	D
Terminal Ave S	Daniels Pkwy to Terminal Access Rd	9.0	53.8	24,540	277	1.1%	B	31,108	340	1.1%	B	39,434	419	1.1%	C
Ben Hill Griffith Pkwy	Terminal Access Rd to Alico Rd	9.0	53.8	20,972	236	1.1%	B	26,585	291	1.1%	B	33,700	358	1.1%	C
Alico Rd	I-75 to Study Area Edge	9.0	54.1	17,722	1,431	8.1%	E	22,465	1,761	7.8%	E	28,478	2,168	7.6%	E
Terminal Access Rd	Terminal Access S to RSW	9.0	53.8	28,393	1,393	4.9%	B	35,993	1,714	4.8%	C	45,626	2,110	4.6%	D

8.6.3 Rail Growth

RSW does not have on-site rail access and limited opportunities for shipment by rail surrounding the airport. If freight were to be transported by rail, it would occur outside of the study area and require transit by truck prior to rail access.

8.6.4. Qualitative Industrial Growth Analysis

This study has identified two locations, within the RSW study area, as suitable for industrial activity and growth, based on a review using the methodology described in Section 4.4 of the report. The sites described below should be considered in addition to Skyplex, which is discussed throughout this section.

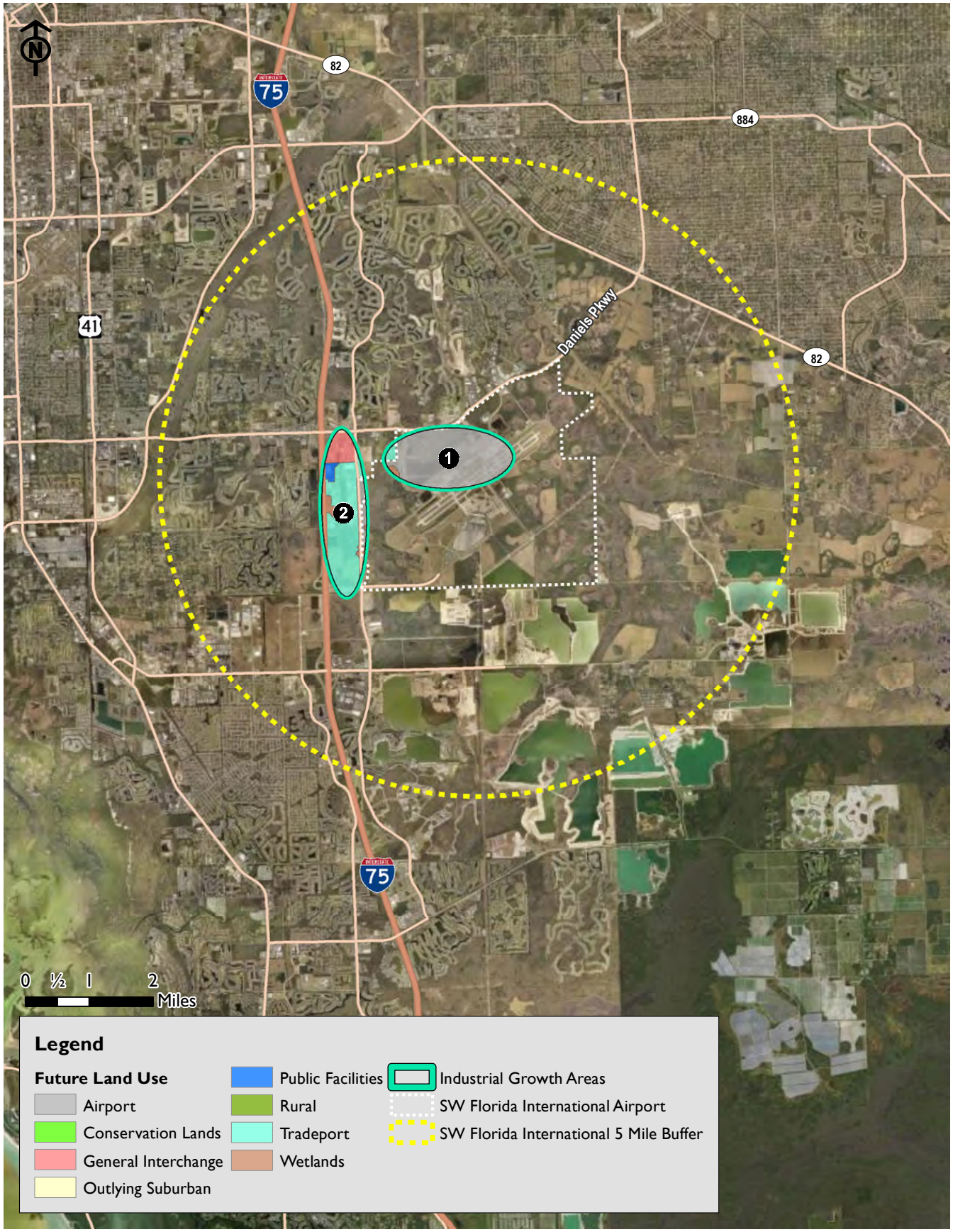
Proposed industrial growth area 1 at RSW is the Skyplex development occurring north of the airport and shown in Figure 65. Skyplex is situated between Daniels Parkway and RSW airport, approximately 1.5 miles from I-75. Skyplex consists on 1,150 acres of aviation (280 acres) and non-aviation (870 acres) designated parcels. Of the 280 acres zoned for aviation uses (Figure 63), 75 acres offer ramp accessibility, accommodating up to Category IV aircraft. The 870 acres of non-aviation zoned properties (Figure 64) offer a wide-range of development options, such as warehousing and light industrial uses.

Proposed industrial growth area 2 (Figure 65) is located to the west of RSW. This location is bordered by I-75 (west), Daniel's Parkway (north), and Alico Road (south). Treeline Avenue bisects this location (north-south) and Terminal Access Road provides access to the airport, running east-west through this site. There is existing industrial development in the northwest corner of this site, between Treeline Avenue and I-75. This location has a variety of zoning classifications currently co-existing, including Agricultural, Commercial, Vacant, City, and Industrial. The Future Land Use Map narrows the designations to Tradeport, Industrial Commercial Interchange, General Interchange, and Public. Aside from existing industrial development, the majority of the site is vacant.

Figure 63 – Skyplex Aviation Zoned Parcels

Figure 64 – Skyplex Non-Aviation Zoned Parcels

Figure 65 - RSW Industrial Growth Areas



8.7 Recommendations

Recommendations for RSW are focused on the airport site, the surrounding roadway network, and any on site rail improvements, if applicable. They are based on information from within this study and are categorized as short-term (1 to 5 Years), mid-term (6 to 9 years), and long-term (10 to 20 years), as shown in Table 42. Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan.

Table 42 - RSW Recommendations

Location	Improvement Recommendations	Identified Needs	Implementation Timeframe
RSW Airport Site Recommendations			
RSW	Construct second runway	Future runway	Mid and Long-Term
RSW	Business Directory Skyplex	List and promote a business directory for commercial, light industrial, and aviation businesses that lease property at Skyplex	Short Term (1-5 Years)
RSW	Runways	Major Construction	Short Term (1-5 Years)
RSW	Taxiways	Major Construction	Short Term (1-5 Years)
RSW	Aprons	Major Construction	Short Term (1-5 Years)
RSW Roadway Recommendations			
Alico Road from Ben Hill Griffith Pkwy to Airport Haul Rd	Widen to 4-lanes	Failing LOS Excising through 2040	Short-Term (1-5 Years)
Daniels Pkwy from I-75 to SR 82	Enforce access management	Roadway will experience failing LOS if access management not enforced	Short & Long Term
Daniels Pkwy from Gateway Blvd to SR 82	Widen form 4-lanes to 6-lanes to match Daniels Pkwy to the west	Long term traffic demands from area development likely to put strain on 4-lane section of Daniels Pkwy	Long-Term (10-20 Years)
Major intersections on Daniels Pkwy	Conduct periodic traffic analysis to identify potential bottleneck conditions	Long term access needs for airport	Mid and Long-Term
Jetport Commerce Parkway and Jetport Loop Intersection	Pavement Reconstruction	Alligator Cracking and Rutting Present	Short-Term (1-5 Years)
Paul J. Doherty Parkway and Chamberlin Parkway Intersection	Pavement Reconstruction	Alligator Cracking and Rutting Present	Short-Term (1-5 Years)
RSW Rail Recommendations			
There are no recommendations for rail improvements within the RSW study area			

8.8 Conclusion

Airport site recommendation for RSW include, construction of a new runway, promoting existing businesses at Skyplex, and pavement improvements. In an effort to increase efficiency of operations for both passenger and air cargo operations, a second planned runway has been discussed. The recommendation made in this study is to construct the already planned runway. RSW promotes commercial, light industrial, and aviation uses at its industrial park, Skyplex. In an

effort to attract new businesses, RSW should develop a current list of businesses that exist on site and promote them via the Skyplex website. Promoting existing businesses would help to broaden their reach and attract new businesses that may seek to partner and want to be located near them. RSW pavements that need the most immediate major rehabilitation are the aprons and taxiways across the airport. The cargo apron is in need of immediate restoration as an example.

Continuing collaboration with FDOT to maintain the surrounding roadway network around RSW will improve intersection operations and roadway capacity within the study area. Facilitating these improvement around RSW will help to inspire confidence for the existing and future businesses and continue to promote economic stability for the region.

9

Winter Haven Municipal Airport

9. Winter Haven Municipal Airport

GIF is owned and operated by the City of Winter Haven, Florida and is classified as a regional public-use airport. This means that the airport is a GA airport with no scheduled services and supports regional economies. There are charter (air taxi), jet flying, and rotorcraft flights as well. GIF airfield facilities and services include aircraft storage, maintenance, and fueling.

GIF is classified as a Class E airspace, which has no defined vertical limit and does not require specific aircraft equipment as some of the higher level classifications do. Other characteristics that associate with a Class E airspace include no ATCT on the ground and the airport is not located within close proximity to another busy airport.

9.1 Study Area Physical Conditions Review

9.1.1 GIF Study Area

Figure 66 shows the GIF study area with a five mile radius around the airport. The study area and airport are within Polk County, Florida. The major roadways within the study area are US 92, 21st Street Northwest, and Havendale Boulevard (SR 544).

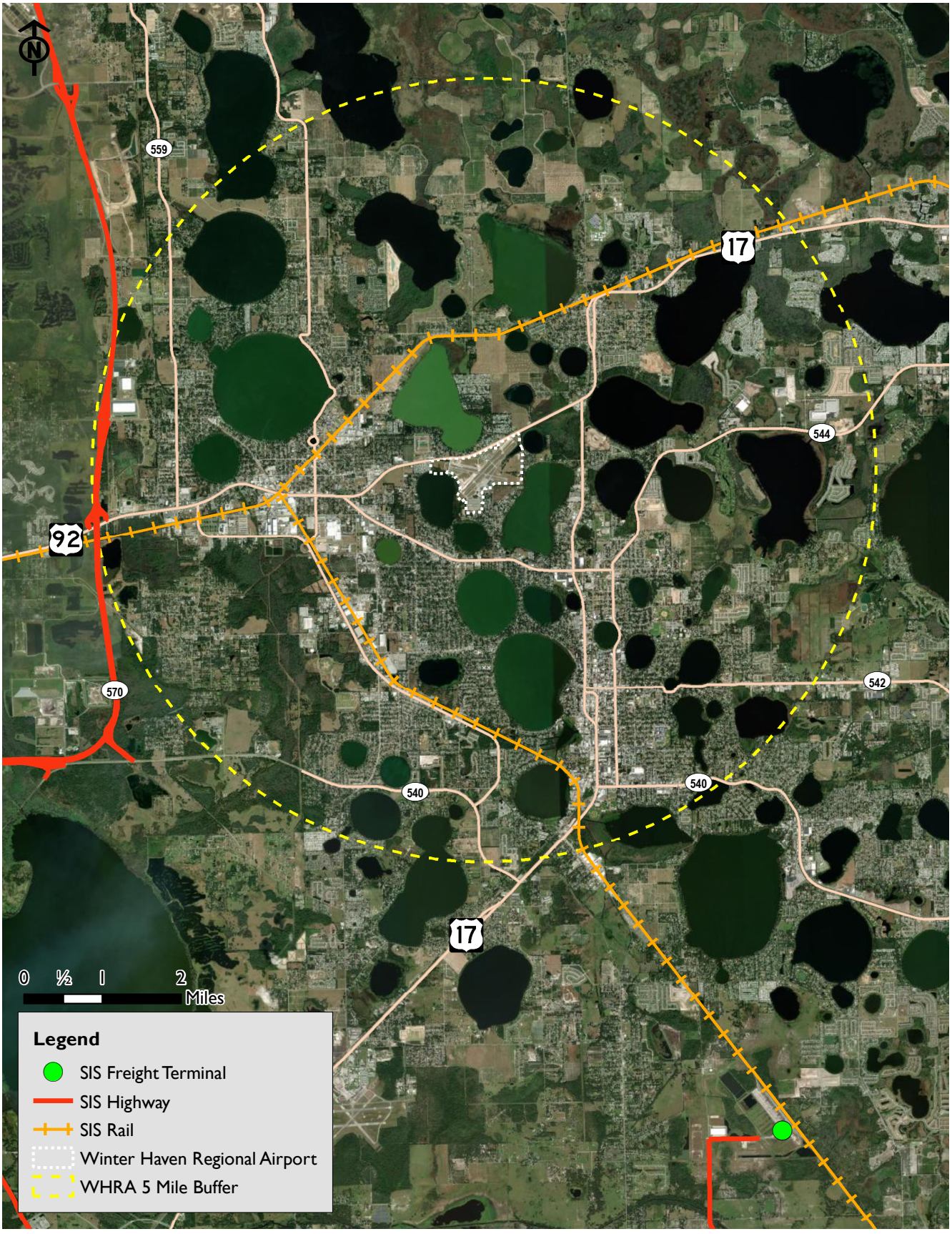
9.1.2 SIS Facilities

There are three SIS facilities located within the study area as shown in Figure 66. These facilities include:

- SR 570, which is a limited access toll road to the western edge of the study area
- CSX north / south line
- CSX east / west line

There is an SIS Freight Terminal outside of the study area. The CSX Central Florida ILC is located within 20 miles of the airport. This facility is an intermodal container transfer facility with a total of 318 acres on site and an additional 930 acres surrounding for future warehousing, industrial, and office needs.

Figure 66 - GIF Study Area and SIS Facilities



9.1.3 Roadway Infrastructure Assessment

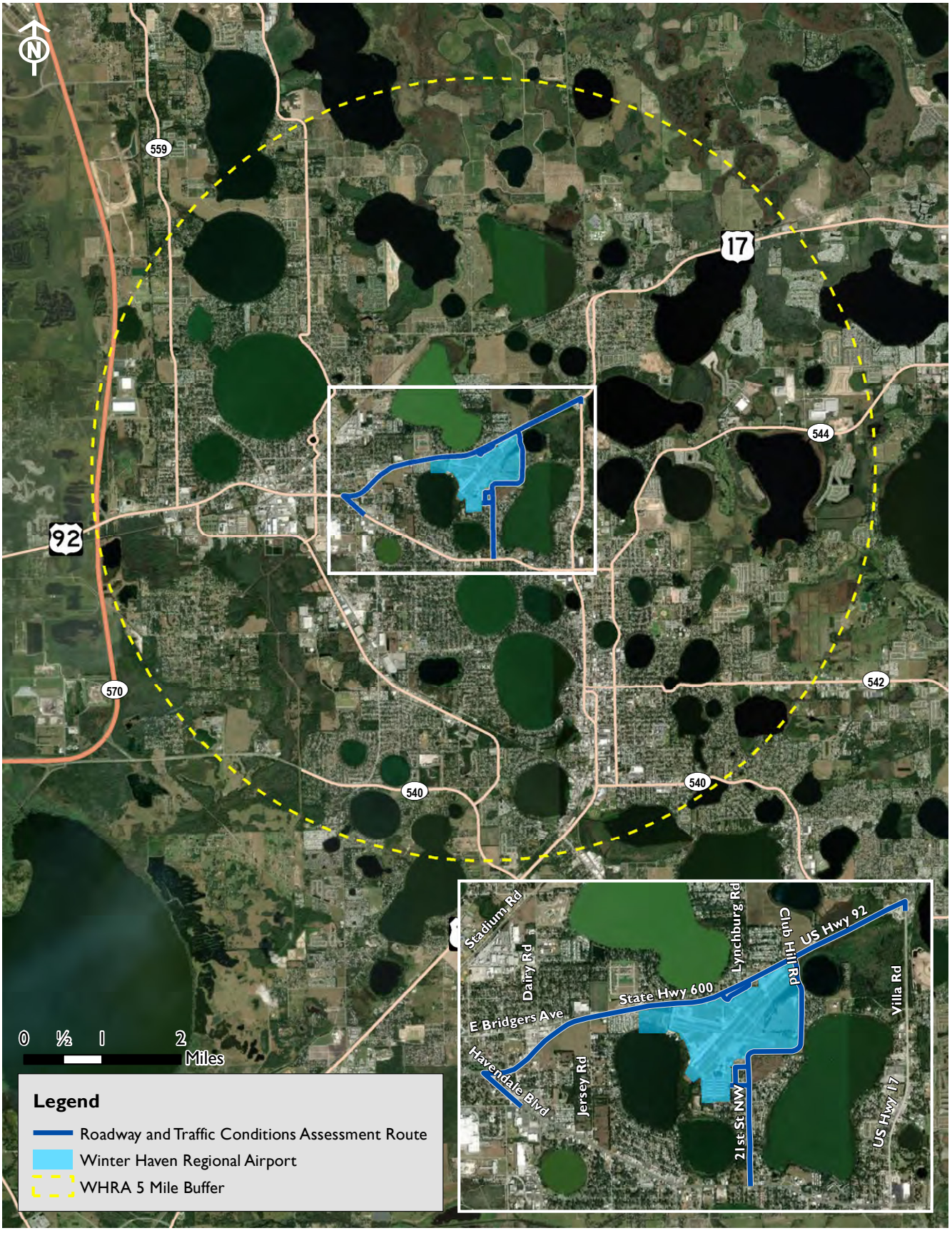
Field observations of the roadway network were conducted on Tuesday, October 8th, 2019 starting at approximately 2:00 PM within the study area. The route that was driven can be seen in Figure 68. Observations focused on existing conditions of the roadway infrastructure as well as identification of traffic congestion. Details from the assessment are as follows:

- All roadways had light traffic; and
- Two sharp curves are present on 21st Street at GIF, between US-92 and Riddle Road NW. In addition to deficient wayfinding, providing advanced warning of the approaching turning movements, the roadway is in poor condition. The roadway segment is displaying moderate to severe alligator cracking; often a sign of sub-base failure, poor drainage, or repeatedly being over-loaded (Figure 67). Chunks of asphalt are breaking off at the roadway's edge line. Rutting is occurring along the right southbound wheel path. Numerous pavement patches are also present along the roadway.

Figure 67 - 21st Street

Google Speed was reviewed for roads near the airport. Roads that were reviewed as part of this analysis include US 92, SR 544, and 21st Street Northwest. The only noticeable congestion observed during peak periods was along Lake Alfred Road and Havendale Boulevard. There was no noticeable congestion along 21st Street Northwest or US 92 during peak periods.

Figure 68 - GIF Roadway Assessment



9.1.4 Concrete Intersection Improvement

Within each study area, the existing conditions assessment identified intersections that should be further evaluated for a heavier duty pavement application. For GIF, the intersection of US 92 and SR 544 should be evaluated for a concrete application. Table 43 identifies the intersection and provides the rationale for why it was recommended. Recommendation criteria includes; facilities with high and growing truck volumes, proximity to existing and planned industrial land uses, and proximity/connectivity to SIS facilities.

Table 43 - GIF Concrete Rationale

Intersections	Reason for Consideration for Concrete Pavement
US 92 @ SR 544	Both US 92 and SR 544 have high truck AADT volumes with 3,492 and 1,248 trucks per day respectively on US 92 and SR 544 at this intersection. Both roadways are major multi-lane facilities that provide E-W mobility for commuters and trucks traveling west to SR 570, a SIS Corridor.

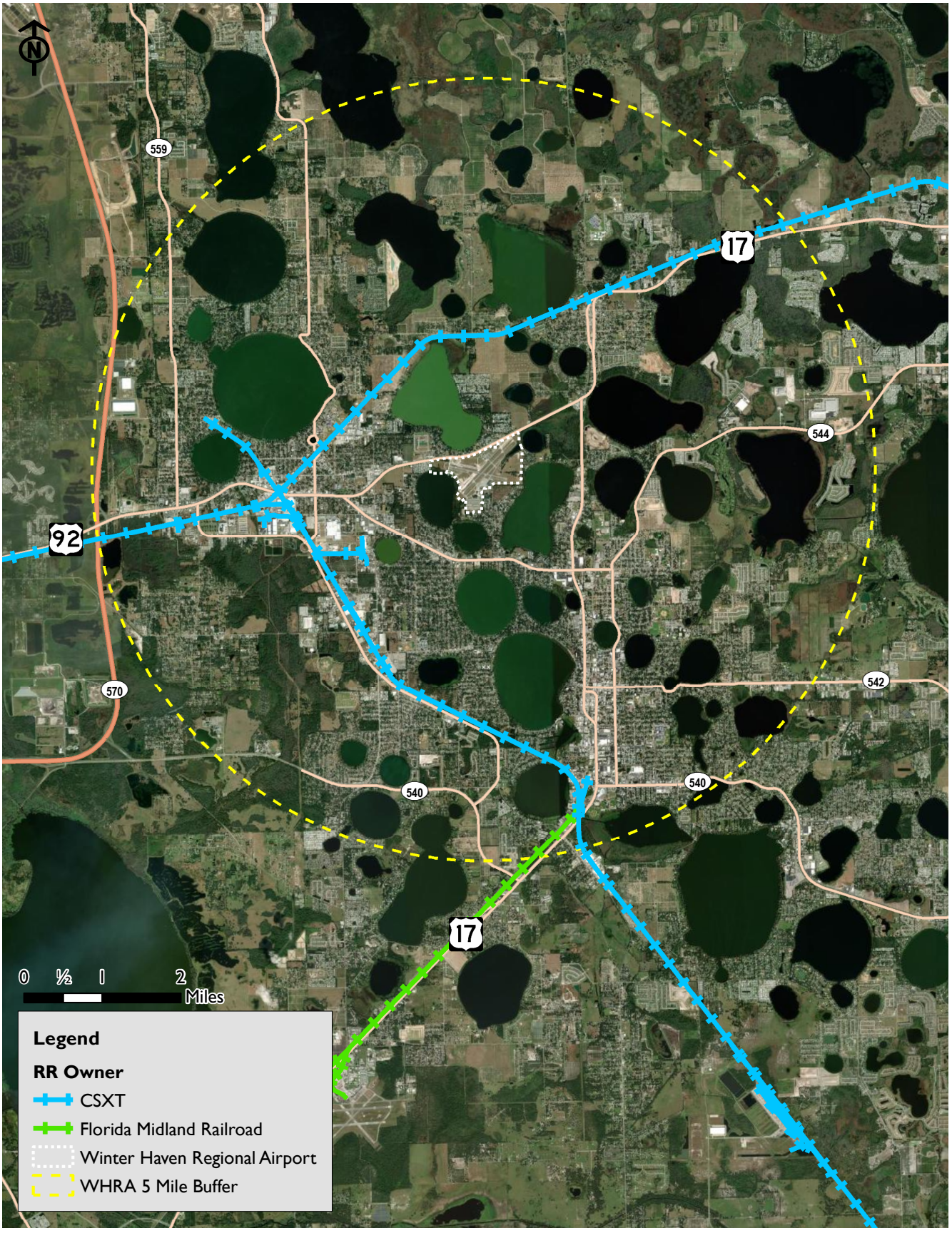
9.1.5 Rail

CSX operates two rail lines and Florida Midland Railroad (FMID) operates one line within the GIF study area (Figure 69). The east-west CSX line runs from Jacksonville to Tampa. The north-south line runs from West Palm Beach to Auburndale. Both CSX lines are currently SIS facilities for the State of Florida. FMID is short line that runs from Winter Park to Bartow, located at the southern perimeter of the study area.

CSX Intermodal Terminals owns and operates two intermodal railroad facilities in the region. CSX Central Florida ILC is located in Winter Haven, Florida approximately 17 miles from the airport and handles mainly 53 foot (domestic), containerized traffic. CSX Intermodal Tampa is in operations and is approximately 52 miles from the airport and handles both domestic and international size container traffic.

There are no facilities that offer warehousing and transloading services with CSX with rail access in the study area. If transloading and rail service is desired by any future tenant, an industrial partnership would be required with CSX or with an industrial developer.

Figure 69 - GIF Study Area Rail Facilities



9.1.6 Rail Crossing

The at-grade railroad crossing on Spirit Lake Road (Inventory Number 625396J), just south of the intersection of Avenue G NW and Spirit Lake Road, was identified during tenant interviews as causing long traffic delays during crossings (Figure 70 and Figure 71). The CSX Transportation crossing is signalized with Two Quadrant Protection and there are advance crossing warning signs on Spirit Lake Road.

An Inventory Report for this crossing was completed on December 28, 2019. It was determined that there are 12 daily train crossings at this location. Four daytime crossings (6:00AM to 6:00PM), four nighttime crossings (6:00PM to 6:00AM), and four switching trains. The area is not located in a quiet zone. The 2017 AADT along the roadway is 14,500 vehicles, comprised of eight percent truck traffic and an average of 29 school buses per day. The speed limit on Spirit Lake Road is 30 MPH and the crossing has a Maximum Timetable Speed of 79 MPH. Per available records, there have been five reported accidents at this crossing location. Three of these incidents occurring since 2009; the most recent happening in June 2019.

Figure 70 - Aerial View of CSX Crossing at Spirit Lake Road (625395J)

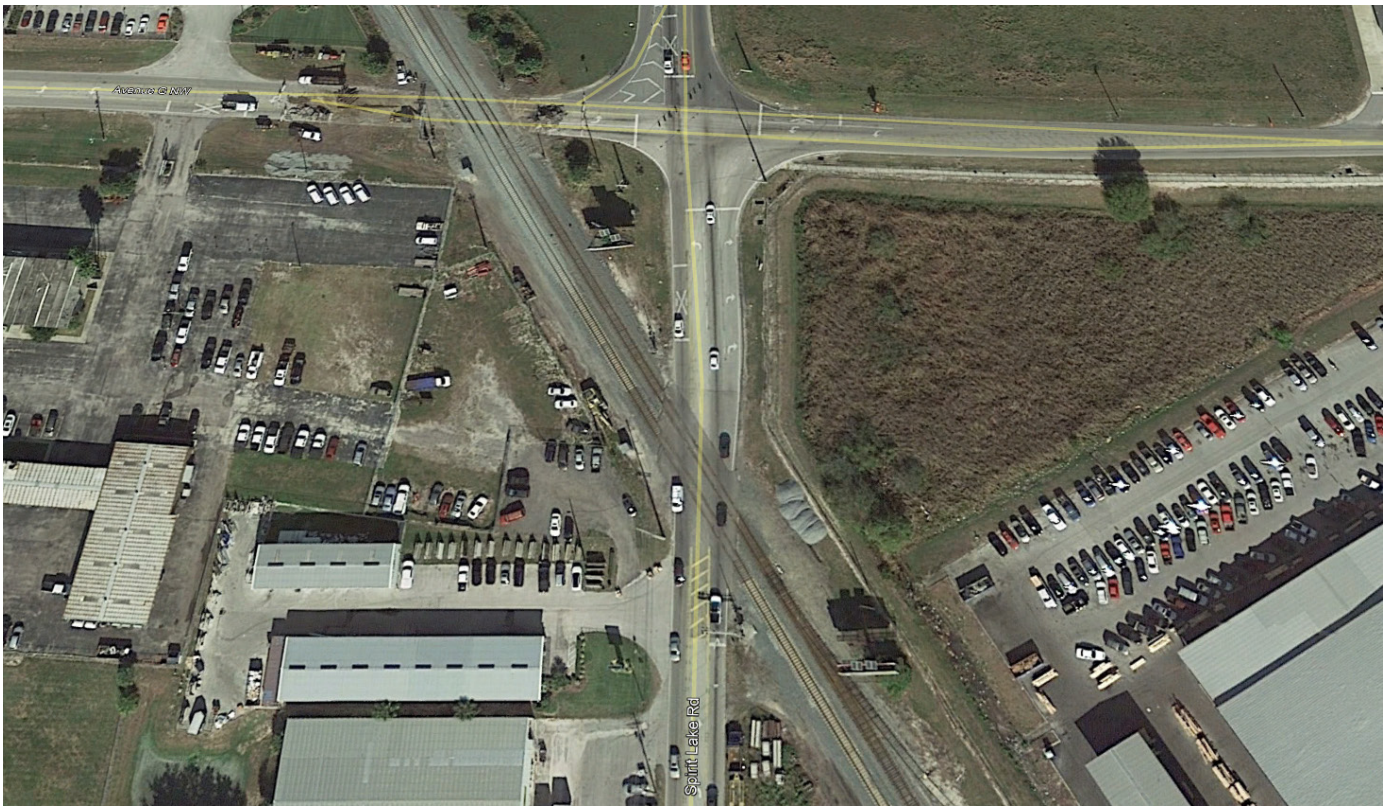


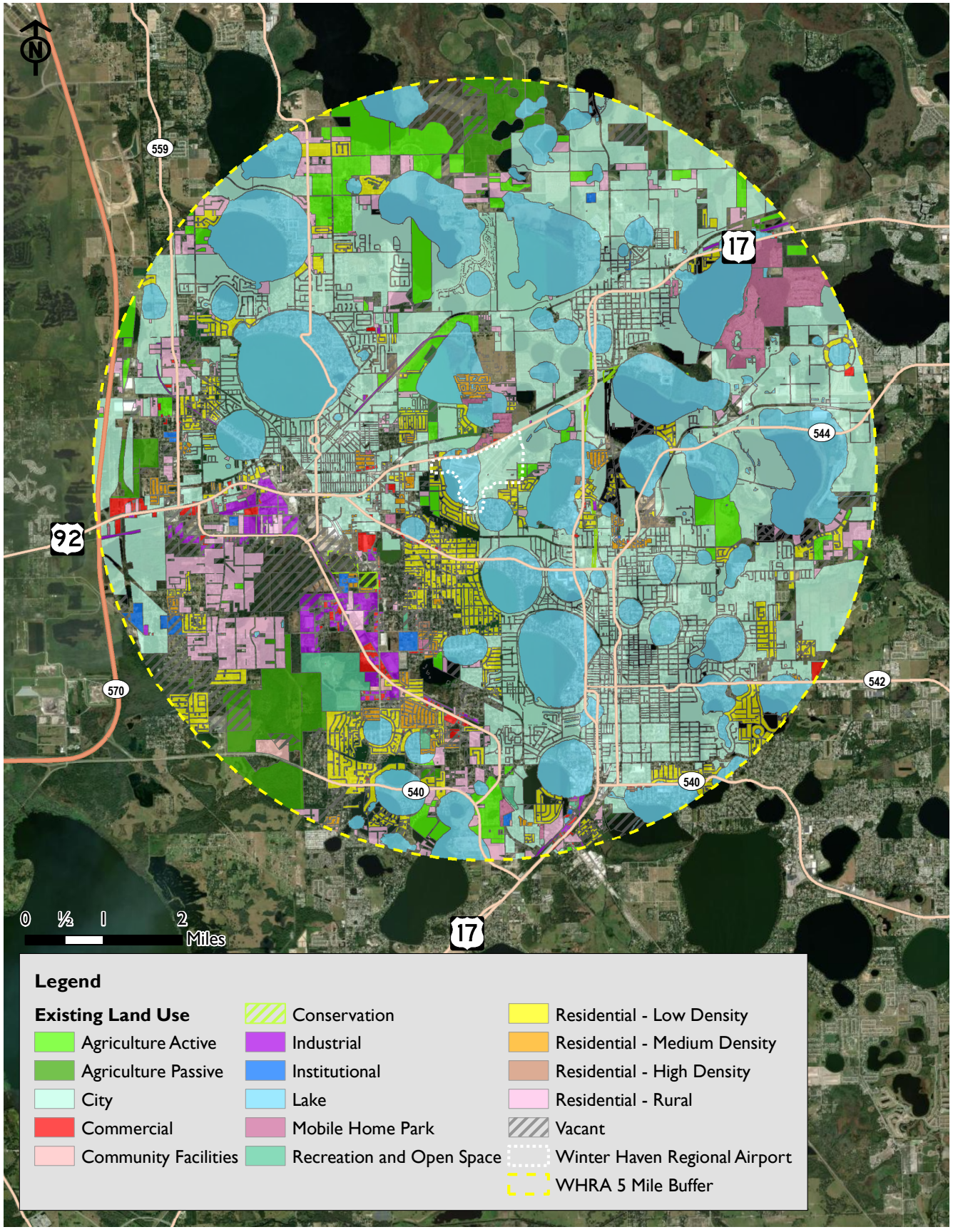
Figure 71 - Northbound Approach to CSX Crossing at Spirit Lake Road

9.1.7 Existing Land Use

The airport is comprised of 520 acres of land within its boundary and zoned as City. As shown in Figure 72, there are existing Industrial land uses located southwest of the airport. General land uses surrounding the airport are as follows:

- Land use throughout the study area is primarily designated as City;
- Land use to the north is generally designated as City, Agricultural Passive, Agricultural Active, and varying types of Residential;
- Land use to the east is generally designated as City, Mobile Park, Agricultural Passive, Agricultural Active, and varying types of Residential;
- Land use to the south is generally designated as City, Agricultural Passive, Agricultural Active, Industrial, Recreation and Open Space, and varying types of Residential; and
- Land use to the west is generally designated as City, Industrial, Residential – Rural, Residential – Low Density, and Commercial.

Figure 72 - GIF Study Area Existing Land Use



9.1.8 Future Land Use

Future land uses are depicted in Figure 73. GIF and a large majority of the surrounding area remain as city for the future land use. Industrial areas are located to the west and south of the airport in close proximity to US 17 and US 92. General usage surrounding the airport is as follows:

- Land use throughout the study area will primarily remain as a city designation;
- Land use to the north is generally designated as City, Agriculture, and Residential – Low Density;
- Land use to the east is generally designated as City, Residential – Suburban, and Residential – Low Density;
- Land use to the south is generally designated as City and varying types of Residential; and
- Land use to the west is generally designated as Preservation, Business Park Center, City, and varying types of Residential.

Figure 74 provides a depiction of vacant parcels and future Industrial land use. Vacant parcels are located throughout the study area, primarily in the southwest region. Future Industrial land uses sit near or on vacant parcels.

Figure 73 - GIF Study Area Future Land Use

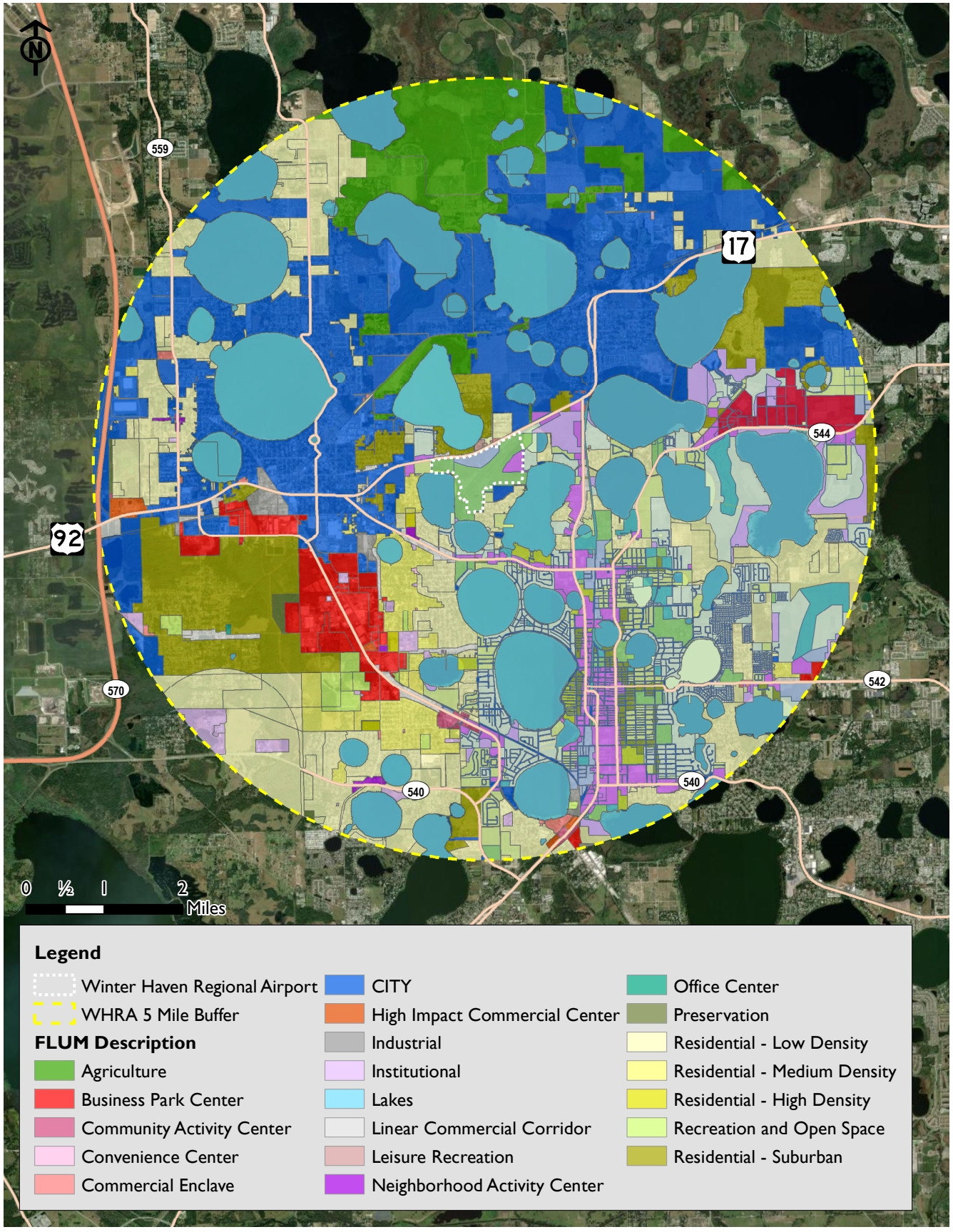
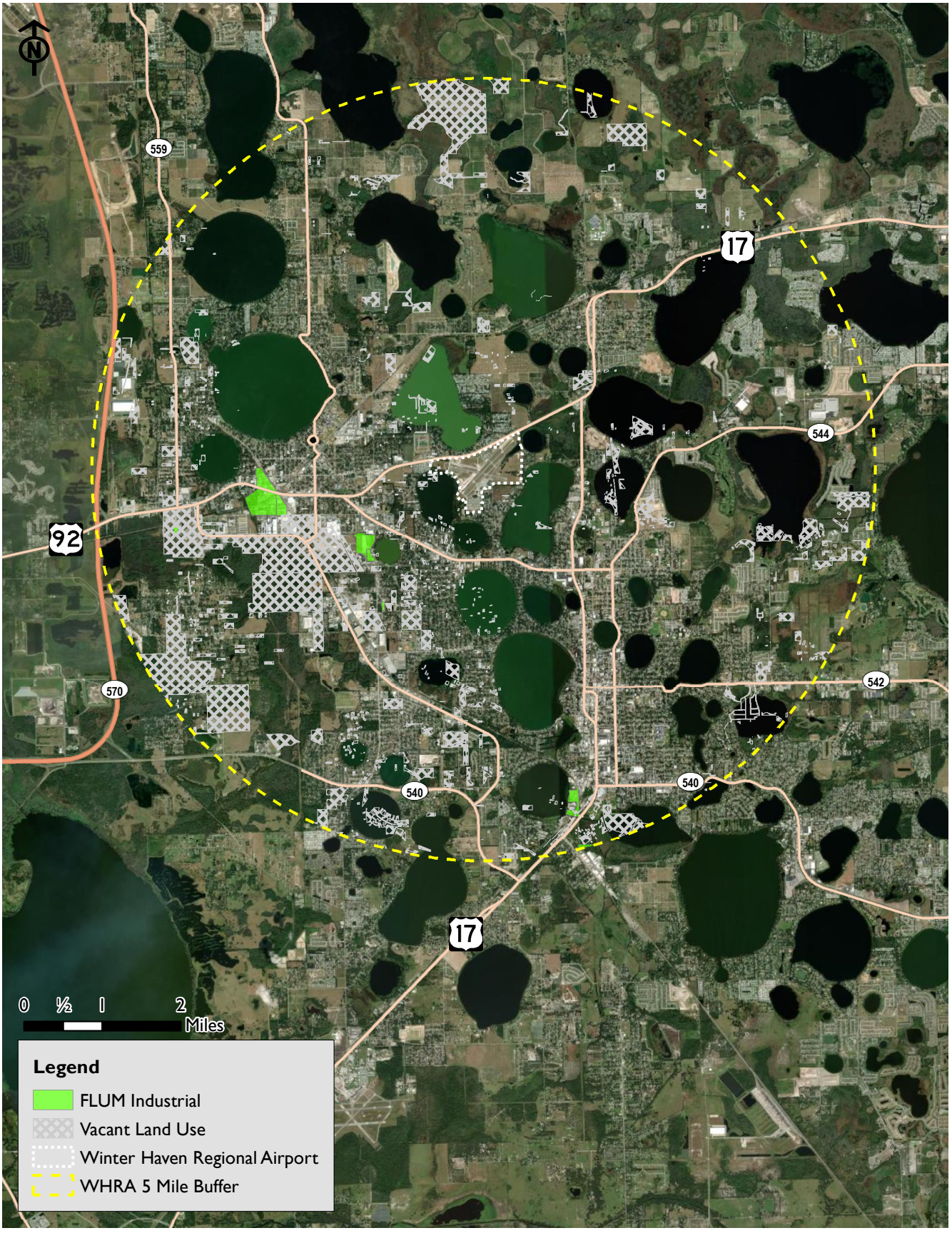


Figure 74 - GIF Study Area Industrial and Vacant Parcels



9.2 Existing Traffic Data and System Performance

9.2.1 AADT and Truck AADT

Data was collected from Florida Traffic Online to determine the baseline AADT and truck AADT traveling within the GIF study area. The measurement of AADT provides basic empirical understanding of traffic conditions on a given roadway. The number is derived by dividing the total annual number of vehicles on a highway or road by 365 days. This information is collected by FDOT and made available publicly.

The roadways that are travelled the most within the GIF study area are US 17, US 92, Havendale Boulevard NW, and 21st Street NW, as shown in Figure 75. US 17 runs north and south on the east side of the airport and averages between 24,000 and 34,000 vehicles per day, depending on the roadway segment. US 92 runs east and west and is the primary entrance to the terminal and averages between 15,000 and 34,000, depending on the roadway segment. Havendale Boulevard NW runs east and west on the south side of GIF and averages between 24,000 and 31,000 vehicles per day. 21st Street NW connects to the airfield and carries approximately 4,700 vehicles per day.

Truck AADT for the GIF study area was reviewed similar to AADT and is shown in Figure 76. The highest truck volumes are along 21st Street NW where trucks account for 12 percent of the total AADT. The highest total truck AADT exist along US 92, with truck AADT 36,000.

Figure 75 - GIF Study Area AADT

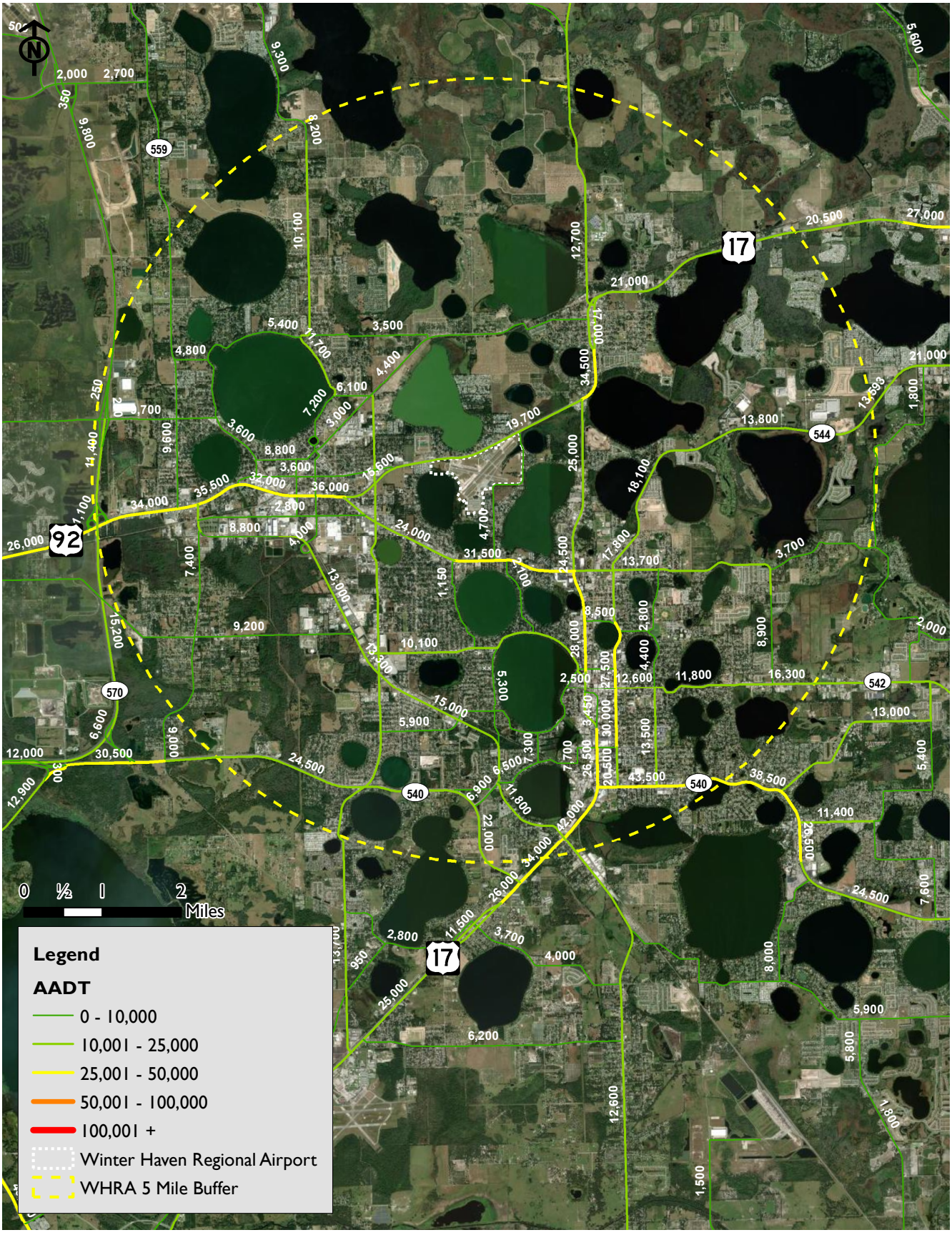
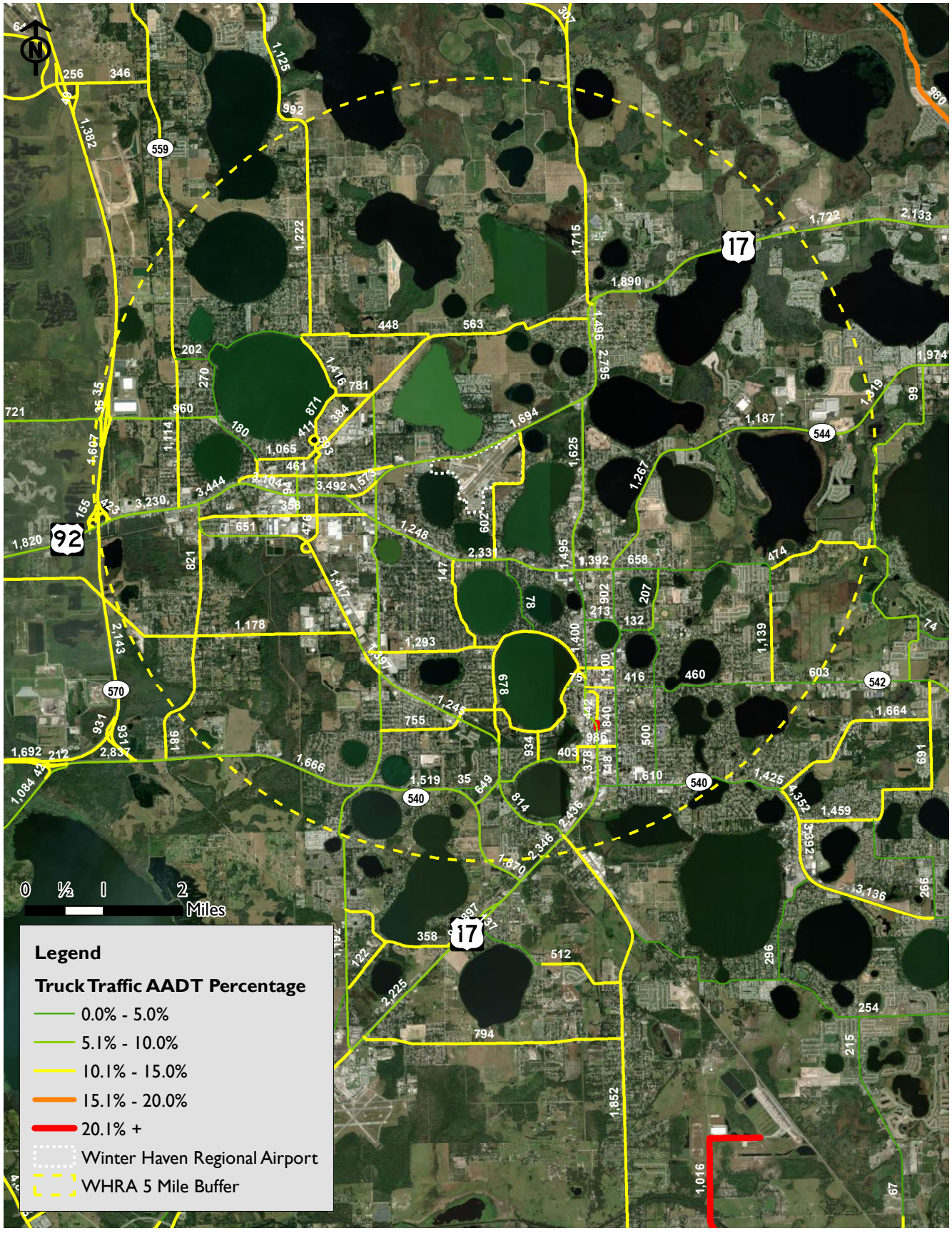


Figure 76 - GIF Study Area Truck Volumes



9.2.2 Crash Rates and Density

Vehicular accidents are depicted as both an area crash rate, five year rate, and crash density, a heat map, as shown in Figure 77 and Figure 78 respectively. The analysis shows that accidents occur frequently in-and-around the following intersections:

- US 92 and Recker Highway;
- US 92 and Berkley Road; and
- US 17 and SR 544

Figure 77 - GIF Study Area Crash Rates

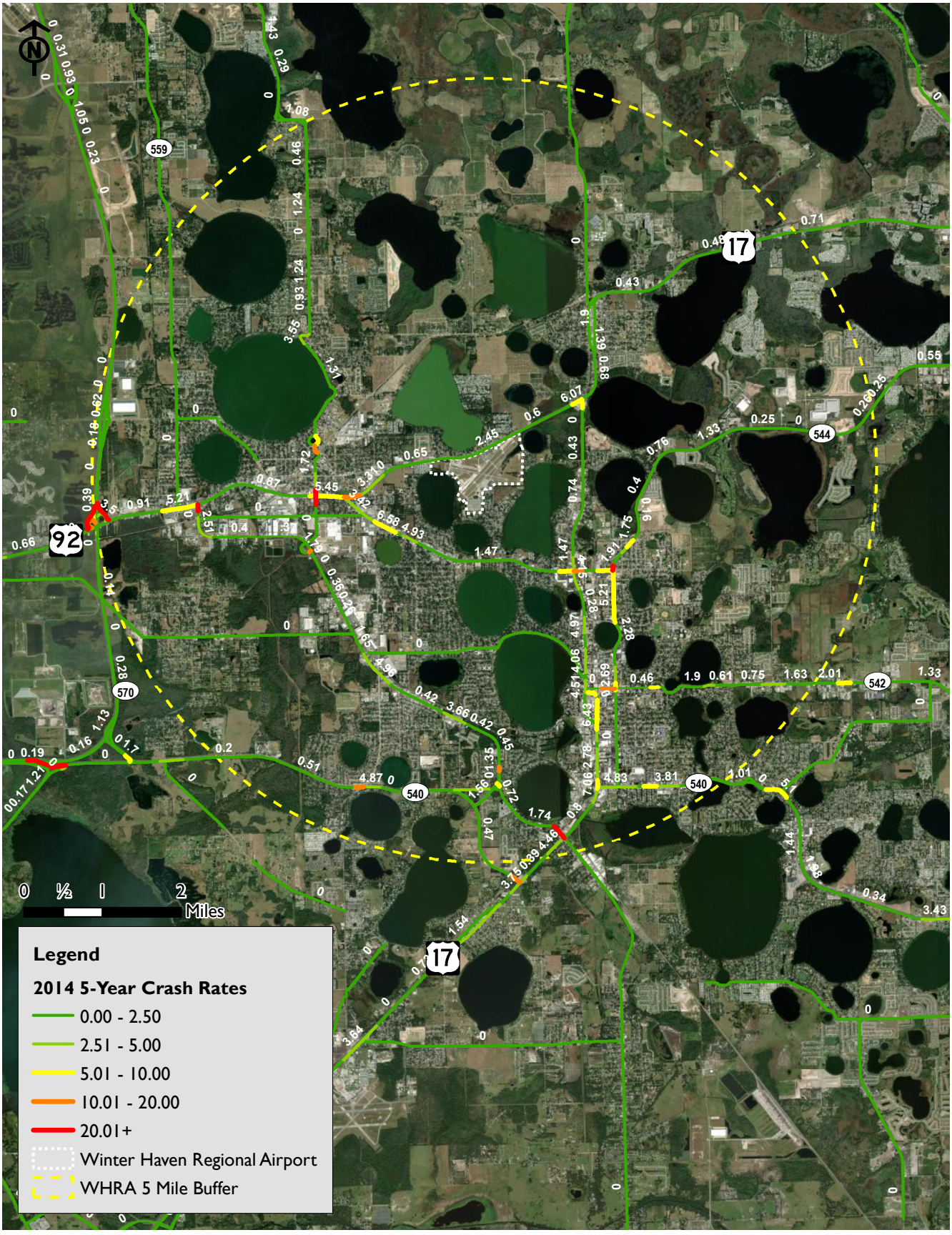
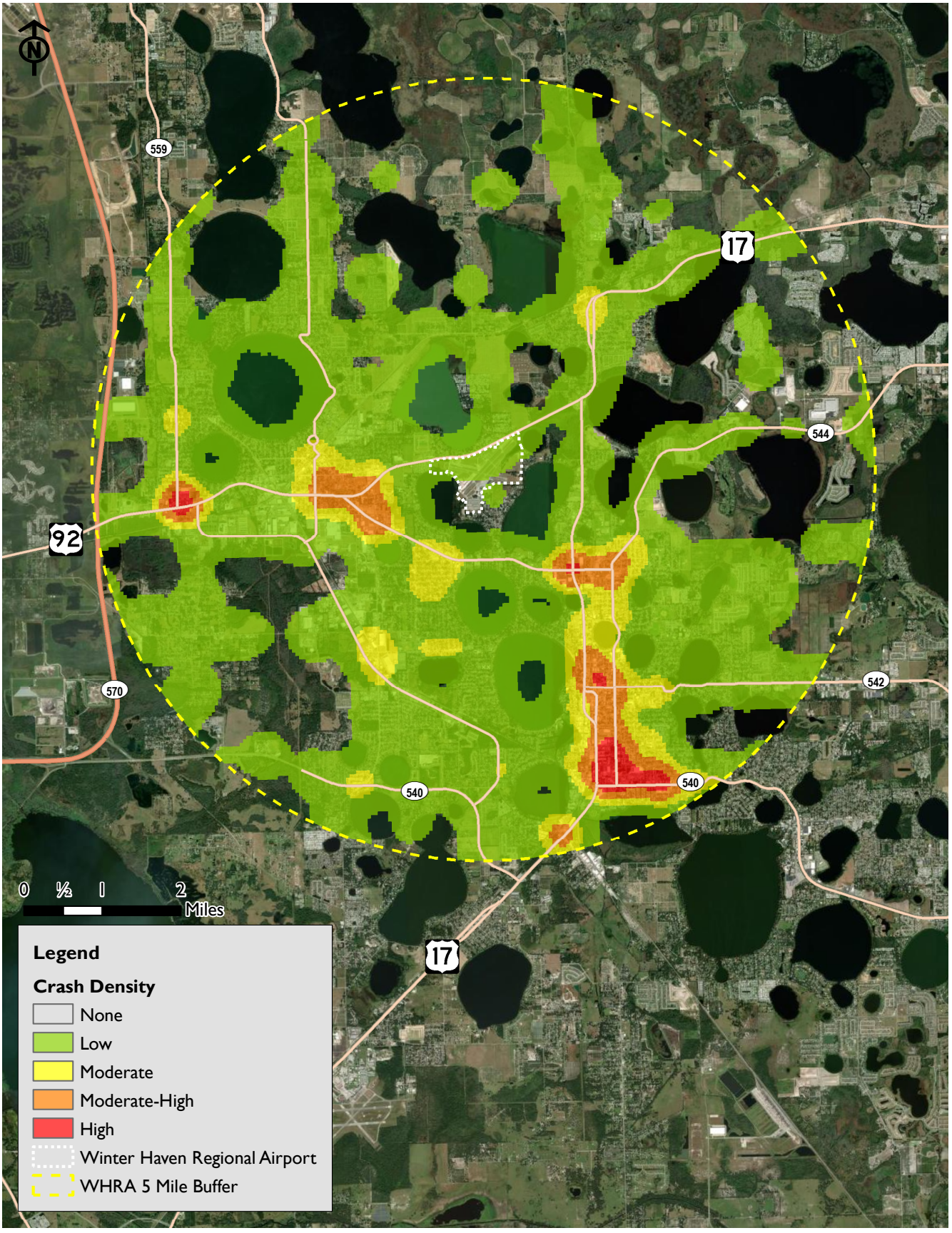


Figure 78 - GIF Study Area Crash Density



9.3 Existing Conditions & Master Plan Review

9.3.1 Geography and Airside Facilities

GIF is located in Polk County and sits on approximately 520 acres with an AMSL of 145 feet. By interstate, the airport is approximately 51 miles from Tampa and 44 miles to Orlando.

Airside facilities include two runways, as shown in Figure 79. Runway 5-23 is the primary facility and Runway 11-29 is the crosswind runway. Runway 5-23 is oriented in a northeast/southwest direction, comprised of asphalt, and is 5,006 feet long by 100 feet wide. It was designed to meet the design criteria for an ARC of B-11. Examples of aircrafts that fall within the B-11 designation include, but are not limited to, Beech King Air C90, the Cessna Citation III, and the Grumman Gulfstream I. Additional information for this runway is included in Table 44.

Runway 11-29 is oriented in a west-north west/east-southeast direction, comprised of asphalt, and is 4,001 feet long by 100 feet wide. It is designed to meet design criteria for an ARC of B-1. Examples of aircrafts that fall within the B-1 designation include, but are not limited to, Beech King Air F90, The Cessna Citation I, and the Piper 400LS Cheyenne. Additional information for this runway is included in Table 44.

Figure 79 - GIF Airside Facilities

Source: 2016 GIF Airport Master Plan

Table 44 - GIF Runway Characteristics

Characteristic		Runway 5	Runway 23	Runway 11	Runway 29
Length & Width		5,006' x 100'		4,001' x 100'	
Displaced Threshold		None	None	None	None
Marking (Condition)		Non-Precision	Non-Precision	Basic	Basic
Approach Aids		PAPI (2-Box)	PAPI (2-Box)	None	None
Surface Type		Asphalt		Asphalt	
Strength	Single Wheel	30,000 Lbs.		12,500 Lbs.	
	Dual Wheel	N/A		N/A	
	Dual Tandem	N/A		N/A	
	Double Dual Tandem	N/A		N/A	
Effective Gradient		0.01%	0.01%	0.05%	0.05%
Pavement Condition (2015)		Good		Satisfactory	

Runway 11 to Runway 5. Taxiway D is located south of Runway 11-29 and connects to Runway 29 to the south apron. Taxiway F connects the north terminal apron to Runway 23.

Other airside facilities also include the following:

- Identification lighting for night time and adverse weather operations;
- MIRL on Runway 5-23 (Runway 11-29 is not equipped with runway lighting);
- Medium Intensity Runway Taxiway Lights on Taxiways B and F (the remaining taxiways do not have runway lighting);
- Airport rotating beacon for night time operations;
- Non-precision instrument approach pavement markings are used on Runway 5-23 and basic runway markings are incorporated on Runway 11-29; and
- Take-off and landing aids are utilized on site including three lighted wind socks and segmented circles, runway end identification lights on Runway 5-23 (these are not used on Runway 11-29), and precision approach path indicators are incorporated at both ends of Runway 5-23 (these are not used on Runway 11-29).

The 2019 Statewide Airfield Pavement Management Program, developed by FDOT, determines the condition of pavements so that funding can be prioritized accordingly for assets. Figure 80 depicts the results of the pavement study. Within the study, FDOT recommends Minimum Service PCI for pavements based on the use of the transportation facility and the airport type as shown in Table 45. Maintenance and repair should be conducted to improve pavement conditions and to prevent critical PCI status, as set by the FDOT Recommended Minimum Service Level. Major construction is needed once the pavements reach the Critical PCI threshold. The study forecasts average pavement conditions generally if no improvements are to be made as shown in Table 46 which shows degradation over time.

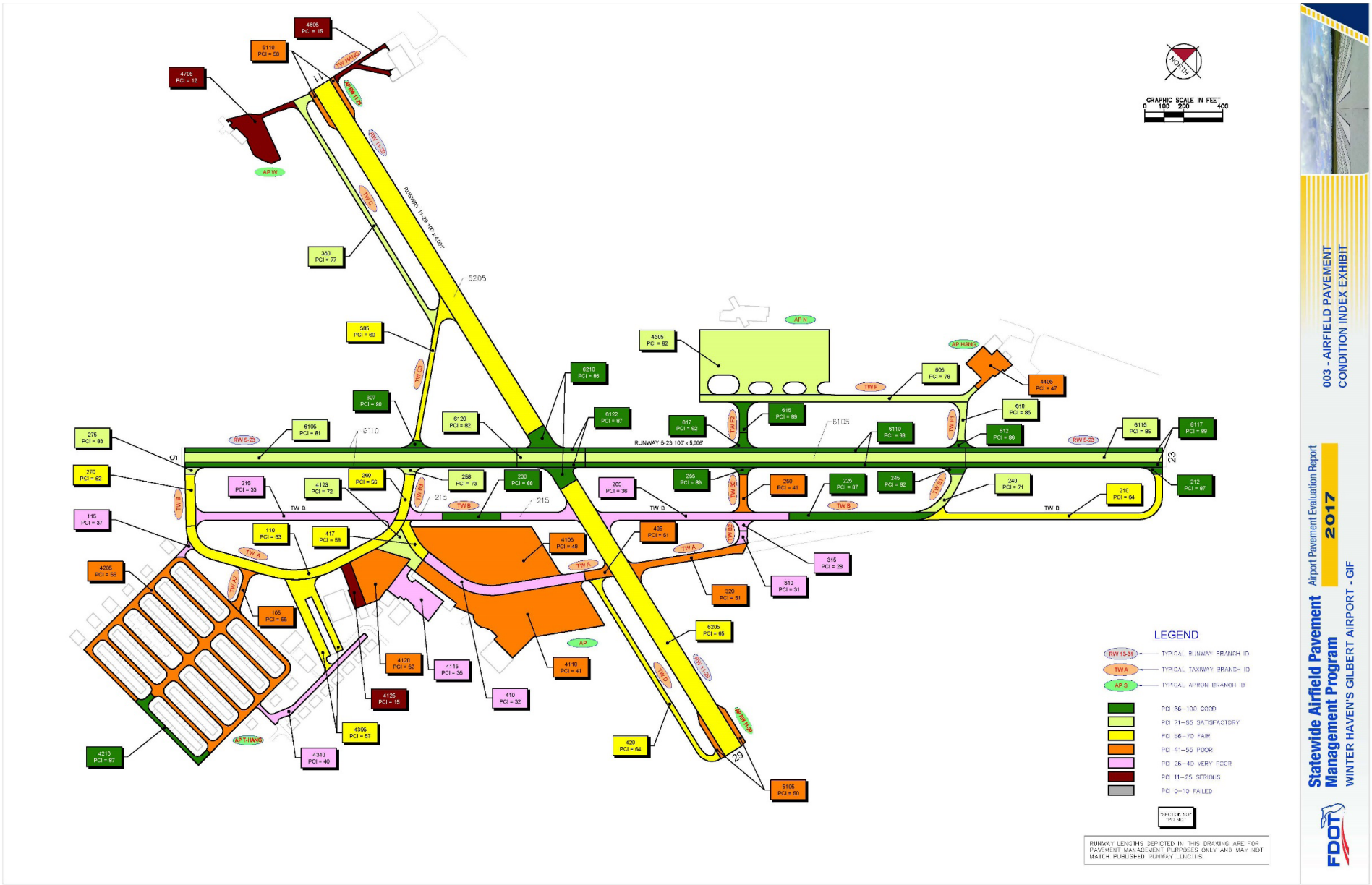
Table 45 - FDOT Airfield Recommended and Critical Service PCI Levels

Use	FDOT Recommended Minimum Service Level PCI			Critical PCI
	Primary Airports	Regional Reliever Airports	General Aviation Airports	
Runway	75	75	75	65
Taxiway	70	65	65	65
Apron	65	65	60	65

Table 46 - GIF Forecasted Pavement Conditions (Overall Area-Weighted PCI)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Runway	71	70	68	67	66	65	64	63	62	61
Taxiway	53	52	50	49	47	46	45	44	43	42
Apron	48	46	44	42	40	38	36	34	32	30

Figure 80 - GIF Pavement Conditions



Source: FDOT 2019 Statewide Airfield Pavement Management Program

9.3.2 Roadway Access

GIF sits just south of US 92 and north of Havendale Boulevard. Access to the airfield is directly off of US 92 or indirectly off of 21st Street Northwest. GIF sits approximately seven miles south of I-4 and is approximately 35 miles from Orlando and 35 miles from Tampa.

9.3.3 Tenants

Airport facilities at GIF include a terminal building; thirteen T-Hangars buildings (a total of 128 T-Hangars); 25 conventional hangars ranging from 5,000 to 14,000 square feet in size; and general buildings that house Civil Air Patrol, the City of Winter Haven's document storage, the Experimental Aircraft Association facilities, and airport storage. A list of the current tenants at GIF can be found in Table 47.

Table 47 - GIF Tenants

Tenants	
Aviation Research, Training, & Services	Flight Training 101
Blue Horizon Flight Center	HOVA Flight Services
Brown's Seaplane Base	Hubble Upholstery
Central Florida Flying Club	Plane Instruments & Avionics
Civil Air Patrol	Preston Aviation
DME Services of N. Florida	Seaplane Pilots Association
Enterprise Rent-A-Car	Waldo Wright's Flying Service
Experimental Aircraft Association	Wilco Aircraft Services

Below are a list of tenants that either play a role or have the potential to play a role in the air cargo industry at GIF.

The following businesses provide MRO services at GIF:

- HOVA Flight Services;
- Plane Instruments and Avionics; and
- Wilco Aircraft Services.

The majority of freight received by these businesses is likely received by USPS, FedEx, or UPS based on the nature of their work. Additional freight may be received by LTL as necessary.

9.3.4 Foreign Trade Zone

GIF is not located within an FTZ. In an effort to promote economic activity, a FTZ is a physical location that is granted special privileges by the US Federal Government for the importation and exportation of merchandise to-and-from the United States of America. Although an FTZ site is physically located within the US, for customs purposes, the site is considered to be located outside of the Customs Territory of the United States and all merchandise entering the FTZ site is considered international commerce. This allows for tariffs on goods that are shipped into the US and then back out to either be delayed, reduced, or eliminated.

9.4 Facility Planned Improvements

GIF is not planning to deal with any air freight in the foreseeable future. They are, however, planning on airside improvements for:

- Construction of Building #270 (10 T-Hangars);
- Runway 11 – Access Road Runway Protection Zone;
- Taxiway C/D Connector; and
- Taxiway E Extension.

9.5 Roadway Planned Improvements

GIF is located within the boundaries of the Polk Transportation Planning Organization (PTPO). PTPO develops the LRTP which includes all federally funded or regionally significant projects within its jurisdiction. Projects in the LRTP are categorized based on fiscal constraints and compared against other transportation projects in the region. The PTPO Board of Directors adopted the Momentum 2040 (the PTPO LRTP) in December of 2015. Projects near the airport that may benefit freight movement within the study area if they are completed are:

- An intersection project at US 17 and Avenue T NE;
- Capacity improvements at Spirit Lake Road/42nd Street NW (from CR 542 to SR 544);
- Capacity Improvements along CR 557 (from US 17/92 to I-4); and
- Capacity Improvements on US 17/92 (from Rochelle Avenue to US 27).

Like the LRTP, the TIP is managed by PTPO. The TIP is a short-range (five year forecast) for projects that have or will receive federal funding. There is one project that will impact freight movements within the study area:

- US 92 Resurfacing.

9.6 Projected Growth

9.6.1 Aviation Cargo Growth

There is currently no documented air cargo operations at GIF according to FACS. All freight activity is based upon tenants leasing on airport property with freight arriving and departing by truck. At this time, the transition to air cargo operations is not anticipated and additional review would be required if an existing or new tenant were to show interest in air cargo operations. As a result, no air cargo projections were made for GIF.

9.6.2 Roadway Network Growth

Traffic operating conditions were evaluated for the study area roadways that are most likely to be impacted by forecasted automobile and freight movement growth for GIF. Table 48 presents the LOS analysis results for these roadways. All roadways currently operate at acceptable LOS.

Table 48 - GIF Existing Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2018				
				AADT	Truck AADT	Truck %	Peak Hour Volume	LOS
US 92	Magnolia Dr to Lake Alfred Rd	9.0	56.0	16,100	1,567	9.7%	1,450	B
SR 544	Magnolia Dr to Lake Alfred Rd	9.0	56.0	27,750	1,790	6.5%	2,500	B
21st St NW	US 92 to SR 544	9.0	56.0	4,700	602	12.8%	425	B

Vehicular traffic growth around GIF is projected to grow at a CAGR of 2.90 percent based on the population growth of Polk County. The roads in the study area that were evaluated for future LOS area as shown in Table 49. SR 544 carries the most volume and is expected to do so in the future.

While GIF does not have any scheduled or ad hoc air cargo operations, projected growth followed the same assumption as other ad hoc cargo operations within the study, 0.52 percent CAGR, as a conservative estimate. The most frequently used road by trucks is SR 544.

Roadway capacity analyses were also conducted based on the 2020, 2030, and 2040 traffic projections. The results of the future conditions capacity analysis indicated that all study area roadways are expected to operate at acceptable LOS for all years.

Table 49 - GIF Future Conditions LOS Analysis for Study Area Roadways

Roadway	Limits	K-Factor	D-Factor	2020				2030				2040			
				AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
US 92	Magnolia Dr to Lake Alfred Rd	9.0	56.0	17,047	1,584	9.3%	**B**	22,689	1,668	7.4%	**B**	30,197	1,757	5.8%	**C**
SR 544	Magnolia Dr to Lake Alfred Rd	9.0	56.0	29,383	1,808	6.2%	**B**	39,106	1,904	4.9%	**C**	52,048	2,006	3.9%	**C**
21st St NW	US 92 to SR 544	9.0	56.0	4,977	608	12.2%	**B**	6,623	641	9.7%	**C**	8,815	675	7.7%	**C**

9.6.3 Rail Growth

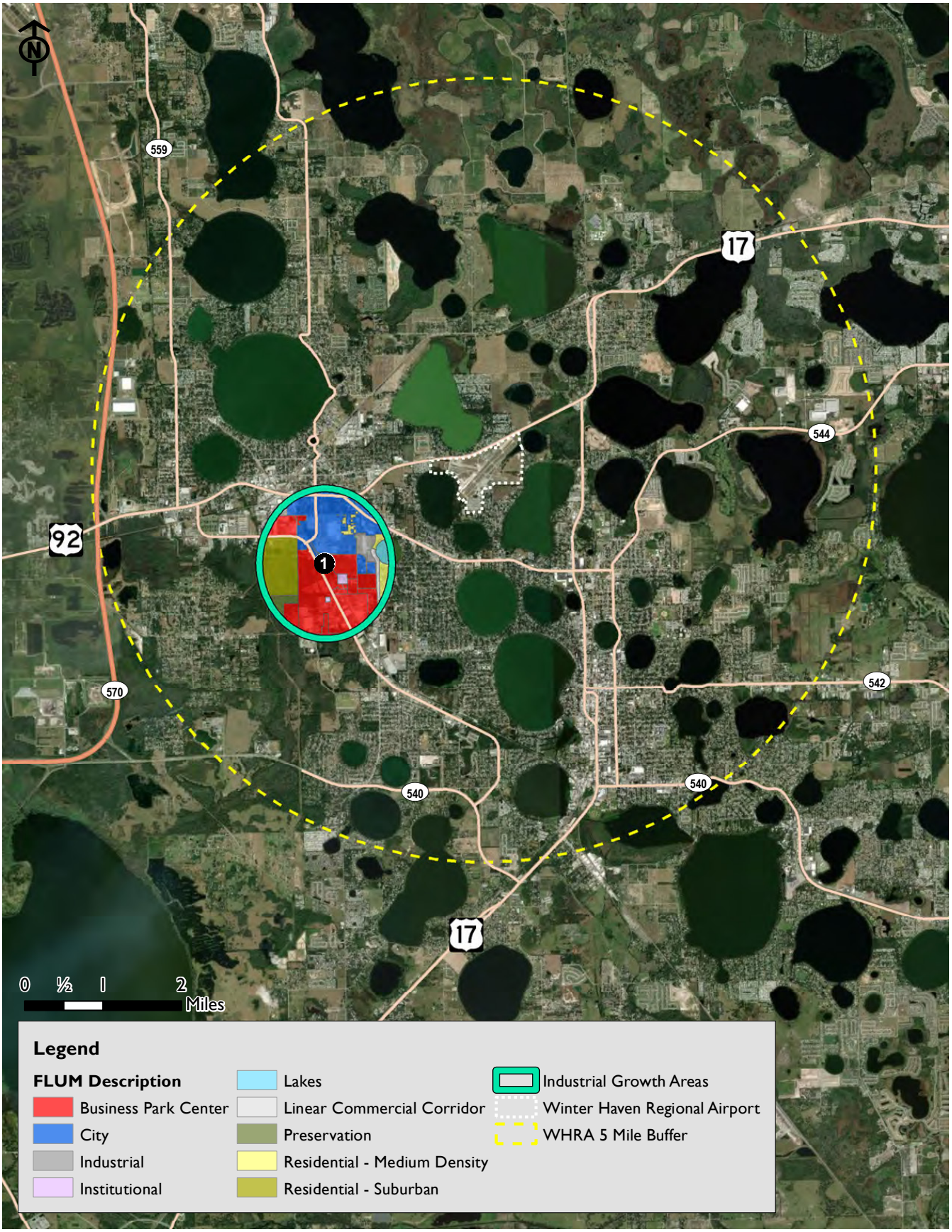
GIF does not have on-site rail access and limited opportunities for shipment by rail surrounding the airport. If freight were to be transported by rail, it would occur outside of the study area and require transit by truck prior to rail access.

9.6.3 Qualitative Industrial Growth Summary

This study has identified one location, within the GIF study area, as suitable for industrial activity and growth, based on a review using the methodology described in Section 4.4 of the report.

The proposed industrial growth are for Winter Haven is located southwest of the airport, as shown in Figure 81. This location is generally bounded by US 92 (north), SR 544 (east), E Main Street (south), and Thornhill Road (west). County Road 655 also bisects this location in the north, before turning southeast. There is existing industrial usage south and immediately north of US 92 and running south along CR655. Vacant land exists north between E Main Street and the northern portion of CR 655. This location provides direct access to US 92, and is in close proximity to the Polk Parkway (SR 570) and US 17. GIF is approximately four miles from this area. Northern portions of the site provide access to the CSX rail line, where industrial development is preexisting. Future land use in this area is designated as Industrial, City, and Business Park.

Figure 81 - GIF Study Area Rail Facilities



9.7 Recommendations

Recommendations for GIF are focused on the airport site, the surrounding roadway network, and any on site rail improvements, if applicable. They are based on information from within this study and are categorized as short-term (1 to 5 Years), mid-term (6 to 9 years), and long-term (10 to 20 years), as shown in Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan.

Runway, Taxiway, and Aprons are generalized recommendations within this study. More details on specific segments of each category should be referred to the Major Rehabilitation Exhibits within the 2019 Statewide Airfield Pavement Management Plan.

Table 50 - GIF Recommendations

Location	Improvement Recommendations	Identified Needs	Implementation Timeframe
GIF Airport Site Recommendations			
GIF	Runways	Major Construction	Short Term (1-5 Years)
GIF	Taxiways	Major Construction	Short Term (1-5 Years)
GIF	Aprons	Major Construction	Short Term (1-5 Years)
GIF Roadway Recommendations			
21st Street south of US 92	Improved safety signage for sharp curves	Local concern and accident history	Short-Term (1-5 Years)
Intersection of US 92 at SR 552	Intersection improvement	Congestion at intersection, unsignalized westbound left turn likely to become safety and operational concern as traffic increases	Mid-Term (5-10 Years)
Intersections on US 92 (main airport access, Lynchburg Rd, and 21st St)	Conduct periodic traffic analysis to identify potential bottleneck conditions	Long term access needs for airport	Mid- and Long-Term (5-10 Years)
GIF Rail Recommendations			
Spirit Lake Road at-grade CSX crossing in Winter Haven, Florida (Inventory Number 625396J)	Provide crossing flashing signal facing towards Burns Flooring and Kitchen.	Inadequate Safety Equipment	Short-Term (1-5 Years)
	Revise gate mast direction to block traffic from Burns Flooring and Kitchen from turning left onto the crossing.	Inadequate Safety Equipment	Short-Term (1-5 Years)
	Consider four-quadrant protection as there was recent accidents. (Need to consider overhead power lines)	Technology Improvement	Short-Term (1-5 Years)
	Evaluate if a "Queue Cutter" light is warranted to keep vehicles from queuing on crossing.	Technology Improvement	Short-Term (1-5 Years)
	Additional signage for semi-trucks to know they are clear from queuing on crossing.	Improve Signage	Short-Term (1-5 Years)

9.8 Conclusion

GIF is a general aviation airport with no documented air cargo operations or volumes. Airside improvements such as improving pavement quality should still be a focus to continue other aviation activities to assist with the needs of existing tenants. Most of the pavements are in immediate need of major rehabilitation over the short-term.

Continued collaboration with FDOT and local governments to maintain the surrounding roadway network is imperative for the movement of people and goods surrounding GIF. There are three roadway recommendations that will improve intersection operations and roadway safety/capacity, thereby benefiting the surrounding region.

While GIF does not have any direct rail access, the north/south CSX line does have an at-grade crossing within the study area. Recommendations were provided to improve the safety and circulation for the crossing focusing on improved safety, signage, and technology at the crossing.

10

Conclusion

10. Conclusion

10.1 Airports

Five airports were examined within this study to help gain a better understanding of their existing conditions and how growth of air cargo and freight may increase the need for either airside or roadway network improvements. RSW, located in Lee County, near Fort Myers, Florida, provides commercial air passenger service and scheduled air cargo operations for the region. Also in Lee County, Florida, near the City of Punta Gorda, PGD provides commercial air passenger service and unscheduled air cargo operations. Within the City of Lakeland, LAL is a GA airport that currently has unscheduled air cargo operations and plans to expand to scheduled air cargo operations with Amazon beginning service at the airport in June of 2020. SEF, located in Highlands County, Florida, outside of the City of Sebring, is a GA airport with neither scheduled nor unscheduled air cargo operations. Operating similarly to SEF, GIF, located in Winter Haven, Florida, has neither scheduled nor unscheduled air cargo operations at the current time.

The three study airports that currently have air cargo shipment activities are RSW, PGD, and LAL, are shown in Table 51. This table compares projections for air cargo volumes in 2020, 2030, and 2040 for each airport. While the growth at RSW and PGD is consistent, the projections for LAL are exponential because of the addition of Amazon. Each airport does project increased growth of air cargo, and as such, infrastructure investments will be required to maintain and improve existing infrastructure. Continuing a working relationship with FDOT to monitor pavement assets, plan for and prioritize improvements will help facilitate the appropriation of funding for each airport, as applicable.

Table 51 - Projected Air Cargo Freight Volume (Short Tons)

Airport	2016	2020	2030	2040
LAL	32	143,363	176,493	217,238
RSW	16,747*	17,098	18,008	18,967
PGD	31	34	42	52

*RSW is a 2018 figure

10.2 Roadway Network

The roadway network that surrounds each airport supports both automobile and truck traffic. Each study area was evaluated based on tenant interviews, on-site observations, and data available through FDOT. Table 52 identifies three roads from two airports within this study that have or will have significant LOS issues now or in the future. Alico Road, near RSW, was the only road in the study with an existing LOS E, below the acceptable threshold. Lee MPOs LRTP does have a widening project for Alico Road, but it is not programmed in the TIP as of yet. Two other roads, near LAL, Drane Field Road and Airport Road are projected to experience degrading levels of service below the acceptable threshold, reaching LOS E by 2040.

Each airport should continue to collaborate with their tenants to identify constraints to freight movmement. Airport should then collaborate with FDOT to identify potential solutions and planning for required future improvements. This communication process should have a feedback loop and be evaluated often to ensure improvements meet the requirements of the freight users.

Table 52 - ARTIDA Study Selected Roads LOS E

Airport	Roadway	Limits	2018				2040			
			AADT	Truck AADT	Truck %	LOS	AADT	Truck AADT	Truck %	LOS
LAL	Drane Field Rd	County Line Rd to Pipkin Creek Rd	11,250	935	8.30%	C	21,100	1,477	7.00%	E
LAL	Airport Rd	Drane Field Rd to SR 570	10,600	954	9.00%	C	19,881	1,507	7.60%	E
RSW	Alico Rd	I-75 to Study Area Edge	16,901	1,372	8.10%	E	28,478	2,168	7.60%	E

10.3 Rail

Moving freight by rail is important as it reduces the number of trucks on the road thereby reducing environmental impacts and increasing safety on the regional roadway network. The only airport with existing, dedicated rail service is SEF. SEF should continue to make investments or find partnerships to improve the rail line that serves its current and anticipated tenants in to the future. SEF should also continuously work to maintain relations with CSX in an effort to better serve its existing tenants.

10.4 Conclusion

Based on geographical location, each airport has unique opportunities to grow cargo at or near the airports. Continued coordination with existing, feasible future tenants, and FDOT, as well as infrastructure maintenance and construction will be required to ensure each airport can meet their growth visions for cargo and/or passenger transport both on and off-site.

There is also a unique opportunity surrounding each airport for industrial growth. Land surrounding airports may be undesirable for residential development, due to feasible noise and vibration within the flight paths of the airport, and more applicable for industrial growth based on proximity to the SIS network. Through continued monitoring of the feasible growth and continued coordination with existing industrial users in the area, FDOT will have a better understanding of feasible truck traffic growth in the future on the roadway network.

Teaming between FDOT and each of the airports as well as industrial users will allow for advanced planning and construction of infrastructure for the roadway network. These improvements have the opportunity to improve both freight and passenger movement through the region of each identified study area.

Appendix A: Tenant Interviews

Florida Department of Transportation

RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: Lakeland Linder International Airport
Date & Time: August 28, 2019 9:30 AM EST
Location: 3900 Don Emerson Drive, Lakeland, FL 33811 & Teleconference

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with Lakeland Linder Airport on September 27, 2019 at 3:30PM. The purpose of this meeting was to gain an understanding of current airport conditions and operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Gene Conrad: Director, Lakeland Linder International Airport
- Monique Whitehead: Industry Specialist, TranSystems (Facilitator)
- Matt McIntosh: Transportation Planner, TranSystems

The interview conducted focused on a variety of topics including warehousing development surrounding the airport, Amazon leasing space from Lakeland Airport, Lakeland Airport Planned Improvements, and bottlenecks on the surrounding roadway network. This document provides a summary of topics discussed in the meeting:

Warehousing Development

Warehousing developments are being constructed and expanding around the intersection of County Line Road and Drane Field Road (east Polk County/west Hillsborough County). Trucks from Cheney Brothers, Amazon, Publix, and many other companies will be utilizing this intersection and it will need to be improved to accommodate the increased truck demand. Mr. Conrad also identified a pinch point at Drane Field Road and Waring Road (NE of airport) coming off of the Polk Parkway, also backing up traffic on the Parkway. These backups are the result of 13,000 commuters coming to the area.

Amazon

Amazon is currently constructing a facility on-site that is anticipated to be operational June of 2020. Phase 1 of their new facility will be 23,000 square feet on 110 acres of land. Projections for freight are approximately 225 trucks and 15 airplanes during peak period.

Mr. Conrad stated that if Amazon had not selected LAL for their newest logistics facility, the airport would have pursued the perishable market, in support of Publix. He stated that while the perishable market is not currently "hot and heavy", there is potential for future demand.

Lakeland Airport Planned Improvements

To accommodate their future growth and the arrival of Amazon, LAL is updating their instrument landing system from Cat 1 to Cat 3. Cat 2 will be implemented by June of 2020; with Cat 3 projected by November 2021. Other projects that will assist with the increased growth include:

- A project to rehab and strengthen runway 927 ($24 million) which is currently designed and the airport was receiving proposals for construction at the time of this interview. This project is 90 percent federally funded, 5 percent state funded, and 5 percent locally funded.
- Long term is south parallel runway.

Regional Roadway Network Bottlenecks

LAL is located in close proximity to several growing industrial and commercial facilities, GEICO Corporate headquarters is located south of the airport, Publix Super Markets Corporate Office is located north of the airport, and Rooms-to-Go operates a distribution center north of the airport. Other warehousing and distribution centers are locating northwest of the airport, on County Line Road, where there is direct access to SR 92 and I-4. Access to these facilities as well as LAL are heavily dependent on Drane Field Road, Waring Road, Hamilton Road, and County Line Road. Discussion regarding these roadways focused on the following:

- Mr. Conrad stated that approximately 13,000 people use Polk Parkway daily which causes traffic back up to gain access to companies surrounding the airport.
- There have been discussions to incorporate a roundabout at both the entrance to the airport and Publix headquarters, along airport road.
- The intersection of County Line Road and Drain Field Road requires improvement.
- West Pipkin Road is a four lane road from County Line Road to Medulla Road prior to the GEICO Headquarter building, and then reduces to two lanes. This creates a bottleneck in accessing the headquarters building.
- During the interview, Mr. Conrad drew attention to the fact that Hamilton Road provides the only access to the airport from the west. Hamilton Road is a county road on the western perimeter of the airport, which Mr. Conrad suggested, cannot handle the demand that currently exists.
- Overall, Mr. Conrad believes that, in order to continue to accommodate the growth in the surrounding area, significant roadway capacity projects may be required.

Florida Department of Transportation
RON DESANTIS
GOVERNOR
801 N. Broadway Avenue
Bartow, FL 33830
KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Punta Gorda Airport**
Tenant: **Cheney Brothers**
Date & Time: **March 2, 2020 1:00 PM EST**
Location: **1101 Northpoint Parkway, West Palm Beach 33407 & Teleconference**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with the Cheney Brothers on March 2, 2020 at 1:00 PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Warren Newell; Director of Development, Cheney Brothers, Incorporated
- Keith Robbins: Freight Coordinator, FDOT D1
- Matt McIntosh: Transportation Planner, TranSystems (Facilitator)

Business Services and Products

Cheney Brothers transports 15,500 different products serving the chemical, dry paper products, and restaurant markets as a "brand line distributor". Cheney Brothers' Punta Gorda serves southwest Florida, generally from Tampa to Fort Myers/Naples. The Punta Gorda location is 100% truck operations; with approximately 200 trucks in their fleet.

The facility is currently 345,000 sq. ft. with an expansion project underway to add 82,000 sq. ft., totaling 427,000 sq. ft.

Trucking Operations

Over-the-road trucks leave the facility between 12:00 AM and 7:00 AM. These trucks then enter the distribution system, bound for various locations throughout the state. Upon arrival, these trucks then unload to additional trailers who deliver products to their ultimate destination. Cheney Brothers operates six days per week – 24 hours per day, with no Saturday operations; resuming operations on Sunday afternoon.

The employment pool is small in the Palm Beach region, with the availability of truck drivers being an issue. This is not as true in Punta Gorda, which is a reason why Cheney Brothers chose this location. Cheney Brothers believed that other support/complimentary businesses would follow them to Punta Gorda, but this has not been realized yet.

Growth

Cheney Brothers is growing at a rate of 10 percent to 15 percent per year. Future growth is projected between 15 percent and 20 percent. Peak season for Cheney Brothers occurs from Thanksgiving to April, mimicking "snow bird" travel patterns, and reflecting a 30 percent to 40 percent increase in operations

Regional Roadway Network Bottlenecks

Punta Gorda has a good transportation network overall; however, signage around the airport is insufficient. Mr. Newell stated that within local downtown areas have insufficient parking for delivery trucks and a number of truck traffic restrictions. All restaurants also expect food deliveries to occur between 8:00 AM and 9:00 AM, during morning peak, creating additional congestion issues.

General Notes

Other general notes of interest from the interview include the following:

- Cheney Brothers' preferred customers are those that do not require warehouse space/capacity at the Cheney Brother's facility. Storing final goods on site is cost prohibitive and limits the profit margin.
- Hazardous materials on site only include ammonia refrigeration.
- Cheney Brothers, Incorporated is a first-in-line company for natural disaster response, providing logistical assistance to the state.

Florida Department of Transportation

RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: Punta Gorda Airport
Date & Time: March 2, 2020 1:00 EST
Location: 128 Authority Lane, Punta Gorda, FL

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with the Punta Gorda Airport on December 9, 2019 at 1:00 PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- James Parrish: Director, Punta Gorda Airport
- Monique Whitehead: Industry Specialist, TranSystems
- Matt McIntosh: Transportation Planner, TranSystems

Tenants

The airport's largest tenants are Cheney Brothers (industrial park) and FedEx. FedEx has a 36 bay trucking facility, built in 2005, with a 40-year lease. Currently, there are no freight planes operating at the airport. The last planes with cargo operations at Punta Gorda Airport were operated by Skybus, who left in 2008.

General Aviation

Mr. Parrish stated that there are 390 private aircraft currently based at the airport. Approximately 82,000 flight operations occur per year, approximately 4,000 of these flights are Allegiant Airline passenger flights. All flights are scheduled and operations at the airport occur 24/7.

Mr. Parrish remarked that to continue to grow their general aviation business they would require additional hangar space. Similar to Lakeland Linder Airport, Punta Gorda Airport is expecting general aviation to move away from Punta Gorda in favor of smaller airports because of the scheduled service requirements of Allegiant Airlines.

Capital Improvements

Punta Gorda Airport has plans for $18 million in infrastructure spending in 2020. Greenfield development is planned for the north side of the airport, and consists of 130 acres, both airside and landside development.

Growth

Flight schools and maintenance overhaul and repair education are a focus of the airport's future business plans. Punta Gorda Airport understands that General Aviation is growing in Florida, which will create demand for both of these businesses. The county is also starting an aircraft mechanic program. This program has helped in gaining support for two FAA and FDOT grants for a general aviation center and to extend an existing runway.

Regional Roadway Network Bottlenecks

According to Mr. Parrish, a corridor study on Jones Loop Road is either forthcoming or ongoing. This intersection, Jones Loop Road and Piper Road, will need to be signalized or have a roundabout installed. The airport estimates that 90 percent of traffic at this intersection either turns left onto Piper Road from Jones Loop Road or right onto Jones Loop Road from Piper Road.

Mr. Parrish acknowledged that the airport would like to implement larger signage directing traffic from the interstate to the airport, but are restricted by FDOT regulations. The airport shares the concerns of its tenants that wayfinding to the airport is severely lacking after exiting I-75.

General Notes

Other general notes of interest from the interview include the following:

According to Mr. Parrish, the region contains the second oldest community in the state. This makes it hard to attract new business to the area.

Florida Department of Transportation
RON DESANTIS
GOVERNOR
801 N. Broadway Avenue
Bartow, FL 33830
KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Southwest Florida International Airport**
Tenant: **FedEx**
Date & Time: **January 10, 2020 10:30 EST**
Location: **14011 Jetport Loop, Fort Myers, Florida 33913 & Teleconference**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with FedEx on January 10, 2020 at 10:30AM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Jay Cassens: Properties, FedEx
- Roger Smith: Operations, FedEx
- Teri Kerichenko: Properties, FedEx
- Monique Whitehead: Industry Specialist, TranSystems
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Products

FedEx operations at Southwest Florida International Airport consist of plane and truck movements for parcel services. One morning plane arrives at 5:48am and is turned for departure at 9:40pm. Cargo is shipped to five local facilities via truck, and then it proceeds to its final business and residential destinations. One FedEx plane equates to approximately six tractor trailers and three straight trucks (20-24 feet) of freight. Mr. Cassens identified the FedEx location at Southwest Florida International Airport as serving a coverage area from Naples to Punta Gorda.

During peak season, a larger plane is used, sometimes two planes, equating to approximately 11-12 vehicles with double-turns (drop-off at Fort Meyers Station and return to repeat the process). Typical peak season occurs between Thanksgiving and Christmas for FedEx; however, at this location peak occurs between Mid-October and May.

Regional Roadway Network Bottlenecks

A primary concern of FedEx, related to local roadways, is the amount of residential development occurring in the Fort Myers area and the subsequent effect on traffic movement in all directions. Examples pointed out by Mr. Cassens include apartments being built off Chamberlin Parkway and 1,000 homes being built at SR 82 and Daniels Parkway, including a new high school. Daniels Parkway will

become a major obstacle/hindrance in the near future. Currently, FedEx uses Daniels Parkway to access I-75 for northern routes.

Other bottlenecks noted within the interview included:

- Southern routes use the airport's Terminal Access Road, including the City of Lehigh Acres. This community is growing fast and there is currently only one way to access the city.
- Traffic on I-75 can back up significantly in the southbound direction; these delays primarily caused by accidents. These same backups are not typically experienced northbound.
- Mr. Cassens reported no constraints on airport property, with the exception of the company's on cargo area. Growth at this FedEx facility is only limited by the amount of equipment FedEx has available to it on-site.

General Notes

Other general notes of interest from the interview included the following:

- This FedEx facility has experienced growth rates of 11 to 15 percent year-over-year for the last three years.

Florida Department of Transportation

RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Sebring Regional Airport**
Tenant: **Advanced Drainage Systems**
Date & Time: **August 13, 2019 4:15 PM EST**
Location: **128 Authority Lane, Sebring FL 33870**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with Advanced Drainage Systems (ADS) on August 13, 2019 at 4:15PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Jamie Urey: Plant Manager, Advanced Drainage Systems
- Andy Nicol: Vice President, TranSystems (Facilitator)
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Products

At their Sebring Airport facility, located on Almond Drive, ADS manufactures both poly-propylene and poly-ethylene drainage pipes, ranging from five to 30 feet in diameter. Their clientele includes FDOT and other contractors. The facility operates 24 hours and seven days per week.

ADS is a product conversion driven company. Product is manufactured based on customer orders, typically a more expensive form of manufacturing; however, it does reduce storage and finished goods costs. Due to this manufacturing process changeover time, cycle time, and lead time to the customer become very important to meet their customers' needs. ADS is typically able to complete an order within three hours and have the order to the client within 24 hours, barring specialty product requests.

Mr. Urey described ADS' Sebring operations as a large company with small a facility. Currently, ADS Sebring has 58 total employees and is operating at max capacity in terms of employees and machinery. ADS Sebring occupies one 43,000 sq. ft. building with 18 to 20 foot ceilings. At the time of the interview, ADS was forecasted to make 2.2 million pounds of product in 2019. In order to meet customer demand, they recently expanded their operations to accommodate increased production of ploy-propylene pipe and they are working closely with an ADS location in Winter Garden, Florida. The Sebring facility primary markets are south and central Florida but they offer limited products north to Jacksonville, Florida. Their Winter Garden location serves customers north of I-4 for their poly-ethylene pipe product.

Logistics

To meet product delivery requirements, ADS, has ten dedicated drivers on-site that typically make two turns per day to the distribution center and to local customers. The fleet drove a total of 1.1 million miles last year, including over 8,200 drops. Deliveries leave at 4:00 am, and return back to the facility by lunch, then perform another run.

ADS receives 80 percent of their product by rail. Rail car switches are performed by CSX and occur three to four times a week.

Color and mix raw material arrives by common carriers and box vans. Common carrier is DSL. ADS then delivers products to customers themselves. They do not use an outside company for shipping.

General Notes

Other general notes of interest from the interview included the following:

- Potential expansion markets have been identified in Tampa and Fort Lauderdale, with growth primarily driven by poly-propylene. Mr. Ulrey identified Webster Turn Drive as the primary issue at the airport in terms general roadway conditions and limited space to turn a truck.

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RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Sebring Regional Airport**
Tenant: **Diversified CPC International, Inc.**
Date & Time: **August 13, 2019 3:00 PM EST**
Location: **128 Authority Lane, Sebring FL 33870**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, Diversified CPC International, Inc. on August 13, 2019 at 3:00 PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Robert Scott: TITLE, Diversified CPC International, Inc.
- Andy Nicol: Vice President, TranSystems (Facilitator)
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Products

Diversified CPC International repackages butane/isobutene for use in lighters, specialty fuels, and aerosol propellants for export to multiple locations, including Barbados and South America. Butane arrives at the facility by rail and is subsequently shipped out by truck.

Mr. Scott stated that Diversified recently added an 800 foot rail spur at their facility. This new rail spur also serves the purpose of adding extra rail storage space for other airport tenants.

Regional Roadway Network Bottlenecks

Bottlenecks identified during the interview included:

- The intersection of Haywood Taylor Boulevard and Kenilworth Boulevard acts as a bottleneck because the roadway transitions from four lanes down to two lanes between US-98 and the Kenilworth Boulevard intersection. There are existing plans to widen Kenilworth Boulevard from two lanes to four lanes between the airport and US-27.
- Mr. Scott stressed that Sebring needs to be included as part of the planning efforts for new FDOT roadway corridors that will provide further access to the central parts of Florida.

Mr. Scott commented that US-27 and US-98 are tough to navigate, because of the congestion, noting that the Circle K at the intersection of US-27 and US-98 is the busiest in the state.

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RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with Sebring Airport on August 13, 2019 at 2:30 PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Mike Willingham: Director, Sebring Regional Airport
- Andy Nicol: Vice President, TranSystems (Facilitator)
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Growth

Mr. Willingham stated that the airport is multi-modal and has grown considerably in the last 10 to 15 years, and view themselves as an inland port for the region. Sebring Airport offers the largest cluster of jobs in the county, is located within Foreign Trade Zone #215, and is the only CRA on airport property in the country. The airport is an amenity for an industrial development. In addition, Sebring Airport contracts with Avon Park Air Force Range, providing a huge revenue source for the airport.

Mr. Willingham foresees continued expansion and growth by means of advancing business with legacy companies and positioning for future markets (space, urban air mobility vehicles, and aircraft components). The airport's largest freight shipping tenants are Turf Care (by weight) and Advanced Drainage Systems (by volume). Everything produced by tenants departs by truck.

The airport is positioning itself for businesses including unmanned vehicles, drones, and parts manufacturing also being an option. The airport is a participant in the Central Florida Aviation Cluster Feasibility Study being conducted by the Central Florida Regional Planning Council. Future projects at the airport include replacement of a WWII vintage aircraft apron, a $5 million rail project that includes a two mile rail spur and full reconstruction of the CSX line (in discussions), and a runway expansion project to extend total length to 7,000 feet (in the planning phase).

Regional Roadway Network Bottlenecks

Bottlenecks and required improvements identified during the interview included:

- Haywood Taylor Road was identified as requiring milling and additional work.
- Webster Turn Drive is a county road requiring the most maintenance of roads providing access to the airport. The county has budgeted money for improvements, but not enough. This road was also identified as an area prone to flooding following rainfall.

- A major bottleneck point at the airport is at the location of the Genpak facility, which becomes heavily congested during peak seasons. There is currently no area to turn a truck around in this area.
- The intersection of US-98 and US-27 is very congested.

The off ramp of US-27 and SR 66 eastbound is also becoming very busy.

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RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Sebring Regional Airport**
Tenant: **Turf Care Supply Corporation**
Date & Time: **August 13, 2019 3:45 PM EST**
Location: **128 Authority Lane, Sebring FL 33870**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, Turf Care Supply Corporation on August 13, 2019 at 3:45 PM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Brad Dostal: General Manager, Turf Care Supply Corp.
- Andy Nicol: Vice President, TranSystems (Facilitator)
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Products

Turf Care has three plants on the east coast, including Ohio (corporate), Massachusetts, and Florida. They purchase raw materials, phosphates and nitrogen, and packages fertilizer blends/weed-and-feed for clients as their sole business. Mr. Dostal stated that their specialty is in packaging and has identified the acquisition of packaging operations as a potential expansion market to further vertically integrate their company. Turf Care caters to landscapers and distributors, not direct to the end user, including Scotts Miracle Grow.

Throughput

Turf Care has 36 full-time employees in Sebring, with an ability to increase to 76 total employees during peak season between November and April.

Approximately 80 percent of the raw material arrives by rail and the remaining 20 percent arrives by truck (both domestic and international shipments). Finished goods typically dwell for approximately 48 hours; however, a stockpile is developed on-site for peak season demand. Throughput defined as railcars and trucks (53' containers) are as follows:

- During peak season the facility typically receives 15 to 20 railcars per week and departs approximately 40 trucks per day.
- During non-peak season, the facility typically receives five to ten railcars per week and departs 10 trucks per day.

Infrastructure

At Sebring Airport, Turf Care has three buildings (90,000 sq. ft., 26,000 sq. ft., and 8,000 sq. ft.). The 8,000 sq. ft. building is rented and used for storage.

Regional Roadway Network Bottlenecks

Access to Turf Care's facility has the same access and egress as Diversified CPC and Advanced Drainage, via Webster Turn Drive. The road was described as "torn-up" and experiences truck parking issues during peak seasons. Turning trucks around is an issue, because of the width of the roadway. Mr. Dostal stated that if the lot next store to Turf Care is built, these issues will only worsen. Mr. Dostal has also received complaints from trucking partners that the airport is in the middle-of-nowhere, which results in grouping deliveries and delayed shipments.

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RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: Winter Haven Regional Airport
Date & Time: December 9, 2019 10:00 EST
Location: 2073 US-92, Winter Haven, FL 33881

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with the Winter Haven Regional Airport on December 9, 2019 at 10:00 AM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Ashley Udick: Interim Director, Winter Haven Regional Airport
- Monique Whitehead: Industry Specialist, TranSystems
- Matt McIntosh: Transportation Planner, TranSystems

General Aviation

With the recent arrival of Amazon at the Lakeland Linder Airport, Winter Haven Regional Airport has been receiving increased inquiries for general aviation facilities; however, GIF is currently at capacity and Ms. Udick advised that other regional airports were unable to meet the demand as well. Hangars are limited at the airport, most especially for large planes. In order to account for the increase demand, GIF is currently in the solicitation process to build a new row of T-Hangers. Bids came in too high during the original solicitation.

Growth

The master plan contains aviation and non-aviation options for future growth and development. Ms. Udick stated that flying groups (training schools) might be an opportunity for growth at the airport; however, it would be dependent on construction of a hotel, which is programmed in the airport's master plan. Ms. Udick also noted that the largest canning factory in Puerto Rico is moving operations to the Winter Haven area.

Capital Improvements

Ms. Udick stated that funding is the biggest obstacle in accomplishing priorities of the airport's CIP. GIF is heavily subsidized by the City and just started receiving FAA/FDOT funding. The city is funding a utility project, including fiber optic, sewer, electric, and water and primarily on the north side of the airport. This project is part of larger plan to bring fiber optic to Auburndale. Other projects include:

- A taxiway extension project (Echo) is currently in design.

- The extension will run parallel to runway 1129 (secondary runway).

If funding was available, the airport would prioritize the addition of bulk hangers and rehabilitation of old hangars, because capacity is limiting their ability to grow. Funding could also cover a lack of equipment. The airport has no tug, inadequate software, and no capability of tracking fuel. Ms. Udick also stated that the airport needs a ground power unit, which most turbo props require.

Regional Roadway Network Bottlenecks

Bottlenecks and required improvements identified during the interview included:

- There are two dangerous curves on 21st Street resulting in car accidents and causing reoccurring damage to the fence line of GIF. Ms. Udick also identified this road as a candidate for resurfacing.
- The at-grade highway railroad crossing on Spirit Lake Road can cause delays because of the length of the crossing times.

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RON DESANTIS
GOVERNOR

801 N. Broadway Avenue
Bartow, FL 33830

KEVIN J. THIBAULT, P.E.
SECRETARY

April 3, 2020

Keith Robbins, (863-519-2913)
Keith.Robbins@dot.state.fl.us

Meeting Summary
Airport: **Winter Haven Regional Airport**
Tenant: **Wilco Aircraft Services**
Date & Time: **December 9, 2019 9:00 AM EST**
Location: **3000 21st NW Hangar 95, Winter Haven Florida, 33881**

A meeting was held in relation to task work order (TWO) 4, the ARTIDA study, with Wilco Aircraft Services on December 9, 2019 at 9:00 AM. The purpose of this meeting was to gain an understanding of current airport conditions and tenant operations as well as recommendations or constraints perceived in the future regarding the surrounding roadway network.

Attendees of this meeting included:

- Amanda Hancock: Manager, Wilco Aircraft Services
- Monique Whitehead: Industry Specialist, TranSystems
- Matt McIntosh: Transportation Planner, TranSystems

Business Services and Products

Wilco Aircraft Services provides a variety of services, such as flight schools, charter, and maintenance, The Winter Haven location is focused on aircraft maintenance. Typical operations do not require freight operations for this company and the majority of their freight is received through parcel services via UPS and FedEx.

Winter Haven Regional Airport Growth

Growth at the Winter Haven Airport is primarily anticipated through transfer of smaller airplanes from Lakeland, because of lower fuel prices and the heavy commercial traffic from Amazon, and a new flight school is expected at Winter Haven. The airport's local competitor is the Bartow Airport; however, the Bartow airport does not a large enough geographical footprint to expand and meet demand.

Winter Haven is a non-controlled airport, meaning there is no control tower. This limits the industrial partners that can locate at the airport without developing an agreement with the airport for future development of their air control requirements.

The airport recently received funding for an access system and security upgrades from FAA, and potentially FDOT. Ms. Hancock suggested that security at the airport is fairly lax – "everyone knows the gate code". The airport won't attract new "bigger" customers until a new security system is implemented. A timeline for implementation of the new access system and security features is undecided.

Regional Roadway Network Bottlenecks

Ms. Hancock stated that a lot of housing developments, mostly subdivisions, are being constructed around the airport which is increasing congestion. Specific bottlenecks and required improvements identified in the interview included:

- The intersection of Havendale Boulevard and US 17, particularly south of 17, is a location where traffic backs up during the morning, lunch, and evening peak times. Havendale Boulevard is a high speed corridor with a limited police presence.
- The intersections of Avenue K SW and US 17 and Avenue O SW and US 17 are both dangerous intersections with blind curves and fast turning traffic signals.
- Ms. Hancock also identified the Dundee Road expansion project as a major roadway project that will provide some relief for traffic in the area.
- Highway 17 and Cypress Gardens Blvd are the busiest roads in the area.

Appendix B: Highway Capacity Software

HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Airport Road from Drane Field Road to SR 570	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2700
Measured FFS	Measured	Free-Flow Speed, mi/h	50.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	547	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	9.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.32

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	50.0
Speed Slope Coefficient	3.31675	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41013	PF Power Coefficient	0.72846
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2700	-	-	47.6

Vehicle Results

Average Speed, mi/h	47.6	Percent Followers, %	59.7
Segment Travel Time, minutes	0.64	Followers Density, followers/mi/ln	6.9
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	547	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.87	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Airport Road from Drane Field Road to SR 570	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2700
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	579	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.90
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.31693	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.40207	PF Power Coefficient	0.73255
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2700	-	-	49.0

Vehicle Results

Average Speed, mi/h	49.0	Percent Followers, %	60.9
Segment Travel Time, minutes	0.63	Followers Density, followers/mi/ln	7.2
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	579	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.86	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Airport Road from Drane Field Road to SR 570	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2700
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	774	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.46

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.31819	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.40202	PF Power Coefficient	0.73252
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2700	-	-	48.6

Vehicle Results

Average Speed, mi/h	48.6	Percent Followers, %	68.7
Segment Travel Time, minutes	0.63	Followers Density, followers/mi/ln	10.9
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	774	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.76	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Airport Road from Drane Field Road to SR 570	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2700
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1026	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.60

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.31928	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.40198	PF Power Coefficient	0.73249
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	16.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2700	-	-	48.2

Vehicle Results

Average Speed, mi/h	48.2	Percent Followers, %	76.0
Segment Travel Time, minutes	0.64	Followers Density, followers/mi/ln	16.2
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	1026	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.69	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	County Line Road from Drane Field Rd to W Pipkin	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	55.0	Access Point Density, pts/mi	7.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	53.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1085	Heavy Vehicle Adjustment Factor (f_{HV})	0.885
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	646
Total Trucks, %	13.00	Capacity (c), pc/h/ln	2038
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1973
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	51.9
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	12.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	571	Effective Speed Factor (S_t)	4.79
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	6.82
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: County Line Road from Drane Field Rd to W Pipkin	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	55.0	Access Point Density, pts/mi	7.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	53.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1150	Heavy Vehicle Adjustment Factor (f_{HV})	0.887
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	682
Total Trucks, %	12.80	Capacity (c), pc/h/ln	2038
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1973
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.35

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	51.9
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	13.1
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	605	Effective Speed Factor (S_t)	4.79
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	6.76
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: County Line Road from Drane Field Rd to W Pipkin	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	55.0	Access Point Density, pts/mi	7.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	53.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1530	Heavy Vehicle Adjustment Factor (f_{HV})	0.894
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	900
Total Trucks, %	11.80	Capacity (c), pc/h/ln	2038
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1973
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	51.9
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	17.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	805	Effective Speed Factor (S_t)	4.79
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	6.45
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: County Line Road from Drane Field Rd to W Pipkin	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	55.0	Access Point Density, pts/mi	7.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	53.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	2040	Heavy Vehicle Adjustment Factor (f_{HV})	0.902
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1190
Total Trucks, %	10.90	Capacity (c), pc/h/ln	2038
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1973
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	51.9
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	22.9
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	1074	Effective Speed Factor (S_t)	4.79
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	6.21
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Drane Field Rd from County Line to Pipkin Creek	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	19000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	584	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.30
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.42266	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.43187	PF Power Coefficient	0.66006
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	19000	-	-	48.9

Vehicle Results

Average Speed, mi/h	48.9	Percent Followers, %	63.4
Segment Travel Time, minutes	4.42	Followers Density, followers/mi/ln	7.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	584	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.65	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Drane Field Rd from County Line to Pipkin Creek	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	19000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	616	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.42284	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.43186	PF Power Coefficient	0.66006
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	19000	-	-	48.8

Vehicle Results

Average Speed, mi/h	48.8	Percent Followers, %	64.6
Segment Travel Time, minutes	4.42	Followers Density, followers/mi/ln	8.2
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	616	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.64	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Drane Field Rd from County Line to Pipkin Creek	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	19000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	816	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.48

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.4
Speed Slope Coefficient	3.42392	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.43182	PF Power Coefficient	0.66003
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	12.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	19000	-	-	48.5

Vehicle Results

Average Speed, mi/h	48.5	Percent Followers, %	71.4
Segment Travel Time, minutes	4.45	Followers Density, followers/mi/ln	12.0
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	816	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.58	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: Drane Field Rd from County Line to Pipkin Creek	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	19000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1089	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.64

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	51.5
Speed Slope Coefficient	3.42501	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.43177	PF Power Coefficient	0.66000
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	17.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	19000	-	-	48.1

Vehicle Results

Average Speed, mi/h	48.1	Percent Followers, %	78.0
Segment Travel Time, minutes	4.49	Followers Density, followers/mi/ln	17.7
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	1089	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.52	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: S Pipkin Rd from Drane Field to W Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	8400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	15.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	237	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	12.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	38.6
Speed Slope Coefficient	2.68083	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.39023	PF Power Coefficient	0.68088
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	8400	-	-	37.5

Vehicle Results

Average Speed, mi/h	37.5	Percent Followers, %	40.6
Segment Travel Time, minutes	2.55	Followers Density, followers/mi/ln	2.6
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	237	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.43	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: S Pipkin Rd from Drane Field to W Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	8400
Measured FFS	Measured	Free-Flow Speed, mi/h	50.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	247	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	12.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	50.0
Speed Slope Coefficient	2.68191	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.36154	PF Power Coefficient	0.72158
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	8400	-	-	48.8

Vehicle Results

Average Speed, mi/h	48.8	Percent Followers, %	39.2
Segment Travel Time, minutes	1.96	Followers Density, followers/mi/ln	2.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	247	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.22	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: S Pipkin Rd from Drane Field to W Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	8400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	15.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	332	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	9.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	38.7
Speed Slope Coefficient	2.68642	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.39069	PF Power Coefficient	0.68087
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	8400	-	-	37.3

Vehicle Results

Average Speed, mi/h	37.3	Percent Followers, %	48.1
Segment Travel Time, minutes	2.56	Followers Density, followers/mi/ln	4.3
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	332	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.45	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: S Pipkin Rd from Drane Field to W Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	8400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	15.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	442	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	38.8
Speed Slope Coefficient	2.69003	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.39098	PF Power Coefficient	0.68087
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	8400	-	-	37.1

Vehicle Results

Average Speed, mi/h	37.1	Percent Followers, %	55.0
Segment Travel Time, minutes	2.57	Followers Density, followers/mi/ln	6.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	442	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.95	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Basic Freeway Report

Project Information

Analyst	TranSystems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: SR 570 from Old Tampa Hwy to Pipkin Creek Rd	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	61.8
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1825	Heavy Vehicle Adjustment Factor (f_{HV})	0.877
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1095
Total Trucks, %	14.00	Capacity (c), pc/h/ln	2318
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2318
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.47
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	61.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.7
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	61.8		

Design Analysis Table

Number of Lanes, ln	2	3	4	5
Density, pc/mi/ln	17.7	11.8	8.9	7.1
LOS	B	B	A	A

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HCS7 Basic Freeway Report

Project Information

Analyst	TranSystems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: SR 570 from Old Tampa Hwy to Pipkin Creek Rd	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	61.8
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1930	Heavy Vehicle Adjustment Factor (f_{HV})	0.879
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1156
Total Trucks, %	13.80	Capacity (c), pc/h/ln	2318
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2318
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	61.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.7
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	61.8		

Design Analysis Table

Number of Lanes, ln	2	3	4	5
Density, pc/mi/ln	18.7	12.5	9.4	7.5
LOS	C	B	A	A

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HCS7 Basic Freeway Report

Project Information

Analyst	TranSystems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: SR 570 from Old Tampa Hwy to Pipkin Creek Rd	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	61.8
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2570	Heavy Vehicle Adjustment Factor (f_{HV})	0.887
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1525
Total Trucks, %	12.80	Capacity (c), pc/h/ln	2318
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2318
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	61.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	24.7
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	61.8		

Design Analysis Table

Number of Lanes, ln	2	3	4	5
Density, pc/mi/ln	24.7	16.5	12.3	9.9
LOS	C	B	B	A

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HCS7 Basic Freeway Report

Project Information

Analyst	TranSystems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: SR 570 from Old Tampa Hwy to Pipkin Creek Rd	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	61.8
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3420	Heavy Vehicle Adjustment Factor (f_{HV})	0.894
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	2014
Total Trucks, %	11.80	Capacity (c), pc/h/ln	2318
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2318
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	34.8
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	61.8		

Design Analysis Table

Number of Lanes, ln	2	3	4	5
Density, pc/mi/ln	34.8	21.7	16.3	13.0
LOS	D	C	B	B

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: W Pipkin Rd from County Line to S Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	20000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	7.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	421	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	6.30
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.2
Speed Slope Coefficient	3.46692	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.42695	PF Power Coefficient	0.66207
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	20000	-	-	50.1

Vehicle Results

Average Speed, mi/h	50.1	Percent Followers, %	55.3
Segment Travel Time, minutes	4.54	Followers Density, followers/mi/ln	4.6
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	421	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.81	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: W Pipkin Rd from County Line to S Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	20000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	7.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	447	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	6.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.2
Speed Slope Coefficient	3.46710	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.42694	PF Power Coefficient	0.66207
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	20000	-	-	50.0

Vehicle Results

Average Speed, mi/h	50.0	Percent Followers, %	56.7
Segment Travel Time, minutes	4.54	Followers Density, followers/mi/ln	5.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	447	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.81	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: W Pipkin Rd from County Line to S Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	20000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	7.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	595	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	5.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.35

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.3
Speed Slope Coefficient	3.46782	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.42691	PF Power Coefficient	0.66205
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	20000	-	-	49.7

Vehicle Results

Average Speed, mi/h	49.7	Percent Followers, %	63.6
Segment Travel Time, minutes	4.58	Followers Density, followers/mi/ln	7.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	595	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.83	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	LAL: W Pipkin Rd from County Line to S Pipkin	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	20000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	7.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	789	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	5.30
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.46

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.3
Speed Slope Coefficient	3.46872	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.42687	PF Power Coefficient	0.66202
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	11.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	20000	-	-	49.3

Vehicle Results

Average Speed, mi/h	49.3	Percent Followers, %	70.5
Segment Travel Time, minutes	4.61	Followers Density, followers/mi/ln	11.3
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	789	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.82	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Haywood Taylor Blvd from US 98 to Kennilworth Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	6400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	6.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	195	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	15.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.9
Speed Slope Coefficient	3.70841	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.30767	PF Power Coefficient	0.75439
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6400	-	-	56.5

Vehicle Results

Average Speed, mi/h	56.5	Percent Followers, %	31.7
Segment Travel Time, minutes	1.29	Followers Density, followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	195	Bicycle Effective Width, ft	14
Bicycle LOS Score	9.26	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Haywood Taylor Blvd from US 98 to Kennilworth Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	6400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	6.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	205	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	14.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.9
Speed Slope Coefficient	3.70913	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.30761	PF Power Coefficient	0.75437
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6400	-	-	56.5

Vehicle Results

Average Speed, mi/h	56.5	Percent Followers, %	32.7
Segment Travel Time, minutes	1.29	Followers Density, followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	205	Bicycle Effective Width, ft	14
Bicycle LOS Score	9.08	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Haywood Taylor Blvd from US 98 to Kennilworth Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	6400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	6.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	253	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	12.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	58.0
Speed Slope Coefficient	3.71274	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.30733	PF Power Coefficient	0.75426
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6400	-	-	56.3

Vehicle Results

Average Speed, mi/h	56.3	Percent Followers, %	37.1
Segment Travel Time, minutes	1.29	Followers Density, followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	253	Bicycle Effective Width, ft	14
Bicycle LOS Score	8.22	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Haywood Taylor Blvd from US 98 to Kennilworth Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	6400
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	6.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	305	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	11.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	58.0
Speed Slope Coefficient	3.71599	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.30707	PF Power Coefficient	0.75416
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6400	-	-	56.1

Vehicle Results

Average Speed, mi/h	56.1	Percent Followers, %	41.4
Segment Travel Time, minutes	1.30	Followers Density, followers/mi/ln	2.3
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	305	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.51	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Kenilworth Blvd from Haywood Taylor to Sebring Pkwy	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	28000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	8.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	358	Opposing Demand Flow Rate, veh/h	247
Peak Hour Factor	0.95	Total Trucks, %	5.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.7
Speed Slope Coefficient	3.49333	Speed Power Coefficient	0.52695
PF Slope Coefficient	-1.23947	PF Power Coefficient	0.77246
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	28000	-	-	56.0

Vehicle Results

Average Speed, mi/h	56.0	Percent Followers, %	42.9
Segment Travel Time, minutes	5.68	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	358	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.44	Bicycle Effective Speed Factor	4.79
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Kenilworth Blvd from Haywood Taylor to Sebring Pkwy	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	28000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	8.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	374	Opposing Demand Flow Rate, veh/h	258
Peak Hour Factor	0.95	Total Trucks, %	5.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.7
Speed Slope Coefficient	3.49695	Speed Power Coefficient	0.52445
PF Slope Coefficient	-1.24168	PF Power Coefficient	0.77175
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	28000	-	-	56.0

Vehicle Results

Average Speed, mi/h	56.0	Percent Followers, %	44.1
Segment Travel Time, minutes	5.69	Followers Density, followers/mi/ln	2.9
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	374	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.43	Bicycle Effective Speed Factor	4.79
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Kenilworth Blvd from Haywood Taylor to Sebring Pkwy	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	28000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	8.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	458	Opposing Demand Flow Rate, veh/h	311
Peak Hour Factor	0.95	Total Trucks, %	4.30
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.8
Speed Slope Coefficient	3.51441	Speed Power Coefficient	0.51305
PF Slope Coefficient	-1.25173	PF Power Coefficient	0.76843
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	28000	-	-	55.7

Vehicle Results

Average Speed, mi/h	55.7	Percent Followers, %	49.7
Segment Travel Time, minutes	5.71	Followers Density, followers/mi/ln	4.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	458	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.33	Bicycle Effective Speed Factor	4.79
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: Kenilworth Blvd from Haywood Taylor to Sebring Pkwy	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	28000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	8.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	558	Opposing Demand Flow Rate, veh/h	379
Peak Hour Factor	0.95	Total Trucks, %	3.70
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.8
Speed Slope Coefficient	3.53461	Speed Power Coefficient	0.50035
PF Slope Coefficient	-1.26283	PF Power Coefficient	0.76461
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	28000	-	-	55.4

Vehicle Results

Average Speed, mi/h	55.4	Percent Followers, %	55.4
Segment Travel Time, minutes	5.74	Followers Density, followers/mi/ln	5.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	558	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.26	Bicycle Effective Speed Factor	4.79
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: US 98 from County Rd 17 to Arbuckle Creek Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	53000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	8.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	358	Opposing Demand Flow Rate, veh/h	247
Peak Hour Factor	0.95	Total Trucks, %	5.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.7
Speed Slope Coefficient	3.49333	Speed Power Coefficient	0.52695
PF Slope Coefficient	-1.23947	PF Power Coefficient	0.77246
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	53000	-	-	56.0

Vehicle Results

Average Speed, mi/h	56.0	Percent Followers, %	42.9
Segment Travel Time, minutes	10.75	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	358	Bicycle Effective Width, ft	14
Bicycle LOS Score	5.44	Bicycle Effective Speed Factor	4.79
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: US 98 from County Rd 17 to Arbuckle Creek Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	53000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	389	Opposing Demand Flow Rate, veh/h	268
Peak Hour Factor	0.95	Total Trucks, %	12.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.0
Speed Slope Coefficient	3.45949	Speed Power Coefficient	0.52204
PF Slope Coefficient	-1.24616	PF Power Coefficient	0.77003
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	53000	-	-	55.2

Vehicle Results

Average Speed, mi/h	55.2	Percent Followers, %	45.3
Segment Travel Time, minutes	10.92	Followers Density, followers/mi/ln	3.2
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	389	Bicycle Effective Width, ft	14
Bicycle LOS Score	8.35	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: US 98 from County Rd 17 to Arbuckle Creek Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	53000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	479	Opposing Demand Flow Rate, veh/h	326
Peak Hour Factor	0.95	Total Trucks, %	10.90
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.0
Speed Slope Coefficient	3.47998	Speed Power Coefficient	0.50993
PF Slope Coefficient	-1.25692	PF Power Coefficient	0.76644
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	53000	-	-	54.9

Vehicle Results

Average Speed, mi/h	54.9	Percent Followers, %	51.1
Segment Travel Time, minutes	10.97	Followers Density, followers/mi/ln	4.5
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	479	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.70	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	SEF: US 98 from County Rd 17 to Arbuckle Creek Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	53000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	584	Opposing Demand Flow Rate, veh/h	395
Peak Hour Factor	0.95	Total Trucks, %	9.40
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.6
Speed Slope Coefficient	3.47429	Speed Power Coefficient	0.49769
PF Slope Coefficient	-1.26995	PF Power Coefficient	0.76126
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	53000	-	-	54.2

Vehicle Results

Average Speed, mi/h	54.2	Percent Followers, %	57.0
Segment Travel Time, minutes	11.12	Followers Density, followers/mi/ln	6.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	584	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.19	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Bermont Rd from Hwy 17 to Strasse Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	14300
Measured FFS	Measured	Free-Flow Speed, mi/h	50.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	274	Opposing Demand Flow Rate, veh/h	237
Peak Hour Factor	0.95	Total Trucks, %	33.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	50.0
Speed Slope Coefficient	3.38437	Speed Power Coefficient	0.52952
PF Slope Coefficient	-1.25744	PF Power Coefficient	0.75385
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	14300	-	-	48.7

Vehicle Results

Average Speed, mi/h	48.7	Percent Followers, %	37.7
Segment Travel Time, minutes	3.34	Followers Density, followers/mi/ln	2.1
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	274	Bicycle Effective Width, ft	14
Bicycle LOS Score	22.26	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Bermont Rd from Hwy 17 to Strasse Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	14300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	284	Opposing Demand Flow Rate, veh/h	247
Peak Hour Factor	0.95	Total Trucks, %	32.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.8
Speed Slope Coefficient	3.38968	Speed Power Coefficient	0.52695
PF Slope Coefficient	-1.24404	PF Power Coefficient	0.77097
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	14300	-	-	54.4

Vehicle Results

Average Speed, mi/h	54.4	Percent Followers, %	37.6
Segment Travel Time, minutes	2.99	Followers Density, followers/mi/ln	2.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	284	Bicycle Effective Width, ft	14
Bicycle LOS Score	21.40	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Bermont Rd from Hwy 17 to Strasse Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	14300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	347	Opposing Demand Flow Rate, veh/h	305
Peak Hour Factor	0.95	Total Trucks, %	27.90
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.0
Speed Slope Coefficient	3.41606	Speed Power Coefficient	0.51412
PF Slope Coefficient	-1.25563	PF Power Coefficient	0.76709
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	14300	-	-	54.3

Vehicle Results

Average Speed, mi/h	54.3	Percent Followers, %	42.8
Segment Travel Time, minutes	2.99	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	347	Bicycle Effective Width, ft	14
Bicycle LOS Score	17.72	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Bermont Rd from Hwy 17 to Strasse Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	14300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	432	Opposing Demand Flow Rate, veh/h	374
Peak Hour Factor	0.95	Total Trucks, %	23.90
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.1
Speed Slope Coefficient	3.44255	Speed Power Coefficient	0.50125
PF Slope Coefficient	-1.26717	PF Power Coefficient	0.76309
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	14300	-	-	54.1

Vehicle Results

Average Speed, mi/h	54.1	Percent Followers, %	48.7
Segment Travel Time, minutes	3.00	Followers Density, followers/mi/ln	3.9
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	432	Bicycle Effective Width, ft	14
Bicycle LOS Score	14.90	Bicycle Effective Speed Factor	4.79
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Jones Loop Rd from Piper to Alfred Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	9500
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	45	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	153	Opposing Demand Flow Rate, veh/h	137
Peak Hour Factor	0.95	Total Trucks, %	5.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	45.8
Speed Slope Coefficient	2.79782	Speed Power Coefficient	0.55939
PF Slope Coefficient	-1.22759	PF Power Coefficient	0.75199
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	9500	-	-	45.3

Vehicle Results

Average Speed, mi/h	45.3	Percent Followers, %	25.8
Segment Travel Time, minutes	2.38	Followers Density, followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	153	Bicycle Effective Width, ft	18
Bicycle LOS Score	4.40	Bicycle Effective Speed Factor	4.42
Bicycle LOS	D		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Jones Loop Rd from Piper to Alfred Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	9500
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	45	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	158	Opposing Demand Flow Rate, veh/h	142
Peak Hour Factor	0.95	Total Trucks, %	5.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	45.8
Speed Slope Coefficient	2.80049	Speed Power Coefficient	0.55749
PF Slope Coefficient	-1.22947	PF Power Coefficient	0.75148
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	9500	-	-	45.2

Vehicle Results

Average Speed, mi/h	45.2	Percent Followers, %	26.4
Segment Travel Time, minutes	2.39	Followers Density, followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	158	Bicycle Effective Width, ft	18
Bicycle LOS Score	4.36	Bicycle Effective Speed Factor	4.42
Bicycle LOS	D		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Jones Loop Rd from Piper to Alfred Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	9500
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	45	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	195	Opposing Demand Flow Rate, veh/h	174
Peak Hour Factor	0.95	Total Trucks, %	4.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	45.8
Speed Slope Coefficient	2.81497	Speed Power Coefficient	0.54701
PF Slope Coefficient	-1.23991	PF Power Coefficient	0.74868
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	9500	-	-	45.1

Vehicle Results

Average Speed, mi/h	45.1	Percent Followers, %	30.5
Segment Travel Time, minutes	2.40	Followers Density, followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	195	Bicycle Effective Width, ft	14
Bicycle LOS Score	4.88	Bicycle Effective Speed Factor	4.42
Bicycle LOS	E		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Jones Loop Rd from Piper to Alfred Blvd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	9500
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	45	Access Point Density, pts/mi	10.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	242	Opposing Demand Flow Rate, veh/h	211
Peak Hour Factor	0.95	Total Trucks, %	4.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	45.9
Speed Slope Coefficient	2.83003	Speed Power Coefficient	0.53634
PF Slope Coefficient	-1.25066	PF Power Coefficient	0.74578
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	9500	-	-	44.9

Vehicle Results

Average Speed, mi/h	44.9	Percent Followers, %	35.2
Segment Travel Time, minutes	2.41	Followers Density, followers/mi/ln	1.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	242	Bicycle Effective Width, ft	14
Bicycle LOS Score	4.80	Bicycle Effective Speed Factor	4.42
Bicycle LOS	E		

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Piper Rd from US 17 to Jones Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	6.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	43.5		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	280	Heavy Vehicle Adjustment Factor (f_{HV})	0.952
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	155
Total Trucks, %	5.00	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.08

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.4
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	3.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	1.5		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	147	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.98
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Piper Rd from US 17 to Jones Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	6.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	43.5		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	290	Heavy Vehicle Adjustment Factor (f_{HV})	0.954
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	160
Total Trucks, %	4.80	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.09

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.4
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	3.8
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	1.5		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	153	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.95
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Piper Rd from US 17 to Jones Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	6.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	43.5		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	360	Heavy Vehicle Adjustment Factor (f_{HV})	0.960
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	198
Total Trucks, %	4.20	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.11

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.4
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	4.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	1.5		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	189	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.88
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: Piper Rd from US 17 to Jones Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	6.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	43.5		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	440	Heavy Vehicle Adjustment Factor (f_{HV})	0.965
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	240
Total Trucks, %	3.60	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.13

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.4
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	5.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	1.5		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	232	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.83
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: US 17 from I-75 to Washington Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	12.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	47.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	990	Heavy Vehicle Adjustment Factor (f_{HV})	0.873
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	597
Total Trucks, %	14.60	Capacity (c), pc/h/ln	1916
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1855
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	45.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	13.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	521	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	7.34
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: US 17 from I-75 to Washington Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	12.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	47.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1035	Heavy Vehicle Adjustment Factor (f_{HV})	0.876
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	622
Total Trucks, %	14.20	Capacity (c), pc/h/ln	1916
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1855
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	45.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	13.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	545	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	7.17
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: US 17 from I-75 to Washington Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	12.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	47.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1265	Heavy Vehicle Adjustment Factor (f_{HV})	0.891
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	747
Total Trucks, %	12.20	Capacity (c), pc/h/ln	1916
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1855
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	45.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	16.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	666	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	6.36
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	CCAA: US 17 from I-75 to Washington Loop Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	12.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	47.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1555	Heavy Vehicle Adjustment Factor (f_{HV})	0.906
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	904
Total Trucks, %	10.40	Capacity (c), pc/h/ln	1916
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1855
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.49

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	45.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	19.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	3.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	818	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	5.72
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	F

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Alico Road from I-75 to Study Area Edge	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	24000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	863	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.51

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	41.5
Speed Slope Coefficient	2.88644	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.47056	PF Power Coefficient	0.62754
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	16.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	24000	-	-	39.0

Vehicle Results

Average Speed, mi/h	39.0	Percent Followers, %	73.8
Segment Travel Time, minutes	7.00	Followers Density, followers/mi/ln	16.4
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	863	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.47	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Alico Road from I-75 to Study Area Edge	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	24000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	911	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	8.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.54

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	41.5
Speed Slope Coefficient	2.88644	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.47056	PF Power Coefficient	0.62754
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	17.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	24000	-	-	38.9

Vehicle Results

Average Speed, mi/h	38.9	Percent Followers, %	75.0
Segment Travel Time, minutes	7.01	Followers Density, followers/mi/ln	17.6
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	911	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.50	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Alico Road from I-75 to Study Area Edge	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	24000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1153	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.68

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	41.5
Speed Slope Coefficient	2.88698	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.47059	PF Power Coefficient	0.62753
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	23.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	24000	-	-	38.6

Vehicle Results

Average Speed, mi/h	38.6	Percent Followers, %	80.0
Segment Travel Time, minutes	7.07	Followers Density, followers/mi/ln	23.9
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	1153	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.53	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Alico Road from I-75 to Study Area Edge	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	24000
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1463	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.86

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	41.5
Speed Slope Coefficient	2.88734	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.47061	PF Power Coefficient	0.62753
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	32.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	24000	-	-	38.3

Vehicle Results

Average Speed, mi/h	38.3	Percent Followers, %	84.5
Segment Travel Time, minutes	7.13	Followers Density, followers/mi/ln	32.3
Vehicle LOS	E		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	1463	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.58	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Ben Hill Griffith Pkwy from Termional Access Rd to Alico Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	5.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	48.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	970	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	516
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1950
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1888
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	10.9
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	1.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	511	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.63
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Ben Hill Griffith Pkwy from Termional Access Rd to Alico Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	5.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	48.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1015	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	540
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1950
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1888
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.29

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	11.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	534	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.65
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Ben Hill Griffith Pkwy from Termional Access Rd to Alico Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	5.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	48.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1290	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	686
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1950
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1888
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.36

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	14.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	679	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.77
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Ben Hill Griffith Pkwy from Termional Access Rd to Alico Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	5.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	48.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1635	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	870
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1950
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1888
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	18.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	861	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.89
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Daniels Pkwy from Terminal Ave to SR 82	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1700	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	930
Total Trucks, %	4.00	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.49

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	19.5
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	895	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.62
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Daniels Pkwy from Terminal Ave to SR 82	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1785	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	976
Total Trucks, %	3.90	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	20.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	939	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.61
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Daniels Pkwy from Terminal Ave to SR 82	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	2260	Heavy Vehicle Adjustment Factor (f_{HV})	0.963
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1235
Total Trucks, %	3.80	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	25.8
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	1189	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.71
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Daniels Pkwy from Terminal Ave to SR 82	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	2865	Heavy Vehicle Adjustment Factor (f_{HV})	0.964
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1564
Total Trucks, %	3.70	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	46.4
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	33.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	D
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	1508	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.80
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Access from Terminal Access S to RSW Airport	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	1.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	44.8		

Direction 1 Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Driver Population SAF	0.950	Final Capacity Adjustment Factor (CAF)	0.939
Driver Population CAF	0.939		

Direction 1 Demand and Capacity

Volume(V) veh/h	1310	Heavy Vehicle Adjustment Factor (f_{HV})	0.953
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	724
Total Trucks, %	4.90	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1784
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	17.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	0.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	689	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.74
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Access from Terminal Access S to RSW Airport	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	1.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	44.8		

Direction 1 Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Driver Population SAF	0.950	Final Capacity Adjustment Factor (CAF)	0.939
Driver Population CAF	0.939		

Direction 1 Demand and Capacity

Volume(V) veh/h	1375	Heavy Vehicle Adjustment Factor (f_{HV})	0.953
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	760
Total Trucks, %	4.90	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1784
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	17.9
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	0.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	724	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.76
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Access from Terminal Access S to RSW Airport	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	1.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	44.8		

Direction 1 Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Driver Population SAF	0.950	Final Capacity Adjustment Factor (CAF)	0.939
Driver Population CAF	0.939		

Direction 1 Demand and Capacity

Volume(V) veh/h	1745	Heavy Vehicle Adjustment Factor (f_{HV})	0.954
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	962
Total Trucks, %	4.80	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1784
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	22.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	0.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	918	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.85
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Access from Terminal Access S to RSW Airport	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	1.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	44.8		

Direction 1 Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Driver Population SAF	0.950	Final Capacity Adjustment Factor (CAF)	0.939
Driver Population CAF	0.939		

Direction 1 Demand and Capacity

Volume(V) veh/h	2210	Heavy Vehicle Adjustment Factor (f_{HV})	0.956
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1216
Total Trucks, %	4.60	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1784
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	42.5
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	28.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	D
Access Point Density Adjustment (f_A)	0.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	1163	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.92
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Ave S from Daniels Pkwy to Terminal Access Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1130	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	602
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	12.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	595	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.71
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Ave S from Daniels Pkwy to Terminal Access Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1190	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	634
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	13.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	626	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.73
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Ave S from Daniels Pkwy to Terminal Access Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1505	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	801
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	16.8
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	792	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.85
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	RSW: Terminal Ave S from Daniels Pkwy to Terminal Access Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	50.0	Access Point Density, pts/mi	4.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	49.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1910	Heavy Vehicle Adjustment Factor (f_{HV})	0.989
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1016
Total Trucks, %	1.10	Capacity (c), pc/h/ln	1956
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1893
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	47.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	21.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	1.0		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	1005	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	2.97
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	C

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: 21st St NW from US 92 to SR 544	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	10300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	22.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	253	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	12.80
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	36.9
Speed Slope Coefficient	2.59955	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.39945	PF Power Coefficient	0.66028
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10300	-	-	35.7

Vehicle Results

Average Speed, mi/h	35.7	Percent Followers, %	43.1
Segment Travel Time, minutes	3.28	Followers Density, followers/mi/ln	3.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	253	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.55	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: 21st St NW from US 92 to SR 544	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	10300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	22.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	263	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	12.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	36.9
Speed Slope Coefficient	2.60063	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.39956	PF Power Coefficient	0.66028
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10300	-	-	35.7

Vehicle Results

Average Speed, mi/h	35.7	Percent Followers, %	44.0
Segment Travel Time, minutes	3.28	Followers Density, followers/mi/ln	3.2
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	263	Bicycle Effective Width, ft	14
Bicycle LOS Score	7.33	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: 21st St NW from US 92 to SR 544	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	10300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	22.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	353	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	9.70
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	37.0
Speed Slope Coefficient	2.60514	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.40003	PF Power Coefficient	0.66030
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10300	-	-	35.5

Vehicle Results

Average Speed, mi/h	35.5	Percent Followers, %	50.5
Segment Travel Time, minutes	3.30	Followers Density, followers/mi/ln	5.0
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	353	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.55	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	TranSysems - PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: 21st St NW from US 92 to SR 544	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	10300
Lane Width, ft	12	Shoulder Width, ft	2
Speed Limit, mi/h	40	Access Point Density, pts/mi	22.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	468	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.95	Total Trucks, %	7.70
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	37.0
Speed Slope Coefficient	2.60875	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.40040	PF Power Coefficient	0.66031
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10300	-	-	35.3

Vehicle Results

Average Speed, mi/h	35.3	Percent Followers, %	57.2
Segment Travel Time, minutes	3.31	Followers Density, followers/mi/ln	7.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	468	Bicycle Effective Width, ft	14
Bicycle LOS Score	6.04	Bicycle Effective Speed Factor	4.17
Bicycle LOS	F		

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: SR 544 from Magnolia Dr to Lake Alfred Dr	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	-
Lane Width, ft	-	Left-Side Lateral Clearance (LC_R), ft	-
Median Type	-	Total Lateral Clearance (TLC), ft	-
Free-Flow Speed (FFS), mi/h	45.0		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1400	Heavy Vehicle Adjustment Factor (f_{HV})	0.939
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	523
Total Trucks, %	6.50	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.28

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.9
Total Lateral Clearance Adj. (f_{LLC})	-	Density (D), pc/mi/ln	11.9
Median Type Adjustment (f_M)	-	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	-		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	491	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	4.05
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: SR 544 from Magnolia Dr to Lake Alfred Dr	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	25.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	38.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1480	Heavy Vehicle Adjustment Factor (f_{HV})	0.942
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	551
Total Trucks, %	6.20	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	37.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	14.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	6.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	519	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.99
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: SR 544 from Magnolia Dr to Lake Alfred Dr	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	25.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	38.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1970	Heavy Vehicle Adjustment Factor (f_{HV})	0.953
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	725
Total Trucks, %	4.90	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.39

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	37.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	19.2
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	6.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	691	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.74
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: SR 544 from Magnolia Dr to Lake Alfred Dr	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	25.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	38.8		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	2625	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	957
Total Trucks, %	3.90	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	37.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	25.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	6.3		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	921	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	3.60
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2018
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: US 92 from Magnolia Dr to Lake Alfred Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	15.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	41.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	810	Heavy Vehicle Adjustment Factor (f_{HV})	0.912
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	468
Total Trucks, %	9.70	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	40.2
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	11.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	426	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	5.11
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	E

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2020
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: US 92 from Magnolia Dr to Lake Alfred Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	15.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	41.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	860	Heavy Vehicle Adjustment Factor (f_{HV})	0.915
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	494
Total Trucks, %	9.30	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	40.2
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	12.3
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	453	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	4.99
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	E

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2030
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: US 92 from Magnolia Dr to Lake Alfred Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	15.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	41.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1140	Heavy Vehicle Adjustment Factor (f_{HV})	0.931
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	644
Total Trucks, %	7.40	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.35

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	40.2
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	16.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	B
Access Point Density Adjustment (f_A)	3.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	600	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	4.45
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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HCS7 Multilane Highway Report

Project Information

Analyst	TranSystems PS	Date	4/7/2020
Agency	FDOT	Analysis Year	2040
Jurisdiction	D5	Time Period Analyzed	Peak
Project Description	GIF: US 92 from Magnolia Dr to Lake Alfred Rd	Unit	United States Customary

Direction 1 Geometric Data

Direction 1	N		
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Access Point Density, pts/mi	15.0
Lane Width, ft	12	Left-Side Lateral Clearance (LC_R), ft	6
Median Type	Divided	Total Lateral Clearance (TLC), ft	12
Free-Flow Speed (FFS), mi/h	41.3		

Direction 1 Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity

Volume(V) veh/h	1525	Heavy Vehicle Adjustment Factor (f_{HV})	0.945
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	850
Total Trucks, %	5.80	Capacity (c), pc/h/ln	1900
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1839
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46

Direction 1 Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	40.2
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	21.1
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	C
Access Point Density Adjustment (f_A)	3.8		

Direction 1 Bicycle LOS

Flow Rate in Outside Lane (v_{OL}),veh/h	803	Effective Speed Factor (S_t)	4.62
Effective Width of Volume (W_v), ft	18	Bicyle LOS Score (BLOS)	4.08
Average Effective Width (W_e), ft	24	Bicycle Level of Service (LOS)	D

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