
# 2021 Airport Master Plan Update

## Orlando Sanford International Airport

## Volume I: Airport Master Plan

*Sanford Airport Authority*


COMPLETED FALL 2021

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This document has 444 pages including the cover.

## Document history

Document title: Airport Master Plan Update

Document reference: 1.0

| Revision | Purpose description | Originated | Checked | Reviewed | Authorized | Date |
|---|---|---|---|---|---|---|
| 1.0 | SFB AMPU Final | CMH | JDH | GF | TR | 10/29/2021 |
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## Client signoff

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|---|---|
| Client | Sanford Airport Authority (SAA) |
| Project | Orlando Sanford International Airport |
| Job number | 100063290 |
| Client signature/date | |

# Orlando Sanford International Airport
# Airport Master Plan Update
# Fall 2021

1200 Red Cleveland Blvd.,
Sanford, FL 32773
(407) 585-4000
Flysfb.com

482 S. Keller Rd.,
Orlando, FL 32810
(407) 647-7275
Atkinsglobal.com

P.O Box 621
Georgetown, KY 40324
(502) 535-6570
Rawiedemann.com

5555 E Michigan Street
Orlando, FL 32822
(407)-599-1122
Avconinc.com

121 Pearl St.
Ypsilanti, MI 48197
(734) 961-3200
Jacobsendaniels.com

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Sarah Hayes

Phillip Hocking

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Travis Bird

### Jacobsen Daniels

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Matt Johnson

**Managing Consultant**

Andrew Blaisdell

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# Executive Summary

The purpose for updating the Orlando Sanford International Airport (SFB or Airport) Airport Master Plan (AMP) is to describe the Airport's short-, medium-, and long-term plans to meet the future demand in a safe, efficient, economical, and environmentally responsible and sustainable manner. The AMP assists in ensuring the Airport meets the goals, objectives, and mission of the Sanford Airport Authority (SAA), the surrounding community, and the national aviation system (NAS).

This executive summary provides a condensed summary of findings of the comprehensive master planning process that was completed in late-2021. Where appropriate, this summary references locations within the AMP where more detailed information can be found.

## Inventory of Existing Conditions

To develop a robust and responsible plan, the existing conditions should be clearly and entirely identified. The existing conditions of the airport infrastructure is the basis for then identifying what is needed to meet current and future demands. Chapter 2, **Inventory of Existing Conditions**.

, provides details about the existing conditions of the Airport. A thorough inventory was conducted that catalogued information regarding the airfield infrastructure, commercial passenger facilities, general aviation facilities, support facilities, airspace environment, and the environment on and around the Airport. This information was utilized to identify any and all deficiencies that may require updates in the future.

The Airport consists of four runways, with three east-west oriented runways varying in size, and one north-south oriented runway intersecting the other three. The primary runway, Runway 9L/27R, is mainly utilized for commercial service aircraft and similarly large aircraft. The remaining east-west runways are primarily accommodating general aviation traffic based on their existing configurations. The one north-south runway, Runway 18/36, is utilized for operations when local winds necessitate as such or local airspace environments constitute a north-south approach/departure. An expansive taxiway system connects the four runways to airside locations around the Airport, including the commercial service terminal building, the South East Ramp general aviation area, and the general aviation facilities on the western portion of the airport property. The commercial service terminal has 16 gates and is capable of accommodating both domestic and international operations. Various landside parking facilities are available for individuals utilizing the commercial service terminal, with an existing parking garage and multiple surface lots. The Airport has a large general aviation presence, with existing flight school operators such as the L3 Airline Academy and PropellerHead Aviation, and other private operators which utilize the conventional hangars and office buildings throughout the airport. The Fixed Based Operator (FBO), MillionAir, is located to the west of the commercial service terminal and handles a majority of the itinerant general aviation traffic.

## Aviation Demand Forecasts

The forecast of aviation demand is a key component of the AMP as it provides an understanding of the future demand that can be used to identify future facility needs. Chapter 3, **Aviation Demand Forecasts.**

, provides a detailed analysis of several forecast methodologies that were utilized in the development of the airports preferred forecast. Aviation demand forecasts are reviewed and approved by the Federal Aviation Administration (FAA). FAA approval of the forecast was received on March 24$^{th}$, 2020. This approval is required to ensure the presented forecasts are realistic, based on thorough analyses, data driven, and supported by information provided in the AMP and overall industry trends. At the time that the forecast approval was received, the onset of the COVID-19 pandemic was commencing, which would go on to drastically impact the global aviation market. Discussions between the Consultants, Airport, and FAA were held to determine if an update to the forecast was necessary. It was subsequently decided that no update would occur and the approved forecast would stand. This AMP has a base year of 2017 and provides a 20-year forecast of activity from 2018 to 2037. The forecast includes projections of passenger enplanements, based aircraft, and aircraft operations. Aircraft operations were categorized further with separate forecasts being produced for air carrier, air cargo, general aviation (GA), and air taxi/commuter. A forecast of military operations was obtained from the FAA Terminal Area Forecast (TAF) and incorporated into the overall aircraft operations forecast.

The Airport's market area socioeconomic trends were analyzed to identify potential indicators in key data sets such as growth of the Gross Domestic Product (GDP), population, and employment. Each of the local socioeconomic categories analyzed demonstrated a higher compound annual growth rate (CAGR) throughout the planning period when compared to the Florida CAGR and that of the United States. Additionally, the Airport's market area tourism and visitor industry was incorporated into the analysis to highlight central Florida's heightened market impact from domestic and international tourism.

The forecast of passenger enplanements serves as a basis to define airside, commercial terminal, and landside facility needs. Three methodologies were employed to produce passenger enplanement forecasts for analysis, including trend-line, regression, and market-share analysis. The preferred enplanement forecast was selected to be a composite forecast based on the average of the 10-year trend-line and market-share analysis forecasts. The regression analysis was excluded due to low correlations, deeming it unreliable. This composite forecast provides the long-term growth rate of passenger enplanements at 3.3 percent from the base year through the end of the planning period. However, based on discussions with the Sanford Airport Authority (SAA), it was determined that passenger enplanements will grow at a higher rate in the short-term, then slow in the medium- and long-term. Therefore, a 5.0 percent growth rate was applied from the base year through 2020, while a 3.0 percent growth rate was applied from 2020 to 2037. These differing growth rates culminate to a 3.3 percent growth rate throughout the planning period as previously stated. **Table 1-1** summarizes the preferred passenger enplanement forecast

**Table 1-1 – Preferred Passenger Enplanement Forecast Summary**

| Year | Domestic | International | Total |
|---|---|---|---|
| 2017 (Base Year) | 1,283,646 | 152,578 | 1,436,224 |
| 2022 (Base Year + 5) | 1,576,429 | 187,379 | 1,763,808 |
| 2027 (Base Year + 10) | 1,827,374 | 217,207 | 2,044,581 |
| 2037 (Base Year + 20) | 2,455,462 | 291,863 | 2,747,325 |

Source: FAA Terminal Area Forecast dated February 2019, SAA records, analysis by Jacobsen|Daniels, 2019

The forecast of based aircraft is directly related to the GA activity levels. A projection of based aircraft is essential for the proper planning of future airside and landside infrastructure, such as aircraft parking aprons and the number of storage hangars. Like the passenger enplanement forecasts, the based aircraft forecast methodologies included a trend-line, regression, and market-share analysis. The preferred based aircraft forecast selected is a composite based on the trend-line and market-share analysis. The regression analysis was excluded due to low correlations, deeming it unreliable. This composite forecast provides a long-term growth rate for based aircraft at 1.8 percent through the end of the planning period. A based aircraft fleet mix was established to identify the specific growth of each aircraft type more accurately. **Table 1-2** outlines the fleet mix by percentage of distribution between each aircraft type. **Table 1-3** summarizes the preferred based aircraft forecast.

**Table 1-2 - Based Aircraft Fleet Mix Distribution**

| Aircraft Type | Percent of Fleet Distribution |
|---|---|
| Single-Engine | 63.8% |
| Multi-Engine | 13.5% |
| Turboprop | 4.0% |
| Helicopter | 1.7% |
| Jet | 17.0% |

Source: FAA Terminal Area Forecast dated February 2019, SAA records; analysis by Jacobsen|Daniels, 2019

**Table 1-3 - Preferred Based Aircraft Forecast Summary**

| Year | Total |
|---|---|
| 2017 (Base Year) | 350 |
| 2022 (Base Year + 5) | 382 |
| 2027 (Base Year + 10) | 417 |
| 2037 (Base Year + 20) | 498 |

Source: FAA Terminal Area Forecast dated February 2019, SAA records, and analysis by Jacobsen|Daniels, 2019.

As previously mentioned, the aircraft operations forecast was split by the type of operation. The categories of operations forecast include air carrier, air cargo, air taxi/commuter, and GA.

The air carrier operations forecast was based on the preferred enplanement passenger forecast combined with historical and anticipated trends in load factors along with average aircraft seats-per-departure. The established air carrier growth rate is aligned with the established passenger enplanements preferred growth rate. Directly related to the air carrier operations forecast is the air cargo forecast. Air cargo at SFB has historically been exclusive to “belly” cargo transported in the main cargo hold of commercial airline aircraft. The air cargo forecast was developed by forecasting the historic levels of cargo carried per commercial airline operation and identifying a trend that could be applied to future cargo levels per operation. The level of air cargo tonnage was then applied to the air carrier operations forecast to generate the air cargo forecast.

The forecasting of GA and air taxi/commuter operations were combined into a single section. This combination of operations is primarily due to a shift in the reporting of GA and air taxi/commuter operations in the recent past for the airports largest GA tenant, L3 Airline Academy. Four forecasting methodologies were utilized to produce four GA and air taxi/commuter forecasts, including a trend-line, regression, market-share, and operations-per-based-aircraft analysis. The preferred GA and air taxi/commuter forecast selected is a composite of the average of the operations-per-based-aircraft, 5-year trend-line, and market-share analysis. This composite forecast provides a long-term CAGR of 1.0 percent through the end of the planning period. The preferred forecast was then split into GA and air taxi/commuter operations based on the percentage mix outlined in the 2018 FAA TAF, providing a separate forecast for each category of operation.

Military operations are typically not forecasted due to the sporadic nature of such operations. The 2018 FAA TAF forecast retained the total military operations constant. Therefore, the AMP forecast of military operations has aligned with this and will keep military operations at a constant (0.0 percent growth rate) 191 operations throughout the planning period.

**Table 1-4** summarizes the preferred aircraft operations forecast.

**Table 1-4 - Preferred Aircraft Operations Forecast Summary**

| Year | Air Carrier | General Aviation | Air Taxi & Commuter | Military | Total |
|---|---|---|---|---|---|
| 2017 (Base Year) | 19,760 | 196,592 | 86,500 | 192 | 303,044 |
| 2022 (Base Year + 5) | 23,470 | 233,801 | 102,872 | 191 | 360,334 |
| 2027 (Base Year + 10) | 27,206 | 235,808 | 103,755 | 191 | 366,960 |
| 2037 (Base Year + 20) | 36,558 | 239,874 | 105,544 | 191 | 382,167 |

Source: Analysis by Jacobsen|Daniels, 2019

## Demand Capacity and Facility Requirements

Following the documentation of the Airport’s existing conditions and the formulation and FAA approval of a realistic and thorough forecast, a determination of facility requirements which are necessary to accommodate the anticipated demand throughout the 20-year planning period is established. Chapter 4,

**Demand Capacity and** Facility Requirements, defines those facilities that are necessary to meet the anticipated demand. Established facility requirements are based on specific levels of based aircraft and operations, and meeting these established levels are necessary to justify such facilities. While forecasts of activity are thoroughly vetted and ultimately approved by the FAA, a forecast is subject to inaccuracies due to unknown and unforeseeable influences. Therefore, Planning Activity Levels (PALs) were established for commercial service terminal requirements, roadway/landside facility requirements, and general aviation facility requirements. PALs are associated with specific activity levels established within the forecast which, when achieved, would indicate thresholds where proposed facility improvements or development are necessary. Some airfield facility requirements are not associated with the established PAL thresholds, as some are required for safety or standards mitigation.

The following sections outline the design criteria and facility requirements that were established as part of the AMP process. Further analysis and details can be found in Chapter 4, **Demand Capacity and Facility Requirements**, of this report.

## Demand and Capacity Analysis

There are three primary metrics that describe the capacity of the Airport in simple terms. Those metrics include Hourly Visual Flight Rules (VFR) Capacity, Hourly Instrument Flight Rules (IFR) Capacity, and Annual Service Volume (ASV). ASV is a measure of the number of annual operations that can occur at the airport without incurring delay, also referred to as annual capacity. Calculating the capacity metrics is completed using the throughput method outlined in FAA AC 150-5060-5, *Airport Capacity and Delay*. Several parameters are considered when calculating the VFR and IFR Hourly Capacity, such as Instrument Approach Procedures (IAP), and the amount of time the airport handles VFR operations compared to IFR operations. ASV is calculated based on the existing runway configuration, aircraft fleet mix, and the parameters and assumptions identified within the chapter, and incorporates the hourly VFR and IFR capacities previously calculated.

Based on the calculations, the VFR Hourly Capacity at SFB was calculated to be 353 operations per hour in the east-west operational configuration, and 121 operations per hour in the north-south operational configuration. The IFR Hourly Capacity calculations use many of the same assumptions as the VFR Hourly Capacity Calculations. However, IFR Hourly Capacity calculations utilize a different set of formulas due to the lower visibility associated with IFR operations. The IFR Hourly Capacity at the Airport is 118 operations per hour in the east-west operational configuration and 60 operations per hour in the north-south operational configuration. This lower number of operations is primarily because of the greater aircraft separation requirements and the instrument approach capabilities of the Airport.

ASV is utilized as a guide in determining when airport development should occur in order to meet the growing demand. FAA Order 5090.5, Formulation of the NPIAS and ACIP, states that planning for capacity enhancing projects such as runway enhancements and other airfield reconfigurations should begin once the airports demand reaches 60 percent of the ASV. Development should begin once the airports demand reaches 80 percent of the ASV, or within 5-years of that point. Based on the FAA approved forecast, the ASV at SFB was calculated to be 451,619, with current operations at approximately 356,212 (as of 2019), or 79 percent of the ASV.

**Table 1-5 - Annual Service Volume**

| Year | ASV | Total Annual Operations | % of ASV |
|---|---|---|---|
| Actual[1] (2019) | 451,619 | 356,212 | 79% |
| +5 Years (2022) | | 360,334 | 80% |
| +10 Years (2027) | | 366,960 | 81% |
| +20 Years (2037) | | 382,167 | 85% |

Source: AC 150/5060-5, Airport Capacity and Delay; FAA TFMSC; Jacobsen Daniels June 2020

Note: [1]Total 2019 forecast demand derived from the forecast

## Critical Aircraft and Airport Reference Code

Determination of the critical aircrafts, and associated Runway Design Codes (RDCs) and Taxiway Design Groups (TDG), is a critical step in the AMP process and has significant influence on the overall development depicted in the preferred development alternative. The established critical aircrafts determine the design criteria for which the airport will be developed, including runway lengths, taxiway configurations and geometry, and the areas necessary for the protection of aircraft operations, passengers, and the neighboring community.

The FAA defines the critical aircraft as "…the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport." Regular use as defined by the FAA is having 500 annual operations or more, including local and itinerant operations, excluding touch-and-go operations. An operation is considered either a takeoff or landing. Further, an airport can have multiple critical aircrafts depending on the number of runways, differing operational usage across the airport, and the overall layout of the airport facilities.

Due to SFB having multiple runways with varying operational usage, there have been three established existing critical aircrafts and three established future critical aircraft across the four runways. The critical aircrafts at SFB were determined by utilizing FAA Traffic Flow Management System Counts (TFMSC) data, ATCT reporting, and other available operational statistics. Based on analyzed historical flight activity, it was established that the existing and future critical aircraft for the primary runway (Runway 9L/27R) is the Boeing 787-8. Boeing 787-8 operations are limited to the primary runway due to the insufficient length of the other three runways. Runway 18/36 has an existing critical aircraft, of a Boeing 767-200. However, this aircraft has a restriction on load factors due to the runway length. The future critical aircraft for Runway 18/36 is established as the Airbus A320 Family. Runway 9R/27L is currently utilized primarily for touch-and-go training operations and to serve aircraft based at the southeast ramp. The King Air 200 is established as the existing critical aircraft for Runway 9R/27L. It is recommended that this runway be upgraded to accommodate commercial service aircraft to serve as a back-up runway and to address future demand constraints. Aligned with this recommendation, the established critical aircraft for Runway 9R/27L is the Airbus A320 Family. Runway 9C/27C is limited to small aircraft with a B-II RDC and TDG 2, such as a Beechcraft King Air 200. Based on the aviation demand forecasts, the critical aircraft for Runway 9C/27C is not anticipated to change within the planning period. **Table 1-6** summarizes the existing and future critical aircraft, along with their associated RDCs and TDGs, for SFB's four runways

**Table 1-6 - Critical Aircrafts Summary**

| Runway | Existing Critical Aircraft | Runway Design Code (RDC) / Taxiway Design Group (TDG) | Future Critical Aircraft | Runway Design Code (RDC) / Taxiway Design Group (TDG) |
|---|---|---|---|---|
| Runway 9L/27R | Boeing 787-8 | D-V / 5 | Boeing 787-8 | D-V / 5 |
| Runway 18/36 | Boeing 767-200 | D-IV / 5 | Airbus A320 Family | C-III / 3 |
| Runway 9R/27L | King Air 200 | B-II / 2 | Airbus A320 Family | C-III / 3 |
| Runway 9C/27C | King Air 200 | B-II / 2 | King Air 200 | B-II / 2 |

Source: FAA, Traffic Flow Management System Counts (TFMSC), 2019 FAA AC 150/5300-13A

## Runway Requirements

Runway requirements were analyzed to ensure that future operations could be accommodated. These primary requirements include the runway lengths, widths, designations, and pavement conditions. The established critical aircraft for each runway dictates the requirements for future development.

Runway length analyses are conducted in accordance with FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. The typical performance factor for determining runway length is associated with the critical aircraft's takeoff distance, as this is typically the more demanding operation compared to landing. **Table 1-7** summarizes the future runway length requirements based on these analyses.

**Table 1-7 – Future Runway Length Requirements Summary**

| Runway | Existing Runway Length (Feet) | Runway Length Required (Feet) | Extension Recommended (Feet) |
|---|---|---|---|
| Runway 9L/27R | 11,002 | 10,000 | N/A |
| Runway 18/36 | 6,002 | 7,200 | 1,198 |
| Runway 9R/27L | 5,839 | 7,200 | 1,361 |
| Runway 9C/27C | 3,578 | 4,200 | 622 |

Source: Airplane Characteristics for Airport Planning, D6-58333, Figure 3.3.1, Airbus A320 Aircraft Characteristics – Airport and Maintenance Planning Manual, Figure 3-3-1-991-005-A01, Atkins Analysis 2020

Runway width requirements are determined using FAA AC 150/5300-13A, *Airport Design*, and the future RDC. **Table 1-8** summarizes the future runway width requirements.

**Table 1-8 – Future Runway Width Requirements Summary**

| Runway | Existing Runway Width (Feet) | Runway Width Required (Feet) | Widening Recommended (Feet) |
|---|---|---|---|
| Runway 9L/27R | 150 | 150 | N/A |
| Runway 18/36 | 150 | 150 | N/A |
| Runway 9R/27L | 75 | 150 | 75 |
| Runway 9C/27C | 75 | 75 | N/A |

Source: FAA AC 150/5300-13A, *Airport Design*. Atkins 2020

## Taxiway Requirements

In 2012, the FAA introduced new design standards with respect to taxiways. The Taxiway Design Group (TDG) was developed which identified the taxiway design standards, specifically for fillets, that are applicable based on a critical aircraft type analysis. Additionally, new standards were introduced which dictate overall taxiway geometry that are intended to decrease potential incursions, incidents, or complex layouts. These changes have had a significant impact on the airport design and several taxiway system geometry updates have been identified at airports nationwide. Improvements are not required to be commenced immediately, however as airports conduct development projects which impact the taxiway systems, the updates and reconfigurations should be included as part of that development.

Based on the evaluation of the approved critical aircraft, the existing and future critical design aircraft were identified to have a TDG of 5. However, not all areas of the airport are utilized similarly, and consideration for the types of uses throughout the airport should be made. Taxiways/taxilanes should be designed to facilitate separation for the most demanding ADG/TDG that utilizes each area of an airport.

The TDG of the critical aircraft dictates the taxiway requirements, as outlined in FAA AC 150/5300-13A, *Airport Design*. Taxiway M and Taxiway P have been identified as existing taxiways that do not meet current or future design standards based on the parameters of the specific critical aircraft of the runway they serve. Both Taxiways have non-standard fillet geometry per TDG 2 standards (as associated with the Runway 9C/27C critical aircraft, the King Air 200). Furthermore, Taxiway P has a non-standard compass calibration pad located within the connector that is recommended for relocation.

## Inadvisable Airfield Geometry

Inadvisable airfield geometry includes pavement that is non-compliant with current design and geometric standards and areas that are prone to high activity that could potentially lead to pilot confusion incursions, or accidents. These areas can include runways, taxiways, aprons, and intersections. Updates to alleviate inadvisable geometry should be made as development projects are completed that touch upon these specific pavement areas.

The following areas have been identified as having inadvisable geometry:

- Taxiway P provides direct access from Runway 9C/27C onto the Terminal Apron;
- Taxiway B2 provides direct access from Runway 9L/27R into an apron area;
- Taxiway L (north of Runway 9L/27R) provides direct access from Runway 9L/27R into an apron area;
- Taxiway A3 provides direct access from Runway 9L/27R into an apron area;
- Taxiway S3 provides direct access from Runway 9R/27L onto the South East Ramp;
- Taxiway S4 provides direct access from Runway 9R/27L onto the General Administration Services Apron;
- The eastern portion of Taxiway C is aligned with Runway 9C/27C;
- Taxiway K1 is aligned with Runway 9C/27C; and,
- The FAA has identified the area between the Runway 9C approach holding positions on Taxiway K as Hot Spot-1 (HS1). The holding position markings and signage in this area are intended to ensure that aircraft operators do not enter the Runway 9C approach environment when the runway is actively being used. HS1 was identified due to the area's a-typical and complex layout which creates a higher potential for runway incursions.

## Commercial Service Terminal Requirements

Commercial service terminal requirements were analyzed utilizing the established PALs and their associated operational levels. The utilized methodology and planning best practices include the application of industry standards and logical assumptions, along with focusing on framework created outlining codes and regulations. These frameworks include FAA advisory circulars, Airport Cooperative Research Program (ACRP) guidebooks, and International Air Transportation (IATA) reference manuals. The following major functional areas were analyzed as part of this section:

- Aircraft Gates
- Ticketing/Check-In Areas
- TSA Passenger Screening and FIS
- Baggage Handling
- Hold Rooms
- Concessions
- Terminal Services

### Aircraft Gate Requirements

Aircraft gate requirements were analyzed on the basis of applying an average daily turn per gate, and then comparing this factor to the future PAL activity level derived from the forecast. Utilizing this methodology, it was found that out of the existing 16 gates (with one gate only able to accommodate a regional jet in its current configuration), the required PAL 4 gate requirements increase the need to 19 as outlined in **Table 1-9**.

**Table 1-9 - Aircraft Gate Requirements Summary**

| Existing Gates[1] | PAL 4 Gate Requirements | PAL 4 Gate Deficiency |
|---|---|---|
| 16 | 19 | (3) |

Note: 1- Existing 16 gates, however 1 gate limited to regional jet aircraft – requirement assumes Gate 16 can be upgraded for A320 series

Source: Jacobsen Daniels, 2020

### Ticketing/Check-In Area Requirements

The ticketing/check-in area includes the ticketing counters, ticketing kiosks, passenger queuing areas and passenger circulation. Various assumptions were established centered around departing passenger behavior and the utilization of specific ticketing/check in infrastructure. Additionally, further assumptions were made regarding the square-foot space requirements centered around a single piece of counter position, kiosks, and circulation. **Table 1-10** summarizes the ticketing/check-in area requirements.

**Table 1-10 - Ticketing/Check-In Area Requirements**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Check-in Counter & Bag Drop Positions (#)[1] | 45 | 35 | 41 | 48 | 57 | 66 | (21) |
| Kiosks (#)[1,3] | 0 | 11 | 13 | 15 | 18 | 21 | (21) |
| Curbside Positions (#)[1] | 2 | 4 | 5 | 6 | 6 | 7 | (5) |
| Total Check-in (SF)[2] | 11,648 | 15,592 | 18,292 | 21,352 | 25,402 | 29,452 | (17,804) |

Notes:

1/ Positions based on following assumptions for departing passenger activity: 25 percent bypassing counters; 50 percent check-in counters; 20 percent kiosks; and 5 percent curbside
2/ Total square foot (SF) required – The check-in counter area assumes 60 SF per counter position. The check-in queue area assumes a 22-foot deep queue in front of the check-in counters.
3/ Each kiosk will require a 22 square-foot area and 250 square feet of circulation area

Source: Jacobsen Daniels and WJD Planning, July 2020

### TSA Passenger Screening and FIS Requirements

The Transportation Security Administration (TSA), which performs passenger security screening, maintains guidelines for the layout of required screening space, equipment, and the checkpoint areas in the TSA's Checkpoint Design Guide (CDG). There are currently eight standard passenger screening lanes at SFB. To identify the existing and future space requirements, it was assumed that 80 percent of passengers will use standard lanes (150 passengers per lane per hour), with the remaining 20 percent utilizing pre-check lanes (240 passengers per lane per hour). Based on these assumed metrics compared to the PAL levels, seven lanes are adequate for the baseline forecast while an additional four lanes will be required by PAL 4. The existing Federal Inspection Services (FIS) space, utilized for international arrivals, has been determined to be adequate throughout the planning period, however it does not currently meet United States Customs and Border Protection (CBP) standard requirements.

**Table 1-11 - TSA Passenger Screening and FIS Requirements Summary**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Standard Lanes (#) | | 6 | 7 | 8 | 9 | 10 | |
| Precheck Lanes (#) | | 1 | 2 | 2 | 2 | 2 | |
| Total Lanes (#) | 8 | 7 | 9 | 10 | 11 | 12 | (4) |
| Queue Area (SF) | 4,714 | 4,200 | 5,400 | 6,000 | 6,600 | 7,200 | (2,486) |
| Total SSCP (SF) | 15,802 | 10,500 | 13,500 | 15,000 | 16,500 | 18,000 | (2,198) |
| TSA Administration[1] (SF) | 1,537 | 3,888 | 3,888 | 3,888 | 3,888 | 3,888 | (2,351) |
| Total TSA (SF) | 17,339 | 14,388 | 17,388 | 18,888 | 20,388 | 21,888 | (4,549) |
| FIS[2] | 46,680 | 24,425 | 24,425 | 24,425 | 24,425 | 24,425 | 22,255 |

Notes:

1/ TSA Administration requirements based on previous discussion with TSA and held constant

2/ FIS required space is based on 900 peak hour international arriving passenger, CBP standards and requirements specific to SFB

FIS requirements are based on analysis completed by CPH and vetted with CBP.

FIS existing space does not include the two international baggage carousels that are accounted for in the baggage handling table.

*Queue area is not included in total TSA area.

Source: Jacobsen Daniels and WJD Planning, June 2020

### Baggage Facility Requirements

Baggage handling facilities include outbound baggage makeup areas, TSA baggage screening, inbound baggage facilities, and baggage claim areas. Similar to previous sections, various assumptions have been established to calculate the facility and space requirements for these baggage handling facilities. **Table 1-12** summarizes the baggage handling facility requirements.

**Table 1-12 - Baggage Handling Facility Requirements Summary**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Outbound Baggage Area (SF) | 28,679 | 21,600 | 25,200 | 25,200 | 25,200 | 28,800 | (121) |
| EDS Machine (#) | 6 | 4 | 5 | 5 | 7 | 8 | (2)* |
| Baggage Screening Area (SF) | 5,195 | 2,040 | 2,190 | 2,190 | 2,490 | 2,640 | 2,555 |
| Inbound Baggage (SF) | 31,313 | 5,625 | 9,375 | 11,250 | 11,250 | 15,000 | 16,313 |
| Baggage Claim Carousels (#) | 8** | 3 | 5 | 6 | 6 | 8 | 0 |
| Baggage Claim (SF) | 58,629 | 34,703 | 37,705 | 45,246 | 45,246 | 60,328 | (1,699) |

Note: * Deficiency dependent on Explosives Detection System (EDS) machine baggage screening rate. Rates can be as high as 1,000 bags per hour per machine.

**Includes baggage claim for CBP international arrivals which was removed from FIS Square footage.

Source: Jacobsen Daniels, June 2020

### Terminal Service Requirements

Terminal service facilities include public restrooms, offices, meet-and-greet areas, rental car counters, and are all located within the interior of the terminal. Various assumptions have been established to calculate terminal service facilities. Out of the various interior terminal service facilities, it was found that the only deficiency through the planning period to PAL 4 is in restroom facilities. **Table 1-13** summarizes the terminal service requirements.

**Table 1-13 - Terminal Service Requirements Summary**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Passenger Services and meet-and-greet (SF) | 16,688 | 7,467 | 9,893 | 11,424 | 13,183 | 15,236 | 1,452 |
| Restroom (SF) | 13,474 | 22,000 | 23,500 | 23,500 | 23,500 | 23,500 | (10,026) |
| Offices (SF) | 48,793 | 38,210 | 38,210 | 38,210 | 38,210 | 38,210 | 10,583 |

Source: Jacobsen Daniels, June 2020

## General Aviation Facility Requirements

General Aviation (GA) services serve a critical role in ensuring a safe and efficient operational environment. Proper planning of GA facilities will ensure that demand is met as needed, reducing the overall impact on other critical activity at the airport. The primary elements covered within the GA facility requirements analyses include:

- Aircraft storage hangars;
- Aircraft parking aprons; and,
- GA terminal space (FBOs).

GA facility requirements are measured based on PALs that are directly tie to forecast data related to general aviation activity. This data includes based aircraft, GA operations and peak hour operations, and air taxi/commuter operations and peak hour operations.

**Table 1-14 - General Aviation Facility Requirements Summary**

| GA Facility | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| GA Terminal (Square Foot) | 1,075 | (13) | (88) | (125) | (200) |
| T-Hangars (Unit) | (17) | (32) | (48) | (67) | (87) |
| Conventional Hangars (Square Foot) | 63,613 | 41,733 | 9,433 | (11,997) | (55,747) |
| GA Based Aircraft Apron (Square Yard) | 5,434 | 1,867 | (1,728) | (5,955) | (10,314) |
| GA Itinerant Apron (Square Yard) | (12,508) | (16,162) | (16,414) | (16,540) | (16,792) |

Source: Atkins, 2021

As seen in the table above, it was found that the specific GA facilities that required immediate planning for expansion are T-hangars and GA itinerant storage apron. These two facilities are baseline deficient and will increase in deficiency throughout the planning period. Both GA based aircraft storage apron and conventional hangar facilities become deficient in PAL GA 2 and PAL GA 3, respectively. While the GA terminal space was found to be deficient through the planning period, the amount has been determined to be negligible.

### Air Traffic Control Tower

The existing tower does not meet all FAA siting criteria as defined in Order 6480.4B, *Airport Traffic Control Tower Siting Requirements*. The lack of positive visual control over all movement areas is non-standard, and therefore it is recommended that the ATCT is relocated to achieve positive visual control and meet all FAA siting criteria. The existing ATCT was commissioned in 1993 and construction was completed in 1996. The existing facility has now exceeded its useful life.

## Preferred Development Alternative

The preferred development alternative outlines the necessary development and facility requirements to meet the forecast demand, ensure competitiveness, financial viability, and to provide the Airport and surrounding community with the greatest overall benefit.

Alternatives have been independently developed for the airside and landside. Airside alternatives include development modifying or expanding runways, taxiways, aprons, aircraft storage hangars, and airside commercial terminal development. Landside alternatives include development such as landside commercial terminal infrastructure, vehicle parking and roadway modifications. These proposed development alternatives are outlined in Chapter 5, **Development Alternatives**.

### Preferred Airside Development

The preferred airside development alternative incorporates substantial runway modifications. These runway modifications are specifically focused on the enhancement of Runway 9R/27L to accommodate commercial service, the conversion of Runway 18/36 into a TDG 5/ADG V taxiway with partial removal, and the extension of Runway 9C/27C to a total length of 4,200 feet. The runway modifications enable the Airport to accommodate future anticipated demand and to ensure that effective land utilization is achieved. The Runway 18/36 removal allows for the reclamation of land to the north, south, and east of the existing runway, while the enhancement of Runway 9R/27L retains a secondary runway for commercial service operations and increases the airports overall capacity accommodating future growth.

Numerous taxiway modifications are proposed to support the reconfiguration of the runway layouts, address inadvisable taxiway design, and to enhance the efficiency of ground operations. The primary proposed taxiway modifications include a full-length parallel taxiway to the north of Runway 9L/27R and a full-length parallel taxiway to the north of the enhanced Runway 9R/27L. These two parallel taxiways will increase capacity and provide airside access to property historically inaccessible. Other taxiway modifications include taxiway connector relocations to mitigate inadvisable geometry and to increase ground operation efficiency.

As outlined in the Facility Requirements section, a required expansion of the commercial service terminal is necessary to accommodate established PAL 4 demand. This proposed expansion includes three new terminal gates and enhancing existing Gate 16 to accommodate larger commercial aircraft. The three new terminal gates require a 61,400 square-foot east terminal expansion along with 37,447 square yard apron expansion. The enhancement of existing Gate 16 requires a 12,600 square-foot west terminal expansion as well as the relocation of the existing flight kitchen facility.

Proposed apron modifications will accommodate the projected demand and satisfy the facility requirements throughout the planning period. Both based aircraft and itinerant aircraft storage aprons are proposed to be expanded to ensure that PAL GA 4 level of demand is satisfied. GA facility expansions include both conventional hangar storage and T-hangar storage to accommodate PAL GA 4 demand. Aircraft storage hangar development is primarily centralized around the existing Southeast Ramp, with the exception of one conventional hangar being proposed to expand the existing FBO aircraft storage area on the west side of the terminal apron. Aircraft storage hangar expansion has been proposed to accommodate the PAL GA 4 established level of demand. Multiple areas around the Airport have been identified for future aeronautical development and will be reserved as such if further demand is realized throughout the planning period. Additional areas around the Airport property have been reserved for non-aeronautical development to reserve and highlight areas of the Airport that will not have a negative impact on the safe and efficient operation of the airport. A specific area to the south of Marquette Avenue has been identified for a mix of non-aeronautical development, with approximately 39 acres being reserved for a solar farm.

Support facility modifications include an air traffic control tower (ATCT) relocation, fuel storage expansion, airport maintenance facility expansion, and relocated compass calibration pad. The ATCT relocation allows for the mitigation of the non-standard condition experienced in the towers current location. The proposed location for the facility is sited east of the existing Runway 18/36 and directly west of the aircraft “boneyard”. The proposed site of the ATCT facility is preliminary and a further evaluation of the site will be required prior to design and construction. A proposed secondary maintenance facility, sited directly south of the proposed ATCT facility, will allow for Airport operations personnel to position necessary equipment on the eastern portion of the Airport property to increase maintenance efficiency and to increase storage space required for such activities.

Property acquisition is identified for areas that are encompassed by existing or future Runway Protection Zones (RPZ). These areas are proposed to be acquired to comply with FAA guidance regarding land use surrounding the airport environment. Approximately 40 acres of proposed property acquisition is delineated for such mitigation. Approximately 186 acres of property acquisition is delineated for other future airport development needs.

**Table 1-15** summarizes the preferred airside development alternative.

**Table 1-15 - Preferred Airside Development Alternative Summary**

| Feature | Preferred Development Alternative |
|---|---|
| Runway 9R/27L | Split extension to a total length of 7,200 feet |
| Runway 18/36 | Conversion to TDG 5, ADG V taxiway and partial removal |
| Runway 9C/27C | Runway 27C end eastward relocation/expansion by 643 feet |
| Runway 9L/27R | No action |
| Taxiway A | Expansion to full north parallel taxiway to Runway 9L/27R |
| Taxiway M | Extension across Runway 9C/27C connecting to Taxiway B |
| Taxiway E | Expansion to full north parallel taxiway to enhanced Runway 9R/27L |
| Apron Expansion | ~15,000 square yard apron area connected to Taxiway K1 relocation<br>Increased itinerant apron area associated with proposed FBO conventional hangar development |
| Airside Gate Expansion and Associated Terminal Expansion | Three (3) new gates capable of supporting ADG III to ADG V aircraft<br>- 61,400 square-foot east terminal expansion<br>- 37,447 square yard apron expansion<br>Enhance existing Gate 16 to accommodate ADG III aircraft<br>- 12,600 square-foot west terminal expansion<br>- Relocation of existing flight kitchen facility |
| Conventional Hangar | Addition of approximately 100,800 square feet of hangar space |
| T-Hangar | Addition of 90 units |
| Air Traffic Control Tower | East relocation |
| Future Property Acquisition | Required (RPZ): 39.67 acres<br>Future airport development: 186.23 acres<br>Total: 225.90 acres |
| Solar Farm Development | 39.34 acres south of Marquette Avenue |

Source: Atkins Analysis

## Preferred Landside Development

The preferred landside development alternative incorporates both landside roadway adjustments and enhanced landside parking facilities. A five-level parking structure and four level Rent-A-Car (RAC) ready/return structure to accommodate the anticipated demand for landside parking and rental car operations is proposed. The five-level parking structure will have an estimated capacity of 4,000 spaces. A proposed adjustment to Red Cleveland Boulevard will allow for the diversion of traffic from the curbside roadway to minimize unnecessary traffic on the terminal curbside area. This roadway adjustment will connect with proposed and existing parking areas, and then ultimately join into Airline Avenue.

## Environmental Overview

Identifying potential environmental impacts is a crucial part of the master planning process as it provides the ability to mitigate potential adverse impacts through avoidance and integration of environmentally conscious means and methods. Several environmental features were evaluated within and around the airport property. Chapter 6,

**Environmental Overview**, provides a detailed overview of the features, including floodplains, noise, wetlands, Section 4(f) properties, hazardous materials, and more.

Regarding hazardous waste and pollution prevention on the Airport, an existing, closed landfill, located east of existing Runway 18/36 and just north of Runway 9R/27L may have potentially hazardous waste/environmental impacts on future development. Future development will be planned to circumvent impacts to the closed landfill in accordance with FAA and National Environmental Policy (NEPA) guidelines.

Noise contours developed utilizing the FAA's Aviation Environmental Design Tool (AEDT) have been depicted in Chapter 6. These noise contours were produced based on operational levels outlined in the 2017 base year forecast and through the planning period, taking into consideration the proposed runway reconfigurations. FAA land use guidance indicates that virtually all noise sensitive land uses are compatible with noise levels below the 65 DNL contour. Therefore, this contour has been primarily analyzed for off-airport land use compatibility. A primary measurement of noise impacts is the metric of noise sensitive areas (NSAs), which include residential, educational, health, religious structures/sites, parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. From the existing noise contours to the future PAL 3 noise contours, the 65 DNL contour is expected to grow from 73.5 acres and 22 NSAs to encompassing approximately 229 acres and 121 NSAs. However, if the Airport implements the preferred airfield development alternative between PAL 3 and PAL 4, the off-airport area impacted by the 65 DNL contour is expected to retract from 229 acres and 121 NSAs to 146 acres and 59 NSAs.

Wetlands, as identified from the National Wetland Inventory Program, have been identified on airport property. Those areas are located: a) Northeast and southeast of the intersection between Runways 18/36 and 9L/27R, b) East of Runway 18/36, between Taxiway Charlie and Runway 9R/27L, c) Around the perimeter of 'Kidney Pond' which is due west of South East Ramp's facilities, d) Between the touchdown zone to Runway 27L and Taxiway Sierra, e) Along the perimeter of Golden Lake, f) Southeast of the Red Cleveland Blvd and Marquette Ave intersection, and g) Southwest of the Summerlin Ave and SR 46 intersection near the Airport's northwest corner. These wetlands are protected under federal law, and all proposed future development or other impacts to the wetlands should be mitigated to the greatest extent to avoid adverse impacts.

## Financial Plan

The Capital Improvement Plan (CIP) is a tool for outlining planning and development needs over the 20-year planning period. The projects included in the CIP are vital to achieving the future goals and objectives of the airport and meet the growing demand. The projects included within the CIP are prioritized based on meeting the goals of the Airport while addressing all capacity and safety needs. The CIP is broken down into short-term (1-5 years), medium-term (6-10 years) and long-term (11-20 years) needs. Project phasing also takes into account anticipated funding availability each year. Detailed cost estimates for the CIP have been included in Volume II of this report.

The Financial Plan Chapter outlines methods of financing and financial feasibility for implementing the proposed CIP projects associated with the preferred development alternative. The financial plan includes a forecast of revenues and expenses that can be utilized to determine whether net operational revenues will be available to pay for the local share of the CIP over the planning period. An analysis of the Airport's current pricing concepts with the associated historical revenue and expanses allows for a revenue and expense forecast to be created.

A comparison between the revenue and expense forecast was conducted to calculate the remaining funding available for completing development projects identified in the CIP. It was found that a shortfall will exist assuming the current pricing models and assumptions within the forecasts stay constant. Various methods for meeting the financial goals have been recommended to ensure the needs of the CIP can be met throughout the planning period. These methods include the increase of the Airport's established Passenger Facility Charge (PFC) amount, accelerating passenger growth levels above the established forecast, and increase of non-aeronautical development and tenants. Further financial details and assumptions can be found in Chapter 7, **Financial Plan**.

# Covid-19 Disclaimer

Airport master planning is intended to aid an airport in achieving its future goals and objectives by documenting existing conditions, observing past trends to project future growth expectations, and providing a development plan of future facilities needed to meet the airport's future demands. This Airport Master Plan Update (AMPU) commenced in November 2018, and the predicted growth in aviation activity was based upon official FAA historical records on aircraft operations and passenger enplanements reported from 1997 through 2017.

The Federal Aviation Administration (FAA) finalized their review and approved the aviation activity forecasts associated with this AMPU on March 24, 2020. The next day, the United States President at the time approved disaster declarations for Florida and other states, resulting from what is currently a global pandemic (the Pandemic) of coronavirus disease 2019 (COVID-19) also commonly known as the 'coronavirus pandemic', caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

The Pandemic's outbreak originated from Wuhan, the capital city of the Hubei province, People's Republic of China and was first identified in a person on November 17, 2019, more than one month earlier than doctors began noting cases of the disease. The World Health Organization (WHO) declared the outbreak a Public Health Emergency of International Concern and a global pandemic on January 30 and March 11, 2020 respectively. As of this writing, more than 6.3 million cases have been reported globally resulting in more than 376,000 deaths in more than 188 countries and territories, and more than 2.71 million people have recovered.

The global air transport impact from the Pandemic has been unprecedented. Since the birth of commercial passenger aviation in 1926, no other pandemic or event, including the September 11, 2001 Terrorist Attacks (9/11), has been as catastrophic to aviation demand. By comparison, overall revenues from the airline industry fell by $23 billion in the wake of 9/11, whereas forecast implications of the Pandemic range from $63 to $113 billion lost revenues.

Airports Council International (ACI) released an updated model in May 2020 which forecast prolonged and more widespread impacts and effects of the Pandemic, resulting in worse predictions for traffic and revenue losses for airports across all regions. ACI's current prediction estimates a reduction of more than two billion passengers at the global level in the second quarter of 2020 and more than 4.6 billion passengers for all of 2020. That represents an estimated decline in total airport revenues on a global scale of $39.2 billion in the second quarter and more than $97 billion for 2020.

In effort to reduce those impacts to U.S. airports and airlines, among other industries, U.S. Congress passed the Coronavirus Aid, Relief, and Economic Security (CARES) Act (H.R. 748, Public Law 116-136), which was signed into law by the President on March 27, 2020. The CARES Act included $10 billion in funds to be awarded as economic relief to eligible U.S. airports which were affected by the prevention of, preparation for, and response to the Pandemic. Given this government aid and potential future bail outs, as well as the necessity for air travel as a means of transportation around the world, it is nearly inevitable that the airline industry will recover. However, analysts' expectations that people will still be afraid to fly even after the worst of the Pandemic is over makes it nearly impossible to predict how long that recovery will take.

As such, the projections and forecasts in this AMPU are unlikely to occur by their presented timelines. However, given the almost inevitable recovery of the aviation industry, the levels of aircraft operations and passenger enplanements predicted by this AMPU should increase the shelf life of the plans presented to facilitate that growth. Furthermore, the timelines presented in the forecast chapter should be viewed as Planning Activity Levels (PALs) to understand that future airport improvements are tied to such levels and not dates on a calendar. This AMPU focusses on four PAL periods; immediate, intermediate, mid-range and long-term, which would traditionally be associated with the first five years, then ten, fifteen, and finally 20 years from the baseline year of the forecasts, in this case 2017. Given the uncertainty caused by the Pandemic, development presented in this AMPU may require further justification prior to its implementation.

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# Introduction

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# 1. Introduction

## 1.1. Purpose

The purpose of this study is to provide a 20-year development program that will enhance the safety, efficiency, economy, and environmental viability of the Orlando Sanford International Airport (SFB or Airport). The program is intended to meet the development goals of the Sanford Airport Authority (SAA), strengthen the Airport's capability to facilitate demands for future aviation services, allow the Airport to more adequately fulfil its role in the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS), and create additional public value for residents in its catchment area as well as global airport users. SAA's mission is '…to operate, maintain, improve, expand and professionally manage the Orlando Sanford International Airport for the convenience and benefit of the air traveling public and economic development of the Central Florida community.', and this document is consistent with it.

The Airport Master Plan Update (AMPU) is a cooperative effort between the SAA, the Florida Department of Transportation (FDOT), and the FAA. This AMPU includes a written and graphical representation of the Airport's proposed ultimate development plans. The AMPU shall serve as the primary guide for the phased implementation of improvements necessary to meet the expected growth in aviation demand at SFB over a 20-year planning period.

In addition, this AMPU, when carried out over the ensuing years, will allow the SFB Airport to accommodate growing demands, that ultimately generate positive effect on the City of Sanford, Seminole County, and the Central Florida region. An Airport Layout Plan (ALP), which is essential to an airport's ability to qualify for and receive federal and/or state funding assistance, has been included in this Master Plan.

## 1.2. Goals and Visioning

The primary objectives of this master plan update includes a vision of what the Airport desires to achieve in the future. The Airport's vision is reflected in the master plan Summary Report and the Airport Layout Plan. The practical outcome of a master planning effort is a 20-year development program that will create a safe, efficient, economical, continued regulatory compliant, and environmentally acceptable airport facility to meet the development goals needed for the Airport, local community, and the region. Understanding the Airport's future goals is imperative to properly prepare and implement an airport master plan. These goals guide master planners in identifying what is important for the Airport to accomplish which therefore forms a 'road map' for the Airport to follow. Different stakeholders associated with an airport often have differing views on what the airport should become and how that should be accomplished. Understanding the key planning issues drawn from the desires of the airport stakeholders, culminates a clear and shared vision of the Airport's future to be established and mapped.

Understanding the incredibly dynamic nature of the aerospace industry, master plans are statements of intention and not guarantees of action by an airport. Results of a master plan update are based on what an airport projects to achieve in the 20-year planning period. These goals defined serve as a reference point for future decision making. When future decisions and actions are required, this document will guide decision makers in making prudent decisions based on logic and data. The goals should be subject to evaluation annually to insure they are still valid. Master plans are built on a set of assumptions based on certain economic, demographic, political, regulatory, climatic, management, and technological circumstances remaining relatively constant. Any significant change to any of these circumstances may impact how an airport addresses future development. An airport may have to modify goals; when there are clear indications that the assumptions are no longer valid, and the established development plan is no longer in the best interests of the airport's situation. The goals of the master plan should not be changed to appease political factions or populist sentiment.

The following list summarizes the Airport's desired goals and visions associated with the AMPU:

- Continue to provide an airport that is safe, reliable, and efficient.
- Conduct future development that adequately addresses aviation demand and high caliber of service to airport users, and tenants.
- Continue to meet and enhance the level of service provided to all projected airport users and develop an airport facility that will provide adequate capacity to fill the role as a commercial service airport in Florida.

- Continuously work towards environmental compatibility
- Develop the Airport and immediate vicinity to minimize negative environmental impacts to the region.
- Develop airport in a manner that supports local and regional economic goals while accommodating new opportunities and shifts in development patterns.
- Ensure adequate and convenient ground access to and from the Airport.
- Prudently manage all fiscal matters in accordance with FAA requirements and in a manner that sustains the airports competitiveness for attracting new and expanded business opportunities.

## 1.3. Master Planning Process

The master plan has been developed in accordance with the guidelines and standards set forth in the FAA Advisory Circulars (AC) 150/5070-6B, Airport Master Plans and 150/5300-13A, Airport Design. In addition, other ACs that will be used during analysis of specific topics include, but are not limited to, FAA AC 150/5060-5, Airport Capacity and Delay, and FAA Order 5050-4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. Guidance from the FAA, the FDOT, and SAA have also been incorporated into the development of this AMPU. **Figure 1-1** outlines the master planning process.

**Figure 1-1 - Steps in the Master Planning Process**


Source: Atkins, 2021

## 1.4. Key Planning Issues

The key planning issues were derived from discussions with the Airport staff, sponsor representatives, and community leaders to guide the master plan effort. They have been included in the Public Participation Program and provided review and comment by interested stakeholders and citizens. Although contained in the introduction to the master plan, the key planning issues listed below were obtained and refined throughout the planning process. They are not listed in order of importance and each holds equal significance. The FAA guidance identified above provides the framework of topic elements that must be reviewed.

**Key Airfield Planning Issues**

Determine the capacity of each runway and the airfield overall so that changes to the airfield can be identified far enough in advance to program extensions and improvements in a timely manner.
Determine when runway name changes will be necessary due to the change in magnetic declination so that these changes can be anticipated, and associated airfield projects programmed in advance.
Identify airfield geometry that no longer meets FAA standards and safety criteria so that projects can be programmed at the appropriate time to bring the affected areas into compliance.
Evaluate the pavement management program to determine any changes necessary to identify, catalog, and program maintenance and replacement activities in an economical and timely manner.
Asses the future requirements of the Airport's lighting vault.
Enhance the plan for compatible placement of additional or new aviation users including but not limited to aircraft manufacturing, repair, maintenance, research, design, air cargo, general and corporate aviation.
Determine alternatives to improve the runway and taxiway safety areas.
Determine how the evolution of UAV can be integrated into traditional airfield environment for use by the SAA for security, maintenance, or commercial tenant applications.
Assess and determine if four runways are necessary for current and future demand versus using and maintaining just three runways.

**Key Terminal Planning Issues**

1. Determine the appropriate scale and extent for the future expansion of the existing terminal building in the following categories:
    a. advances in passenger processing technologies;
    b. anticipated future increase in passengers;
    c. anticipated changes in baggage handling technologies;
    d. potential concession space;
    e. terminal curb space use and allocation; and
    f. improve passenger movement flow.

Identify the need for more international terminal capacity including addressing the Federal Government Federal Inspection Service (FIS) evolving requirements.

**Key Landside Planning Issues**

1. Determine future parking needs for private and commercial vehicles either through a parking garage or surface parking lots.

Determine the need to widen East Airport Boulevard and Marquette Avenue.
Widen Marquette Avenue.
Assess the existing aviation fuel farm delivery.
Replace old airport maintenance facility in new location.
Determine the need to construct a new General Aviation (GA) terminal building.
Assess ground vehicle traffic flow and determine what roadway and signalization improvements could require meeting future traffic demand, at the intersection of Marquette Avenue and Red Cleveland Boulevard and the intersection of Mellonville Avenue and Airport Boulevard.
Determine the need for additional aviation hangar space by type, number, and locations.
Determine the need for future land acquisition for expansion or compatibility purposes.

**Key Sustainability/Environmental Planning Issues**

1. Develop concepts for implementing and managing an airport-wide recycling program.

Identify projects that are eligible for VALE grants that meet specific airport needs.
Determine need for an aircraft ground run-up enclosure, also known as a 'hush house,'.
Determine options to reduce grass mowing for reducing emissions.

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# Inventory of Existing Conditions

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# 2. Inventory of Existing Conditions

The development of an AMPU for the Airport requires the collection and evaluation of baseline information relating to the Airport's property, facilities, services, location, and tenants, as well as access, utilities, and environmental considerations. The collected information will be used to determine any required airport improvements or expansion that will be identified as part of the aviation activity forecast and the facility requirements analyses. The information presented in this chapter was obtained through a variety of sources including Airport site visits, interviews with Airport staff and tenants, and examination of airport records and other public documents. This chapter includes the followings sections.

- Airport Background;
- Airport Facilities; and
- Airspace Structure.

## 2.1. Regional Setting and Land Use Airport Background

### 2.1.1. Location

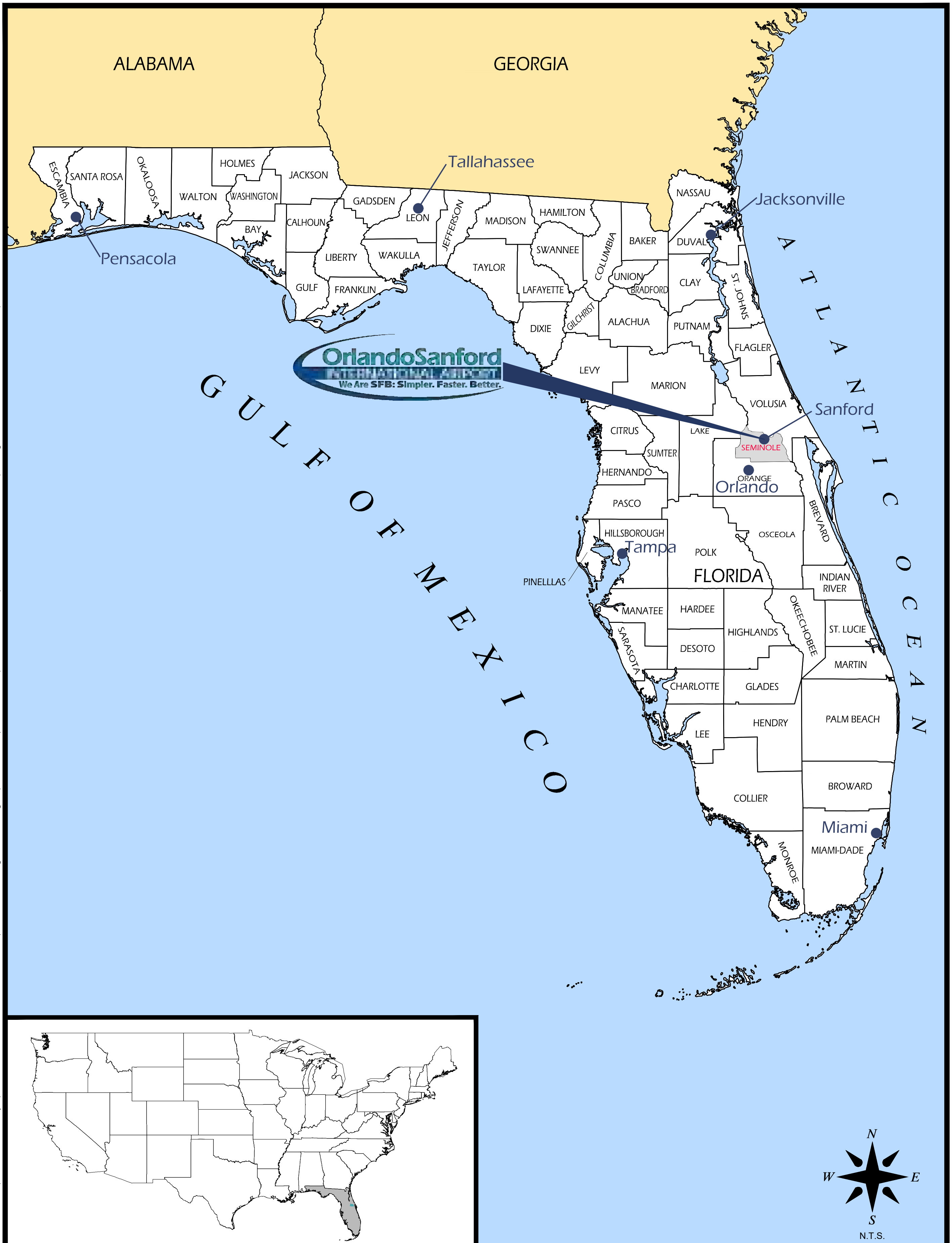
The City of Sanford is in the northern portion of Seminole County, approximately 18 miles northeast of Orlando, Florida. The Airport's property consists of approximately 2,400 acres and is in the south eastern portion of the City of Sanford. State Road 417 (SR-417), also known as the Central Florida GreeneWay, and Interstate 4 (I-4) provide major highway access to the Airport. State Highway 46 (SR-46) provides access to the Airport from the west via I-4 and from the east via I-95. The primary roadways into the Airport include: East Lake Mary Boulevard, connecting to Red Cleveland Boulevard, Airport Boulevard via Sanford Avenue, and Wylly Avenue via Sanford Avenue. **Figure 2-1** and **Figure 2-2** graphically depict the Airport's location and vicinity maps, respectively.

### 2.1.2. Role

The FAA's National Plan of Integrated Airport Systems (NPIAS) lists SFB as a 'Small Hub, Primary Commercial Service' airport facility. The Small Hub classification defines airports that enplane between 0.05 and 0.25 percent of total U.S. passenger enplanements. **Figure 2-3** depicts the categories of airports in the NPIAS.

According to FAA records there were over 563 airports in the Nation considered 'Commercial Service' in calendar year (CY) 2018 because they received scheduled passenger service and boarded at least 2,500 passengers (https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy18-commercial-service-enplanements.pdf). That represents an increase of over 60 airports from the prior year. To be considered a 'Primary Commercial Service' (PCS) airport requires that more than 10,000 passengers be boarded each year. PCS is broken up into four sub-categories; 1) 'Large Hub', 2) 'Medium Hub', 3) 'Small Hub', and 4) 'Nonhub Primary'.

Airports which enplane at least one percent of the Nation's passenger boardings are in the 'Large Hub' category. There were 30 'Large Hub' airports listed in the FAA's latest commercial service airport rankings, published on November 7, 2018. Airports that enplane between a quarter of a percent and one-percent are in the 'Medium Hub' category. There were 31 'Medium Hub' airports listed on the FAA rankings. Airports that enplane between five-hundredths of a percent and a quarter of a percent of the Nation's passenger boardings are in the 'Small Hub' category. There were 69 'Small Hub' airports listed on the FAA rankings, and SFB was one of them. In fact, SFB is ranked 79th overall with 1,504,888 CY 2018 annual passenger enplanements.




Member of the SNC-Lavalin Group

2020 Orlando Sanford International Airport Master Plan Update
Location Map

Figure 2-1

Plotted By: HAND3027 Nov25,2019 - 5:32pm
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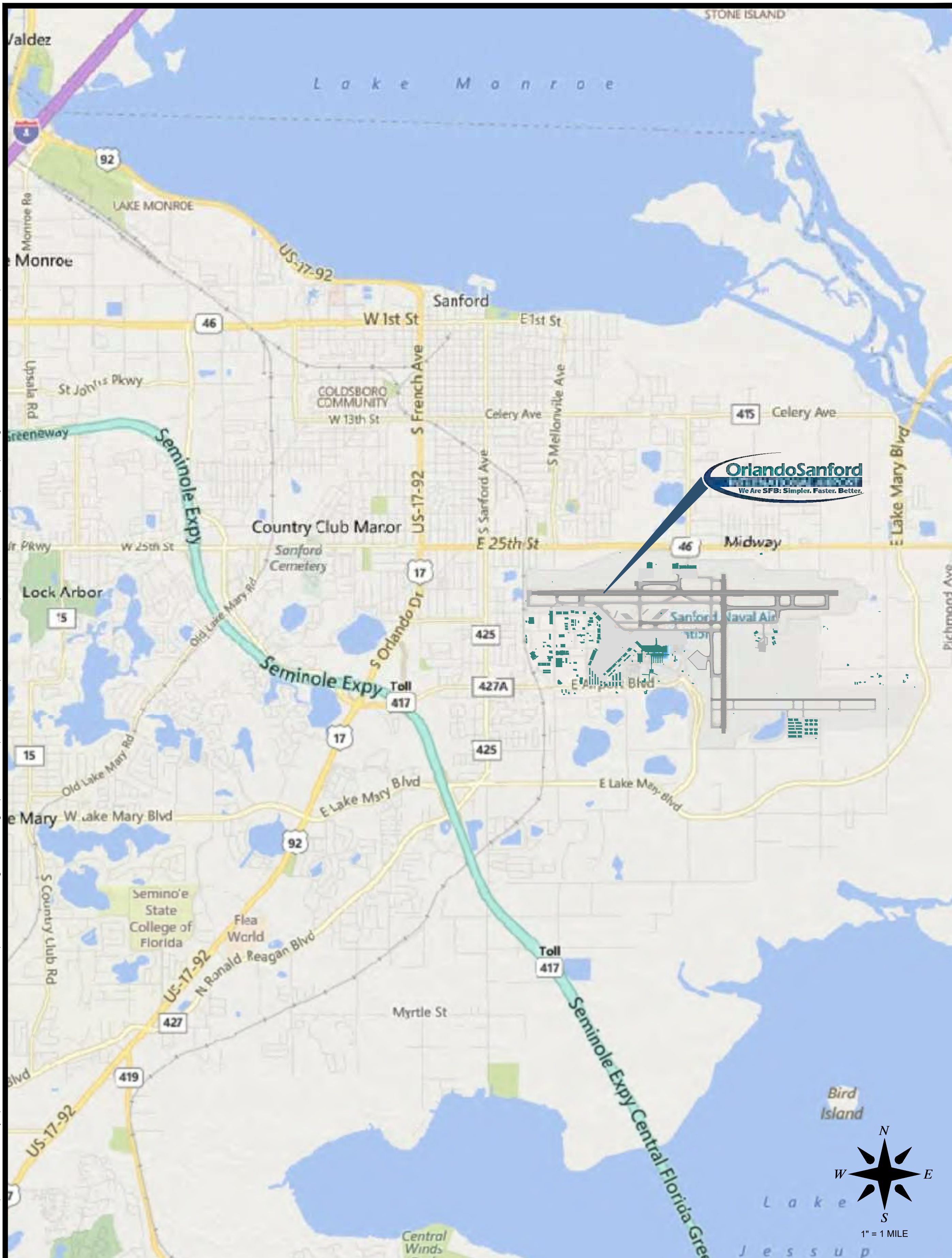



OrlandoSanford INTERNATIONAL AIRPORT We Are SFB: Simpler. Faster. Better.

ATKINS Member of the SNC-Lavalin Group

Orlando Sanford International
Airport Master Plan Update
Vicinity Map

Figure
2-2

**Figure 2-3 - NPIAS Airport Classifications**

| Airport Classifications | | Hub Type: Percentage of Annual Passenger Boardings | Common Name |
|---|---|---|---|
| **Commercial Service:** Publicly owned airports that have *at least 2,500* passenger boardings each calendar year and receive scheduled passenger service **§47102(7)** | **Primary:** Have *more than 10,000* passenger boardings each year **§47102(16)** | **Large:** 1% or more | **Large Hub** |
| | | **Medium:** At least 0.25%, but less than 1% | **Medium Hub** |
| | | **Small:** At least 0.05%, but less than 0.25% | **Small Hub** |
| | | **Nonhub:** More than 10,000, but less than 0.05% | **Nonhub Primary** |
| | **Nonprimary** | **Nonhub:** At least 2,500 and no more than than 10,000 | **Nonprimary Commercial Service** |
| **Nonprimary** (Except Commercial Service) | | Not Applicable | **Reliever §(47102(23))**<br>**General Aviation (47102(8))** |

Source: https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/

## 2.1.3. History

### 2.1.3.1. 1930s and 40s

SFB began its history prior to the 1940s as an 865-acre airport equipped with two runways. The U.S. Navy felt the need for additional naval air training facilities in May 1942. On June 11, 1942, the City of Sanford deeded the Airport to the Navy, and the Airport became the Naval Air Station (NAS) of Sanford. The Navy acquired an additional 615 acres of land for the station and immediately began construction of its facilities. Some of those original facilities are still present at the Airport and were remodelled and brought up to code to be used as storage hangars or other functions. The base was commissioned on November 3, 1942 while it was still under construction. It was intended to be used to train two bomber squadrons, though just one was established.

The first unit to report to the base was operational training unit (OTU) VB2 #1 which had been formed a short time earlier in Jacksonville, FL. That unit was responsible for pilot checkout in the Lockheed PV-1 Ventura, and it operated 34 PV-1s, four Lockheed PBO Hudsons, one PV-3, and 21 Beechcraft SNBs.

Active flight operations began in 1943 at the NAS, which served as a fighter and dive-bomber training base. The base initially operated PV-1 Venturas, PBO Hudsons and SNB-2 Kansans. Peak wartime complement reached approximately 360 officers and 1,400 enlisted men with 150 officers and enlisted Women Accepted for Volunteer Emergency Service (WAVES). Late in 1943 VB2 #1 transferred to NAS Beaufort, S.C., but OUT VF #6 replaced them and began training pilots in the General Motors FM-1 Wildcat, of which there were 221 stationed at NAS Sanford by April 1944. Those FM-1 aircraft were soon replaced by their improved version FM-2 Wildcat, and by the end of the war pilots were being trained on the Grumman F6F Hellcat carrier-based aircraft. NAS Sanford trained approximately 50 percent of the Navy’s World War II carrier-based bomber and fighter pilots.

The NAS was decommissioned after World War II, in 1946. The City of Sanford reacquired the land, and the facility was renamed the Sanford Regional Airport. Between 1946 and 1950, while operating under its new name, the

Airport accommodated several tenants, including the New York Giants American Baseball Training Camp, a retirement home, a hospital, and a clothing company.

#### 2.1.3.2. 1950s

The Navy reacquired the Airport and commissioned it as the Naval Auxiliary Air Station Sanford after the Korean War began in 1951. The Navy purchased an additional 164 acres, bringing the total acreage of the Airport to 1,644. Subsequently designated as a full Naval Air Station and renamed NAS Sanford, substantial upgrades followed to turn the air station into a Master Jet Base for the carrier-based Douglas A-3 Skywarrior nuclear attack aircraft of Reconnaissance Attack Wing One in June 1955. The upgrades included construction of additional new hangars, support buildings for the base, wing and squadrons, precision approach radar/ground controlled approach (PAR/GCA), non-directional beacon (NDB) and tactical air navigation (TACAN) navigational aids, a robust storage and distribution system for JP-5 jet fuel (which relied on resupply via a railroad spur into the base), a Navy Dispensary, Navy Exchange complex, base theater, two swimming pools, recreational facilities, and separate clubs for officers, chief petty officers and enlisted personnel. NAS Sanford was an important training base for fighter, attack, and reconnaissance aircraft during the Cold War era.

First arrivals of the A3D Skywarriors, the Navy's largest carrier-based bombers, began in January 1957. In addition to the Skywarrior, other associated land-based training aircraft such as the P2V-3W Neptune were assigned to the base to support A3D training.

Due to the Skywarrior's nuclear strike mission and the presence of an associated special weapons storage area at NAS Sanford, Marine Corps personnel provided both base and weapons storage area security, leading to the establishment of Marine Corps Barracks Sanford.

On February 6, 1959, NAS Sanford was dedicated as Ramey Field in honor of Lieutenant Commander Robert W. Ramey, USN, a decorated World War II pilot who lost his life in 1958 after saving his crew when he guided his crippled A-3D Skywarrior aircraft away from a residential area.

#### 2.1.3.3. 1960s

December 1963 marked the beginning of the A3D aircrafts' replacement by the Mach 2+ North American A-5A Vigilante aircraft. This aircraft was designed as a nuclear bomber but was later converted to a reconnaissance aircraft and played a major role in the Vietnam conflict. NAS Sanford eventually became home to ten Vigilante squadrons and their families. A commemorative NAS Sanford Memorial Park, along with plaques and a retired RA-5C Vigilante aircraft on loan from the National Museum of Naval Aviation were dedicated in May 2003 and are positioned on the main entrance road within the Airport's perimeter in memory to NAS Sanford personnel who served their country during World War II, Vietnam, and the Korean and Cold Wars.

The Airport operated as a training base for fighter, attack, and reconnaissance aircraft until it was closed by Congress in June of 1968, transferring the wing and squadrons to NAS Albany, Georgia. The City of Sanford realized that closure of the base would pose an economic threat to the local economy. Therefore, the City acquired the property from the federal government in 1969 and renamed the facility Sanford Airport. The air station's recently retired Executive Officer, Commander J.S. "Red" Cleveland, USN Ret., was hired as the first Airport Manager.

#### 2.1.3.4. 1970s

The Sanford Industrial Commission was established to promote the industrial aspects of the Airport. In 1970, the City Department of Aviation replaced the commission, and all administrative and operational control was taken over by the City. In 1971, Florida Legislature created the Sanford Airport Authority (SAA), a dependent special district, by legislative act. Since 1971, the SAA has been responsible for the operation, maintenance, and development of the Airport and its facilities, and is comprised of nine members appointed by the Sanford City Commission. The Authority elects its own chair, vice chair, secretary, and treasurer. The Airport is operated by the President/CEO, who is appointed by the Authority, and their staff of full-time employees and part-time employees.

Initially functioning as an uncontrolled airfield, the former Navy control tower was reactivated in the early 1970s as a non-Federal Aviation Administration facility, employing several retired enlisted Navy air traffic controllers who had previously served at NAS Sanford.

#### 2.1.3.5. 1980s and 90s

During the late 1980s, growth in operations required an increase in airfield capacity and efficiency. A primary cause of this growth was the result of Comair Aviation Academy (now L3Harris Airline Academy) relocating to the Airport in 1989. This growth in operations through the years prompted several changes, including the name of the Airport. The Airport has been renamed four times since 1989. Its name has changed from the Sanford Regional Airport to Central Florida Regional Airport to Orlando Sanford Airport and finally to the Orlando Sanford International Airport in 1996. These name changes represent the Airport's business directions.

In 1991, an existing east/west taxiway was modified to establish a parallel east/west runway. In 1992, major portions of the action film Passenger 57 starring Wesley Snipes, Tom Sizemore, Bruce Payne and Elizabeth Hurley were filmed at the Airport, where it represented a small airport in Louisiana. Shortly after filming, a new, temporary control tower was constructed, and air traffic control operations were assumed by the FAA. The former Navy control tower and the large Navy hangar to which it had been attached were then demolished.

A new five-gate international passenger terminal capable of accommodating commercial jet airline service was constructed in 1996. Charter airlines catering to the British tourist demographic who had previously been utilizing Orlando International Airport were offered greatly reduced landing fees if they would use SFB. Therefore, many of those carriers relocated their operations and scheduled international and domestic passenger air service soon followed.

Between 1995 and 1999 Alamo's rental car surface lot and building were added in the current location of the parking garage. Around the same time, the Airport's first north side tenant arrived upon completion of a new 30,300 square yard aircraft parking apron and an over 10,500-square-foot FBO building flanked by two hangars in excess of 28,700 square feet each. Those facilities were constructed north of and near the current midpoint of Runway 9L-27R.

The current air traffic control tower (ATCT) was commissioned in 1996. In 1999, a new parallel runway (Runway 9R-27L) was constructed to provide greater separation between the larger jet commercial aircraft and the GA aircraft during arrival and departure operations, causing the former GA Runway 9R-27L to be renamed 9C-27C. Rounding out the decade, scheduled domestic commercial passenger service was established in 1999.

#### 2.1.3.6. 2000s

Major airport expansions occurred in the decade starting in 2000. The existing Runway 9L instrument landing system (ILS) was complemented by the installation of an ILS on Runway 27R in late 2000. That installation enabled commercial aircraft to land directly from the east, flying over relatively less populated areas and minimizing over flights of urban areas located west of the Airport. Terminal B, a seven-gate domestic terminal expansion project was completed in 2001 to accommodate the existing and anticipated growth of domestic commercial service. That expansion included rehabilitation of the international terminal apron and a paved employee Parking Lot D which had a capacity of approximately 86 vehicles.

2005 was a busy construction year at the Airport. A portion of parallel Taxiway Alpha was constructed along with an over 28,000 square yard aircraft parking apron north of and near the midpoint of Runway 9L-27R. Taxiway Bravo (B) was extended to the approach end of Runway 27R, making it a full-length parallel taxiway. A relatively small, circular gravel aircraft rescue and firefighting (ARFF) training pit which contained a Boeing 727 was added southeast of the ARFF station. South East Ramp constructed its first twelve hangar structures (71 hangar units) south of the Runway 27L approach end (currently the midpoint of Runway 9R-27L). Approximately 200 vehicle spaces were added to the Airport's long-term Parking Lot B, and additional rental car facilities were constructed to the east of that long-term parking lot.

In 2007 the Airport added a five-level, 830 space parking garage and a paved employee parking lot capable of accommodating over 250 vehicles. The East Terminal Apron, an over 27,000 square yard commercial service aircraft remain over-night (RON) parking apron was completed, and South East Ramp nearly doubled its hangar capacity by adding twelve new hangar structures (64 hangar units) in the same year.

Runway 9R-27L was extended in 2008 to a length of 6,647 feet, thereby allowing for operations by larger and more complex aircraft. Runway 9R was also equipped with an ILS as well as a medium intensity approach lighting system with runway alignment indicator lights (MALSR) in 2008.

#### 2.1.3.7. 2010s

One of the Airport's most noteworthy achievements in the decade starting in 2010 occurred in 2016 when the Airport appointed its first female president, Diane Crews. Also noteworthy in that decade was when the Airport became one of the Nation's first to provide ticketed passenger screening by a private security contractor, in lieu of the Transportation Security Administration (TSA). The following paragraphs summarize the Airport's other achievements or changes in this last decade.

The ARFF aircraft training area was paved and expanded in 2010 and was connected to Taxiway Charlie (C) via a non-movement area connector between the ARFF station and the Sheriff's hangar. That area was repurposed for aircraft demolition and utilized by Avocet, an aircraft maintenance, repair, and overhaul (MRO) company. The Airport's Parking Lot C was expanded by 150 vehicle spaces for a total capacity of 345 vehicles in 2010, and a small, unmarked gravel cell lot was added off Red Cleveland Boulevard. just north of the Vigilante memorial aircraft display. That gravel cell lot grew each year until 2016 when it reached its current square shape, and it was paved with asphalt in 2018.

The Florida Department of Transportation (FDOT) embarked on an enabling project in the Airport's northwest quadrant in 2012. That project was completed in 2015, and re-routed over half a mile of State Road 46 (SR-46) onto airport property, which in turn enabled the reconstruction and widening of nearly three miles of SR-46 from Mellonville Avenue to east of Lake Mary Boulevard. The SR-46 widening project was completed in 2019, and the re-routed portion on airport property was de-coupled/closed, but can be used for future airport development.

Construction of the Airport's largest hangar (over 55,500 square feet) was completed at the beginning of 2012 and was dedicated to Avocet's aircraft MRO services. The Airport's second largest hangar was completed by the end of 2012. That hangar is 50,000 square feet, located east of the South East Ramp complex, and is connected directly to Runway 9R-27L and its parallel Taxiway Sierra (S) via connector Taxiway S4. The General Services Administration (GSA) houses an unknown number of rotorcraft in that hangar.

The Airport's primary Runway 9L-27R was extended to a length of 11,002 feet by the end of 2013, making it the third longest civil use runway in Central Florida and the seventh longest in Florida. Between 2013 and 2014, the Avocet demo pad area near the ARFF station experienced a near doubling expansion to the south, and by the start of 2014 there were nine large commercial/cargo aircraft being demoed there. That number grew to 13 by the middle of 2017, and that does not include the at least 14 Avocet aircraft stored at their hangar and apron facilities at the time. Historical aerial photos indicate that the Avocet apron housed as many as 20 mixed sized jet powered aircraft in their hangar and parking apron.

In 2014 the Airport installed a test bed of artificial turf in a 3.5-acre portion of the runway safety area (RSA) north of the Runway 18 approach end. Prior to its installation, that area had become inhabited by nearly 100 gopher tortoises in 140 burrows which presented glaring environmental, and safety violations of the RSA. The results from the yearlong study demonstrated that the artificial turf was compatible with safe airport operations, was durable to passive environmental factors, was not attractive to other hazardous species, resisted gopher tortoise burrowing activity, and did not exhibit detrimental reductions to braking during aircraft or vehicle excursions. The artificial turf also performed well during the occasional passage by operational vehicles, including those used for ARFF.

The Airport replaced each of its 12 passenger boarding bridges (PBBs) with new apron drive systems in 2015, which provide passengers with a first-class aircraft loading/unloading experience and reduced the Airport's operational and maintenance costs associated with the previous systems.

One of the Airport's turf seasonal overflow parking lots was paved in 2016 and converted to their current economy lot. During peak periods that lot overflowed into a lighted turf lot of similar size and capacity adjacent to the northeast. However, in 2018 over half of that turf lot was overtaken by a new RON apron known as the 'Romeo Ramp' as it is connected to Taxiway Romeo (R). The 'Romeo Ramp' expansion is intended to serve as an RON pad and eventual terminal apron. That expansion included widening of Taxiway R to 75 feet with paved shoulders between Taxiways Charlie (C) and Echo (E).

Construction of the Airport's new outbound and inbound baggage facilities were completed in 2017, increasing the efficiency of baggage delivery. The design for the Airport's first major terminal expansion since Terminal B was constructed was completed in 2017.

Although not directly on airport property, it is significant to note that between 2015 and 2016 a large development adjacent to the Airport's south east property line sprouted from what used to be a citrus grove. That development is known as the Boombah Sports Complex at Seminole County, and it includes 15 fully lit baseball diamonds, a paved parking lot able to house 484 standard and 16 handicap vehicles, as well as 18 busses. Five of the baseball diamonds are marked to support standard soccer fields, and four are marked to support football fields. The complex also features a large central pavilion for groups, 25 batting cage lanes, an airport sponsored themed playground, central picnic area, ample restrooms, an administration building, and three centrally located concession/hospitality buildings.

Another significant off-airport development was completed in 2018. That is the 43,000-square-foot Allegiant Air Training Centre, which shares the Airport's property line, northwest of the Red Cleveland and Marquette intersection, and houses office space, classrooms and top-of-the-line simulators for Airbus aircraft capable of annually training 150 pilots, 500 flight attendants, and 100 mechanics .

The most significant airport improvements in this latest decade are associated with changes currently being made to the commercial passenger terminal infrastructure. When complete the terminal expansion is expected to add 36,400 square feet of enclosed, terminal space, which includes four new gates, redirected traffic flow, consolidated security screening, new baggage claim areas, and additional terminal curb frontage. The project will also add approximately 34,000 square feet of exterior space covered by canopy, and approximately 19,500 square feet of area previously inaccessible to passengers is being renovated and reallocated as passenger dwelling and screening space.

### 2.1.4. Management

The Airport staff is classified by functional department, and all department heads report to the President and Chief Executive Officer (CEO), who in turn reports to the Sanford Airport Authority's (SAA) nine board members. SAA currently employs 95 full-time and five part-time employees which is an increase of 15 full time employees since the previous AMPU.

The Airport benefits from a unique blend of local government and private investment resulting in a customer focused airport. The Airport is owned and operated by the SAA, which through the President & CEO, has full oversight authority and responsibility over the entire airport and airfield facilities, including the operations and management of the International & Domestic Terminal Buildings.

In 1997, TBI Management, Inc. (TBI) was contracted by the SAA to manage both the international and domestic terminals, develop additional air service under oversight by the President/CEO, and provide ground handling and cargo services. As of October 1, 2013 TBI, has operated as a subsidiary of Airports World Wide (AWW), which was acquired by VINCI Airports in the Fall of 2018. Locally, they are referred to as Orlando Sanford International, Inc. (OSI, Inc.). OSI, Inc. manage leases with airlines, concessions, and ground traffic (rental cars, buses, taxis, etc.). This unique relationship allows the cost of operating SFB to be shared between a public and private entity. SAA focuses on developing, operating, regulating, and maintaining the physical plant of the Airport, the Foreign Trade Zone, and Commerce Park. In addition, SAA maintains and encourages airside development, general aviation (GA), flight training, law enforcement, etc.

### 2.1.5. Meteorological Conditions

The meteorological conditions commonly experienced at an airport can play a large role in the layout and usage of the facility. Weather patterns characterized by periods of low visibility and cloud ceilings often lower the capacity of an airfield. Furthermore, wind direction and velocity to a large extent dictate runway usage. The following sections further discuss and present the Airport's meteorological data.

#### 2.1.5.1. Weather Reporting

Automated weather reporting systems are increasingly being installed at airports. These systems consist of various sensors, a computer-generated voice subsystem, and a transmitter to broadcast local, current weather data directly to operating pilots. The Airport has the capabilities of on airfield weather reporting via an Automated Surface Observing System (ASOS). The ASOS is located and installed to the west of the lighting vault and can record the following information:

- Sky condition: Cloud height and amount up to 12,000 feet
- Visibility (To at least 10 SM)
- Basic present weather information: Type and intensity for rain, snow, and freezing rain

- Obstructions to vision: Fog, and haze
- Altimeter setting
- Dew point temperature
- Wind direction, speed, and character (gusts, squalls, etc.)
- Precipitation
- Selected significant remarks: Variable cloud height, variable visibility, etc.

In addition to the ASOS, the Airport has a segmented circle including a lighted wind-cone located between Runway 9C-27C, Taxiway B, and to the east of Taxiway Lima (L). A segmented circle is a ground-based marking identifying the traffic pattern, wind direction, and wind strength to pilots. The segmented circle includes a series of white markings arranged in a circle with traffic pattern indicators protruding from the circle to specify the direction of the traffic pattern. A lighted wind indicator, also known as a 'wind cone' or 'windsock,' is placed at the center of the segmented circle to indicate wind direction and strength. Additional supplemental wind-cones are located throughout the airfield at the following locations:

- South of Taxiway S, between connector Taxiways S4 and S5
- Southeast of the intersection between Taxiways R and S
- Northeast of the intersection between Taxiways B and B8
- East of the Runway 9L glideslope equipment shelter, on the north side of that runway

#### 2.1.5.2. Ceiling and Visibility

FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, identifies three categories of ceiling and visibility minimums. These categories include Visual Meteorological Conditions (VMC), Instrument Meteorological Conditions (IMC), and Poor Visibility and Ceiling (PVC). Data obtained through the National Climatic Data Center (NCDC) consisting of 10 years of hourly wind observations has been used to express information at SFB in more specific terms:

- VMC conditions, defined as having a ceiling equal to or greater than 1,000 feet above ground level (AGL) and visibility equal to or greater than three statute miles, represent most atmospheric observations (over 96 percent of the time).
- IMC conditions, with a ceiling less than 1,000 feet and/or visibility less than three miles, but ceiling equal to or greater than 200 feet and visibility equal to or greater than ½ mile, occur at the Airport approximately 3.7 percent of the time.
- PVC conditions, with a ceiling less than 200 feet and/or visibility less than ½ mile, represent periods in which the Airport is unable to service air traffic and must close. Those conditions rarely occur, often for only a few short periods each year.

#### 2.1.5.3. Wind Coverage

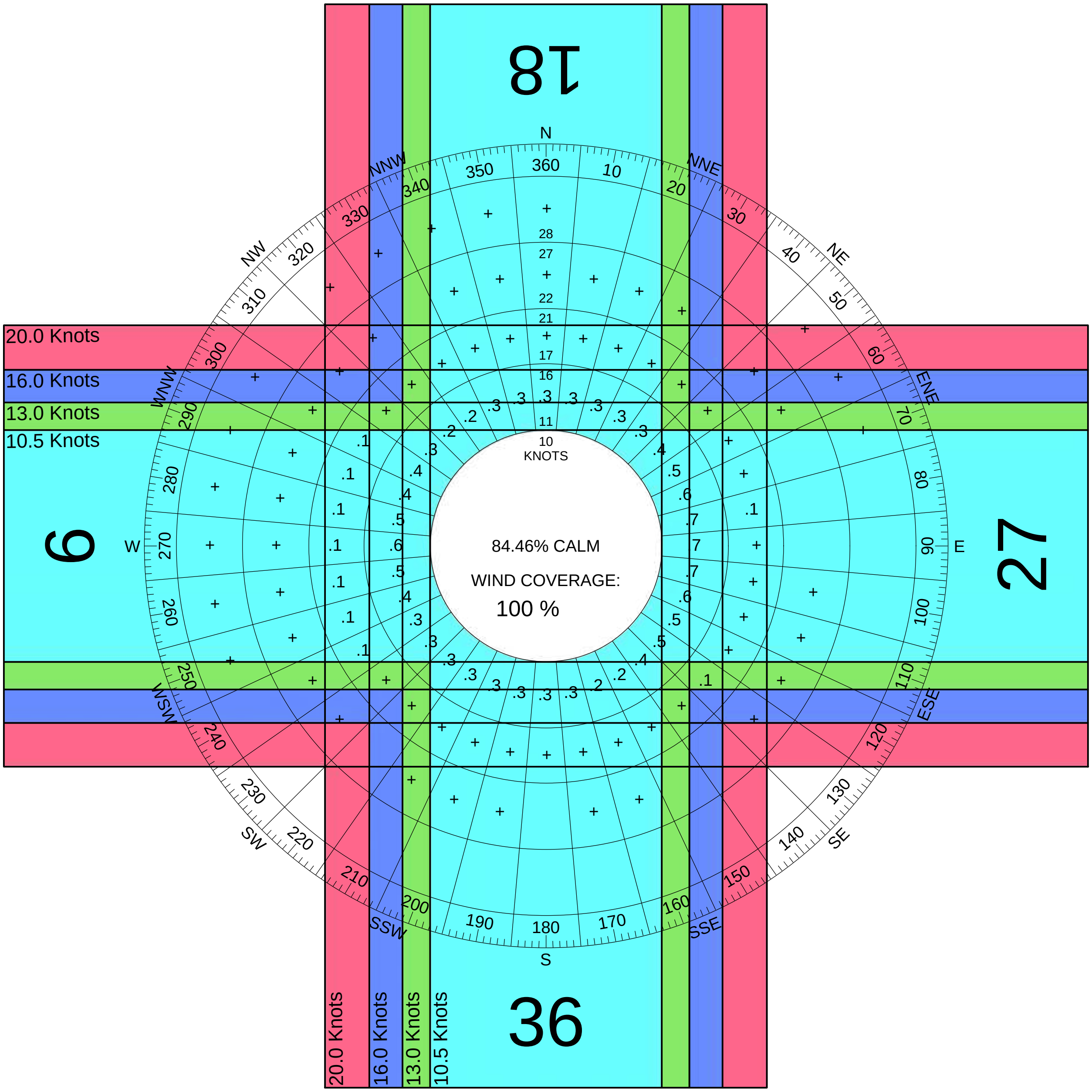
Local wind conditions at an airport play a large role in the runway usage at the field, as aircraft operate most efficiently when taking-off into the wind. Runways not oriented to take full advantage of prevailing winds are often not utilized as frequently. Aircraft can operate on a runway when the crosswind component, or wind component perpendicular to direction of travel, is not excessive. Crosswind components differ slightly depending on the size of aircraft. The appropriate crosswind components for the Airport's four runways were determined by the type of aircraft typically operating on those runways.

Figure 2-4, Figure 2-5 and **Figure 2-6** respectively depict the Visual Flight Rules (VFR), Instrument Flight Rules (IFR), and All-Weather wind roses when considering a 20-knot crosswind component for the large commercial service runways (Runway 9L-27R and 18-36), a 13-knot crosswind for the corporate jet/GA runway (Runway 9R-27L), and a 10.5-knot crosswind for the small GA runway (Runway 9C-27C). The FAA indicates that the desired wind coverage for an airport is at least 95 percent, meaning the maximum crosswind component is not exceeded more than five percent of the time.

The Airport's calculated wind coverage shows that the parallel east-west runways achieve greater than 95 percent wind coverage at each crosswind component when considering all weather conditions. The intersecting runway, Runway 18-36, achieves greater than 95 percent wind coverage for all crosswind components except the 10.5-knot metric used for small GA aircraft. During inclement weather conditions, characterized by IMC, both the parallel east-west runways and the Runway 18-36 achieve greater than 95 percent wind coverage for each crosswind component except the 10.5-knot metric. The combined wind coverage exceeds 95 percent for all crosswind components during VMC and IMC. However, AC 150/5320-4B, *Runway Length Requirements for Airport Design* states that:

> "*even when the 95-percent crosswind coverage standard is achieved for the design airplane or airplane design group, cases arise where certain airplanes with lower crosswind coverage capabilities are unable to utilize the primary runway. For airplanes with lesser crosswind capabilities, a crosswind runway may be built, provided there is <u>regular usage</u>."*

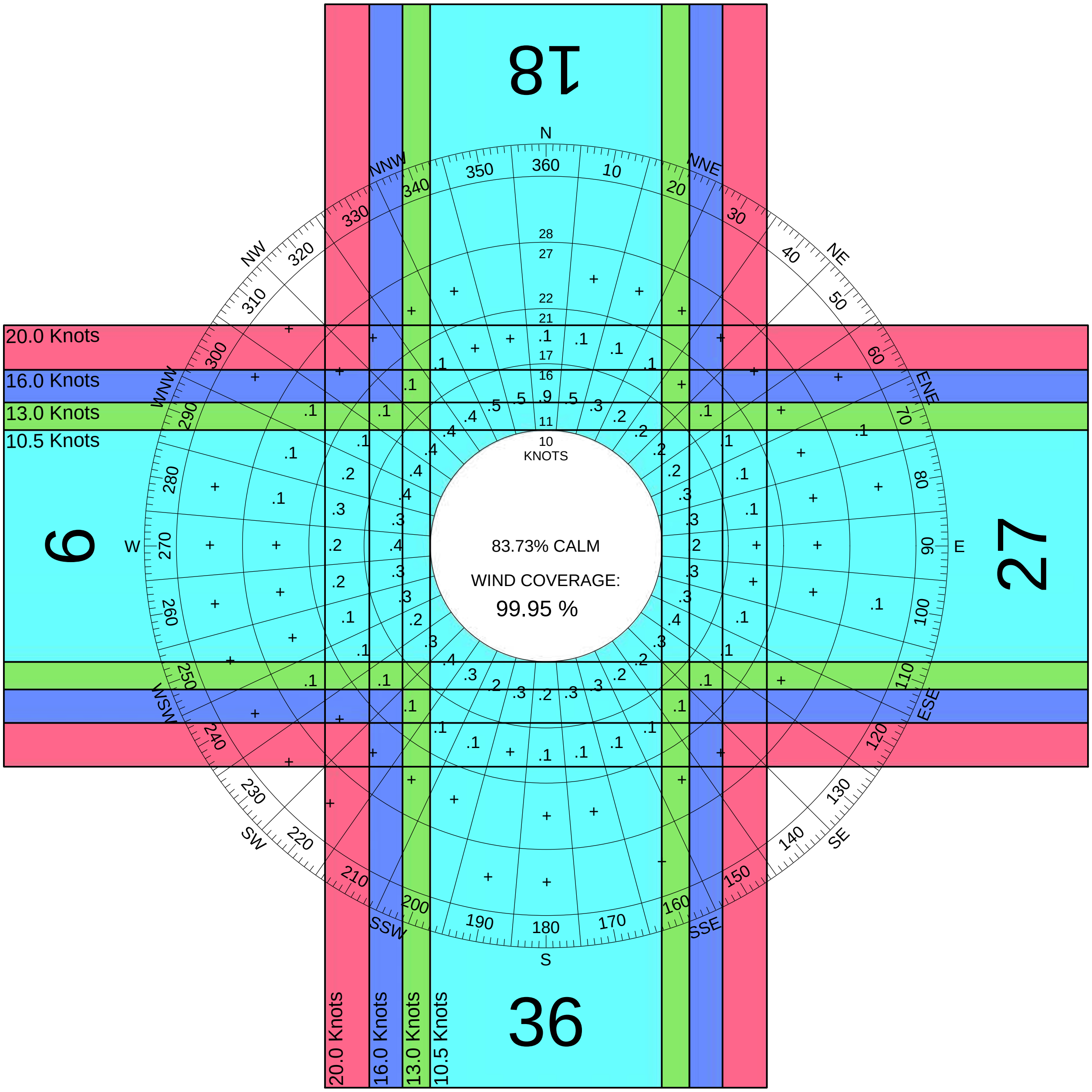
ATCT personnel have indicated that Runway 18-36 is utilized approximately two percent of the time, especially during winter months when winds tend to 'howl' out of the north or south. Even commercial service operators, such as Allegiant Airlines, utilize Runway 18-36 during such periods when the crosswind component is deemed to be too strong.




# RUNWAYS 9-27 & 18-36 WIND COVERAGE

| CROSS WIND COMPONENT | VFR COVERAGE |
|---|---|
| 10.5 Knots | 99.40% |
| 13.0 Knots | 99.89% |
| 16.0 Knots | 99.99% |
| 20.0 Knots | 100% |

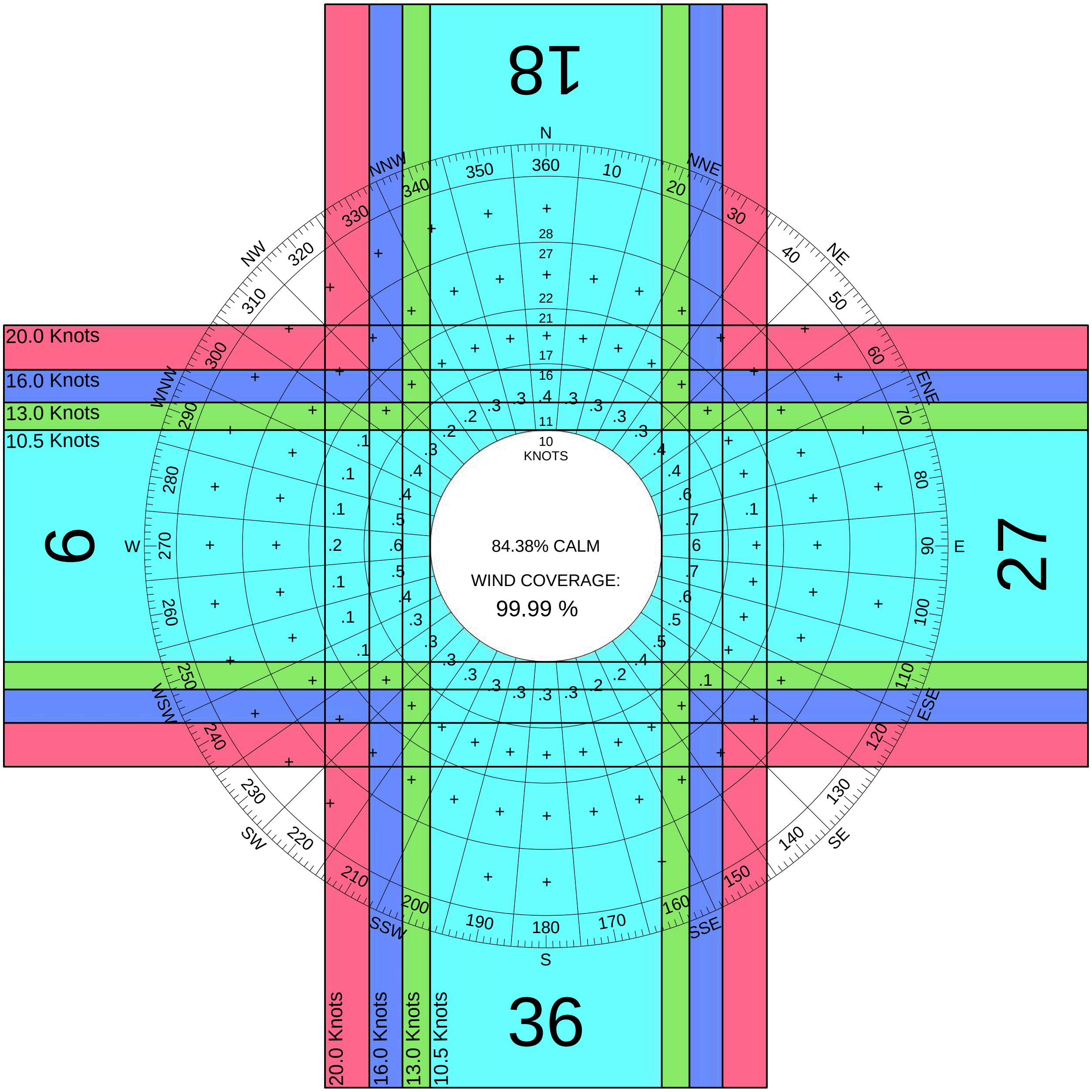
Station: Orlando Sanford International Airport, Station Number 72205
Source: National Climatic Data Center/National Oceanic and Atmospheric Administration
Period of Observation: 2009 - 2018
All Weather Observations: 106,500
VFR Weather Observations: 95,410 (89.59% of the time)
Calm Observations: 80,588 (84.46% of the VFR time periods)




# RUNWAYS 9-27 & 18-36
# WIND COVERAGE

| CROSS WIND COMPONENT | IFR COVERAGE |
|---|---|
| 10.5 Knots | 98.41% |
| 13.0 Knots | 99.43% |
| 16.0 Knots | 99.82% |
| 20.0 Knots | 99.95% |

Station: Orlando Sanford International Airport, Station Number 72205
Source: National Climatic Data Center/National Oceanic and Atmospheric Administration
Period of Observation: 2009 - 2018
All Weather Observations: 106,500
IFR Weather Observations: 11,538 (10.83% of the time)
Calm Observations: 9,661 (83.73% of the IFR time periods)




## RUNWAYS 9-27 & 18-36 WIND COVERAGE

| CROSS WIND COMPONENT | ALL WEATHER COVERAGE |
|---|---|
| 10.5 Knots | 99.29% |
| 13.0 Knots | 99.84% |
| 16.0 Knots | 99.97% |
| 20.0 Knots | 99.99% |

Station: Orlando Sanford International Airport, Station Number 72205
Source: National Climatic Data Center/National Oceanic and Atmospheric Administration
Period of Observation: 2009 - 2019
All Weather Observations: 106,500
Calm Observations: 89,867 (84.38% of the time)

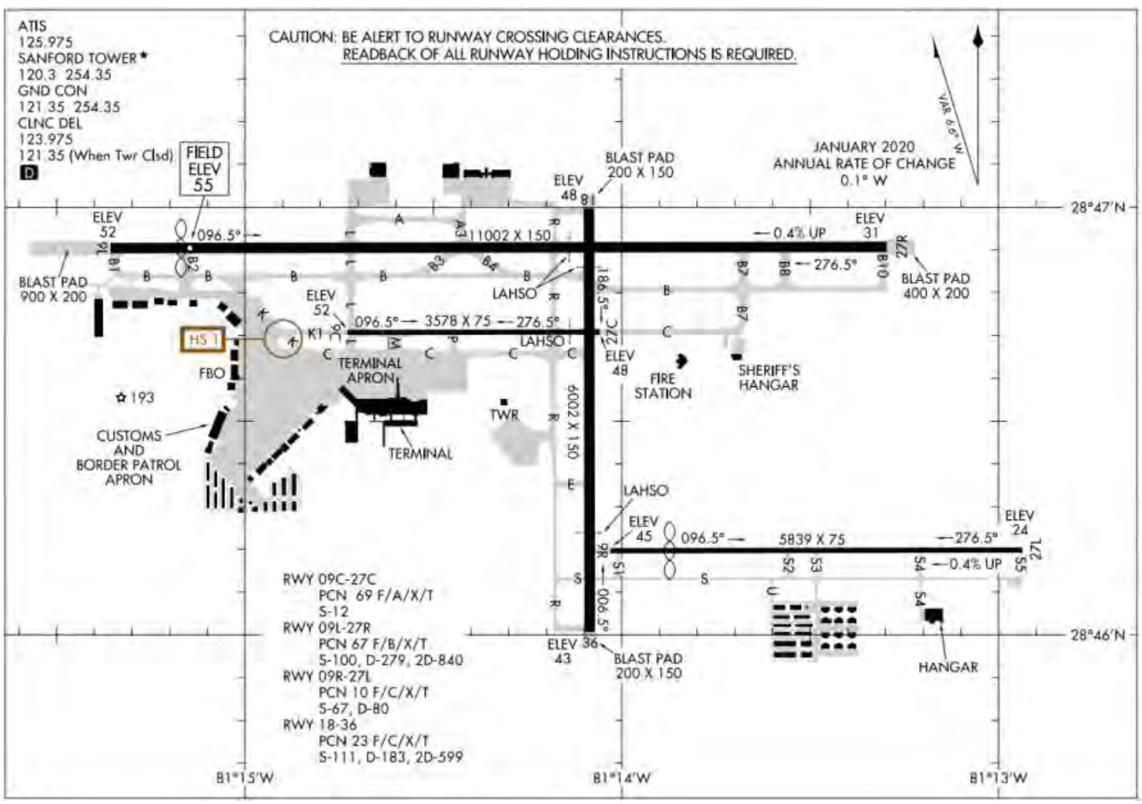
## 2.2. Airport Facilities

The identification of existing aviation facilities, specifically their locations and abilities to meet the Airport's daily needs are essential elements of the master planning process. As noted in the Section 2.1.3, the Airport's facilities have changed significantly in the last 20 years. With the introduction of what was then Comair Aviation Academy (currently L3Harris Airline Academy) and international charter and domestic carrier operations, the Airport has expanded from a two-runway airport to a four-runway airport to meet the needs of its tenants and users. The Airport has been certified under 14 CFR Part 139 to allow scheduled air carrier service. In addition, the Airport provides the following services: rental cars; aircraft fuel (100LL and Jet A); hangars and tie-downs; commercial aircraft MRO, major airframe and power-plant maintenance; high-pressure, bottled oxygen; avionics service; air cargo; charter flights; flight instruction; aircraft rental and sales; customs services; and foreign trade zone. The existing conditions of airside, terminal, landside, and support facilities will be discussed in the following sections.

### 2.2.1. Airside Facilities

Airside facilities comprise the most crucial component of the facility inventory. Runways and taxiways are not the only airside facilities to be inventoried and inspected. Lighting components, aprons, airfield signage, navigational equipment, markings, and many other facilities allow the airfield to function efficiently. The following sub-sections present information collected on all key airside facilities. **Figure 2-7** depicts an overview of the Airport's existing airside facilities.

**Figure 2-7 - Existing Airport Facilities**




Source: FAA Airfield Facility Directory (AFD), May 21, 2020 (Not for navigation)

#### 2.2.1.1. Runways

Four active bi-directional runways currently serve airport operators at SFB. Three of those runways are parallel and oriented in an east-west direction and are identified as 9L-27R, 9C-27C, and 9R-27L. Runway 18-36 is oriented in a north-south direction. Both Runways 9L-27R and 18-36 are certified for air carrier use. **Table 2-1** provides a summary of the Airport's runway specifications.

**Table 2-1 - Runway Specifications**

| | Runway 9L-27R | Runway 9C-27C | Runway 9R-27L | Runway 18-36 |
|---|---|---|---|---|
| Dimensions | | | | |
| Length | 11,002’ | 3,578’ | 5,839’ | 6,002’ |
| Width | 150’ | 75’ | 75’ | 150’ |
| Surface Material | Asphalt | Asphalt | Asphalt | Asphalt/Concrete |
| Surface Treatment | Grooved | None | None | Grooved |
| Lighting | HIRL[1] | MIRL[2] | HIRL[1] | MIRL[2] |
| Marking | Precision | Basic | Precision/Non-Precision | Non-Precision |
| Approach Aids | ILS[3]/GPS[4]/LOC[5]/ PAPI[6]-4/MALSR[7] | PAPI[6]-2 | ILS[3]/GPS[4]/LOC[5]/ PAPI[6]-4/ MALSR[7]/REILs[8] | RNAV[9] GPS[4]/ PAPI[6]-4/REILs[8] |
| Load Bearing Capacity by Gear Type | | | | |
| SWL (pounds) | 100,000 | 12,000 | 67,000 | 111,000 |
| DWL (pounds) | 279,000 | N/R | 80,000 | 183,000 |
| DTW (pounds) | 840,000 | N/R | N/R | 599,000 |
| Approach Slope | 50:1; 50:1 | 20:1; 20:1 | 50:1; 20:1 | 20:1; 20:1 |
| Effective Gradient | 0.21% | 0.12% | .09% | .10% |
| Runway End Coordinates | | | | |
| Latitude | 9L: 28° 46’ 54.25” N | 9C: 28° 46’ 42.43” N | 9R: 28° 46’ 11.80” N | 18: 28° 46’ 59.83” N |
| | 27R: 28° 46’ 54.44” N | 27C: 28° 46’ 42.49” N | 27L: 28° 46’ 11.89” N | 36: 28° 46’ 00.40” N |
| Longitude | 9L: 81° 15’ 21.44” W | 9C: 81° 14’ 43.71” W | 9R: 81° 14’ 1.81” W | 18: 81° 14’ 05.24” W |
| | 27R: 81° 13’ 17.80” W | 27C: 81° 14’ 03.50” W | 27L: 81° 12’ 56.20” W | 36: 81° 14’ 05.10” W |
| *Notes:* | | | | |

*1. HIRL; High Intensity Runway Lights*

*2. MIRL; Medium Intensity Runway Lights*

*3. ILS; Instrument Landing System*

*4. GPS; Global Positioning System*

*5. LOC; Localizer*

*6. PAPI; Precision Approach Path Indicator*

*7. MALSR; Medium Intensity Approach Lighting System; not on Runway 27L approach end*

*8. REILs; Runway End Identifier Lights*

*9. RNAV; Area Navigation*

Sources: Atkins, 2020; AirNav, 2020.

#### 2.2.1.1.1. Runway 9L-27R

Runway 9L-27R is considered the Airport's primary runway and measures 11,002 feet long by 150 feet wide. It is constructed of asphalt and has a grooved surface with 25-foot wide paved shoulders. The pavement strength rating is 100,000 pounds (lbs) for single wheel load (SWL); 279,000 lbs for dual-wheel load (DWL); and 840,000 lbs for dual tandem wheel load (DTW). That runway was extended by 1,402 feet to the east in 2013. Runway 9L has a displaced threshold located 1,000 feet from its approach end.

#### 2.2.1.1.2. Runway 9C-27C

Parallel Runway 9C-27C lies south of the primary runway, and measures 3,578 feet long by 75 feet wide. Runways 9L-27R and 9C-27C are separated, centerline-to-centerline, by 1,200 feet. In addition, Runway 9C-27C connects to Taxiway C at Runway 18-36 and Taxiway C connects to Taxiway Bravo-7 (B-7). Therefore, it can be and is used as an air carrier taxiway allowing aircraft to exit onto Taxiway Mike (M) to access the terminal ramp area. Runway 9C-27C is constructed of asphalt and has an SWL strength of 12,000 lbs.

#### 2.2.1.1.3. Runway 9R-27L

Parallel Runway 9R-27L lies south of Runway 9C-27C and is used primarily for GA training and corporate operations. It is 5,839 feet long and 75 feet wide. Its separations from 9L-27R and 9C-27C, centerline-to-centerline, are approximately 4,300 feet and 3,100 feet, respectively. Runway 9R-27L is composed of asphalt and has SWL and DWL strength capacities of 67,000 and 80,000 lbs respectively. Runway 9R has a 839-foot displaced threshold.

#### 2.2.1.1.4. Runway 18-36

The north-south runway is designated as Runway 18-36 and measures 6,002 by 150 feet. Runway 18-36 provides crosswind coverage for small aircraft and efficient cost-effective air carrier operations. Runway 18-36 is constructed of asphalt and concrete, has a grooved surface, and 25-foot paved shoulders. The pavement on Runway 18-36 has SWL, DWL, and DTW load bearing strength capacities of 111,000, 183,000, and 599,000 lbs respectively.

#### 2.2.1.1.5. Runway Declared Distances

The FAA requires the use of declared distances for all runways specified for commercial use, as well as runways with certain operational conditions. The Airport publishes declared distances for each of its four runways which are listed in **Table 2-2**. Declared distances are a means of obtaining a standard safety area by reducing the usable runway length dependent on the type of operation (takeoff or landing) and are defined as:

- Takeoff Run Available (TORA) – The runway length declared available and suitable for the ground run of an aircraft taking off.
- Takeoff Distance Available (TODA) – The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA.
- Accelerate Stop Distance Available (ASDA) – The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff.
- Landing Distance Available (LDA) – The runway length declared available and suitable for an aircraft to land.

**Table 2-2 - Declared Distances**

| Declared Distance | Runway 9L | Runway 27R | Runway 9C | Runway 27C | Runway 9R | Runway 27L | Runway 18 | Runway 36 |
|---|---|---|---|---|---|---|---|---|
| TORA | 11,002' | 11,002' | 3,578' | 3,578' | 5,839' | 5,839' | 6,002' | 6,002' |
| TODA | 11,002' | 11,002' | 3,578' | 3,578' | 5,839' | 5,839' | 6,002' | 6,002' |
| ASDA | 11,002' | 11,002' | 3,578' | 3,578' | 5,839' | 6,264' | 5,956' | 6,002' |
| LDA | 10,002' | 11,002' | 3,578' | 3,578' | 5,000' | 5,839' | 5,956' | 6,002' |

Source: FAA 5010 Airport Data Sheets

#### 2.2.1.2. Taxiways

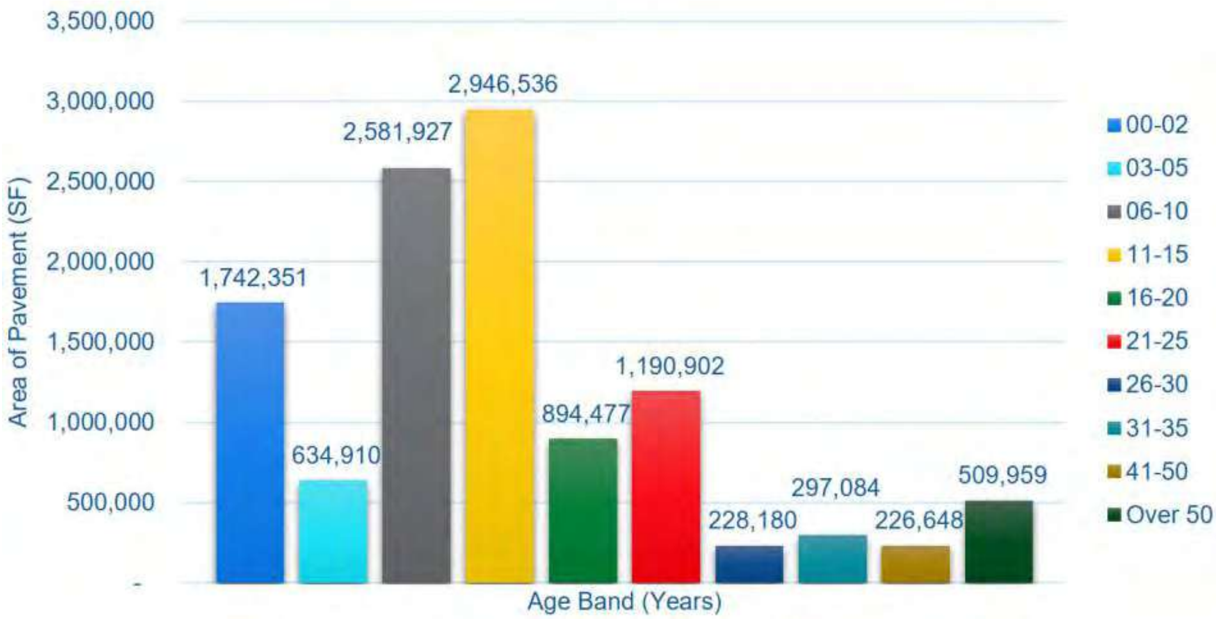
All the Airport's taxiway pavement surfaces are composed of asphalt. The Airport's four runways each have a parallel taxiway to accommodate operations. Taxiways Alpha (A), Bravo (B), Charlie (C), Lima (L), Mike (M), and the portion of Romeo (R) between Taxiways C and Echo (E) are 75 feet wide. All other taxiways are 50 feet wide except for Taxiway Sierra (S) which is 35 feet wide. These taxiways, some of which have existed since World War II, are designed to meet the specifications of the runway they serve, as well as the critical aircraft associated with each runway. A summary of the Airport's taxiways is as follows:

- Taxiway A is a 75-foot-wide partial length parallel taxiway located on the northside of Runway 9L-27R, with a runway centerline to taxiway centerline separation of 400 feet. At present, Taxiway A connects the Avocet and Constant Aviation aprons and provides access to Runway 9L-27R via Connector Taxiways L and A-3.
- Taxiway B is a 75-foot-wide full-length parallel taxiway serving Runway 9L-27R. Located just south of Runway 9L-27R, Taxiway B has a runway centerline to taxiway centerline separation of 400 feet except for the portion found east of Runway 18-36, which maintains a centerline separation of 600 feet. Taxiway B provides access to both ends of Runway 9L-27R as well as Taxiways Kilo (K), L, R, Runway 18-36, and Connector Taxiways B-1, B-2, B-3, B-4, B-7, B-8, and B-10.
- Taxiway C is a 75-foot-wide taxiway which originates at the southern extent of Taxiway K and runs east providing access to the commercial passenger aircraft terminal apron and Runway 18-36 where it seems to end, however it continues east of Runway 18-36 along the alignment of Runway 9C-27C until connecting with Taxiway B-7. Taxiway C also connects with Taxiways L, M, Papa (P), and R. When south of Runway 18-36, Taxiway C has a centerline separation of 300 feet from the Runway centerline.
- Taxiway E is a 75-foot-wide taxiway which connects Runway 18-36 with Taxiway R at a point 2,100 feet from Runway 36's approach end.
- Taxiway K is a 50-foot-wide taxiway located south of Runway 9L and Taxiway B and connects the GA apron and the terminal ramp. Because of its close proximity to the Runway 9C approach end and the GA apron tie-down positions, Taxiway K, is non-accessible to aircraft with tail heights or wingspans exceeding 34 or 80 feet respectively. Taxiway K-1 is a connector taxiway from Taxiway K to the approach end of Runway 9C.
- Taxiway R is a full-length parallel taxiway serving the west side of Runway 18-36. Its centerline separation from Runway 18-36 is approximately 490 feet. Its width is 50 feet except for the portion of R between Taxiways C and E, which is 75 feet wide. Taxiway R provides access to both ends of Runways 18-36, and 9C, as well as Taxiway B, Taxiway C, Taxiway E, and Taxiway S.
- Taxiway S is a 35-foot-wide full-length parallel taxiway serving Runway 9R-27L. Taxiway S maintains a 400 foot centerline separation from Runway 9R-27L and provides access to both ends of Runway 9R-27L as well as Taxiways R and Uniform (U), and Connector Taxiways S-1, S-2, S-3, S-4, S-5.
- Taxiway L is a 75-foot-wide taxiway that intersects Runway 9L-27R at a point approximately 2,500 feet from the 9L approach end. Taxiway L runs in a north-south direction, starting from Taxiway C at the commercial terminal apron running north across the Runway 9C approach end, intersecting Taxiway B and then Runway 9L-27R, and ceases at Taxiway A.
- Taxiways M and P are short connector taxiways, which connect Runway 9C-27C to the commercial terminal apron. Taxiway P is closed to aircraft with wingspans greater than 49 feet (Airplane Design Group I) given its pavement fillet geometry. Taxiway P is unique in that it contains the Airport's compass calibration pad.
- Taxiway U is a 35-foot wide connection between Taxiway S and the west side of South East Ramp. It runs from Taxiway S to the northwest corner of South East Ramp where it becomes a hangar access taxilane which continues to the southwest corner of South East Ramp's facilities.

#### 2.2.1.3. Pavement Strength/Condition

The Airport has a mix of pavement conditions as was revealed by onsite analysis of airfield pavement during a February 2019 site visit, discussion with airport staff, and consultation of SFB's 2019 Airport Pavement Evaluation Report (APER) associated with FDOT's Statewide Airfield Pavement Management Program (SAPMP). Standard airfield pavement design practices presume a 20-year pavement design life. **Figure 2-8** depicts the Airport's average pavement ages reported in FDOT's SFB APER. According to the data presented in that figure, the Airport's average pavement age is 14 years, and nearly 56 percent of it is more than 11 years old.

**Figure 2-8 - APER's Figure 3.1.2 - Average Age of Pavement at Inspection**




Source: FDOT Statewide Airfield Pavement Management Program, Airport Pavement Evaluation Report, SFB, November 2019

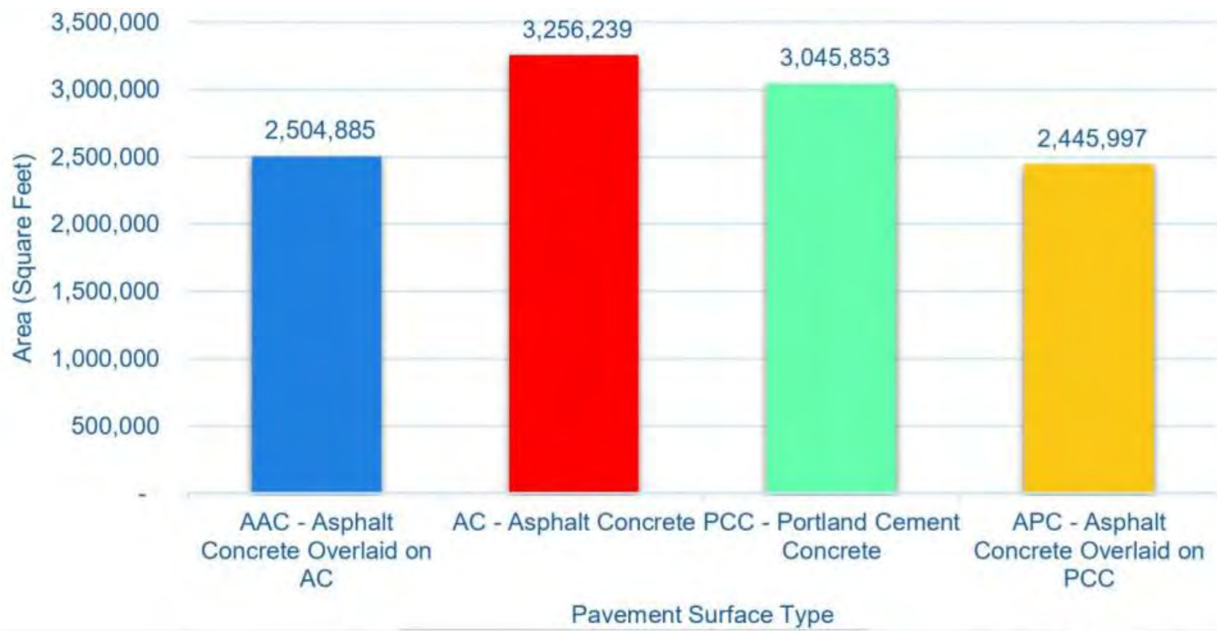
The APER also reported the functional classification of the Airport's pavement, grouped in three categories: Apron, Runway, and Taxiway/Taxilane. **Figure 2-9** depicts the Airport's identified pavements' functional use by area in square feet as was reported in SFB's APER. Additionally, the APER reports the airfield pavement facility surface types, grouped in four categories of pavement; Portland cement concrete (PCC) 27 percent, asphalt concrete (AC) 29 percent, asphalt concrete overlaid on asphalt concrete (AAC) 22 percent, and asphalt concrete overlaid on Portland cement concrete (APC) 22 percent. **Figure 2-10** depicts the Airport's amount of each pavement type reported in SFB's APER.

**Figure 2-9 - APER's Figure 3.1.3 – Airfield Pavement Functional Classification Use by Area**


Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019

The FDOT performed a network-level Pavement Condition Index (PCI) of the Airport's pavements, which provided insight for understanding the overall condition of the network (current and future). This insight allows for the planning of short and long-term budget needs for pavement maintenance or replacement, and to identify the pavement sections which are subject for project consideration. The computation of a PCI requires examination of specific distress types (with causes attributed to climate, load, or other distress mechanisms), determination of the severity, and quantity of distress manifestation.

**Figure 2-10 - APER's Figure 3.1.4 (a) – Pavement Surface Type by Area (SF)**




Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019

**Figure 2-11** summarizes the Airport's network-level pavement condition analysis based on the most recent PCI Survey inspection results, as was reported in SFB's APER. According to that data, over 75 percent of the Airport's pavement was classified as being in 'good', 'satisfactory', or 'fair' condition.

**Figure 2-11 - APER's Figure 4.1.1 – Latest Condition – Overall Network**


Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019

**Figure 2-12**, **Figure 2-13**, and **Figure 2-14** depict the branch-level (Runway, Taxiway, or Apron) pavement conditions reported in the Airport's APER.

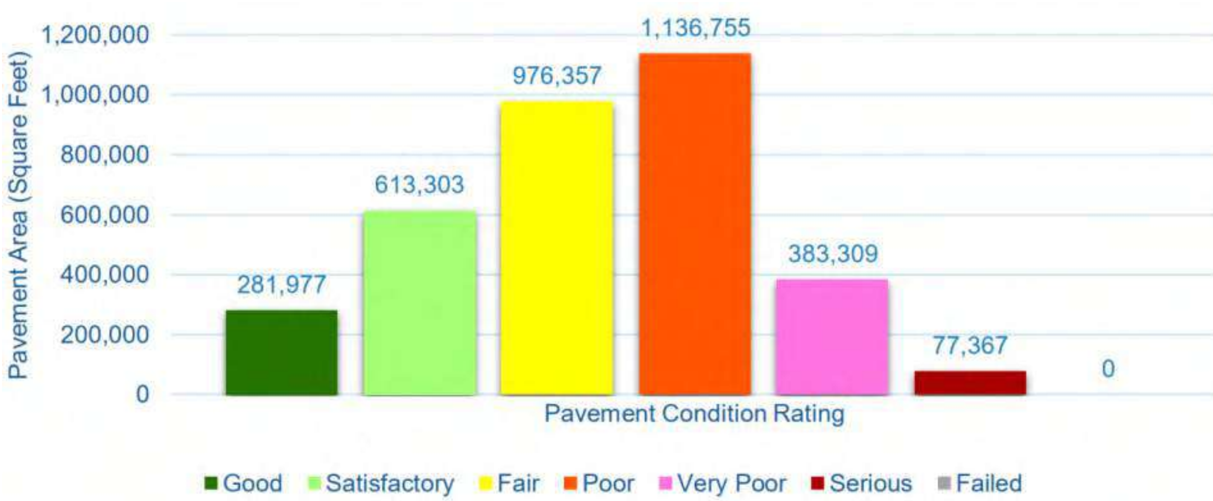
Nearly 91 percent of the Airport's runway pavements are reported to be in 'good' to 'fair' condition, however the outer half of Runway 18-36 was identified as being in 'poor' condition. The inner 75 feet (37.5 feet on either side of Runway centerline) of that runway was rehabilitated in 2010 and is now considered to be in 'fair' condition.

Almost half (46 percent) of the Airport's taxiway pavement was reported to be in 'poor' to 'serious' condition. The Airport has already developed designs to rehabilitate most of those taxiway pavements, specifically Taxiways A, B, L, and C.

**Figure 2-12 - APER's Figure 4.1.2 (a) – Latest Condition – Runway Pavements**

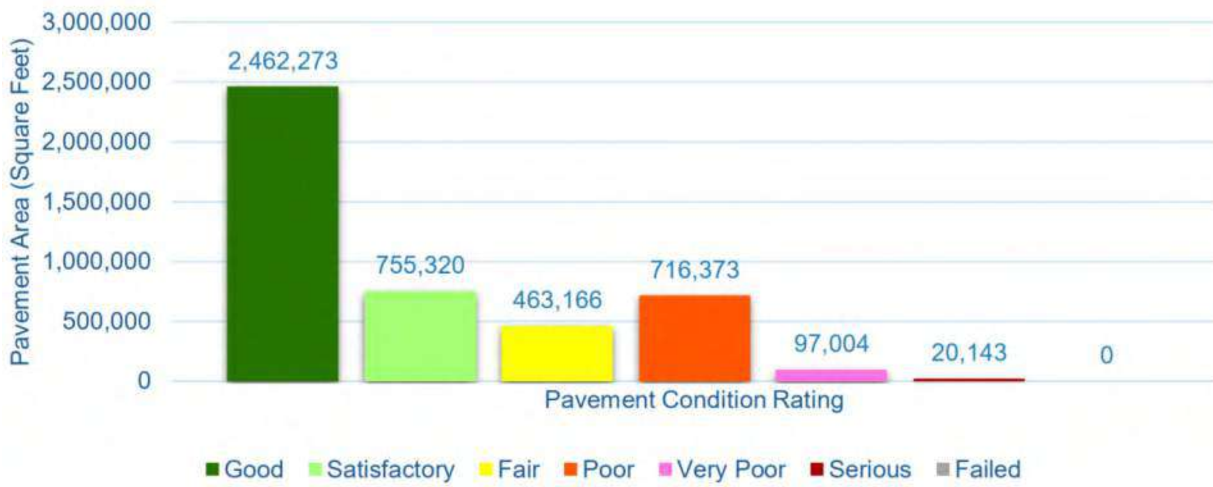

Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019

**Figure 2-13 - APER's Figure 4.1.2 (b) – Latest Condition – Taxiway Pavements**




Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019

**Figure 2-14 - APER's Figure 4.1.2 (c) – Latest Condition – Apron Pavements**




*Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019*

While the vast majority (81.5 percent) of the Airport's apron pavement is reported to be in 'good' to 'fair' condition, some apron areas have been identified to require rehabilitation soon. Specifically, the asphalt areas along the perimeter of the terminal area's PCC apron, most of Constant Aviation's asphalt apron, and the asphalt portions of the L3Harris Airline Academy's aircraft parking apron. **Figure 2-15** depicts the Airport's Airfield PCI Exhibit as it appears in the APER.

### 2.2.1.4. Runway Design Code (RDC)

The Runway Design Code (RDC) signifies standards to which a runway is to be built and maintained. Aircraft Approach Category (AAC), Airplane Design Group (ADG), and approach visibility minimums are combined to form the RDC of a specific runway. The AAC portion of the RDC relates to the aircraft approach speed, as depicted in **Table 2-3**. The ADG is the second component of the RDC and it is represented by a roman numeral as depicted in **Table 2-4.** The ADG relates to the aircraft wingspan or tail height. Instrument approach visibility minima measured as runway visual range (RVR) makes up the final component of a RDC as depicted in **Table 2-5**. RVR is the distance over which a pilot can see the runway surface markings while on the runway centerline and is normally expressed in feet. The airport reference code (ARC) is the critical RDC minus the approach visibility minimums. The existing RDC of each of the Airport's runways are outlined in **Table 2-6.**

**Table 2-3 - Aircraft Approach Category (AAC)**

| AAC | Approach Speed |
|---|---|
| A | Approach speed less than 91 knots |
| B | Approach speed 91 knots or more but less than 121 knots |
| C | Approach speed 121 knots or more but less than 141 knots |
| D | Approach speed 141 knots or more but less than 166 knots |
| E | Approach speed 166 knots or more |

Source: FAA AC 150/5300-13A, Airport Design

**Table 2-4 – Airplane Design Group (ADG)**

| Group # | Tail Height | Wingspan |
|---|---|---|
| I | < 20' | < 49' |
| II | 20' - < 30' | 49' - < 79' |
| III | 30' - < 45' | 79' - < 118' |
| IV | 45' - < 60' | 118' - < 171' |
| V | 60' - < 66' | 171' - < 214' |
| VI | 66' - < 80' | 214' - < 262' |

Source: FAA AC 150/5300-13A, Airport Design

**Table 2-5 – Visibility Minimums**

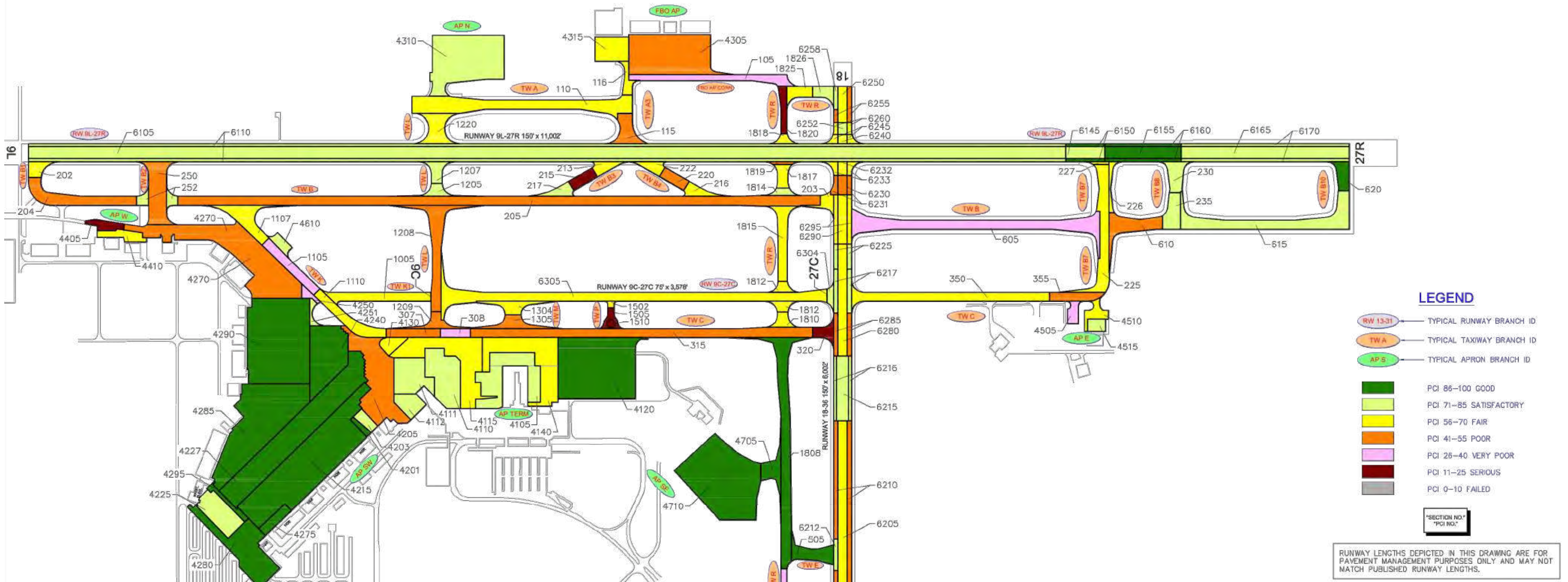
| RVR (') | Flight Visibility Category (statute mile) |
|---|---|
| VIS | Visual Approach |
| 5,000' | Not lower than 1 mile |
| 4,000' | Lower than 1 mile but not lower than ¾ mile (APV ≥ 3/4 but < 1 mile) |
| 2,400' | Lower than 3/4 mile but not lower than 1/2 mile (CAT-I PA) |
| 1,600' | Lower than 1/2 mile but not lower than 1/4 mile (CAT-II PA) |
| 1,200' | Lower than 1/4 mile CAT-III PA) |

Source: FAA AC 150/5300-13A, Airport Design

**Table 2-6 – SFB's Existing RDCs**

| Runway | Existing RDC |
|---|---|
| 9L-27R | D-V-2400 |
| 9R-27L | B-II-2400 |
| 9C-27C | B-I (Small Aircraft)-VIS |
| 18-36 | D-IV-4000 |

Source: Atkins Analysis, 2021




| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 PCI = 28 | 110 PCI = 63 | 115 PCI = 46 | 116 PCI = 69 | 202 PCI = 67 | 203 PCI = 67 | 204 PCI = 51 | 205 PCI = 54 | 213 PCI = 69 | 215 PCI = 15 | 216 PCI = 64 | 217 PCI = 73 | 220 PCI = 55 |
| 222 PCI = 67 | 225 PCI = 61 | 226 PCI = 63 | 227 PCI = 66 | 230 PCI = 83 | 235 PCI = 79 | 250 PCI = 48 | 252 PCI = 73 | 307 PCI = 53 | 308 PCI = 29 | 315 PCI = 47 | 320 PCI = 23 | 350 PCI = 70 |
| 355 PCI = 55 | 505 PCI = 100 | 605 PCI = 38 | 610 PCI = 49 | 615 PCI = 77 | 620 PCI = 95 | 1005 PCI = 60 | 1105 PCI = 37 | 1107 PCI = 58 | 1110 PCI = 62 | 1205 PCI = 72 | 1207 PCI = 74 | 1208 PCI = 49 |
| 1209 PCI = 50 | 1220 PCI = 58 | 1304 PCI = 68 | 1305 PCI = 47 | 1502 PCI = 67 | 1505 PCI = 23 | 1510 PCI = 12 | 1805 PCI = 38 | 1806 PCI = 75 | 1808 PCI = 100 | 1810 PCI = 60 | 1812 PCI = 67 | 1814 PCI = 77 |
| 1815 PCI = 69 | 1817 PCI = 56 | 1818 PCI = 61 | 1819 PCI = 49 | 1820 PCI = 21 | 1825 PCI = 60 | 1826 PCI = 85 | 1905 PCI = 86 | 1910 PCI = 77 | 1915 PCI = 73 | 1920 PCI = 70 | 1925 PCI = 78 | 1930 PCI = 70 |
| 1940 PCI = 79 | 1950 PCI = 92 | 4105 PCI = 85 | 4110 PCI = 80 | 4111 PCI = 79 | 4112 PCI = 85 | 4115 PCI = 64 | 4120 PCI = 93 | 4130 PCI = 61 | 4140 PCI = 65 | 4201 PCI = 87 | 4203 PCI = 80 | 4205 PCI = 54 |
| 4215 PCI = 99 | 4225 PCI = 83 | 4227 PCI = 100 | 4240 PCI = 100 | 4250 PCI = 40 | 4251 PCI = 83 | 4270 PCI = 49 | 4275 PCI = 98 | 4280 PCI = 97 | 4285 PCI = 100 | 4290 PCI = 100 | 4295 PCI = 99 | 4305 PCI = 44 |
| 4310 PCI = 79 | 4315 PCI = 65 | 4405 PCI = 17 | 4410 PCI = 58 | 4505 PCI = 35 | 4510 PCI = 66 | 4515 PCI = 77 | 4610 PCI = 74 | 4705 PCI = 100 | 4710 PCI = 100 | 5010 PCI = 82 | 6105 PCI = 71 | 6110 PCI = 77 |
| 6145 PCI = 84 | 6150 PCI = 94 | 6155 PCI = 86 | 6160 PCI = 89 | 6165 PCI = 85 | 6170 PCI = 84 | 6205 PCI = 70 | 6210 PCI = 49 | 6212 PCI = 81 | 6215 PCI = 82 | 6216 PCI = 78 | 6217 PCI = 78 | 6225 PCI = 78 |
| 6230 PCI = 51 | 6231 PCI = 55 | 6232 PCI = 67 | 6233 PCI = 56 | 6240 PCI = 69 | 6245 PCI = 57 | 6250 PCI = 59 | 6252 PCI = 73 | 6255 PCI = 47 | 6258 PCI = 74 | 6260 PCI = 65 | 6280 PCI = 61 | 6285 PCI = 55 |
| 6290 PCI = 65 | 6295 PCI = 69 | 6304 PCI = 71 | 6305 PCI = 66 | 6405 PCI = 61 | 6410 PCI = 80 | | | | | | | |

*Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report; SFB, November 2019.*

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2020 Orlando Sanford International Airport Master Plan Update

Airfield Pavement Condition Index (PCI) Map

Figure 2-15

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### 2.2.1.5. Airfield Safety Areas and Object Free Areas

Runways and taxiways are surrounded by imaginary areas known as “safety areas” and “object free areas”. The purpose of these areas is to minimize the likelihood of serious damage to aircraft that unintentionally leave designated movement areas as well as to offer greater accessibility for firefighting and rescue equipment during emergencies. These areas require appropriate grading between one percent and five percent. The designated areas must remain free of obstructions to enhance the safety of aircraft that overrun, undershoot, or veer off the airfield pavement.

According to FAA’s AC 150-5300-13A, the dimensions of the Runway Safety Area (RSA), and Runway Object Free Area (ROFA), are based on the runway’s specific RDC. The dimensions of the Taxiway Safety Area (TSA) and Taxiway/Taxilane Object Free Areas (TOFA) are determined by the ADG of the critical aircraft. **Table 2-7** depicts the dimensions of the Airport’s safety and free areas.

**Table 2-7 – Runway and Taxiway Safety Area Dimensions**

| | Runway 9L-27R | Runway 9R-27L | Runway 9C-27C | Runway 18-36 |
|---|---|---|---|---|
| Runway Safety Area | | | | |
| Length Beyond Runway End | 1,000’ | 600’ | 240’ | 1,000’ |
| Length Prior to Threshold | 600’ | 600’ | 240’ | 600’ |
| Width | 500’ | 300’ | 120’ | 500’ |
| Runway Object Free Area | | | | |
| Length Beyond Runway End | 1,000’ | 1,000’ | 240’ | 1,000’ |
| Length Prior to Threshold | 600’ | 600’ | 240’ | 600’ |
| Width | 800’ | 800’ | 250’ | 800’ |
| Taxiway Safety Area Width | 214’ | 79’ | 214’ | 171’ |
| Taxiway Object free Area Width | 320’ | 131’ | 320’ | 259’ |
| Taxilane Object Free Area Width | 276’ | 115’ | 276’ | 225’ |

Source: FAA AC 150/5300-13A, Airport Design

### 2.2.1.6. Runway Protection Zones (RPZs)

Per FAA AC 150/5300-13A, Runway Protection Zones (RPZ) are set in place ‘to enhance the protection of people and property on the ground.’ RPZs are most commonly located off the ends of each runway, and they are trapezoidal in shape. There are two types of RPZs; approach and departure. Dimensions for an approach RPZ are a function of the Aircraft Approach Category (AAC) and approach visibility minimum associated with the approach runway end, and they are typically larger than a departure RPZ. Departure RPZ dimensions are a function of the AAC and departure procedures associated with the runway. Typically, RPZs start at a location 200 feet beyond the end of a runway, however displaced thresholds and declared distances may require an approach RPZ to start at a location other than 200 feet beyond the runway end, and that is when two RPZs would be required. Approach and departure RPZs normally overlap. **Table 2-8** depicts the dimensions of the existing RPZ.

**Table 2-8 – Runway Protection Zone Dimensions**

| | Runway 9L-27R | | Runway 9R-27L | | Runway 9C-27C | | Runway 18-36 | |
|---|---|---|---|---|---|---|---|---|
| | **Approach** | **Departure** | **Approach** | **Departure** | **Approach** | **Departure** | **Approach** | **Departure** |
| Length | 2,500’ | 1,700’ | 2,500’ / 1,000’ | 1,000’ | 1,000’ | 1,000’ | 1,700’ | 1,700’ |
| Inner Width | 1,000’ | 500’ | 1,000’ / 500’ | 500’ | 250’ | 250’ | 1,000’ / 500’ | 500’ |
| Outer Width | 1,750’ | 1,010’ | 1,750’ / 700’ | 700’ | 450’ | 450’ | 1,510’ / 1,010’ | 1,010’ |

Source: FAA AC 150/5300-13A, Airport Design

### 2.2.1.7. Lighting, Marking, and Signage

A variety of lighting, marking, and signage are available at the Airport to facilitate identification, approach, landing, and taxiing operations. These aids are essential during operations at night and during adverse weather conditions. These systems, categorized by function, are further described in the following sections.

#### 2.2.1.7.1. Identification Lighting

A rotating airport beacon light universally indicates the location and presence of an airport. The rotating beacon is equipped with an optical system that projects two beams of light (one green and one white) 180 degrees apart. The Airport’s beacon is located on the west side of the airfield in the Airport industrial park area. Specifically, the Airport beacon is found at the intersection of Mellonville Avenue and East 29$^{th}$ Street and its elevation is 193 feet above mean sea level (AMSL). It was installed in 2010 and uniquely acts as a cell tower.

#### 2.2.1.7.2. Obstruction Lighting

Airspace obstructions near the Airport are marked or lit at all times to warn pilots of their presence. Existing obstructions that cannot be removed are identified and lit. Those obstructions may be identified for pilots on approach charts and on the official Airport Obstruction Chart, published by the National Oceanic and Atmospheric Administration (NOAA).

#### 2.2.1.7.3. Approach Lighting

There are three types of approach aids: electronic navigational aids, visual approach aids, and approach lighting. Approach Lighting Systems (ALS) are used in the approaches to runways as adjuncts to electronic NAVAIDS for the final portion of IFR approaches and as visual guides for nighttime approaches under VFR conditions. Approach lighting systems provide pilots with visual clues regarding aircraft alignment, roll angle, height, and position relative to a runway’s landing threshold.

The Airport’s Runways 9L, 27R, and 9R are each equipped with a medium intensity approach lighting system (MALS) with runway alignment indicator lights (RAILs) known as MALSRs. Those systems assist pilots transitioning from the cockpit instrument landing segment to the visual runway environment and provide a lighted approach path along the extended runway centerline. RAILs flash in sequence as a series of blueish-white lights moving toward the runway threshold. These lights effectively emphasize runway centerline alignment. Roll indication is emphasized by a single row of white lights located on either side and symmetrically along the column of approach lights.

Another of the Airport’s approach light systems are Precision Approach Path Indicators (PAPIs). A PAPI is a system of lights located near a runway end which provides pilots with visual descent guidance information during an approach to that runway. That system typically has a visual range of approximately four miles. Runways 9L, 27R, 9R, 27L, 18, and 36 are each equipped with PAPI-4 (four-light unit) systems while Runways 9C and 27C are equipped with PAPI-2 (two-light unit) systems. All approach light systems are reported by SAA to be in good condition.

#### 2.2.1.7.4. Runway End Identification Lighting

Runway End Identification Light (REIL) systems help pilots identify runway thresholds in areas of light pollution or large open spaces. REILs consist of two synchronized flashing unidirectional white lights situated near a runway's threshold. They are visible through 360 degrees of the azimuth and can be seen several miles from an airport under good visibility conditions. Following are the Airport's runway ends equipped with REILs: 27L, 18, 36, and 9C. SAA reports that all of the Airport's REIL systems are in good condition.

#### 2.2.1.7.5. Runway Edge Lighting

Runway edge lights are white, visible through 360 degrees of the azimuth, and can be seen several miles from an airport under good visibility conditions. Runway edge lighting is used to outline the edges of a runway during periods of darkness or restricted visibility. These systems are classified in accordance with their intensity or brightness. The Airport implements High Intensity Runway Lights (HIRL) on Runways 9L-27R and 9R-27L. Runways 9C-27C and 18-36 are equipped with Medium Intensity Runway Lights (MIRL). All runway edge lighting systems are reported by SAA to be in good condition.

#### 2.2.1.7.6. Runway Threshold Lighting

The identification of runway ends or thresholds assists pilots of approaching aircraft in much the same manner as other approach aids. Runway ends or displaced thresholds are given special lighting consideration. Threshold identification lights make use of a two-color lens: red and green. The green half of the lens faces the approaching aircraft and indicates the beginning of the usable runway. The red half of the lens faces the airplane on the rollout or takeoff, indicating the end of the usable runway. Each of the Airport's runway ends are equipped with threshold lights. The threshold lighting on Runways 9L, 9R, and 27R are each equipped with a continuous bar of light, augmenting each's precision approach lighting. SAA reports that the threshold lighting systems are in good condition.

#### 2.2.1.7.7. Taxiway Lighting

The final segment of a flight commences with the taxi operation to the terminal gate, parking apron or hangar. Taxiway lighting, which delineates the taxiway edges provides guidance to pilots during periods of low visibility and darkness. The most commonly used type of taxiway lighting consists of a series of blue fixtures spaced a minimum of 200 feet apart along the taxiway edges. These lights provide taxiway alignment up to the apron. Excluding Taxiway F, all the Airport's taxiways are equipped with Medium Intensity Taxiway Lighting (MITL) spaced 75 feet apart on straight taxiway segments and varied distances along curved taxiway pavement. Most of the taxiway lighting network has been converted to a high efficiency, light-emitting diode (LED) system since the completion of the last AMPU. That system is reported by SAA to be in good condition.

#### 2.2.1.7.8. Apron Lighting

The entire apron in front of the Airport's commercial terminal building is equipped with a floodlight system via a network of 12 high-mast light poles (one per gate). The Airport's newest apron, known as 'Romeo Ramp,' and is equipped with four high-mast floodlights around its landside border. However, most of the Airport's remaining apron areas are not lit. SAA reports that the apron lighting systems are in good condition.

#### 2.2.1.7.9. Airfield Markings

The Airport's airfield markings are currently compliant with FAA standards and recommendations. Runway 9L, 9R, and 27R are marked with precision markings in accordance with the ILS precision approaches to those runway ends. Runway 18-36 is marked with non-precision markings consistent with the established RNAV GPS approach to the Runway 18 end. Runway 27L is also equipped with non-precision markings which support its RNAV GPS approach. Runway 9C-27C is marked with basic visual markings. Magnetic headings and variation have pushed all of the runways to their 'half-way point' and will require re-designation to 10-28 and 1-19 once paint conditions warrant remarking.

Taxiway markings are more basic in nature; however, FAA Advisory Circular 150/5340-1L, *Standards for Airport Markings*, identifies requirements for Part 139 certificated airports which include enhanced taxiway centerline markings, surface painted hold sign markings, and extension of the runway holding position markings onto paved shoulders, all of which are provided at the Airport.

##### 2.2.1.7.10. Signage

The Airport's signage consists of all required signage for a Part 139 certified airport including airfield location, mandatory instruction, and runway hold position signage. The majority of signs are lit with LED systems, and they assist pilots in recognizing their position on the airfield and direct them to their desired locations. They are key components to ground operations as they provide air traffic control (ATC) personnel the ability to effectively relay direction to pilots. It is recommended that all signs which are not LED are upgraded when practical.

#### 2.2.1.8. Land and Hold Short Operations

Land and Hold Short Operations (LAHSO) operations are an ATC procedure intended to increase airport capacity without compromising safety. Previously known as Simultaneous Operations on Intersecting Runways (SOIR), LAHSO has replaced the procedure by expanding to include landing operations to hold short of an intersecting runway or taxiway. Specific markings are placed on the runway pavement to depict the safe hold short line prior to the intersecting airfield pavement. LASHO markings and signage are located on three of the Airport's four runways. Runway 9R-27L is the Airport's sole runway that does not have LAHSO markings and signage.

## 2.2.2. Navigational Aids

Navigational aids, commonly referred to as NAVAIDs, assist pilots with en route navigation, approaches, and departures into and out of airports. They consist of both ground-based electronic systems and space-based satellite radio systems. NAVAIDs vary in sophistication. Typically, the degree of sophistication relates to the information provided to an approaching aircraft's pilot. The more sophisticated the NAVAID, the lower the minimums are at an airport. For that reason, instrument approaches and the NAVAIDs that make up the ground-based equipment required to perform the approach procedure are divided into two categories: precision and non-precision. A precision approach provides both horizontal and vertical guidance to pilots as their aircraft descends to land. A non-precision approach provides only horizontal guidance to the runway end.

The types of NAVAIDs available at an airport play an important role in use of the facility. Typically, pilots of corporate or commercial aircraft anticipate access to an airport in nearly all-weather conditions. Therefore, it is incumbent upon an airport to have NAVAIDs that allow for approaches to the airport during marginal and instrument flight conditions if it intends to attract or serve corporate or commercial aircraft.

Various types of NAVAIDs are utilized at the Airport. Ground-based electronic NAVAIDs that are located on or near the Airport are classified as en route NAVAIDs or terminal area NAVAIDs. Details on those two classes of NAVAID are discussed further in the following sections.

### 2.2.2.1. En Route Navigational Aids

En route NAVAIDs are designed to assist pilots with navigation between their origin and destination airports. En route NAVAIDs are established to maintain accurate en route air navigation. They use ground-based transmission facilities and onboard receiving instruments. There is one type of en route NAVAID in the Orlando operating area. The very high frequency (VHF) omnidirectional range (VOR) is a ground based NAVAID which transmits high frequency radio signals 360 degrees in azimuth from its station. These radio signals enable pilots to turn at a given point above the ground or fly along a radial and align with the station. VORs are often combined with distance measuring equipment (DME) or tactical air navigation equipment (TACAN). These emit signals enabling pilots to determine their line-of-sight distance from the facility. The TACAN also provides azimuth information for military aircraft.

In addition, VORs are used to define low altitude (Victor) and high altitude (Jet Route) airways through the area. Low altitude airways are designated from 1,200 feet AGL, up to but not including, 18,000 feet MSL (Class E airspace). They are generally used to accommodate lower-speed, non-jet aircraft. They are also used to vector jet traffic into and out of airports. Pilots flying to and from the Airport may use the Orlando VORTAC (VOR and TACAN) and/or the Ormond Beach VORTAC. The Orlando and Ormond Beach VORTACs are approximately 15 nautical miles (NM) south-southwest and 32.2 NM north-northeast of the Airport respectively.

### 2.2.2.2. Terminal Area NAVIDs and Landing Aids

Included in this group are NAVAIDs located at or near the airfield for providing aircraft guidance information while arriving, departing, or overflying the area under all weather conditions. Landing aids provide either precision or non-precision approaches to an airport or runway. Both precision and non-precision approaches provide runway alignment course guidance (horizontal guidance) to pilots, while precision approaches also provide glide slope information (vertical guidance) for descent purposes. The Airport has eight Instrument Approach Procedures (IAPs), three of which are instrument landing systems (ISL) and the other five are area navigation (RNAV) GPS procedures. Seven of the Airport's eight IAPs provide vertical guidance, therefore they are all considered precision approaches. Characteristics of each IAP are listed in **Table 2-9,** and descriptions of each type of procedure are provided in the following sections.

**Table 2-9 – SFB Instrument Approach Procedure Summary**

| Instrument Approach Procedure | | | Aircraft Category | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| Runway 9L ILS or LOC | Straight-In ILS | Precision | 255 – ½ | 255 – ½ | 255 – ½ | 255 – ½ |
| Runway 9R ILS or LOC | Straight-In ILS | Precision | 239 – ½ | 239 – ½ | 239 – ½ | 239 – ½ |
| Runway 27R ILS or LOC | Straight-In ILS | Precision | 245 – ½ | 245 – ½ | 245 – ½ | 245 – ½ |
| Runway 9L RNAV (GPS) | LPV DA | Precision | 255 – ½ | 255 – ½ | 255 – ½ | 255 – ½ |
| Runway 9R RNAV (GPS) | LPV DA | Precision | 239 – ½ | 239 – ½ | 239 – ½ | 239 – ½ |
| Runway 18 RNAV (GPS) | LPV DA | Precision | 249 – ¾ | 249 – ¾ | 249 – ¾ | 249 – ¾ |
| Runway 27L RNAV (GPS) | LNAV MDA | Non- Precision | 420 - 1 | 420 - 1 | 420 – 1½ | 420 - 2 |
| Runway 27R RNAV (GPS) | LPV DA | Precision | 245 – ½ | 245 – ½ | 245 – ½ | 245 – ½ |

Source: FAA, AirNav.com, 2020

##### 2.2.2.2.1. ILS Systems

ILSs are considered a Precision Approach as an ILS system provides an approach path for alignment and descent of an aircraft on final approach to a runway. The system provides three functions: guidance, range, and alignment. Guidance is provided vertically by a ground-based glide slope antenna and horizontally by a localizer antenna. Marker beacons or Distance Measuring Equipment (DME) furnishes range. Approach lighting systems and runway edge lights supply visual alignment.

Currently SFB has a Category I ILS established for Runways 9L, 9R, and 27R. The ILS approaches to these runways use a standard 3.0-degree glide slope with a runway threshold crossing height of 45 feet for Runway 9R and 55 feet for both Runways 9L and 27R. The Airport's ILS approaches can be flown whenever the ceiling is 200 feet or greater and visibility is at least one-half mile.

##### 2.2.2.2.2. RNAV-GPS

Area Navigation (RNAV-GPS) instrument approaches have become commonplace as GPS and Wide Area Augmentation System (WAAS) have become mainstream. RNAV-GPS approaches utilize a space-based radio-navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control. The Airport is equipped with five RNAV approaches, four of which utilize WAAS and provide vertical course guidance. The RNAV approaches to Runways 9L, 9R, and 27R provide precision approach minima of half-mile visibility and decent altitudes (DAs) of 200 feet AGL. The other two RNAV approaches to Runways 18 and 27L provide minima of three-quarter mile visibility with 200 feet DA and one mile visibility with 400 feet DA respectively.

## 2.2.3. Commercial Passenger Facilities

### 2.2.3.1. Commercial Terminal Apron

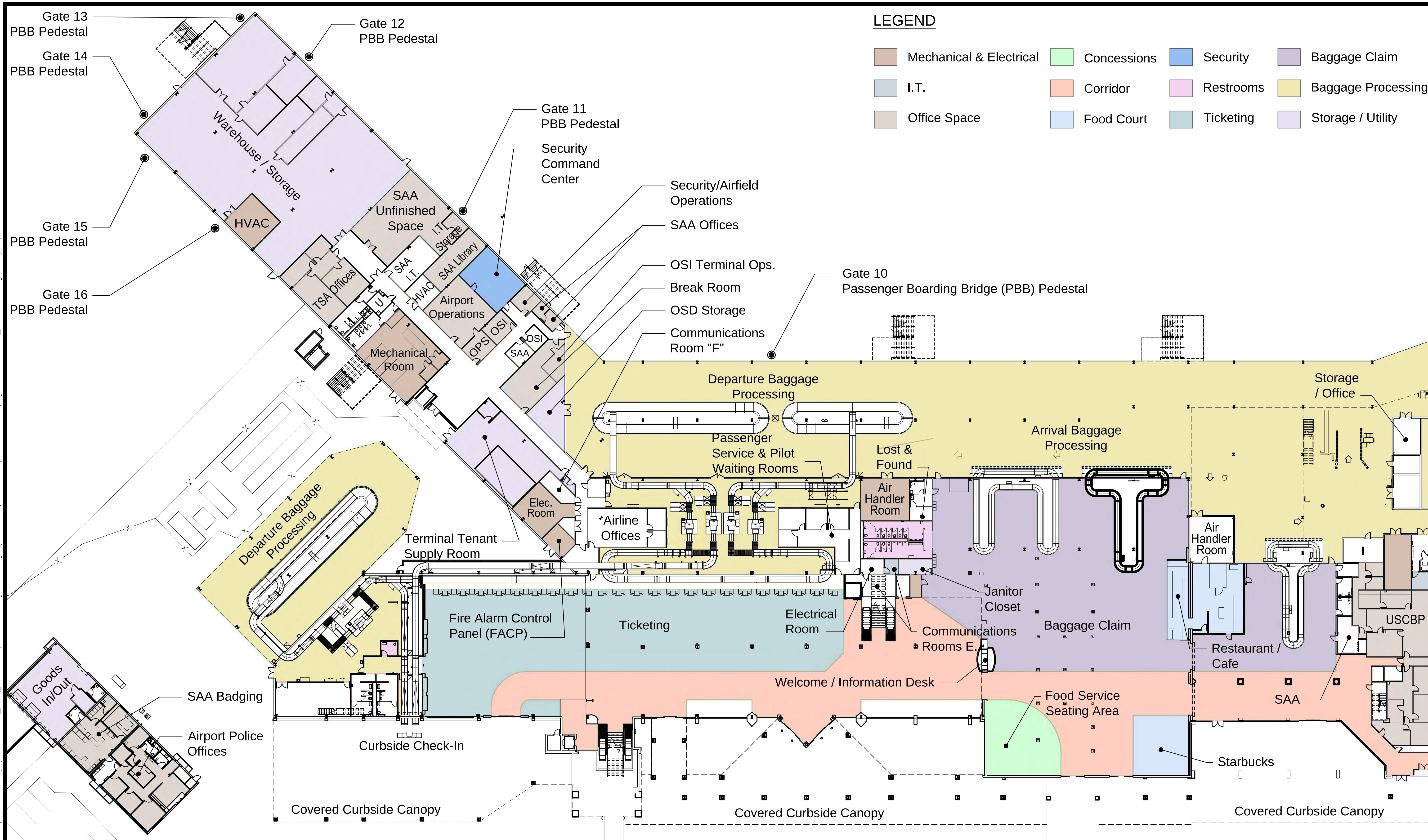
The Airport's commercial service apron is approximately 67,500 square yards. It is in the immediate vicinity of the commercial terminal gates and supports commercial aircraft when navigating to and from and docking with the terminal concourse. The East Terminal Apron is roughly 27,250 square yards and is located immediately east of the commercial terminal apron. That apron area is currently used for aircraft maneuvering, equipment staging, and for remain overnight (RON) parking of aircraft. However, upon completion of the on-going terminal expansion, this apron will be occupied by the Airport's four newest terminal contact gates (Gates 1 – 4). The East Terminal Apron's strength is sufficient to support large, wide-body air carrier aircraft, e.g., B747, B767, B777, B787, A340, A350, A380, etc. The displacement of commercial terminal apron from the completion of the terminal expansion is offset from the newly constructed Romeo Ramp. The Romeo Ramp is located along Taxiway R and is approximately 35,400 square yards.

#### 2.2.3.2. Commercial Terminal Building

The Airport's commercial terminal facility is south of Runway 9C-27C and west of Runway 18-36. The terminal complex is accessible via East Lake Mary Boulevard by Red Cleveland Boulevard, as well as Airport Boulevard. Prior to 2020 the terminal complex was split between domestic (Terminal B) and international (Terminal A) passenger spaces. However, given both terminals' international sterile corridors, each has the flexibility to serve domestic or international passengers, therefore the differentiation between the two dissolved, and it is currently referred to as simply the 'passenger terminal.' An international sterile corridor is a dedicated space where international passengers arrive or depart and are kept separate from domestic passengers. Those at the Airport allow for the flexibility to service domestic or international operations at Gates 5 through 13. However, Gates one through four and 14, 15 and 16 are limited to domestic passenger operations as they are not linked to the international sterile corridor.

The space previously known as the 'Domestic Terminal (Terminal B)' was originally constructed in 1992 and was expanded in 2000 and 2001. Like many areas of the terminal, that area is currently being expanded to nearly double the ticketing/check-in spaces (from 27 to 43 ticket counters), increase the linear pick-up/drop-off curb frontage, and expand the Airport's in-line baggage processing facilities, to include the Airport's first ever curb-side check-in area. On-going terminal construction is likely to be completed near the end of this AMPU planning process. As such, those expansions are considered 'existing' infrastructure for planning purposes even though they have yet to be commissioned.

The area previously known as 'Terminal B' has grown from approximately 166,000 square feet of conditioned space as reported in the Airport's 2012 AMPU to approximately 178,000 square feet (approximately 96,000 and 82,000 square feet on its first and second floors respectively). The first level of that area consists of a main lobby, ticketing, departure and arrival areas, Starbucks, a café, gift shop, and multiple baggage claim areas, all accessible to the public. Areas on the first level which require secured access control and are not accessible to the public include inbound and outbound baggage processing areas, airline offices, airport security and operations offices, terminal tenant supply rooms, mechanical, electrical, I.T. rooms, and warehouse storage space. Approximately 47,000 square feet of covered, secured, unconditioned space is primarily used for ground service equipment (GSE) storage and baggage processing functions. **Figure 2-16** depicts the first level of the Area previously known as 'Terminal B'.

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Terminal Gates 10 - 16
First Floor

Figure 2-16

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The second level of the area previously known as 'Terminal B' consists of a centralized TSA passenger screening area, a large gift shop, a food court including another Starbucks, other concession areas, and departure hold rooms for Gates 10 through 16. This area also houses airport operations and SAA offices. Making way for a new centralized passenger screening area, OSI, Inc. recently relocated its offices from just west of the existing passenger screening area to the Welcome Center building. **Figure 2-17** depicts the second level of the Area previously known as 'Terminal B'.

The area previously known as the 'International Terminal' or 'Terminal A' was constructed in 1996 along with a 60,000-square-foot Federal Inspection Service (FIS) facility. The FIS was expanded in 2004 and 2005 to accommodate international traffic growth. This area is depicted on **Figure 2-18** and **Figure 2-19** and encompasses approximately 209,000 square feet of conditioned space (approximately 93,000 and 116,000 square feet on its first and second floors respectively). As is depicted in **Figure 2-18**, the majority of its first level consists of US Customs and Border Protection (USCBP) offices and the FIS Immigrations and Naturalizations processing areas. Another large portion of the first level consists of a new baggage claim area which provides three baggage claim islands. The baggage claim area is the only portion of the first level which does not require security screening or clearance and is accessible to the public. Other elements of the first level of this area consist of airline offices, pilot lounge and dispatch, duty free warehouse, and various storage space. Ground handling personnel offices are also located in a 2,600-square-foot space on the first level of the terminal pier directly underneath Gates 7 and 8. The first level also consists of approximately 45,500 square feet of covered, secured, unconditioned space primarily used for GSE storage and baggage processing functions.

As is depicted in **Figure 2-19**, the second level of the area previously known as 'Terminal A' is devoted to passenger departure lounges with supporting concessions including duty-free shopping, several restaurants and pubs, and a VIP lounge (Royal Palm Lounge). An unconditioned area approximately 5,600 square feet on the second level consists of a covered and screened outdoor space which is used as a smoking area. As was previously mentioned, OSI, Inc.'s offices are located adjacent to the Royal Palm Lounge, in the second level of the Welcome Center building, which is connected to the terminal via a second level enclosed walkway over the airport entrance road.

**Figure 2-20** and **Figure 2-21** depict the newly constructed terminal expansion, which added four commercial passenger service gates to the Airport. The first level (**Figure 2-20**) of that expansion consists primarily of 14,000 square feet of covered, unconditioned space primarily used for GSE storage. There are two mechanical and I.T. rooms on the first level which make up approximately 4,500 square feet of conditioned space. The second level (**Figure 2-21**) is almost entirely made up of 20,600 square feet of a conditioned sterile corridor leading to Gates 1 through 4's PBBs.

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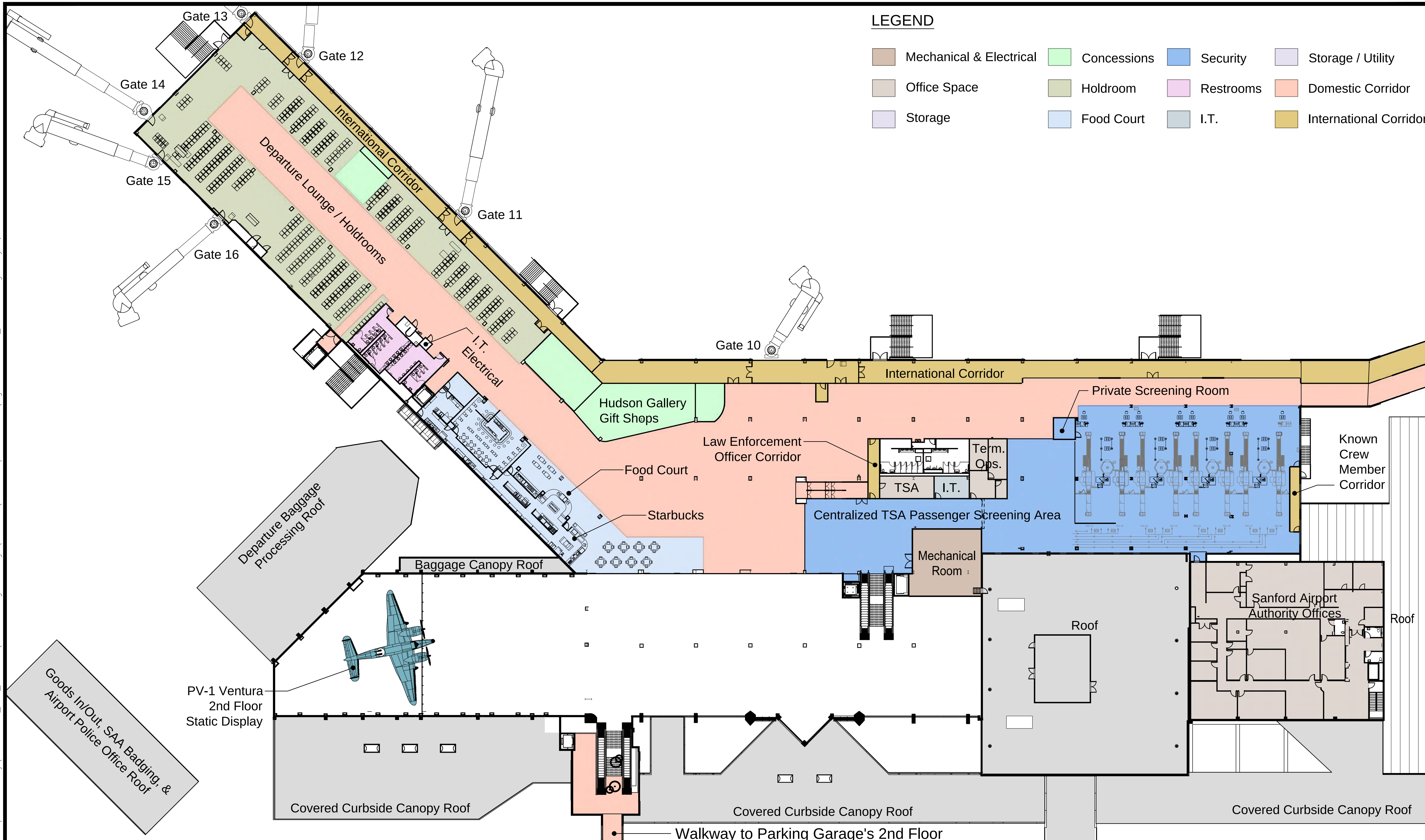


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Terminal Gates 10 - 16
Second Floor

Figure 2-17

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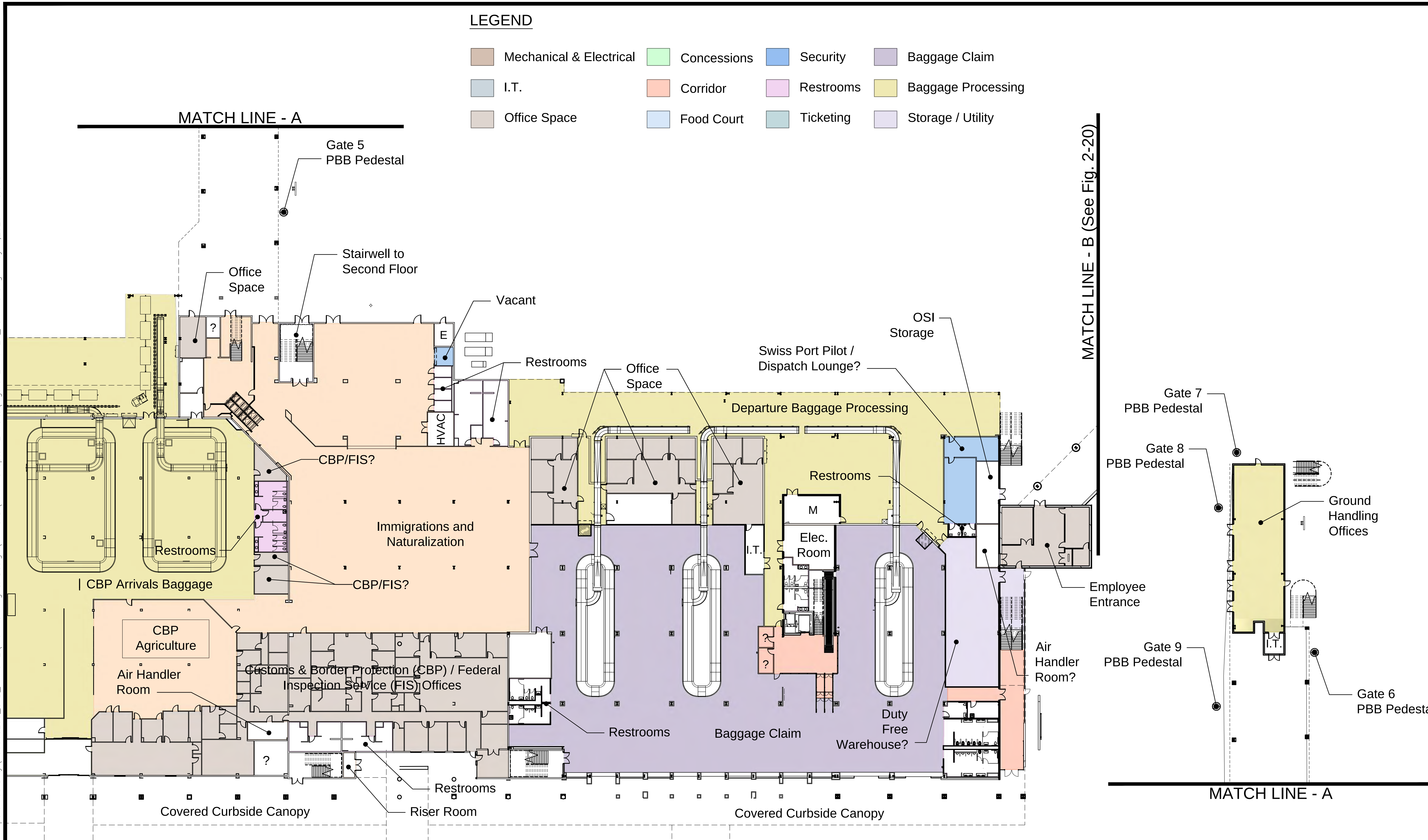


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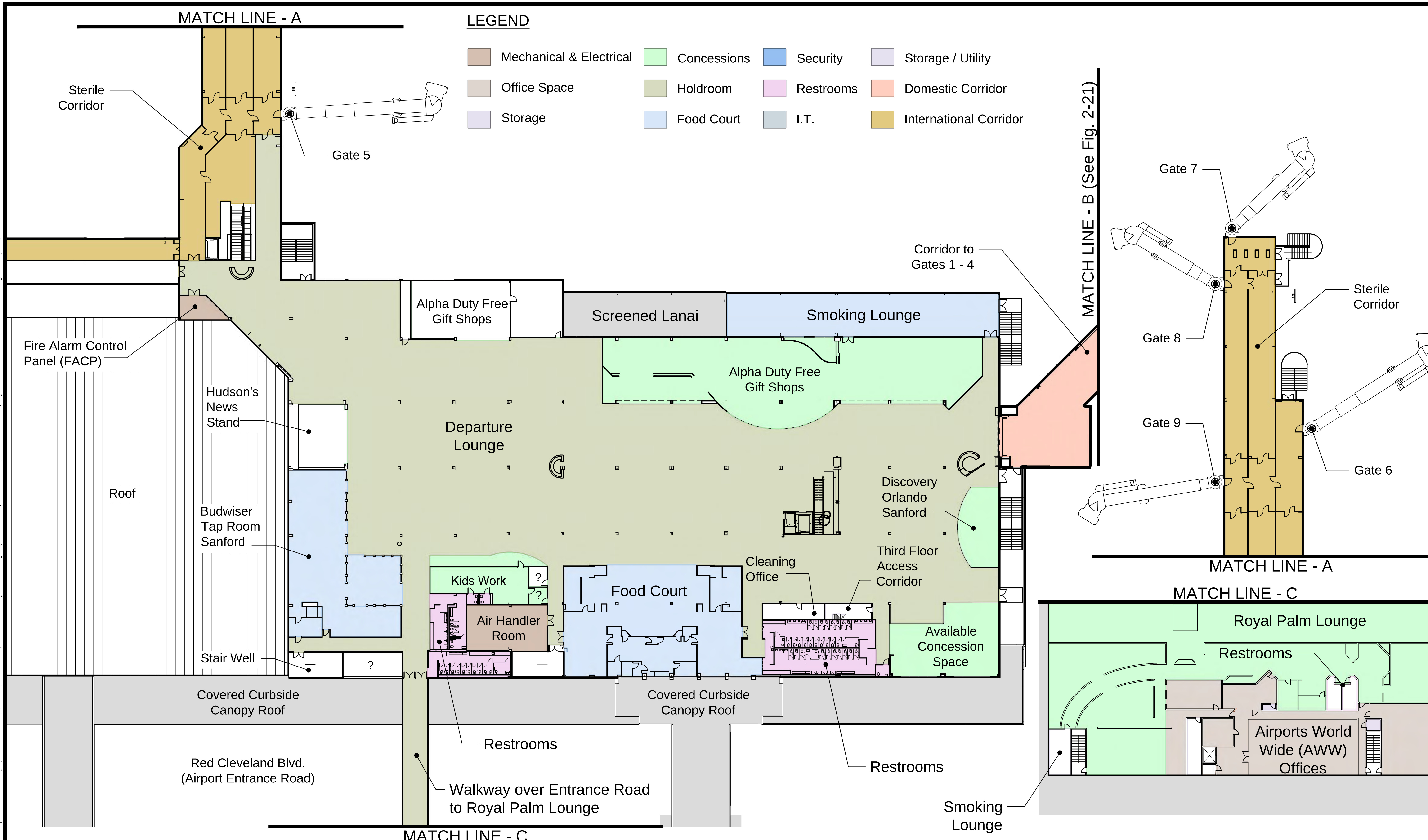
Terminal Gates 5 - 9
First Floor

Figure
2-18

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Terminal Gates 5 - 9 Second Floor

Figure 2-19

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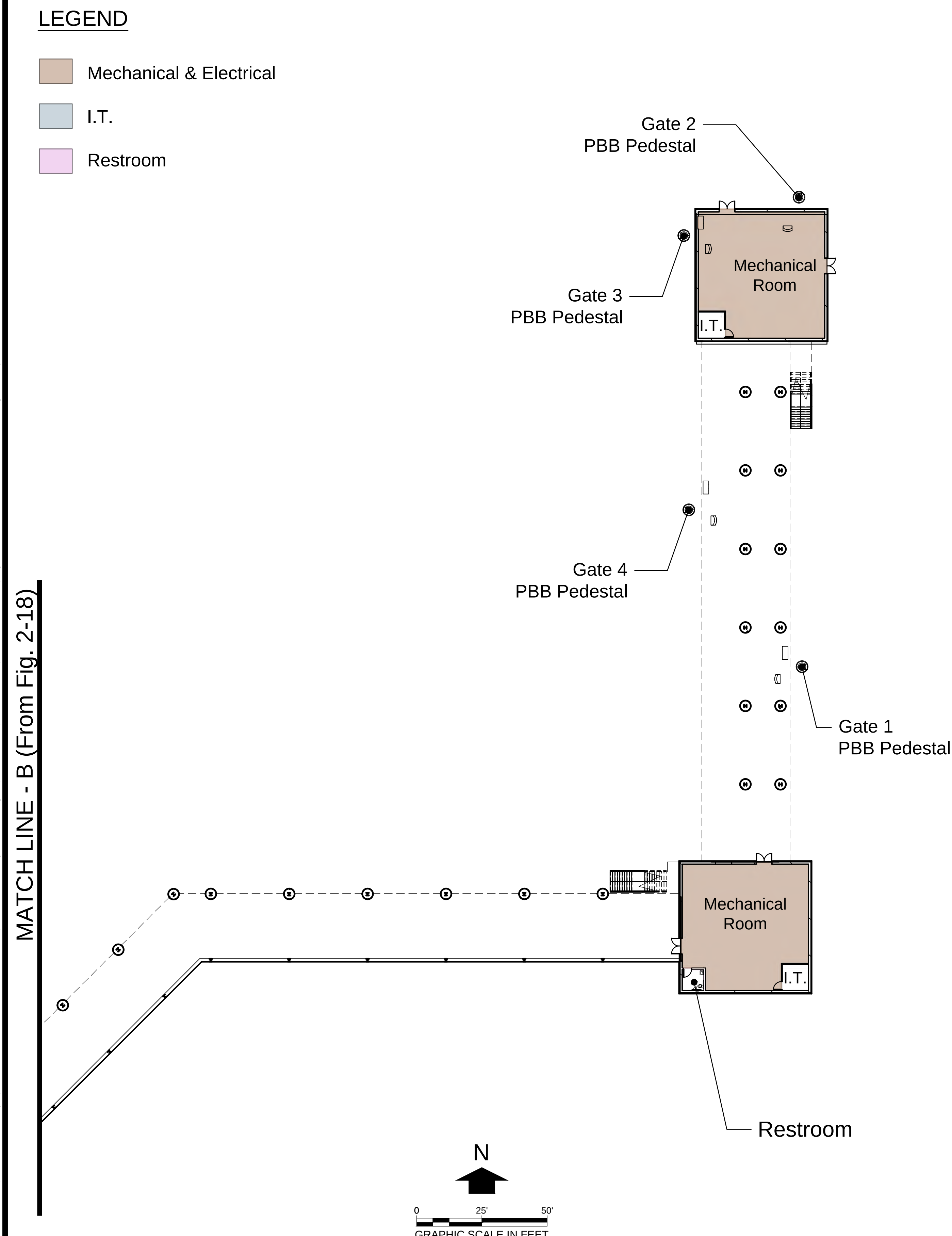


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J:\05_Projects\Sanford Airport Authority\100063290_SFB_AMPU-2\4.0 Planning & Design\4.1 CAD\4.1.1 Chapter Exhibits\Figure 2-16-21_Terminal.dwg

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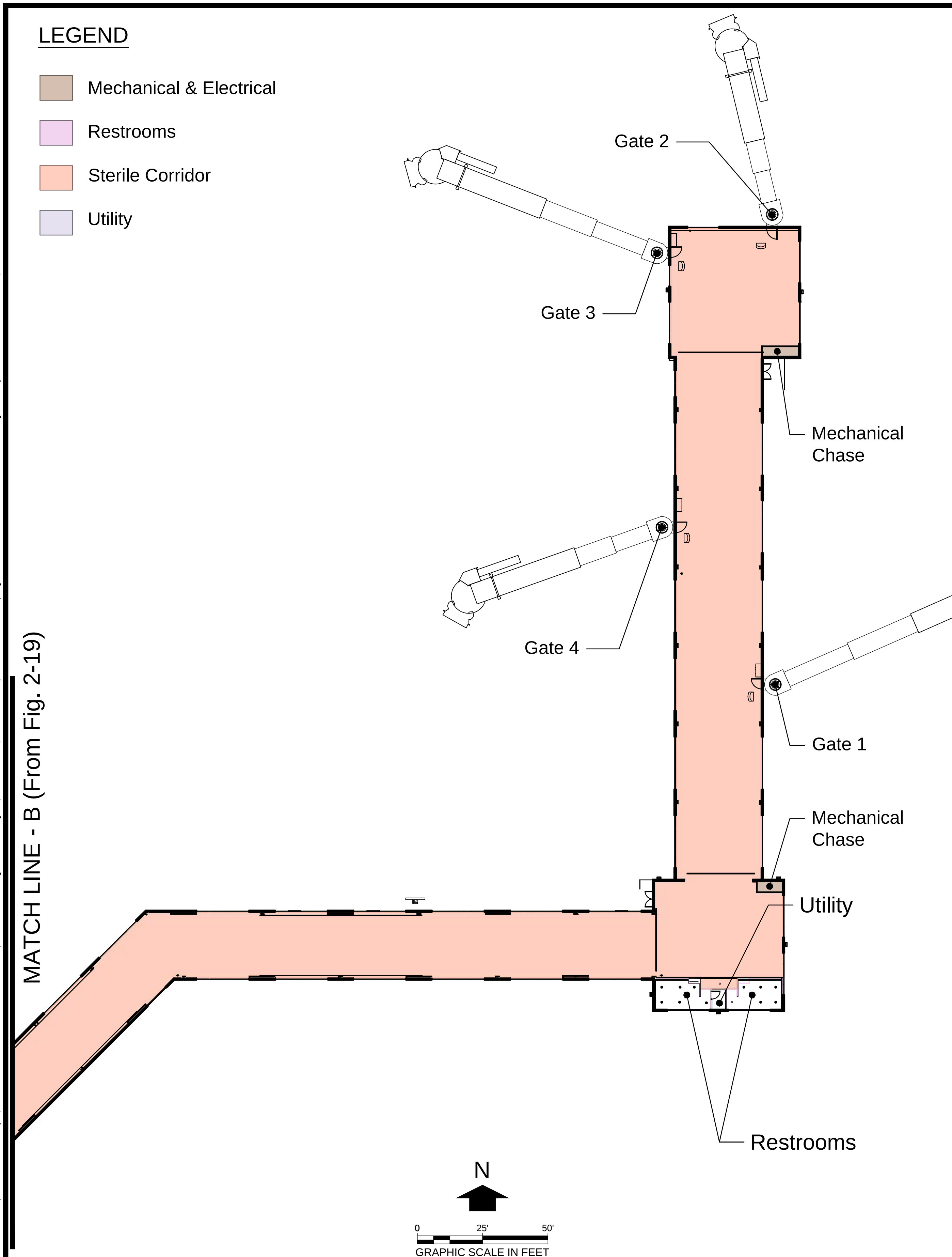
Terminal Gates 1 - 4 First Floor

Figure 2 - 20




2020 Orlando Sanford International Airport Master Plan Update
Terminal Gates 1 - 4 Second Floor

Figure 2 - 21

### 2.2.3.3. Access and Circulation

#### 2.2.3.3.1. Ground Access System

The existing transportation network of the region is important in assessing the Airport's future development. The existing ground access system supports not only passengers coming to and from the Airport but cargo which is being transported in and out as well. The access system is well developed in the Sanford area and consists of highway, rail, and air service. A CSX railway shares the Airport's western border and has several spurs on airport property which provide rail access to the Airport's industrial tenants. The closest passenger rail stations are SunRail's 'Sanford Station' and 'Lake Mary Station' which are both about a seven-mile drive to or from the Airport's terminal curb. Major highways in the area consist of U.S. Highway 17-92, SR-46, SR-415, County Road 427, and State Highway 417 (the Central Florida GreeneWay). I-4 is the nearest interstate, located approximately seven miles west of the Airport (see **Figure 2-2**).

#### 2.2.3.3.2. Airport Access

The transition to Greater Orlando's newest international airport began in the early 1990s. As construction of the Central Florida GreeneWay created a direct highway link between the Airport and the resorts of Kissimmee and Walt Disney World, SAA authorized construction of a new passenger terminal (previously known as 'Terminal B'), which was completed in 2001.

Regional access to the Airport is provided via I-4, I-95, and the Central Florida GreeneWay. I-4 runs east and west through the central part of Florida, connecting Tampa, on the west coast, with Daytona Beach on the east coast. I-95 is a north-south route, located along the east coastline connecting Jacksonville and Miami. The Central Florida GreeneWay is an expressway located within one mile of the Airport connecting the City of Sanford with eastern Orlando, Kissimmee/St. Cloud area, and Disney attractions. The Airport is situated between these three highways, with I-4 located to the west, I-95 to the east, and the Central Florida GreeneWay located to the southwest.

SR-46 is an east-west highway, providing access to the Airport from the west via I-4 and from the east via I-95. The Florida Department of Transportation (FDOT) finished widening SR-46 in 2019 from two lanes to four lanes between Mellonville Avenue (west of the Airport) and SR-426 (east of the Airport). The four-lane East Lake Mary Boulevard encircles airport property by connecting with SR-46 at the Airport's northeast property corner and travelling south and west to connect with the Central Florida GreeneWay.

Local airport access is provided via a variety of routes. From the north, the Airport may be accessed by driving south on County Road 427 (Sanford Avenue), and turning east onto Wylly Avenue, ultimately entering the Airport from the west. Another option is to continue south on County Road 427 and turning east onto Airport Boulevard.

The Airport can be accessed from the south via US Highway 17-92, County Road 427, and East Lake Mary Boulevard. **Figure 2-2** illustrates the roadways within the Airport's vicinity.

#### 2.2.3.3.3. Terminal Building Curb Frontage

The terminal building curb provides space for passenger and baggage drop-off and pick-up. Approximately 906 feet of total frontage exist, of which 764 feet is usable for pick-up and drop-off. The remaining 142 feet of curb frontage consists of pedestrian crosswalks. The terminal curb road consists of four traffic lanes: two for loading and unloading baggage, and two through lanes.

### 2.2.3.4. Automobile Parking Facilities

Vehicular parking in the Airport's terminal area includes separate parking areas that can be categorized as public parking, employee parking, and seasonal/discretionary parking. **Figure 2-22** and **Figure 2-23** identify the various automobile related facilities near the terminal area.

#### 2.2.3.4.1. Public Parking

There are five public parking facilities provided at the Airport; the Cell Phone Lot (Lot C), Economy Lot (Lot E), Hourly Lot (Lot H), Garage (Lot G), and Long-term Lot (Lot L). The Cell Phone Lot is located off Red Cleveland Boulevard, just north of the Vigilante memorial aircraft display. It evolved from a small, unmarked gravel area in 2010 to its current square paved area of approximately 26,900 square yards able to efficiently accommodate approximately 70 standard sized vehicles. Parking in the cell phone lot is free. It is intended to reduce the number of vehicles traversing the terminal curb, thereby relieving curb-side vehicle congestion. Overnight parking in the cell phone lot is prohibited as it is not intended to store unoccupied passenger vehicles.

What was once a seasonal turf overflow parking lot became the economy parking ‘Lot F’ when it was paved, marked and lit in 2016. Lot E is at the southeast corner of the intersection of Red Cleveland and Airport Boulevards, and the rate to park there is $13 per day. There are 596 parking spaces and 12 spaces for the disabled in the economy lot. During peak periods approximately 300 more vehicle spaces are provided in a seasonal turf lot adjacent to the northern edge of Lot E. Lot E is served by a shuttle bus every 15 minutes which transports passengers to and from the terminal curb. A concrete sidewalk connects the lot to the terminal curb if someone didn’t want to utilize the shuttle bus.

The closest lot to the terminal is the Hourly parking ‘Lot H’, which is due east of the terminal building adjacent to the international ticketing area. Lot H was utilized primarily by employees, however the Airport’s increase in passenger traffic has necessitated its repurposing. Lot H had a capacity of storing 345 vehicles, however the ongoing terminal expansion project required the removal of over 100 vehicle spaces and 8 spaces for the disabled. As such, Lot H currently has capacity for storing 230 vehicles. The first 15 minutes of parking is free, and then the rate is $2 for every 20 minutes with a maximum daily charge of $28.

The vehicle parking garage ‘Lot G’ is due south of the area previously known as the ‘Domestic Concourse.’ It was opened to the public in August 2007. The parking garage is predominantly used for short- and long-term parking, offering 830 public parking spaces in its five levels. The public parking rate for the garage is $2 per 20 minutes up to a maximum daily rate of $17. The garage has a direct connection to the terminal building via an enclosed pedestrian bridge from the second floor of the garage which leads to an elevator and escalators providing access to the domestic passenger ticket counter area.

The long-term parking ‘Lot L’ is located south of the parking garage, is slightly farther from the terminal building. It has a total capacity of 806 vehicles and is the second most economical parking option constantly available to Airport users. The current parking rate for the long-term lot is $2 per 30 minutes up to a daily maximum rate of $14.

#### 2.2.3.4.2. Seasonal Parking

The seasonal lots are unpaved areas used for overflow parking most typically experienced during the winter holiday season. The Airport utilizes two such turf lots. While the capacity, fee structure, and operation of the seasonal overflow lots are likely to change annually, typically the Airport charges flat parking rates based on the number of days a car is parked. The Airport offers shuttle buses every 15 minutes between the seasonal overflow parking areas and the terminal building. When in use the seasonal lots are lit by portable gas generated flood lights for safety and security. The current fee structure for the seasonal lots is $10 per day up to a weekly maximum rate of $50 and a total maximum of $100.

Seasonal ‘Lot 1’ is at the southeast corner of the Airline Avenue, Airport Boulevard intersection. It has the capacity to house approximately 760 vehicles. Seasonal ‘Lot 2’ is east of the northeast corner of the intersection of Mellonville Avenue and Airport Boulevard. It has the capacity to house approximately 525 vehicles. Both lots are opened at the discretion of the Airport based on anticipated demand for parking facilities during peak periods.

#### 2.2.3.4.3. Employee Parking

Airport employees have a designated employee parking lot, known as ‘Lot E’. It is west of the long-term lot and provides approximately 250 vehicle parking spaces. The employee lot is connected to the terminal building via a sidewalk which parallels Airline Avenue.

### 2.2.3.5. Ground Transportation

The Airport’s ground transportation services have historically experienced large demand levels resulting from passengers consisting mainly of tourists en route to one of Orlando’s many area attractions. The Airport’s ground transportation services include rental cars, busses, limousines, taxi service, and rideshare companies Uber and Lyft. **Figure 2-19** and **Figure 2-20** previously identified the various ground transportation facilities located in the Airport’s terminal area.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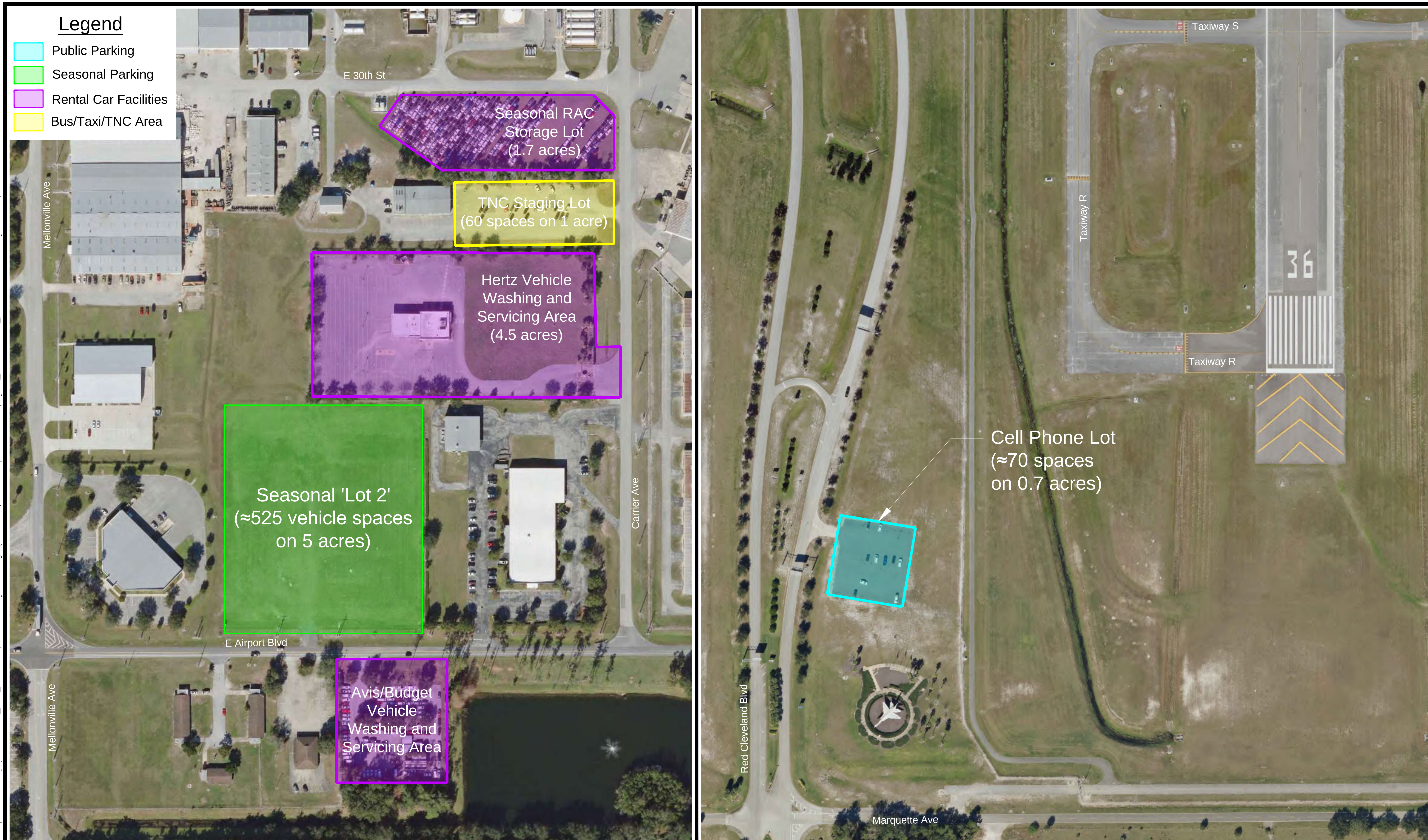
Vehicle Facilities ≤ Half Mile from the Terminal Area

Figure 2-22

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Vehicle Facilities ≥ Half Mile & ≤ 1 Mile from the Terminal Area

Figure 2-23

#### 2.2.3.5.1. Rental Cars

Eight rental car companies currently provide services at the Airport. They include Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, and Thrifty. Each have a rental counter and office space located in the Welcome Center building across the street from the terminal curb. Dollar and Alamo both have large independent facilities within the Airport's terminal area used for washing and servicing vehicles and additional parking of vehicles ready for rental. Specifically, Dollar and Thrifty currently have parking positions for 305 vehicles in their designated private parking area, and Alamo currently maintains 650 parking positions. The need for rental car ready space has grown to the point that the Airport's short-term parking lot was converted to such in 2017. This converted lot has 154 standard vehicle parking spaces and four designated spaces for disabled drivers or passengers.

#### 2.2.3.5.2. Taxi/Bus/Limo

There are over 100 companies which provide either taxi, shuttle bus, limo, and other pre-arranged transportation options to the Airport's travellers. The designated pick-up zone for taxi, and pre-arranged shuttle services is adjacent to the western edge of the Welcome Center which is directly across the street from the passenger terminal. This area contains open air covered canopies for passenger comfort and convenience. There is approximately 200 linear feet available for taxis and shuttles (estimated space for four taxis and two shuttles). Approximately 320 linear feet are available for larger buses (estimated space for four buses). Also located in this area are approximately 10 parking spaces for taxis, limos, and shuttles and four spaces for airport operations vehicles.

#### 2.2.3.5.3. Ride-share

The aviation industry is widely referring to a rideshare company as a Transportation Network Company (TNC). The two most prolific TNCs are Uber and Lyft, both of which provide their services to the Airport's users. TNCs share the same pick-up zone as taxi and buses previously mentioned. However, they are not staged in that location, but rather in a designated TNC staging lot located at the intersection of East 29th Street and Carrier Avenue. A geofence has been established to provide TNC drivers a first-in, first-out (FIFO) experience which ensures fairness and that TNC vehicles are only taking up space along the terminal curb facilities when they are summoned, thereby reducing curb side congestion.

## 2.2.4. General Aviation Facilities

The Airport's GA activity consists primarily of corporate, flight training, and recreational flying operations. The facilities associated with those types of operations include aircraft storage hangars, based and transient aircraft tie-down aprons, fixed base operators (FBOs), and GA vehicle parking. Presently, a total of 348 aircraft are based at the Airport. The Airport's based aircraft mix consists of 222 single-engine, 47 multi-engine, 14 turbo-prop, 59 jet aircraft, and 6 helicopters. **Figure 2-24** depicts Airport's GA facilities.

### 2.2.4.1. Aircraft Storage Buildings/Hangars

Storage needs for GA aircraft often reflect an airport's local climatic weather conditions. In addition, the size and sophistication of an airport's based aircraft fleet reflects the types of hangars needed. In general, aircraft with higher values are more likely to be stored in larger, more secure facilities. There are two types of hangar space available at the Airport; T-hangars and conventional hangars.

#### 2.2.4.1.1. Conventional Hangars

A conventional hangar is typically a rectangular or square shaped facility and can hold multiple aircraft while also allowing for additional equipment to be stored within the facility. These hangars are often stand-alone structures, however they can also be connected. Conventional hangars provide greater flexibility than T-hangars because they do not have interior support structures that limit aircraft positioning. They are usually equipped with utilities such as electricity, water, and possibly sewer services. A review of the Airport's facilities reveals a total of 49 conventional hangar buildings. Some of those hangar buildings contain multiple bays. For example, the 18 conventional hangar structures on the South East Ramp complex consist of 24 corporate hangars with 12 offices, 42 large box hangars, and 8 small box hangars (74 total bays). Other conventional hangars are intended to store multiple aircraft, such as those found along Hangar Road, or those associated with FBO or MRO operations.

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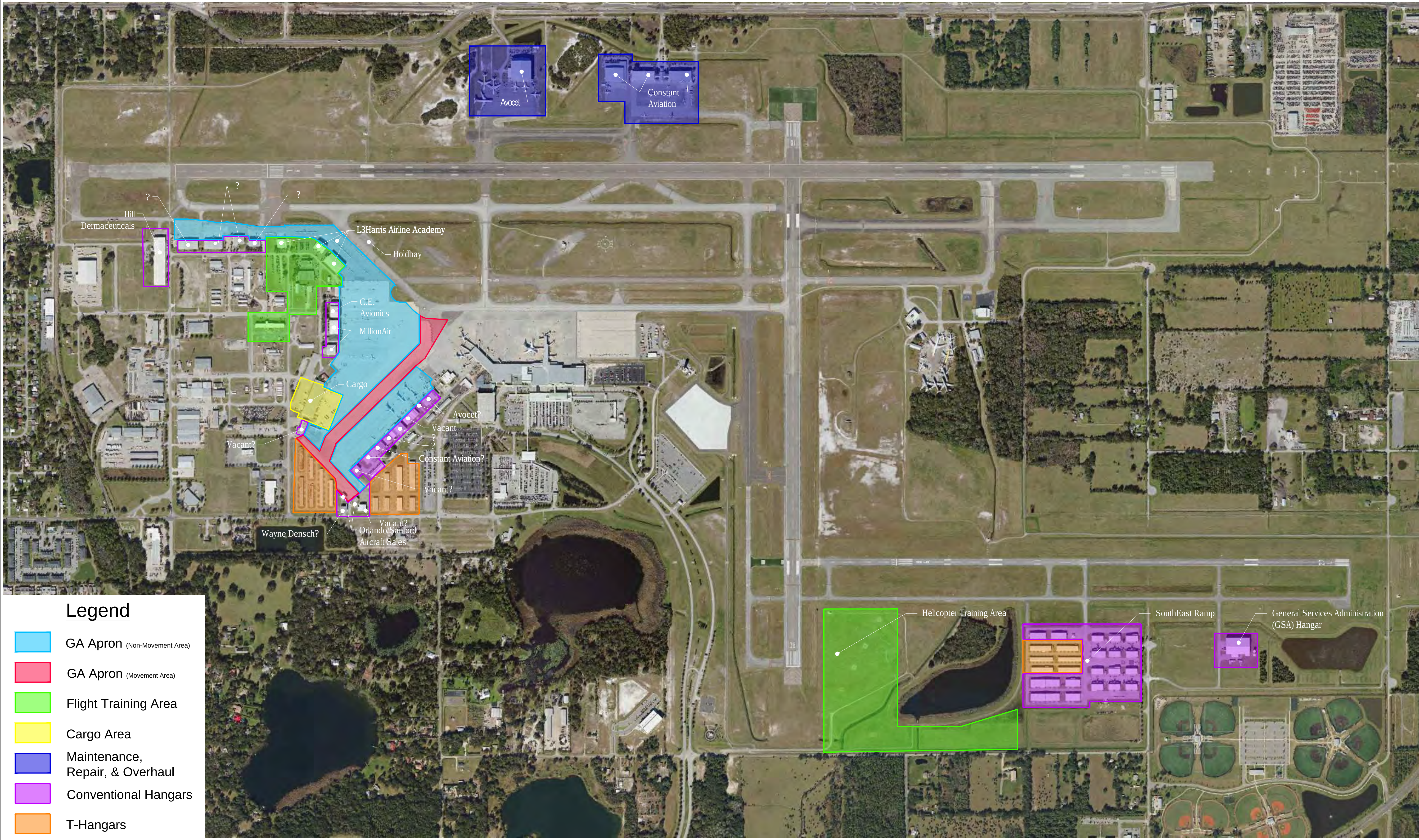


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General Aviation, Cargo, and Other Tenant Facilities

Figure 2-24

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#### 2.2.4.1.2. T-Hangars

T-Hangars are designed to maximize aircraft storage utilization while minimizing both cost and utilized land. They typically allow for the complete protection of aircraft stored inside and are often scaled for small recreational aircraft. These facilities are usually rectangular and store aircraft in a line by alternating direction of aircraft by nose and tail.

The Airport's T-hangar facilities are found primarily in two areas. The original T-Hangar area consists of 13 buildings, containing a total of 106 units for aircraft storage. Those buildings are located on the south side of the West GA Apron. Of the 106 units, 32 are built for typical twin-engine aircraft and the remaining 74 were built for single-engine aircraft. The South East Ramp hangar complex was established in 2005 and is adjacent to Runway 9R-27L. This complex contains six T-Hangar buildings (four large T-hangar buildings and two small T-Hangar buildings) which provide 34 units for light-twin aircraft and 24 units for single-engine aircraft.

### 2.2.4.2. General Aviation Apron Areas

The Airport contains multiple GA apron areas, located on its west, north, and east sides, which serve a variety of airport tenants' aircraft parking and tie-down needs.

### 2.2.4.3. Fixed Base Operators (FBOs)

Up until March 2019, the Airport relied on two large FBOs to provide fueling, maintenance, and terminal facilities to small aircraft GA and corporate users. Those FBOs include Constant Aviation and MillionAir. However, due to the increase of corporate aircraft maintenance needs, Constant Aviation has turned its focus on the growing demand of aircraft maintenance leaving MillionAir as the Airport's sole FBO provider.

#### 2.2.4.3.1. MillionAir

MillionAir is located on the West Apron adjacent to the L3Harris Airline Academy and the Air Cargo operations area. The main facility is 30,955 square feet, of which 6,955 square feet is used as office, administration, lounge, and flight planning space. The main hangar is approximately 24,000 square feet with 11,490 square yards of adjacent apron space which is equipped with roughly 15 universal tie-down spaces. MillionAir maintains a secondary hangar, measuring approximately 14,400 square feet in area.

MillionAir provides fuel services to its customers via four 20,000-gallon Jet-A tanks and one 20,000-gallon AvGas tank located at the fuel farm on East 30th Street. MillionAir recently acquired control of Constant Aviation's two 20,000-gallon fuel tanks; one Jet-A and one AvGas tank. Fuel dispersal to aircraft is provided by MillionAir via multiple fuel trucks. MillionAir's private automobile parking area allows for 41 parked vehicles.

Other aircraft services currently provided by MillionAir include bottled oxygen, parking, heavy aircraft maintenance including power plant, avionics services, aviation accessories, catering, pilot supplies, car rentals, and courtesy transportation.

### 2.2.4.4. Other Aviation Tenants

The Airport is home to several other aviation tenants. Tenant businesses include aircraft and avionics maintenance operators, flight schools, aircraft/helicopter manufacturers, aircraft sales and rentals, and small air taxi and charter operators. The following sections discusses the Airport's major tenants in further detail.

#### 2.2.4.4.1. Avocet MRO Services

Avocet is a FAA and European Union Aviation Safety Agency (EASA) certified MRO provider who has conducted aircraft maintenance for over 25 years. Avocet has recently pioneered the standard process of converting a passenger Airbus A321 to a freighter aircraft. Over the next five years it is estimated that 1,600 A321 aircraft will be converted worldwide, and Avocet is projecting to handle over 60 of those conversions at the Airport. Avocet's hangar and apron are located due west of the Constant Aviation Apron. Avocet leases various other facilities on the Airport. The SAA constructed a new 44,000-square-foot hangar designed to accommodate a B767-300 aircraft in January 2011. That hangar includes approximately 4,000 square feet of shop space and 5,300 square feet of office space.

As stated previously, Avocet's operations are expected to steadily grow throughout the planning period's mid-term. Avocet's representatives have expressed to SAA the likely need for additional hangar and apron space to keep up with their expected increases in MRO activity in the immediate future.

#### 2.2.4.4.2. CE Avionics

CE Avionics is one of the Airport's longest running tenants, established at the Airport in 1970. Representing all major aircraft manufactures, CE Avionics provides complete sales, installation, and service of avionics, autopilots, and flight instrumentation. CE Avionics conducts their main operations from a single 12,000-square-foot corporate box hangar (100 x 120 feet) and 4,000-square-foot office and shop space (100 x 40 feet) adjacent and due north of the MillionAir FBO.

CE Avionics' clients consist mainly of corporate aircraft which are no longer covered by their factory warrantees, and approximately 75 percent of their clients are not based at SFB. Approximately 25 percent of their clients are local, one of which is the L3Harris Airline Academy, its 'next door neighbor' which brings an average one aircraft per day for maintenance and repair.

Some of the largest aircraft types that CE Avionics services include King Airs, Cessna Citations, Falcon 400s, Hawker 900 and 950s, and Gulfstream G-IVs, G-Vs, and G-450s. CE Avionics' business is not limited to aircraft physically located at the Airport. They dispatch mobile ground units to any airport in Central Florida (from as far south as Boca Raton to as far north as Jacksonville), providing on-demand service. Approximately 30 to 40 percent of CE Avionics' installations are conducted in that manner.

CE Avionics' 18,000-square-foot aircraft parking apron was fully reconstructed between 2015 and 2017. Their vehicle parking area abuts their office and shop space and consists of 15 paved parking spaces, but with 23 employees their vehicle parking area is over capacity.

A meeting with CE Avionics revealed that their sales are expected to double, and they are looking to hire 15 additional employees in the next five years. According to CE Avionics' key staff, their facilities at the Airport need to grow commensurately. That rapid growth projection partly stems from the FAA's mandate that all aircraft operating in any airspace requiring a transponder be equipped with an Automatic Dependent Surveillance-Broadcast (ADS-B) by January 1, 2020. The FAA's final rule which established the ADS-B mandate was published in May 2010, and the FAA's public communication since then has remained clear that there will be no extensions to their January 1, 2020 deadline. Only aircraft which are flown in uncontrolled airspace or those without electrical systems (i.e. hot air balloons and gliders) are exempt from the mandate.

#### 2.2.4.4.3. Constant Aviation

Constant Aviation announced its acquisition of StarPort Aviation in March 2017. As previously mentioned, Constant was one of the Airport's two FBOs up until March 2019. Constant specializes in airframe and engine maintenance, major repairs, avionics, interior refurbishment, paint, parts distribution and accessory services and is one of the fastest growing MROs in the country. In addition to SFB, they have branches at Cleveland Hopkins International Airport (CLE), Cuyahoga County Airport (CGF), Phoenix-Mesa Gateway Airport (IWA), and McCarran International Airport (LAS). They also have 'aircraft on ground' (AOG) mobile response teams which enable them to provide maintenance, avionics and structure technicians anywhere in the country.

Constant's main facility is on the north side of Runway 9L-27R just off SR 46, though they utilize several facilities at various locations on the Airport. Constant's main facilities are the Airport's closest to the approach end of Runway 18 and consist of one 12,000-square-foot office building and passenger lounge and two 20,000-square-foot hangars with room for up to four Gulfstream Vs, and a 30,000-square-foot maintenance hangar flanked by approximately 17,000 square feet of office space. Their aircraft parking apron is approximately 27,800 square yards. Constant's main ramp can withstand the weight of a Boeing 727 (170,000 pounds) and has 18 anchored tie-down positions for smaller aircraft. As was previously mentioned, they have a 40,000-gallon fuel farm (two 20,000 gallon tanks; one Jet-A and one Avgas) which is now owned and operated by MillionAir. The typical aircraft fleet served by Constant includes Bombardier, Dassault, Textron (Hawker/Beechcraft), Embraer, Nextant, and Gulfstream aircraft.

Constant also utilizes a 20,000-square-foot hangar with approximately 2,000 square feet of office space due south of the approach end of Runway 9L, adjacent to Hill Dermaceuticals. That hangar facility is equipped with approximately 5,900 square yards of aircraft parking apron and a 17-space vehicle parking lot. Finally, Constant utilizes two 8,100-square-foot (90 x 90 feet) hangars connected to the Airport's west ramp located on Hangar Road.

Constant's main automobile parking lot has the capacity for roughly 150 vehicles, eight of which are reserved for customers. However, the company currently employs 216 people and expect to grow by 30 to 50 people in the next year. As such, their representatives indicated that Constant's designated parking infrastructure is currently deficient.

##### 2.2.4.4.4. Hill Dermaceuticals

Hill Dermaceuticals (Hill) is a privately-owned pharmaceutical company that develops and manufactures innovative dermatology products for children and adults. Hill provides unique products that enhance the treatment of difficult to treat dermatologic diseases, and their sole purpose is 'to serve the field of dermatologic diseases exclusively, to the very best of its ability.' Hill was the first industrial business to be built at the Airport since 1987.

Hill's main facilities were originally built in 1999 and consist of a 7,500-square-foot (60 x 125 feet) aircraft hangar and a 1,040 square yard (125 x 75 foot) aircraft parking apron southwest of Runway 9L's approach end. They have a 10,000 gallon above ground fuel tank at the western edge of the apron. Their Good Manufacturing Practices (GMP) facility is connected to the southern edge of their hangar and is 57,500 square feet (125 x 460 feet). As such, their hangar and GMP facility, which are connected, make up 65,000 square feet, the Airport's largest building aside from its terminal facilities. The GMP is flanked with vehicle parking able to park 28 and 20 vehicles on its east and west sides, respectively. The northwest corner of the GMP is equipped with a truck dock.

Hill has expanded its main facilities twice since 1999. In 2002 and 2008 they extended their GMP to the south by approximately 160 feet (20,000 square feet) and 80 feet (10,000 square feet) respectively. Between 2016 and 2017 Hill built another facility on airport property, just north of the Seminole County Supervisor of Elections building, which is at the northeast corner of the intersection between Airport Boulevard and Mellonville Avenue. Hill's new building is approximately 19,500 square feet and is equipped with a truck dock, and a 24-space vehicle parking lot. As such, Hill's building facilities have averaged an annual expansion of 2,750 square feet from 1999 to 2017.

##### 2.2.4.4.5. L3Harris Airline Academy

The majority of the Airport's pilot instruction is performed by L3Harris Airline Academy, which was previously Aerosim Flight Academy. L3Harris is an accredited, full-service flight training school, offering flight training (private, instrument, commercial, ATP, and recurrent training), ground school, and pilot supplies. L3Harris currently bases 105 aircraft at the Airport; 48 Cessna 172s, 25 Cirrus SR20s, 23 Piper Seminoles, 5 Diamond DA42s, 6 Piper Arrows, and 4 King Air C-90s. In 2018, L3Harris generated an average of 1,100 flights per week, and that steadily increased throughout 2019.

The Academy operates out of seven buildings on the airfield. They have a dedicated Testing Center building (2749 Flightline Avenue) which is 1,685 square feet consisting of computer testing cubicles. Their course classrooms are in a 17,235-square-foot building at 2700 Flightline Avenue Their administration building contains offices and briefing rooms and is 8,550 square feet at 2694 Flightline Avenue Their flight operations building is 12,100 square feet at 2649 Flightline Avnue, and consists of aircraft dispatch, offices, and a retail supply store. L3Harris' largest building is a 39,072-square-foot residential dormitory for students at 1345 East 28th Street. Their Part 142 training program is in a 10,000-square-foot hangar and office at 1320 East 26th Place. Their shipping and receiving as well as storage for aircraft parts, GSE and personnel is contained in an 8,640-square-foot building at 1350 East 26th Place.

Their aircraft are parked in approximately 100 apron tie-downs, in a non-nested configuration which is safer and more efficient especially with student pilots. However, the flight school is running out of ramp and hangar space, so aircraft parked in nested rows may be required temporarily until additional apron and or hangar space is made available.

L3Harris conducts their own aircraft fueling operations via fuel trucks. Their fuel is stored in two 10,000-gallon AvGas fuel tanks, one 500-gallon MoGas (unleaded aviation fuel) tank, and one 20,000-gallon Jet-A fuel tank. Their operations average a monthly fuel consumption rate of 50,000 gallons, 7,000 gallons, and 1,000 gallons for AvGas, Jet-A, and MoGas respectively.

L3Harris' vehicle parking areas consist of 156 paved parking spots, nine of which are reserved for visitors, 14 are reserved for employees, seven spots for fleet vehicles, and 126 spaces available to all. However, the paved parking area is inadequate for L3Harris' needs, therefore grass overflow lots are consistently used.

#### 2.2.4.4.6. South East Ramp

The South East Ramp private hangar complex was established in 2005 and has over 275,000 square feet of hangar facilities for lease in 24 buildings. South East Ramp provides a wide range of hangar types and sizes including 12 corporate hangars (each over 9,000 square feet), five large box hangars (range from 1,528 to 3,857 square feet), four large T-hangar buildings (1,452 square feet per unit), and two small T-hangar buildings (807 square feet per unit). South East Ramp includes a large, 48,610-square-foot hangar used exclusively by the General Services Administration (GSA).

South East Ramp contains a full-service pilot lounge and meeting center that includes kitchen facilities, a flight planning area, and an entertainment area featuring club-style furnishings, large-screen TV and pool table.

South East Ramp's facilities store a variety of GA aircraft. Currently, there are 82 single-engine piston, 12 multi engine piston, six turbo prop, six jet, and three helicopter aircraft based at South East Ramp. Those aircraft generate an average of approximately 85 flights each week. Fuel for those aircraft is stored in two 12,500-gallon self-serve tanks (one Jet-A and one 100LL) just north of the pilot lounge. This designated 100LL fuel is only available to South East Ramp aircraft that are members of the fuel co-op. South East Ramp can also provide fuel services to jet aircraft via their 3,000-gallon Jet-A fuel truck. Each month South East Ramp aircraft consume approximately 20,000 and 2,300 gallons of Jet-A and AvGas fuel respectively.

South East Ramp has consistently grown and has plans to expand their facilities to the south and east to keep up with the demands and desires of aircraft owners to store their aircraft in South East Ramp's facilities.

### 2.2.4.5. General Aviation Automobile Parking

GA automobile parking is typically limited to designated areas along the front or side of each facility. Parking facilities range from two spaces to more than 100 spaces, as in the case of L3Harris Airline Academy and Constant Aviation. Tenant meetings revealed that one of the strongest needs felt by most GA tenants was for additional paved automobile parking.

## 2.2.5. Air Cargo Facilities

The Airport's air-cargo activity has historically utilized air-carrier aircraft, as no all-cargo carrier has been established. For this reason, a roughly 53,000-square-foot cargo building was constructed near the terminal apron just north of the Airport's original T-hangar facilities. This cargo building is equipped with a 6,600-square-foot refrigeration facility which allows for the storage of items such as flowers and perishable foods for overseas import or export.

## 2.2.6. Support Facilities

Several support facilities serve important roles in ensuring the efficiency of airport operations. These services include airport operations and maintenance, ARFF, ATC, fuel facilities, airport utilities, and airport police. These services all play key roles in the support of the Airport's aviation operations. **Figure 2-25** identifies the Airport's support facilities.

### 2.2.6.1. Airport Operations and Maintenance

The Operations Department is collectively responsible for all airside functions, terminal and landside coordination, and coordination of safety and security related functions. All Transportation Security Administration (TSA) directives, airfield inspections, wildlife management, airport user group communications, airspace coordination with ATC, and aircraft noise abatement issues are responsibilities of this department. The Operations Department conducts the required security classes of tenant employees for security badging purposes and maintains the integrity of the Airport's badging system.

The Airport's maintenance equipment is stored in several buildings on the west side of the airfield. These buildings are used to store lawn mowers and other shop and maintenance equipment. FAA guidelines indicate maintenance-building needs are related to the amount of paved areas and activity levels. For instance, increases in runway, taxiway, and apron pavement, combined with increasing activity levels, may result in the need to provide additional maintenance building space.

### 2.2.6.2. Airport Rescue and Firefighting

Airports that serve commercial passenger aircraft operations are required to have active and adequate ARFF facilities and personnel.. FAR Part 139.315 establishes an ARFF index that categorizes facilities based on size and assigns an index letter. The index for an ARFF facility is dependent upon the longest aircraft operated by an air carrier that operates an average of more than five flights a day from that airport. For example, airports that average more than five flights a day for an aircraft with a length between 91 to 126 feet would be an index "B". In the Airport's case, the ARFF facility is classified as a 'D' facility with a limited 'E' certification (24 hours advanced notice required by commercial service air carrier). The index 'D' certification is a direct result of the international air charter operations. These international operators primarily use wide-body aircraft such as the Boeing 767-200 and the Airbus A330-200 which require a well-equipped and capable ARFF facility and personnel.

Eleven full-time and two part-time employees are tasked with the responsibility of maintaining first response readiness for any airfield disaster or emergency response incidents that might occur. The Airport's ARFF facility has state of the art equipment and currently has one 3,000-gallon vehicle, three 1,500-gallon vehicles, and one 1,000-gallon vehicle. In addition, the Airport has an agreement with the City of Sanford and Seminole County Fire Departments to provide supplemental equipment and coverage in case backup support is needed.

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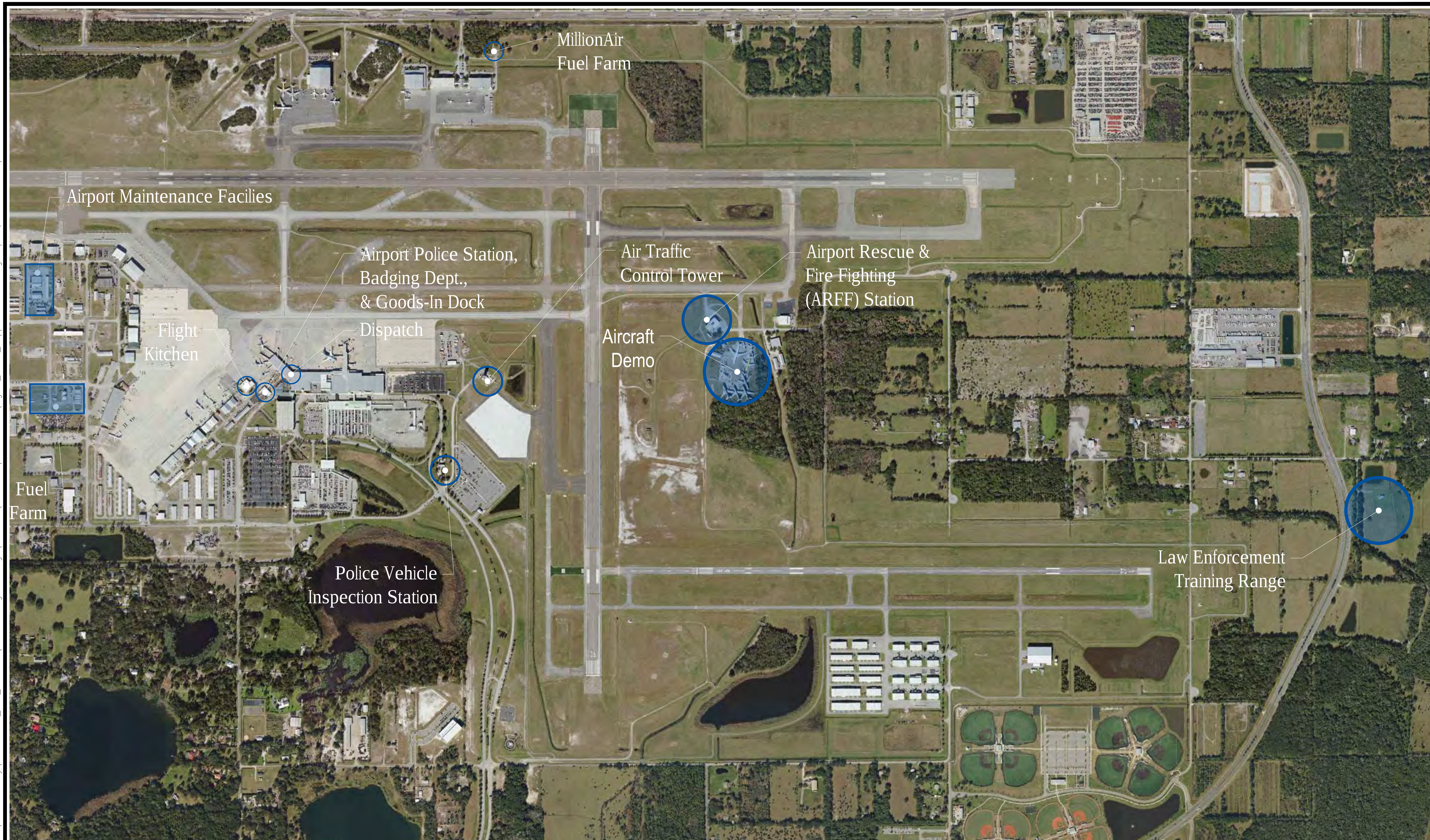


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Airport Support Facilities

Figure 2-25

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### 2.2.6.3. Fuel Storage

The Airport's fuel storage tank capacity ranges in size from 10,000 gallons to 250,000 gallons. Tanks owned by Hill Dermaceuticals and South East Ramp are located near their facilities, and as was previously mentioned MillionAir's tanks are located near Constant Aviation's facilities. However, most of the fuel tanks are located along 30th Street in the Commerce Park and are owned and managed by OSI, INC. **Table 2-10** lists the fuel storage facilities located on airport property. The 30th Street fuel farm has a total storage capacity of 950,000 gallons, which is dedicated entirely to Jet-A fuel and is intended primarily for use by scheduled air carrier aircraft.

**Table 2-10 – Existing Fuel Tank Facilities**

Aircraft Category

| Facility | Owner/Leasee | Location | Size (gallons) | Content |
|---|---|---|---|---|
| Tank 1 | L3Harris Airline Academy | 1250 E. 30th Street | 10,000 | 100LL |
| Tank 2 | L3Harris Airline Academy | 1250 E. 30th Street | 10,000 | 100LL |
| Tank 3 | MillionAir | 2841 Flight Line Avenue | 20,000 | Jet-A |
| Tank 4 | MillionAir | 2841 Flight Line Avenue | 20,000 | 100LL |
| Tank 5 | Constant Aviation | 100 Constant Court | 20,000 | Jet-A |
| Tank 6 | Constant Aviation | 100 Constant Court | 20,000 | 100LL |
| Tank 7 | Hill Dermaceuticals | 2650 S. Mellonville Avenue | 10,000 | Jet-A |
| Tank 8 | Sheriff's Office | 500 Don Knight Lane | 10,000 | Jet-A |
| Tank 9 | South East Ramp | Self Service on Apron | 12,500 | 100LL |
| Tank 10 | South East Ramp | Self Service on Apron | 12,500 | Jet-A |
| Tank 11 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 12 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 13 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 14 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 15 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 16 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 17 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 18 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 19 | OSI, INC. / Menzies | E. 30th Street | 50,000 | Jet-A |
| Tank 20 | OSI, INC. / Menzies | E. 30th Street | 250,000 | Jet-A |
| Tank 21 | OSI, INC. / Menzies | E. 30th Street | 250,000 | Jet-A |
| Tank 22 | OSI | Commerce Park | 20,000 | Jet-A |
| Tank 23 | OSI | Commerce Park | 20,000 | Jet-A |
| Tank 24 | OSI | Commerce Park | 20,000 | Jet-A |

Source: Sanford Airport Authority

### 2.2.6.4. Air Traffic Control Tower

The Airport's ATCT is the agency responsible for controlling aircraft operations within the terminal area and the area approximately five NM from the airport reference point (ARP). The majority of this area is centered over the

Airport from the surface up to 1,600 feet mean sea level (MSL). The ATCT provides air traffic control for the Airport itself, while Orlando International Airport (MCO) provides terminal radar approach control (TRACON) for the rest of the terminal area surrounding SFB.

FAA air traffic controllers provide ATC services at the Airport via the Sanford ATCT, which exercises control over aircraft operations on the ground and in the Airport's traffic control area (Class C). Currently, there are 23 FAA personnel (17 controllers, one manager, four supervisors, and one office administrator) authorized to operate the Tower. Sanford Tower is a Level 9 IFR tower with a 232-complexity index, and is operational daily between the hours of 6:30 a.m. and 11:00 p.m. Sanford Tower is seven stories high and located to the East of the International Terminal Building, due north of Romeo Ramp. The FAA commissioned the permanent tower site in the fall of 1993. Construction of the ATCT was completed in 1996. Sanford Tower is consistently one of the top 30 busiest in the Nation due to the Airport's heavy flight training operations.

#### 2.2.6.5. Utilities

Based on existing utility records and information provided by the respective utility companies, an overview of the existing utilities present on airport property was created and presented in **Figure 2-26**. Information was collected on the existing potable water, natural gas, and storm sewer networks that service both the main terminal as well as the Airport's GA facilities. Sanitary sewer force mains and pump stations are present on airport property, and their information is included in the overview.

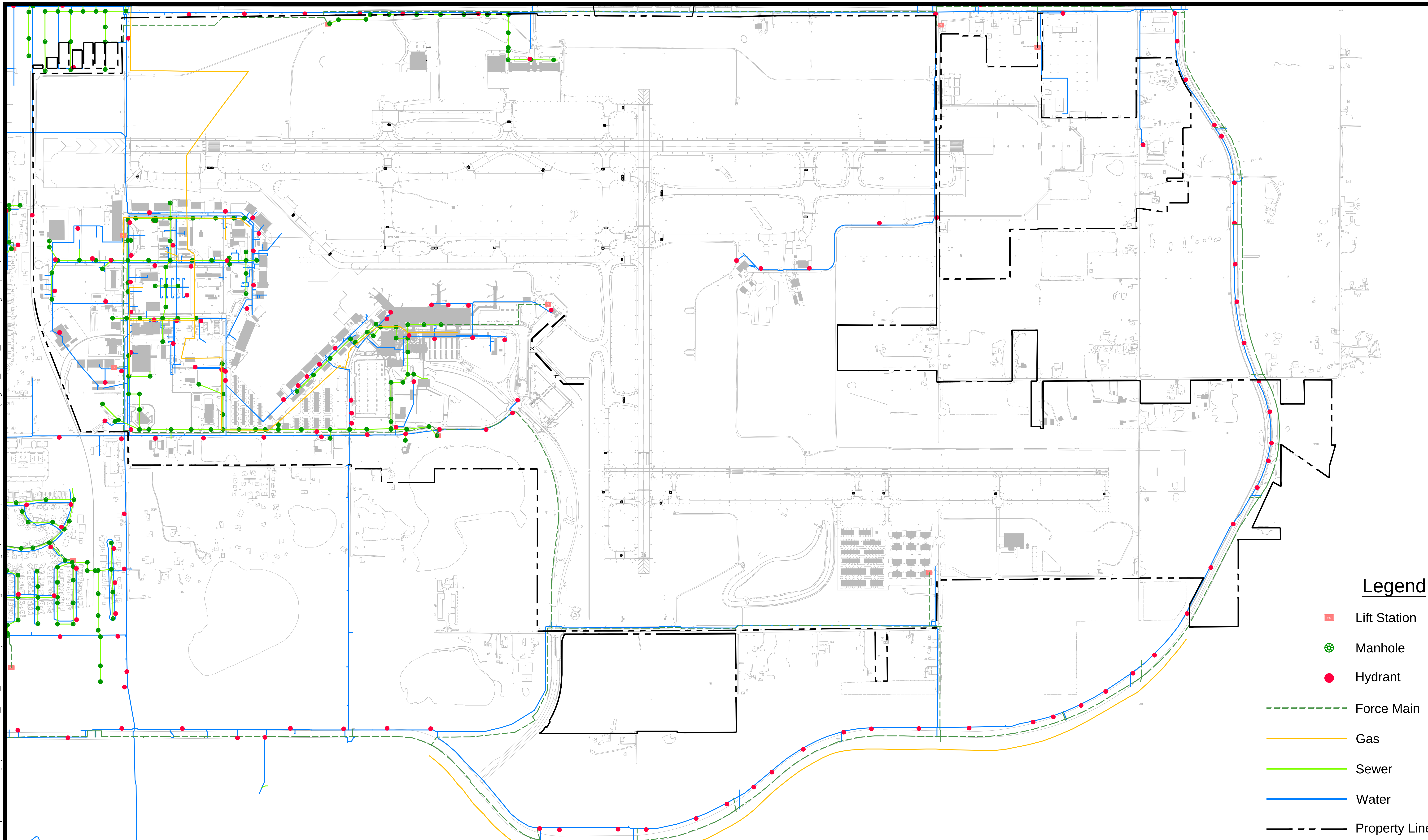
Potable water is supplied to airport facilities by the City of Sanford, Florida's Department of Water and Sewer Utilities. A water main runs parallel with East Lake Mary Boulevard, to the Airport's southern property line. A portion of that water main crosses the east side of the property, continuing along SR-415A. To the west of the Silver Lake Drive and East Lake Mary Boulevard intersection, three branches from that water main continue north, onto airport property. The eastern most of the three branches continues north and then east along Marquette Avenue and is used to service GA facilities. The other two branches continue north, following Ohio Avenue and South Mellonville Avenue, respectively. Both are used to support the network of water lines that service the main terminal areas.

A separate water main is located north of airport property, along East 25th Street (SR 46). This main provides potable water for the corporate hangar facilities located north of Runway 9L-27R. This main runs east along the road and branches to the south at Beardall Avenue and then continues south to Moore's Station Road where it turns to the west and provides service to the Airport's ARFF facilities.

Natural gas is supplied to the Airport's main terminal facilities by Florida Public Utilities. A four-inch polyethylene gas line runs along the southern edge of East Lake Mary Boulevard, south of airport property. Unlike the water main, this gas line does not continue along SR 415A, rather it stops short of entering the east side of the Airport's property. It does not supply gas to any airport owned facility. The main terminal facilities are supplied by a six-inch steel coated and wrapped steel gas line that originates north of East 25th Street (SR 46), north of the Airport's property. That gas line crosses under Runway 9L-27R, and supplies several smaller lines, one of which runs along Carrier Avenue and Airport Boulevard up to the main terminal facilities. There are no gas lines that support the Airport's GA facilities.

The Airport's sanitary services are provided by the City of Sanford, Florida's Department of Water and Sewer Utilities. Sizes of force mains are unknown, and therefore have been excluded. There are several force mains that support the Airport, one of which is located along East Lake Mary Boulevard. This force main follows the same path to the east as the water main, with a portion crossing onto airport property. Like the water line, this force main branches off just west of the East Lake Mary Boulevard intersection. This branch continues north to Marquette Avenue where it splits into two more branches. The east branch continues east along Marquette Avenue until it connects into a pump station located near the GA facilities. The north branch continues north to Airport Boulevard. where it continues to the west. That branch supports the main terminal facilities through a network of force mains and four pump stations. A sixth airport pump station is located at the north end of the property, just south of SR-46. That pump station supports a force main which splits into two branches, one east and one west. Both branches continue in their respective directions off airport property.

Storm sewers are located throughout the main terminal facility areas, as well as near the GA facilities and the corporate hangars located north of Runway 9L-27R. Sizes of pipes and inlets are unknown and therefore not included. The two main storm sewer lines run parallel to Airport Boulevard and East 28th Street. Another storm sewer network is located on the northern portion of airport property, along the south side of SR-46. That pipe network services the corporate hangars in that area. No storm sewer network was recorded for the GA facility area.

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2020 Orlando Sanford International Airport Master Plan Update

Existing Utility Network

Figure 2-26

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#### 2.2.6.6. Airport Police Department

The Airport Police Department is comprised of its chief, twelve officers, and one reserve officer. Airport Police Officers provide law enforcement coverage for the Airport on a continual basis. As a rule, a minimum of two Police Officers are scheduled on-duty at any given time. The Airport Control Center reports to the Airport Police Chief, who in turn, reports to the Airport President & CEO. There are six full time Airport Dispatchers, and one full time Airport Dispatch Supervisor. The Control Center personnel monitors and records all activities at the Airport, tracks all needs and events during on-going emergencies and activities, and provides radio and telephone assistance to all airport users including: Airport Operations, ARFF, Airport Police, Airport Maintenance, and Airport Administration.

The dispatchers monitor and provide support for no less than 12 complex computer systems, such as the Airfield Lighting System, the Spillman-Summit Records Management System (RMS) & Computer Aided Dispatch (CAD), the Thorguard lightning protections system, the Simplex Fire Alarm system, the Hirsch-Velocity Access Control system, the Genetec-Omnicast digital Video Recording system, the NICE digital Audio Recording system, and the Emergency Generator Monitoring system.

## 2.3. Airspace Structure

Congress granted the FAA the authority to control all airspace over the United States by passing the Federal Aviation Act of 1958. The FAA then established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. Airspace, including air navigation facilities, airports, and landing areas, aeronautical charts and information, associated rules, regulations and procedures, technical information, personnel, and material. System components shared jointly with United States Military branches are also included. Florida's airspace has high traffic capacity due to its multiple major commercial airports, as well as its numerous GA airports. The state's ideal flying conditions which occur almost year-round promotes GA pilots' activity to thrive. High tourism demand drives daily commercial passenger traffic which is a large contributor to the state's overall high air traffic volume.

### 2.3.1. Airspace Environs

Airspace is classified as controlled or uncontrolled. Controlled airspace is supported by ground-to-air communications, NAVAIDs, and air traffic services. In September 1993, the FAA reclassified major airspace. Those classifications are graphically depicted in **Figure 2-27** and **Figure 2-28** depict the regional airspace surrounding the Airport. The types of controlled airspace in the Orlando/Sanford area include:

- Class A airspace, which includes all airspace between 18,000 feet AMSL and 60,000 feet AMSL (as well as waters 12 NM off the cost of the 48 contiguous states).
- Class B airspace, which is generally the airspace from 10,000 feet AMSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers and is designed to contain all published instrument procedures once an aircraft enters the airspace.
- Class C airspace is from either the surface or 1,200 feet AMSL to 4,000 feet AMSL. This variation can be determined based on the location within the five NM coverage from the airport property. The Airport is classified as Class C airspace. The Airport's airspace includes all airspace from the established 55 feet AMSL elevation, up to 4,000 feet AMSL, and consists of two airspace layers.
- Class D airspace for airports with ATCTs, which normally extends from the surface to 2,500 feet above an airport's established elevation (charted in AMSL) and includes control zones and airport traffic areas. Class D airspace surrounding the airports in the Orlando area are individually configured.
- Class E airspace, which includes all controlled airspace other than Class A, B, C, or D. Class E airspace extends upward from either the surface of the designated altitude to overlying or adjacent controlled airspace. Class E airspace includes transition areas and control zones for airports without ATCTs.
- Class G airspace, which is uncontrolled airspace.

### 2.3.1.1. Class C Airspace

The Airport's airspace is classified as Class C, which is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at some commercial service airports. To fly inside Class C airspace, aircraft must have a two-way radio, an encoding transponder, and pilots must have established communication with the ATC controlling that airspace. Aircraft may be flown below the floor of Class C airspace or above Class C airspace ceiling without establishing communication with ATC.

Class C airspace surrounds airports that have an operational ATCT, are serviced by a radar approach control, and have a certain number of IFR operations or passenger enplanements. In the case of SFB, Orlando Approach Control provides approach control services.

There are two layers of Class C airspace centered over the Airport. The inner core area is approximately five NM in diameter centered about the Airport and extends vertically from the Airport's elevation to the floor of Orlando International Airport's (MCOs) Class B airspace, or 3,000 feet MSL. The airspace in the eastern most portion of the Airport's inner five NM ring begins at 700 feet MSL and extends vertically to the floor of MCOs Class B airspace. The elevated floor in this area enables operations at Cedar Knoll airport (private airport located approximately four NM due east of SFB) without coordination with Sanford's ATCT. The outer ring of SFBs Class C airspace has a diameter of approximately 10 NM and extends from 1,300 feet MSL to the floor of MCOs Class B airspace, or 3,000 feet MSL. The Class C airspace is active between 6:30 a.m. and 11:00 p.m. local time. When the Airport's ATCT is not in operation, the Class C airspace reverts to Class G airspace.

### 2.3.1.2. Class B Airspace

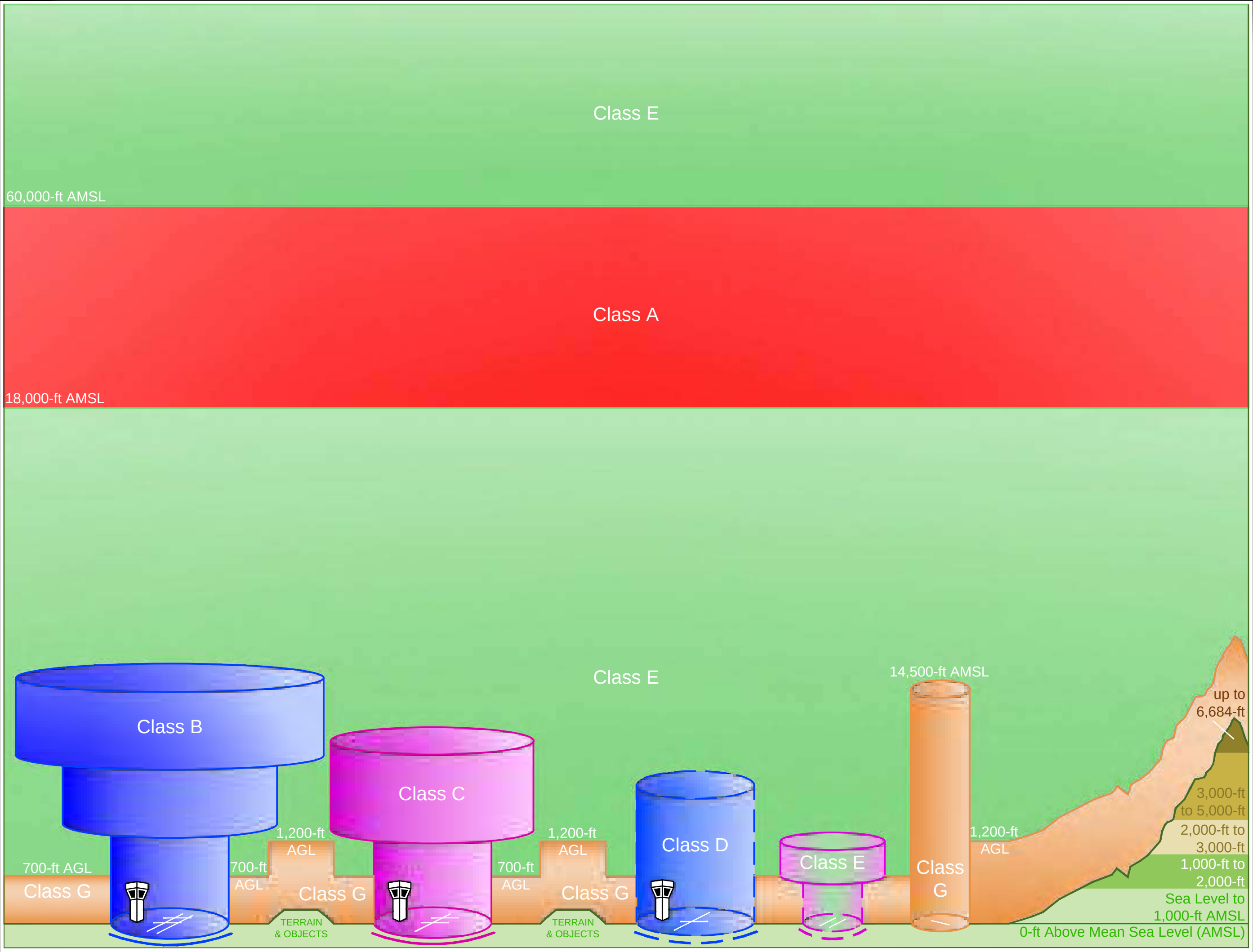
The Airport's Class C airspace is enclosed in the Class B airspace of MCO, which is approximately 21 miles southwest of the Airport. Class B airspace is defined around the busiest airports in the nation. All aircraft entering Class B airspace must obtain ATC clearance prior to entry. Aircraft must be equipped with a two-way radio for communications with ATC, an operating Mode C transponder, and automatic altitude reporting equipment. VFR flights may proceed under their own navigation after obtaining clearance but must obey any explicit instructions given by ATC. The exact shape of the airspace varies from one Class B area to another, but in most cases, it has the shape of an inverted wedding cake, with a series of "shelves" of airspace of several thousand feet in thickness centered on a specific airport. Each shelf is larger than the one beneath it. Class B airspace normally begins at the surface in the immediate area of its airport, and successive shelves of greater thickness and radii begin at higher altitudes at greater distances from the originating airport. At the Airport's location within the Class B airspace of MCO, the Class B is from 3,000 feet up to 10,000 feet AMSL.

### 2.3.1.3. Restricted Airspace

Restricted airspace is located directly east of the Airport's airspace. Entry into restricted airspace is prohibited under certain conditions without a special clearance obtained from the controlling agency obtained directly or via ATC. Restricted airspace designated R-2935 and R-2934 is located directly east of the Airport and is primarily in place for Kennedy Space Center located in Cape Canaveral, Florida. If pilots stay below 11,000 AMSL they will remain below R-2935, however R-2934 restricts all elevations.

### 2.3.1.4. Alert Areas

Alert areas are depicted on aeronautical charts to inform non-participating pilots of areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should be particularly alert when flying in these areas. All activity within an alert area must be conducted in accordance with CFRs, without waiver, and pilots participating as well as pilots transiting the area must be equally responsible for collision avoidance. Alert area designated A-294 is located directly to the northeast of the Airport. This area is identified to have a high volume of flight training activity from the surface to 4,000 feet AMSL.




## Communication Requirements and Weather Minimums

| | Class A | Class B | Class C | Class D | Class E | Class G |
|---|---|---|---|---|---|---|
| Minimum Pilot Qualification | Instrument Rating | Student * | Student * | Student * | Student * | Student * |
| Entry Requirements | IFR: ATC Clearance<br>VFR: Operations Prohibited | ATC Clearance | IFR: ATC Clearance<br>VFR: Two-Way Communication w/ ATC | IFR: ATC Clearance<br>VFR: Two-Way Communication w/ ATC | IFR: ATC Clearance<br>VFR: None | None |
| VFR Visibility Below 10,000 AMSL ** | N/A | 3 Statute Miles | 3 Statute Miles | 3 Statute Miles | 3 Statute Miles | Day: 1 Statute Mile<br>Night: 3 Statute Miles |
| VFR Cloud Clearance Below 10,000 AMSL | N/A | Clear of Clouds | 500 Below<br>1,000 Above<br>2,000 Horizontal | 500 Below<br>1,000 Above<br>2,000 Horizontal | 500 Below<br>1,000 Above<br>2,000 Horizontal | 500 Below<br>1,000 Above<br>2,000 Horizontal *** |
| VFR Visibility 10,000 AMSL and Above ** | N/A | 3 Statute Miles | 3 Statute Miles | 3 Statute Miles | 5 Statute Miles | 5 Statute Miles |
| VFR Cloud Clearance 10,000 AMSL and Above | N/A | Clear of Clouds | 500 Below<br>1,000 Above<br>2,000 Horizontal | 500 Below<br>1,000 Above<br>2,000 Horizontal | 500 Below<br>1,000 Above<br>1 Statute Mile Horizontal | 1,000 Below<br>1,000 Above<br>1 Statute Mile Horizontal |
| Airport Application | N/A | • Radar<br>• Instrument Approaches<br>• Weather<br>• Control Tower<br>• High Density | • Radar<br>• Instrument Approaches<br>• Weather<br>• Control Tower | • Instrument Approaches<br>• Weather<br>• Control Tower | • Instrument Approaches<br>• Weather | |
| Special VFR Permitted? | No | Yes | Yes | Yes | Yes | N/A |

* Prior to operating within Class B, C, or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilots are prohibited at those airports listed in FAR Part 91, Appendix D, Section 4.
** Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.
*** Class G VFR cloud clearance at 1,200 AGL and below (day): clear of clouds.

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Airport Master Plan Update
U.S. Airspace Classifications

Figure 2-27


Source: FAA Jacksonville Sectional Aeronautical Chart, Effective to August 15, 2019

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Airport Master Plan Update
Regional Airspace

Figure 2-28

Plotted By: HAND3027 J:\05_Projects\Sanford Airport Authority\100063290_SFB_AMPU-2\4.0 Planning & Design\4.1 CAD\4.1.1 Chapter Exhibits\2-28_SFB_Regional Airspace.dwg Jul08,2020 - 2:24pm

#### 2.3.1.5. Victor Airways

Victor Airways are commonly referred to as 'highways in the sky' as they are low altitude airway corridors that typically measure eight miles wide and are between altitudes 1,200 and 18,000 feet AMSL. Aircraft assigned to altitudes above 18,000 feet use the Jet Route (High Altitude) system.

Victor airways are designated navigational routes ranging between VOR facilities. They are recognized on sectional charts with a 'V' followed by its designated number. Victor airways have a floor of 1,200 feet AGL and extend rising to an altitude of 18,000 feet AMSL and their width depends on the distance between their navaid vertices, such as very-high frequency omni-directional range stations (VORs). When two VORs are less than 102 NM apart, the victor airway between them extends four NM on either side of the centerline for a total width of eight NM. When two VORs are more than 102 NM apart, the width of the airway beyond 51 NM from a VOR is 4.5 degrees on either side of the centerline. The maximum width of the airway is at a designated changeover point between the two navaids, which is typically halfway. Four Victor Airways are near the Airport, including V51, V267, V533, and V437 which passes directly over the Airport and connects to the Orlando Melbourne International Airport (MLB) VOR.

### 2.3.2. Delegation of Air Traffic Control Responsibilities

The FAA operates 22 Air Route Traffic Control Centers (ARTCCs), which control aircraft operating under IFR within controlled airspace, while in the en route phase of flight. The Airport is within the area controlled by the Jacksonville Center, which controls airspace that encompasses Northern Florida, the southeast quarter of Georgia, the southeast half of South Carolina, and small adjacent portions of both North Carolina and Alabama. Jacksonville Center transfers pilots to the Orlando approach control prior to their entry to the Airport's airspace.

Jacksonville ARTCC exercises their control of activity into and out of the Airport through remote radar and radio facilities located throughout the region. All air controllers employed by the Jacksonville Center are located at a single operation site in Hilliard, Florida (Jacksonville metropolitan area). From this location, controllers manage air traffic within the five-state region described above.

### 2.3.3. Operating Procedures

The FAA Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. An analysis of airspace use is critical in determining the capacity of the airfield and the operational interaction of the Airport and its surrounding airports. Flights into the Airport are conducted using both IFR and VFR. IFR governs procedures for conducting instrument flight during adverse weather conditions. VFR governs the procedures for flight under visual conditions. Most air carrier operations are conducted under IFR, even if weather conditions do not dictate such procedures. Published procedures for instrument approaches outline a pilot's required flight path and altitude. The Jacksonville ARTCC is responsible for en route control of all aircraft operating on an IFR flight into the Sanford Area.

Pilots can enter or exit the Sanford Area via federal airways. Many aircraft use Victor Airways, which are generated by VORs, providing air navigation orientation to pilots.

An airport such as SFB, which has an operating ATCT, has a defined air traffic area (ATA) surrounding it. Aircraft within the ATA must be in contact with ATC to receive approval for takeoffs, landings, and over flights of the Airport. Standard ATAs are designed to include all airspace within five NM of the Airport, up to but not including 3,000 feet AGL.

### 2.3.4. Airports in the Region

There are currently 10 public-use airports within a 30 NM radius of SFB. Their brief descriptions are provided in **Table 2-11**. There are numerous private airports within a 30 NM radius of SFB. 'Private airports' are publicly or privately owned, but they are not open or available for public-use. However, they may be available upon an invitation of the owner or manager.

**Table 2-11 – Airports Surrounding Orlando Sanford International Airport (SFB)**

| Airport Name (Identifier) | Location (Distance from SFB) | NPIAS Classification | Runway Headings & Dimensions |
|---|---|---|---|
| Orlando Executive (ORL) | Orlando, FL<br>14.8 NM South-West | Regional/Reliever | **7/25:** 6,004' x 150'<br>**13/31:** 4,625' x 100' |
| Deland Municipal (DED) | DeLand, FL<br>17.6 NM North-Northwest | Regional/Reliever | **5/23:** 4,301' x 75'<br>**12/30:** 6,001' x 100' |
| Orlando Apopka (X04) | Apopka, FL<br>18.7 NM East-Southeast | N/A | **15/33:** 3,987' x 60' |
| Massey Ranch Airpark (X50) | New Smyrna Beach, FL<br>20.3 NM North-East | N/A | **18/36:** 4,360' x 60' |
| Orlando International (MCO) | Orlando, FL<br>21.2 NM South-West | Primary Service/Large Hub | **18L/36R:** 12,005' x 200'<br>**18R/36L:** 12,004' x 200'<br>**17R/35L:** 10,000' x 150'<br>**17L/35R:** 9,001' x 150'<br>**H1:** 44' x 44' |
| New Smyrna Beach (EVB) | New Smyrna Beach, FL<br>22.5 NM North-East | Regional/Reliever | **7/25:** 5,000' x 75'<br>**11/29:** 4,319' x 75'<br>**2/20:** 4,000' x 100' |
| Arthur Dunn Air Park (X21) | Titusville, FL<br>23.0 NM South-East | Local/GA | **15/33:** 2,961' x 70'<br>**4/22:** 1,805' x 100' |
| Umatilla Municipal (X23) | Umatilla, FL<br>23.6 NM North-West | Basic/GA | **1/19:** 2,500' x 60' |
| Daytona Beach International (DAB) | Daytona Beach, FL<br>25.9 NM North-East | Primary Service/Non-Hub | **7L/25R:** 10,500' x 150'<br>**7R/25L:** 3,195' x 100'<br>**16/34:** 6,001' x 150' |
| Space Coast Regional (TIX) | Titusville, FL<br>27.8 NM South-East | Regional/GA | **18/36:** 7,319' x 150'<br>**9/27:** 5,000' x 100' |

Source: Skyvector.com, FAA 5010 Airport Data Sheets

## 2.4. Land Use and Zoning

Land use and zoning around an airport is critically important to the future utility and sustainability of airport operations. Without the security and support provided by compatible land uses around an airport property, airports and their sponsors can face a variety of safety difficulties, health and human safety concerns, and social/political dissent, which in the long run detracts from an airport's ability to reach its full public value potential.

The Airport is situated on approximately 2,400 acres and boasts one of the most efficient and user-friendly passenger terminal facilities in the United States. The Airport is located within the boundaries of the City of Sanford in the north western portion of Seminole County Florida, 18 miles northeast of Orlando, FL.

Future County and City land use policy should consider existing as well as future Airport facility development within their land use/zoning plans. Currently, property to the east and south of the Airport is used for agriculture. The areas north and west of the Airport are a mix of residential and commercial land uses. The previous master plan anticipated that the by-pass road (Lake Mary Boulevard extension) would encourage residential and commercial development south and east of the Airport, and that has indeed occurred in the last five years. Residential development is not considered a compatible land use for areas surrounding an airport, however commercial and industrial land uses are more compatible. Airport height zoning currently exists in the City of Sanford for the area lying under the western approach to Runway 9L ILS. SAA is working with County Planning and Zoning officials to hold residential development to a minimum under the approaches to the Airport's runways. In fact, the SAA plans to continue acquiring land areas up to Lake Mary Boulevard for additional airport development as well as for protection from residential encroachment.

The FAA requires through grant assurances that the Airport Sponsor assures compatible uses and heights of structures in the airport vicinity. The FAA relies on state and local zoning regulation to provide height and airspace protection. Chapter 333, Florida Statutes, Subsection 333.03(1), provides such protection. The area in the Airport's immediate vicinity is comprised of a variety of existing urban and rural developments. Seminole County continues to grow in population, and the underdeveloped areas near the Airport are subject to potential urban development. The City of Sanford currently designates the entire expanse of SFB property as Restricted Industrial (RI1) which is compatible with aviation activity.

Land east of Airport property is predominantly unincorporated areas of Seminole County. However, zoning classifications such as Agricultural (AG), Medium Industrial (MI2), General Commercial (GC2), and Restricted Industrial (RI2) can be found.

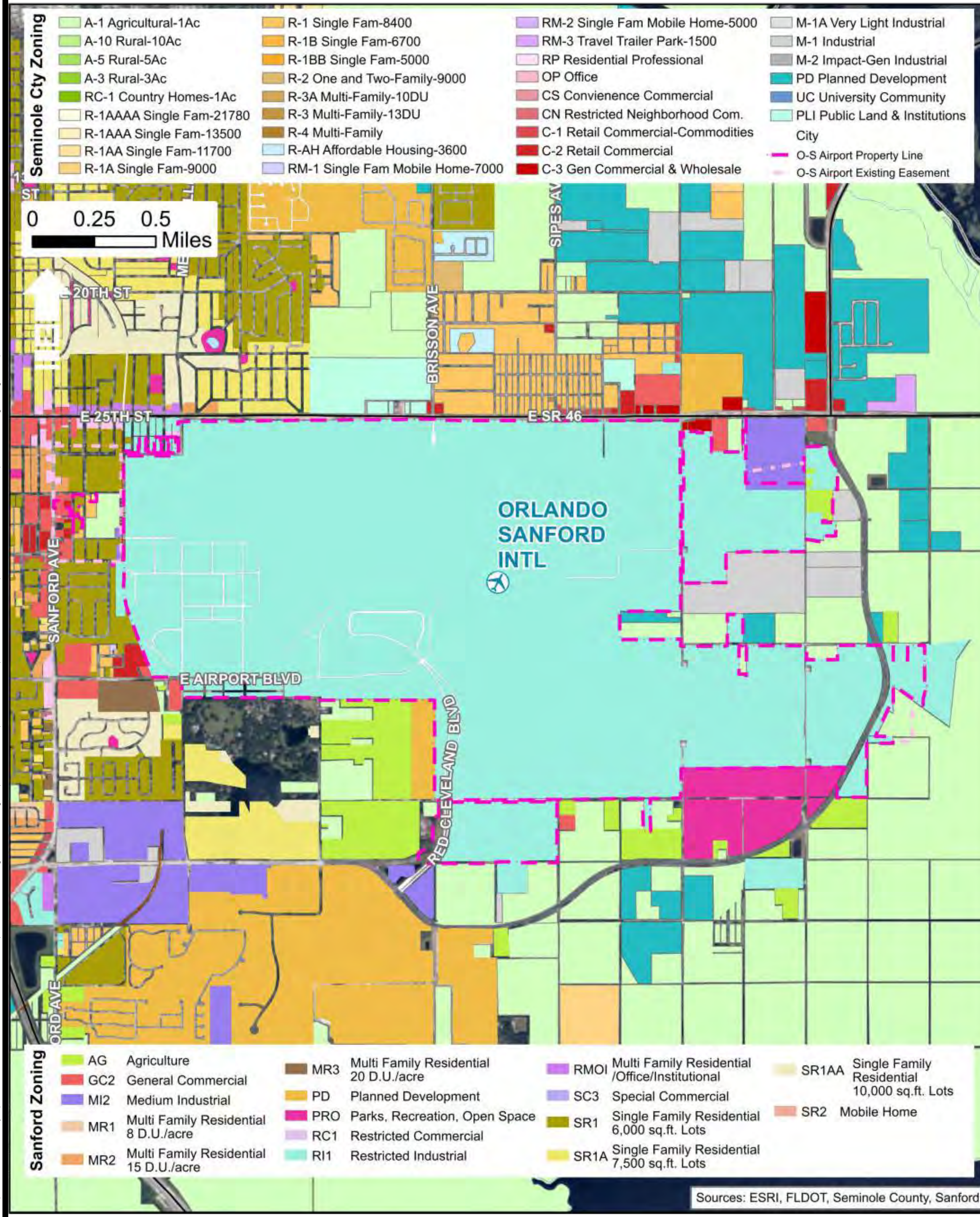
Extending westward of the Airport for several miles is an area characterized primarily by urban residential development that includes the incorporated cities of Sanford and Lake Mary, as well as unincorporated areas of Seminole County. **Figure 2-29** reveals the land use classifications of properties surrounding SFB. In general, south of SFB is a combination of undeveloped land and scattered large lot residential development; however, near the Airport, there are large lot residential properties and subdivisions in the vicinity of Lake Golden, Lake Onora, and Silver Lake.

## 2.4.1. Currently Vacant and Underutilized Land

Current land uses surrounding the Airport fall into three major categories: residential, industrial, and agricultural. Lands to the north and west of the Airport are predominantly residential. Lands to the east of the Airport are primarily agricultural. Industrial uses are seen to the south of the Airport property. The current on-airport land use is shown in **Figure 2-30.**

### 2.4.1.1. Commerce Park

The Commerce Park is in the Airport's southwest quadrant and consists of 395 acres, of which 52.5 are still available for future development. The existing buildings within the commerce park are currently at 95 percent capacity. Future development within the Commerce Park will depend upon the Airport's main business development. The Commerce Park is well positioned for future growth, and increased air service is anticipated to bring related job growth. Additionally, high-tech employers in the Lake Mary Boulevard/I-4 area can benefit from the availability of low-cost warehouse and back-office operational space located near air transportation support. Furthermore, the Airport and the area along SR 46 could provide the support areas necessary for a successful executive and high technology center.

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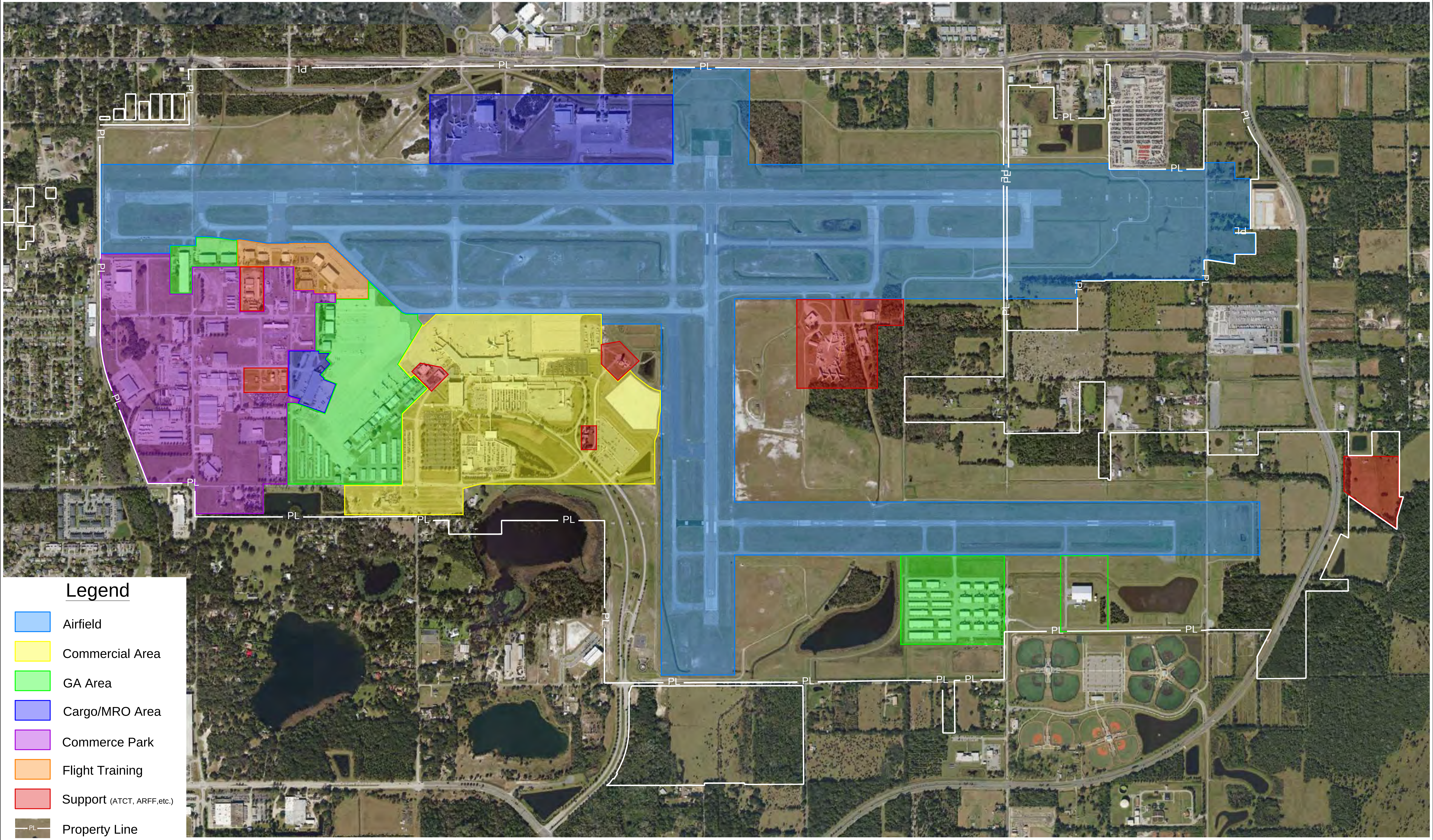
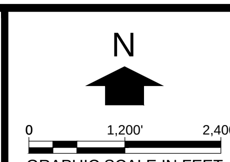
Airport Master Plan Update
Existing Off-Airport Zoning Districts

Figure 2-29

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2020 Orlando Sanford International Airport Master Plan Update

Existing On-Airport Land Use

Figure 2-30

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#### 2.4.1.2. North Area

Initial discussions have suggested that the Airport's north area, west of Runway 18-36, could be developed for heavy aircraft MRO and future cargo east of Runway 18-36. Since Runway 9L-27R is designated for heavy commercial traffic, this area will allow for significant aviation industrial development.

Furthermore, this area can effectively be accessed via SR-46. This is one of the prime areas for future commercial aviation development. The northern area has been designed to accommodate heavy wide-body aircraft. Constant Aviation and Avocet currently lease property in the Airport's northern area.

#### 2.4.1.3. Southeast Area

The area designated as the southeastern segment is the property found to the south of Runway 9R-27L and east of Runway 18-36. Initial discussions with SAA suggested that this section could be developed for GA operations, such as flight training, maintenance, aircraft storage, etc. Several based operators have previously expressed interest in moving to that area, which could allow them to expand their facilities and could relieve congestion in the Airport's southwestern portion. Such relocations could also separate smaller GA aircraft from the larger and heavier commercial aircraft.

#### 2.4.1.4. East Midfield Area

The Airport's eastern segment, located between Runway 9L-27R and Runway 9R-27L and east of Runway 18-36, had been initially designated for a mixture of GA corporate facilities and non-aviation related development. In the future, it is anticipated that this area could provide for additional conventional hangar and apron space, as well as Airport support facilities (i.e. future ATCT, fuel farms, etc.) as well as make parcels available for corporate or industrial development.

## 2.5. Summary

This inventory chapter provided a summary of baseline conditions and included detailed information relating to the Airport's property, airside, terminal, and landside facilities, services, location, and tenants, as well as ground access, utilities and environmental considerations. The next step in the planning process is to develop aviation demand forecasts for future aircraft operations, passenger enplanements, and based aircraft. Once completed this information will be compared to data developed in this section to define the adequacy of existing facilities and to provide an indication of what airport enhancements may be necessary throughout the planning period.

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# Aviation Demand Forecasts

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# 3. Aviation Demand Forecasts

## 3.1. Introduction

This report describes the forecasts of future aviation activity at Orlando Sanford International Airport (SFB) that were developed to guide the Master Plan Update (Master Plan) process. Activity forecasts represent critical inputs to the Master Plan as they are used to determine the required level of airport facility development needed to accommodate expected levels of future demand. The forecasts for this Master Plan have been prepared using the base fiscal year of 2017 and cover a 20-year planning horizon. Key activities measured in the forecast include commercial airline passenger enplanements, commercial aircraft operations, cargo, based aircraft, and general aviation (GA), air taxi/commuter, and military operations.

SFB serves international and domestic carriers in the Orlando metropolitan area. The National Plan of Integrated Airport Systems (NPIAS) classifies SFB as a small hub airport1. In the 2017 calendar year, SFB's passenger enplanement activity represented 0.16 percent of the total U.S. activity.

## 3.2. Socioeconomic Review of the Market Area

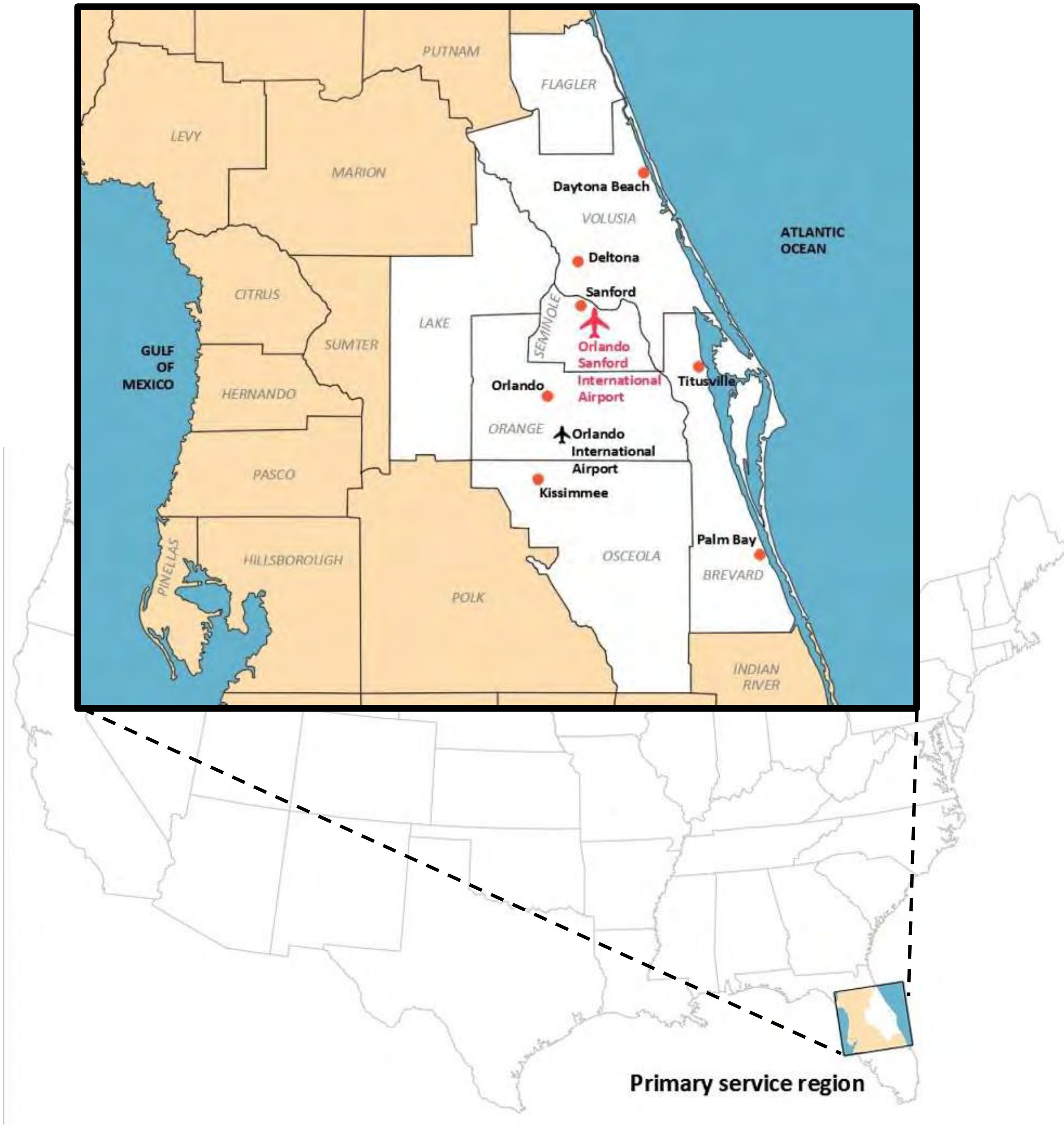
This section describes historical and forecasted socioeconomic activity in the SFB service region. For the purposes of the forecast analysis, the SFB service region (Market Area) consists of the following metropolitan statistical areas: 1) Orlando-Kissimmee; 2) Deltona-Daytona Beach-Ormond Beach; and 3) Palm Bay-Melbourne-Titusville. This area is located in central Florida and includes the principal cities of Orlando, Kissimmee, Sanford, Palm Bay, Titusville, Deltona, and Daytona Beach. According to the U.S. Office of Management and Budget, the Market Area consists of the Lake, Orange, Osceola, Seminole, Volusia, Flagler, and Brevard counties.

The closest major cities to SFB are Sanford, located approximately 4 miles northwest; Orlando, approximately 23 miles southwest; and Kissimmee, approximately 48 miles southwest. **Figure 3-1** shows the counties within the Market Area along with SFB's location.

SFB is a hub for national carrier Allegiant Air and is also served by charter flights from Europe. SFB is home to L3 Harris Airline Academy, a major pilot training school for prospective regional airline and international pilots. In addition, Propellerhead Aviation offers flight training, aircraft rentals and other services at SFB.

[1] A small hub airport is defined by the FAA as an airport that enplanes less than 0.25 percent of total U.S. air passenger traffic.

**Figure 3-1 - Market Area Map**



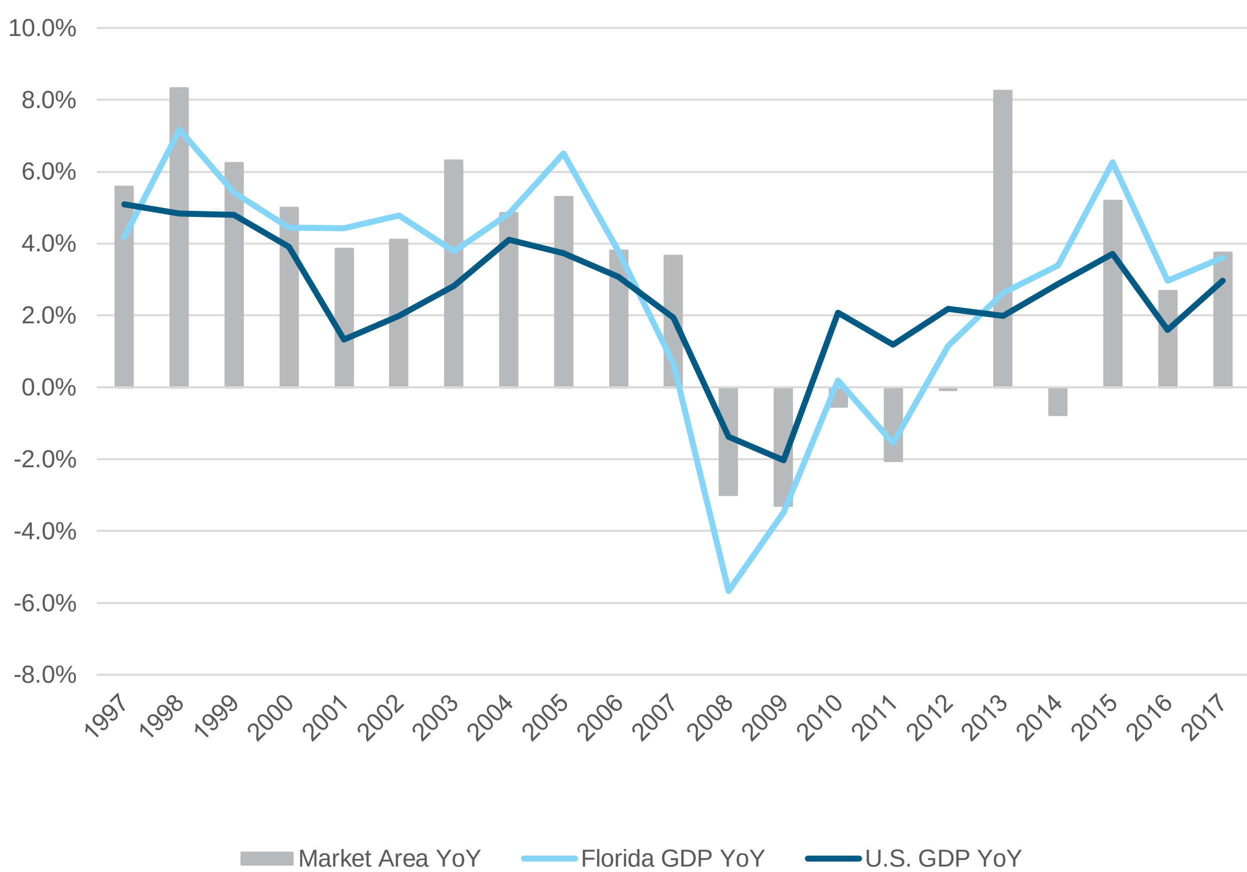

Source: Jacobsen|Daniels, 2019

### 3.2.1. Gross Domestic Product Trends and Outlook

Air travel demand and airport passenger traffic are strongly linked to the economic characteristics of a region. Metro Orlando is a popular tourist destination due to the many theme parks in the area. Famous attractions include Walt Disney World, SeaWorld Orlando, and Universal Orlando. Millions of tourists visit these and other attractions every year. The citrus industry historically dominated the Orlando area economy but has declined over the past 100 years. Orlando is also a major food-processing center.

**Figure 3-2** shows historical year-over-year (YoY) Gross Domestic Product (GDP) growth for the Market Area, the State of Florida, and the United States between 1997 and 2017. GDP growth within the Market Area historically out-performed the nation in 14 of the last 20 years, with the exception of 2008-2012, encompassing the Great Recession[2] and the years just following, and 2014. Over the next 10 and 20 years, Woods and Poole Economics projects that the Market Area GDP will grow at rates above the national average. The GDP is expected to grow by 2.5 percent between 2017 and 2027 and by 2.3 percent between 2017 and 2037[3] (see **Table 3-1**).

**Figure 3-2 - Historic Annual Growth of GDP (CY 1997-2017)**




Source: Woods and Poole Economics, 2018

[2] Great Recession in the U.S. began in December 2007 and ended in June 2009, according to *the US Business Cycle Expansions and Contractions*

[3] Source: Woods and Poole Economics, 2018

**Table 3-1 - Historical and Forecast GDP Growth (CY 1997-2037)**

| | Historical | | | Forecast | |
|---|---|---|---|---|---|
| | 1997 | 2007 | 2017 | 2027 | 2037 |
| GDP (US$) | | | | | |
| Market Area | 84,639 | 139,648 | 153,483 | 197,378 | 243,476 |
| Florida | 507,192 | 792,792 | 866,025 | 1,093,569 | 1,327,712 |
| United States | 10,768,753 | 14,820,650 | 17,204,393 | 20,671,067 | 24,206,857 |
| Market Area Share | | | | | |
| % of Florida | 16.7% | 17.6% | 17.7% | 18.0% | 18.3% |
| % of United States | 0.8% | 0.9% | 0.9% | 1.0% | 1.0% |
| Compound Annual Growth Rate | | 10 Year (2007-2017) | 20 Year 2007-2027) | 10 Year (2017-2027) | 20 Year (2017-2037) |
| Market Area | | 0.9% | 3.0% | 2.5% | 2.3% |
| Florida | | 0.9% | 2.7% | 2.4% | 2.2% |
| United States | | 1.5% | 2.4% | 1.9% | 1.7% |

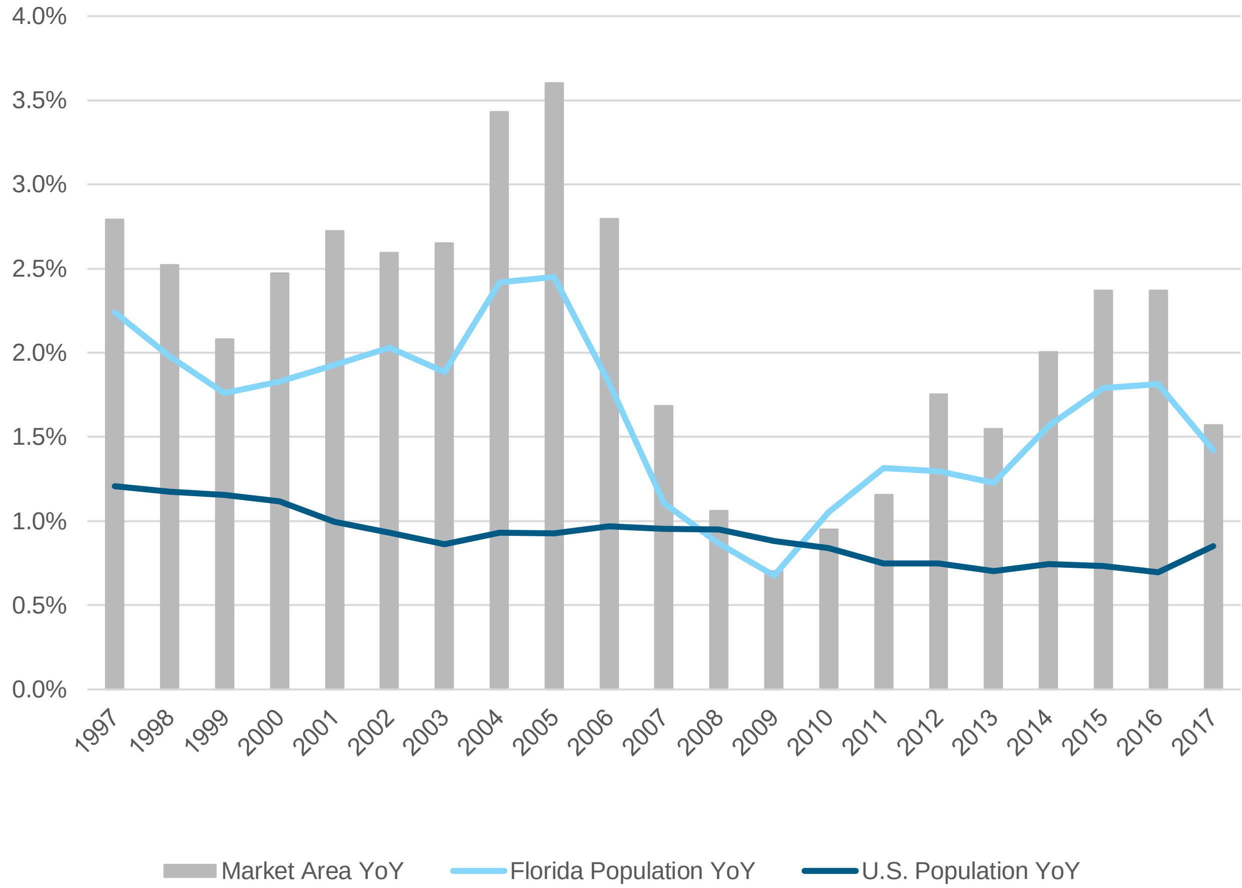
Source: Woods and Poole Economics, 2018

## 3.2.2. Population

As of 2017, the population of the Market Area represents 17.8 percent of the Florida population and 1.1 percent of the total U.S. population. According to Woods and Poole's 2018 estimates, the Market Area has a population of approximately 3.7 million. Between 2007 and 2017, the Market Area population increased an average of 1.5 percent per year and has been growing faster than the rest of Florida and the U.S., which grew 1.3 percent and 0.8 percent per year respectively during the same period (see **Figure 3-3**).

Over the next ten years, population growth in the Market Area is forecast by Woods and Poole to increase by approximately 1.6 percent annually, which outpaces the anticipated U.S. growth rate of 0.9 percent. On the state level, Florida's population is forecast to grow an average of 1.4 percent annually from 2017 to 2037. By 2037, the Market Area's share of the total state population is expected to increase slightly from 18.0 percent today to 18.3 percent by 2037 (see **Figure 3-2**).

**Figure 3-3 - Historic Annual Growth of Population (CY 1997-2017)**




Source: Woods and Poole Economics, 2018

**Table 3-2 - Historical and Forecast Population Growth (CY 1997-2017)**

| | Historical | | | Forecast | |
|---|---|---|---|---|---|
| | 1997 | 2007 | 2017 | 2027 | 2037 |
| Population (in millions) | | | | | |
| Market Area | 2,453 | 3,187 | 3,715 | 4,368 | 5,085 |
| Florida | 15,186 | 18,368 | 20,906 | 24,232 | 27,820 |
| United States | 272,647 | 301,231 | 325,888 | 357,430 | 389,046 |
| Market Area Share | | | | | |
| % of Florida | 16.2% | 17.4% | 17.8% | 18.0% | 18.3% |
| % of United States | 0.9% | 1.1% | 1.1% | 1.2% | 1.3% |
| Compound Annual Growth Rate | | 10 Year | 20 Year | 10 Year | 20 Year |
| | | (2007-2017) | 2007-2027) | (2017-2027) | (2017-2037) |
| Market Area | | 1.5% | 2.1% | 1.6% | 1.6% |
| Florida | | 1.3% | 1.6% | 1.5% | 1.4% |
| United States | | 0.8% | 0.9% | 0.9% | 0.9% |

Source: Woods and Poole Economics, 2018

## 3.2.3. Employment Trends

In terms of non-farm employment, Florida ranks 1st among all states in the U.S. South as defined by the Bureau of Labor Statistics (BLS), with a workforce of over 10.2 million employees as of June 2018. The BLS Establishment, or Payroll Data, is estimated from a survey of approximately 400,000 business establishments that account for about one-third of all jobs in the country (excluding agricultural sector jobs) and is frequently used to analyze labor market and economic conditions. Non-farm payroll employment is utilized because it provides accurately reported data, which gauges the economic health of the nation, and helps calculate unemployment rates.

Florida's total employment is up 1.3 percent since June 2017 (see **Table 3-3**), making it the fourth fastest growing state in the South in terms of the number of non-farm employees. In addition, the Florida labor force grew faster than the U.S. average over the past 12 months. The Florida non-farm labor force represents about 6.3 percent of the total U.S. labor force as of June 2018.

**Table 3-3 - Non-Agriculture Employement (June 2017 to June 2018)**

| | | Non-Farm Employees (in millions) | | Net Change | % Change | Rank by % Change |
|---|---|---|---|---|---|---|
| Rank | State | June 2018 | June 2017 | | | |
| 1 | Florida | 10,232.6 | 10,103.1 | 129.5 | 1.3% | 4 |
| 2 | Georgia | 5,155.4 | 5,057.8 | 97.6 | 1.9% | 1 |
| 3 | North Carolina | 4,997.5 | 4,938.0 | 59.5 | 1.2% | 5 |
| 4 | Virginia | 4,348.9 | 4,310.8 | 38.1 | 0.9% | 8 |
| 5 | Tennessee | 3,245.9 | 3,193.6 | 52.3 | 1.6% | 2 |
| 6 | Maryland | 3,233.3 | 3,223.2 | 10.1 | 0.3% | 9 |
| 7 | South Carolina | 2,313.1 | 2,310.5 | 2.6 | 0.1% | 11 |
| 8 | Alabama | 2,187.7 | 2,167.8 | 19.9 | 0.9% | 7 |
| 9 | Kentucky | 2,063.0 | 2,058.3 | 4.7 | 0.2% | 10 |
| 10 | Mississippi | 1,281.6 | 1,280.9 | 0.7 | 0.1% | 12 |
| 11 | West Virginia | 785.1 | 776.5 | 8.6 | 1.1% | 6 |
| 12 | Delaware | 484.5 | 477.6 | 6.9 | 1.4% | 3 |
| - | United States | 162,140.0 | 160,214.0 | 1,926.0 | 1.2% | - |

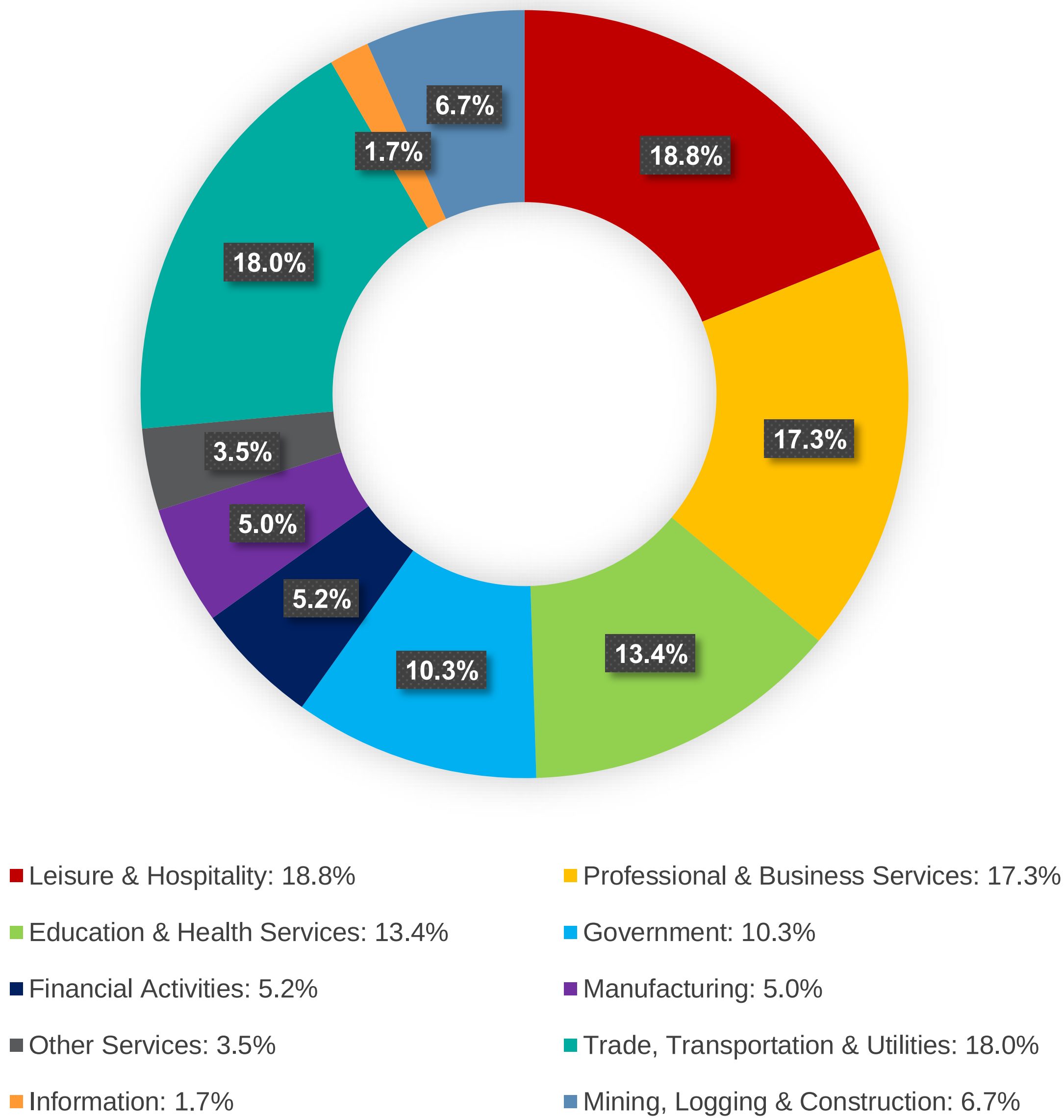
Note: June 2018 are preliminary numbers; seasonally adjusted by BLS reporting

Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS)

In 2019, the leading industries for employment in the Market Area were Leisure and Hospitality; Trade, Transport and Utilities; Professional and Business Services; Education and Health Services; and Government. As reflected in **Figure 3-4**, data for November 2019 show that Leisure and Hospitality accounts for 18.8 percent of the Market Area's non-farm employees; Trade, Transport and Utilities accounts for 18.0 percent; Professional and Business Services accounts for 17.3 percent; Education and Health Services accounts for 13.4 percent; and Government represents 10.3 percent of non-farm employees.

The Market Area has a diversified employment base, which is a strength of its economy. The top five industry sectors make up more than 77 percent of its non-farm employee total.

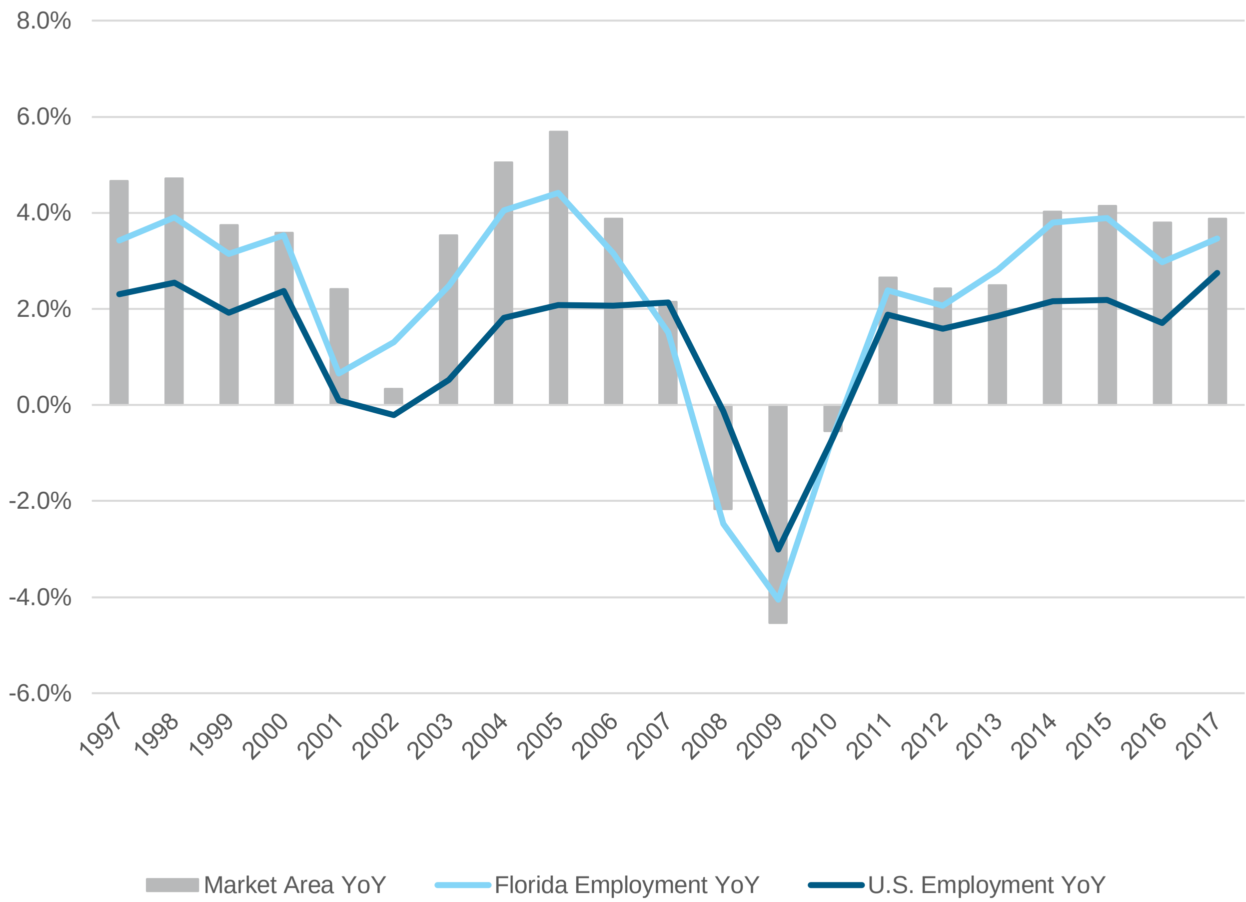
**Figure 3-4 - Market Area Employment By Industry**




Source: U.S. Bureau of Labor Statistics, November 2019

Between 2007 and 2017, the Market Area's employment increased an average of 1.6 percent per year and has been growing at a faster rate than the State of Florida and the U.S., which grew 1.4 percent and 1.0 percent per year, respectively, during the same ten-year period. Over the next ten years, employment growth in the Market Area is forecast by Woods and Poole to increase by approximately 2.0 percent annually, which outpaces the anticipated U.S. compound annual growth rate of 1.4 percent and the state's expected compound annual growth rate of 1.9 percent. (See **Figure 3-5**). From 2017 to 2037, Florida's employment is forecast to grow an average of 1.7 percent annually compared to an expected 1.8 percent compound growth rate within the Market Area. By 2037, the Market Area's share of the total state employment is expected to increase slightly from 18.2 percent today, to 18.7 percent (see **Table 3-4**).

**Figure 3-5 - Historic Annual Growth of Employment (CY 1997-2017)**




Source: Woods and Poole Economics, 2018

**Table 3-4 - Historical and Forecast Employment Growth (CY 1997-2017)**

| | Historical | | Forecast | | |
|---|---|---|---|---|---|
| | 1997 | 2007 | 2017 | 2027 | 2037 |
| Employment (in thousands) | | | | | |
| Market Area | 1,338 | 1,888 | 2,207 | 2,694 | 3,155 |
| Florida | 8,005 | 10,557 | 12,114 | 14,566 | 16,880 |
| United States | 154,543 | 179,886 | 198,990 | 229,158 | 256,759 |
| Market Area Share | | | | | |
| % of Florida | 16.7% | 17.9% | 18.2% | 18.5% | 18.7% |
| % of United States | 0.9% | 1.0% | 1.1% | 1.2% | 1.2% |
| Compound Annual Growth | | 10 Year | 20 Year | 10 Year | 20 Year |
| | | (2007-2017) | 2007-2027) | (2017-2027) | (2017-2037) |
| Market Area | | 1.6% | 2.5% | 2.0% | 1.8% |
| Florida | | 1.4% | 2.1% | 1.9% | 1.7% |
| United States | | 1.0% | 1.3% | 1.4% | 1.3% |

Source: Woods and Poole Economics, 2018

### 3.2.4. Major Employers in the Region

The major employment industries in the Market Area include trade, transportation, and utilities; professional and business services; government; and leisure and hospitality. In 2017, Walt Disney World accounted for 73,000 employees in the Market Area and Universal Studios accounted for 23,000. Adventist Health System/Florida Hospital accounted for 21,815 employees. A list of the area's major employers in 2017/2018 is provided **Table 3-5**.

**Table 3-5 - Market Area Leading Employers**

| Company | Industry | Employment |
|---|---|---|
| Walt Disney World Resort | Leisure and Hospitality | 73,000 |
| Universal Orlando Resort (Comcast) | Leisure and Hospitality | 23,000 |
| Adventist Health System/Florida Hospital | Education and Health Services | 21,815 |
| Publix | Trade, Transportation, and Utilities | 19,783 |
| Orlando Health | Education and Health Services | 19,032 |
| University of Central Florida | Education and Health Services | 9,134 |
| Lockheed Martin | Professional and Business Services | 9,000 |
| Kennedy Space Center (NASA) | Government | 8,500 |
| Seminole County Public Schools | Education and Health Services | 7,687 |
| Volusia County Schools | Education and Health Services | 7,443 |

Sources: Orlando Economic Partnership; Orlando Sentinel; Orlando Business Journal, 2017; North Brevard Economic Development Zone Summer 2018 Report; County of Volusia, Division of Economic Development, January 2017

### 3.2.5. Tourism and Visitor Industry

The Market Area has long been a strong tourist market drawing in vacationers from all over the U.S. and abroad by marketing its unique location and attractions. With these local attractions, the SFB's passengers are mostly beginning or ending their trip at SFB rather than connecting to another city, with the recent 2018 Catchment Area Study estimating approximately 70 percent of Origin and Destination (O/D) passenger traffic is from visitors to the area. Passengers at SFB are also primarily domestic, with a 92 to 8 percent split between domestic and international passengers in fiscal year (FY) 2018 based on SFB records.

SFB benefits from a blend of local government and private investment through the operation of a public/private partnership between the Sanford Airport Authority (SAA) and Airports Worldwide (AWW). AWW was contracted by SAA to manage both the international and domestic terminals and parking facilities; develop additional air service; and provide ground handling and cargo services. This public/private partnership is making large efforts to attract new service to SFB[4].

According to Allegiant Air,[5] the Airport's primary domestic passenger service carrier, over 80 destination airports are available for connection to/from SFB as of January 2020. Allegiant's connections have historically accounted for over 90 percent of the Airport's enplanements[4]. SFB has historically been successful catering to European charter operators bringing tourists to the Orlando area. SFB has international service through Thomson Airways (United Kingdom), TUI Airlines (Amsterdam), and Surinam (seasonal).

International traffic has been declining at SFB since the early 2000s, which can largely be attributed to the global economic recession beginning in late 2007. Prior to 2007, SFB had close to 500,000 international enplanements per year. The number has now stabilized at an average of 135,000 annual international enplanements for the last five years (FY 2014-2018 based on SFB records). That level of international traffic highlights the importance and potential opportunity SFB has for growth and continued success. SFB is positioning to continue increasing its market share of Orlando area passenger traffic by maintaining relationships with air carriers and highlighting SFB's strengths of convenience and low costs. In addition, SAA recently developed ground transportation services that offer easy access to local attractions.

## 3.3. Forecast Methodology

Projecting aviation demand is a critical step in the overall airport master planning process, as it informs the magnitude and general timing of future facility needs. Aviation activity is influenced by many factors at the local, regional, and national levels. The forecasts in this section consider these factors, utilizing multiple forecasting techniques based on the historical activity statistics through FY 2017, while also incorporating near-term plans from key airport stakeholders.

The Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) for SFB for 2018 – 2045 assumes an unconstrained demand for aviation services based upon local and national economic conditions, as well as aviation industry trends. In other words, for purposes of estimating future demand, the forecasts assume airport facilities and airspace can be provided to meet the expected demand.

The Master Plan forecasts utilize historical relationships between activity measures (enplanements, operations, and based aircraft), as well as local and national factors that influence aviation activity. Forecasts for each element are reviewed for reasonableness and in the context of specific historical events that may have influenced airport activity. If a specific forecast technique deviated significantly from the other techniques due to known anomalies in the historical data, then that particular forecast was not included in the determination of the preferred forecast. In addition, once a long-term forecasted growth rate was determined, the year-to-year growth rates were adjusted (not constant throughout) to reflect specific known near-term growth plans, while maintaining the overall AAGR for the 20-year period.

The methods utilized to forecast each activity measure included trend line analysis, regression analysis, and market share analysis. These FAA-supported methods have been applied to develop the most accurate long-term forecasts possible for SFB through FY 2037 and are discussed in detail below.

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[4] Source: *2017 SFB Annual Report*

[5] Source: *https://www.allegiantair.com/ January 2020*

## 3.4. Passenger Enplanements

The future level of passenger enplanements at SFB will help to define airside, terminal, and landside facility needs. Passenger aircraft operations are determined by the expected enplanement demand and aircraft fleet characteristics, including average seating capacities and assumed load factors.

The FAA's TAF separates enplanements for air carriers and commuters. Air carrier enplanements include scheduled and non-scheduled domestic and international passengers on U.S. commercial and foreign flag carriers. Commuter enplanements include connecting passenger enplanements carried by regional airlines to feed mainline carriers. The total number of enplanements was forecasted for air carriers, as this is the majority of passenger traffic generated at SFB.

As outlined in the 2018 SFB Gate Needs Study[6], the TAF has understated enplanements when compared to detailed monthly airport operational reports:

- 2018 SFB Gate Needs Study – enplanements in the detailed airport operational reports were, on average, 5.0 percent higher than the 2017 TAF for FY 2012-2016
- 2018 TAF and SAA Statistics – enplanements in the detailed airport operational reports were, on average, 4.1 percent higher than the 2018 TAF for FY 2013-2017

According to the SAA, the FAA had recently reviewed the 2018 Gate Needs Study and had accepted the SAA enplanement counts, which are higher than the TAF. This was confirmed by the FAA staff in the kick-off meeting for the Master Plan. To account for this understatement, all of the Master Plan enplanement forecasts utilize the latest 2018 TAF enplanement actuals from FY 2007 through FY 2017 with an adjustment of +4.1 percent, based on the latest five-year average difference from the detailed airport reports (see **Table 3-6**). The various analytical techniques applied to forecast total enplanements are described below.

**Table 3-6 - TAF vs. SAA Historical Enplanements – Five Year Average Difference**

| Year | SAA Domestic | SAA International | SAA Total Enplanements | TAF Enplanements | Difference vs. TAF |
|---|---|---|---|---|---|
| 2013 | 775,471 | 213,427 | 988,898 | 944,086 | 4.7% |
| 2014 | 894,980 | 137,346 | 1,032,326 | 979,332 | 5.4% |
| 2015 | 1,063,603 | 129,228 | 1,192,831 | 1,134,834 | 5.1% |
| 2016 | 1,194,994 | 140,885 | 1,335,879 | 1,296,262 | 3.1% |
| 2017 | 1,264,237 | 144,895 | 1,409,132 | 1,379,787 | 2.1% |
| Five Year Average Difference (2013-2017) | | | | | 4.1% |

Sources: FAA Terminal Area Forecast dated February 2019 (FY 2007-2017), SAA published statistics; analysis by Jacobsen|Daniels, 2019

### 3.4.1. Enplanement Trend Line Analysis

Trend line analysis examines historical growth trends in activity and applies these trends to current demand levels to produce future activity projections. This forecast methodology assumes that the factors that influence aviation activity in the past will remain the same in the future. Linear trend projections are typically used to provide baseline forecasts that reflect stable market conditions. The two historical time periods used for this forecast approach are as follows:

- Five-year historical data from FY 2012 to 2017
- Ten-year historical data from FY 2007 to 2017

As shown in **Table 3-7**, the enplanement trend analysis uses the compound annual growth rates based on the five and ten-year historical periods and projects enplanements forward to FY 2037 at the respective rates. The compound annual growth rate for the five-year period from FY 2012 through FY 2017 is 10.6 percent. This growth rate was projected into the future resulting in passenger enplanements growing to 10,783,572 enplanements by FY

[6] Source: *Orlando Sanford International Airport Gate Needs Study, August 2018*

2037. The compound annual growth rate for the last ten years, FY 2007 to FY 2017, is 3.6 percent. Projected forward, this compound annual growth rate would result in 2,885,896 passenger enplanements in FY 2037. Based on discussion with SFB and AWW, the five-year trend is not representative of long-term growth as it includes a period in which commercial service by Allegiant was quickly being reinstated following a temporary reduction in service.

**Table 3-7 - Enplanement Trend Analysis**

| Year | Adjusted TAF Enplanements | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| 2007 | 1,013,195 | - | - |
| 2008 | 1,018,048 | - | - |
| 2009 | 853,536 | - | - |
| 2010 | 618,359 | - | - |
| 2011 | 722,735 | - | - |
| 2012 | 867,635 | - | - |
| 2013 | 982,702 | - | - |
| 2014 | 1,019,390 | - | - |
| 2015 | 1,181,252 | - | - |
| 2016 | 1,349,283 | - | - |
| 2017 | 1,436,224 | - | - |
| 2018 | - | 1,588,544 | 1,487,220 |
| 2019 | - | 1,757,018 | 1,540,026 |
| 2020 | - | 1,943,360 | 1,594,708 |
| 2021 | - | 2,149,465 | 1,651,330 |
| 2022 | - | 2,377,428 | 1,709,964 |
| 2023 | - | 2,629,568 | 1,770,679 |
| 2024 | - | 2,908,449 | 1,833,550 |
| 2025 | - | 3,216,906 | 1,898,653 |
| 2026 | - | 3,558,078 | 1,966,068 |
| 2027 | - | 3,935,432 | 2,035,877 |
| 2028 | - | 4,352,808 | 2,108,164 |
| 2029 | - | 4,814,448 | 2,183,018 |
| 2030 | - | 5,325,048 | 2,260,530 |
| 2031 | - | 5,889,800 | 2,340,794 |
| 2032 | - | 6,514,447 | 2,423,908 |
| 2033 | - | 7,205,341 | 2,509,973 |
| 2034 | - | 7,969,509 | 2,599,094 |
| 2035 | - | 8,814,721 | 2,691,379 |
| 2036 | - | 9,749,573 | 2,786,941 |
| 2037 | - | 10,783,572 | 2,885,896 |

| Year | Adjusted TAF Enplanements | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| Compound Annual Growth Rates (2017-2037) | | 10.6% | 3.6% |
| 5-Year CAGR (2012-2017) | | 10.6% | - |
| 10-Year CAGR (2007-2017) | | 3.6% | - |

Source: FAA Terminal Area Forecast dated February 2019 (FY 2007-2017); analysis by Jacobsen|Daniels, 2019

### 3.4.2. Enplanement Regression Analysis

Regression analysis is a statistical technique for estimating relationships between variables. It determines correlations between independent, or known, variables and dependent variables. The coefficient of determination ($r^2$) is a statistical measure showing the extent to which there is a relationship between the two variables. The closer the $r^2$ value is to 1.0, the higher the confidence is that a change in the independent variable will translate into a change in the dependent variable. As a rule of thumb, an $r^2$ value over 0.90 carries a strong statistical correlation.

The socioeconomic trends of the surrounding community are factors that can affect expected aviation activity at an airport. Population, employment and earnings statistics provide indications of the community's ability to support aviation activities and of the underlying level of demand for aviation services. The regression analysis examines the relationship between the independent variables of population, employment, and per capita income and the dependent variable of enplanements. Future enplanements are projected based upon the actual and projected correlation between historical enplanements and the socioeconomic statistics for the Market Area.

The historical and forecast of socioeconomic data were obtained from Woods and Poole Economics, Inc. The results of the various regression analyses are described below and shown in **Table 3-8**.

- **Population Regression**: Using population as the basis for the regression analysis, total enplaned passengers are forecast to increase from 1,436,224 in FY 2017 to 3,120,670 in FY 2037 resulting in a compound annual growth rate of 4.0 percent. The r2 value for this regression analysis is 0.75.
- **Employment Regression**: Using employment as the basis for the regression analysis, total enplaned passengers are forecast to increase from 1,436,224 in FY 2017 to 2,951,037 in FY 2037 resulting in a compound annual growth rate of 3.7 percent. The r2 value for this regression analysis is 0.91.
- **Per Capita Income Regression**: Using per capita income as the basis for the regression analysis, total enplaned passengers are forecast to increase from 1,436,224 in FY 2017 to 6,436,970 in FY 2037 resulting in a compound annual growth rate of 7.8 percent. The r2 value for this regression analysis is 0.80.

Overall, the regression analysis methodology resulted in correlations at or below 0.90, with the employment regression at the highest correlation. Therefore, the results of the regression analysis were not considered for the preferred forecast.

**Table 3-8 - Enplanement Regression Analysis**

| Year | Adjusted TAF Enplanements | Population (thousands) | Employment (thousands) | Per Capita Income | Enplanements – Population | Enplanements – Employment | Enplanements – Per Capita |
|---|---|---|---|---|---|---|---|
| 2008 | 1,018,048 | 3,221 | 1,847 | 34,759 | - | - | - |
| 2009 | 853,536 | 3,243 | 1,763 | 32,828 | - | - | - |
| 2010 | 618,359 | 3,274 | 1,753 | 33,844 | - | - | - |
| 2011 | 722,735 | 3,312 | 1,800 | 35,297 | - | - | - |
| 2012 | 867,635 | 3,370 | 1,844 | 35,647 | - | - | - |
| 2013 | 982,702 | 3,422 | 1,889 | 35,919 | - | - | - |
| 2014 | 1,019,390 | 3,491 | 1,965 | 37,476 | - | - | - |
| 2015 | 1,181,252 | 3,573 | 2,047 | 39,478 | - | - | - |
| 2016 | 1,349,283 | 3,658 | 2,125 | 40,220 | - | - | - |
| 2017 | 1,436,224 | 3,715 | 2,207 | 41,766 | - | - | - |
| 2018 | - | 3,776 | 2,264 | 43,342 | 1,449,897 | 1,542,509 | 1,531,173 |
| 2019 | - | 3,838 | 2,314 | 44,951 | 1,529,092 | 1,620,585 | 1,659,067 |
| 2020 | - | 3,901 | 2,359 | 46,660 | 1,609,500 | 1,692,571 | 1,794,994 |
| 2021 | - | 3,965 | 2,407 | 48,506 | 1,691,140 | 1,768,193 | 1,941,778 |
| 2022 | - | 4,030 | 2,456 | 50,560 | 1,774,024 | 1,846,061 | 2,105,125 |
| 2023 | - | 4,096 | 2,502 | 52,809 | 1,858,106 | 1,918,749 | 2,283,905 |
| 2024 | - | 4,163 | 2,549 | 55,249 | 1,943,431 | 1,992,659 | 2,477,925 |
| 2025 | - | 4,231 | 2,597 | 57,913 | 2,029,846 | 2,068,170 | 2,689,749 |
| 2026 | - | 4,299 | 2,645 | 60,772 | 2,117,296 | 2,145,016 | 2,917,061 |
| 2027 | - | 4,368 | 2,694 | 63,818 | 2,205,774 | 2,221,706 | 3,159,246 |
| 2028 | - | 4,438 | 2,742 | 67,068 | 2,295,161 | 2,297,708 | 3,417,638 |
| 2029 | - | 4,509 | 2,790 | 70,521 | 2,385,555 | 2,373,745 | 3,692,265 |
| 2030 | - | 4,581 | 2,838 | 74,158 | 2,476,906 | 2,449,526 | 3,981,389 |

| Year | Adjusted TAF Enplanements | Population (thousands) | Employment (thousands) | Per Capita Income | Enplanements – Population | Enplanements – Employment | Enplanements – Per Capita |
|---|---|---|---|---|---|---|---|
| 2031 | - | 4,652 | 2,886 | 77,943 | 2,568,456 | 2,524,581 | 4,282,329 |
| 2032 | - | 4,724 | 2,932 | 81,903 | 2,660,012 | 2,598,303 | 4,597,228 |
| 2033 | - | 4,796 | 2,978 | 86,067 | 2,751,749 | 2,670,753 | 4,928,358 |
| 2034 | - | 4,868 | 3,023 | 90,454 | 2,843,649 | 2,742,223 | 5,277,114 |
| 2035 | - | 4,940 | 3,068 | 95,122 | 2,935,728 | 2,812,707 | 5,648,329 |
| 2036 | - | 5,012 | 3,112 | 100,000 | 3,028,060 | 2,882,217 | 6,036,148 |
| 2037 | - | 5,085 | 3,155 | 105,041 | 3,120,670 | 2,951,037 | 6,436,970 |
| Compound Annual Growth Rates | | | | | | | |
| - | - | - | - | - | 4.0% | 3.7% | 7.8% |
| Coefficient of Determination | | | | | | | |
| - | - | 0.75 | 0.91 | 0.80 | - | - | - |

Source: FAA Terminal Area Forecast dated February 2019 (FY 2007-2017), Woods and Poole Economics 2018; analysis by Jacobsen|Daniels, 2019

### 3.4.3. Enplanement Market Share Analysis

The market share analysis methodology is a top-down approach to forecast aviation activity based on SFB's historical share of the state, region, and national markets. This approach assumes the growth in activity at SFB will be proportionate to the growth in activity of the state, region, and nation. As market shares are held constant over the forecast period, the resulting increases in the activity will be in line with the growth rates established in the FAA's Aerospace Forecasts and TAF for each market. Once a market share projection is developed, the share can increase or decrease to reflect more recent historical trends, resulting in growth rates for SFB that are either higher or lower than the FAA's forecasts for each market. For this forecast, the 2017 market share percentage was applied and then we adjusted the market share to reflect the 10-year historical trend projected out for the 20-year planning period. The results of the market share analysis are shown in **Table 3-9** and described below.

- **SFB and the State of Florida**: The historical SFB's share of enplaned passengers for the State of Florida has increased slightly over the past 10 years, from 1.5 percent in FY 2007 to 1.7 percent in FY 2017. Applying the FY 2017 market share (1.7 percent), total enplanements are projected to reach 2,433,872 in FY 2037, for a compound annual growth rate of 2.7 percent. Considering the 10-year historical increase in market share of 0.26 percentage points and projecting that out for 20 years, suggests the market share would increase by 0.51 percentage points to 2.2 percent. Applying the increased share (2.2 percent), yields total enplanements in 2037 of 3,157,750 and a compound annual growth rate of 4.0 percent.
- **SFB and the Southern Region**: The historical SFB's share of enplaned passengers for the Southern Region7 has increased slightly over the past 10 years, from 0.6 percent in FY 2007 to 0.7 percent in FY 2017. Applying the FY 2017 market share (0.7 percent), total enplanements are projected to reach 2,295,440 in FY 2037, a compound annual growth rate of 2.4 percent. Considering the 10-year historical increase in market share of 0.15 percentage points and projecting that out for 20 years suggests that the market share would increase by 0.30 percentage points to 1.0 percent. Applying the increased market share (1.0 percent) yields a total enplanement level of 3,217,421 in 2037 and a compound annual growth rate of 4.1 percent.
- **SFB and the U.S.:** The historical SFB's share of enplaned passengers for the United States has increased slightly over the past 10 years, from 0.13 percent in FY 2007 to 0.17 percent in FY 2017. Applying the FY 2017 market share (0.17 percent), total enplanements are projected to reach 2,222,520 in FY 2037, a compound annual growth rate of 2.2 percent. Considering the 10-year historical increase in share of 0.04 percent and projecting that out for 20 years suggests that the market share would increase by 0.07 percent to 0.24 percent. Applying the increased market share (0.24 percent) yields a total enplanement level of to 3,158,595 in 2037 and a compound annual growth rate of 4.0 percent

[7] The Southern Region includes Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and the U.S. Virgin Islands.

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**Table 3-9 - Enplanement Market Share Analysis**

| Year | Adjusted TAF Enplanements | State of Florida TAF | Southern Region TAF | U.S. TAF | % of Florida | % of Southern Region | % of U.S. | State of Florida | | Southern Region | | U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | 1.7% | 1.7% to 2.2% | 0.7% | 0.7% to 1.0% | 0.17% | 0.17% to 0.24% |
| 2007 | 1,013,195 | 68,926,255 | 172,000,918 | 756,525,464 | 1.5% | 0.6% | 0.13% | - | - | - | - | - | - |
| 2008 | 1,018,048 | 69,414,686 | 173,150,595 | 747,466,798 | 1.5% | 0.6% | 0.14% | - | - | - | - | - | - |
| 2009 | 853,536 | 64,741,807 | 162,630,578 | 695,488,533 | 1.3% | 0.5% | 0.12% | - | - | - | - | - | - |
| 2010 | 618,359 | 65,366,623 | 162,913,063 | 702,818,621 | 0.9% | 0.4% | 0.09% | - | - | - | - | - | - |
| 2011 | 722,735 | 69,094,117 | 169,095,789 | 722,926,202 | 1.0% | 0.4% | 0.10% | - | - | - | - | - | - |
| 2012 | 867,635 | 69,848,049 | 170,789,344 | 731,053,513 | 1.2% | 0.5% | 0.12% | - | - | - | - | - | - |
| 2013 | 982,702 | 70,267,688 | 170,889,088 | 734,336,521 | 1.4% | 0.6% | 0.13% | - | - | - | - | - | - |
| 2014 | 1,019,390 | 71,564,866 | 173,781,263 | 753,529,877 | 1.4% | 0.6% | 0.14% | - | - | - | - | - | - |
| 2015 | 1,181,252 | 76,216,675 | 181,837,100 | 786,384,586 | 1.5% | 0.6% | 0.15% | - | - | - | - | - | - |
| 2016 | 1,349,283 | 80,699,802 | 190,462,825 | 822,586,152 | 1.7% | 0.7% | 0.16% | - | - | - | - | - | - |
| 2017 | 1,436,224 | 83,174,825 | 194,849,675 | 846,556,739 | 1.7% | 0.7% | 0.17% | - | - | - | - | - | - |
| 2018 | - | 88,613,565 | 204,273,808 | 887,027,038 | - | - | - | 1,530,138 | 1,552,893 | 1,505,689 | 1,535,928 | 1,504,884 | 1,536,575 |
| 2019 | - | 94,025,879 | 216,942,841 | 927,374,941 | - | - | - | 1,623,595 | 1,671,884 | 1,599,072 | 1,663,300 | 1,573,336 | 1,639,602 |
| 2020 | - | 96,785,487 | 222,607,396 | 951,340,881 | - | - | - | 1,671,247 | 1,745,806 | 1,640,825 | 1,739,682 | 1,613,996 | 1,715,963 |
| 2021 | - | 99,461,185 | 227,952,572 | 973,596,970 | - | - | - | 1,717,450 | 1,819,610 | 1,680,224 | 1,815,199 | 1,651,754 | 1,790,891 |
| 2022 | - | 102,036,319 | 233,037,697 | 995,029,034 | - | - | - | 1,761,916 | 1,892,922 | 1,717,706 | 1,890,188 | 1,688,115 | 1,865,864 |
| 2023 | - | 104,547,880 | 237,989,622 | 1,015,797,464 | - | - | - | 1,805,284 | 1,966,362 | 1,754,206 | 1,965,583 | 1,723,349 | 1,941,100 |
| 2024 | - | 106,958,003 | 242,722,430 | 1,035,068,887 | - | - | - | 1,846,901 | 2,039,157 | 1,789,091 | 2,040,602 | 1,756,044 | 2,014,907 |
| 2025 | - | 109,339,992 | 247,416,821 | 1,054,043,471 | - | - | - | 1,888,032 | 2,112,646 | 1,823,693 | 2,116,694 | 1,788,236 | 2,089,501 |
| 2026 | - | 111,709,202 | 252,114,698 | 1,073,017,630 | - | - | - | 1,928,943 | 2,187,109 | 1,858,321 | 2,194,205 | 1,820,426 | 2,165,451 |
| 2027 | - | 114,165,732 | 257,002,543 | 1,092,560,588 | - | - | - | 1,971,361 | 2,264,520 | 1,894,349 | 2,274,789 | 1,853,582 | 2,243,925 |
| 2028 | - | 116,641,652 | 261,995,137 | 1,112,650,527 | - | - | - | 2,014,114 | 2,343,583 | 1,931,149 | 2,357,763 | 1,887,665 | 2,324,938 |
| 2029 | - | 119,189,062 | 267,145,661 | 1,133,320,175 | - | - | - | 2,058,102 | 2,425,371 | 1,969,113 | 2,443,659 | 1,922,732 | 2,408,619 |
| 2030 | - | 121,770,168 | 272,406,671 | 1,154,378,676 | - | - | - | 2,102,671 | 2,509,163 | 2,007,892 | 2,532,108 | 1,958,459 | 2,494,617 |
| 2031 | - | 124,440,111 | 277,821,287 | 1,175,949,046 | - | - | - | 2,148,774 | 2,596,133 | 2,047,803 | 2,623,564 | 1,995,054 | 2,583,245 |
| 2032 | - | 127,177,131 | 283,336,698 | 1,197,790,347 | - | - | - | 2,196,036 | 2,685,891 | 2,088,457 | 2,717,590 | 2,032,109 | 2,674,018 |
| 2033 | - | 129,918,933 | 288,868,822 | 1,219,740,641 | - | - | - | 2,243,380 | 2,777,157 | 2,129,233 | 2,813,412 | 2,069,349 | 2,766,599 |
| 2034 | - | 132,672,925 | 294,470,996 | 1,242,112,645 | - | - | - | 2,290,935 | 2,870,095 | 2,170,527 | 2,911,565 | 2,107,304 | 2,861,721 |
| 2035 | - | 135,412,005 | 300,066,191 | 1,264,545,129 | - | - | - | 2,338,232 | 2,964,121 | 2,211,769 | 3,011,305 | 2,145,362 | 2,958,582 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2036 | - | 138,187,989 | 305,738,029 | 1,287,208,236 | - | - | - | 2,386,166 | 3,060,371 | 2,253,575 | 3,113,483 | 2,183,811 | 3,057,594 |
| 2037 | - | 140,950,756 | 311,417,713 | 1,310,024,370 | - | - | - | 2,433,872 | 3,157,750 | 2,295,440 | 3,217,421 | 2,222,520 | 3,158,595 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | | |
| - | - | 2.7% | 2.4% | 2.2% | - | - | - | 2.7% | 4.0% | 2.4% | 4.1% | 2.2% | 4.0% |
| 10-Yr Change in SFB Share (2007-2017) | | | | | | | | | | | | | |
| - | - | - | - | - | 0.26% | 0.15% | 0.04% | - | - | - | - | - | - |
| Assumed 20-Yr Change in SFB Share (2017-2037) | | | | | | | | | | | | | |
| - | - | - | - | - | 0.51% | 0.30% | 0.07% | - | - | - | - | - | - |
| SFB % Share | | | | | | | | | | | | | |
| - | - | - | - | - | - | - | | 1.7% | 2.2% | 0.7% | 1.0% | 0.17% | 0.24% |

Source: FAA Terminal Area Forecast dated February 2019, SAA records; analysis by Jacobsen|Daniels, 2019

### 3.4.4. Comparison of Enplaned Passenger Forecasts

Enplaned passenger forecasts developed using each of the methodologies described above are presented in **Table 3-10**.

**Table 3-10 - Enplanement Forecast Comparison**

| Year | Adjusted TAF Enplanements | Trend Analysis | | Regression Analysis | | | Market Share - State of Florida | | Market Share - Southern Region | | Market Share -U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | Florida | Florida | Southern | Southern | U.S. | U.S. |
| 2007 | 1,013,195 | - | - | - | - | - | - | - | - | - | - | - |
| 2008 | 1,018,048 | - | - | - | - | - | - | - | - | - | - | - |
| 2009 | 853,536 | - | - | - | - | - | - | - | - | - | - | - |
| 2010 | 618,359 | - | - | - | - | - | - | - | - | - | - | - |
| 2011 | 722,735 | - | - | - | - | - | - | - | - | - | - | - |
| 2012 | 867,635 | - | - | - | - | - | - | - | - | - | - | - |
| 2013 | 982,702 | - | - | - | - | - | - | - | - | - | - | - |
| 2014 | 1,019,390 | - | - | - | - | - | - | - | - | - | - | - |
| 2015 | 1,181,252 | - | - | - | - | - | - | - | - | - | - | - |
| 2016 | 1,349,283 | - | - | - | - | - | - | - | - | - | - | - |
| 2017 | 1,436,224 | - | - | - | - | - | - | - | - | - | - | - |
| 2018 | - | 1,588,544 | 1,487,220 | 1,449,897 | 1,542,509 | 1,531,173 | 1,530,138 | 1,552,893 | 1,505,689 | 1,535,928 | 1,504,884 | 1,536,575 |
| 2019 | - | 1,757,018 | 1,540,026 | 1,529,092 | 1,620,585 | 1,659,067 | 1,623,595 | 1,671,884 | 1,599,072 | 1,663,300 | 1,573,336 | 1,639,602 |
| 2020 | - | 1,943,360 | 1,594,708 | 1,609,500 | 1,692,571 | 1,794,994 | 1,671,247 | 1,745,806 | 1,640,825 | 1,739,682 | 1,613,996 | 1,715,963 |
| 2021 | - | 2,149,465 | 1,651,330 | 1,691,140 | 1,768,193 | 1,941,778 | 1,717,450 | 1,819,610 | 1,680,224 | 1,815,199 | 1,651,754 | 1,790,891 |
| 2022 | - | 2,377,428 | 1,709,964 | 1,774,024 | 1,846,061 | 2,105,125 | 1,761,916 | 1,892,922 | 1,717,706 | 1,890,188 | 1,688,115 | 1,865,864 |
| 2023 | - | 2,629,568 | 1,770,679 | 1,858,106 | 1,918,749 | 2,283,905 | 1,805,284 | 1,966,362 | 1,754,206 | 1,965,583 | 1,723,349 | 1,941,100 |
| 2024 | - | 2,908,449 | 1,833,550 | 1,943,431 | 1,992,659 | 2,477,925 | 1,846,901 | 2,039,157 | 1,789,091 | 2,040,602 | 1,756,044 | 2,014,907 |
| 2025 | - | 3,216,906 | 1,898,653 | 2,029,846 | 2,068,170 | 2,689,749 | 1,888,032 | 2,112,646 | 1,823,693 | 2,116,694 | 1,788,236 | 2,089,501 |
| 2026 | - | 3,558,078 | 1,966,068 | 2,117,296 | 2,145,016 | 2,917,061 | 1,928,943 | 2,187,109 | 1,858,321 | 2,194,205 | 1,820,426 | 2,165,451 |
| 2027 | - | 3,935,432 | 2,035,877 | 2,205,774 | 2,221,706 | 3,159,246 | 1,971,361 | 2,264,520 | 1,894,349 | 2,274,789 | 1,853,582 | 2,243,925 |
| 2028 | - | 4,352,808 | 2,108,164 | 2,295,161 | 2,297,708 | 3,417,638 | 2,014,114 | 2,343,583 | 1,931,149 | 2,357,763 | 1,887,665 | 2,324,938 |
| 2029 | - | 4,814,448 | 2,183,018 | 2,385,555 | 2,373,745 | 3,692,265 | 2,058,102 | 2,425,371 | 1,969,113 | 2,443,659 | 1,922,732 | 2,408,619 |
| 2030 | - | 5,325,048 | 2,260,530 | 2,476,906 | 2,449,526 | 3,981,389 | 2,102,671 | 2,509,163 | 2,007,892 | 2,532,108 | 1,958,459 | 2,494,617 |
| 2031 | - | 5,889,800 | 2,340,794 | 2,568,456 | 2,524,581 | 4,282,329 | 2,148,774 | 2,596,133 | 2,047,803 | 2,623,564 | 1,995,054 | 2,583,245 |
| 2032 | - | 6,514,447 | 2,423,908 | 2,660,012 | 2,598,303 | 4,597,228 | 2,196,036 | 2,685,891 | 2,088,457 | 2,717,590 | 2,032,109 | 2,674,018 |
| 2033 | - | 7,205,341 | 2,509,973 | 2,751,749 | 2,670,753 | 4,928,358 | 2,243,380 | 2,777,157 | 2,129,233 | 2,813,412 | 2,069,349 | 2,766,599 |
| 2034 | - | 7,969,509 | 2,599,094 | 2,843,649 | 2,742,223 | 5,277,114 | 2,290,935 | 2,870,095 | 2,170,527 | 2,911,565 | 2,107,304 | 2,861,721 |

| Year | Adjusted TAF Enplanements | Trend Analysis | | Regression Analysis | | | Market Share - State of Florida | | Market Share - Southern Region | | Market Share -U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | Florida | Florida | Southern | Southern | U.S. | U.S. |
| 2035 | - | 8,814,721 | 2,691,379 | 2,935,728 | 2,812,707 | 5,648,329 | 2,338,232 | 2,964,121 | 2,211,769 | 3,011,305 | 2,145,362 | 2,958,582 |
| 2036 | - | 9,749,573 | 2,786,941 | 3,028,060 | 2,882,217 | 6,036,148 | 2,386,166 | 3,060,371 | 2,253,575 | 3,113,483 | 2,183,811 | 3,057,594 |
| 2037 | - | 10,783,572 | 2,885,896 | 3,120,670 | 2,951,037 | 6,436,970 | 2,433,872 | 3,157,750 | 2,295,440 | 3,217,421 | 2,222,520 | 3,158,595 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | |
| - | - | 10.6% | 3.6% | 4.0% | 3.7% | 7.8% | 2.7% | 4.0% | 2.4% | 4.1% | 2.2% | 4.0% |
| Average of All Forecast Techniques | | | | | | | | | | | | 4.5% |
| Average of 10-Year Trend and Market Share Analysis | | | | | | | | | | | | 3.3% |

Source: Jacobsen|Daniels, 2019

## 3.4.5. Preferred Enplanement Forecasts

The forecasts outlined in the previous sections detail multiple growth scenarios based on trend, market share and regression analysis. This section identifies a preferred enplaned passenger forecast to be used in further analysis of operations and peak activity forecast components.

**Table 3-11** presents the preferred enplanement forecast for SFB. The preferred forecast is a composite forecast based on the average of the 10-year trend analysis and market share analysis forecasts. The 5-year trend was not included as part of the composite forecast as it is not representative of long-term growth given commercial service was quickly reinstated from a temporary reduction. This is largely be attributed to, Allegiant returning operations to SFB after moving to Orlando International for a few years. The regression analysis forecasts were not included as correlations were below 0.90.

This composite forecast provides a long-term growth rate for enplanements at SFB of 3.3 percent from FY 2017 to 2037, which is slightly higher than the 2018 FAA TAF growth rate of 2.4 percent, although within the five- and ten-year variance thresholds of 10 percent and 15 percent, respectively. Total enplanements are projected to reach 2,747,325 in FY 2037.

In addition, based on discussion with the SAA, it was assumed that the enplanements would not grow at a constant rate but would grow faster in the near-term and slightly slower in the long-term. To reflect this, the proposed forecast applies an assumed 5.0 percent near-term enplanement growth rate for FY 2017-2020 based on guidance received regarding expected air carrier growth. A 3.0 percent growth rate is then applied from 2020-2037. This results in the overall compound annual growth rate of 3.3 percent over the 20-year period. The utilization of a higher annual growth rate in the near-term aligns with the 2018 FAA TAF forecast, which shows a 4.5 percent compound annual growth rate for FY 2017-2020 and a 2.0 percent compound annual growth rate for FY 2020-37.

The determination of domestic and international enplanements is based on the five-year historical average for domestic vs. international percentages sourced from the SAA enplanement records. The breakdown is presented in **Table 3-11.**

**Table 3-11 - Preferred Enplanement Forecast Comparison – Domestic and International Split**

| Year | Domestic | International | Total Enplanements | 2018 FAA TAF | % Difference vs TAF |
|---|---|---|---|---|---|
| 2017 | 1,283,646 | 152,578 | 1,436,224 | 1,379,787 | 4.1% |
| 2018 | 1,347,829 | 160,207 | 1,508,036 | 1,486,519 | 1.4% |
| 2019 | 1,415,220 | 168,217 | 1,583,437 | 1,546,129 | 2.4% |
| 2020 | 1,485,981 | 176,628 | 1,662,609 | 1,575,023 | 5.6% |
| 2021 | 1,530,537 | 181,924 | 1,712,461 | 1,606,000 | 6.6% |
| 2022 | 1,576,429 | 187,379 | 1,763,808 | 1,639,456 | 7.6% |
| 2023 | 1,623,697 | 192,997 | 1,816,695 | 1,672,425 | 8.6% |
| 2024 | 1,672,382 | 198,784 | 1,871,167 | 1,704,590 | 9.8% |
| 2025 | 1,722,528 | 204,745 | 1,927,272 | 1,736,221 | 11.0% |
| 2026 | 1,774,176 | 210,884 | 1,985,060 | 1,768,045 | 12.3% |
| 2027 | 1,827,374 | 217,207 | 2,044,581 | 1,802,115 | 13.5% |
| 2028 | 1,882,166 | 223,720 | 2,105,886 | 1,837,192 | 14.6% |
| 2029 | 1,938,601 | 230,428 | 2,169,029 | 1,874,670 | 15.7% |
| 2030 | 1,996,729 | 237,337 | 2,234,066 | 1,912,733 | 16.8% |
| 2031 | 2,056,599 | 244,453 | 2,301,053 | 1,952,796 | 17.8% |

| Year | Domestic | International | Total Enplanements | 2018 FAA TAF | % Difference vs TAF |
|---|---|---|---|---|---|
| 2032 | 2,118,265 | 251,783 | 2,370,048 | 1,994,221 | 18.8% |
| 2033 | 2,181,779 | 259,333 | 2,441,112 | 2,035,943 | 19.9% |
| 2034 | 2,247,198 | 267,109 | 2,514,307 | 2,077,965 | 21.0% |
| 2035 | 2,314,579 | 275,118 | 2,589,697 | 2,119,783 | 22.2% |
| 2036 | 2,383,980 | 283,367 | 2,667,347 | 2,162,459 | 23.3% |
| 2037 | 2,455,462 | 291,863 | 2,747,325 | 2,204,897 | 24.6% |
| Compound Annual Growth Rates | | | | | |
| 2017-2020 | - | - | 5.0% | 4.5% | - |
| 2020-2037 | - | - | 3.0% | 2.0% | - |
| 2017-2037 | - | - | 3.3% | 2.4% | - |

Notes: Difference in enplanements for FY 2017 accounts for the 4.1 percent discrepancy in 2017 discussed in previous sections. Domestic and International enplanements split based on five-year historical average of 89.4 percent domestic and 10.6 percent international

Source: FAA Terminal Area Forecast dated February 2019, SAA records, analysis by Jacobsen|Daniels, 2019

## 3.5. Based Aircraft Forecast and Fleet Mix

Typically, the number of based aircraft are related to the GA activity in the area, the local demand for aircraft storage facilities, the amenities provided by SFB, and the capacity of other airports in the vicinity with comparable facilities. A projection of GA aircraft that will be based at SFB is required for the proper planning of future airside and landside requirements, such as runway usage, aircraft parking apron, and the number of hangars needed. **Table 3-12** presents historical based aircraft at SFB. The historical based aircraft data was obtained from the FAA's 2018 TAF. As shown, the number of based aircraft at SFB fluctuated from a low of 309 in FY 2007, peaking in 2009 at 380 before dropping again then rising to 350 in FY 2017. Similar to the enplanement forecast, three types of forecasts were developed for the based aircraft including trend line, regression and market share analyses, and are summarized in the following sections.

**Table 3-12 - Historical Based Aircraft**

| Year | Based Aircraft |
|---|---|
| 2007 | 309 |
| 2008 | 372 |
| 2009 | 380 |
| 2010 | 368 |
| 2011 | 364 |
| 2012 | 333 |
| 2013 | 330 |
| 2014 | 344 |
| 2015 | 323 |
| 2016 | 350 |
| 2017 | 350 |

Source: FAA Terminal Area Forecast dated February 2019; analysis by Jacobsen|Daniels, 2019

## 3.5.1. Based Aircraft Trend Line Analysis

As shown in **Table 3-13**, based aircraft at SFB grew at a compound annual growth rate of 1.3 percent from FY 2007 to FY 2017 and 1.0 percent from FY 2012 to FY 2017. Projecting these trends throughout the planning period results in total based aircraft in FY 2037 of 427 and 449 based on the 5-year and 10-year growth trends, respectively.

**Table 3-13 - Based Aircraft Trend Analysis**

| Year | 2018 TAF Based Aircraft | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| 2007 | 309 | - | - |
| 2008 | 372 | - | - |
| 2009 | 380 | - | - |
| 2010 | 368 | - | - |
| 2011 | 364 | - | - |
| 2012 | 333 | - | - |
| 2013 | 330 | - | - |
| 2014 | 344 | - | - |
| 2015 | 323 | - | - |
| 2016 | 350 | - | - |
| 2017 | 350 | - | - |
| 2018 | 354 | 354 | 354 |
| 2019 | 359 | 357 | 359 |
| 2020 | 364 | 361 | 363 |
| 2021 | 368 | 364 | 368 |
| 2022 | 373 | 368 | 372 |
| 2023 | 378 | 372 | 377 |
| 2024 | 382 | 375 | 382 |
| 2025 | 387 | 379 | 387 |
| 2026 | 392 | 383 | 392 |
| 2027 | 398 | 387 | 396 |
| 2028 | 404 | 391 | 401 |
| 2029 | 410 | 394 | 406 |
| 2030 | 416 | 398 | 412 |
| 2031 | 422 | 402 | 417 |
| 2032 | 428 | 406 | 422 |
| 2033 | 434 | 410 | 427 |
| 2034 | 440 | 415 | 433 |
| 2035 | 446 | 419 | 438 |
| 2036 | 452 | 423 | 443 |

| Year | 2018 TAF Based Aircraft | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| 2037 | 459 | 427 | 449 |
| Compound Annual Growth Rates (2017-2037) | | 1.0% | 1.3% |
| 5-Year CAGR (2012-2017) | | 1.0% | - |
| 10-Year CAGR (2007-2017) | | 1.3% | - |

Source: FAA Terminal Area Forecast dated February 2019 and analysis by Jacobsen|Daniels, 2019

### 3.5.2. Based Aircraft Regression Analysis

The regression modelling is based on demographic elements from the SFB Market Area discussed earlier in this chapter. This analysis regressed individual elements of population, employment, earnings, and per capita income from historical data compared to the number of based aircraft to determine if a positive relationship existed that could serve as the basis for a forecast. The socioeconomic variables of population, employment, and per capital income, produced r2 values of 0.34, 0.22 and 0.30, respectively. Overall, the regression methodology resulted in low correlation coefficients across all categories and was not selected as the preferred forecast for based aircraft. **Table 3-14** depicts the forecast of based aircraft resulting from the regression analysis.

**Table 3-14 - Based Aircraft Regression Analysis**

| Year | Based Aircraft | Population | Employment | Per Capita Income | Based Aircraft – Population | Based Aircraft – Employment | Based Aircraft – Per Capita Income |
|---|---|---|---|---|---|---|---|
| 2008 | 372 | 3,221 | 1,847 | 34,759 | - | - | - |
| 2009 | 380 | 3,243 | 1,763 | 32,828 | - | - | - |
| 2010 | 368 | 3,274 | 1,753 | 33,844 | - | - | - |
| 2011 | 364 | 3,312 | 1,800 | 35,297 | - | - | - |
| 2012 | 333 | 3,370 | 1,844 | 35,647 | - | - | - |
| 2013 | 330 | 3,422 | 1,889 | 35,919 | - | - | - |
| 2014 | 344 | 3,491 | 1,965 | 37,476 | - | - | - |
| 2015 | 323 | 3,573 | 2,047 | 39,478 | - | - | - |
| 2016 | 350 | 3,658 | 2,125 | 40,220 | - | - | - |
| 2017 | 350 | 3,715 | 2,207 | 41,766 | - | - | - |
| 2018 | - | 3,776 | 2,264 | 43,342 | 329 | 332 | 328 |
| 2019 | - | 3,838 | 2,314 | 44,951 | 325 | 329 | 322 |
| 2020 | - | 3,901 | 2,359 | 46,660 | 321 | 326 | 316 |
| 2021 | - | 3,965 | 2,407 | 48,506 | 317 | 323 | 309 |
| 2022 | - | 4,030 | 2,456 | 50,560 | 313 | 320 | 302 |
| 2023 | - | 4,096 | 2,502 | 52,809 | 309 | 318 | 294 |
| 2024 | - | 4,163 | 2,549 | 55,249 | 305 | 315 | 285 |
| 2025 | - | 4,231 | 2,597 | 57,913 | 300 | 312 | 275 |
| 2026 | - | 4,299 | 2,645 | 60,772 | 296 | 309 | 265 |
| 2027 | - | 4,368 | 2,694 | 63,818 | 292 | 307 | 254 |
| 2028 | - | 4,438 | 2,742 | 67,068 | 287 | 304 | 242 |
| 2029 | - | 4,509 | 2,790 | 70,521 | 283 | 301 | 230 |
| 2030 | - | 4,581 | 2,838 | 74,158 | 278 | 298 | 217 |

| Year | Based Aircraft | Population | Employment | Per Capita Income | Based Aircraft – Population | Based Aircraft – Employment | Based Aircraft – Per Capita Income |
|---|---|---|---|---|---|---|---|
| 2031 | - | 4,652 | 2,886 | 77,943 | 274 | 296 | 203 |
| 2032 | - | 4,724 | 2,932 | 81,903 | 269 | 293 | 189 |
| 2033 | - | 4,796 | 2,978 | 86,067 | 264 | 290 | 174 |
| 2034 | - | 4,868 | 3,023 | 90,454 | 260 | 288 | 158 |
| 2035 | - | 4,940 | 3,068 | 95,122 | 255 | 285 | 142 |
| 2036 | - | 5,012 | 3,112 | 100,000 | 251 | 282 | 124 |
| 2037 | - | 5,085 | 3,155 | 105,041 | 246 | 280 | 106 |
| Compound Annual Growth Rates (2017-2037) | | - | - | - | -1.7% | -1.1% | -5.8% |
| Coefficient of Determination | | 0.34 | 0.22 | 0.30 | - | - | - |

Source: FAA Terminal Area Forecast dated February 2019, Woods and Poole Economics 2018; analysis by Jacobsen|Daniels, 2019

### 3.5.3. Based Aircraft Market Share Analysis

Two market share percentages were applied for the based aircraft market share forecast including the 2017 market share percentage and the market share percentage reflecting the 10-year historical trend projected out for 20 years. The results of the market share analysis are shown in **Table 3-15** and is described in the following paragraphs.

- **SFB and the State of Florida**: SFB's historical share of based aircraft for the State of Florida has fluctuated during the past 10 years. Applying the FY 2017 ratio (3.0 percent) to the State of Florida TAF based aircraft projections yields a total based aircraft projection of 457 for SFB by FY 2037. This results in a compound annual growth rate of 1.3 percent. Considering the 10-year historical increase in market share of 0.7 percent and projecting that out for 20 years, suggests the market share would increase by 1.4 percentage points to 4.4 percent. Applying the increased market share (4.4 percent) results in a total based aircraft projection of 662 by FY 2037 and a compound annual growth rate of 3.2 percent.
- **SFB and the Southern Region**: SFB's historical share of based aircraft for the Southern Region has fluctuated slightly during the past 10 years. Applying the FY 2017 ratio (1.1 percent) yields a total based aircraft at SFB projection of 415 by FY 2037, and a compound annual growth rate of 0.9 percent. Considering the 10-year historical increase in market share of 0.25 percent and projecting that out for 20 years, suggests the market share would increase by 0.5 percentage points to 1.6 percent. Applying the increased market share (1.6 percent) to the 2018 TAF for the Southern Region yields a total based aircraft projection of 601 by FY 2037. This suggests a compound annual growth rate of 2.7 percent.
- **SFB and the U.S.**: SFB's historical share of based aircraft for the entire U.S. has also fluctuated during the last 10 years. Applying the FY 2017 ratio (0.21 percent) generates an SFB based aircraft total of 411 by FY 2037, a compound annual growth rate of 0.8 percent. Considering the historical 10-year increase in market share of 0.05 percent and projecting that out for 20 years, suggests the market share will increase by 0.11 percentage points to 0.32 percent. Applying this increased market share (0.32 percent) to the 2018 TAF for the U.S. yields a based aircraft projection of 624 by FY 2037, with a compound annual growth rate of 2.9 percent.

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**Table 3-15 - Based Aircraft Market Share Analysis**

| Year | SFB TAF and SAA Stats | State of Florida TAF | Southern Region TAF | U.S. TAF | % of Florida | % of Southern Region | % of U.S. | State of Florida | | Southern Region | | U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | 3.0% | 3.0% to 4.4% | 1.1% | 1.1% to 1.6% | 0.21% | 0.21% to 0.32% |
| 2007 | 309 | 13,170 | 36,262 | 199,461 | 2.3% | 0.9% | 0.15% | - | - | - | - | - | - |
| 2008 | 372 | 11,238 | 32,448 | 175,453 | 3.3% | 1.1% | 0.21% | - | - | - | - | - | - |
| 2009 | 380 | 10,624 | 32,639 | 177,310 | 3.6% | 1.2% | 0.21% | - | - | - | - | - | - |
| 2010 | 368 | 10,931 | 30,834 | 165,396 | 3.4% | 1.2% | 0.22% | - | - | - | - | - | - |
| 2011 | 364 | 10,832 | 29,258 | 160,333 | 3.4% | 1.2% | 0.23% | - | - | - | - | - | - |
| 2012 | 333 | 11,292 | 30,175 | 163,260 | 2.9% | 1.1% | 0.20% | - | - | - | - | - | - |
| 2013 | 330 | 11,554 | 31,136 | 166,878 | 2.9% | 1.1% | 0.20% | - | - | - | - | - | - |
| 2014 | 344 | 11,838 | 32,163 | 170,313 | 2.9% | 1.1% | 0.20% | - | - | - | - | - | - |
| 2015 | 323 | 11,360 | 30,798 | 163,959 | 2.8% | 1.0% | 0.20% | - | - | - | - | - | - |
| 2016 | 350 | 11,998 | 33,047 | 173,860 | 2.9% | 1.1% | 0.20% | - | - | - | - | - | - |
| 2017 | 350 | 11,570 | 31,875 | 167,140 | 3.0% | 1.1% | 0.21% | - | - | - | - | - | - |
| 2018 | - | 11,722 | 32,141 | 168,615 | - | - | - | 355 | 363 | 353 | 361 | 353 | 362 |
| 2019 | - | 11,884 | 32,436 | 169,988 | - | - | - | 359 | 376 | 356 | 372 | 356 | 374 |
| 2020 | - | 12,044 | 32,692 | 171,326 | - | - | - | 364 | 389 | 359 | 383 | 359 | 387 |
| 2021 | - | 12,213 | 32,972 | 172,784 | - | - | - | 369 | 403 | 362 | 394 | 362 | 399 |
| 2022 | - | 12,391 | 33,262 | 174,212 | - | - | - | 375 | 417 | 365 | 406 | 365 | 412 |
| 2023 | - | 12,575 | 33,564 | 175,758 | - | - | - | 380 | 432 | 369 | 418 | 368 | 426 |
| 2024 | - | 12,750 | 33,880 | 177,194 | - | - | - | 386 | 446 | 372 | 430 | 371 | 439 |
| 2025 | - | 12,919 | 34,152 | 178,582 | - | - | - | 391 | 461 | 375 | 442 | 374 | 452 |
| 2026 | - | 13,090 | 34,427 | 179,958 | - | - | - | 396 | 476 | 378 | 454 | 377 | 465 |
| 2027 | - | 13,265 | 34,712 | 181,373 | - | - | - | 401 | 491 | 381 | 467 | 380 | 479 |
| 2028 | - | 13,439 | 35,004 | 182,784 | - | - | - | 407 | 507 | 384 | 479 | 383 | 492 |
| 2029 | - | 13,620 | 35,305 | 184,218 | - | - | - | 412 | 523 | 388 | 492 | 386 | 506 |
| 2030 | - | 13,802 | 35,603 | 185,681 | - | - | - | 418 | 539 | 391 | 505 | 389 | 520 |
| 2031 | - | 13,982 | 35,925 | 187,129 | - | - | - | 423 | 556 | 394 | 518 | 392 | 535 |
| 2032 | - | 14,163 | 36,222 | 188,578 | - | - | - | 428 | 573 | 398 | 531 | 395 | 549 |
| 2033 | - | 14,347 | 36,519 | 190,035 | - | - | - | 434 | 590 | 401 | 545 | 398 | 564 |
| 2034 | - | 14,534 | 36,832 | 191,531 | - | - | - | 440 | 607 | 404 | 558 | 401 | 578 |
| 2035 | - | 14,725 | 37,136 | 193,033 | - | - | - | 445 | 625 | 408 | 572 | 404 | 594 |
| 2036 | - | 14,916 | 37,484 | 194,592 | - | - | - | 451 | 644 | 412 | 587 | 407 | 609 |

| Year | SFB TAF and SAA Stats | State of Florida TAF | Southern Region TAF | U.S. TAF | % of Florida | % of Southern Region | % of U.S. | State of Florida | | Southern Region | | U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | 3.0% | 3.0% to 4.4% | 1.1% | 1.1% to 1.6% | 0.21% | 0.21% to 0.32% |
| 2037 | - | 15,116 | 37,800 | 196,134 | - | - | - | 457 | 662 | 415 | 601 | 411 | 624 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | | |
| - | - | 1.1% | 0.6% | 0.6% | - | - | - | 1.3% | 3.2% | 0.9% | 2.7% | 0.8% | 2.9% |
| 10-Yr Change in SFB Share (2007-2017) | | | | | | | | | | | | | |
| - | - | - | - | - | 0.7% | 0.25% | 0.05% | - | - | - | - | - | - |
| Assumed 20-Yr Change in SFB Share (2017-2037) | | | | | | | | | | | | | |
| - | - | - | - | - | 1.4% | 0.5% | 0.11% | - | - | - | - | - | - |
| SFB % Share | | | | | | | | | | | | | |
| - | - | - | - | - | - | - | - | 3.0% | 4.4% | 1.1% | 1.6% | 0.21% | 0.32% |

Source: FAA Terminal Area Forecast dated February 2019; analysis by Jacobsen|Daniels, 2019

## 3.5.4. Comparison of Based Aircraft Forecasts

The based aircraft forecasts developed using each of the methodologies described above are presented in **Table 3-16**.

**Table 3-16 - Based Aircraft Forecast Comparison**

| Year | 2018 FAA TAF | Trend Analysis | | Regression Analysis | | | Market Share of State of Florida | | Market Share of Southern Region | | Market Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | Florida | Florida | Southern | Southern | U.S. | U.S. |
| 2007 | 309 | - | - | - | - | - | - | - | - | - | - | - |
| 2008 | 372 | - | - | - | - | - | - | - | - | - | - | - |
| 2009 | 380 | - | - | - | - | - | - | - | - | - | - | - |
| 2010 | 368 | - | - | - | - | - | - | - | - | - | - | - |
| 2011 | 364 | - | - | - | - | - | - | - | - | - | - | - |
| 2012 | 333 | - | - | - | - | - | - | - | - | - | - | - |
| 2013 | 330 | - | - | - | - | - | - | - | - | - | - | - |
| 2014 | 344 | - | - | - | - | - | - | - | - | - | - | - |
| 2015 | 323 | - | - | - | - | - | - | - | - | - | - | - |
| 2016 | 350 | - | - | - | - | - | - | - | - | - | - | - |
| 2017 | 350 | - | - | - | - | - | - | - | - | - | - | - |
| 2018 | 354 | 354 | 354 | 329 | 332 | 328 | 355 | 363 | 353 | 361 | 353 | 362 |
| 2019 | 359 | 357 | 359 | 325 | 329 | 322 | 359 | 376 | 356 | 372 | 356 | 374 |
| 2020 | 364 | 361 | 363 | 321 | 326 | 316 | 364 | 389 | 359 | 383 | 359 | 387 |
| 2021 | 368 | 364 | 368 | 317 | 323 | 309 | 369 | 403 | 362 | 394 | 362 | 399 |
| 2022 | 373 | 368 | 372 | 313 | 320 | 302 | 375 | 417 | 365 | 406 | 365 | 412 |
| 2023 | 378 | 372 | 377 | 309 | 318 | 294 | 380 | 432 | 369 | 418 | 368 | 426 |
| 2024 | 382 | 375 | 382 | 305 | 315 | 285 | 386 | 446 | 372 | 430 | 371 | 439 |

| Year | 2018 FAA TAF | Trend Analysis | | Regression Analysis | | | Market Share of State of Florida | | Market Share of Southern Region | | Market Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | Florida | Florida | Southern | Southern | U.S. | U.S. |
| 2025 | 387 | 379 | 387 | 300 | 312 | 275 | 391 | 461 | 375 | 442 | 374 | 452 |
| 2026 | 392 | 383 | 392 | 296 | 309 | 265 | 396 | 476 | 378 | 454 | 377 | 465 |
| 2027 | 398 | 387 | 396 | 292 | 307 | 254 | 401 | 491 | 381 | 467 | 380 | 479 |
| 2028 | 404 | 391 | 401 | 287 | 304 | 242 | 407 | 507 | 384 | 479 | 383 | 492 |
| 2029 | 410 | 394 | 406 | 283 | 301 | 230 | 412 | 523 | 388 | 492 | 386 | 506 |
| 2030 | 416 | 398 | 412 | 278 | 298 | 217 | 418 | 539 | 391 | 505 | 389 | 520 |
| 2031 | 422 | 402 | 417 | 274 | 296 | 203 | 423 | 556 | 394 | 518 | 392 | 535 |
| 2032 | 428 | 406 | 422 | 269 | 293 | 189 | 428 | 573 | 398 | 531 | 395 | 549 |
| 2033 | 434 | 410 | 427 | 264 | 290 | 174 | 434 | 590 | 401 | 545 | 398 | 564 |
| 2034 | 440 | 415 | 433 | 260 | 288 | 158 | 440 | 607 | 404 | 558 | 401 | 578 |
| 2035 | 446 | 419 | 438 | 255 | 285 | 142 | 445 | 625 | 408 | 572 | 404 | 594 |
| 2036 | 452 | 423 | 443 | 251 | 282 | 124 | 451 | 644 | 412 | 587 | 407 | 609 |
| 2037 | 459 | 427 | 449 | 246 | 280 | 106 | 457 | 662 | 415 | 601 | 411 | 624 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | |
| - | 1.4% | 1.0% | 1.3% | -1.7% | -1.1% | -5.8% | 1.3% | 3.2% | 0.9% | 2.7% | 0.8% | 2.9% |
| Average of All Forecast Techniques | | | | | | | | | | | | 0.5% |
| Average of All Forecast Techniques excluding Regression Analysis | | | | | | | | | | | | 1.8% |

Source: Jacobsen|Daniels, 2019

### 3.5.5. Preferred Based Aircraft Forecast

To select the preferred forecast of based aircraft, the various forecasts were reviewed and evaluated to determine how they compare to the expected growth at SFB. The selected based aircraft forecast is the best representation of what is expected to occur at SFB.

The preferred forecast, as presented in **Table 3-17**, is a composite forecast based on the average of all forecast techniques except the regression analysis due to the low correlations. This results in a long-term growth rate (FY 2017-2037) for based aircraft of 1.8 percent, slightly higher than the 2018 FAA TAF growth rate of 1.4 percent for the same period. The preferred forecast accounts for the anticipated growth from L3 Harris Airline Academy. By taking the SFB's current based aircraft counts and increasing L3 Harris Airline Academy's count to 125 as planned for 2019, the result is 361 based aircraft, which is in line with the forecast's 362 based aircraft for 2019

**Table 3-18** presents SFB's current based aircraft counts by aircraft type, and the forecast of based aircraft by type. The expected fleet mix (FY 2019) is identified by aircraft class: single-engine piston, multi-engine piston, jet aircraft, helicopters, and turbo-prop. This information is also sourced from SFB tenants. The estimated distribution of based aircraft for the base year is assumed to be constant through the planning period.

**Table 3-17 - Preferred Based Aircraft Forecast**

| Year | Total | 2018 TAF | % Difference vs TAF |
|---|---|---|---|
| 2017 | 350 | 350 | - |
| 2018 | 356 | 354 | 0.6% |
| 2019 | 362 | 359 | 0.8% |
| 2020 | 368 | 364 | 1.1% |
| 2021 | 375 | 368 | 1.9% |
| 2022 | 382 | 373 | 2.4% |
| 2023 | 389 | 378 | 2.9% |
| 2024 | 396 | 382 | 3.7% |
| 2025 | 403 | 387 | 4.1% |
| 2026 | 410 | 392 | 4.6% |
| 2027 | 417 | 398 | 4.8% |
| 2028 | 424 | 404 | 5.0% |
| 2029 | 432 | 410 | 5.4% |
| 2030 | 440 | 416 | 5.8% |
| 2031 | 448 | 422 | 6.2% |
| 2032 | 456 | 428 | 6.5% |
| 2033 | 464 | 434 | 6.9% |
| 2034 | 472 | 440 | 7.3% |
| 2035 | 480 | 446 | 7.6% |
| 2036 | 489 | 452 | 8.2% |
| 2037 | 498 | 459 | 8.5% |
| AAGR (2017-2037) | 1.8% | 1.4% | - |

Source: FAA Terminal Area Forecast dated February 2019, SAA records, and analysis by Jacobsen|Daniels, 2019.

**Table 3-18 - Preferred Based Aircraft Fleet Mix Forecast**

| Year | Single-Engine | Multi-Engine | TurboProp | Helicopter | Jet | Total |
|---|---|---|---|---|---|---|
| 2017 | 223 | 47 | 14 | 6 | 60 | 350 |
| 2018 | 227 | 48 | 14 | 6 | 61 | 356 |
| 2019 | 231 | 49 | 15 | 6 | 61 | 362 |
| 2020 | 235 | 50 | 15 | 6 | 62 | 368 |
| 2021 | 239 | 51 | 15 | 6 | 64 | 375 |
| 2022 | 244 | 52 | 15 | 7 | 64 | 382 |
| 2023 | 248 | 53 | 16 | 7 | 65 | 389 |
| 2024 | 253 | 53 | 16 | 7 | 67 | 396 |
| 2025 | 257 | 54 | 16 | 7 | 69 | 403 |
| 2026 | 262 | 55 | 16 | 7 | 70 | 410 |
| 2027 | 266 | 56 | 17 | 7 | 71 | 417 |
| 2028 | 270 | 57 | 17 | 7 | 73 | 424 |
| 2029 | 276 | 58 | 17 | 7 | 74 | 432 |
| 2030 | 281 | 59 | 18 | 8 | 74 | 440 |
| 2031 | 286 | 61 | 18 | 8 | 75 | 448 |
| 2032 | 291 | 62 | 18 | 8 | 77 | 456 |
| 2033 | 296 | 63 | 19 | 8 | 78 | 464 |
| 2034 | 301 | 64 | 19 | 8 | 80 | 472 |
| 2035 | 306 | 65 | 19 | 8 | 82 | 480 |
| 2036 | 312 | 66 | 20 | 8 | 83 | 489 |
| 2037 | 318 | 67 | 20 | 9 | 84 | 498 |
| % of Fleet | 63.8% | 13.5% | 4.0% | 1.7% | 17.0% | 100% |

Source: FAA Terminal Area Forecast dated February 2019, SAA records; analysis by Jacobsen|Daniels, 2019

## 3.6. Aircraft Operations and Fleet Mix

This section presents operations and fleet mix projections for air carrier, air cargo, air taxi/commuter, GA, and military activity at SFB.

### 3.6.1. Air Carrier Operations and Fleet Mix

The air carrier operations forecast is based on the preferred enplaned passenger forecast presented earlier, combined with historical and expected trends in load factors and average aircraft seats-per-departure. To generate the operations forecast, the following methodology was followed. Air carrier enplanements were divided by an assumed load factor to calculate the number of seats required to transport the forecasted enplanements. The number of seats was divided by the expected average seats-per departure to calculate the number of departures. The number of departures was assumed to equal the number of arrivals. Therefore, the number of departures was then multiplied by two in order to calculate the total number of operations. Total operations at SFB are presented in **Table 3-19** and forecast of air carrier operations by fleet in **Table 3-20**.

The following points highlight the key assumptions that were used to derive the air carrier aircraft operations forecast for SFB.

- **Seats-per-departure:** The average number of seats-per-departure for the air carrier airlines, including domestic and international, was calculated to be 167.0 based on schedule data through October 2019, excluding Via Air operations which have ceased operation. The schedule reflects the 2018 completion of Allegiant Air's transition from the MD-80 fleet type to the Airbus A319 and A320 aircraft. The seats-per-departure are assumed constant throughout the planning period.
- **Load Factor:** The load factors for SFB's air carrier airlines are typically higher than the national average given Allegiant Air makes up over 90 percent of air carrier operations and Allegiant Air's revenue management strategy is to adjust air fares as needed to achieve a 90 percent load factor target (in contrast to other airlines that use a mix of both air fare and load factor in order to optimize revenue). Based on 2018 T100 data, SFB had an overall load factor of 87.9 percent. Taking into account Allegiant Air's transition from MD-80 aircraft to Airbus A319 and A320, which brings the airline's average seats per departure down by about 3 percent, the 2018 load factor would have been 90.5 percent taking into account Allegiant Air's slightly lower seats per departure. Therefore, an air carrier load factor of 90.0 percent was applied and held constant throughout the planning period.
- **Fleet Mix:** The air carrier operations fleet mix at SFB consists of wide body (Boeing 787), and narrow body (Airbus 319/320). Fleet mix projections reflect Allegiant Air's recent full transition into the Airbus A319/A320 aircraft with the retirement of the MD-80 fleet. Projections assume the existing fleet mix will remain constant through the planning period. The fleet mix was then applied to the total operations forecast to generate operations by fleet mix forecast summarized in **Table 3-20**

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**Table 3-19 - Total Operations Forecast by Year**

| Year | Total Enplanements | Average Seats per Departure | Load Factor | Departures | Operations |
|---|---|---|---|---|---|
| 2018 | 1,508,036 | 167 | 90% | 10,034 | 20,068 |
| 2019 | 1,583,437 | 167 | 90% | 10,535 | 21,070 |
| 2020 | 1,662,609 | 167 | 90% | 11,062 | 22,124 |
| 2021 | 1,712,461 | 167 | 90% | 11,394 | 22,788 |
| 2022 | 1,763,808 | 167 | 90% | 11,735 | 23,470 |
| 2023 | 1,816,695 | 167 | 90% | 12,087 | 24,174 |
| 2024 | 1,871,167 | 167 | 90% | 12,450 | 24,900 |
| 2025 | 1,927,272 | 167 | 90% | 12,823 | 25,646 |
| 2026 | 1,985,060 | 167 | 90% | 13,207 | 26,414 |
| 2027 | 2,044,581 | 167 | 90% | 13,603 | 27,206 |
| 2028 | 2,105,886 | 167 | 90% | 14,011 | 28,022 |
| 2029 | 2,169,029 | 167 | 90% | 14,431 | 28,862 |
| 2030 | 2,234,066 | 167 | 90% | 14,864 | 29,728 |
| 2031 | 2,301,053 | 167 | 90% | 15,310 | 30,620 |
| 2032 | 2,370,048 | 167 | 90% | 15,769 | 31,538 |
| 2033 | 2,441,112 | 167 | 90% | 16,242 | 32,484 |
| 2034 | 2,514,307 | 167 | 90% | 16,729 | 33,458 |
| 2035 | 2,589,697 | 167 | 90% | 17,230 | 34,460 |
| 2036 | 2,667,347 | 167 | 90% | 17,747 | 35,494 |
| 2037 | 2,747,325 | 167 | 90% | 18,279 | 36,558 |

Source: Sabre 2019 schedule data; analysis by Jacobsen|Daniels, 2019

**Table 3-20 - Air Carrier Operations and Fleet Mix Forecast**

| Fleet Type | Seats Per Departure | 2022 | | 2027 | | 2032 | | 2037 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Operations | % | Operations | % | Operations | % | Operations | % |
| A319 | 156 | 12,720 | 54.2% | 14,745 | 54.2% | 17,092 | 54.2% | 19,813 | 54.2% |
| A320 | 177 | 10,420 | 44.4% | 12,079 | 44.4% | 14,003 | 44.4% | 16,231 | 44.4% |
| B787 | 307 | 330 | 1.4% | 382 | 1.4% | 443 | 1.4% | 514 | 1.4% |
| | Total | 23,470 | | 27,206 | | 31,538 | | 36,558 | |
| Forecasted Enplanements | | 1,763,808 | | 2,044,581 | | 2,370,048 | | 2,747,325 | |
| Average Seats per Departure | | 167.0 | | 167.0 | | 167.0 | | 167.0 | |
| Assumed Load Factor | | 90% | | 90% | | 90% | | 90% | |
| Departures | | 11,735 | | 13,603 | | 15,769 | | 18,279 | |
| Operations | | 23,470 | | 27,206 | | 31,538 | | 36,558 | |

Note: The assumed fleet mix is based on the 2019 schedule data excluding Via's operations as these were discontinued in late 2019

Source: Sabre 2019 schedule data; analysis by Jacobsen|Daniels, 2019

## 3.6.2. Air Cargo Tonnage

Air cargo operations and fleet mix are included in the air carrier category described above. Air cargo at SFB is tied directly to "belly" cargo transported by airlines serving SFB. Air freight ranges from perishables such as food and flowers, to cars, mechanical parts, electrical equipment, etc.

It is important to determine the forecast for total air cargo tonnage because it affects airline belly cargo facilities. Data for the cargo tonnage forecast was obtained from the SFB activity records. These records document the weight of cargo moving through SFB between FY 2007 and FY 2017. Comparing the weight of the cargo with the recorded operations at SFB, an average ratio of tons of cargo per aircraft operation was also obtained. Total air cargo tons have declined in recent years. Considering this trend, the forecast assumes tons per operation of 0.04 based on the three-year average ratio from FY 2015-2017. The three-year average was used since it is more reflective of recent trends that show a decline in air cargo tonnage. By multiplying this average ratio by the annual operations projected for SFB, the weight of air cargo is projected through the year FY 2037 as shown in **Table 3-21.**

**Table 3-21 - Air Cargo Tonnage Forecast**

| Year | Air Cargo Tons | Air Carrier Operations | Tons Per Operation |
|---|---|---|---|
| 2007 | 7,496 | 9,810 | 0.76 |
| 2008 | 5,370 | 11,705 | 0.46 |
| 2009 | 2,215 | 13,248 | 0.17 |
| 2010 | 3,491 | 8,984 | 0.39 |
| 2011 | 2,939 | 10,235 | 0.29 |
| 2012 | 3,179 | 12,468 | 0.25 |
| 2013 | 3,112 | 12,733 | 0.24 |
| 2014 | 1,627 | 13,594 | 0.12 |
| 2015 | 1,316 | 16,045 | 0.08 |
| 2016 | 610 | 18,293 | 0.03 |
| 2017 | 332 | 19,760 | 0.02 |
| Forecast | | | |
| 2018 | 917 | 20,814 | 0.04 |
| 2019 | 963 | 21,856 | 0.04 |
| 2020 | 1,011 | 22,948 | 0.04 |
| 2021 | 1,041 | 23,636 | 0.04 |
| 2022 | 1,073 | 24,346 | 0.04 |
| 2023 | 1,105 | 25,076 | 0.04 |
| 2024 | 1,138 | 25,828 | 0.04 |
| 2025 | 1,172 | 26,602 | 0.04 |
| 2026 | 1,207 | 27,400 | 0.04 |
| 2027 | 1,243 | 28,220 | 0.04 |
| 2028 | 1,281 | 29,066 | 0.04 |
| 2029 | 1,319 | 29,938 | 0.04 |
| 2030 | 1,359 | 30,836 | 0.04 |
| 2031 | 1,399 | 31,760 | 0.04 |

| Year | Air Cargo Tons | Air Carrier Operations | Tons Per Operation |
|---|---|---|---|
| 2032 | 1,441 | 32,712 | 0.04 |
| 2033 | 1,484 | 33,694 | 0.04 |
| 2034 | 1,529 | 34,704 | 0.04 |
| 2035 | 1,575 | 35,744 | 0.04 |
| 2036 | 1,622 | 36,816 | 0.04 |
| 2037 | 1,671 | 37,920 | 0.04 |
| 3-Year Average Tons Per Operation (2015-2017) | | | 0.04 |
| 5-Year Average Tons Per Operation (2013-2017) | | | 0.10 |
| 10-Year Average Tons Per Operation 2008-2017) | | | 0.21 |

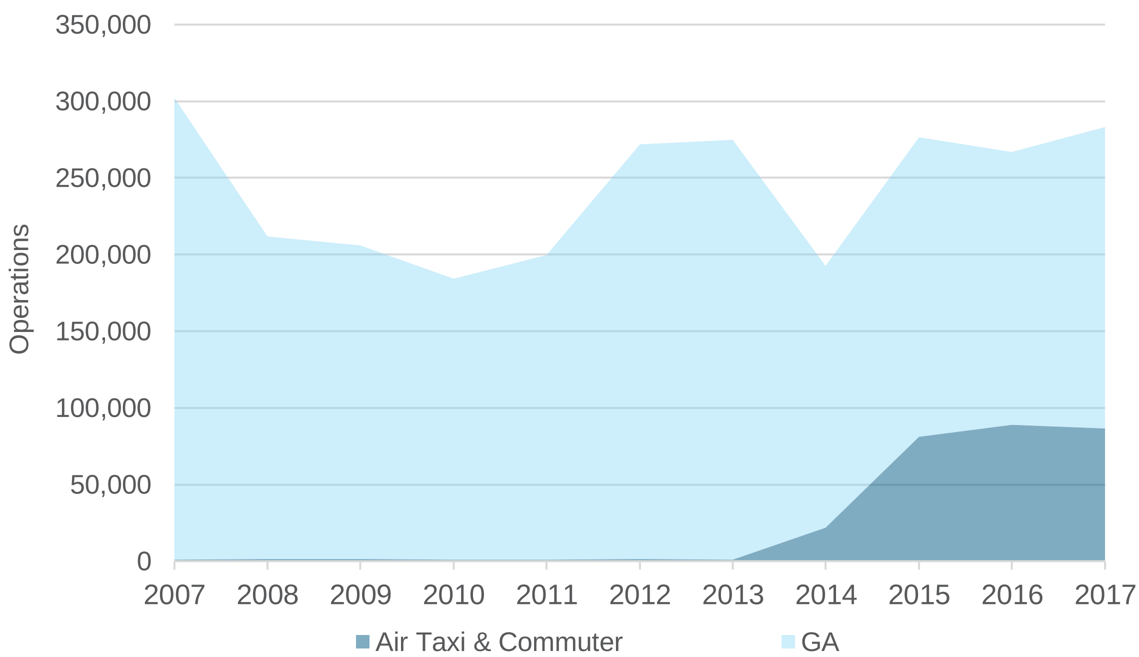
Source: FAA Terminal Area Forecast dated February 2019; Cargo Tons sourced from SFB website March 2019; analysis by Jacobsen|Daniels, 2019

### 3.6.3. General Aviation and Air Taxi/Commuter Aircraft Operations

The following section provides a forecast of GA and Air Taxi/Commuter aircraft operations for SFB. The forecast will assist in determining the need for GA facilities.

Since L3 Harris Airline Academy acquired Aerosim Flight Academy in 2016, some operations that were previously categorized as GA are now counted as air taxi/commuter in the TAF reporting (see **Figure 3-6**). From FY 2015 to FY 2017, the split between GA and air taxi/commuter has maintained close to a 70 percent/30 percent mix, with overall operations for the combined categories around 275,000 operations per year. To address this shift in the historical data, GA and air taxi/commuter operations are forecast together in total. The total forecast is then split between the two categories based on the annual percentage mix forecast in the 2018 FAA TAF.

**Figure 3-6 - Historical GA and Air Taxi/Commuter Operations**




Sources: FAA Terminal Area Forecast dated February 2019; analysis by Jacobsen|Daniels, 2019

In addition to the trend, regression, and market share approaches, the GA and air taxi/commuter operations forecasting also utilize operations per based aircraft (OPBA). The methodologies and underlying assumptions that are used to prepare the forecasts of SFB's GA and air taxi/commuter aircraft operations are discussed in the following sections.

#### 3.6.3.1. Operations per Based Aircraft Analysis

The forecast of total GA and air taxi/commuter operations are prepared using a ratio of operations per based aircraft (OPBA) from historical data. The OPBA is then applied to the forecast of based aircraft to develop estimates of future operations.

As shown in **Table 3-22**, the historical OPBA has fluctuated from a 10-year average of 680 OPBA, to a 5-year average of 764 OPBA, to a 3-year average of 809 OPBA. This analysis assumes an OPBA value of 764 based on the FY 2013-2017 average. Applying this average OPBA to the preferred based aircraft forecast projected total annual GA and air taxi/commuter operations of 380,442 by FY 2037, with a compound annual growth rate of 1.5 percent over the 20-year period.

**Table 3-22 - GA and Air Taxi Operations OPBA Forecast**

| Year | Based Aircraft | GA + Air Taxi/ Commuter Ops | OPBA |
|---|---|---|---|
| 2007 | 309 | 302,099 | 978 |
| 2008 | 372 | 211,795 | 569 |
| 2009 | 380 | 206,153 | 543 |
| 2010 | 368 | 184,047 | 500 |
| 2011 | 364 | 199,706 | 549 |
| 2012 | 333 | 271,735 | 816 |
| 2013 | 330 | 274,920 | 833 |
| 2014 | 344 | 192,402 | 559 |
| 2015 | 323 | 276,501 | 856 |
| 2016 | 350 | 266,848 | 762 |
| 2017 | 350 | 283,092 | 809 |
| Forecast | | | |
| 2018 | 356 | 271,962 | 764 |
| 2019 | 362 | 276,546 | 764 |
| 2020 | 368 | 281,130 | 764 |
| 2021 | 375 | 286,477 | 764 |
| 2022 | 382 | 291,825 | 764 |
| 2023 | 389 | 297,172 | 764 |
| 2024 | 396 | 302,520 | 764 |
| 2025 | 403 | 307,868 | 764 |
| 2026 | 410 | 313,215 | 764 |
| 2027 | 417 | 318,563 | 764 |
| 2028 | 424 | 323,910 | 764 |
| 2029 | 432 | 330,022 | 764 |
| 2030 | 440 | 336,133 | 764 |
| 2031 | 448 | 342,245 | 764 |
| 2032 | 456 | 348,356 | 764 |
| 2033 | 464 | 354,468 | 764 |

| Year | Based Aircraft | GA + Air Taxi/ Commuter Ops | OPBA |
|---|---|---|---|
| 2034 | 472 | 360,579 | 764 |
| 2035 | 480 | 366,691 | 764 |
| 2036 | 489 | 373,566 | 764 |
| 2037 | 498 | 380,442 | 764 |
| OPBA | | | |
| 3-Year Average (2015-2017) | | - | 809 |
| 5-Year Average (2013-2017) | | - | 764 |
| 10-Year Average (2008-2017) | | - | 680 |
| Compound Annual Growth Rate (2017 - 2037) | | 1.5% | - |

Source: FAA Terminal Area Forecast dated February 2019; analysis by Jacobsen|Daniels, 2019

### 3.6.4. GA and Air Taxi/Commuter Trend Line Analysis

As shown in **Table 3-23**, the GA and air taxi/commuter trend analysis uses the compound annual growth rates based on the five and ten-year historical periods and projects operations forward to FY 2037 based on those historical linear trends. The compound annual growth rate for the five-year period from FY 2012 through FY 2017 is 0.8 percent. This growth rate is projected into the future with GA and air taxi/commuter operations growing to 333,469 operations by FY 2037. The compound annual growth rate for the last ten years, FY 2007 to FY 2017, is -0.6 percent. Projecting this rate forward results in 248,590 operations in FY 2037. The 10-year trend is not representative of long-term growth as the base year of FY 2007 was peak for activity followed by a significant drop in 2008. Since 2008, the activity has not reached the 2007 peak level, therefore is not included as part of the preferred forecast.

**Table 3-23 - GA and Air Taxi/Commuter Trend Analysis**

| Year | GA + Air Taxi/ Commuter Ops | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| 2007 | 302,099 | - | - |
| 2008 | 211,795 | - | - |
| 2009 | 206,153 | - | - |
| 2010 | 184,047 | - | - |
| 2011 | 199,706 | - | - |
| 2012 | 271,735 | - | - |
| 2013 | 274,920 | - | - |
| 2014 | 192,402 | - | - |
| 2015 | 276,501 | - | - |
| 2016 | 266,848 | - | - |
| 2017 | 283,092 | - | - |
| 2018 | - | 285,420 | 281,258 |
| 2019 | - | 287,767 | 279,437 |
| 2020 | - | 290,133 | 277,627 |
| 2021 | - | 292,518 | 275,828 |
| 2022 | - | 294,924 | 274,042 |

| Year | GA + Air Taxi/ Commuter Ops | 5-Year Trend Analysis | 10-Year Trend Analysis |
|---|---|---|---|
| 2023 | - | 297,349 | 272,267 |
| 2024 | - | 299,794 | 270,503 |
| 2025 | - | 302,259 | 268,751 |
| 2026 | - | 304,744 | 267,010 |
| 2027 | - | 307,250 | 265,281 |
| 2028 | - | 309,776 | 263,563 |
| 2029 | - | 312,323 | 261,855 |
| 2030 | - | 314,891 | 260,159 |
| 2031 | - | 317,481 | 258,474 |
| 2032 | - | 320,091 | 256,800 |
| 2033 | - | 322,723 | 255,137 |
| 2034 | - | 325,377 | 253,484 |
| 2035 | - | 328,052 | 251,842 |
| 2036 | - | 330,750 | 250,211 |
| 2037 | - | 333,469 | 248,590 |
| Compound Annual Growth Rates (2017-2037) | | 0.8% | -0.6% |
| 5-Year CAGR (2012-2017) | | 0.8% | - |
| 10-Year CAGR (2007-2017) | | -0.6% | - |

Source: FAA Terminal Area Forecast dated February 2019 (FY 2007-2017); analysis by Jacobsen|Daniels, 2019

#### 3.6.4.1. GA and Air Taxi/Commuter Regression Analysis

Regression modeling is based on demographic elements from the Market Area as discussed earlier in this chapter. The socioeconomic variables of population, employment, and per capita income produced r2 values of 0.47, 0.45, and 0.45, respectively. Overall, the regression methodology resulted in low correlation coefficients across all categories. Therefore, the projections based on these regressions is not included in the preferred forecast. Results of the regression analysis are detailed in **Table 3-24**.

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**Table 3-24 - GA and Air Taxi Operations Regression Analysis**

| Year | GA + Air Taxi/ Commuter | Population (thousands) | Employment (thousands) | Per Capita Income | GA Ops + Air Taxi – Population | GA Ops + Air Taxi – Employment | GA Ops + Air Taxi – Per Capita Income |
|---|---|---|---|---|---|---|---|
| 2008 | 211,795 | 3,221 | 1,847 | 34,759 | - | - | - |
| 2009 | 206,153 | 3,243 | 1,763 | 32,828 | - | - | - |
| 2010 | 184,047 | 3,274 | 1,753 | 33,844 | - | - | - |
| 2011 | 199,706 | 3,312 | 1,800 | 35,297 | - | - | - |
| 2012 | 271,735 | 3,370 | 1,844 | 35,647 | - | - | - |
| 2013 | 274,920 | 3,422 | 1,889 | 35,919 | - | - | - |
| 2014 | 192,402 | 3,491 | 1,965 | 37,476 | - | - | - |
| 2015 | 276,501 | 3,573 | 2,047 | 39,478 | - | - | - |
| 2016 | 266,848 | 3,658 | 2,125 | 40,220 | - | - | - |
| 2017 | 283,092 | 3,715 | 2,207 | 41,766 | - | - | - |
| 2018 | - | 3,776 | 2,264 | 43,342 | 292,110 | 295,948 | 298,582 |
| 2019 | - | 3,838 | 2,314 | 44,951 | 301,968 | 304,549 | 313,616 |
| 2020 | - | 3,901 | 2,359 | 46,660 | 311,977 | 312,480 | 329,595 |
| 2021 | - | 3,965 | 2,407 | 48,506 | 322,139 | 320,812 | 346,849 |
| 2022 | - | 4,030 | 2,456 | 50,560 | 332,457 | 329,390 | 366,051 |
| 2023 | - | 4,096 | 2,502 | 52,809 | 342,923 | 337,399 | 387,067 |
| 2024 | - | 4,163 | 2,549 | 55,249 | 353,544 | 345,541 | 409,874 |
| 2025 | - | 4,231 | 2,597 | 57,913 | 364,301 | 353,861 | 434,774 |
| 2026 | - | 4,299 | 2,645 | 60,772 | 375,186 | 362,327 | 461,495 |
| 2027 | - | 4,368 | 2,694 | 63,818 | 386,200 | 370,776 | 489,964 |
| 2028 | - | 4,438 | 2,742 | 67,068 | 397,326 | 379,149 | 520,339 |
| 2029 | - | 4,509 | 2,790 | 70,521 | 408,578 | 387,526 | 552,621 |

| Year | GA + Air Taxi/ Commuter | Population (thousands) | Employment (thousands) | Per Capita Income | GA Ops + Air Taxi – Population | GA Ops + Air Taxi – Employment | GA Ops + Air Taxi – Per Capita Income |
|---|---|---|---|---|---|---|---|
| 2030 | - | 4,581 | 2,838 | 74,158 | 419,950 | 395,875 | 586,608 |
| 2031 | - | 4,652 | 2,886 | 77,943 | 431,345 | 404,144 | 621,984 |
| 2032 | - | 4,724 | 2,932 | 81,903 | 442,742 | 412,266 | 659,001 |
| 2033 | - | 4,796 | 2,978 | 86,067 | 454,161 | 420,248 | 697,926 |
| 2034 | - | 4,868 | 3,023 | 90,454 | 465,601 | 428,122 | 738,923 |
| 2035 | - | 4,940 | 3,068 | 95,122 | 477,062 | 435,888 | 782,560 |
| 2036 | - | 5,012 | 3,112 | 100,000 | 488,556 | 443,546 | 828,148 |
| 2037 | - | 5,085 | 3,155 | 105,041 | 500,084 | 451,128 | 875,265 |
| Compound Annual Growth Rates (2017-2037) | | - | - | - | 3.2% | 2.7% | 6.1% |
| Coefficient of Determination | | 0.47 | 0.45 | 0.45 | - | - | - |

Source: FAA Terminal Area Forecast dated January 2019, Woods and Poole Economics 2018; analysis by Jacobsen|Daniels, 2019

#### 3.6.4.2. GA and Air Traffic/Commuter Market Share Analysis

The results of the market share analysis are shown in **Table 3-25** and described in the following paragraphs. Two market share percentages for each market were applied. First, the 2017 historical percentage was applied over the 20-year period and the second market share was based on the 10-year historical increase in market share from 2007 to 2017.

- **SFB and the State of Florida:** The historical SFB's share of GA and air taxi/commuter operations for the State of Florida has increased slightly over the past 10 years, from 4.0 percent in FY 2007 to 4.2 percent in FY 2017. Applying the FY 2017 market share (4.2 percent), GA and air taxi/commuter operations are projected to reach 342,047 in FY 2037, a compound annual growth rate of 1.0 percent. Increasing SFB's share to 4.6 percent, an increase of 0.38 percentage points over 20 years based on the 10-year historical increase in share of 0.19 percentage points, GA and air taxi/commuter operations are projected to reach 373,153 in 2037, a compound annual growth rate of 1.4 percent.
- **SFB and the Southern Region:** The historical SFB's share of GA and air taxi/commuter operations for the Southern Region has increased slightly over the past 10 years, from 1.5 percent in FY 2007 to 1.7 percent in FY 2017. Applying the FY 2017 market share (1.7 percent), GA and air taxi/commuter operations are projected to reach 306,642 in FY 2037, a compound annual growth rate of 0.4 percent. Increasing SFB's share to 2.0 percent, an increase of 0.31 percentage points over 20 years based on the 10-year historical increase in share of 0.15 percentage points, GA and air taxi/commuter operations are projected to reach 363,514 in 2037, a compound annual growth rate of 1.3 percent.
- **SFB and the U.S.:** The historical SFB's share of GA and air taxi/commuter operations for the United States has increased slightly over the past 10 years, from 0.32 percent in FY 2007 to 0.37 percent in FY 2017. Applying the FY 2017 market share (0.37 percent), GA and air taxi/commuter operations are projected to reach 303,384 in FY 2037, a compound annual growth rate of 0.3 percent. Increasing SFB's share to 0.46 percent, an increase of 0.09 percentage points over 20 years based on the 10-year historical increase in share of 0.05 percentage points, total enplanements are projected to reach 383,084 in 2037, a compound annual growth rate of 1.5 percent.

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**Table 3-25 - GA Operations and Air Taxi/Commuter Market Share Analysis**

| Year | SFB TAF | State of Florida TAF | Southern Region TAF | U.S. TAF | % of Florida | % of Southern Region | % of U.S. | Share of State of Florida | | Share of Southern Region | | Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | 4.2% | 4.2% to 4.6% | 1.7% | 1.7% to 2.0% | 0.37% | 0.37% to 0.46% |
| 2007 | 302,099 | 7,477,733 | 20,165,155 | 94,687,558 | 4.0% | 1.5% | 0.32% | - | - | - | - | - | - |
| 2008 | 211,795 | 7,267,921 | 19,765,676 | 91,755,553 | 2.9% | 1.1% | 0.23% | - | - | - | - | - | - |
| 2009 | 206,153 | 6,692,338 | 18,313,485 | 85,801,027 | 3.1% | 1.1% | 0.24% | - | - | - | - | - | - |
| 2010 | 184,047 | 6,176,988 | 17,696,054 | 83,291,027 | 3.0% | 1.0% | 0.22% | - | - | - | - | - | - |
| 2011 | 199,706 | 6,238,364 | 17,682,729 | 81,763,284 | 3.2% | 1.1% | 0.24% | - | - | - | - | - | - |
| 2012 | 271,735 | 6,317,732 | 17,595,954 | 81,194,956 | 4.3% | 1.5% | 0.33% | - | - | - | - | - | - |
| 2013 | 274,920 | 6,499,470 | 17,675,626 | 80,245,301 | 4.2% | 1.6% | 0.34% | - | - | - | - | - | - |
| 2014 | 192,402 | 6,486,913 | 17,505,217 | 79,180,935 | 3.0% | 1.1% | 0.24% | - | - | - | - | - | - |
| 2015 | 276,501 | 6,637,652 | 17,631,458 | 78,752,565 | 4.2% | 1.6% | 0.35% | - | - | - | - | - | - |
| 2016 | 266,848 | 6,626,686 | 17,048,588 | 77,636,583 | 4.0% | 1.6% | 0.34% | - | - | - | - | - | - |
| 2017 | 283,092 | 6,688,632 | 17,144,097 | 77,075,271 | 4.2% | 1.7% | 0.37% | - | - | - | - | - | - |
| 2018 | - | 7,040,192 | 17,479,481 | 78,041,313 | - | - | - | 297,972 | 299,326 | 288,630 | 291,307 | 286,640 | 290,405 |
| 2019 | - | 7,200,242 | 17,671,097 | 78,687,100 | - | - | - | 304,746 | 307,517 | 291,794 | 297,206 | 289,012 | 296,605 |
| 2020 | - | 7,232,792 | 17,620,385 | 78,370,241 | - | - | - | 306,123 | 310,299 | 290,957 | 299,051 | 287,848 | 299,191 |
| 2021 | - | 7,273,687 | 17,638,530 | 78,425,289 | - | - | - | 307,854 | 313,453 | 291,256 | 302,060 | 288,051 | 303,185 |
| 2022 | - | 7,311,310 | 17,620,589 | 78,291,823 | - | - | - | 309,446 | 316,482 | 290,960 | 304,451 | 287,560 | 306,446 |
| 2023 | - | 7,346,467 | 17,579,433 | 78,034,445 | - | - | - | 310,934 | 319,418 | 290,280 | 306,432 | 286,615 | 309,203 |
| 2024 | - | 7,391,124 | 17,619,845 | 78,195,135 | - | - | - | 312,825 | 322,782 | 290,948 | 309,834 | 287,205 | 313,613 |
| 2025 | - | 7,439,794 | 17,686,976 | 78,502,670 | - | - | - | 314,884 | 326,339 | 292,056 | 313,723 | 288,335 | 318,633 |
| 2026 | - | 7,489,126 | 17,754,933 | 78,815,758 | - | - | - | 316,972 | 329,944 | 293,178 | 317,647 | 289,485 | 323,707 |
| 2027 | - | 7,539,152 | 17,824,119 | 79,134,205 | - | - | - | 319,090 | 333,599 | 294,321 | 321,614 | 290,654 | 328,832 |
| 2028 | - | 7,589,885 | 17,894,236 | 79,457,869 | - | - | - | 321,237 | 337,305 | 295,479 | 325,620 | 291,843 | 334,011 |
| 2029 | - | 7,641,363 | 17,965,351 | 79,785,991 | - | - | - | 323,416 | 341,063 | 296,653 | 329,665 | 293,048 | 339,239 |
| 2030 | - | 7,693,604 | 18,037,496 | 80,119,041 | - | - | - | 325,627 | 344,875 | 297,844 | 333,751 | 294,272 | 344,521 |
| 2031 | - | 7,746,653 | 18,110,661 | 80,457,472 | - | - | - | 327,872 | 348,744 | 299,052 | 337,878 | 295,515 | 349,858 |
| 2032 | - | 7,800,488 | 18,184,788 | 80,800,978 | - | - | - | 330,151 | 352,669 | 300,276 | 342,045 | 296,776 | 355,249 |
| 2033 | - | 7,855,101 | 18,259,879 | 81,149,758 | - | - | - | 332,462 | 356,650 | 301,516 | 346,254 | 298,057 | 360,698 |
| 2034 | - | 7,910,493 | 18,335,958 | 81,504,089 | - | - | - | 334,806 | 360,687 | 302,773 | 350,504 | 299,359 | 366,205 |
| 2035 | - | 7,966,688 | 18,413,019 | 81,863,779 | - | - | - | 337,185 | 364,783 | 304,045 | 354,797 | 300,680 | 371,771 |
| 2036 | - | 8,023,722 | 18,491,136 | 82,229,082 | - | - | - | 339,599 | 368,939 | 305,335 | 359,133 | 302,022 | 377,397 |

| Year | SFB TAF | State of Florida TAF | Southern Region TAF | U.S. TAF | % of Florida | % of Southern Region | % of U.S. | Share of State of Florida | | Share of Southern Region | | Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | 4.2% | 4.2% to 4.6% | 1.7% | 1.7% to 2.0% | 0.37% | 0.37% to 0.46% |
| 2037 | - | 8,081,559 | 18,570,263 | 82,599,972 | - | - | - | 342,047 | 373,153 | 306,642 | 363,514 | 303,384 | 383,084 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | | |
| - | | 1.0% | 0.4% | 0.3% | - | - | - | 1.0% | 1.4% | 0.4% | 1.3% | 0.3% | 1.5% |
| 10-Yr Change in SFB Share (2007-2017) | | | | | | | | | | | | | |
| - | | - | - | - | 0.19% | 0.15% | 0.05% | - | - | - | - | - | - |
| Assumed 20-Yr Change in SFB Share (2017-2037) | | | | | | | | | | | | | |
| - | | - | - | - | 0.38% | 0.31% | 0.10% | - | - | - | - | - | - |
| SFB % Share | | | | | | | | | | | | | |
| - | | - | - | - | - | - | - | 4.2% | 4.6% | 1.7% | 2.0% | 0.37% | 0.46% |

Source: FAA Terminal Area Forecast dated February 2019; analysis by Jacobsen|Daniels, 2019

### 3.6.5. Comparison of GA and Air Taxi/Commuter Operations Forecast

GA and air taxi/commuter operations forecasts developed using each of the methodologies described earlier in this section are presented in **Table 3-26.**

**Table 3-26 - GA and Air Taxi/Commuter Operations Forecast Comparison**

| Year | TAF | OPBA | Trend Analysis | | Regression Analysis | | | Market Share of State of Florida | | Market Share of Southern Region | | Market Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share Florida | Increase Share Florida | Current Share Southern | Increase Share Southern | Current Share U.S. | Increase Share U.S. |
| 2007 | 302,099 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2008 | 211,795 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2009 | 206,153 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2010 | 184,047 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2011 | 199,706 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2012 | 271,735 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2013 | 274,920 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2014 | 192,402 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2015 | 276,501 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2016 | 266,848 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2017 | 283,092 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2018 | 300,613 | 271,962 | 285,420 | 281,258 | 292,110 | 295,948 | 298,582 | 297,972 | 299,326 | 288,630 | 291,307 | 286,640 | 290,405 |
| 2019 | 306,226 | 276,546 | 287,767 | 279,437 | 301,968 | 304,549 | 313,616 | 304,746 | 307,517 | 291,794 | 297,206 | 289,012 | 296,605 |
| 2020 | 308,003 | 281,130 | 290,133 | 277,627 | 311,977 | 312,480 | 329,595 | 306,123 | 310,299 | 290,957 | 299,051 | 287,848 | 299,191 |
| 2021 | 309,907 | 286,477 | 292,518 | 275,828 | 322,139 | 320,812 | 346,849 | 307,854 | 313,453 | 291,256 | 302,060 | 288,051 | 303,185 |
| 2022 | 311,771 | 291,825 | 294,924 | 274,042 | 332,457 | 329,390 | 366,051 | 309,446 | 316,482 | 290,960 | 304,451 | 287,560 | 306,446 |
| 2023 | 313,618 | 297,172 | 297,349 | 272,267 | 342,923 | 337,399 | 387,067 | 310,934 | 319,418 | 290,280 | 306,432 | 286,615 | 309,203 |
| 2024 | 315,604 | 302,520 | 299,794 | 270,503 | 353,544 | 345,541 | 409,874 | 312,825 | 322,782 | 290,948 | 309,834 | 287,205 | 313,613 |
| 2025 | 317,643 | 307,868 | 302,259 | 268,751 | 364,301 | 353,861 | 434,774 | 314,884 | 326,339 | 292,056 | 313,723 | 288,335 | 318,633 |
| 2026 | 319,696 | 313,215 | 304,744 | 267,010 | 375,186 | 362,327 | 461,495 | 316,972 | 329,944 | 293,178 | 317,647 | 289,485 | 323,707 |
| 2027 | 321,763 | 318,563 | 307,250 | 265,281 | 386,200 | 370,776 | 489,964 | 319,090 | 333,599 | 294,321 | 321,614 | 290,654 | 328,832 |
| 2028 | 323,845 | 323,910 | 309,776 | 263,563 | 397,326 | 379,149 | 520,339 | 321,237 | 337,305 | 295,479 | 325,620 | 291,843 | 334,011 |
| 2029 | 325,941 | 330,022 | 312,323 | 261,855 | 408,578 | 387,526 | 552,621 | 323,416 | 341,063 | 296,653 | 329,665 | 293,048 | 339,239 |
| 2030 | 328,052 | 336,133 | 314,891 | 260,159 | 419,950 | 395,875 | 586,608 | 325,627 | 344,875 | 297,844 | 333,751 | 294,272 | 344,521 |
| 2031 | 330,179 | 342,245 | 317,481 | 258,474 | 431,345 | 404,144 | 621,984 | 327,872 | 348,744 | 299,052 | 337,878 | 295,515 | 349,858 |
| 2032 | 332,321 | 348,356 | 320,091 | 256,800 | 442,742 | 412,266 | 659,001 | 330,151 | 352,669 | 300,276 | 342,045 | 296,776 | 355,249 |
| 2033 | 334,478 | 354,468 | 322,723 | 255,137 | 454,161 | 420,248 | 697,926 | 332,462 | 356,650 | 301,516 | 346,254 | 298,057 | 360,698 |
| 2034 | 336,649 | 360,579 | 325,377 | 253,484 | 465,601 | 428,122 | 738,923 | 334,806 | 360,687 | 302,773 | 350,504 | 299,359 | 366,205 |

| Year | TAF | OPBA | Trend Analysis | | Regression Analysis | | | Market Share of State of Florida | | Market Share of Southern Region | | Market Share of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5-Year Trend | 10-Year Trend | Population | Employment | Per Capita Income | Current Share | Increase Share | Current Share | Increase Share | Current Share | Increase Share |
| | | | | | | | | Florida | Florida | Southern | Southern | U.S. | U.S. |
| 2035 | 338,837 | 366,691 | 328,052 | 251,842 | 477,062 | 435,888 | 782,560 | 337,185 | 364,783 | 304,045 | 354,797 | 300,680 | 371,771 |
| 2036 | 341,041 | 373,566 | 330,750 | 250,211 | 488,556 | 443,546 | 828,148 | 339,599 | 368,939 | 305,335 | 359,133 | 302,022 | 377,397 |
| 2037 | 343,260 | 380,442 | 333,469 | 248,590 | 500,084 | 451,128 | 875,265 | 342,047 | 373,153 | 306,642 | 363,514 | 303,384 | 383,084 |
| Compound Annual Growth Rates (2017-2037) | | | | | | | | | | | | | |
| - | 1.0% | 1.5% | 0.8% | -0.6% | 2.9% | 2.4% | 5.8% | 1.0% | 1.4% | 0.4% | 1.3% | 0.3% | 1.5% |
| Average of All Forecast Techniques | | | | | | | | | | | | | 1.5% |
| Average of OPBA, 5-Year Trend and Market Share Analysis | | | | | | | | | | | | | 1.0% |

Source: Jacobsen|Daniels, 2019

### 3.6.5.1. Preferred GA and Air Taxi/Commuter Operations Forecast

**Table 3-27** presents the preferred GA and air taxi/commuter operations forecast for SFB. The preferred forecast is a composite forecast based on the average of the operations per based aircraft (OPBA), 5-year trend analysis, and market share analysis forecasts. This composite forecast provides a long-term growth rate for GA and air taxi/commuter operations at SFB. The result is a 1.0 percent compound annual growth from FY 2017 to 2037, which is in line with the 2018 FAA TAF.

In addition, the proposed forecast applies an assumed 8.8 percent near-term growth rate for FY 2017-2019 based on guidance from SFB and tenants regarding expected growth and is representative of YTD 2019 actuals. To align with the overall 20-year compound annual growth rate of 1.0 percent, a 0.2 percent growth rate is then applied from 2020-2037. The utilization of a higher annual growth rate in the near-term aligns with the 2018 FAA TAF, which shows a 4.0 percent compound annual growth rate for FY 2017-2019 and a 0.6 percent compound annual growth rate for FY 2019-2037.

The preferred forecast is then split into GA and air taxi/commuter operations based on the percentage mix outlined in the 2018 FAA TAF.

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**Table 3-27 - GA and Air Taxi Operations Forecast**

| Year | GA and Air Taxi/ Commuter | TAF - GA and Air Taxi/ Commuter | % Difference vs TAF | GA | GA (TAF) | % Difference vs TAF | Air Taxi/ Commuter | TAF - Air Taxi/ Commuter | % Difference vs TAF |
|---|---|---|---|---|---|---|---|---|---|
| 2017 | 283,092 | 283,092 | 0.0% | 196,592 | 196,592 | 0.0% | 86,500 | 86,500 | 0.0% |
| 2018 | 307,932 | 300,613 | 2.4% | 213,842 | 204,270 | 4.7% | 94,090 | 96,343 | -2.3% |
| 2019 | 334,951 | 306,226 | 9.4% | 232,605 | 205,514 | 13.2% | 102,346 | 100,712 | 1.6% |
| 2020 | 335,524 | 308,003 | 8.9% | 233,003 | 206,443 | 12.9% | 102,521 | 101,560 | 0.9% |
| 2021 | 336,098 | 309,907 | 8.5% | 233,402 | 207,376 | 12.6% | 102,696 | 102,531 | 0.2% |
| 2022 | 336,673 | 311,771 | 8.0% | 233,801 | 208,313 | 12.2% | 102,872 | 103,458 | -0.6% |
| 2023 | 337,249 | 313,618 | 7.5% | 234,201 | 209,256 | 11.9% | 103,048 | 104,362 | -1.3% |
| 2024 | 337,826 | 315,604 | 7.0% | 234,602 | 210,203 | 11.6% | 103,224 | 105,401 | -2.1% |
| 2025 | 338,404 | 317,643 | 6.5% | 235,003 | 211,155 | 11.3% | 103,401 | 106,488 | -2.9% |
| 2026 | 338,983 | 319,696 | 6.0% | 235,405 | 212,111 | 11.0% | 103,578 | 107,585 | -3.7% |
| 2027 | 339,563 | 321,763 | 5.5% | 235,808 | 213,072 | 10.7% | 103,755 | 108,691 | -4.5% |
| 2028 | 340,144 | 323,845 | 5.0% | 236,212 | 214,038 | 10.4% | 103,932 | 109,807 | -5.4% |
| 2029 | 340,726 | 325,941 | 4.5% | 236,616 | 215,008 | 10.0% | 104,110 | 110,933 | -6.2% |
| 2030 | 341,309 | 328,052 | 4.0% | 237,021 | 215,983 | 9.7% | 104,288 | 112,069 | -6.9% |
| 2031 | 341,893 | 330,179 | 3.5% | 237,426 | 216,964 | 9.4% | 104,467 | 113,215 | -7.7% |
| 2032 | 342,478 | 332,321 | 3.1% | 237,832 | 217,949 | 9.1% | 104,646 | 114,372 | -8.5% |
| 2033 | 343,064 | 334,478 | 2.6% | 238,239 | 218,939 | 8.8% | 104,825 | 115,539 | -9.3% |
| 2034 | 343,651 | 336,649 | 2.1% | 238,647 | 219,933 | 8.5% | 105,004 | 116,716 | -10.0% |
| 2035 | 344,239 | 338,837 | 1.6% | 239,055 | 220,933 | 8.2% | 105,184 | 117,904 | -10.8% |
| 2036 | 344,828 | 341,041 | 1.1% | 239,464 | 221,938 | 7.9% | 105,364 | 119,103 | -11.5% |
| 2037 | 345,418 | 343,260 | 0.6% | 239,874 | 222,947 | 7.6% | 105,544 | 120,313 | -12.3% |

| Year | GA and Air Taxi/ Commuter | TAF - GA and Air Taxi/ Commuter | % Difference vs TAF | GA | GA (TAF) | % Difference vs TAF | Air Taxi/ Commuter | TAF - Air Taxi/ Commuter | % Difference vs TAF |
|---|---|---|---|---|---|---|---|---|---|
| Compound Annual Growth Rates | | | | | | | | | |
| 2017-2019 | 8.8% | 4.0% | - | 8.8% | 2.2% | - | 8.8% | 7.9% | - |
| 2019-2037 | 0.2% | 0.6% | - | 0.2% | 0.5% | - | 0.2% | 1.0% | - |
| 2017-2037 | 1.0% | 1.0% | - | 1.0% | 0.6% | - | 1.0% | 1.7% | - |

Note: GA and Air Taxi/Commuter split based on TAF annual % split

Source: FAA Terminal Area Forecast, February 2019; analysis by Jacobsen|Daniels, 2019

### 3.6.5.2. Forecast of GA Itinerant and Local Operations

GA operations are classified as either local or itinerant. As defined by the FAA TAF, local operations are performed by aircraft that:

- Remain in the local traffic pattern;
- Execute simulated instrument approaches or low passes at the airport; and/or,
- Operates to or from the same airport within a designated practice area within a 20-mile radius of the airport.

Itinerant operations are those performed by aircraft with a specific origin or destination away from SFB. As shown in **Table 3-28**, the itinerant share of GA operations has decreased from approximately 40 percent prior to FY 2015 and has ranged from 12 to 14 percent between FY 2015 and 2017.

**Table 3-28 - GA Operations – Historical Itinerant and Local Shares**

| Year | Itinerant | Local | Total GA Ops | Itinerant Share | Local Share |
|---|---|---|---|---|---|
| 2007 | 122,593 | 178,352 | 300,945 | 41% | 59% |
| 2008 | 101,421 | 108,930 | 210,351 | 48% | 52% |
| 2009 | 89,056 | 115,828 | 204,884 | 43% | 57% |
| 2010 | 72,775 | 110,299 | 183,074 | 40% | 60% |
| 2011 | 74,997 | 123,686 | 198,683 | 38% | 62% |
| 2012 | 99,785 | 170,484 | 270,269 | 37% | 63% |
| 2013 | 109,295 | 164,470 | 273,765 | 40% | 60% |
| 2014 | 57,609 | 113,056 | 170,665 | 34% | 66% |
| 2015 | 25,957 | 169,366 | 195,323 | 13% | 87% |
| 2016 | 25,096 | 152,790 | 177,886 | 14% | 86% |
| 2017 | 23,897 | 172,695 | 196,592 | 12% | 88% |

Source: FAA Terminal Area Forecast, February 2019

For this analysis, the distribution of itinerant and local share of GA operations was based on FY 2017 actuals and held constant throughout the planning period. The results are shown in **Table 3-29**.

**Table 3-29 - GA Operations – Itinerant and Local Forecast**

| Year | Itinerant | Local | Total GA Ops | Share | Share |
|---|---|---|---|---|---|
| 2017 | 23,897 | 172,695 | 196,592 | 12% | 88% |
| 2018 | 25,994 | 187,848 | 213,842 | 12% | 88% |
| 2019 | 28,275 | 204,330 | 232,605 | 12% | 88% |
| 2020 | 28,323 | 204,680 | 233,003 | 12% | 88% |
| 2021 | 28,371 | 205,031 | 233,402 | 12% | 88% |
| 2022 | 28,420 | 205,381 | 233,801 | 12% | 88% |
| 2023 | 28,469 | 205,732 | 234,201 | 12% | 88% |
| 2024 | 28,517 | 206,085 | 234,602 | 12% | 88% |
| 2025 | 28,566 | 206,437 | 235,003 | 12% | 88% |
| 2026 | 28,615 | 206,790 | 235,405 | 12% | 88% |

| Year | Itinerant | Local | Total GA Ops | Share | Share |
|---|---|---|---|---|---|
| 2027 | 28,664 | 207,144 | 235,808 | 12% | 88% |
| 2028 | 28,713 | 207,499 | 236,212 | 12% | 88% |
| 2029 | 28,762 | 207,854 | 236,616 | 12% | 88% |
| 2030 | 28,811 | 208,210 | 237,021 | 12% | 88% |
| 2031 | 28,861 | 208,565 | 237,426 | 12% | 88% |
| 2032 | 28,910 | 208,922 | 237,832 | 12% | 88% |
| 2033 | 28,959 | 209,280 | 238,239 | 12% | 88% |
| 2034 | 29,009 | 209,638 | 238,647 | 12% | 88% |
| 2035 | 29,059 | 209,996 | 239,055 | 12% | 88% |
| 2036 | 29,108 | 210,356 | 239,464 | 12% | 88% |
| 2037 | 29,158 | 210,716 | 239,874 | 12% | 88% |
| Compound Annual Growth Rates | | | | | |
| 2017-2019 | 5.8% | 5.8% | 5.8% | - | - |
| 2019-2037 | 0.2% | 0.2% | 0.2% | - | - |
| 2017-2037 | 1.0% | 1.0% | 1.0% | - | - |

Note: Local vs Itinerant split based on 2017 percentage split

Source: Jacobsen|Daniels, 2019

### 3.6.6. Military Operations

Military operations are difficult to forecast at any airfield, because military activity is heavily dependent on each year's available federal military budget and the status of events on a regional or worldwide basis. The 2018 FAA TAF forecast kept the total military operations constant. For the purposes of this analysis, it is forecast that military operations at SFB will be held at 191 operations during the planning period, in accordance with the TAF, as shown in **Table 3-30.**

**Table 3-30 - Military Operations Forecast**

| Year | Itinerant | Local | Total Operations |
|---|---|---|---|
| 2017 | 158 | 34 | 192 |
| 2018 | 149 | 42 | 191 |
| 2019 | 149 | 42 | 191 |
| 2020 | 149 | 42 | 191 |
| 2021 | 149 | 42 | 191 |
| 2022 | 149 | 42 | 191 |
| 2023 | 149 | 42 | 191 |
| 2024 | 149 | 42 | 191 |
| 2025 | 149 | 42 | 191 |
| 2026 | 149 | 42 | 191 |

| Year | Itinerant | Local | Total Operations |
|---|---|---|---|
| 2027 | 149 | 42 | 191 |
| 2028 | 149 | 42 | 191 |
| 2029 | 149 | 42 | 191 |
| 2030 | 149 | 42 | 191 |
| 2031 | 149 | 42 | 191 |
| 2032 | 149 | 42 | 191 |
| 2033 | 149 | 42 | 191 |
| 2034 | 149 | 42 | 191 |
| 2035 | 149 | 42 | 191 |
| 2036 | 149 | 42 | 191 |
| 2037 | 149 | 42 | 191 |

Source: FAA Terminal Area Forecast, February 2019; analysis by Jacobsen|Daniels, 2019

## 3.7. Peak Activity Forecasts

The traffic demand patterns imposed upon an airport are subject to seasonal, monthly, daily, and hourly variations. These variations result in peak periods when the greatest amount of demand is placed upon facilities required to accommodate passenger and aircraft movements. Peaking characteristics are critical in the assessment of existing facilities to determine their ability to accommodate forecast increases in passenger and operational activity throughout the study period. The objective of developing peak period forecasts is to provide a design level that sizes facilities so they are neither underutilized nor overcrowded too often.

To evaluate the peaking patterns at an airport, the annual enplanements and aircraft operations forecasts are converted to monthly, daily, and hourly equivalents. The SFB average day peak month (ADPM) approximates activity levels that occur on an average day in the peak month. SAA monthly activity reports from January to December 2018 were used to identify the peak month (July) and associated peak percentages for each forecast element. The peak hour percentages for enplanements and air carrier operations were based on data included in the 2018 Gate Needs Study. For air taxi/commuter, GA, and military operations, the peak hour percentages were based on SFB's prior master plan assumptions.

**Table 3-31** shows the peak month (PM), ADPM, and peak hour percentages used to develop the peak period forecasts for each of the key operations segments at SFB, as well as the forecasted peak activity levels.

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Table 3-31 - Peak Activity Forecast

| Enplanements | 2017 | 2022 | 2027 | 2032 | 2037 |
|---|---|---|---|---|---|
| Annual Enplanements | 1,436,224 | 1,763,808 | 2,044,581 | 2,370,048 | 2,747,325 |
| Peak Month (10.6%) | 152,000 | 186,669 | 216,384 | 250,829 | 290,757 |
| ADPM (Peak Month/31) | 4,904 | 6,022 | 6,981 | 8,092 | 9,380 |
| Peak Hour (33.9% of ADPM) | 1,662 | 2,041 | 2,366 | 2,742 | 3,178 |
| Air Carrier Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
| Annual Operations | 19,760 | 23,470 | 27,206 | 31,538 | 36,558 |
| Peak Month (10.3%) | 2,035 | 2,417 | 2,802 | 3,248 | 3,765 |
| ADPM (Peak Month/31) | 66 | 78 | 91 | 105 | 122 |
| Peak Hour (21.8% of ADPM) | 15 | 18 | 20 | 23 | 27 |
| Air Taxi/Commuter Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
| Annual Operations | 86,500 | 102,872 | 103,755 | 104,646 | 105,544 |
| Peak Month (8.3%) | 7,153 | 8,507 | 8,580 | 8,653 | 8,728 |
| ADPM (Peak Month/31) | 231 | 275 | 277 | 280 | 282 |
| Peak Hour (20.0% of ADPM) | 47 | 55 | 56 | 56 | 57 |
| General Aviation Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
| Annual Operations | 196,592 | 233,801 | 235,808 | 237,832 | 239,874 |
| Peak Month (8.7% of Annual) | 17,120 | 20,361 | 20,536 | 20,712 | 20,890 |
| ADPM (Peak Month/31) | 553 | 657 | 663 | 669 | 674 |
| Peak Hour (20.0% of ADPM) | 111 | 132 | 133 | 134 | 135 |
| Military Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
| Annual Operations | 192 | 191 | 191 | 191 | 191 |
| Peak Month (2.8% of Annual) | 6 | 6 | 6 | 6 | 6 |
| ADPM (Peak Month/31) | 1 | 1 | 1 | 1 | 1 |

| Military Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
|---|---|---|---|---|---|
| Peak Hour (50.0% of ADPM) | 1 | 1 | 1 | 1 | 1 |
| Total Operations | 2017 | 2022 | 2027 | 2032 | 2037 |
| Annual Operations | 303,044 | 360,334 | 366,960 | 374,207 | 382,167 |
| Peak Month | 26,314 | 31,291 | 31,924 | 32,619 | 33,389 |
| ADPM (Peak Month/31) | 851 | 1,011 | 1,032 | 1,055 | 1,079 |
| Peak Hour | 174 | 206 | 210 | 214 | 220 |

Note: Air Taxi peak hour assumed to be the same as GA given changes in reporting for a portion of L3 Harris Airline Academy operations from GA to Air Taxi

Sources: Peak Month - SAA Monthly Activity Reports dated January-December 2018, Peak Hour - 2018 Gate Needs Study for Enplanements and Air Carrier Operations, 2012 SFB Master Plan for GA, Air Taxi, and Military Operations. Analysis by Jacobsen|Daniels, 2019

# 3.8. Enplanements and Aircraft Operations Summary

**Table 3-32** presents a comparison of key SFB Forecast elements to the TAF, illustrating that all forecast metrics are within the allowable variance from the TAF. **Table 3-33**, presents the annual activity forecast. These forecasts, along with the peak activity data, will be utilized to develop facility requirements for SFB as part of the Airport Master Plan process. The forecast is within 10 percent of the TAF in the first five years and within 15 percent of the TAF in the first ten years.

**Table 3-32 - Master Plan Forecasts Comparison to TAF**

| Enplanements | Master Plan | 2018 TAF | % Difference |
|---|---|---|---|
| Base Year (FY 2017) | 1,443,531 | 1,379,787 | 4.6% |
| Base Year + 5 Years (FY 2022) | 1,763,808 | 1,639,456 | 7.6% |
| Base Year + 10 Years (FY 2027) | 2,044,581 | 1,802,115 | 13.5% |
| Air Carrier Operations | Master Plan | 2018 TAF | % Difference |
| Base Year (FY 2017) | 19,760 | 19,760 | - |
| Base Year + 5 Years (FY 2022) | 23,470 | 22,935 | 2.3% |
| Base Year + 10 Years (FY 2027) | 27,206 | 25,226 | 7.8% |
| Air Taxi/Commuter Operations | Master Plan | 2018 TAF | % Difference |
| Base Year (FY 2017) | 86,500 | 86,500 | - |
| Base Year + 5 Years (FY 2022) | 102,872 | 103,458 | -0.6% |
| Base Year + 10 Years (FY 2027) | 103,755 | 108,691 | -4.5% |
| General Aviation Operations | Master Plan | 2018 TAF | % Difference |
| Base Year (FY 2017) | 196,592 | 196,592 | - |
| Base Year + 5 Years (FY 2022) | 233,801 | 208,313 | 12.2% |
| Base Year + 10 Years (FY 2027) | 235,808 | 213,072 | 10.7% |
| Military Operations | Master Plan | 2018 TAF | % Difference |
| Base Year (FY 2017) | 192 | 192 | - |
| Base Year + 5 Years (FY 2022) | 191 | 191 | 0% |
| Base Year + 10 Years (FY 2027) | 191 | 191 | 0% |
| Total Operations | Master Plan | 2018 TAF | % Difference |
| Base Year (FY 2017) | 303,044 | 303,044 | - |
| Base Year + 5 Years (FY 2022) | 360,334 | 334,897 | 7.6% |
| Base Year + 10 Years (FY 2027) | 366,960 | 347,180 | 5.7% |

Note: Difference in enplanements for FY 2017 due to the 3.9 percent adjustment to the base year given historical understatement of TAF enplanements

Source: FAA Terminal Area Forecast, February 2019 and analysis by Jacobsen|Daniels, 2019

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Table 3-33 - Enplanements and Operations Summary

| Year | Enplanements | | | Itinerant Operations | | | | | Local Operations | | | Total Operations | Total Based Aircraft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Air Carrier | Commuter | Total Enplanements | Air Carrier | Air Taxi/ Commuter | General Aviation | Military | Total Itinerant | Civil | Military | Total Local | | |
| 2007 | 1,013,195 | 1,720 | 1,014,915 | 9,810 | 1,154 | 122,593 | 650 | 134,207 | 178,352 | 74 | 178,426 | 312,633 | 309 |
| 2008 | 1,018,048 | 85 | 1,018,133 | 11,705 | 1,444 | 101,421 | 491 | 115,061 | 108,930 | 1,281 | 110,211 | 225,272 | 372 |
| 2009 | 853,536 | 804 | 854,340 | 13,248 | 1,269 | 89,056 | 190 | 103,763 | 115,828 | 616 | 116,444 | 220,207 | 380 |
| 2010 | 618,359 | 1,622 | 619,981 | 8,984 | 973 | 72,775 | 379 | 83,111 | 110,299 | 565 | 110,864 | 193,975 | 368 |
| 2011 | 722,735 | 30,177 | 752,912 | 10,235 | 1,023 | 74,997 | 161 | 86,416 | 123,686 | 37 | 123,723 | 210,139 | 364 |
| 2012 | 867,635 | 725 | 868,360 | 12,468 | 1,466 | 99,785 | 290 | 114,009 | 170,484 | 83 | 170,567 | 284,576 | 333 |
| 2013 | 982,702 | 1,600 | 984,302 | 12,733 | 1,155 | 109,295 | 229 | 123,412 | 164,470 | 137 | 164,607 | 288,019 | 330 |
| 2014 | 1,019,390 | 1,890 | 1,021,280 | 13,594 | 21,737 | 57,609 | 191 | 93,131 | 113,056 | 59 | 113,115 | 206,246 | 344 |
| 2015 | 1,181,252 | 1,237 | 1,182,489 | 16,045 | 81,178 | 25,957 | 248 | 123,428 | 169,366 | 14 | 169,380 | 292,808 | 323 |
| 2016 | 1,349,283 | 466 | 1,349,749 | 18,293 | 88,962 | 25,096 | 169 | 132,520 | 152,790 | 1 | 152,791 | 285,311 | 350 |
| 2017 | 1,436,224 | 7,307 | 1,443,531 | 19,760 | 86,500 | 23,897 | 158 | 130,315 | 172,695 | 34 | 172,729 | 303,044 | 350 |
| Forecast | | | | | | | | | | | | | |
| 2018 | 1,508,036 | 0 | 1,508,036 | 20,068 | 94,090 | 25,994 | 149 | 140,543 | 187,848 | 42 | 187,890 | 328,191 | 356 |
| 2019 | 1,583,437 | 0 | 1,583,437 | 21,070 | 102,346 | 28,275 | 149 | 152,096 | 204,330 | 42 | 204,372 | 356,212 | 362 |
| 2020 | 1,662,609 | 0 | 1,662,609 | 22,124 | 102,521 | 28,323 | 149 | 153,385 | 204,680 | 42 | 204,722 | 357,839 | 368 |
| 2021 | 1,712,461 | 0 | 1,712,461 | 22,788 | 102,696 | 28,371 | 149 | 154,280 | 205,031 | 42 | 205,073 | 359,077 | 375 |
| 2022 | 1,763,808 | 0 | 1,763,808 | 23,470 | 102,872 | 28,420 | 149 | 155,195 | 205,381 | 42 | 205,423 | 360,334 | 382 |
| 2023 | 1,816,695 | 0 | 1,816,695 | 24,174 | 103,048 | 28,469 | 149 | 156,134 | 205,732 | 42 | 205,774 | 361,614 | 389 |
| 2024 | 1,871,167 | 0 | 1,871,167 | 24,900 | 103,224 | 28,517 | 149 | 157,090 | 206,085 | 42 | 206,127 | 362,917 | 396 |
| 2025 | 1,927,272 | 0 | 1,927,272 | 25,646 | 103,401 | 28,566 | 149 | 158,072 | 206,437 | 42 | 206,479 | 364,241 | 403 |
| 2026 | 1,985,060 | 0 | 1,985,060 | 26,414 | 103,578 | 28,615 | 149 | 159,076 | 206,790 | 42 | 206,832 | 365,588 | 410 |
| 2027 | 2,044,581 | 0 | 2,044,581 | 27,206 | 103,755 | 28,664 | 149 | 160,104 | 207,144 | 42 | 207,186 | 366,960 | 417 |
| 2028 | 2,105,886 | 0 | 2,105,886 | 28,022 | 103,932 | 28,713 | 149 | 161,156 | 207,499 | 42 | 207,541 | 368,357 | 424 |
| 2029 | 2,169,029 | 0 | 2,169,029 | 28,862 | 104,110 | 28,762 | 149 | 162,233 | 207,854 | 42 | 207,896 | 369,779 | 432 |
| 2030 | 2,234,066 | 0 | 2,234,066 | 29,728 | 104,288 | 28,811 | 149 | 163,336 | 208,210 | 42 | 208,252 | 371,228 | 440 |
| 2031 | 2,301,053 | 0 | 2,301,053 | 30,620 | 104,467 | 28,861 | 149 | 164,467 | 208,565 | 42 | 208,607 | 372,704 | 448 |
| 2032 | 2,370,048 | 0 | 2,370,048 | 31,538 | 104,646 | 28,910 | 149 | 165,625 | 208,922 | 42 | 208,964 | 374,207 | 456 |
| 2033 | 2,441,112 | 0 | 2,441,112 | 32,484 | 104,825 | 28,959 | 149 | 166,809 | 209,280 | 42 | 209,322 | 375,739 | 464 |
| 2034 | 2,514,307 | 0 | 2,514,307 | 33,458 | 105,004 | 29,009 | 149 | 168,024 | 209,638 | 42 | 209,680 | 377,300 | 472 |
| 2035 | 2,589,697 | 0 | 2,589,697 | 34,460 | 105,184 | 29,059 | 149 | 169,270 | 209,996 | 42 | 210,038 | 378,890 | 480 |
| 2036 | 2,667,347 | 0 | 2,667,347 | 35,494 | 105,364 | 29,108 | 149 | 170,545 | 210,356 | 42 | 210,398 | 380,513 | 489 |
| 2037 | 2,747,325 | 0 | 2,747,325 | 36,558 | 105,544 | 29,158 | 149 | 171,853 | 210,716 | 42 | 210,758 | 382,167 | 498 |

| Year | Enplanements | | | Itinerant Operations | | | | | Local Operations | | | Total Operations | Total Based Aircraft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Air Carrier | Commuter | Total Enplanements | Air Carrier | Air Taxi/ Commuter | General Aviation | Military | Total Itinerant | Civil | Military | Total Local | | |
| Compound Annual Growth Rates | | | | | | | | | | | | | |
| 2007-2017 | 3.6% | - | 3.6% | 7.3% | 54.0% | -15.1% | -13.2% | -0.3% | -0.3% | -7.5% | -0.3% | -0.3% | 1.3% |
| 2017-2037 | 3.3% | - | 3.3% | 3.1% | 1.0% | 1.0% | -0.3% | 1.4% | 1.0% | 1.1% | 1.0% | 1.2% | 1.8% |

Source: Analysis by Jacobsen|Daniels, 2019

# Demand Capacity and Facility Requirements

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# 4. Demand Capacity and Facility Requirements

## 4.1. Introduction

This chapter presents design criteria that will be used for airport-specific planning and serve as the basis of the Orlando Sanford International Airport's (SFB's or the Airport's) demand/capacity and facility requirements analysis. All design standards presented in this section have been established by the Federal Aviation Administration (FAA) and industry best practices for developing airport facilities to meet existing and forecast levels of activity.

This chapter compares the expected aviation demand to the existing capacities of the facilities at the Airport based on the aviation activity forecasts presented in the previous chapter of this Airport Master Plan Update (AMPU). These comparisons are then used to determine facility requirements anticipated during the 20-year planning period. Recommended facility improvements are directly related to forecast aviation activity and strive to position the Airport and surrounding community to adequately accommodate future demand. After examining the airfield design criteria (airport capacity and delay, airport reference code (ARC), design aircraft, design standards, etc.), this chapter focuses on distinct requirements of the Airport's functional areas such as:

- Airfield and Airside (Runways, taxiways, etc.) Facilities
- Commercial Terminal Facilities
- General Aviation Facilities
- Landside, Ground Access and Parking, and Support Facilities

Any shortcomings in the ability to serve the forecasted demand or meet FAA design standards are identified, and recommendations are made regarding physical improvements which could mitigate those deficiencies.

## 4.2. Design Criteria

FAA established airport design standards were employed in this AMPU for evaluating airport facilities' capabilities to meet existing and forecast levels of aviation activity.

### 4.2.1. Critical Aircraft

The first step in identifying airfield facility requirements is to identify an airport's existing and forecast critical aircraft. The FAA defines an airport's critical aircraft as the aircraft representing the combination of the most demanding Aircraft Approach Category (AAC) and Airplane Design Group (ADG) which conducts at least 500 annual operations at that airport. The critical aircraft determines the specific separation and airfield design standards required by the FAA to be applied to airport facility design; runway/taxiway separation, runway/taxiway widths, etc. Those standard requirements may be specific to each runway and associated taxiways at an airport.

The current Airport Design AC 150/5300-13A includes specific taxiway standards based on Taxiway Design Groups (TDGs). A taxiway's TDG classification is based on the characteristics of the largest aircraft frequenting that taxiway including the outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distances.

It is important to note that different elements of an airport can be defined by different critical aircraft. For example, each runway can have a different critical aircraft should it serve a different set of the airports fleet mix. Similarly, taxiways serving specific areas of the airport may have a different critical aircraft than others.

The critical aircraft can be determined using one of two methods. Either a single aircraft can be identified as meeting the criteria of regular use, or if a single aircraft does not adequately represent the largest aircraft that makes regular use of the airport, a grouping of aircraft with similar characteristics can be used. By grouping aircraft with the same AAC and ADG, a group of aircraft that meet the criteria of regular use can effectively be used as the critical aircraft. For SFB, a combination of both methods was utilized dependent upon each runway's annual operations.

#### 4.2.1.1. Aircraft Approach Category

Aircraft Approach Categories are based on a reference landing speed ($V_{REF}$), if specified, or 1.3 times the aircraft's stall speed ($V_{SO}$) at its maximum certificated landing weight. Those velocities are commonly known as 'approach speed'. Ranges of approach speeds are grouped together into five categories from A to E as described in **Table 4-1**.

**Table 4-1 - Aircraft Approach Category**

| AAC | $V_{REF}$ / Approach Speed |
|---|---|
| A | Approach speed less than 91 knots |
| B | Approach speed 91 knots or more but less than 121 knots |
| C | Approach speed 121 knots or more but less than 141 knots |
| D | Approach speed 141 knots or more but less than 166 knots |
| E | Approach speed 166 knots or more |

Source: AC 150/5300-13A, Airport Design

**Table 4-3** provides details on the Airport's most common aircraft in each AAC during the 2019 calendar year. The largest aircraft frequenting the Airport included the Boeing 787 (B787) and Boeing 747 (B747), which accounted for approximately 850 annual operations combined. These two aircraft are classified as AAC D.

#### 4.2.1.2. Airplane Design Group

The Airplane Design Group (ADG) is a classification of an aircraft based on its wingspan and tail height as summarized in **Table 4-2**. There are six ADG classifications which are provided roman numerals from I through VI. **Table 4-3** provides details on the Airport's most common aircraft in each ADG during the 2019 calendar year. The Airport's largest aircraft to conduct at least 500 annual operations include the B787 series. This aircraft is classified as ADG V according to Appendix 1 of AC 150/5300-13A Airport Design.

**Table 4-2 - Airplane Design Group (ADG)**

| Group # | Tail Height (Ft) | Wingspan (Ft) |
|---|---|---|
| I | <20 | <49 |
| II | 20 - <30 | 49 - <79 |
| III | 30 - <45 | 79 - <118 |
| IV | 45 - <60 | 118 - <171 |
| V | 60 - <66 | 171 - <214 |
| VI | 66 - <80 | 214 - <262 |

Source: AC 150/5300-13A, Airport Design

#### 4.2.1.3. Runway Design and Airport Reference Codes

The Runway Design Code (RDC) is a combination of the AAC, ADG, and the visibility minimum, signifying the FAA design standards required for an individual runway. An Airport Reference Code (ARC) is a designation which signifies an airport's highest RDC, minus the third component of the RDC (visibility). The ARC is used for planning and design only and is not intended to prohibit aircraft which may be able to operate safely at an airport. The number of annual operations and the most common aircraft for each combination is presented in **Table 4-3**. As shown and previously mentioned, the critical aircraft was determined to have an ARC of D-V (B787 aircraft).

**Table 4-3 - Runway Design Code**

| | | AAC | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | |
| ADG | I | SR20 - Ciruss SR-20<br>C172 - Cessna Skyhawk 172<br>PA44 - Piper Seminole | 24,548<br>10,539<br>2,830 | BE9L - Beech King Air 90<br>BE 40 - Beechjet 400/T-1<br>C414 - Cessna Chancellor 414 | 1,050<br>160<br>103 | LJ45 - Bombarider Learjet 45<br>LJ60 - Bombarider Jearjet 60<br>LJ31 - Bombardier Learjet 31/A/B | 90<br>55<br>21 | LJ35 - Bombarider Learjet 35/36<br>T38 - Northrop T-38 Talon<br>F18S - F18 Hornet | 31<br>17<br>2 |
| | | **Total** | **40,165** | **Total** | **1,980** | **Total** | **207** | **Total** | **51** |
| | II | PC12 - Pilatus PC-12<br>DHC6 - DeHavilland Twin Otter | 145<br>2 | BE20 - Beech 200 Super King<br>E55P - Embraer Phenom 300<br>C25B - Cessna Citation CJ3 | 1,198<br>382<br>316 | C650 - Cessna III/VI/VII<br>E145 - Embraer ERJ-145<br>H25B - Bae HS 125/700-800 / Haweker 800 | 329<br>266<br>195 | GLF4 - Gulfstream IV/G400 | 81 |
| | | **Total** | **147** | **Total** | **3,034** | **Total** | **11,225** | **Total** | **81** |
| | III | | | FA7X - Dassault Falcon F7X<br>SB20 - Saab 2000<br>FA8X - Dassault Falcon 8X | 12<br>2<br>2 | A319 - Airbus A319<br>A320 - Airbus A320 All Series<br>B737 - Boeing 737-700 | 11,665<br>10,477<br>58 | B738 - Boeing 737-800<br>GLF5 - Gulfstream V/G500<br>MD83 - Boeing (Douglas) MD 83 | 33<br>19<br>9 |
| | | **Total** | **0** | **Total** | **16** | **Total** | **22,348** | **Total** | **80** |
| | IV | | | IL76 - Ilyushin IL 76 | 2 | C130 - Lockheed 130 Hercules<br>B752 - Boeing 757-200<br>B763 - Boeing 767-300 | 31<br>16<br>4 | MD 11 - Boeing (Douglas) MD 11 | 4 |
| | | **Total** | **0** | **Total** | **2** | **Total** | **53** | **Total** | **4** |
| | V | | | | | A332 - Airbus A330-200<br>A343 - Airbus A340-300 | 5<br>4 | B788 - Boeing 787-8 Dreamliner<br>B789 - Boeing 787-9 Dreamliner<br>B744 - Boeing 747-400 | 728<br>129<br>2 |
| | | **Total** | **0** | **Total** | **0** | **Total** | **9** | **Total** | **859** |
| | VI | | | | | A124 - Antonov AN-124 | 6 | | |
| | | **Total** | **0** | **Total** | **0** | **Total** | **6** | **Total** | |

Note: Top three most active aircraft in each RDC along with their respective number of operations are shown. Totals include all aircraft within the RDC.

Source: FAA, Traffic Flow Management System Counts (TFMSC), 2019 FAA AC 150/5300-13A

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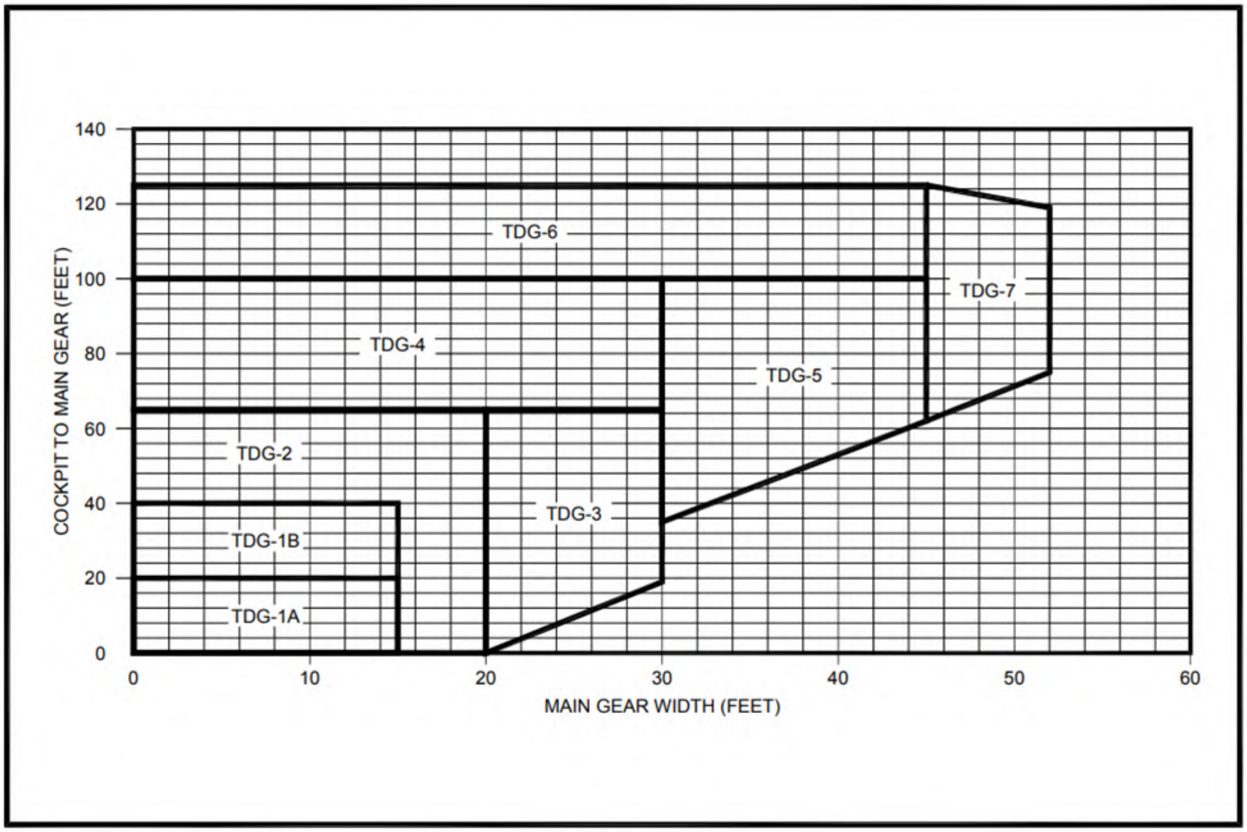
#### 4.2.1.4. Taxiway Design Group

The Taxiway Design Group (TDG) is an airplane's classification based on outer to outer main gear width and cockpit to main gear distance. The TDG establishes the design standards for taxiway fillet geometry, taxiway width, TDGs range from 1 through 7 and are defined in FAA AC 150/5300-13A, as shown in **Figure 4-1.**

**Figure 4-1 - Taxiway Design Groups**




Source: FAA, AC 150/5300-13A, *Airport Design*

**Table 4-4** classifies the TDG of the most common aircraft to operate at the Airport during the 2019 calendar year. TDG-5 represent the largest group to conduct over 500 annual operations at the Airport during that time period.

**Table 4-4 - Operations by TDG**

| Taxiway Design Group | Aircraft | Operations |
|---|---|---|
| 1A | BE55 - Beech Baron 55 | 119 |
| | C525 - Cessna Citation Jet/CJ1 | 94 |
| | BE36 - Beech Bonanza 36 | 74 |
| | Other | 203 |
| | **Total** | **490** |
| 1B | CL30 - Bombardier (Canadair) Challenger 300 | 125 |
| | C680 - Cessna Citation Sovereign | 109 |
| | C68A - Cessna Citation Latitude | 68 |

| Taxiway Design Group | Aircraft | Operations |
|---|---|---|
| | Other | 194 |
| | **Total** | **496** |
| 2 | BE20 - Beech 200 Super King | 1,198 |
| | C25B - Cessna Citation CJ3 | 316 |
| | E145 - Embraer ERJ-145 | 266 |
| | Other | 446 |
| | **Total** | **2,226** |
| 3 | A319 - Airbus A319 | 11,665 |
| | A320 - Airbus A320 All Series | 10,477 |
| | B737 - Boeing 737-700 | 58 |
| | Other | 104 |
| | **Total** | **22,304** |
| 4 | B722 - Boeing 727-200 | 36 |
| | B752 - Boeing 757-200 | 16 |
| | MD83 - Boeing (Douglas) MD 83 | 9 |
| | Other | 14 |
| | **Total** | **75** |
| 5 | B788 - Boeing 787-8 Dreamliner | 728 |
| | B789 - Boeing 787-9 Dreamliner | 129 |
| | A332 - Airbus A330-200 | 5 |
| | Other | 12 |
| | **Total** | **874** |
| 6 | MD11 - Boeing (Douglas) MD 11 | 4 |
| | **Total** | **4** |
| Other (No TDG Provided) | | 44,624 |

Source: FAA, Traffic Flow Management System (TFMS), 2020

#### 4.2.1.5. Existing and Future Critical Aircraft

Based on recent flight activity, the Airport's critical aircraft is the Boeing B787-8 Dreamliner (B788), which is classified with an RDC D-V and TDG 5 aircraft and has a maximum takeoff weight of 502,500 pounds. Although the B788 is the Airport's critical aircraft, its operations are limited to Runway 9L/27R. Based on the forecast, the critical aircraft for Runway 9L/27R is not anticipated to change within the planning period.

Runway 9R/27L is largely used for touch and go training operations and to serve aircraft based at the southeast ramp. Based on current activity from the FAA Traffic Flow Management System Counts (TFMSC), the existing critical aircraft for Runway 9R/27L is the King Air 200 which is classified with an RDC B-II and TDG 2. It is recommended, however, that this runway be upgraded to accommodate commercial service aircraft to serve as a back-up runway and to address future demand.

The existing critical aircraft for Runway 18/36, per the previous master plan and approved ALP, is the Boeing 767-200 (B762), which is a D-IV aircraft. Runway 18/36 is unlikely to be utilized for takeoff operations by the B762 and

B788, as its 6,002-foot length would limit such operations to severely restricted load factors (approximately 50 percent and 30 percent load factors, respectively). Such load factors would deem operations of a B762 or B788 uneconomical. Fortunately for B762, B788, or equivalent operators, it is unlikely that conditions at the Airport would require them to depart from a runway other than 9L/27R.

The Airbus A320 family of aircraft with an RDC of C-III and TDG 3 is the recommended future critical aircraft for Runway 9R/27L. The Airbus A320 family is the recommended future critical aircraft for Runway 18/36.

Runway 9C/27C is limited to small aircraft with a B-II RDC and TDG 2, such as a Beechcraft King Air 200. Based on the aviation demand forecasts, the critical aircraft for Runway 9C/27C is not anticipated to change within the planning period.

The existing critical aircraft, and its specifications, are outlined for each runway in **Table 4-5.** The future critical aircraft, and its specifications, are outlined for each runway in **Table 4-6**. **Table 4-7** summarizes the taxiway widths based on the recommended TDG.

**Table 4-5 - Existing Critical Aircraft Requirements**

| Runway | 9L/27R | 18/36 | 9R/27L / 9C/27C |
|---|---|---|---|
| Design Standard | Boeing 787-8 | Boeing 767-200 | King Air 200 |
| Length (ft.) | 186.08 | 159.19 | 46.67 |
| Wingspan (ft.) | 197.25 | 156.07 | 57.92 |
| Tail Height (ft.) | 56.08 | 51.18 | 14.33 |
| Maximum Take-Off Weight (lbs.) | 502,500 | 315,000 | 15,000 |
| Aircraft Approach Category | D | D | B |
| Airplane Design Group | V | IV | II |
| Taxiway Design Group | 5 | 5 | 2 |
| Main Gear Width (MGW) (ft.) | 38.10 | 35.76 | 17.17 |
| Cockpit to Main Gear (CMG) (ft.) | 83.40 | 72.11 | 15.00 |

Source: FAA, AC 150/5300-13A

**Table 4-6 – Future Critical Aircraft Requirements**

| Runway | 9L/27R | 9R/27L / 18/36 | 9C/27C |
|---|---|---|---|
| Design Standard | Boeing 787-8 | Airbus A320 Family | King Air 200 |
| Length (ft.) | 186.08 | 146.03 | 46.67 |
| Wingspan (ft.) | 197.25 | 117.45 | 57.92 |
| Tail Height (ft.) | 56.08 | 39.70 | 14.33 |
| Maximum Take-Off Weight (lbs.) | 502,500 | 206,132 | 15,000 |
| Aircraft Approach Category | D | C | B |
| Airplane Design Group | V | III | II |
| Taxiway Design Group | 5 | 3 | 2 |
| Main Gear Width (MGW) (ft.) | 38.10 | 29.40 | 17.17 |
| Cockpit to Main Gear (CMG) (ft.) | 83.40 | 64.20 | 15.00 |

Note: Largest A320 dimensions shown for A-321 with sharklets

Source: FAA, AC 150/5300-13A

**Table 4-7 – Future TDG Required Width**

| Taxiway | Taxiway Design Group (TDG) | Taxiway Width | Largest Runway Served | Future TDG Required Width |
|---|---|---|---|---|
| Taxiway A | 5 | 75’ | 09L/27R | 75’ |
| Taxiway B | 5 | 75’ | 09L/27R | 75’ |
| Taxiway C | 5 | 75’ | 09L/27R | 75’ |
| Taxiway E | 3 | 90’ | 18/36 | 50’ |
| Taxiway K | 5 | 75’ | 09L/27R | 75’ |
| Taxiway L | 5 | 75’ | 09L/27R | 75’ |
| Taxiway M | 2 | 130’ | 09C/27C | 35’ |
| Taxiway P | 2 | 50’ | 09C/27C | 35’ |
| Taxiway R | 3 | 50’ – 75’ | 18/36 | 50’ |
| Taxiway S | 3 | 35’ – 50’ | 09R/27L | 50’ |
| Taxiway U | 2 | 35’ | 09R/27L | 35’ |
| New Parallel TW North of 09R/27L | 3 | | 09R/27L | 50’ |

Source: Jacobsen Daniels, July 2020

## 4.3. Airside Capacity

The relationship between demand and capacity and how that relationship impacts the planning of future facilities is complex. Numerous factors affect how efficiently a certain level of activity (demand) can be accommodated within a specific system or facility (capacity). Acceptable levels of service or convenience vary by user, facility, and airport sponsor.

Airfield capacity is typically defined as the maximum number of annual or peak-period aircraft operations an airfield can accommodate. The FAA defines annual airfield capacity in terms of Annual Service Volume (ASV), and peak periods are typically measured in peak hour capacity. When demand approaches capacity, even for periods within the peak hour, delays may occur. Conversely, if airfield facilities provide excess capacity, then an airport has room for growth and expansion.

The capacity of SFB's existing runway system and its ability to meet forecast demand was evaluated using the FAA's AC 150/5060-5, *Airfield Capacity and Delay*. Key elements that are considered when evaluating an airport's capacity include weather, runway-use configurations, fleet mix, touch-n-go activity, and taxiway exit locations. These factors are discussed below.

### 4.3.1. Weather

Weather conditions can significantly impact the capacity and utilization of airfield facilities. Weather conditions are categorized into two main categories, Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). VMC occurs when visibility is greater than or equal to three statute miles and cloud ceilings are 1,000 feet Above Ground Level (AGL) or higher. IMC occurs when the visibility is less than three statute miles or cloud ceilings are less than 1,000 feet AGL.

These weather conditions are closely related to two operational flight rules used by pilots: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). During VMC pilots may operate under VFR and they are primarily responsible for the safety of their aircraft and proper separation between terrain, objects, and other aircraft. Additionally, separation required between aircraft is reduced and capacity levels increase compared to those during IMC while pilots operate under IFR. During IMC pilots are required to operate under IFR, and Air Traffic Control (ATC) is primarily responsible for the safety of and adequate separation between aircraft. Weather conditions under IMC, particularly cloud ceilings and visibility, adversely impact airfield capacity. As weather conditions deteriorate, spacing between aircraft must increase to provide an additional safety margin. The increase in distance between aircraft contributes to fewer operations in a given period at an airport and therefore reduces its overall airfield capacity.

Most pilots who operate turboprop and jet aircraft, regardless of weather, do so under IFR. To increase capacity in both the airspace and the airports in the area, ATC will allow pilots operating under IFR to maintain visual separation when weather permits. Visual approaches can typically be conducted under IFR whenever the ceiling is 3,000 feet or greater and the visibility is five miles or more. Conversely, IFR separation is required whenever cloud ceilings are less than 1,000 feet AGL or visibility is less than three miles. SFB operates under VFR conditions approximately 89.1 percent of the year, and IFR conditions approximately 10.9 percent of the year. This is important because landing and takeoff rules are different during IMC versus VMC. During IMC, pilots can land only if there is an Instrument Landing System (ILS), Area Navigation (RNAV), or other instrument approach procedure (IAP). IMC may determine whether pilots conducting landings are forced to use a primary runway instead of a crosswind runway if that crosswind runway is not equipped with an IAP, or circling minima are not provided for. In the case of SFB, Runways 9L, 27R, and 9R each have an ILS IAP, which provide guidance for precision approaches. Runways 9L, 9R 18, 27L, and 27R have RNAV (GPS) IAPs which provide guidance for non-precision landing approaches.

### 4.3.2. Airfield Configuration

The Airport has four runways: three parallel, oriented east-west, and one crosswind-oriented north-south. There are four configurations in which the Airport operates. Each scenario was matched to a configuration in the figures in Chapter 3 of AC 150/5060-5, *Airfield Capacity and Delay,* to calculate the hourly capacity. The first configuration (Runways 9L/27R, 9C/27C, and 9R/27L operating in VFR conditions) was matched with the AC's Figure 3-19 and Diagram 31 in Figure 3-2 of the AC. This configuration is used 99.5 percent of the time under VFR conditions. The second configuration (Runways 9R and 9L, or 27R and 27L) was matched to Figure 3-51 and Diagram 1 and is utilized 99.5 percent of the time in IFR conditions. The third configuration (Runway 18/36) was matched with Figure 3-3 and is utilized 0.5 percent of the time in VFR conditions. The fourth configuration (Runway 18[8]) was matched to

[8] During north-south operations, only Runway 18 can be utilized under IFR conditions as Runway 36 does not have an IAP.

Figure 3-43 and Diagram 1 of the AC. This configuration is utilized 0.5 percent of the time in IFR conditions. The figures identify the hourly capacity base for each configuration used in the capacity calculation. **Table 4-8** provides a summary of the operational configurations, weather conditions, percentage use, and applicable figure number from AC 150/5060-5.

**Table 4-8 - Airfield Operational Configurations**

| # | Configuration | Weather Conditions | Percentage Use | Figure # |
|---|---|---|---|---|
| 1st | Runways 9L/27R, 9C/27C, and 9R/27L | VFR | 99.5% | 3-19 |
| 2nd | Runway 9L and 9R, or 27L and 27R | IFR | 99.5% | 3-51 |
| 3rd | Runway 18/36 | VFR | 0.5% | 3-3 |
| 4th | Runway 18 | IFR | 0.5% | 3-43 |

Source: Jacobs Daniels, June 2020; Sanford Tower Air Traffic Control

## 4.3.3. Aircraft Fleet Mix

The types of aircraft that utilize an airfield can have a significant impact on its capacity. Air traffic controllers and pilots consider factors such as aircraft size, wake-turbulence (counter-rotating vortices trailing behind aircraft in flight), and speed to maintain safe and efficient operations in an airport's environment. Larger aircraft typically fly at faster speeds and can create larger wake-turbulence vortices which can affect the operational safety of smaller aircraft. ATC uses defined standards for speed, heading, and altitude to separate various aircraft types as they approach and depart an airport. A greater diversity in fleet can lead to less capacity per hour as proper spacing and operational considerations are applied. **Table 4-9** provides a summary of the different classifications of aircraft used in the capacity calculation.

**Table 4-9 - Aircraft Characteristics**

| Aircraft Classification | Takeoff Weight (lbs) | Number of Engines | Wake Turbulence Classification |
|---|---|---|---|
| A | 12,500 or less | Single | Small |
| B | | Multi | |
| C | 12,501 – 300,000 | Multi | Large |
| D | Over 300,000 | Multi | Heavy |

Source: AC 150/5060-5, Airport Capacity and Delay; Jacobsen Daniels, October 2019

**Table 4-10** shows the projected aircraft classification operations across the planning horizon. The breakdown of aircraft by classification is based on the TFMSC data recorded in 2019. The TFMSC data only records IFR operations or operations that submit flight plans. Therefore, it does not show the true picture of the fleet mix for use in the capacity calculation. To identify the existing and future fleet mix it was assumed that all C and D aircraft file flight plans and are therefore recorded in the TFMSC. Therefore, the 2019 TFMSC for C and D aircraft would be equal to the total operations conducted by C and D aircraft in that year. The total C and D operations recorded in the TFMSC are divided by the 2019 total operations from the forecast to generate a percentage for both C and D aircraft. The remaining operations (from the forecast for 2019) are assumed to be conducted by A, B, or other classification of aircraft. To project the future fleet mix over the 20-year planning period, the percentage of C and D aircraft operations are held constant and applied to the total operations from the forecast.

As shown in the **Table 4-10**, A, B and other make up the Airport's largest percentage of operations. Annual operations by C aircraft are anticipated to grow from 25,301 operations to 30,118 operations and D aircraft are anticipated to increase from 886 to 1,020.

**Table 4-10 - SFB Annual Operations by Aircraft Classification - TFMSC**

| | Actual | | Forecast | | | |
|---|---|---|---|---|---|---|
| Aircraft Classification | 2019 % | 2019 Ops. | 2022 Ops. | 2027 Ops. | 2032 Ops. | 2037 Ops. |
| A / B / Other | 92.65% | 330,025 | 333,851 | 339,980 | 346,695 | 354,069 |
| C | 7.10% | 25,301 | 26,778 | 27,757 | 28,864 | 30,118 |
| D | .27% | 886 | 907 | 940 | 978 | 1,020 |

Source: FAA, Traffic Flow Management System Counts (TFMSC)

Notes: Includes general aviation, as well as flights that are no classified in any other category shown. Operations by aircraft type were allocated based on the FAA's TFMSC data. Aircraft not assigned a classification in TFMSC are grouped into the category of "other".

The aircraft mix is used to calculate a Mix Index (MI) which is then used for airfield capacity studies. The FAA defines the mix index as a mathematical expression, representing the percent of Class C aircraft, plus three times the percent of Class D aircraft (C+3D); MI = C + 3D. The FAA has established mix index ranges for use in capacity calculations as listed below:

- 0 to 20
- 21 to 50
- 51 to 80
- 51 to 120
- 121 to 180

The aircraft mix index is 7.9 based on the percentage of C and D aircraft listed in **Table 4-10**. While the actual MI for the Airport is subject to vary slightly from year-to-year given changes in air traffic operations, the likelihood of the Airport's mix index to grow beyond the first MI grouping of 0-20 over the planning period is low. GA and flight training operations are expected to continue representing the majority of Airport operations.

### 4.3.4. Arrivals Percentage

The percent of arrivals is the ratio of arrivals to total operations. It is typically safe to assume that the total annual arrivals will equal total departures, and that average daily arrivals will equal average daily departures. Therefore, a factor of 50 percent arrivals will be used in the capacity calculations for the Airport.

### 4.3.5. Touch-and-Go Percentage

Touch-and-goes are an operation where an aircraft lands and immediately takes off, and are usually associated with flight training. The touch-and-go percentage is the ratio of landings with an immediate takeoff to total operations. This type of operation is typically associated with flight training. The number of touch-and-go operations normally decrease as air carrier operations increase, the demand for service and number of total operations approach runway capacity, and/or weather conditions deteriorate. Typically, touch-and-go operations are assumed to be between zero and 50 percent of total operations. However, the Airport has a high number of local operations, which are generally due to the large number of training operations conducted by L3Harris Flight Academy. Additionally, itinerant GA aircraft from nearby airports utilize the ILS approach at SFB for flight training. Therefore, information regarding the number of touch-and-go operations was evaluated in conjunction with the operational statistics for the base year, as presented in Chapter 3. An analysis of the available data showed that approximately 98 percent of local GA operations and 25 percent of itinerant GA operations were touch-and-goes. Thus, based on the information available, it is estimated that touch-and-go operations account for approximately 65 percent of total operations at SFB.

Based on this information, a touch-and-go factor was selected as required by the guidelines presented in the FAA AC 150/5060-5, *Airport Capacity and Delay*. A touch and go factor of 1.4 was selected for VFR operations. For IFR operations a factor of 1.0 was used as touch-and-go operations are generally not practiced during IMC. These factors will be used later in the capacity calculations.

## 4.3.6. Taxiway Exit Factors

Runway capacities are highest when there are full length parallel taxiways with ample entrance and exit taxiways. Having such reduces the amount of time an aircraft occupies a runway after landing. The criteria for exit factors are based on the MI, the distance between taxiway exits, and a runway's landing threshold. Because the Airport's MI was between 0 and 20, only exit taxiways between 2,000 and 4,000 feet from the threshold and spaced at least 750 feet apart contribute to the taxiway exit factors. The exit factors are then identified using the appropriate figure from chapter 3 of AC 150/5060-5 for each airfield configuration. The total number of usable exits for each runway end are shown in **Table 4-11**.

**Table 4-11 - Usable Runway Exits**

| Runway End | Usable Exits |
|---|---|
| 9L | 1 |
| 27R | 1 |
| 9C | 1 |
| 27C | 1 |
| 9R | 2 |
| 27L | 1 |
| 18 | 2 |
| 36 | 2 |

Source: Jacobsen Daniels, 2020

## 4.3.7. Instrument Approach Capability

Instrument approach capability is qualified based upon the ability of an airport to safely accommodate aircraft operations during periods of inclement weather. In this regard, weather is characterized by two measures: local visibility in statute miles and height of a substantial cloud ceiling above airport elevation. These two measures are termed "approach minima". IAP's utilize either ground-based or satellite-based navigational equipment, along with analysis of the approach corridor to determine the given approach minima any each IAP. In general, precision approaches such as the ILS provide lower approach minima as they utilize both vertical and horizontal guidance while non-precision approaches, such as RNAV(GPS) approaches utilize only vertical guidance. SFB does not currently have any IAPs to Runways 9C/27C, or 36, however, circling minima provided in the airports other IAPs can provide access to these runways during IFR conditions.

## 4.3.8. General Airspace Limitations

The airspace surrounding SFB is moderately constrained due to the proximity of the Orlando Executive Airport (ORL), Orlando International Airport (MCO), and Daytona Beach International Airport (DAB). Additionally, five GA airports, Deland Municipal - Sydney H Taylor Field (DED), Orlando Apopka Airport (X04), Bob Lee Flight Strip (1J6), Massey Ranch Airpark (X50), and Bob White Field (X61) are all located less than 21 nautical miles from SFB. This level of activity and general congestion has specific impacts on the airspace in the area, and the overall capacity of the Airport.

The airspace capacity limiting factors that have been identified at SFB include restrictions on the airspace available for additional instrument approaches. Due to congested airspace from ILS approaches at SFB, ORL, and MCO, it is unlikely that SFB will be able to upgrade the Runway 18 approach from non-precision to precision, or that Runway 36 will be able to obtain any instrument approach. The airspace and overall approach requirements for precision and non-precision approaches are significant, and the addition of a southern approach to SFB's Runway 36 would likely cause considerable conflicts with existing approaches provided at ORL and MCO.

The airspace limitations identified in this section are used as a contributing factor in the airfield capacity calculations. However, it should be noted that the instrument approach limitations that were identified are expected to have a negligible effect on the overall Airport capacity.

### 4.3.9. Airside Capacity Calculations

The airfield capacity calculations in this section were performed using the parameters, assumptions, and variables outlined in the previous sections. These calculations also utilize data from the aviation demand forecast, as presented in Chapter 3, for portions of the capacity calculations. The following sections outline the hourly capacities in VFR and IFR conditions, ASV, Annual Delay, and Average Aircraft Delay.

#### 4.3.9.1. VFR Hourly Capacity

The hourly VFR capacities for Runways 9L/27R, 9C/27C, 9R/27L, and 18/36 were calculated based on the guidance and procedures in FAA AC 150/5060-5, *Airport Capacity and Delay*. The runways were divided into two groups, based on direction. Furthermore, for capacity calculations, Runways 9C/27C and 9R/27L were recognized as ineligible for operations by Class C or D aircraft, as their load bearing capacities are not compatible with such aircraft.

The hourly VFR capacity for the three east-west parallel runways was calculated to be 353 operations per hour for both easterly and westerly flow of traffic. Additionally, the VFR hourly capacity for Runway 18/36 was calculated to be 121 operations per hour for both north and south traffic flow. The following equation and calculations present the step-by-step method that was utilized to calculate the hourly VFR capacities, based on the guidance provided in FAA AC 150/5060-5, *Airport Capacity and Delay*.

**Hourly VFR Equation**

Hourly Capacity Base (C*) x Touch & Go Factor (T) x Exit Factor (E) = Hourly Capacity

| **East-West Group (3 Parallel RWs)** | **North-South Group (Runway 18/36)** |
|---|---|
| C* x T x E = Hourly Capacity | C* x T x E = Hourly Capacity |
| 268 x 1.40 x 0.94 = 353 | 92 x 1.40 x 0.94 = 121 |

The hourly capacities will be used in the ASV calculations for the Airport.

#### 4.3.9.2. Hourly IFR Capacity

Hourly IFR capacities were calculated for Runways 9L/27R, 9R/27L, and 18 as they are the only runways currently equipped to support instrument approaches. During IFR conditions, when air traffic is landing and taking off to the east, Runway 9L and 9R are available. Similarly, when aircraft are landing and taking off to the west during IFR conditions, Runways 27L and 27R are available These runways allow for an hourly capacity of 118 operations. When aircraft are landing and taking off to the south during IFR conditions, only Runway 18 is capable of supporting instrument approaches. This single runway configuration allows for approximately 60 hourly IFR operations. The hourly IFR capacity equation and calculations are shown below.

**Hourly IFR Equation**

Hourly Capacity Base (C*) x Touch & Go Factor (T) x Exit Factor (E) = Hourly Capacity

| **Easterly Flow (Runway 9L & 9R)** | **Westerly Flow (Runway 27R)** |
|---|---|
| C* x T x E = Hourly Capacity | C* x T x E = Hourly Capacity |
| 119 x 1.0 x 0.99 = 118 | 61 x 1.0 x 0.99 = 60 |

Hourly capacity was calculated by multiplying the hourly capacity base (identified in the figures for the specific airfield configurations), touch-and-go factor, and exit factor for a given airfield configuration. The calculations for the existing hourly capacity in IFR and VFR conditions are shown in **Table 4-12**.

**Table 4-12 - Hourly Capacity**

| VFR | | | | |
|---|---|---|---|---|
| Configuration | Hourly Capacity Base | Touch & Go Factor | Exit Factor | Hourly Capacity |
| East-West Group (3 Parallels) | 268 | 1.4 | 0.94 | 353 |
| North-South (Runway 18/36) | 92 | 1.4 | 0.94 | 121 |
| IFR | | | | |
| Configuration | Hourly Capacity Base | Touch & Go Factor | Exit Factor | Hourly Capacity |
| East-West Group (Runway 9R & 9L or 27R & 27L) | 119 | 1.0 | 0.99 | 118 |
| Southern Flow (Runway 18) | 61 | 1.0 | 0.99 | 60 |

Source: AC 150/5060-5, Airport Capacity and Delay; Jacobsen Daniels June 2020

#### 4.3.9.3. Annual Service Volume (ASV)

ASV is a reasonable estimate of an airport's capacity on an annual basis and is a useful assessment for long-range planning. FAA's AC 150/5060-5, *Airport Capacity and Delay*, was used to estimate the Airport's ASV. The ASV is a function of the airport's existing runway configuration, aircraft fleet mix, and the parameters and assumptions identified herein. The ASV calculation also incorporates the hourly VFR and IFR capacities previously calculated. As the mix of larger aircraft (Categories C and D) using an airport increases, its ASV will decrease. The ASV is calculated by multiplying weighted hourly capacity (Cw) by annual/daily demand (D) and daily/hourly demand (H) as represented by the following mathematical formula, $Cw * D * H = ASV$. The calculation for the Airport's ASV is shown in **Table 4-13**.

**Table 4-13 - Annual Service Volume Calculation**

| Airfield Configuration | | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|---|---|---|---|---|---|
| FAA AC 150/5060-5 Rwy Configuration | | Figure 3-19 Rwys 9R/27L, 9C/27C, 9L/27R) | Figure 3-51 (Rwys 9R & 9L or 27R & 27L) | Figure 3-3 (Rwy 18/36) | Figure 3-43 (Rwy 18) |
| Configuration Utilization During VFR | | 99.50% | 0.00% | 0.50% | 0.00% |
| Configuration Utilization During IFR | | 0.00% | 99.50% | 0.00% | 0.50% |
| Percent VFR | | 89.1% | | | |
| Percent IFR | | 10.9% | | | |
| Percent of Aircraft in Each Mix Category | A/B | 92.63 | 92.63 | 92.63 | 92.63 |
| | C | 7.10 | 7.10 | 7.10 | 7.10 |
| | D | 0.27 | 0.27 | 0.27 | 0.27 |
| Aircraft Mix Index | | 7.91 | 7.91 | 7.91 | 7.91 |
| Hourly Capacity Base (C*) | | 268 | 119 | 92 | 61 |
| Touch-and-Go Factor (T) | | 1.40 | 1.00 | 1.40 | 1.00 |
| Exit Factor (E) | | 0.94 | 0.99 | 0.94 | 0.99 |
| Hourly Capacity = C* x T x E | | 353 | 118 | 121 | 60 |
| Scenario Weighting Factor | | -- | -- | -- | -- |
| Scenario Weighted Capacity (C) | | 353 | 118 | 121 | 60 |
| % of Maximum Capacity | | 100% | 33% | 34% | 17% |
| Weighting Factor (W) | | 1 | 4 | 25 | 4 |
| % (P) Use of Rwy Config. | | 95.87% | 3.29% | 0.48% | 0.37% |
| Weighted Hourly Capacity (Cw) | | 263.19 | | | |
| Existing Annual Demand | | 356,212 | | | |
| Avg. Daily Demand During Peak Month | | 998 | | | |
| Avg. Daily Demand | | 976 | | | |
| Avg. Peak Hour Demand During the Peak Month | | 203 | | | |
| Demand Ratios | Daily (D) | 356.93 | | | |
| | Hourly (H) | 4.81 | | | |
| ASV FORMULA | | Cw x D x H | | | |
| **ASV CALCULATION** | | **451,619** | | | |

Source: AC 150/5060-5, Airport Capacity and Delay; Jacobsen Daniels June 2020

The ASV for the current SFB airfield configuration and operations was calculated to be 451,619 operations. As summarized in **Table 4-14**, the existing airfield system is currently at 79 percent of its capacity and is projected to reach 85 percent of its annual capacity by 2037. According to the FAA, the following guidelines should be used to determine necessary steps as demand reaches designated levels.

- 60 percent of ASV: Threshold at which planning for capacity improvements should begin.
- 80 percent of ASV: Threshold at which planning for improvements should be complete and construction should begin.
- 100 percent of ASV: Airport has reached the total number of annual operations (demand) the airport can accommodate, and capacity-enhancing improvements should be made to avoid extensive delays.

Efforts to increase capacity to meet the existing and forecast demand are recommended within the planning period. Operational efficiencies and physical development, including runway extensions and taxiway improvements, as well as technological enhancements to increase capacity should be evaluated.

**Table 4-14 - Demand vs. Airfield Capacity**

| | Actual | Forecast | | | |
|---|---|---|---|---|---|
| | 2019[1] | 2022 | 2027 | 2032 | 2037 |
| Forecast Demand | 356,212 | 360,334 | 366,960 | 374,207 | 382,167 |
| Capacity | 451,619 | 451,619 | 451,619 | 451,619 | 451,619 |
| Capacity Level | 79% | 80% | 81% | 83% | 85% |

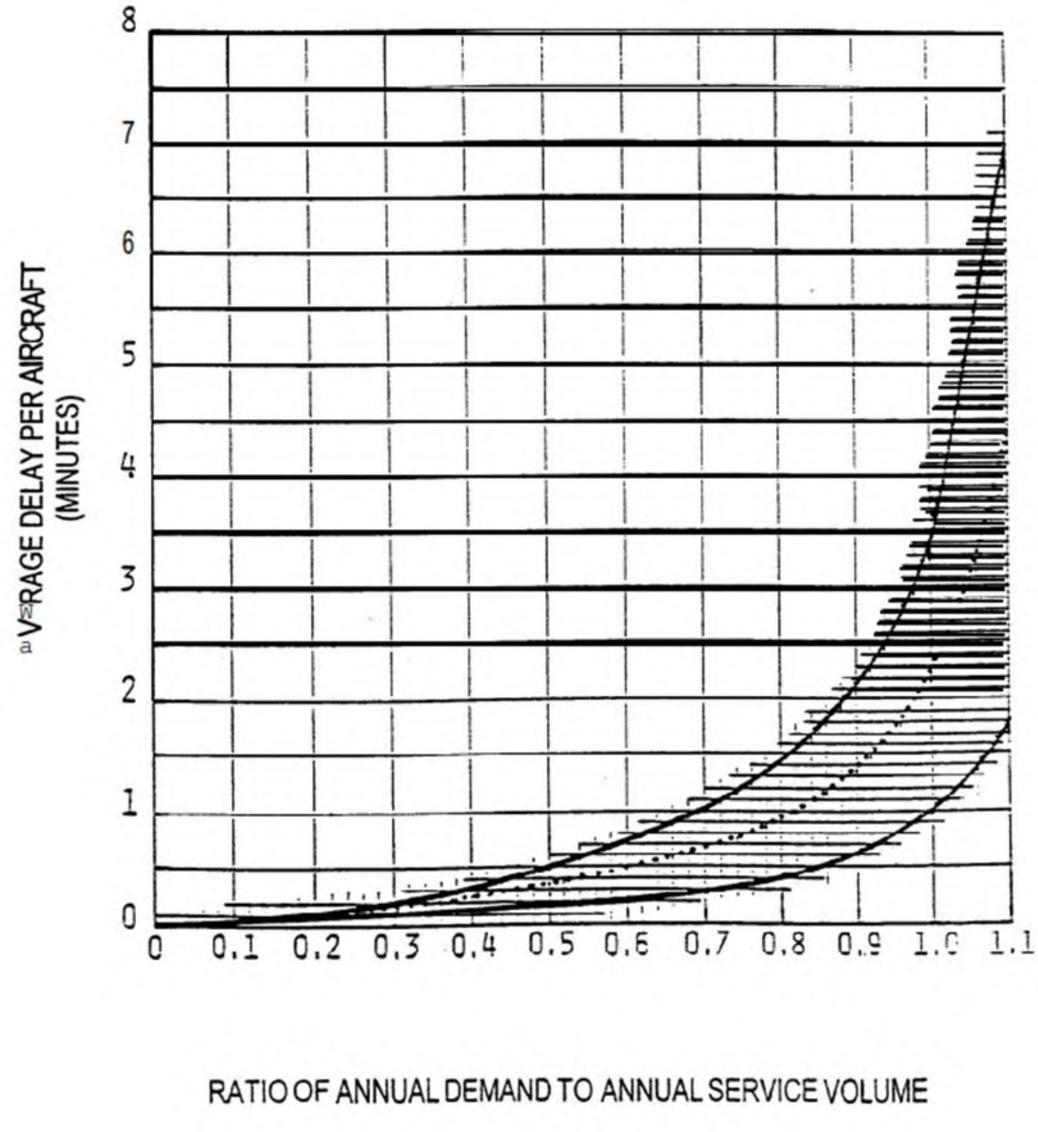
Source: AC 150/5060-5, Airport Capacity and Delay; FAA TFMSC; Jacobsen Daniels June 2020

Note: [1]Total 2019 forecast demand derived from the forecast

#### 4.3.9.4. Annual and Average Aircraft Delay

An additional factor in determining an airport's capacity is to calculate the amount of delay an aircraft may experience at the airport, which is described in minutes per operation. The relationship between the ratio of demand to ASV and delay is shown in **Table 4-15** and is expressed by Average Delay. The Average Delay was identified using the ratio of ASV to annual demand and Figure 2-2 of AC 150/5060-5 (see **Figure 4-2**, below). The Average Delay is multiplied by the Annual Demand to determine Annual Delay, which is expressed in hours. In 2022, aircraft delay is projected to reach 0.7 minutes per aircraft operation. This is multiplied by the forecast annual demand to reach 3,859 hours of annual delay. In 2037, aircraft delay is expected to reach 0.76 minutes per aircraft operation. This is multiplied by the forecast annual demand to reach 4,841 hours of annual delay.

**Figure 4-2 - Average Delay Chart from AC 150/5060-5**




Source: AC 150/5060-5, Airport Capacity and Delay

**Table 4-15 - Average Aircraft Delay**

| | Actual | Forecast | | | |
|---|---|---|---|---|---|
| | 2019 | 2022 | 2027 | 2032 | 2037 |
| Annual Demand | 356,212 | 360,334 | 366,960 | 374,207 | 382,167 |
| Ratio of Demand to ASV | 0.69 | 0.70 | 0.71 | 0.72 | 0.74 |
| Average Delay (Minute) | 0.65 | 0.70 | 0.75 | 0.75 | 0.76 |
| Annual Delay (Hour) | 3,859 | 4,204 | 4,587 | 4,678 | 4,841 |

Source: AC 150/5060-5, Airport Capacity and Delay; Jacobsen Daniels June 2020

## 4.4. Airspace Capacity

Airspace capacity in and around an airport can become constrained when flight paths to other nearby airports come close to, or directly over, the study airport, with more complex approach and departure paths adding to the congestion. A review of the obstructions, airports, and associated approach procedures that surround the Airport was completed to determine airspace capacity. A summary of the Instrument Approach Procedures (IAPs) at SFB is outlined in Section 2.2.2.2 in the Inventory Chapter of this report. Figure 2-28 in the Inventory Chapter illustrated the overall airspace surrounding the Airport, as depicted in the FAA's Jacksonville Sectional Aeronautical Chart, 103rd Edition, effective August 15, 2019. FAA Sectional Aeronautical Charts are typically updated and replaced on a six-month cycle.

As discussed in the Inventory Chapter, the airspace in the Airport's vicinity is controlled by Air Traffic Control (ATC), and consists of Class B airspace associated with Orlando International Airport (MCO), and Class C airspace at the Airport. **Table 4-16** lists the Airport's nearest public-use airports, their distance and heading from SFB, the number of instrument approach procedures available at that airport, and the lowest approach minima.

Aircraft en-route to or departing from those airports often utilize the same airway routes and/or navigational aids (NAVAIDS) and traverse the same airspace as SFB operations at varying altitudes. That combined level of activity requires enhanced coordination by ATC facilities to ensure safe and efficient flight operations. **Figure 4-3** summarizes and defines the typical symbols utilized on IAP procedure charts.

The following is a list of acronyms that are utilized regularly throughout this section:

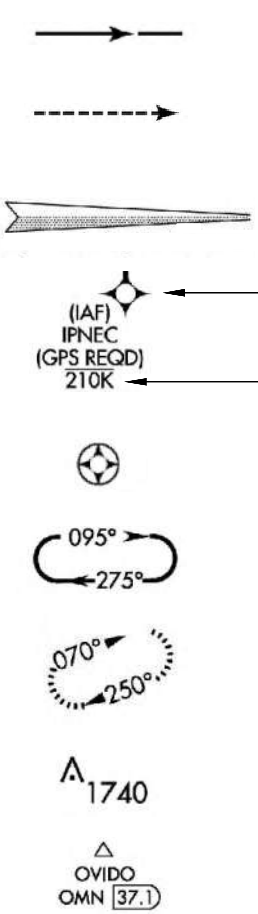
- ILS: Instrument Landing System
- CAT-I: Category I Approach
- CAT-II: Category II Approach
- CAT-III: Category III Approach
- GPS: Global Positioning System
- RNAV: Area Navigation
- DME: Distance Measuring Equipment
- IAP: Instrument Approach Procedure

**Table 4-16 - Public-Use Airports Near SFB**

| Airport Name (I.D.) | Distance (nm) from SFB | Direction (true heading) from SFB | # Instrument Approach Procedures | Approach Minima (Type / DA [ft. AGL]/ RVR [sm]) |
|---|---|---|---|---|
| Executive Airport (ORL) | 14.8 | 200° | 4 | ILS / 200 / ½ |
| Deland Municipal-Sidney H. Taylor Field (DED) | 17.6 | 352° | 4 | RNAV / 296 / 1 |
| Orlando Apopka Airport (X04) | 18.7 | 257° | 2 | RNAV / 558 / 1 |
| Bob Lee Flight Strip (1J6) | 20.1 | 348° | 0 | Visual Only |
| Massey Ranch Airpark (X50) | 20.3 | 53° | 2 | RNAV / 489 / 1 |
| Bob White Field (X61) | 20.9 | 263° | 0 | Visual Only |
| Orlando International Airport (MCO) | 21.2 | 191° | 25 | CAT III ILS / 600-ft |
| Mid Florida Airport at Eustis (X55) | 21.2 | 281° | 0 | Visual Only |
| New Smyrna Beach Municipal Airport (EVB) | 22.5 | 42° | 4 | RNAV / 293 / 1 |
| Arthur Dunn Air Park (X21) | 23.0 | 114° | 2 | RNAV / 550 / 1 |
| Umatilla Municipal Airport (X23) | 23.6 | 292° | 2 | RNAV / 653 / 1 |
| Daytona Beach International Airport (DAB) | 25.9 | 21° | 8 | ILS / 200 / ½ |
| Space Coast Regional Airport (TIX) | 27.8 | 124° | 5 | ILS / 200 / ½ |
| Pierson Municipal Airport (2J8) | 30.7 | 338° | 0 | Visual Only |
| Ormond Beach Municipal Airport (OMN) | 32.1 | 11° | 3 | RNAV / 261 / 1 |

Source: FAA's Airport Data and Information Portal (ADIP), July 2020

Example: SFB Runway 9R ILS Approach Procedure




- Approach Procedure Track
- Missed Approach Procedure Track
- Localizer (LOC/LDA) Course
- Fly-By Waypoint
- Maximum Speed Along Track (210 Knots)
- Fly-Over Waypoint
- Holding Pattern (Hold In-Lieu of Procedure Turn)
- Holding Pattern (Missed Approach)
- Obstacle (Man-Made)
- Reporting Point (On-Request)

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Instrument Approach Procedures
Symbol Legend

Figure
4-3

### 4.4.1. Airspace and Instrument Approach Limitations

The Airport's airspace capacity is impacted by its neighboring airports' proximity and levels of air traffic. The Airport's published approach and departure procedures were reviewed along with its neighboring airports to determine their impacts on SFB's airspace capacity. Leaders from the Central Florida Terminal Radar Approach Control (TRACON) previously expressed to the Airport that increased utilization of SFB's Runway 18/36 for commercial traffic could present ATC challenges. Runway 18 is currently equipped with an RNAV (GPS) approach, and as the following paragraphs detail, that instrument approach procedure (IAP) presents several airspace challenges to ATC.

#### 4.4.1.1. Executive Airport Airspace Convergence

Executive Airport (ORL), also known as 'Orlando Executive', is SFB's closest neighboring public-use airport as detailed in **Table 4-16**. ORL's arrivals and departures are primarily northeast and southwest and are governed by Class D and B rules, depending on elevation The critical operations from an ATC perspective are relative to pilots' simultaneous use of missed approach procedures (MAPs) for both ORL's Runway 7 ILS and RNAV approaches and SFB's Runway 18 RNAV approach. The MAP for SFB's Runway 18 RNAV approach calls for a straight climb to 600-feet AMSL, then a climbing left turn to 2,100-feet AMSL direct to the GOPCE intermediate approach fix (IF). The MAPs for ORL's Runway 7 approaches require a straight climb to 1,500 feet AMSL to the MSHEL Distance Measuring Equipment (DME) fix (6.5 nautical miles (nm) from ORL) and then a climbing left (north) turn to 1,600-feet AMSL on a heading of 020 until intercepting and tracking the 049 degree radial from the ORL Very High Frequency Omnidirectional Range Collocated Tactical Air (VORTAC) to the OVIDO 13-nm DME fix from ORL, where pilots are to hold on the northeast of that fix. **Figure 4-4** displays a blend of those two approach procedures. If pilots properly conducted those simultaneously, their aircraft could be separated by less than two nautical miles. If not conducted perfectly, the off-course paths could converge. The FAA's minimum standard IFR aircraft separation is three nautical miles. As such, this could pose a challenge to controllers who are responsible for maintaining proper aircraft separation during IFR operations. Their diligent scrutiny is required to ensure that proper aircraft separation is provided.

#### 4.4.1.2. DeLand Municipal Airport Airspace Convergence

DeLand Municipal Airport – Sidney H. Taylor Field (DED) is SFB's next closest neighboring public use airport, located less than 18 nautical miles north of SFB. Its airspace is governed by Class E rules. IAPs to DED are handled by the Daytona Approach Control, and DED is equipped with four RNAV (GPS) approaches. SFB's inbound course between IAF DIGGR and IF GOPCE for its Runway 18 IAP crosses DED Runway 30 and 12 approach and departure paths at an elevation of 2,000-feet AMSL. The MAP associated with DED's Runway 12 RNAV (GPS) IAP instructs pilots to conduct a straight climb from 400 to 2,000-feet AMSL. That MAP climb crosses SFB's inbound course approximately six nautical miles after the missed approach point. Most aircraft can climb to 1,600-feet in less than six nautical miles. As such, the possibility exists that aircraft operating at DED cross paths with aircraft approaching SFB at the same flight level, posing the most concerning IFR scenario for operations at SFB. **Figure 4-5** displays a blend of those two IAPs.

Both the approach and missed approach to DED Runway 30 and 12 utilize the approach fix OAKIE. Its associated holding pattern at the conclusion of DED's Runway 12 MAP is less than two nautical miles from SFB's Runway 27R ILS initial holding pattern. Additionally, SFB's IAF VOFOS is 0.02-nm from DED's Runway 12 MAP holding pattern. The DED procedure calls for pilots to hold at OAKIE at 2,000-feet AMSL, whereas SFB's IAF and holding pattern require pilots to be at 1,600-feet AMSL. **Figure 4-6** displays a blend of those IAPs. IAF OAKIE establishes holding patterns for other airports' IAPs, the details of which are discussed further in this section.

#### 4.4.1.3. Massey Ranch Airpark Airspace Convergence

Massey Ranch Airpark (X50) in New Smyrna Beach, Florida, approximately twenty nautical miles northeast of SFB, is equipped with two RNAV (GPS) approaches. Like DED, X50's airspace is governed by Class E rules and its IAPs are handled by the Daytona Approach Control. The X50 RNAV (GPS)-B approach routes pilots from an initial holding pattern at IAF PEKIY. That holding pattern starts outbound from X50 at 4,000-feet AMSL and then calls for pilots to descend to 2,000-feet AMSL before starting their on-course initial descent. Pilots then have nine nm to descend to 1,500-feet AMSL at final approach fix (FAF) APEAK. That descent path passes less than two nm's from the initial holding pattern of SFB's Runway 27R ILS IAP, which is at an altitude of 1,600-feet AMSL. **Figure 4-7** displays a blend of those IAPs.


Source: FAA's Instrument Approach Procedures for SFB's RNAV Rwy 18 and ORL's ILS Rwy 7, effective to July 16, 2020

| | | | |
|---|---|---|---|
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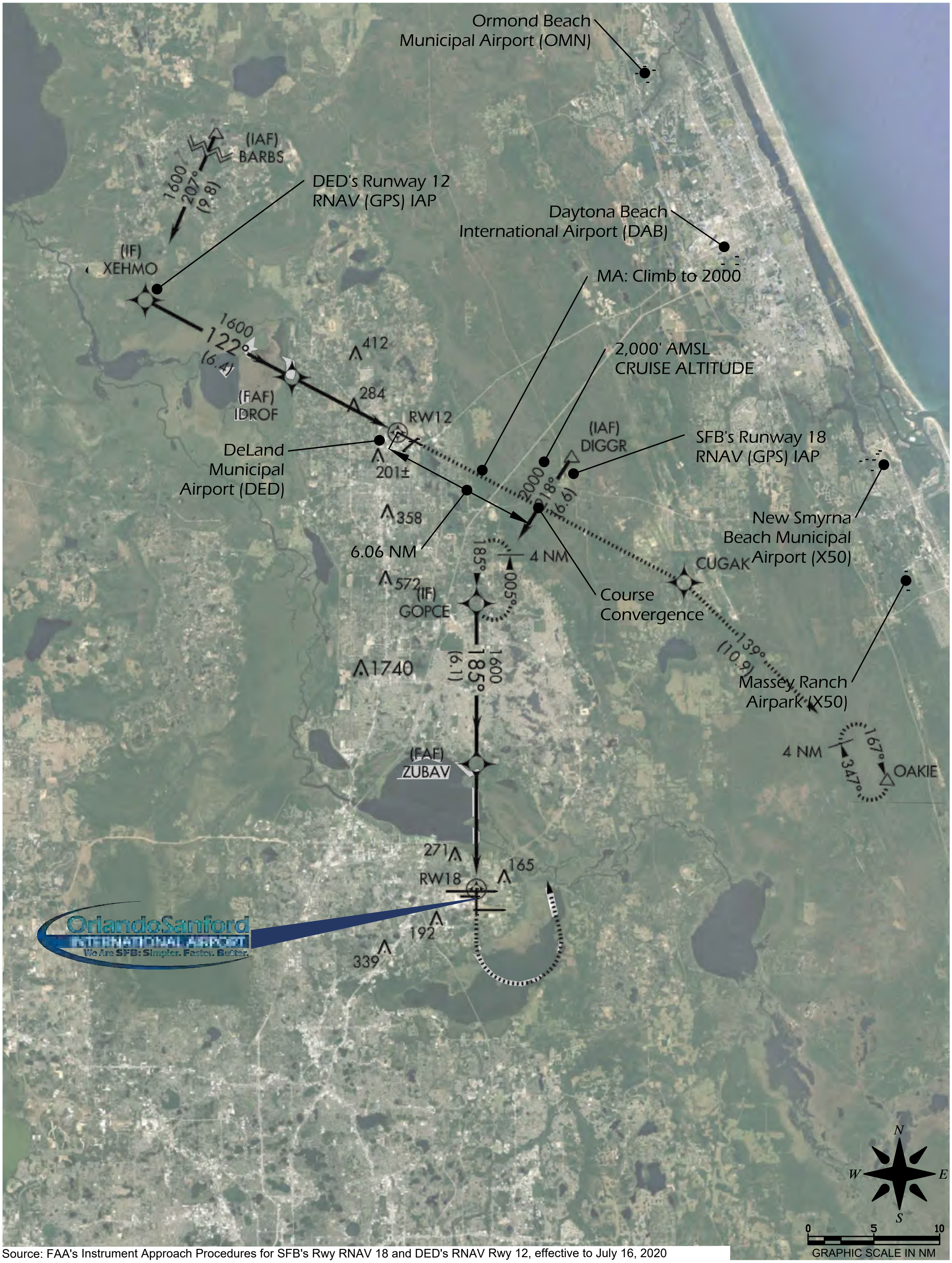


Source: FAA's Instrument Approach Procedures for SFB's Rwy RNAV 18 and DED's RNAV Rwy 12, effective to July 16, 2020

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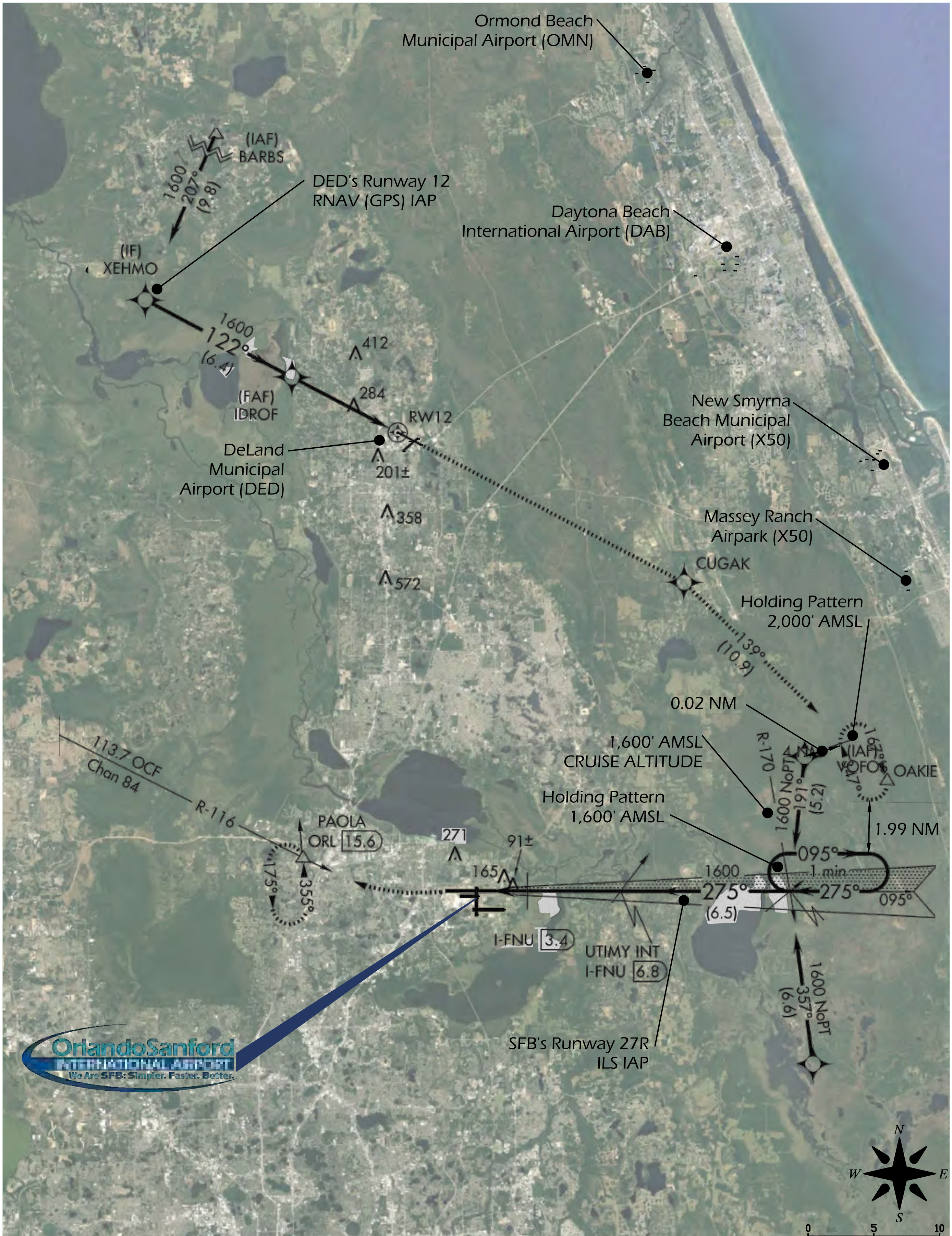
Converging SFB's Rwy 18 and DED's Rwy 12 Instrument Approach Procedures

Figure 4-5




Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and DED's RNAV Rwy 12, effective to July 16, 2020

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Figure 4-6


Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and X50's RNAV (GPS)-B, effective to July 16, 2020

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Figure
4-7

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Of greater concern is that X50's RNAV (GPS)-B approach's initial holding pattern, previously discussed, intersects the MA holding pattern for SFB's Runway 9R ILS or LOC IAP. The intersecting holding patterns are depicted in **Figure 4-8**. SFB's MA holding pattern is at an altitude of 2,800-feet AMSL, which directly intersects the descent path of X50's initial holding pattern from 4,000 to 2,000-feet AMSL.

#### 4.4.1.4. Orlando International Airport Airspace Convergence

The next closest airport posing airspace challenges is the Orlando International Airport (MCO), located approximately 21 nm southwest of SFB. MCO traffic operates from four parallel north-south runways and is governed by Class B rules. MCO's IAPs are handled by the Orlando Approach Control. MCO's IAPs 35L ILS-LOC, CAT-I, and CAT-II-III all involve a MAP holding pattern at 3,000-feet AMSL located just over one NM from SFB's Runway 18 RNAV (GPS) MAP, previously described. However, it is unlikely that those would be operational simultaneously as wind directions at MCO would have to be from the north and those at SFB from the south. As such, this situation is of little concern. The blend of those IAPs is depicted in **Figure 4-9**.

However, pilots conducting a MAP associated with SFB's Runway 9R ILS or LOC IAP are instructed to climb to 500-feet AMSL and then conduct a climbing right turn to 2,800-feet AMSL on a 125-degree heading. The climb to 2,800-feet AMSL passes MCO's 3,000-feet AMSL holding pattern by less than 0.7 nm. This situation is depicted in **Figure 4-10**.

Similarly, SFB's Runway 27R ILS MAP instructs pilots to climb to 500-feet AMSL and then conduct a climbing right turn to 2,800-feet AMSL on a 280-degree heading. MCO's 35L CAT-II-III IAP contains an alternate missed approach holding pattern, and its missed approach fix, ZOKUM, is directly over SFB. That holding pattern is at 3,000-feet AMSL. Aircraft at SFB conducting a Runway 27R ILS MAP will need to be navigated around the MCO missed approach holding pattern and may cause airspace congestion during these scenarios. **Figure 4-11** displays a blend of these IAPs.

#### 4.4.1.5. New Smyrna Beach Municipal Airport Airspace Convergence

New Smyrna Beach Municipal Airport (EVB) is located 22.5 nm northeast of SFB. EVB's airspace is governed by Class D and C rules depending on altitude, and IAP's to EVB are handled by the Daytona Approach Control and New Smyrna Tower. EVB's Runway 7 RNAV (GPS) IAP routes pilots from an initial holding pattern at IAF NINPE. That holding pattern's elevation is as low as 2,800-feet AMSL and is intersected by SFB's Runway 18 RNAV (GPS) IAP. The initial descent of that IAP starts at 2,000-feet AMSL. As such, EVB's initial holding pattern could have as little as 800-feet of separation from SFB's approach path where they intersect. **Figure 4-12** displays a blend of those IAPs. This operational scenario is improbable, however not impossible, due to the typical winds having aircraft utilize the east-west runways at SFB.

Similarly, EVB's Runway 2 RNAV (GPS) IAP routes pilots from an initial holding pattern at IAF LEMVE. The IAF LEMVE holding pattern has a top elevation of 6,000-feet AMSL and a bottom elevation of 2,000-feet AMSL. The holding pattern intersects SFB's Runway 27R ILS IAP IAF, which is at 1,600-feet AMSL. Should an aircraft on EVB's Runway 2 RNAV (GPS) IAP be holding at the minimum safe altitude in the IAF holding pattern, aircraft could have as little as 400 feet of separation when an aircraft begins the approach to SFB using the Runway 27R ILS IAP. **Figure 4-13** displays a blend of those IAPs.

EVB's RNAV (GPS) IAP to Runway 25 utilizes the same holding pattern associated with IAF OAKIE, previously discussed and depicted in **Figure 4-6**. However, the altitude of that pattern is at 4,000-feet AMSL when used for the EVB MAP, thereby providing greater separation from aircraft in the initial 1,600-foot AMSL holding pattern to SFB's Runway 27R ILS IAP, which as was previously mentioned is spaced laterally less than two nm.

#### 4.4.1.6. Arthur Dunn Air Park Airspace Convergence

Arthur Dunn Air Park (X21) is located 23.0 nm east-southeast of SFB. X21's airspace is governed by Class E rules, and IAPs to X21 are handled by the Orlando Approach Control. X21's RNAV (GPS)-A approach routes pilots from an initial holding pattern at IAF OAKIE. That holding pattern's elevation is as low as 2,000-feet AMSL and is located less than two nm from SFB's Runway 27R ILS IAPs initial 1,600-foot AMSL holding pattern. The X21 IAP instructs pilots to descend to 1,800-feet AMSL between OAKIE and FAF YONLI. During that descent, approaching aircraft pass less than 1.5 nm from SFB's initial holding pattern. Similarly, pilots conducting the MAP for X21's RNAV (GPS)-B IAP pass along this same route at a level elevation of 2,000-feet AMSL. **Figure 4-14** and **Figure 4-15** display the blends of those IAPs.


Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 9R and X50's RNAV (GPS)-B, effective to July 16, 2020

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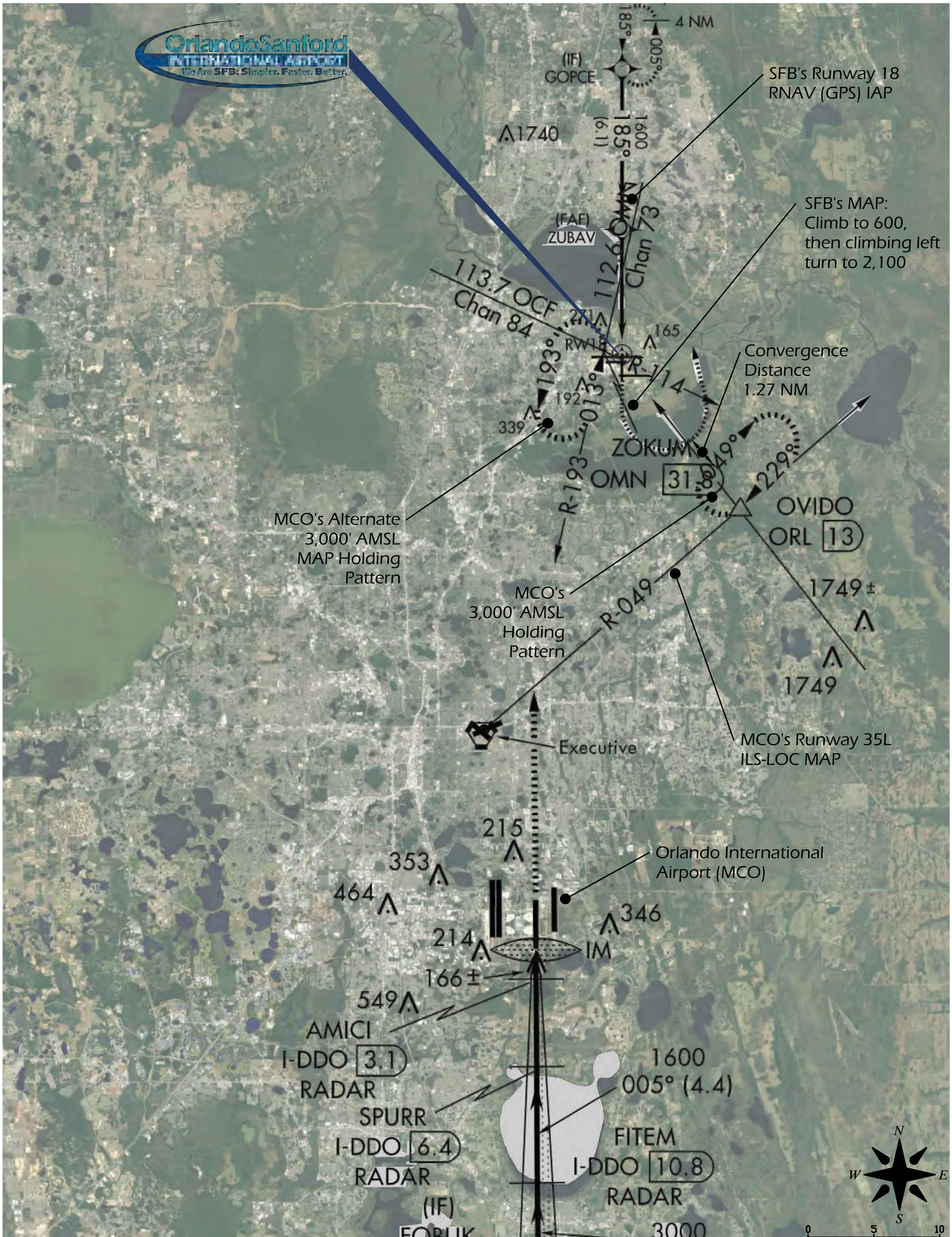


Source: FAA's Instrument Approach Procedures for SFB's RNAV Rwy 18 and MCO's ILS-LOC Rwy 35L, effective to July 16, 2020

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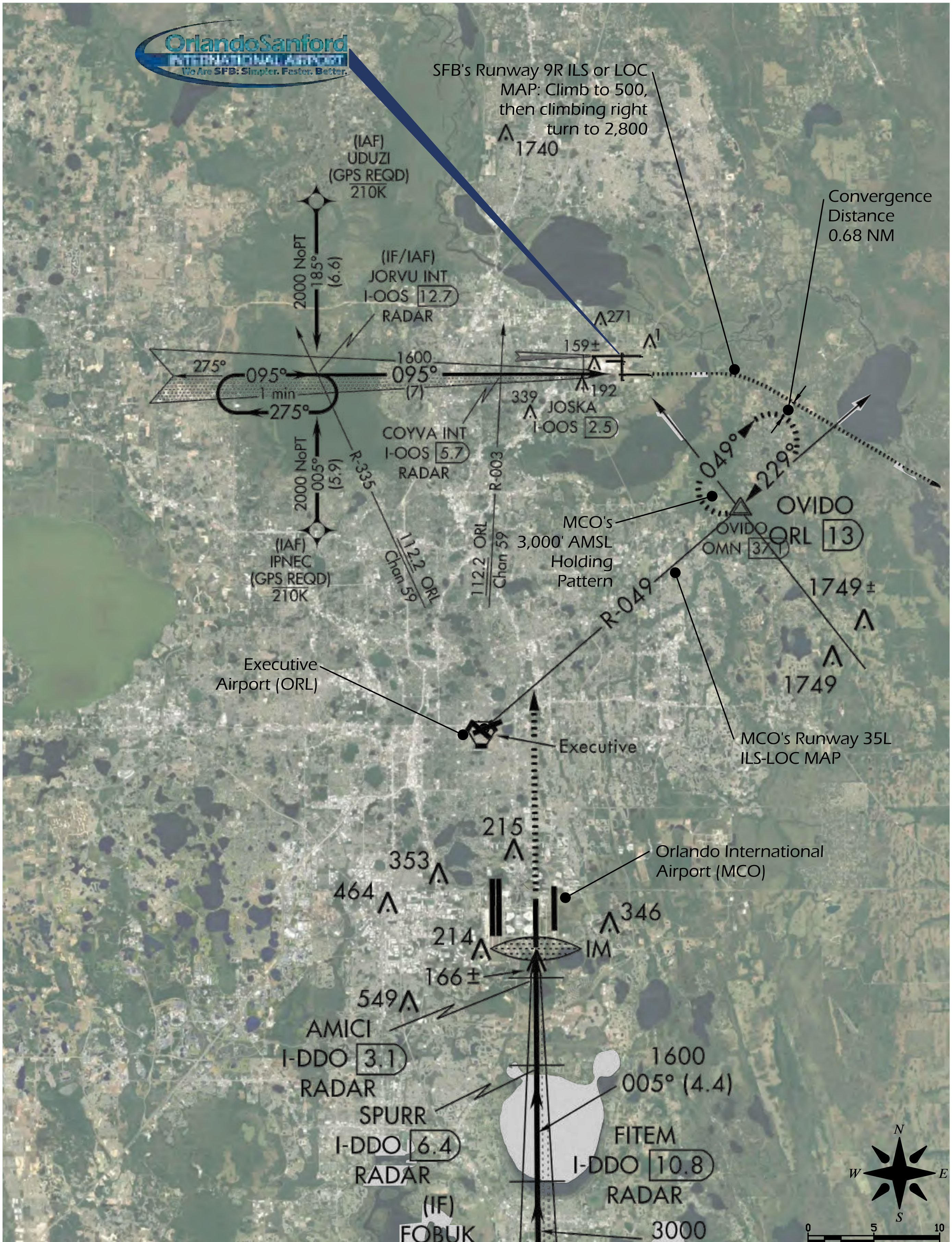


Source: FAA's Instrument Approach Procedures for SFB's ILS-LOC Rwy 9R and MCO's ILS-LOC Rwy 35L, effective to July 16, 2020

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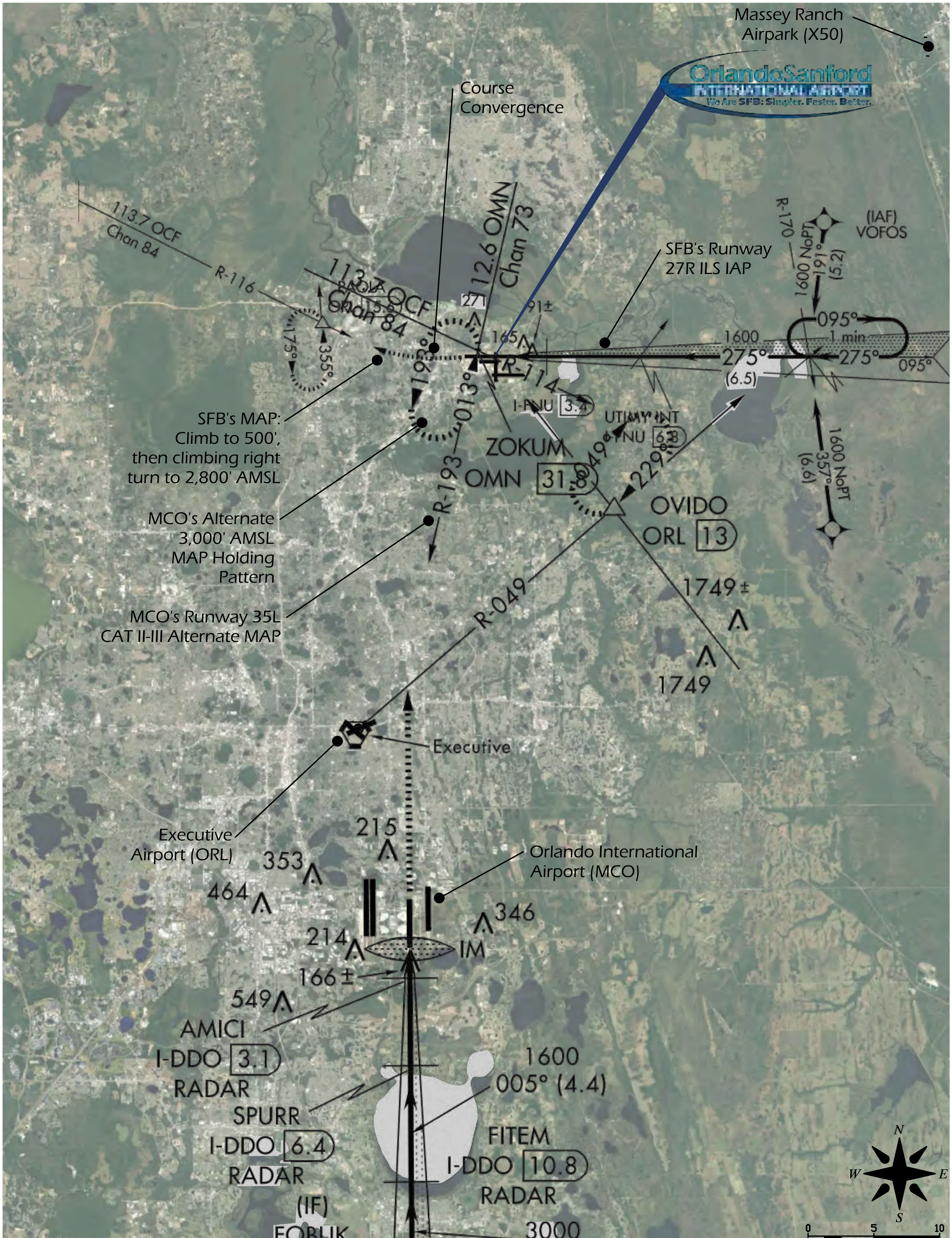
Converging SFB's Rwy 9R and MCO's Rwy 35L Instrument Approach Procedures

Figure 4-10




Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and MCO's ILS Rwy 35L, effective to July 16, 2020

2020 Orlando Sanford International Airport Master Plan Update
Converging SFB's Rwy 27R and MCO's Rwy 35L Instrument Approach Procedures

Figure 4-11

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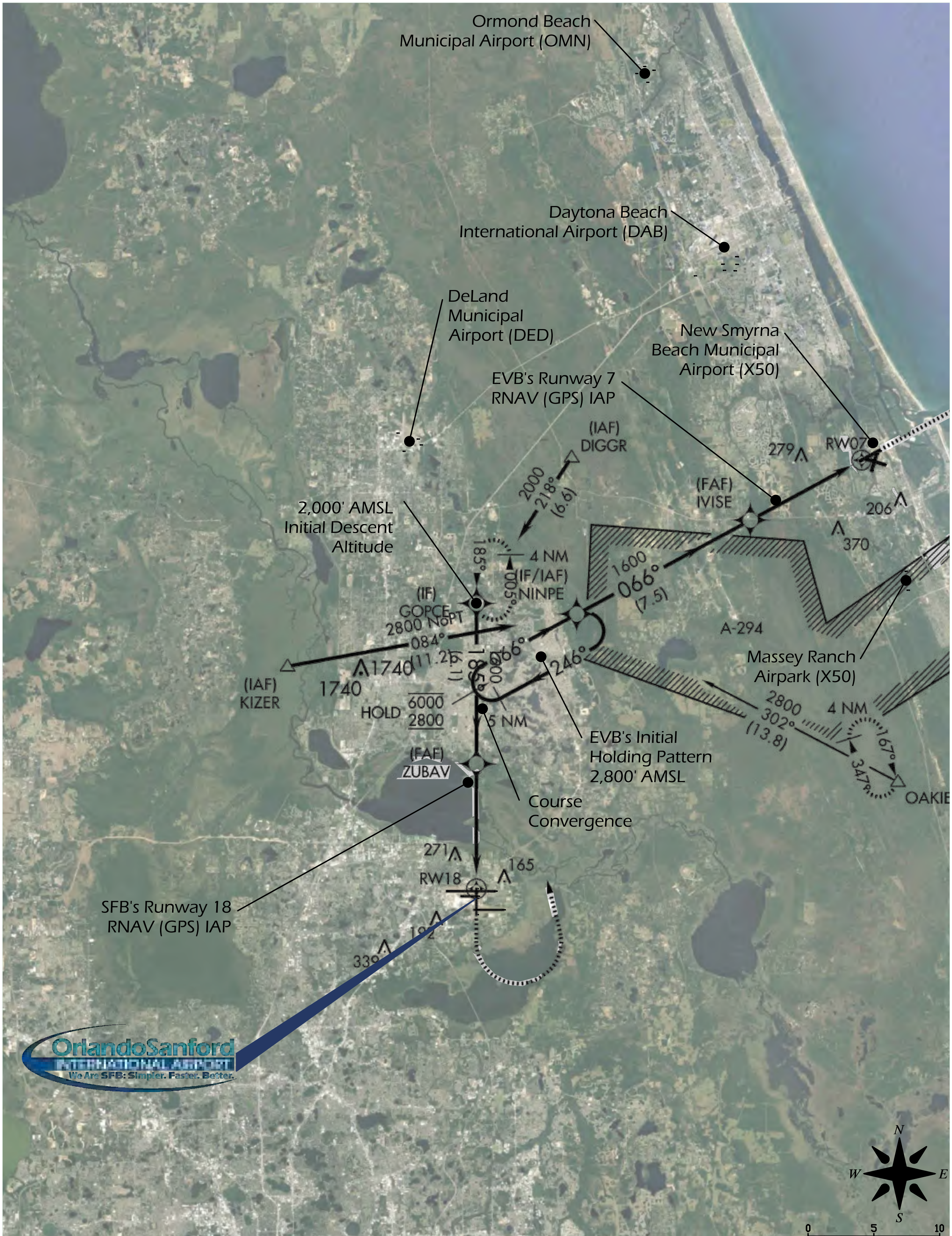


Source: FAA's Instrument Approach Procedures for SFB's RNAV Rwy 18 and EVB's RNAV Rwy 7, effective to July 16, 2020

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Figure 4-12

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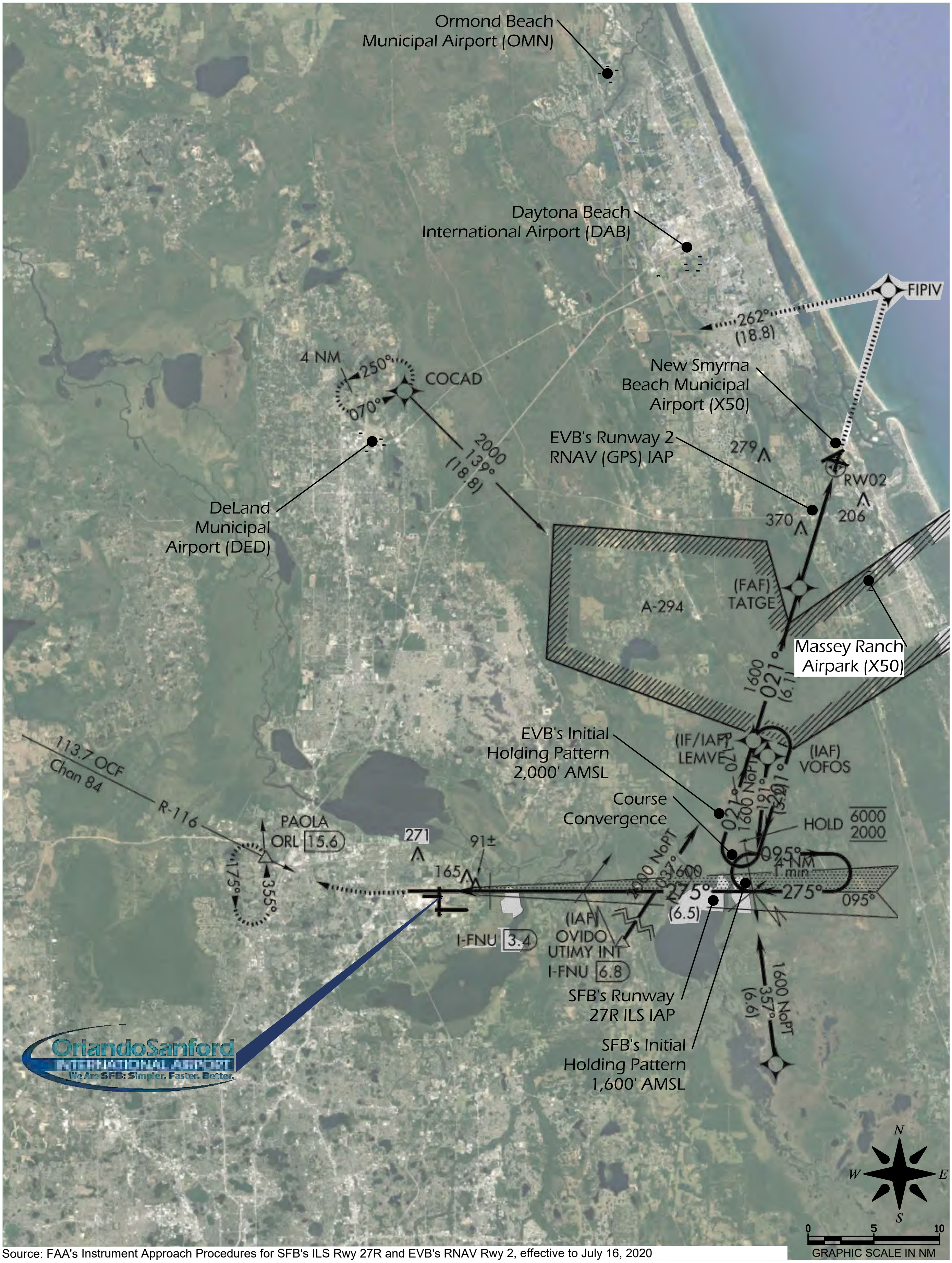


Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and EVB's RNAV Rwy 2, effective to July 16, 2020

| | | |
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| 2020 Orlando Sanford International Airport Master Plan Update<br>Converging SFB's Rwy 27R and EVB's Rwy 2 Instrument Approach Procedures | | Figure 4-13 |

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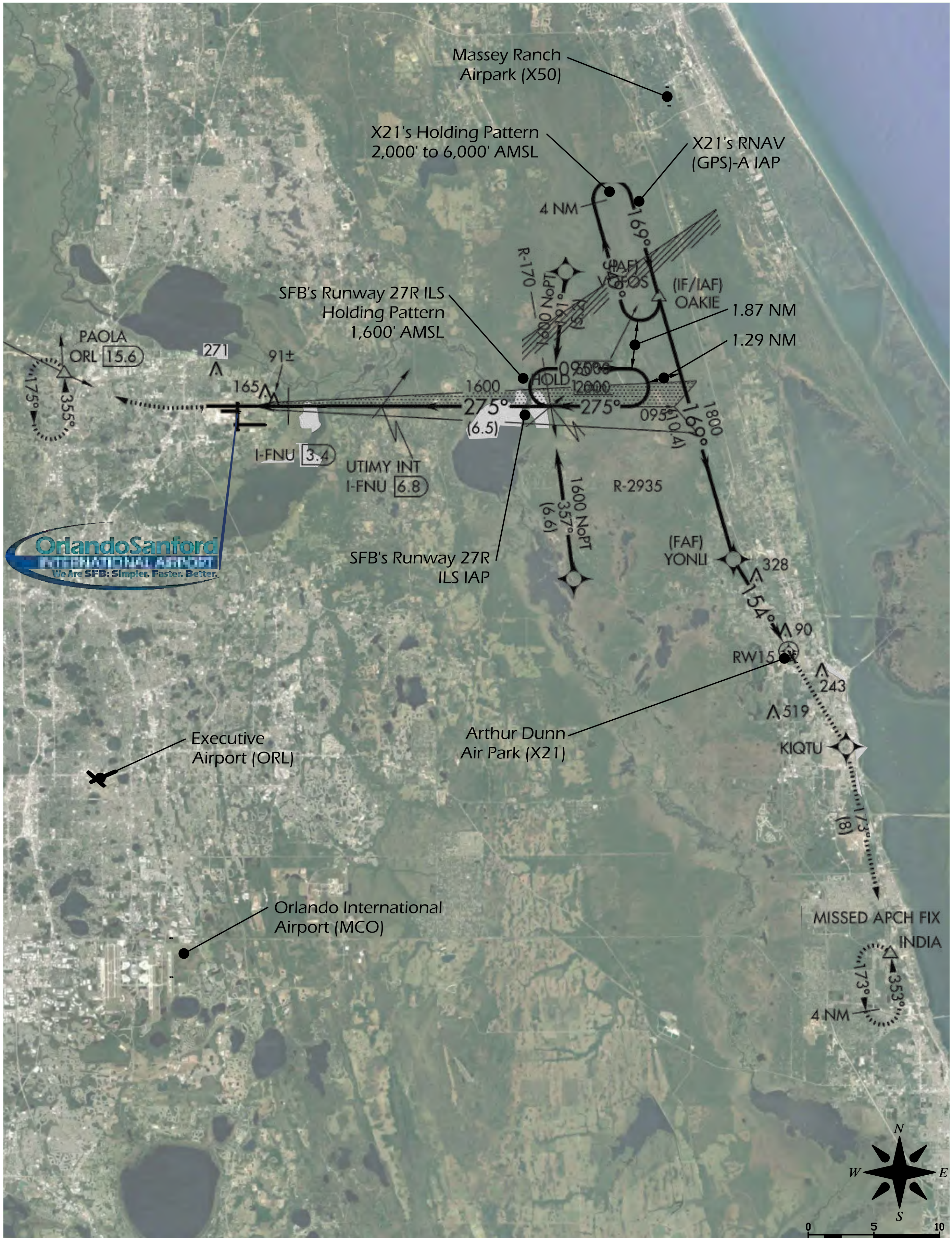


Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and X21's RNAV (GPS)-A, effective to August 13, 2020

2020 Orlando Sanford International Airport Master Plan Update
Converging SFB's Rwy 27R and X21's RNAV-A Instrument Approach Procedures

Figure 4-14

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Source: FAA's Instrument Approach Procedures for SFB's ILS Rwy 27R and X21's RNAV (GPS)-B, effective to August 13, 2020

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Converging SFB's Rwy 27R and X21's RNAV-B Instrument Approach Procedures

Figure 4-15

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#### 4.4.1.7. Daytona Beach International Airport Airspace Convergence

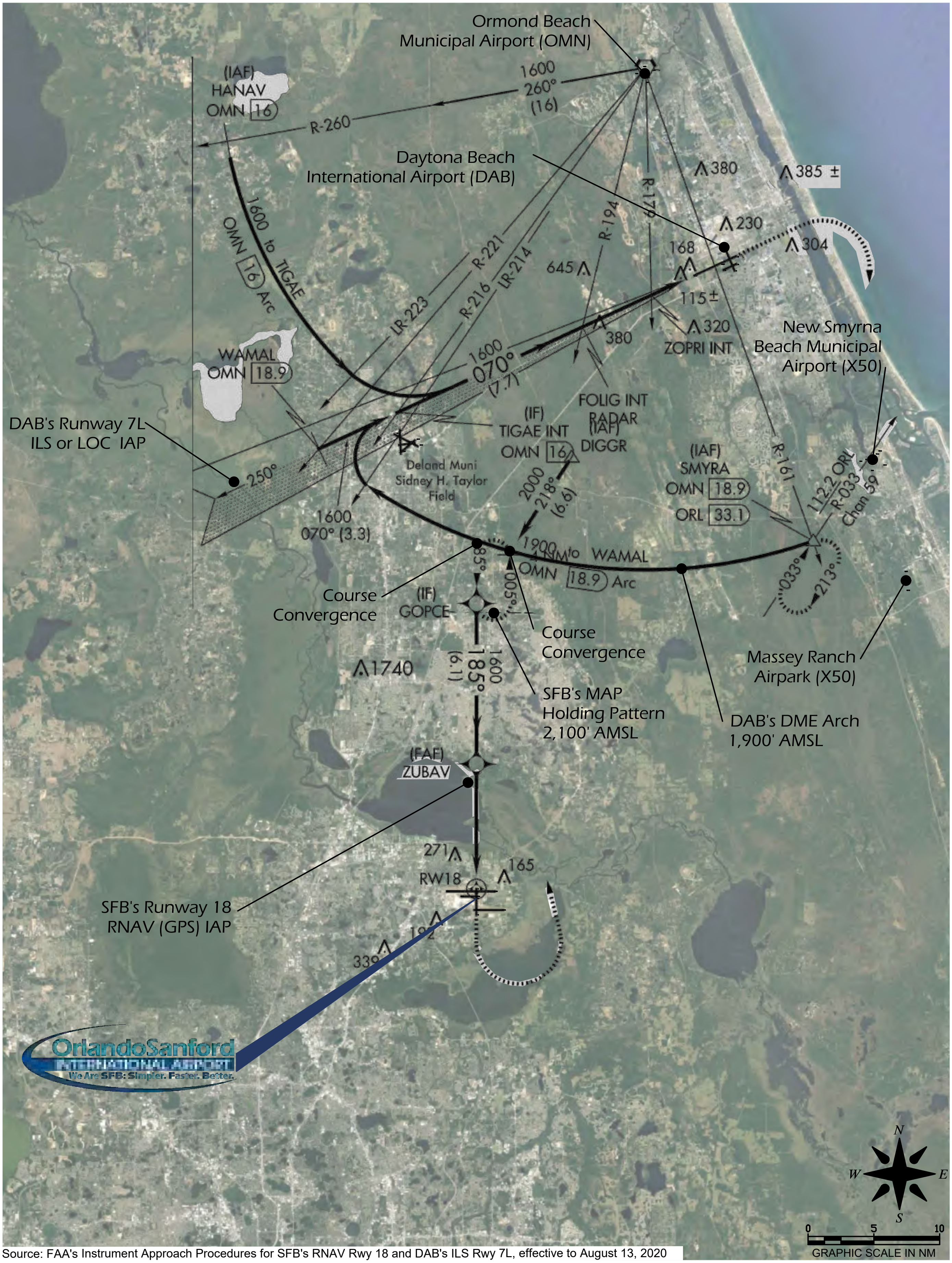
Daytona Beach International Airport (DAB) is the next closest airport to SFB that provides service during IMC and is located approximately 26 nm northeast of SFB. DAB serves scheduled commercial service passenger operations from its primary Runway 7L/25R. DAB's airspace is governed by Class C rules, and instrument approach procedures to EVB are handled by the Daytona Approach Control and Daytona ATC Tower. DAB's most precise IAP to their primary Runway 7L is the only of its IAPs to come near to those associated with SFB. The DAB Runway 7L ILS IAP utilizes a DME 18.9 nm arch, based on the Ormond Beach VORTAC to intercept the final approach course. That arch routes pilots at an elevation of 1,900-feet AMSL, and intersects SFB's MAP holding pattern associated with its Runway 18 RNAV (GPS) IAP. As was previously mentioned, the SFB Runway 18 RNAV (GPS) IAP MAP calls for a straight climb to 600-feet AMSL and then a climbing left turn to 2,100-feet AMSL direct to the GOPCE IF and hold northeast of that IF. As such, aircraft in the GOPCE holding pattern could be as little as 200 feet from aircraft tracking the DAB Runway 7L ILS IAP southern DME arch. **Figure 4-16** displays a blend of those IAPs.

#### 4.4.1.8. Airspace Capacity Summary

As this section demonstrated, the airspace surrounding SFB is constrained by the amount of approaches and departures of multiple airports. This limits the airspace capacity to SFB, and ultimately the number of aircraft that can be processed during peak periods. Only three of the Airport's runway ends are not equipped with an IAP; Runways 9C, 27C, and 36. Given Runway 9C/27C's proximity to the Airport's primary Runway 9L/27R, it is highly unlikely that it will ever be equipped with an IAP.

Runway 18 is equipped with an IAP from the north, and though seldom used, it has the potential to impact instrument operations at SFB's neighboring airports. A future instrument approach to Runway 36 from the south would likely be difficult to obtain due to conflicts with the operations of ORL and MCO. Instrument approach altitudes, airspace protection for holding and missed approach procedures, and adequate separation between approach procedures to all of the neighboring airports are of highest concern. This section has identified multiple IAPs and MAPs associated with SFB and its neighboring airports that have the potential to bring aircraft into close proximity with each other as the IAPs have a number of intersecting and converging courses.

Though the airspace surrounding SFB is constrained, airspace restrictions is only one factor when considering the Airport's overall capacity. Increases in aircraft operations at SFB will not exceed the airspace capacity in its existing configuration. Ensuring that safe and efficient airspace operations continue will require continued coordination between Sanford Tower personnel and Central Florida TRACON (F11), which controls air traffic in the region, specifically those above 3,000 feet AMSL and or those more than five nautical miles from the Airport. SFB is adequately equipped with IAPs from an airport capacity standpoint, and in fact may realize safety benefits from eliminating the IAP to Runway 18. Doing so would not require any modifications to the Airport's physical properties as the IAP does not rely on any ground-based equipment. However, IAP sophistication requirements by potential operators may preclude them from utilizing SFB on a regular basis. For example, the Airport's most precise IAP is based on a CAT-I precision ILS approach. The most precise IAPs provided by the FAA are CAT-II and III ILS approaches, which enable properly certified pilots to land in 'zero, zero' conditions; zero visibility and a descent to zero feet above the runway touchdown zone elevation. Therefore it is incumbent upon the Airport to plan for the inclusion of at least one CAT-II or III IAP to the primary Runway 9L/27R, should such an operator that requires CAT-II or higher precision decide to base their operations at the Airport.




Source: FAA's Instrument Approach Procedures for SFB's RNAV Rwy 18 and DAB's ILS Rwy 7L, effective to August 13, 2020

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|---|---|---|---|

## 4.5. Airside Facility Requirements

Based on the analysis completed in Section 4.2.1, the existing and future critical aircraft for the Airport was identified as the Boeing 787-8 Dreamliner (B788). The future design aircraft (also called “critical aircraft” or “critical design aircraft”) should be used to determine the design standards applicable to future development at the airport. This will ensure that the airport will have the capabilities to safely and efficiently accommodate the most critical aircraft that regularly uses the airport.

It is important to note that not all areas of the airfield are required to conform to the design standards for D-V aircraft. A separate critical aircraft can be identified for specific areas of the airport, such as runways and taxiways developed for GA use or for smaller commercial service aircraft, where the largest critical aircraft is not expected to operate. This method could decrease the space requirements as well as the cost of certain development projects as it will likely decrease the magnitude of the development area.

The following sections discus future facility requirements for the airfield system, including analysis of runway designations, runway length requirements, and discussion on future runway and taxiway improvements.

### 4.5.1. Runway Requirements

The following sections examine the runways’ general characteristics with respect to conformance to FAA design and safety requirements.

#### 4.5.1.1. Runway Designations

A runway’s designation or ‘name’ (runway end numbers and letters) is determined by rounding off the nearest whole number of its magnetic azimuth when oriented along its centerline as if on approach or departure to or from that runway end. Those numbers are then rounded off to the nearest unit of ten. Magnetic azimuth is determined by adjusting the geodetic azimuth associated with a runway to compensate for magnetic declination. Magnetic declination, also known as magnetic variation (MV), is defined as the difference between true north and magnetic north. This value varies over time and is dependent on global location. Change in MV is a natural process and periodically results in the re-designation of runways.

Current MV information was derived from the National Oceanic and Atmospheric Administration’s (NOAA’s) National Centers for Environmental Information (NCEI), formerly the National Geophysical Data Center (NGDC), in July 2020. The previous AMPU reported the declination to be 5°49’ West, calculated in April 2010 and changing by an estimated 0°5’ West per year. Evidently that estimate was precisely predicted as the MV increased by exactly 0°50’ between 2010 and 2020, resulting in a current MV of 6°39’ West, changing by approximately 0°5’ West per year according to the NCEI. However, according to Change 1 of FAA Oder 8260.19H, *Flight Procedures and Airspace*, the NOAA World Magnetic Model (WMM) is used to determine the current MV at a location and to calculate the future MV for use in flight procedure design and publication. The WMM is a joint product of the United States’ National Geospatial-Intelligence Agency (NGA) and the United Kingdom’s Defence Geographic Centre (DGC). The WMM is the standard model used by the U.S. Department of Defense, the U.K. Ministry of Defence, the North Atlantic Treaty Organization (NATO), and the International Hydrographic Organization (IHO), for navigation, and attitude and heading referencing systems using the geomagnetic field. It is also widely used in civilian navigation and heading systems. The model is produced at 5-year intervals, with the current model expiring on December 31, 2024. The Department of Defense’s (DoDs) World Magnetic Model Grid Calculator utilizes the WMM, and it was used to calculate the MV at SFB, which is 6°38’ West.

The current Airport Master Record (FAA Form 5010 or ‘5010’) provides a brief summary of the facilities at SFB. The 5010 is publicly available through the FAA’s Airport Data and Information Portal (ADIP). The 5010, effective December 31, 2020, reports a variation of 5° West based on the epoch year 2000. The Airport’s IAPs and runway designations are based on the MV identified on the 5010. According to FAA Order 8260.19H, careful consideration and evaluation of several factors is required before revising the MV of record for an airport or navigational aid. Updating the MV can have considerable impacts on airport facilities, navigational aids, and IAPs, requiring significant resources and funding to address. Revisions to the MV must be coordinated with the FAA prior to any changes being made at the airport. Coordination efforts should be started well in advance of any changes being implemented, as it can take a considerable amount of time to modify navigational aids and IAPs as necessary. Coordination should be done with the FAA Orlando Airports District Office, the FAA Air Traffic Eastern Service Center, and the FAA Technical Operations office. The MV revision may require the repainting of runway designators as well as updating runway identification signage panels. It is for this reason that the aforementioned

Order requires the MV of record to be changed when the difference between the MV of record and the actual MV exceeds three degrees, unless the associated airport is equipped with a CAT II/III IAP, in which case the maximum MV difference should not exceed one degree of the current, computed airport MV.

The MV of record would need to be revised prior to the Airport being equipped with a CAT II/III IAP, as the difference between the current and actual MV is 1.6 degrees, thereby exceeding the one-degree maximum deviation. If the MV continues to change by 0°5' West per year, the MV of record would differ from the actual by more than three degrees by May 2037.

The previous AMPU identified the need and plan to re-designate the Airport's runways based on the shifts in MV, although in an indefinite time period. Based on the calculations presented in this section, the Airport's runways are likely to require re-designation no later than May 2037, unless the annual rate of change increases or decreases or the Airport is equipped with a CAT II/III IAP. True bearings for each of the Airport's runways were identified through the most recent airport survey completed in accordance with the Airport Layout Plan (ALP) currently on file. **Table 4-17** depicts the calculated current and anticipated (2037) magnetic bearing of the Airport's runways and displays the recommended runway designation of each by 2037. Re-designation should be accomplished during major airfield projects, such as runway rehabilitation/reconstruction, provided coordination with all FAA offices have been completed.

**Table 4-17 - Runway Designation Calculation**

| Existing Runway Designation | True Bearing | July 2020 Magnetic Declination (MV) | July 2020 Magnetic Bearing | May 2037 Expected MV | May 2037 Expected Magnetic Declination | Recommended Runway Designation by 2037 |
|---|---|---|---|---|---|---|
| 9L | 89° 59' 15.65" | 6° 38' West | 96° 37' 15.65" | 8° 2' West | 98° 1' 15.65" | 10L |
| 27R | 269° 59' 15.65" | 6° 38' West | 276° 37' 15.65" | 8° 2' West | 278° 1' 15.65" | 28R |
| 9C | 89° 58' 32.66" | 6° 38' West | 96° 36' 32.66" | 8° 2' West | 98° 0' 32.66" | 10C |
| 27C | 269° 58' 32.66" | 6° 38' West | 275° 36' 32.66" | 8° 2' West | 278° 0' 32.66" | 28C |
| 9R | 89° 59' 0.54" | 6° 38' West | 95° 46' 0.54" | 8° 2' West | 98° 1' 0.54" | 10R |
| 27L | 269° 59' 0.54" | 6° 38' West | 275° 46' 0.54" | 8° 2' West | 278° 1' 0.54" | 28L |
| 18 | 180° 0' 6.56" | 6° 38' West | 185° 47' 6.56" | 8° 2' West | 188° 2' 6.56" | 19 |
| 36 | 0° 0' 6.56" | 6° 38' West | 5° 47' 6.56" | 8° 2' West | 8° 2' 6.56" | 1 |

Source: DOD's World Magnetic Model Grid Calculator and WMM, Atkins Analysis, July 2020

#### 4.5.1.2. Runway Length Requirements

A runway's length is a function of many factors, the most notable of which are the selection of a critical aircraft and the longest nonstop distance being flown by such aircraft from the airport of study. Analyses were conducted to determine the runway length requirements for each runway's future critical aircraft in accordance with FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. That AC recommends calculating the required runway lengths based on a family grouping of aircraft when a runway's critical aircraft has a maximum takeoff weight (MTOW) of less than 60,000 pounds and/or the aircraft is not a regional jet. Required runway length is based on review of the critical aircraft's operational performance specifications when such an aircraft is a regional jet and/or has an MTOW greater than 60,000 pounds. FAA AC 150/5325-4B provides a five-step procedure to determine recommended runway lengths for a selected list of critical design aircraft, as follows:

- Identify the list of critical design aircraft that will make regular use of the proposed runway for an established planning period of at least five years. For federally funded projects, the definition of the term "substantial use" quantifies the term "regular use".
- Identify the aircraft which require the longest runway lengths when operating at MTOW. This is used to determine the method for establishing the recommended runway length. The recommended runway length is determined per individual airplanes and their respective airplane planning manuals when the MTOW of listed aircraft is over 60,000 pounds.

Use AC 150/5325-4B's Table 1-1 (**Table 4-18** in this document) and the aircraft identified in step #2 to determine the method for establishing the recommended runway length. MTOW is used because of the significant role played by aircraft operating weights in determining runway lengths.

Select the recommended runway length from among the various runway lengths generated by step #3 per the process identified in chapters 2, 3, or 4 of the AC, as applicable.

Apply any necessary adjustment to the obtained runway length, when instructed by the applicable chapter of the AC, generated by step #4 to obtain a final recommended runway length. Adjustments to the length may be necessary for runways with non-zero effective gradients, excessive temperatures, wind conditions, airport elevation, etc.

Table 1-1 of the AC is split up into three categories, each recommending a different approach to analyzing required runway length, based on MTOW of a runway's critical aircraft. **Table 4-18** depicts the different analysis methods per the respective aircraft weight category. The following paragraphs provide details of the analyses conducted to determine the Airport's proposed runway length requirements.

**Table 4-18 - Airplane Weight Categorization for Runway Length Requirements**

| Airplane Weight Category<br>Maximum Certificated Takeoff Weight (MTOW) | | | Design Approach | Location of Design Guidelines |
|---|---|---|---|---|
| 12,500 pounds (5,670 kg) or less | Approach speeds less than 30 knots | | Family grouping of small airplanes | Chapter 2; Paragraph 203 |
| | Approach speeds of at least 30 knots but less than 50 knots | | Family grouping of small airplanes | Chapter 2; Paragraph 204 |
| | Approach speeds of 50 knots or more | With less than 10 passengers | Family grouping of small airplanes | Chapter 2; Paragraph 205 Figure 2-1 |
| | | With 10 or more passengers | Family grouping of small airplanes | Chapter 2; Paragraph 205 Figure 2-2 |
| Over 12,500 pounds (5,670 kg) but less than 60,000 pounds (27,200 kg) | | | Family grouping of large airplanes | Chapter 3; Figures 3-1 or 3-2[1] and Tables 3-1 or 3-2 |
| 60,000 pounds (27,200 kg) or more or Regional Jets[2] | | | Individual large airplane | Chapter 4; Airplane Manufacturer Websites (Appendix 1) |

Note 1: When the design airplane's aircraft planning manual (APM) shows a longer runway length than what is shown in Figure 3-2, use the APM. However, users of an APM are to adhere to the design guidelines found in Chapter 4.

Note 2: All regional jets regardless of MTOW are assigned to the 60,000 pounds (27,200 kg) or more weight category

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design,* Table 1-1

As outlined in Section **4.2.1**, **Table 4-5**, and **Table 4-6**, the Airport's critical aircraft include the B788 (for operations on Runway 9L/27R), the Airbus A320 Series (for operations on Runway 9R/27L and 18/36), and the King Air 200 (for operations on 9C/27C). Considering the B788 and A321 have MTOWs of 502,500 and 206,132 pounds respectively, runway length requirements for Runway 9L/27R, 18/36, and 9R/27L have been analyzed based on a review of published aircraft performance specifications. Alternatively, runway length requirements for Runway 9C/27C were based on a review of a family of aircraft likely to make substantial use of those runways.

#### 4.5.1.3. Runway Length: Takeoff Distance

Runway length requirements are based on a variety of factors with takeoff distance of the runway's critical aircraft being the most notable. Departure requirements are typically the most critical for measuring required runway length because departing aircraft typically have a full fuel load, thus increasing their takeoff weight and in turn their required runway length. Average high temperatures and the elevation of the runway are other factors that affect runway length requirements. Higher temperatures and elevations negatively impact aircraft operational performance characteristics.

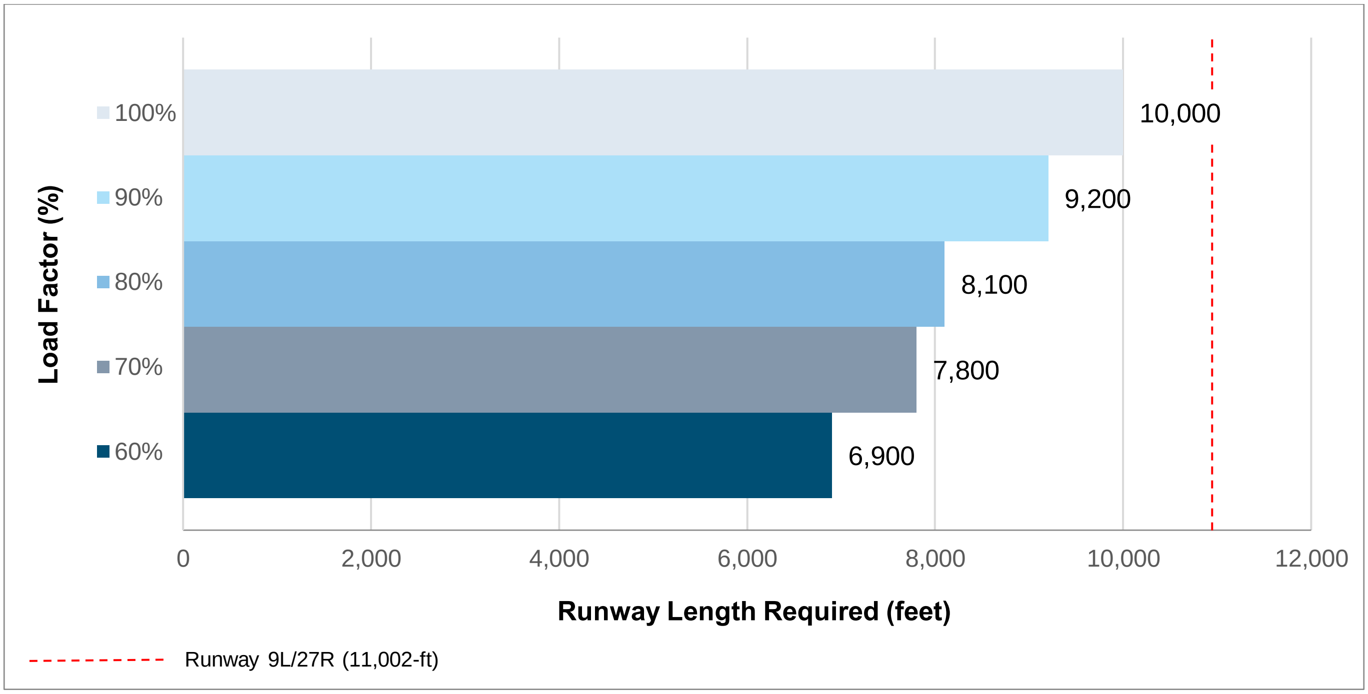
The Airport's relatively low height above sea level reduces the elevation factor, however the Central Florida region typically reaches relatively high temperatures, especially during summer months. The Airport's mean maximum daily temperature during the hottest month (July) is 92.7°F (33.7°C). Sanford's climate is typically warm and tropical for approximately 9 months each year. Such high temperatures reduce aircraft performance, causing an increase in distance required for both aircraft takeoffs and landings. Runway length evaluations must consider the Airport's average elevated temperatures, as cooler standard day conditions rarely occur.

When the critical aircrafts' MTOW exceeded 60,000 pounds, the specific aircraft manufacturer provided Aircraft Planning Manual (APM) was utilized to determine the runway's takeoff distance requirements. APMs provide information on an aircraft's performance, dimensions, weight, design standards, seating capacity, and more. APMs typically provide aircraft performance characteristics during International Standard Atmosphere (ISA) conditions. The International Civil Aviation Organization (ICAO) established ISA as a worldwide standard in 1993. ISA or 'standard day', temperature is 15°C (59°F) at sea level with a pressure altitude of 29.92 inches of mercury (inHg). The following sections detail the takeoff distance requirements determined for each of the Airport's runways. A summary of the takeoff distance requirements for Runways 9L/27R, 9C/27C, 9L/27R, and 18/36 is provided in **Table 4-19.**

#### 4.5.1.3.1. Runway 9L/27R Takeoff Distance Requirements

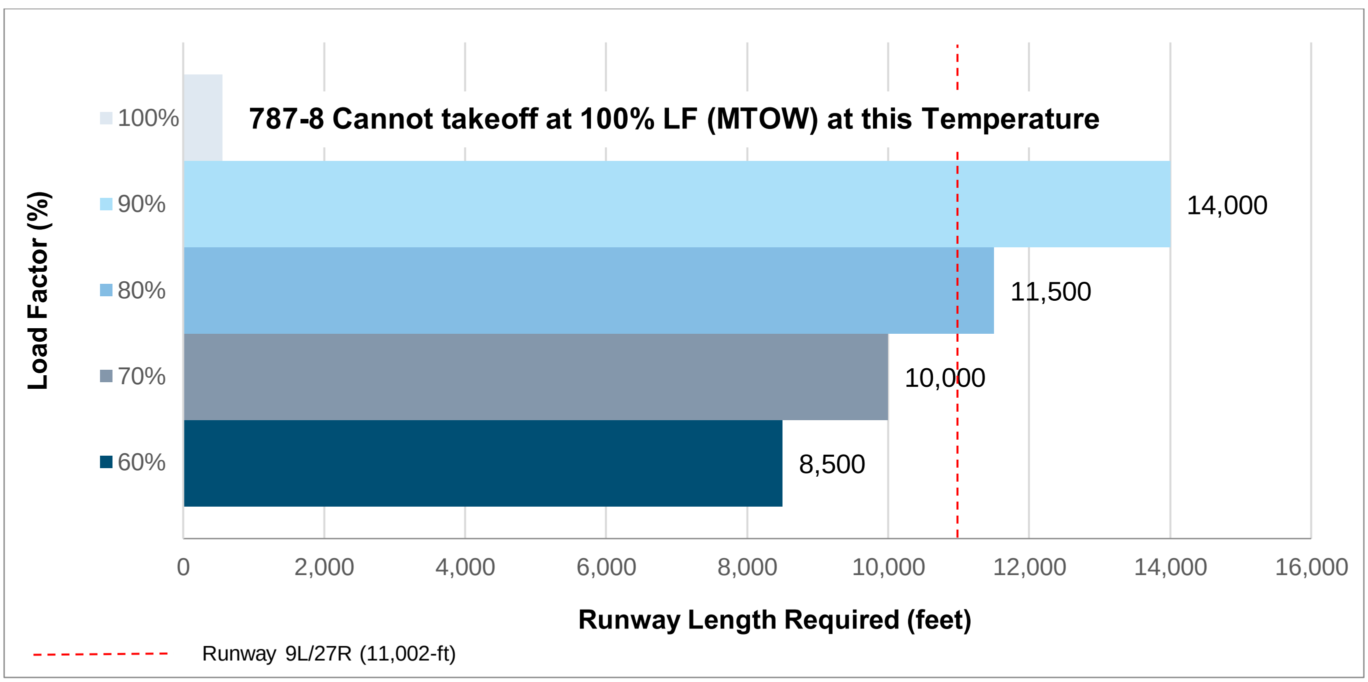
Runway 9L/27R's critical aircraft was determined to be the B788, and since its MTOW is 502,500 pounds, Boeing's 787 Airplane Characteristics for Airport Planning document D6-58333, Revision M, published in March 2018 provided the appropriate performance charts of the B788 aircraft. When analyzed, the APM revealed that Runway 9L/27R's current length of 11,002-feet is long enough for dry operations during ISA conditions without incurring weight penalties. However, weight penalties would be necessary for B788 departures from 9L/27R if temperatures were above 100°F. According to Chart 3.3.3 of D6-58333, a B788 could take off from Runway 9L/27R with zero wind with no higher than 75 percent load factor (465,625 pounds takeoff weight) during standard ISA conditions plus 45 degrees fahrenheit. During similar temperature conditions, the B788 at MTOW would require approximately 15,600 feet of runway length available for takeoff. **Figure 4-17** and **Figure 4-18** depict the required runway takeoff length for B788 aircraft operating at the Airport during dry conditions at ISA temperatures or those as high as 104°F, respectively.

**Figure 4-17 - Boeing 787-8 Takeoff Distance - Standard Day (59°F) Temperature**




Source: Boeing 787 Airplane Characteristics for Airport Planning, D6-58333, Figure 3.3.1, Atkins Analysis, 2020

**Figure 4-18 - Boeing 787-8 Takeoff Distance - Standard Day + 45°F (104°F) Temperature**




Source: Boeing 787 Airplane Characteristics for Airport Planning, D6-58333, Figure 3.3.3, Atkins Analysis, 2020

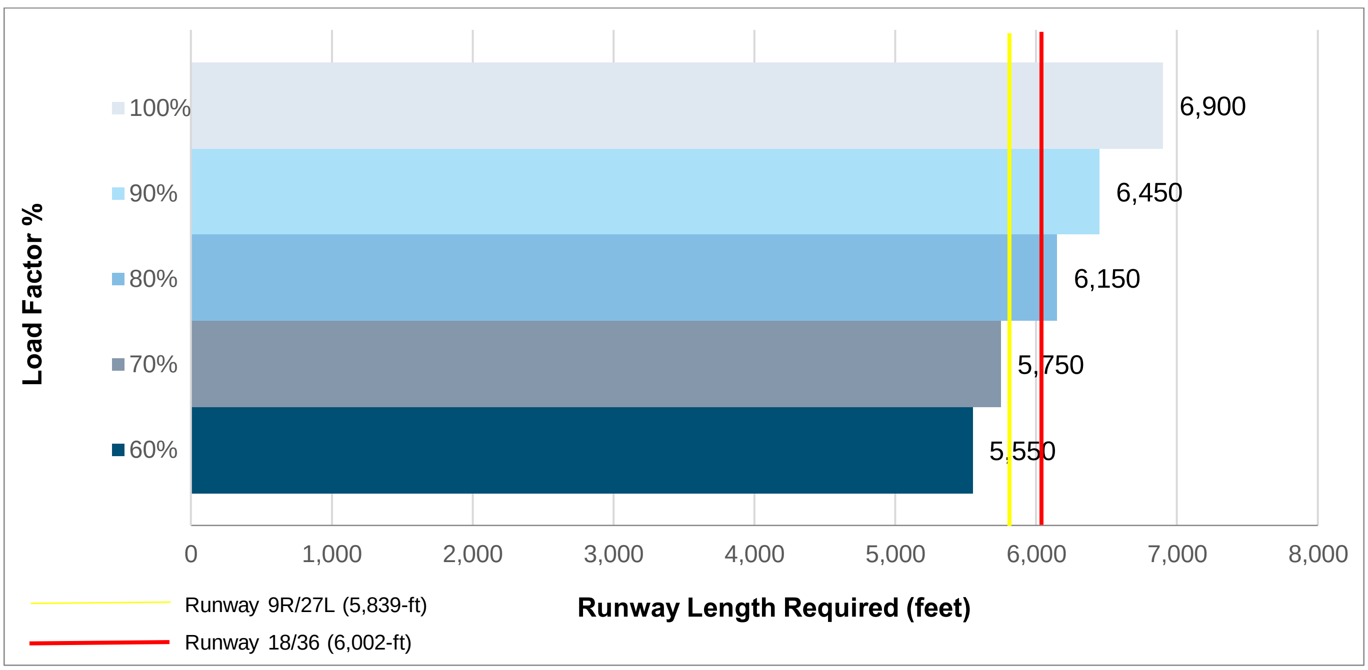
#### 4.5.1.3.2. Runway 18/36 and 9R/27L Takeoff Distance Requirements

The Airbus A320 series of aircraft was identified as the future critical aircraft for Runways 18/36 and 9R/27L. The A320 family's MTOW ranges between 136,000 (A318) and 206,132 (A321 NEO) pounds. As such, the specific manufacturer provided APM was referenced, specifically Airbus' A320 Aircraft Characteristics – Airport and Maintenance Planning, Revision No. 38 – Apr 01/20. As all A320 family operations during the calendar year 2019 were performed using A319 and A320 aircraft types, and the carrier responsible for these operations has shown no intention of upgrading or adding A321 NEO type aircraft, the A320 aircraft type was utilized for runway length calculations for Runways 18/36 and 9R/27L.

**Figure 4-19** and **Figure 4-20** depict results of various A320 take-off load factors during dry conditions and ISA temperatures or those as high as 118°F respectively. As **Figure 4-19** indicates, neither Runway 18/36 nor 9R/27L are long enough to allow unrestricted departures of an A320 during ISA conditions, as when fully loaded a 6,900-foot takeoff distance is required. Runways 18/36 and 9R/27L would need to be extended by 898 or 1,061 feet respectively to provide the minimum required 6,900-foot length needed for departures at MTOW during ISA temperatures.

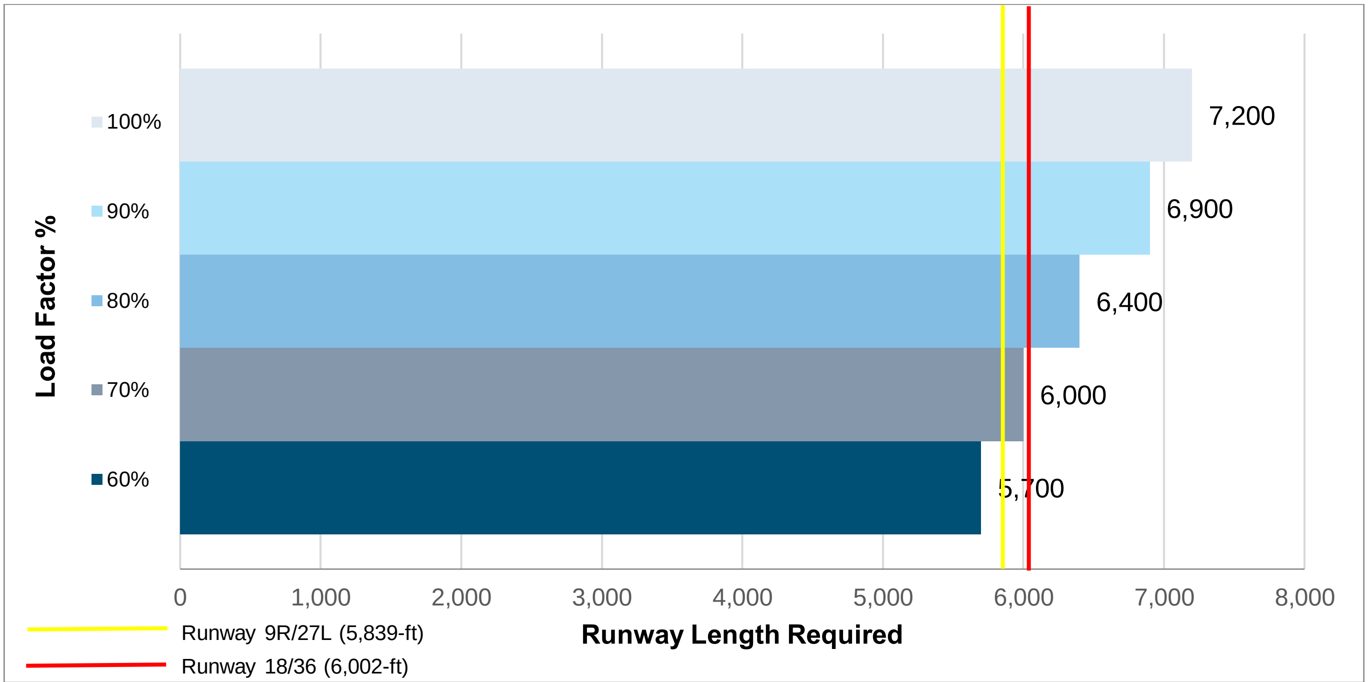
Runway 18/36's current length (6,002-feet) would allow for A320 departures at 75 percent load factors during ISA conditions. Runway 9R/27L's current length (5,839 feet) would allow for A320 departures at 65 percent load factors during ISA temperatures. During high temperature conditions, the Airbus charts depict takeoff distances required at temperatures of 118°F. Such temperatures are rarely, if ever, experienced in Central Florida, however these charts are utilized to determine worst case scenarios. Under such extreme temperatures, Runway 18/36's current length would allow for A320 departures at 60 percent load factors, and Runway 9R/27L's current length would allow for A320 departures at 56 percent load factors. Each runway would need to be extended to 7,200-feet in order to provide unrestricted A320 takeoff operations during any foreseeable atmospheric condition. To accommodate the design aircraft without weight restrictions, both Runways 18/36 and 9R/27L would require extensions of 1,198 and 1,361 feet respectively to meet the 7,200-foot total length requirement.

**Figure 4-19 - Airbus A320 - Takeoff Distance Required - Standard Day (59°F)**




Source: Airbus A320 Airplane Characteristics – Airport and Maintenance Planning Manual, Figure 3-3-1-991-005-A01, Atkins Analysis 2020

Figure 4-20 - A320 - Takeoff Distance Required - Standard Day +59F (118F)



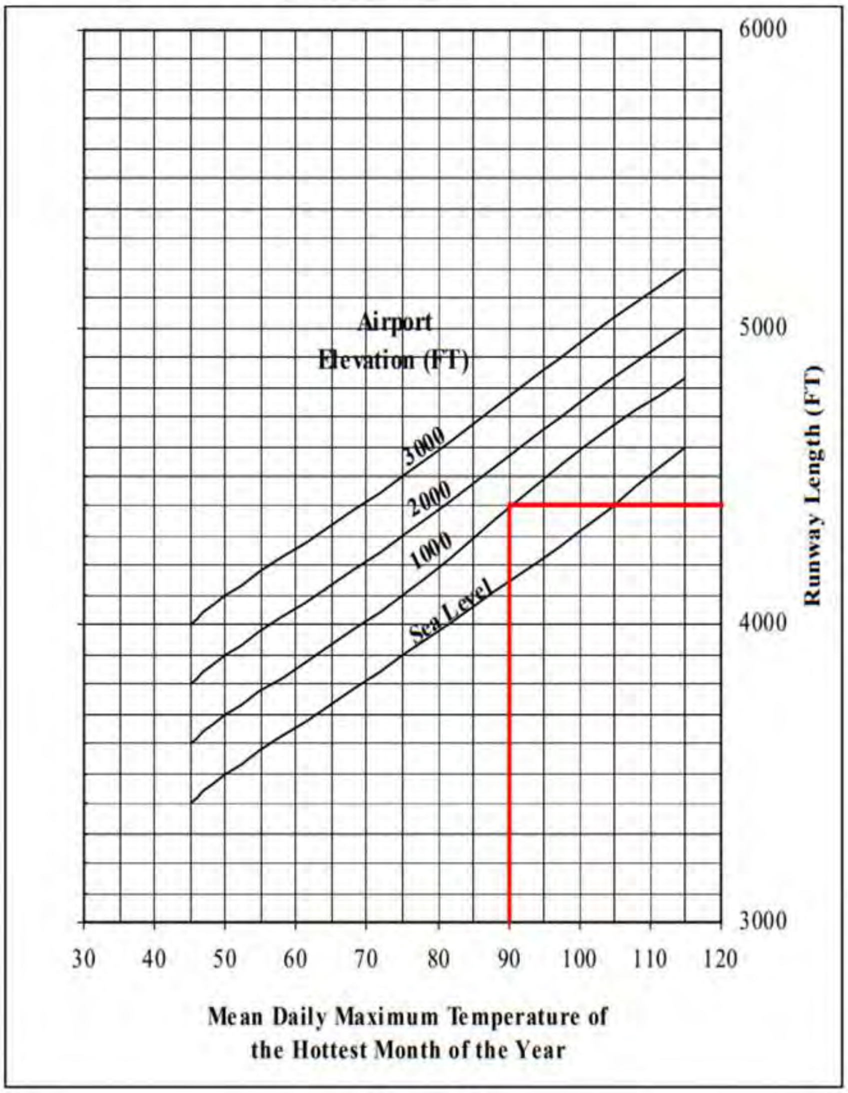

Source: Airbus A320 Airplane Characteristics – Airport and Maintenance Planning Manual, Figure 3-3-1-991-005-A01, Atkins Analysis 2020

#### 4.5.1.3.3. Runway 9C/27C Takeoff Distance Requirements

Runway length requirements for Runway 9C/27C are based on a review of a family of aircraft likely to make substantial use of that runway since the Beechcraft Super King Air (BE20) was determined to be its critical aircraft. The BE20's MTOW is 12,500 pounds, which the FAA classifies in the AC as a 'small airplane'. The BE20 can accommodate up to 13 passengers. As such, Figure 2-2, Small Airplanes Having 10 or More Passenger Seats, of the AC was used to derive Runway 9C/27C's required runway length. That figure utilizes the Airport's mean maximum temperature of the hottest month (92.7°F or 33.7°C) and elevation (55 feet AMSL) to determine a required 4,200-foot runway length, as is depicted in **Figure 4-21**. Runway 9C/27C would need to be extended by at least 622 feet to achieve this length. Only three months of the year experience average low temperatures below 55°F (12.8°C); January, February, and December. The average high temperatures during those months are all 70°F (21.1°C) or higher. Aircraft in the 'small airplanes with fewer than 10 passenger seats' family should be able to takeoff from the existing Runway 9C/27C under no wind conditions at approximately 53°F (11.7°C) or colder.

**Figure 4-21 - Runway 9C/27C Required Runway Length per FAA AC 150/5325-4B's Figure 2-2**

**Figure 2-2. Small Airplanes Having 10 or More Passenger Seats**
(Excludes Pilot and Co-pilot)

| Representative Airplanes | Runway Length Curves |
| --- | --- |
| **Raytheon** B80 Queen Air<br>**Raytheon** E90 King Air<br>**Raytheon** B99 Airliner<br>**Raytheon** A100 King Air<br>(Raytheon formerly Beech Aircraft)<br><br>**Britten-Norman** Mark III-I Trilander<br><br>**Mitsubishi** MU-2L<br><br>**Swearigen** Merlin III-A<br>**Swearigen** Merlin IV-A<br>**Swearigen** Metro II | **Example:** Temperature (mean day max hot month) 90° F (32° C)<br>Airport Elevation (msl) 1,000 feet (328 m)<br>Recommended Runway Length 4,400 feet (1,341 m)<br><br>**Note:** For airport elevations above 3,000 feet (915 m), use the 100 percent of fleet grouping in figure 2-1.<br><br><br><br>**(Degrees F)** |

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, Figure 2-2, Atkins Analysis July 2020

**Table 4-19 - Takeoff Distance Requirements Summary**

| Runway Designation | Existing Runway Length (feet) | Critical Aircraft | Aircraft Load Factor (%) | Required Runway Length (ISA Conditions) | Required Runway Length (Hot/Dry Conditions) |
|---|---|---|---|---|---|
| 9L / 27R | 11,002 | B788 | 100 | 10,000 | N/A |
| 9L / 27R | 11,002 | B788 | 90 | 9,200 | 14,000 |
| 9L / 27R | 11,002 | B788 | 80 | 8,100 | 11,500 |
| 9L / 27R | 11,002 | B788 | 70 | 7,800 | 10,000 |
| 18 / 36 | 6,002 | A320 | 100 | 6,900 | 7,200 |
| 18 / 36 | 6,002 | A320 | 90 | 6,450 | 6,900 |
| 18 / 36 | 6,002 | A320 | 80 | 6,150 | 6,400 |
| 18 / 36 | 6,002 | A320 | 70 | 5,750 | 6,000 |
| 18 / 36 | 6,002 | A320 | 60 | 5,550 | 5,700 |
| 9R / 27L | 5,839 | A320 | 100 | 6,900 | 7,200 |
| 9R / 27L | 5,839 | A320 | 90 | 6,450 | 6,900 |
| 9R / 27L | 5,839 | A320 | 80 | 6,150 | 6,400 |
| 9R / 27L | 5,839 | A320 | 70 | 5,750 | 6,000 |
| 9R / 27L | 5,839 | A320 | 60 | 5,700 | 5,700 |
| 9C/27C | 3,578 | Small Acft w/ 10+ Pax Seats | N/A | 3,650 | 4,200 |

ACFT - Aircraft

Source: Airplane Characteristics for Airport Planning, D6-58333, Figure 3.3.1, Airbus A320 Aircraft Characteristics – Airport and Maintenance Planning Manual, Figure 3-3-1-991-005-A01, Atkins Analysis 2020

### 4.5.1.4. Runway Landing Length Analysis

Another important factor to determine required runway lengths is the critical aircraft's landing capabilities under specific conditions. Landing operations typically require less distance than takeoffs due to aircraft being lighter when landing and their braking capabilities after touchdown. Although landing operations are less critical in regard to runway length required compared to takeoff operations, it is important to quantify each runway's landing length requirements.

In some scenarios, runways require displaced threshold and declared distances to mitigate potential RPZ impacts to ensure safe operations. Approach Runway Protection Zones (RPZs) are considerably larger than departure RPZs, as discussed in the following section of this report (**4.5.1.7.3**). During these scenarios, the runway landing length available will be reduced.

#### 4.5.1.4.1. Runway 9L/27R Landing Distance Requirements

Runway 9L/27R's B788 critical aircraft's maximum design landing weight (MLW) is 380,000 pounds. According to Figure 3.4.2 of Boeing's aforementioned document D6-58333, the B788 aircraft requires 5,550-feet of landing distance at sea level, during ISA temperatures, dry conditions, with no wind, and utilizing 25 degrees of flaps. Since critical operations at the Airport could occur at temperatures considerably hotter than ISA and on wet surfaces, the reported landing distance from the manufacture requires corrections for altitude, temperature, and surface condition. The standard planning altitude correction is seven percent per 1,000 feet AMSL. The standard planning temperature correction is half a percent per degree above ISA for the mean maximum daily temperature of the hottest month (92.7 degrees Fahrenheit; July). The standard planning correction for wet pavement conditions is a 15 percent increase. Applying those necessary adjustments to account for the mean maximum temperature during the hottest month and elevation result in a required landing distance requirement of 6,516-feet during dry conditions and 7,493-feet when wet. Temperatures are likely to be closer to 80°F during wet conditions, therefore the required field length during such is approximately 7,086-feet for the critical aircraft (B788). As such, landing operations on Runway 9L/27R should be provided with a minimum of 7,086-feet to accommodate landings during most conditions, year-round. At 11,002-feet, Runway 9L/27R does not require extension to accommodate the critical aircraft during all landing conditions.

#### 4.5.1.4.2. Runways 9R/27L and 18/36 Landing Distance Requirements

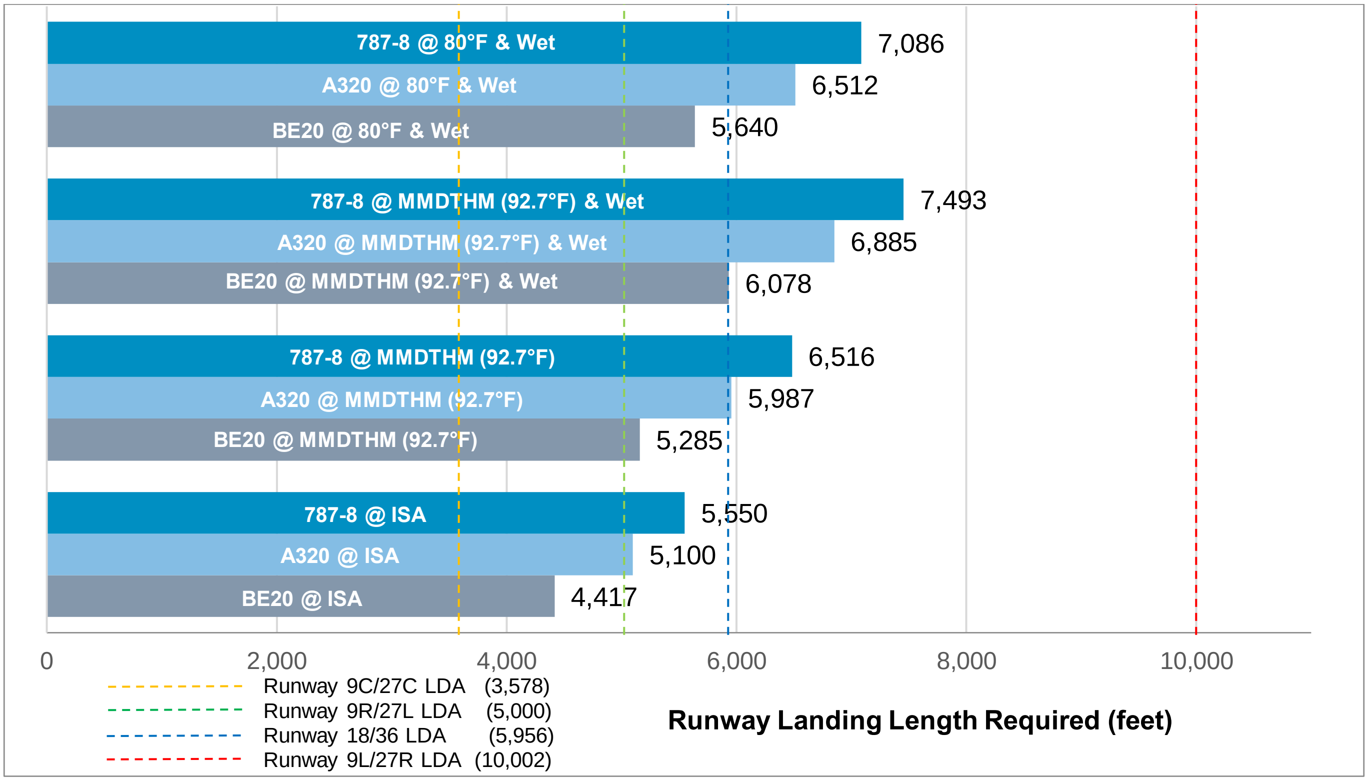
The A320's (Runways 9R/27L and 18/36's critical aircraft) MLW is 148,592 pounds and requires approximately 5,100 feet of landing distance during ISA temperatures at sea level. However, applying the necessary adjustments to account for the mean maximum temperature during the hottest month and elevation result in a required landing distance requirement of 5,987-feet during dry conditions and 6,885-feet during wet conditions. Temperatures are likely to be closer to 80°F during wet conditions, therefore the required field length during such is approximately 6,512-feet. As such, landing operations on Runways 9R/27L and 18/36 should be provided with a minimum of 6,520-foot length to accommodate landings during most conditions, year-round. At 5,839-feet, Runway 9R/27L would require a 681-foot extension to accommodate the critical aircraft during all landing conditions. At 6,002-feet, Runway 18/36 would require a 518-foot extension to accommodate the critical aircraft during all landing conditions.

#### 4.5.1.4.3. Runway 9C/27C Landing Distance Requirements

The BE20's (Runway 9C/27C's critical aircraft) MLW is 12,500 pounds and requires 4,417-feet of landing distance during ISA temperatures at sea level. However, applying the necessary adjustments to account for the mean maximum temperature during the hottest month and elevation result in a required landing distance required of 5,285-feet during dry conditions and 6,078-feet during wet conditions. If temperatures were closer to 80°F during wet conditions, the required field length during such instances is approximately 5,640-feet. As such, landing operations on Runway 9C/27C should be provided with a minimum of 5,640-feet to accommodate landings during most conditions, year-round. At 3,578-feet, Runway 9C/27C would require a 2,062-foot extension to accommodate the critical aircraft during all landing conditions.

**Figure 4-22** depicts the landing length requirements for each of the Airport's critical aircraft compared to the minimum reported landing distance available (LDA) of each runway.

**Figure 4-22 – Runway Landing Length Requirements**




Notes: Max Mean Daily Temperature Hottest Month (MMDTHM), International Standard Atmosphere (ISA), Landing Distance Available (LDA)

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, Figure 2-2, Atkins Analysis July 2020

### 4.5.1.5. Runway Width Requirements

Runway width standards are established in FAA AC 150/5300-13A and are based on RDC criteria. **Table 4-20** outlines the FAA runway width standards for the existing and future critical aircrafts in comparison to the existing runway widths at SFB.

**Table 4-20 - Runway Width Requirements**

| Runway | RDC (Existing and Future) | FAA Requirement Width (Ft.) (Existing and Future) | Existing Width (Ft.) |
|---|---|---|---|
| 9L/27R | D-V | 150 | 150 |
| 9R/27L | B-II / C-III | 75 / 150 | 75 |
| 9C/27C | B-II | 75 | 75 |
| 18/36 | D-IV / C-III | 150 | 150 |

Source: FAA AC 150/5300-13A, *Airport Design*. Atkins 2020

As outlined above, Runway 9R/27L requires a pavement width expansion to a total 150-foot width to accommodate the future RDC of C-III. All other runways at SFB have sufficient pavement widths in accordance to their respective RDCs.

### 4.5.1.6. Runway Pavement Condition Requirements

The following section will analyze the existing runway pavement conditions to ensure that each runway is maintained on an appropriate schedule to remain safe for continued aircraft operations. The data for the existing pavement condition is derived from the FDOT Statewide Airfield Management program, Airport Pavement Evaluation report, completed in 2019, specifically for SFB. **Figure 4-23** depicts the airfield pavement condition as of February 2019. As part of the Airport Pavement Evaluation report, FDOT outlines major rehabilitation required within the next 10-year period. The objective of the major pavement rehabilitation needs, included within the FDOT report, is to provide a planning-level project schedule within an airport's airfield pavement network. These projects are typically recommended when a specific pavement section has deteriorated below the critical PCI value, a point where minor maintenance and repair projects may not be cost-effective. These major rehabilitation requirements will be further explained in the following sections for each runway.

Most of the runway pavement condition at SFB range from satisfactory to fair condition. Typically, runway pavements have a 20-year lifespan, provided that routine maintenance and rehabilitation efforts are done throughout the pavement's life. Provided that the pavement receives adequate routine maintenance throughout its life, major reconstruction efforts are likely to be needed for 20 or more years. Routine maintenance projects can include crack sealing and seal coat while minor rehabilitation could include mill and overlay.

#### 4.5.1.6.1. Runway 9L/27R Pavement Requirements

The majority of the Runway 9L/27R pavement was rehabbed in 2009, with some pavement sections on the east side of the runway being rehabbed in 2013. Three sections towards the Runway 27R end is classified as good condition, where the remainder of the runway pavement is classified to be in satisfactory condition. The area-weighted average PCI for the runway is 75, which represents a satisfactory condition rating. **Table 4-21** outlines the existing pavement condition for Runway 9L/27R as of February 2019.

**Table 4-21 - Runway 9L/27R Pavement Condition Summary**

| Runway | Pavement Section ID | PCI Number | PCI Classification | Forecasted PCI Number 2022 | Estimated Last Construction Date |
|---|---|---|---|---|---|
| 9L/27R | 6105 | 71 | Satisfactory | 63 | 2009 |
| | 6110 | 77 | Satisfactory | 71 | 2009 |
| | 6145 | 84 | Satisfactory | 79 | 2013 |
| | 6150 | 94 | Good | 85 | 2013 |
| | 6155 | 86 | Good | 80 | 2013 |
| | 6160 | 89 | Good | 82 | 2013 |
| | 6165 | 85 | Satisfactory | 79 | 2013 |
| | 6170 | 84 | Satisfactory | 78 | 2013 |

Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report, SFB, November 2019

As stated in the FDOT Airport Pavement Evaluation report, Runway 9L/27R is scheduled to undergo major rehabilitation in area 6105 in program year 2022. This would normally consist of mill and overlays for sections of the runway which have a PCI value below 75. However, according to SAA staff, the original construction of that runway occurred over 30 years ago, and the pavement has been maintained with asphalt overlays. SAA initiated a Runway 9L/27R Emergency Repair Assessment analysis in January 2021, as several areas of the runway are exhibiting serious deterioration. The results of that analysis may determine that immediate repairs should be made to the runway to maintain operational safety, and that a full runway rehabilitation needs to be constructed sooner than previously expected.

#### 4.5.1.6.2. Runway 9R/27L Pavement Requirements

For Runway 9R/27L, the last rehabilitation and pavement treatment years range from 1997 to 2008. The area-weighted average PCI for the runway is 70, which represents a fair condition rating. **Table 4-22** outlines the existing pavement condition for Runway 9R/27L as of February 2019.

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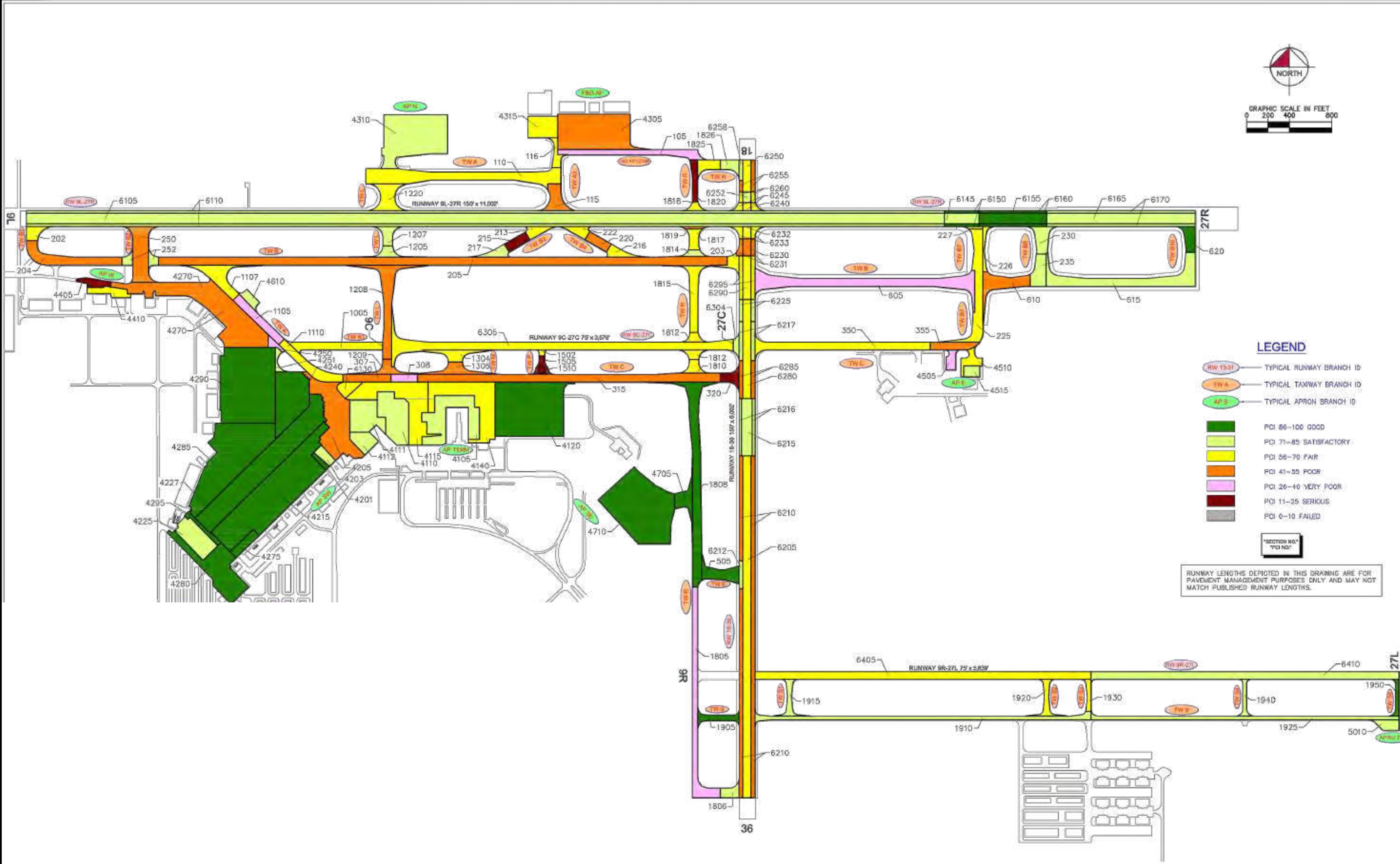


Source: Florida Department of Transportation (FDOT) Statewide Airfield Pavement Management Program - Orlando Sanford International Airport, 2019

| ATKINS<br>Member of the SNC-Lavalin Group | Orlando Sanford International Airport<br>Airport Master Plan Update | OrlandoSanford INTERNATIONAL AIRPORT<br>We Are SFB: Simpler. Faster. Better. | Airfield Pavement Condition | Figure<br>4-23 |
|---|---|---|---|---|

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**Table 4-22 - Runway 9R/27L Pavement Condition Summary**

| Runway | Pavement Section ID | PCI Number | PCI Classification | Forecasted PCI Number 2022 | Estimated Last Construction Date |
|---|---|---|---|---|---|
| 9R/27L | 6405 | 61 | Fair | 55 | 1997 |
| | 6410 | 80 | Satisfactory | 74 | 2008 |

Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report, SFB, November 2019

As stated in the FDOT Airport Pavement Evaluation report, Runway 9R/27L is scheduled to undergo major rehabilitation towards the latter half of the 10-year period of the outlined needs. This will primarily be mill and overlay for sections of the runway which have a PCI value below 75. However, it is recommended to continue to monitor this runway pavement for accelerated deterioration to ensure the safety of all operators.

#### 4.5.1.6.3. Runway 9C/27C Pavement Requirements

For Runway 9C/27C, the last rehabilitation and pavement treatment years range from 1975 to 2006. The area-weighted average PCI for the runway is 66, which represents a fair condition rating. **Table 4-23** outlines the existing pavement condition for Runway 9C/27C as of February 2019.

**Table 4-23 - Runway 9C/27C Pavement Condition Summary**

| Runway | Pavement Section ID | PCI Number | PCI Classification | Forecasted PCI Number 2022 | Estimated Last Construction Date |
|---|---|---|---|---|---|
| 9C/27C | 6304 | 71 | Satisfactory | 63 | 1975 |
| | 6305 | 66 | Fair | 58 | 2006 |

Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report, SFB, November 2019

As stated in the FDOT Airport Pavement Evaluation report, Runway 9C/27C is schedule to undergo major rehabilitation in the next five years. This is primarily due to the runway falling below a PCI value of 75. This rehabilitation will entail primarily mill and overlay for the extent of the runway with some runway pavement reconstruction.

#### 4.5.1.6.4. Runway 18/36 Pavement Requirements

The majority of the Runway 18/36 pavement is currently in fair condition. The last rehabilitation and pavement treatment years range from 1943 to 2009. The area-weighted average PCI for the runway is 63, which represents a fair condition rating. **Table 4-24** outlines the existing pavement condition for Runway 18/36 as of February 2019.

**Table 4-24 - Runway 18/36 Pavement Condition Summary**

| Runway | Pavement Section ID | PCI Number 2019 | PCI Classification | Forecasted PCI Number 2022 | Estimated Last Construction Date |
|---|---|---|---|---|---|
| 18/36 | 6205 | 70 | Fair | 62 | 2009 |
| | 6210 | 49 | Poor | 47 | 1984 |
| | 6212 | 81 | Satisfactory | 77 | 2009 |
| | 6215 | 82 | Satisfactory | 78 | 1943 |
| | 6216 | 78 | Satisfactory | 73 | 1943 |
| | 6217 | 78 | Satisfactory | 73 | 2004 |
| | 6225 | 78 | Satisfactory | 73 | 1984 |
| | 6230 | 51 | Poor | 49 | 2009 |
| | 6231 | 55 | Poor | 54 | 2009 |
| | 6232 | 67 | Fair | 59 | 2009 |
| | 6233 | 56 | Fair | 54 | 2009 |
| | 6240 | 69 | Fair | 61 | 2009 |
| | 6245 | 57 | Fair | 54 | 2009 |
| | 6250 | 59 | Fair | 54 | 2009 |
| | 6252 | 73 | Satisfactory | 65 | 2009 |
| | 6255 | 47 | Poor | 45 | 1984 |
| | 6258 | 74 | Satisfactory | 66 | 2009 |
| | 6260 | 65 | Fair | 57 | 1984 |
| | 6280 | 61 | Fair | 55 | 2009 |
| | 6285 | 55 | Poor | 54 | 1984 |
| | 6290 | 65 | Fair | 57 | 2004 |
| | 6295 | 69 | Fair | 61 | 2004 |

Source: FDOT Statewide Airfield Pavement Management Program; Airport Pavement Evaluation Report, SFB, November 2019

As stated in the FDOT Pavement Evaluation report, Runway 18/36 is scheduled to be the first runway to receive major rehabilitation due to the overall fair condition, with portions of the runway moving to the poor condition classification.

#### 4.5.1.7. Runway Protective Surfaces

Runway protective surfaces such as the Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zone (RPZ) aim to protect aircraft, people, and property in the case of an aircraft deviating from its intended course while conducting conventional runway operations. The following sections outline the Airport's existing and future runway protective surface criteria.

#### 4.5.1.7.1. Runway Safety Area

An RSA is a defined surface surrounding a runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. According to FAA design standards, RSAs must be:

1. Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variation; graded to slope away from its respective runway at 1.5 to 5.0 percent.

Drained by grading or storm sewers to prevent water accumulation;

Capable, under dry conditions, of supporting Aircraft Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft without causing damage to the aircraft; and,

Free of objects, except for those needed to be inside the RSA, such as NAVAIDs, because of their function. Objects higher than 3 inches above grade must be constructed, to the extent practical, on frangible mounted structures of the lowest practical height with the frangible point no higher than 3 inches above grade. Other objects, such as manholes, should be constructed at grade and capable of supporting aircraft, and in no case should said objects exceed 3 inches above grade.

The dimensions of an RSA depend upon a runway's RDC. Meeting RSA requirements is one of the FAA's highest priorities in maintaining safety at the nation's airports. **Table 4-25** lists the Airport's existing and future RSA requirements.

**Table 4-25 - Existing & Future Runway Safety Area (RSA) Dimensions**

| Runway | RDC (Existing / Future) | RSA Width (Ft.) (Existing / Future) | Length Beyond Runway End (Ft.) (Existing / Future) | Length Prior to Threshold (Ft.) (Existing / Future) |
|---|---|---|---|---|
| 9L/27R | D-V-2400 | 500 | 1,000 | 600 |
| 9R/27L | B-II-2400 / C-III-2400 | 300 / 500 | 600 / 1,000 | 600 |
| 9C/27C | B-II (Small)-VIS | 120 / 150 | 240 / 300 | 240 / 300 |
| 18/36 | D-IV-4000 / C-III-4000 | 500 | 1,000 | 600 |

Source: FAA AC 150/5300-13A, *Airport Design*

There is one identified existing impact for the RSAs at SFB. The impact is located beyond the Runway 36 end, where an existing fence line runs through the full width of the RSA surface. The fence line is located approximately five feet prior to the end of the RSA surface. Mitigation of this impact has been created from a reduction of Runway 18's Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA). The ASDA and LDA for Runway 18 has been reduced by 46 feet to ensure the RSA is not impacted.

#### 4.5.1.7.2. Runway Object Free Area

The Runway Object Free Area (ROFA) must be free of objects except those required to support air and ground navigation. The function of the ROFA, also centered on the runway, is to enhance the safety of aircraft operating on the runway. The airport's established RDC determines the ROFA dimensions. Contrary to the RSA, the ROFA does not have specific slope requirements, however the terrain within the ROFA must be relatively smooth and graded to be at or below the edge of the RSA. **Table 4-26** lists the Airport's existing and future ROFA requirements.

**Table 4-26 - Existing & Future Runway Object Free Area Dimensions**

| Runway | RDC (Existing / Future) | ROFA Width (Ft.) (Existing / Future) | Length Beyond Runway End (Ft.) (Existing / Future) | Length Prior to Threshold (Ft.) (Existing / Future) |
|---|---|---|---|---|
| 9L/27R | D-V-2400 | 800 | 1,000 | 600 |
| 9R/27L | B-II-2400 / C-III-2400 | 800 | 600 / 1,000 | 600 |
| 9C/27C | B-II (Small)-VIS | 250 / 500 | 240 / 300 | 240 / 300 |
| 18/36 | D-IV-4000 / C-III-4000 | 800 | 1,000 | 600 |

Source: FAA AC 150/5300-13A, *Airport Design*

There is one identified existing impact for the ROFAs at SFB. The impact, similar to the existing RSA impact identified in the previous section, is located beyond the Runway 36 end. An existing fence line runs through the full width of the ROFA surface approximately five feet from the end of the surface. Mitigation of this impact has been created from a reduction of Runway 18's ASDA and LDA. The ASDA and LDA for Runway 18 has been reduced by 46 feet to ensure the ROFA is not impacted.

#### 4.5.1.7.3. Runway Protection Zone

The Runway Protection Zone (RPZ) is an area centered symmetrically on an extended runway centerline. The RPZ has a trapezoidal shape and is offset from the runway end. The RPZ is aimed to enhance the safety of people and property on the ground by limiting and/or restricting the construction of certain structures within its bounds. This area should be free of land uses that create hazards to air navigation (glare, smoke, etc.).

There are two types of RPZs that can be found at an airport. The approach RPZ and departure RPZ are based on the approach visibility minimums and departure procedures associated with the runway, respectively, along with the AAC of the design aircraft. For a particular runway end, the more stringent RPZ requirements will govern the property interests and clearing requirements the airport should pursue. **Table 4-27** provides the RPZ dimensions for each runway at SFB.

**Table 4-27 – Existing & Future Runway Protection Zone Dimensions**

**Approach RPZ**

| Runway | RDC (Existing / Future) | Length (Ft.) (Existing / Future) | Inner Width (Ft.) (Existing / Future) | Outer Width (Ft.) (Existing / Future) |
|---|---|---|---|---|
| 9L/27R | D-V-2400 | 2,500 | 1,000 | 1,750 |
| 9R | B-II-2400 / C-III-2400 | 2,500 | 1,000 | 1,750 |
| 27L | B-II-2400 / C-III-2400 | 1,000 | 500 | 700 |
| 9C/27C | B-II (Small)-VIS | 1,000 | 250 | 450 |
| 18 | D-IV-4000 / C-III-4000 | 1,700 | 1,000 | 1,510 |
| 36 | D-IV-4000 / C-III-4000 | 1,700 | 500 | 1,010 |

**Departure RPZ**

| Runway | RDC (Existing / Future) | Length (Ft.) (Existing / Future) | Inner Width (Ft.) (Existing / Future) | Outer Width (Ft.) (Existing / Future) |
|---|---|---|---|---|
| 9L/27R | D-V-2400 | 1,700 | 500 | 1,010 |
| 9R/27L | B-II-2400 / C-III-2400 | 1,000 | 500 | 700 |
| 9C/27C | B-II (Small)-VIS | 1,000 | 250 | 450 |
| 18/36 | D-IV-4000 / C-III-4000 | 1,700 | 500 | 1,010 |

Source: FAA AC 150/5300-13A, *Airport Design*

There have been several existing impacts identified for the RPZs at SFB. The following list outlines the identified RPZ impacts at the Airport:

- Runway 9L/27R
  - On the west end of Runway 9L/27R, an active railroad track is present along the width of the RPZs. Beyond both ends of the runway, portions of the protective surface are outside of the airport property line. However, there are established easements to control activity within these areas.
- Runway 18/36
  - Beyond both ends of the runway, the RPZs are impacted by public roadways which cross through the boundary of the protective surface.
  - On the north end of the runway, the RPZ encompasses portions of residential land use beyond E 25th Street.
- Runway 9R/27L
  - Beyond the west end of the runway, the existing RPZ is impacted by public roadways and an automobile parking lot in the northern portion of the boundary of the protective surface. A portion of the RPZ is currently outside of the existing airport property line with no established airport easement for controlled activity.
- Runway 9C/27C
  - Beyond the west end of the runway, a large portion of the RPZ encompasses both active taxiways and aircraft parking aprons. Specifically, Taxiway K1 leads directly onto the runway end which places this taxiway directly aligned down the controlled area of the RPZ surface.
  - Beyond the east end of the runway, the eastern portion of Taxiway C leads directly onto the runway end which places this taxiway directly aligned down the controlled area of the RPZ surface.

It is recommended that all identified RPZ impacts are mitigated to the highest extent possible to enhance the safety of all operators as well as the surrounding community. Options for mitigation will be explored during the development alternatives chapter of the master plan.

### 4.5.2. Taxiway Requirements

As outlined in **Table 4-6** and **Table 4-7** of this chapter, the taxiway system at SFB has varying existing and future TDG design standards depending upon the largest runway served by that particular taxiway. The following existing taxiways do not meet current or future design standards:

- Taxiway M has been identified to have non-standard fillet geometry as aligned with the required TDG 2 standards for the connector.
- Taxiway P has been identified to have non-standard fillet geometry as aligned with the required TDG 2 standards for the connector. In addition, Taxiway P has a non-standard compass calibration pad located on the connector.

**Table 4-28** outlines the taxiways that are current deficient in their respective standard widths.

**Table 4-28 - Width Deficient Taxiways**

| Taxiway | TDG (Current / Future) | TDG Standard Width (ft) (Current / Future) | Actual Taxiway Width (ft) |
|---|---|---|---|
| R | 3 | 50 | Varies (50-75) |
| S | 2 & 3 / 3 | 35 & 50 / 50 | Varies (35-50) |

Source: FAA AC 150/5300-13A, *Airport Design*; Atkins, 2020

It is recommended that the taxiway deficiencies be mitigated during the respective taxiways next major rehabilitation project.

#### 4.5.2.1. Taxiway Pavement Condition

Similar to the runway pavement condition section, the following metrics are derived from the 2019 FDOT Pavement Management Plan for SFB. Projects to rehabilitate the taxiways are routinely conducted every 15 to 20 years after construction, major rehabilitation, or strengthening. FDOT has specified within this report the 10-year major rehabilitation summary needs for SFB. The overall taxiway system received a PCI value of 60 and fair rating. **Table 4-29** outlines the PCI value for each taxiway, condition classification, and the forecast PCI value in 2025 should no pavement maintenance or rehabilitation efforts be completed, and the last date of construction, if known.

**Table 4-29 - Taxiway Pavement Condition**

| Taxiway | 2019 PCI | Condition Classification | 2025 PCI | Last Construction |
|---|---|---|---|---|
| A | 63 | Fair | 58 | |
| A3 | 46-69 | Poor – Fair | 32-63 | |
| B | 38-77 | Very Poor – Satisfactory | 20-69 | 1997-2013 |
| B1 | 67 | Fair | 59 | |
| B2 | 48 | Poor | 37 | |
| B3 | 15-73 | Serious – Satisfactory | 0-66 | 1990-2009 |
| B4 | 55-67 | Poor – Fair | 47-62 | |
| B7 | 61-66 | Fair | 56-59 | |
| B8 | 79-83 | Satisfactory | 67-74 | |
| B10 | 95 | Good | 91 | |
| C | 23-70 | Serious – Fair | 0-64 | 200-2004 |
| E | 100 | Good | 86 | |
| K | 37-74 | Very Poor – Satisfactory | 18-67 | |
| K1 | 60 | Fair | 55 | |
| L | 49-74 | Poor – Satisfactory | 41-66 | 1975-2009 |
| M | 47-68 | Poor – Fair | 34-63 | |
| P | 12-67 | Serious – Fair | 1-59 | |
| R | 21-100 | Serious – Good | 0-86 | 1977-2018 |
| S | 77-86 | Satisfactory – Good | 69-76 | |
| S1 | 73 | Satisfactory | 67 | |
| S2 | 70 | Fair | 64 | |
| S3 | 70 | Fair | 64 | |
| S4 | 79 | Satisfactory | 71 | |
| S5 | 92 | Good | 81 | |
| U | - | - | - | |

Source: 2019 FDOT Pavement Management Plan

#### 4.5.2.2. Taxiway Protective Surfaces

Taxiway protective surfaces, similar to runway protective surfaces, protect aircraft, people, and property in the case of an aircraft unintentionally deviating from its intended ground maneuvering course. The following sections outline existing and future criteria for the taxiway protective surfaces and any existing impacts to those surfaces. **Table 4-30** outlines the taxiway protective surface dimensions for the taxiways at SFB.

**Table 4-30 - Taxiway Protective Surfaces Dimensions**

| Taxiway | TDG (Existing / Future) | ADG (Existing / Future) | TSA Width (Feet) | TOFA Width (Feet) |
|---|---|---|---|---|
| A | 5 | V | 214 | 320 |
| A3 | 5 | V | 214 | 320 |
| B | 5 | V | 214 | 320 |
| B1 | 5 | V | 214 | 320 |
| B2 | 5 | V | 214 | 320 |
| B3 | 5 | V | 214 | 320 |
| B4 | 5 | V | 214 | 320 |
| B7 | 5 | V | 214 | 320 |
| B8 | 5 | V | 214 | 320 |
| B10 | 5 | V | 214 | 320 |
| C | 5 | V | 214 | 320 |
| E | 3 | III | 118 | 189 |
| K | 5 | II | 79 | 131 |
| K1 | 5 | II | 79 | 131 |
| L | 5 | V | 214 | 320 |
| M | 2 | II | 79 | 131 |
| P | 2 | II | 79 | 131 |
| R | 3 | III | 118 | 189 |
| S | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| S1 | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| S2 | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| S3 | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| S4 | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| S5 | 2 / 3 | II / III | 79 / 118 | 131 / 189 |
| U | 2 | II | 79 | 131 |

Source: Atkins, 2021

### Taxiway Safety Area

The Taxiway Safety Area (TSA) provides a protective area around the taxiway pavement. This is to provide space for emergency vehicle access and maneuvering and to minimize the severity of an aircraft run-off. **Table 4-30** outlines the TSA width in respect to the established and future critical aircrafts.

There are no identified impacts to the TSAs at the Airport.

### Taxiway Object Free Area

The Taxiway Object Free Area (TOFA) provides additional protection beyond the TSA. Service vehicle roads, parked aircraft, and other objects that are not necessary for aircraft ground navigation are prohibited within the TOFA. **Table 4-30** outlines the TOFA width with respect to the established existing and future critical aircrafts.

There are two identified impacts to the TOFA surfaces at the Airport. The first identified impact is along the western portion of Taxiway B near the Runway 9L threshold, where a portion of apron pavement encroaches into the TOFA. The second identified impact is along Taxiway C, where the existing non-movement markings along the commercial terminal apron is set back for ADG IV TOFA design width and not the required ADG V TOFA design width. Taxiway C accommodates traffic from Runway 9L/27R, which has a critical aircraft with ADG V design standards. Therefore, the TOFA standards for ADG V currently impact the commercial terminal apron by approximately 30.5 feet. These identified impacts will be further analyzed and mitigated during the creation of the development alternatives.

The second identified impact is along Taxiway C, where with the upgrade of the ADG from IV to V, the upgraded TOFA clearances now impact portions of the commercial terminal apron area. The TOFA width between these two criteria is approximately 61 feet of additional width.

### 4.5.3. Inadvisable Airfield Geometry

Inadvisable airfield geometry includes, but is not limited to, pavement which is non-compliant with current design and geometric standards, and areas that are prone to high activity with multiple intersecting centerlines. In addition, airfield geometry which can cause confusion are required to be mitigated to ensure safe, clear, and concise air and ground maneuvering. A common occurrence of inadvisable airfield geometry is providing direct access from an apron area to an active runway. Such configurations lead to confusion when a pilot typically expects to encounter a parallel taxiway, but instead, accidentally enters a runway. This geometry feature can be mitigated through the relocation of the taxiway connector, installation of a painted or grass island, or re-routing of the taxiway in a manner that requires a 90-degree turn for all aircraft entering or exiting the apron. Forcing aircraft operators to make multiple 90 degree turns prior to entering the runway has been found to enhance the operator's situational awareness and decrease the likelihood of inadvertently entering the runway without proper clearance. Aligned taxiways, ones whose centerline coincides with a runway centerline, is prohibited due to the loss of situational awareness for operators on approach to the specific runway which the taxiway is aligned with. In addition, there is the inability to use the runway while the taxiway is occupied, causing a capacity constraint. It is recommended that aligned taxiways be removed as soon as practical.

Several areas at SFB currently have inadvisable airfield geometry. The following is a list of locations and their respective deficiencies:

- Taxiway P provides direct access from Runway 9C/27C onto the Terminal Apron;
- Taxiway B2 provides direct access from Runway 9L/27R into an apron area;
- Taxiway L (north of Runway 9L/27R) provides direct access from Runway 9L/27R into an apron area;
- Taxiway A3 provides direct access from Runway 9L/27R into an apron area;
- Taxiway S3 provides direct access from Runway 9R/27L onto the South East Ramp;
- Taxiway S4 provides direct access from Runway 9R/27L onto the General Administration Services Apron;
- The eastern portion of Taxiway C is aligned with Runway 9C/27C;
- Taxiway K1 is aligned with Runway 9C/27C; and,
- The FAA has identified the area between the Runway 9C approach holding positions on Taxiway K as Hot Spot-1 (HS1). The holding position markings and signage in this area are intended to ensure that aircraft operators do not enter the Runway 9C approach environment when the runway is actively being used. HS1 was identified due to the area's a-typical and complex layout which creates a higher potential for runway incursions.

The inadvisable geometry scenarios that are listed above will be analyzed and mitigated during the creation of the development alternatives.

All taxiway geometry should be adjusted to meet current airport design standards whenever development projects are carried out which impact infrastructure that does not currently meet standards. This includes reducing wide expansive pavement beyond the standard taxiway geometry.

## 4.5.4. Airfield Lighting Requirements

The existing condition of the airfield lighting equipment at SFB was outlined in the Inventory of Existing Conditions. The following sections will analyze the various lighting requirements.

### 4.5.4.1. Runway End Identification Lighting

Runway End Identification Lighting (REIL) systems are equipped on Runways 27L, 18, 36, and 9C, and are all reported to be in good condition. It is recommended that these systems are monitored and replaced once the useful life is reached.

### 4.5.4.2. Runway Edge Lighting

The High Intensity Runway Lights (HIRL) located on Runway 9L/27R and Runway 9R/27L are reported to be in fair condition due to numerous lighting strikes. The Medium Intensity Runway Lights (MIRL) systems located on Runway 9C/27C and Runway 18/36 are reported to be in good condition. It is recommended that these systems are monitored and replaced once the useful life is reached.

### 4.5.4.3. Runway Threshold Lighting

The runway threshold lighting located on Runways 9L, 9R, and 27R are reported to be in good condition. It is recommended that these systems are monitored and replaced once the useful life is reached.

### 4.5.4.4. Taxiway Lighting

Each taxiway at SFB is equipped with Medium Intensity Taxiway Lighting (MITL). All MITL systems are reported to be in good condition. All taxiway lighting has been converted to high efficiency, light-emitted diode (LED) systems. It is recommended that all MITL systems be monitored and replaced one the useful life is reached.

## 4.5.5. Airfield Signage Requirements

Existing airfield signage at the Airport is adequate for the current facilities per 14 CFR Part 139 standards. However, signage improvements are likely to be required in conjunction with other airfield improvements. Specifically, runway re-designations previously discussed will require signage panels to be updated in association with the new designator. In addition, any future need to re-designate taxiways at the Airport will require new or updated taxiway signage as appropriate.

## 4.5.6. Airfield Pavement Marking Requirements

As previously discussed, the current runway markings at the Airport reflect precision markings on Runways 9L, 9R, and 27R, non-precision markings on Runways 18 and 36, and basic/visual markings on Runways 9C and 27C. All markings are currently reported to be in good condition. Should instrument approach procedures be upgraded on Runways 18 and 36 or added on Runways 9C and 27C, the runway markings will need to be adjusted as necessary to ensure the minimum required markings are in place. In addition, once the runways are re-designated, the landing designator markings will need to be adjusted.

## 4.5.7. NAVAIDs Requirements

As outlined in the Inventory of Existing Conditions, the Airport has several Navigational Aids (NAVAIDs) and visual approach aids to assist pilots operating to, from, and at the Airport. The following sections will evaluate the requirements for these items and pose necessary recommendations if warranted.

### 4.5.7.1. Medium Intensity Approach Lighting Systems (MALSR)

The existing MALSR systems are located on Runways 9L, 27R, and 9R. The MALSR systems are reported to be in good condition. As this system is owned and maintained by the FAA, the necessary replacement of the system's components will take place at the appropriate time in accordance with the FAA maintenance schedule.

### 4.5.7.2. Precision Approach Path Indicators (PAPI)

There is an existing PAPI system on each runway end. Runways 9L, 27R, 9R, 27L, 18, and 36 are equipped with PAPI-4L systems, and Runways 9C and 27C are equipped with PAPI-2L systems. All PAPI systems located at the

Airport are reported to be in good condition. These systems are owned and maintained by SAA. All necessary maintenance will take place at the appropriate time in accordance with the established maintenance schedule.

#### 4.5.7.3. Segmented Circle & Wind Cones

The segmented circle and primary wind cone are located in the center of the airfield, between Runway 9C/27C and Taxiway B. The primary wind cone is currently lit for proper visibility during night operations. Several supplemental wind cones are located around the Airport, as described in Section 2.1.5.1 of this report. Supplemental wind cones are necessary for the quick identification of wind conditions, and allow operators to use this information during their approach or departure procedures. Airfield re-configurations may drive the relocation or addition of supplemental wind cones. The location and amount of supplemental wind cones will be further analyzed within the Development Alternatives section of this report.

#### 4.5.7.4. Automated Surface Observing System (ASOS)

The ASOS system is in the direct vicinity of the segmented circle, between Runway 9C/27C and Taxiway B. The ASOS is owned and maintained by the FAA. Therefore, the maintenance and replacement schedule for this facility is managed entirely by the FAA.

#### 4.5.7.5. Compass Calibration Pad

The guidance regarding the design and siting for compass calibration pads is located within AC 150/5300-13A, Appendix 6. These pads allow for an aircraft's magnetic compass to be checked on a frequent and routine schedule to ensure the accuracy for the equipment. Utilizing the compass calibration pad, operators are able to align the aircraft on known magnetic headings and make adjustments to the compass as necessary. These pads are marked with 12 magnetic radials to aid operators in the adjustment of their magnetic compass. The location of the pads are sited to ensure that no interference is caused by objects and infrastructure within a certain distance of the pad during an operator's calibration. The following guidelines are set for the siting of a compass calibration pad:

- 600 feet from magnetic objects such as large parking lots, busy roads, high voltage electrical transmission, etc.
- 300 feet from buildings, fuel lines, electrical or communication cable conduits and from other aircraft
- 150 feet from runway and taxiway light bases, airfield signs, drainage infrastructure, etc.

The existing compass calibration pad located at SFB is directly centered on Taxiway P, leading to Runway 9C/27C. The existing radial markings on the pad are currently deficient, and have deteriorated to poor condition. In addition, the location of the pad is deficient due to the close proximity of multiple potential sources for magnetic interference. These sources include but are not limited to airfield lighting, airfield signage, commercial service terminal building and apron parking, etc. It is recommended that the compass calibration pad is relocated to a standard location at the Airport, to ensure the accurate and safe environment is provided to operators in which to adjust their magnetic compass equipment. This proposed relocation will be further analyzed during the Development Alternatives chapter of this report.

## 4.6. Commercial Service Terminal Requirements

This section details the demand/capacity analysis and the future facility requirements for each of the individual functions associated with the Orlando Sanford International Airport terminal building.

A detailed spreadsheet of all terminal space requirements for each Planning Activity Level (PAL) is provided in Volume II, Appendix C, *Facility Requirements Supplemental Information*. The following sections provide more explanation on the major functional areas including:

- Aircraft Gates
- Ticketing/Check-in Area
- TSA Passenger Screening and FIS
- Baggage Handling
- Hold Rooms
- Concessions
- Terminal Services

### 4.6.1. Methodology and Basis of Planning

Terminal facilities planning requires the application of industry standards and logical assumptions. The facility program is based on projected growth developed in the forecast, the requirements of local and state building codes and regulations, federal standards and guidelines, and data collected from physical site visits. The program is created within the framework of the following codes and regulations, as well as other industry accepted planning factors:

- FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans
- FAA AC 150/5360-13A, Airport Terminal Planning
- Airport Cooperative Research Program (ACRP) Report 25 Airport Passenger Terminal Planning and Design, v1: Guidebook
- International Air Transport Association (IATA) Airport Development Reference Manual; in particular, the following sections:
    - Section F1: Capacity and Level of Service
    - Section J1: Outline of Principle Functions
    - Section J2: Categories of Passenger Terminal
    - Section J6: Passenger Processing Facilities Planning
    - Section J7: Concession Planning
    - Section J8: Maintenance
    - Section J9: Check-In

Specific assumptions are made to determine the terminal building's capacity by functional area for each Planning Activity Level (PAL). The PALs are based on the five-year increments in the forecast (2022, 2027, 2032 and 2037). However, using PALs allows for the requirements to be implemented based on the specific demand levels, and not the specific year. Assumptions regarding passenger types and origins; future flight schedules, and peaking characteristics; as well as desired Level of Service (LOS) were made to derive the recommended terminal and landside requirements.

The planning criteria were based on the peak hour of the Average Day Peak Month (ADPM) passenger profiles and operations for each PAL. These were derived from the April 2018 flight schedule (April 2, 2018) and the Forecast of Aviation Activity. The 2018 flight schedule was used to establish the baseline passenger profile and peak hour operation characteristics. The baseline passenger profile ratio of enplaning, deplaning, and total passengers was then applied to the peak hour enplanements to establish the future passenger profiles. Similarly, the baseline arriving to departing peak hour operations ratio was applied to the peak hour operations forecast to derive the future peak hour operations characteristics. The type of aircraft and anticipated load factors also inform the terminal requirements. **Table 4-31** presents PAL peak hour passenger profile, peak hour operations characteristics, and the anticipated aircraft and load factor.

**Table 4-31 - Peak Hour Passenger, Operations, and Aircraft Assumptions**

| | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 |
|---|---|---|---|---|---|
| Annual Enplanements | 1,436,224 | 1,763,808 | 2,044,581 | 2,370,048 | 2,747,325 |
| Arriving Peak Hour Passengers | 1,662 | 2,041 | 2,366 | 2,742 | 3,178 |
| Departing Peak Hour Passengers | 1,007 | 1,593 | 1,847 | 2,140 | 2,481 |
| Total Peak Hour Passengers | 2,058 | 2,336 | 2,708 | 3,139 | 3,638 |
| Assumed Aircraft Types | A320<br>B788 | A320<br>B788 | A320<br>B788 | A320<br>B788 | A320<br>B788 |
| Load factor | 90% | 90% | 90% | 90% | 90% |
| Arriving Peak Hour Operations | 10 | 11 | 11 | 11 | 13 |
| Departing Peak Hour Operations | 12 | 14 | 14 | 14 | 16 |
| Total Peak Hour Passenger Operations | 15 | 18 | 20 | 23 | 27 |

Note: Baseline ratios for passenger profiles, operations, and aircraft load factors from April 2, 2018 flight schedule

Source: Jacobsen Daniels and Master Plan Forecast of Aviation Demand, 2020

### 4.6.2. Aircraft Gate Requirements

The Airport terminal currently has 16 aircraft gates, however one of the gates can only accommodate a regional jet in its current configuration.

To identify the future gate needs for each PAL, an average daily turns per gate of 3.2 was maintained and applied to the future PAL activity levels from the forecast. This average daily turns per gate ratio was based on a review of the 2018 and 2019 ADPM schedule (average turns per gate of 3.1 and 3.6, respectively), discussion with the Airport staff, and a review of the other Allegiant hubs. The 3.2 average daily turns per gate allows for some of the future flights during off peak hours but also requires additional gates to accommodate future flights during peak hours.

This methodology identified a need for 19 total gates by PAL 4 if Gate 12 is modified or replaced to accommodate the A320 family or similar aircraft. The results of this methodology are depicted in **Table 4-32**.

**Table 4-32 - Aircraft Gate Requirements**

| Daily Departures per Gate | Annual Enplanements per Gate (a) | Existing Gates 2020 | Total Required Gates PAL 4 (61 ADPM Dep) | Additional New PAL 4 Gates (61 ADPM Dep) (d) | PAL 4 flights added at new gates | PAL 4 flights added at existing gates |
|---|---|---|---|---|---|---|
| 3.2 | 140,000 | 16 | 19 | 3 | 22 | 6 |

Note: *Existing 16 gates, however 1 gate limited to regional jet aircraft – requirement assumes Gate 16 can be upgraded for A320 series

Source: Jacobsen Daniels, 2020

### 4.6.3. Ticketing/Check-In Area

The ticketing/check-in area includes the ticketing counters, ticketing kiosks, passenger queuing areas and passenger circulation. A consolidated check-in space for operations in both Concourse A and B (previously two separate terminals) exists on the west end of the first floor.

To identify ticket counter positions, kiosk positions and curbside positions necessary to accommodate the future activity levels, the following assumptions were made:

- 25 percent of departing passengers will bypass ticketing and go straight to security
- 50 percent of departing passenger will use the check in counter positions
- 20 percent of departing passenger will use kiosk positions
- 5 percent of departing passengers will use curbside positions.

Applying these percentages to the departing passengers for the PALs results in a need of 21 additional check-in counter positions, 21 additional kiosk positions and 6 additional curbside positions.

To identify the area (SF) necessary for the future ticketing/check-in area the following assumptions are applied to the future counter/kiosk positions requirements:

- 60 SF per counter position
- 22 feet que depth in front of each counter
- 22 SF for each kiosks position
- 250 SF of circulation area

**Table 4-33** summarizes the future check-in requirements. Overall, the current ticketing/check-in area is insufficient to accommodate the demand anticipated for PALs 1-4. Queuing space for check-in is suboptimal and will likely need to expand or be reconfigured for the anticipated level of activity to maintain an acceptable level of service during peak hour.

**Table 4-33 - Ticketing/Check-In Area Requirements**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Check-in Counter & Bag Drop Positions (#)[1] | 45 | 35 | 41 | 48 | 57 | 66 | (21) |
| Kiosks (#)[1,3] | 0 | 11 | 13 | 15 | 18 | 21 | (21) |
| Curbside Positions (#)[1] | 2 | 4 | 5 | 6 | 6 | 7 | (5) |
| Total Check-in (SF) [2] | 11,648 | 15,592 | 18,292 | 21,352 | 25,402 | 29,452 | (17,804) |

Notes:

1/ Positions based on following assumptions for departing passenger activity: 25 percent bypassing counters; 50 percent check-in counters; 20 percent kiosks; and 5 percent curbside
2/ Total square foot (SF) required based on – The check-in counter area assumes 60 SF per counter position. The check-in queue area assumes a 22-foot deep queue in front of the check-in counters.
3/ Each kiosk will require a 22 square-foot area and 250 square feet of circulation area

Source: Jacobsen Daniels and WJD Planning, July 2020

### 4.6.4. TSA Passenger Screening and FIS

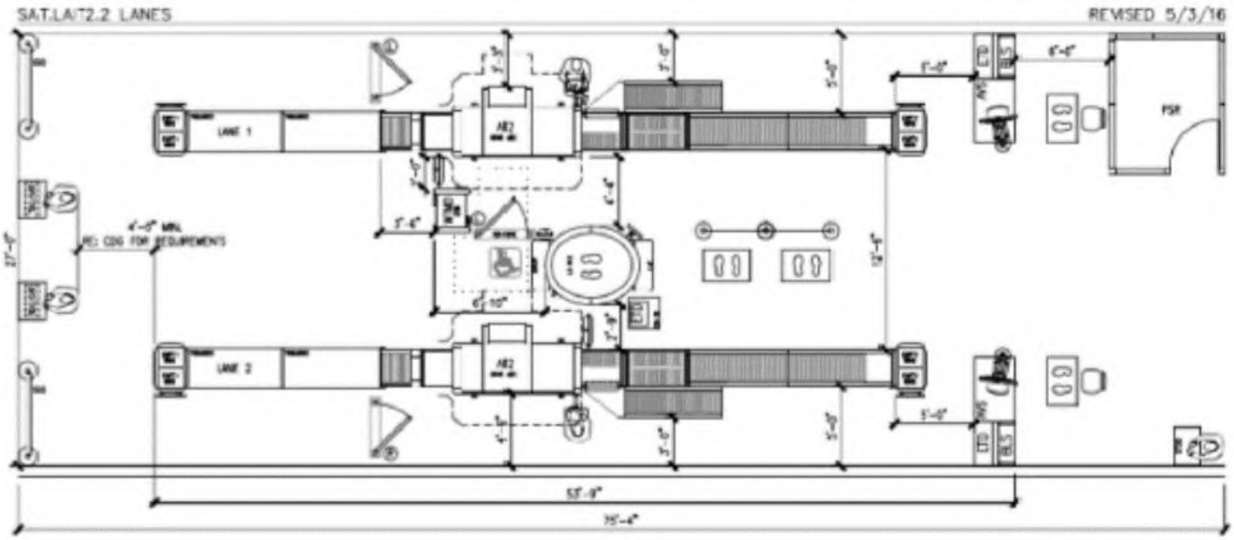
The Transportation Security Administration (TSA) performs passenger screening at US airports. The agency maintains guidelines for the layout of required screening space, equipment, and the security screening checkpoint (SSCP) in the TSA's Checkpoint Design Guide (CDG). Because these areas are federally staffed, configurations must comply with federal design requirements. These guidelines have continued to evolve since the formation of the TSA as threats have changed and technology has provided new methods for screening passengers. There are currently eight (8) standard passenger screening lanes at SFB.

Checkpoint layouts include all equipment and spacing from the Travel Document Checker (TDC) (where agents verify identification) to the end of the screening belt, re-composition area and personal screening room (PSR). Typical elements include:

- X-ray or other screening unit for carry-on bags
- Walk through metal detector (WTMD)
- Advanced Imaging Technology (AIT) full body screening
- Passenger inspection chair and mat
- Alternate Viewing Station (AVS)
- Explosive Trace Detection (ETD)
- Bottle Liquid Scanner (BLS)
- Infeed and composure/extension roller and scanning belts to load bags into and collect bags from the screening machine
- Travel Document Checker (TDC) podiums
- Re-composition area for passengers to re-organize after screening
- Supervisor Transportation Security Officer (STSO) podium

**Figure 4-24** depicts a typical layout for a two lane SSCP. Overall dimensions of the area as shown are approximately 76 feet by 28 feet.

**Figure 4-24 - Typical Two-Lane SSCP with AIT**




Source: Transportation Security Administration, Checkpoint Design Guide, Revision 6.1, June 01, 2016

The length of a typical passenger screening lane is approximately 54-feet, which does not include the TDC and private screening room. Adding these elements can extend the lane to over 76-feet. However, given the restricted layout of the terminal and hold rooms, the space requirement is adjusted to an overall length of 65-feet, acknowledging that tables may need to be removed and the PSR may need to be relocated.

To identify the existing and future lane requirements, it was assumed that 80 percent of passengers will use standard lanes with an average screening rate of 150 passengers per lane per hour. Similarly, 20 percent of passengers will utilize pre-check lanes with a screening rate of 240 passengers per lane per hour. Based on these assumptions, seven (7) lanes are adequate for the baseline forecast; however, this will need to increase to 12 lanes by PAL 4.

Programming for an industry standard maximum wait time of 20 minutes for standard lanes and 10 minutes for pre-check planes, a checkpoint queue depth of 40-feet and width of 15-feet is recommended per lane.

The existing Federal Inspection Services (FIS) facility is 60,000 SF (note includes 2 international baggage carousels) but is currently being redesigned and will be reduced in size. The new design followed the CBP Handbook guidelines and is sized to accommodate 900 peak hour international arriving passengers. Based on the anticipated increase in peak international flights for PAL 4 (2 – 177 seat flights at 90% load and 2 – 307 seat flights at 90% load) peak hour international arriving passengers are anticipated to reach 871 during the planning period. This indicates that the FIS facility will be adequate to accommodate peak hour passenger through PAL 4 but may need to increase in size after PAL 4 if international traffic continues to increase. The new facility will be 24,425 SF which exceeds CBP general standards but has been approved by CBP to meet the specific space requirements of SFB for the 900 peak hour arriving international passengers.

**Table 4-34** presents the recommended security checkpoint requirements and FIS for the future PALs.

**Table 4-34 - Security Screening Checkpoint**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Standard Lanes (#) | | 6 | 7 | 8 | 9 | 10 | |
| Precheck Lanes (#) | | 1 | 2 | 2 | 2 | 2 | |
| Total Lanes (#) | 8 | 7 | 9 | 10 | 11 | 12 | (4) |
| Queue Area (SF) | 4,714 | 4,200 | 5,400 | 6,000 | 6,600 | 7,200 | (2,486) |
| Total SSCP (SF) | 15,802 | 10,500 | 13,500 | 15,000 | 16,500 | 18,000 | (2,198) |
| TSA Administration[1] (SF) | 1,537 | 3,888 | 3,888 | 3,888 | 3,888 | 3,888 | (2,351) |
| Total TSA (SF) | 17,339 | 14,388 | 17,388 | 18,888 | 20,388 | 21,888 | (4,549) |
| FIS[2] | 46,680 | 24,425 | 24,425 | 24,425 | 24,425 | 24,425 | 22,255 |

Notes:

1/ TSA Administration requirements based on previous discussion with TSA and held constant
2/ FIS required space is based on 900 peak hour international arriving passenger, CBP standards and requirements specific to SFB
FIS requirements are based on analysis completed by CPH and vetted with CBP.
FIS existing space does not include the two international baggage carousels that are accounted for in the baggage handling table.

*Queue area is not included in total TSA area.

Source: Jacobsen Daniels and WJD Planning, June 2020

## 4.6.5. Hold Rooms

Hold rooms are provided adjacent to aircraft gates to accommodate passengers waiting to board aircraft. Typically, hold rooms are sized to accommodate 80 percent of the passengers for the maximum size of aircraft for that gate. Seating area is provided based on 15 square feet per seated passenger (80 percent of total passengers in the departure lounge) and 10 square feet per standing passenger (20 percent of total passengers in the departure lounge). In addition to the seating area, space is provided for a gate podium and an egress corridor to/from the passenger boarding bridge door. For hold rooms that are shared by multiple gates, a 10 percent reduction is typically applied to account for the ability to cross-utilize the adjacent departure lounge.

SFB utilizes two distinct models for hold rooms. The first is a standard lounge with each gate having an independent boarding podium and associated lounge space. The second model, referred to as “call-to-gate,” utilizes a single large common lounge and boarding podium shared across multiple gates. Gates 1 through 9 utilize the call-to-gate model, where gates 10 through 16 use standard hold rooms. It was assumed that any additional gates beyond the 16 depicted in Figures 2-17 and 2-19 of the Inventory Chapter would utilize standard hold rooms. Gates 1-4 are under construction and anticipated to be operational in 2021. This analysis assumes that none of these gates are open in the existing or baseline conditions, two are open in PAL 1, and all four gates are open by PAL 2.

Standard gates assumed that 25 percent of passengers stand (requiring 14 SF per passenger) and 75 percent of passengers are seated (requiring 20 SF per passenger) and an additional 500 SF would be needed to accommodate podiums and boarding activities. Due to the shared nature of the call-to-gate model and the likelihood for passengers to utilize other designated spaces (i.e. concessions) during their wait time, it was assumed that this model would require 20 percent less area than the standard hold room and a maximum of two podiums.

Based on this analysis, the existing hold rooms at SFB are undersized and as the demand for gates continues to grow, the hold room requirements grow both for the standard and call-to-gate hold rooms. A summary of the hold room requirements based on the projected gate requirements is shown in **Table 4-35**.

**Table 4-35 - Hold Rooms**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Standard Hold Rooms (SF) | 17,554 | 24,444 | 24,444 | 24,444 | 27,936 | 34,920 | (17,366) |
| Call-to-Gate Hold Rooms (SF) | 44,050 | 20,824 | 26,411 | 31,998 | 31,998 | 31,998 | 12,052 |
| Total Hold Room Area (SF) | 61,604 | 45,268 | 50,855 | 56,442 | 59,934 | 66,918 | (5,314) |

Source: Jacobsen Daniels, June 2020

### 4.6.6. Concessions

Concessions are a critical component of any airport terminal as they provide revenue and necessary services to the travelling public. In terms of sales potential at U.S. domestic airports, airside locations are the strongest, followed by pre-departures landside locations, and finally, arrivals locations.

Concession area requirements are based on the activity level which can support them. An assumption of 14 SF per 1,000 annual passengers is used to identify the total concession requirements. For the breakdown between airside and landside concessions, an assumption of 85 percent airside and 15 percent landside is applied. This is then further divided assuming 55 percent of the total area is used for food and beverage, 40 percent for retail, and 5 percent for duty free. An additional 30 percent of the total area was then added for storage and support facilities. The results of this methodology are detailed in **Table 4-36**.

**Table 4-36 - Concessions Requirement**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Landside (SF) | 6,329 | 3,016 | 3,704 | 4,295 | 4,977 | 5,769 | 560 |
| Food and Beverage (SF) | 3,775 | 1,659 | 2,037 | 2,362 | 2,737 | 3,173 | 602 |
| Retail (SF) | 2,554 | 1,357 | 1,667 | 1,933 | 2,240 | 2,596 | (42) |
| Airside (SF) | 34,855 | 17,088 | 20,992 | 24,336 | 28,203 | 32,689 | 2,166 |
| Food and Beverage (SF) | 15,573 | 9,398 | 11,546 | 13,385 | 15,512 | 17,979 | (2,406) |
| Retail (SF) | 8,590 | 6,835 | 8,397 | 9,734 | 11,281 | 13,076 | (4,486) |
| Duty Free (SF) | 10,692 | 854 | 1,050 | 1,217 | 1,410 | 1,634 | 9,058 |
| Total Concessions (SF) | 41,184 | 20,104 | 24,696 | 28,631 | 33,180 | 38,458 | 2,726 |
| Storage and Support (SF) | 3,258 | 6,031 | 7,409 | 8,589 | 9,954 | 11,537 | (8,279) |

Source: Jacobsen Daniels, June 2020

As shown in **Table 4-36**, the Airport's existing concession space is larger than would be required throughout the planning period; however, this does not account for the needs of the different concourses. Currently, Concourse A has 26,198 square feet of concessions. In contrast, Concourse B has only 8,657 square feet of concessions. **Table 4-37** shows that the concessions in Concourse B will need to double in size by PAL 4. While Concourse A appears to have a large surplus of concessions, because the concourse uses a call-to-gate model, it is estimated that concessions in Concourse A would see a higher rate of traffic. This means that a higher square footage per passenger is reasonable.

**Table 4-37 - Concessions Requirement by Concourse**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus (Deficiency) |
|---|---|---|---|---|---|---|---|
| **Call to Gate (Concourse A)** | 26,198 | 9,398 | 12,596 | 15,575 | 17,203 | 18,306 | 7,892 |
| Food and Beverage | 10,206 | 5,169 | 6,928 | 8,566 | 9,462 | 10,068 | 138 |
| Retail | 5,300 | 3,759 | 5,038 | 6,230 | 6,881 | 7,323 | (2,023) |
| Duty Free | 10,692 | 470 | 630 | 779 | 860 | 915 | 9,777 |
| **Standard Hold Rooms (Concourse B)** | 8,657 | 7,689 | 8,379 | 8,761 | 10,999 | 14,383 | (5,726) |
| Food and Beverage | 5,367 | 4,229 | 4,618 | 4,819 | 6,050 | 7,911 | (2,544) |
| Retail | 3,290 | 3,290 | 3,460 | 3,779 | 4,949 | 6,472 | (3,182) |

Source: Jacobsen Daniels, June 2020

## 4.6.7. Baggage Handling Facilities

Baggage handling facilities include outbound baggage makeup areas, TSA baggage screening, inbound baggage facilities, and baggage claim. Outbound baggage facility requirements are based on peak hour departing passengers and inbound baggage facilities are based on peak hour deplaning passengers. The following assumptions used to calculate the facility and space requirements include:

- Outbound baggage — 60 percent of passengers check bags; 1,800 SF per make-up bag belt
- TSA Baggage Screening — 178 Bags per hour processing rate
- Inbound baggage — 225-foot input length; 25-foot input area width
- Baggage claim — 60 percent of passengers will claim bags; 5,640 SF per baggage claim device; Lobby circulation of 1,500 SF per device; 1,200 SF for baggage offices per device

**Table 4-38** provides a summary of the baggage handling facility requirements. Based on the assumptions above and the current and forecast traffic demand, both the inbound and outbound baggage handling facilities are insufficient to handle the future PAL 1 to PAL 4 demand.

**Table 4-38 - Baggage Facilities**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Outbound Baggage Area (SF) | 28,679 | 21,600 | 25,200 | 25,200 | 25,200 | 28,800 | (121) |
| EDS Machine (#) | 6 | 4 | 5 | 5 | 7 | 8 | (2)* |
| Baggage Screening Area (SF) | 5,195 | 2,040 | 2,190 | 2,190 | 2,490 | 2,640 | 2,555 |
| Inbound Baggage (SF) | 31,313 | 5,625 | 9,375 | 11,250 | 11,250 | 15,000 | 16,313 |
| Baggage Claim Carousels (#) | 8** | 3 | 5 | 6 | 6 | 8 | 0 |
| Baggage Claim (SF) | 58,629 | 34,703 | 37,705 | 45,246 | 45,246 | 60,328 | (1,699) |

Note: * Deficiency dependent on Explosives Detection System (EDS) machine baggage screening rate. Rates can be as high as 1,000 bags per hour per machine.

**Includes baggage claim for CBP international arrivals which was removed from FIS Square footage.

Source: Jacobsen Daniels, June 2020

## 4.6.8. Terminal Services

Terminal services include public restrooms, offices, meet-and-greet areas, rental car counters, and areas for public information and storage of carts and wheelchairs. The number of restrooms recommended is based on ACRP Report 130: Guidebook for Airport Terminal Restroom Planning and Design and include restrooms on both the airside, or secure side, and landside, or non-secure, portion of the terminal. The airside restrooms requirements are based on the number of peak hour equivalent aircraft. ACRP Report 130 utilizes Equivalent Aircraft (EQA) to normalize the passenger load across multiple types of aircraft. One airside restroom module (A women's and men's bathroom) is assigned per every eight EQA according to the ACRP Report; however, due to the increased frequency of recreational travelers at SFB, the analysis assumes one module per every four EQA. The landside restroom requirements are a function of the number of ticket counters and baggage claim carousels. These assumptions are shown below as well as the SF assumptions and equations for each; each:

- Airside — Assumes 1 restroom module for every 4 peak-hour EQA and 2,500 SF per module

  # of Airside Modules = peak hour EQA/4
  Airside bathroom SF = 2,500 X # of Airside Modules

- Landside — Assumes 1 restroom module for every 200 feet of ticket counter and 1 restroom module for every 4 baggage carousels. And 1,500 SF per module

  # of Landside Modules near ticketing = LF of ticket counter/200
  # of Landside Modules near baggage claim = # of carousels/4
  Landside bathroom SF = 1,500 X # of Landside modules

**Table 4-39** provides the recommended requirements for airside and landside restrooms based on these assumptions.

**Table 4-39 - Restroom Requirements**

| | Existing | Baseline | PAL1 | PAL 2 | PAL 3 | PAL 4 | Deficiency (Surplus) |
|---|---|---|---|---|---|---|---|
| Equivalent Aircraft | | 25 | 25 | 25 | 25 | 28 | |
| Airside Modules | | 7 | 7 | 7 | 7 | 7 | |
| Airside SF | 9,948 | 17,500 | 17,500 | 17,500 | 17,500 | 17,500 | (7,552) |
| Ticket Counter length | | 210 | 246 | 288 | 342 | 396 | |
| Baggage carousels | | 3 | 5 | 6 | 6 | 8 | |
| Landside Modules | | 3 | 4 | 4 | 4 | 4 | |
| Landside SF | 3,526 | 4,500 | 6,000 | 6,000 | 6,000 | 6,000 | (2,474) |
| Total Restroom SF | 13,474 | 19,500 | 23,500 | 23,500 | 23,500 | 23,500 | (10,026) |

Source: Jacobsen Daniels, June 2020

The meet-and-greet area requirements are based on the arriving passengers and assumes 15 percent of arriving passengers have meet-and-greet individuals and 25 SF per occupant. Based on the analysis, the total area currently available for meet-and-greet individuals exceeds the required area throughout the planning period. The results of this methodology are shown in **Table 4-40**.

**Table 4-40 - Meet and Greet Area**

| | Existing | Baseline | PAL1 | PAL 2 | PAL 3 | PAL 4 | Deficiency/Surplus |
|---|---|---|---|---|---|---|---|
| Peak Hour Arrivals | | 1,128 | 1,593 | 1,847 | 2,140 | 2,481 | |
| Meeters/ Greeters | | 169 | 239 | 277 | 321 | 372 | |
| SF Required | Combined with passenger services | 4,225 | 5,975 | 6,925 | 8,025 | 9,300 | |

Source: Jacobsen Daniels, June 2020

The office space includes space for the airport operations and administration as well as tenant offices. Based on discussions with the airport staff, the current office space is not adequate. Previous recommendations by the Sanford Airport Authority (SAA) have indicated that the future office space requirements are nearly double that of what exists today (38,210 SF recommended).

The detailed calculations for the other passenger services are included in Volume II, Appendix C, *Facility Requirements Supplemental Information*. **Table 4-41** below provides a summary of the recommended terminal services necessary throughout the planning period.

**Table 4-41 - Terminal Services**

| | Existing | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Passenger Services and meet and greet(SF) | 16,688 | 7,467 | 9,893 | 11,424 | 13,183 | 15,236 | 1,452 |
| Restroom (SF) | 13,474 | 22,000 | 23,500 | 23,500 | 23,500 | 23,500 | (10,026) |
| Offices (SF) | 48,793 | 38,210 | 38,210 | 38,210 | 38,210 | 38,210 | 10,583 |

Source: Jacobsen Daniels, June 2020

### 4.6.9. Summary of Terminal Building Requirements

**Table 4-42** provides a summary of the terminal requirements for each PAL. The other category includes meet-and-greet waiting areas, airline office space, and other general use areas. A detailed description of the individual requirements is provided in Volume II, Appendix C, *Facility Requirements Supplemental Information*. In addition, the table includes area for mechanical elements of the building and circulation areas. These are based on the total building size. A factor of 15 percent was used to calculate the mechanical requirements and 20 percent was used to calculate the circulation area requirements.

**Table 4-42 - Terminal Requirements Summary**

| | Existing** | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Number of Gates (#) | 16 | 12 | 14 | 16 | 17 | 19 | (3) |
| Ticketing/ Check-in (SF) | 11,648 | 15,592 | 18,292 | 21,352 | 25,402 | 29,452 | (17,804) |
| TSA Passenger Screening (SF) | 17,339 | 14,388 | 17,388 | 18,888 | 20,388 | 21,888 | (4,549) |
| FIS* | 46,680 | 24,425 | 24,425 | 24,425 | 24,425 | 24,425 | 22,255 |
| Hold Rooms | 61,604 | 45,268 | 50,855 | 56,442 | 59,934 | 66,918 | (5,314) |
| Concessions | 41,184 | 26,135 | 32,105 | 37,220 | 43,134 | 49,995 | (8,811) |
| Baggage Facilities | 123,816 | 69,968 | 74,470 | 83,886 | 84,186 | 106,768 | 17,048 |
| Terminal Services | 137,847 | 33,767 | 37,693 | 39,224 | 40,983 | 43,036 | 94,811 |

Notes:
*International baggage claim area is accounted for in baggage handling facilities not FIS
** Existing other areas include mechanicals and circulation and may include specific areas identified so were not directly compared to requirements individually.
Source: Jacobsen Daniels, June 2020

As shown in **Table 4-42**, the existing terminal building will not be adequate to accommodate the future PAL 4 demand. The development alternatives will evaluate opportunities to expand the terminal to meet the recommended space requirements. In addition, some of the functional spaces in the terminal exceed the requirements and can be reused for other functional needs.

## 4.7. General Aviation Facility Requirements

The planning of general aviation airside and landside facilities is based on both airside and landside capacity. The requirements for general aviation terminal and support area facilities has been determined for the 20-year planning period. The principal operating elements covered under these analyses for general aviation requirements include:

- Aircraft Hangars,
- Aircraft Parking Aprons; and,
- General Aviation Terminal (Fixed Based Operators, FBOs).

As PALs were created for the commercial service terminal and associated requirements, a separate PAL metric has been created to specifically identify general aviation facility requirement thresholds. The general aviation PAL category (PAL GA) is based on the five-year increments as outlined in the forecast (2022, 2027, 2032, and 2037). The planning criteria was based on the preferred based aircraft forecast, and the general aviation and air taxi / commuter peak activity forecasts as determined in the preceding chapter. A further breakdown of the based aircraft fleet mix forecast can be found in the Aviation Demand Forecast chapter of this report. This PAL GA category will allow for the general aviation facility requirements to be aligned with the specific general aviation forecast as outlined in the preceding chapter. **Table 4-43** presents the PAL GA planning criteria metrics for each PAL GA threshold.

**Table 4-43 - Planning Activity Level - General Aviation Characteristics**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Based Aircraft Forecast | 350 | 382 | 417 | 456 | 498 |
| General Aviation Annual Operations | 192,592 | 233,801 | 235,808 | 237,832 | 239,874 |
| General Aviation Operations Peak Hour | 111 | 132 | 133 | 134 | 135 |
| Air Taxi/Commuter Annual Operations | 86,500 | 102,872 | 103,755 | 104,646 | 105,544 |
| Air Taxi/Commuter Operations Peak Hour | 47 | 55 | 56 | 56 | 57 |

Source: Atkins, 2021

## 4.7.1. General Aviation Terminal

As described in the Inventory of Existing Conditions chapter, the Airport currently has one FBO, MillionAir, which serves the general aviation operations by providing aircraft storage, aircraft refueling, aircraft maintenance, pilot lounges, flight planning rooms, restrooms, and shower facilities. MillionAir's main facility comprises approximately 22,000 square feet (sf), of which 7,000-sf is used as office, administration, lounge, and flight planning space. The remaining 15,000-sf is designated for aircraft storage. While MillionAir is now the only FBO located at the Airport, the total of general aviation terminal space is equivalent to the 7,000-sf as outlined for MillionAir's facility.

Chapter 5 of ACRP Report 113, *Guidebook on General Aviation Facility Planning*, provides general guidance on the sizing of GA terminals. The primary consideration is whether the facility can support the number of pilots, passengers, and visitors during peak hour operations. GA facility sizing can range from 100 to 150 square feet per person. For this analysis, 150 square feet per person was utilized due to the regular handling of corporate jet aircraft, which typically have more passengers and crew compared to single-engine piston aircraft. For planning purposes, the ARCP report suggests using a factor of 2.5 people per peak-hour operation (pilots, passengers, and visitors). This allows for a weighted average between single-engine piston operations up to corporate jet operations.

During the tenant interviews at the start of this master planning process, MillionAir staff indicated that the FBO handles approximately 100 aircraft per week during peak seasons. While the peak hour operations, as outlined in the Aviation Demand Forecast, is 158 for both general aviation and air taxi/commuter operations, a majority of these operations are being contributed by the L3 Harris flight school. Therefore, it has been assumed that MillionAir handles approximately 10 percent of the combination of general aviation and air taxi/commuter peak hour operations. The requirements for the general aviation terminal facility is outlined in **Table 4-44**. Based on that analysis, there is currently a surplus in general aviation terminal space at the Airport. However, as the Airport demand reaches the PAL GA 1 threshold, there will be a slow growth in deficiency. At PAL GA 4, it is anticipated that there will be a deficiency in general aviation terminal space of 200 square feet. Due to the minimal deficiency anticipated throughout the PAL GA thresholds, no further development for the GA terminal space will be identified.

**Table 4-44 - General Aviation Terminal Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| 10% Peak Hour Operations (GA + Air Taxi/Commuter) | 15.8 | 18.7 | 18.9 | 19.0 | 19.2 |
| Peak Hour Users (2.5 per Peak Hour Operation) | 39.5 | 46.8 | 47.3 | 47.5 | 48.0 |
| Required GA Terminal Building Space (Sq. Ft.) | 5,925 | 7,013 | 7,088 | 7,125 | 7,200 |
| Existing GA Terminal Building Capacity (Sq. Ft.) | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 |
| **Surplus / Deficiency (Sq. Ft.)** | **1,075** | **13** | **88** | **125** | **200** |

Source: Atkins, 2021

### 4.7.2. Aircraft Storage Hangars

Hangar requirements are a function of the number of based aircraft, the type of aircraft to be accommodated, owner preferences, and area climate. It is common when calculating the hangar size needs of a facility to use an average size requirement for the various types of aircraft; meaning that each type of aircraft will require a different amount of space (usually measured in square-feet) within a specific type of storage facility, e.g. T-hangar, single-aircraft box hangar, or large multi-aircraft conventional hangar. **Table 4-45** outlines the aircraft storage assumptions currently at the Airport. The assumptions outlined therein will allow for the logical planning of aircraft storage hangars based on forecasted based aircraft throughout the planning period. This planning will ensure that the appropriate allocation of hangar space is achieved for each aircraft type at each PAL GA level.

For single-engine based aircraft, it was assumed that the entire L3 Harris flight school fleet will be based on the associated apron areas. While this accounts for approximately 35 percent of the single-engine fleet, it was found that no other areas on the Airport currently host single-engine aircraft with apron parking. It is assumed that the T-hangar facilities at the Airport are at capacity, and the remaining 65 percent of the single-engine fleet is stored in these facilities.

For multi-engine based aircraft, similarly to the single-engine based aircraft assumption, the flight school's fleet has been assumed to be stored on the apron areas. While the flight school fleet accounts for approximately 60 percent of the multi-engine based aircraft, it was found that no other areas on the Airport currently host multi-engine based aircraft with apron parking. The remaining 40 percent of the multi-engine fleet is assumed to be stored in the larger T-hangar facilities at the Airport.

For jet based aircraft, data gathered from Airport staff and the FBO has shown that approximately 28 percent of the jet based aircraft fleet is stored on apron areas. This includes based aircraft associated with the FBO, MillionAir, and Allegiant Airlines basing commercial jets at the Airport. It is assumed that the remaining 72 percent of jet based aircraft will be stored in conventional and box hangars.

For turboprop based aircraft, data gathered from various tenants at the Airport has shown that the only turboprop aircraft currently stored on apron areas are associated with the flight school. This accounts for approximately 27 percent of turboprop based aircraft, with the remaining 73 percent of turboprop based aircraft being stored in conventional and box hangar facilities.

For rotorcraft based aircraft, data gathered from various tenants at the Airport has indicated that the rotorcraft based aircraft are currently stored in conventional and box hangars. Therefore, it is assumed that all rotorcraft based aircraft will be stored in conventional and box hangars throughout the planning period.

**Table 4-45 - Aircraft Storage Assumptions**

| Aircraft Storage Type | % of Based Aircraft Fleet Using Storage |
|---|---|
| **Single-Engine Piston** | |
| T-Hangar | 65% |
| Parking Apron | 35% |
| Conventional/Box Hangar | 0% |
| **Multi-Engine Piston** | |
| T-Hangar | 40% |
| Parking Apron | 60% |
| Conventional/Box Hangar | 0% |
| **Jet** | |
| T-Hangar | 0% |
| Parking Apron | 28% |
| Conventional/Box Hangar | 72% |
| **Turboprop** | |
| T-Hangar | 0% |
| Parking Apron | 27% |
| Conventional/Box Hangar | 73% |
| **Rotorcraft** | |
| T-Hangar | 0% |
| Parking Apron | 0% |
| Conventional/Box Hangar | 100% |

Source: Atkins, 2021

#### 4.7.2.1. Conventional Hangar

When analyzing conventional hangar requirements, it is common to assign square-foot spatial requirements to the various types of aircraft based at an airport. Estimated conventional hangar requirements can then be extrapolated through analyzing the forecasted based aircraft data while utilizing the assigned spatial requirements for each type of based aircraft. The existing and future based jet aircraft will be the primary driver for conventional hangar requirements due to the comparably large area needed for safe storage. It is assumed that 72 percent of jet based aircraft will be stored in conventional hangars along with 73 percent of turboprop aircraft and 100 percent of rotorcraft. For planning purposes, the spatial requirements for each type of aircraft is identified in **Table 4-46**.

**Table 4-46 - Aircraft Space Requirements (Conventional/Box Hangars)**

| Aircraft Type | Space Required (Square Feet) |
|---|---|
| Jet | 5,200 |
| Turboprop | 4,500 |
| Rotorcraft | 3,200 |

Source: Atkins, 2021

The space requirements for the various aircraft in the Airport's based aircraft fleet mix was applied to the based aircraft forecast (following the percentage assumptions in **Table 4-45**) to estimate conventional hangar requirements for each aircraft type. **Table 4-47** outlines the facilities that are included within this analysis and their respective size. **Table 4-48** outlines the calculated demand requirements for conventional hangar space throughout the planning period.

Based on this analysis, there is an existing surplus of conventional and box hangar space at the Airport. A deficiency in conventional and box hangar space is reached by the PAL GA 3 threshold. The deficiency will continue to grow beyond this threshold, reaching a total of 55,747 square feet in hangar space deficiency by the PAL GA 4 threshold. The actual number of facilities, size, and location will be analyzed during the creation of the development alternatives to ensure that the airport can meet the anticipated future demand. Location will primarily be driven by key aspects such as access, user needs, environmental considerations, and financial feasibility.

**Table 4-47 - Existing Based Aircraft Storage Hangars**

| Building ID Number / Grouping of Hangars | Approximate Space (Sq. Ft.) |
|---|---|
| South East Ramp Complex (522-A, B, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X) | 216,863 |
| General Services Administration Hangar (No ID #) | 48,610 |
| MillionAir Hangar (505) | 15,000 |
| MillionAir Hangar (426) | 10,000 |
| Hangar (516) | 10,130 |
| Hangar (450) | 10,750 |
| Hangar (517) | 20,000 |
| Hangar (543) | 22,000 |
| **Total** | **353,353** |

Source: Atkins, 2021

### 4.7.2.2. T-Hangar

Future t-hangar requirements will be representative of the type of future based aircraft and the preferences of aircraft owners. Existing t-hangar facilities at SFB cater specifically to single-engine and multi-engine aircraft. 98 small t-hangar units, accommodating single-engine aircraft only, and 66 large t-hangar units, accommodating single-engine and multi-engine aircraft, are currently occupied at the Airport. The total existing t-hangar capacity at the Airport is 164 units, with all units currently being occupied. In addition, it has been indicated by SFB staff that there is a current waitlist for t-hangar units totaling to 17 individual aircraft. It is reasonable to anticipate, given the existing demand, that the t-hangar storage need will increase through the planning period. T-hangars provide an efficient method for aircraft storage and should be capitalized to provide additional airport revenue.

During the 2017 based aircraft analysis, it was determined that 28 of the 47 based multi-engine aircraft are owned by the flight school and housed on the apron. It is assumed that the remaining 19 multi-engine aircraft are stored in large t-hangar units, with the remainder of the large t-hangar units being utilized for single-engine aircraft. As stated in **Table 4-45**, , it will be assumed that throughout the planning period, 65 percent of single-engine based aircraft and 40 percent of multi-engine based aircraft will be stored in t-hangar units. Utilizing these assumptions and comparing them to the forecast growth in based aircraft, **Table 4-49** provides a summary of the growing deficiency of t-hangar units at the Airport throughout the planning period.

Based on this analysis, there is a current deficiency of 17 T-hangar units, driven by the T-hangar waitlist. Based on the forecasted growth in based aircraft at the Airport, t-hangar storage demand will continue to increase throughout the planning period. This deficiency will be addressed during the creation of the development alternatives to ensure the Airport can meet the anticipated future demand.

**Table 4-48 - Conventional Hangar Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Single-Engine Aircraft Requiring Hangar Storage | 0 | 0 | 0 | 0 | 0 |
| Multi-Engine Aircraft Requiring Hangar Storage | 0 | 0 | 0 | 0 | 0 |
| Turboprop Aircraft Requiring Hangar Storage | 10 | 11 | 12 | 13 | 15 |
| Jet Aircraft Requiring Hangar Storage | 43 | 46 | 51 | 54 | 61 |
| Rotorcraft Requiring Hangar Storage | 6 | 7 | 7 | 8 | 9 |
| **Total Aircraft Hangar Space Required (Sq. Ft.)** | **289,740** | **311,620** | **343,920** | **365,350** | **409,100** |
| Total Existing Hangar Space (Sq. Ft.) | 353,353 | 353,353 | 353,353 | 353,353 | 353,353 |
| **Surplus/Deficiency (Sq. Ft.)** | **63,613** | **41,733** | **9,433** | **11,997** | **55,747** |

Source: Atkins, 2021

**Table 4-49 - T-Hangar Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Single-Engine Aircraft Requiring T-Hangar Storage | 145 | 159 | 173 | 189 | 207 |
| Multi-Engine Aircraft Requiring T-Hangar Storage | 19 | 21 | 22 | 25 | 27 |
| Existing T-Hangar Waitlist | 17 | 17 | 17 | 17 | 17 |
| Total T-Hangar Demand | 181 | 196 | 212 | 231 | 251 |
| Existing T-Hangar Capacity | 164 | 164 | 164 | 164 | 164 |
| **Surplus/Deficiency (Units)** | **17** | **32** | **48** | **67** | **87** |

Source: Atkins, 2021

## 4.8. Aircraft Apron

General aviation aprons provide for the tie-down and storage of aircraft, as well as access to airside facilities and fueling locations. FAA AC 150/5300-13A provides guidelines for sizing aircraft aprons based on the number of aircraft expected to use the airport on a peak day. Operations can be classified in two categories: local and itinerant. Apron space at SFB was analyzed for each category in accordance with FAA guidance.

There are multiple parking aprons which are located throughout the airport property. To identify the required parking needed for based aircraft not stored in a hangar and itinerant aircraft requiring temporary parking, a demand analysis was conducted. Itinerant aircraft are those that are visiting the airport on a temporary basis and do not remain for an extended period. Areas designated for the parking of itinerant aircraft are typically identified as “itinerant aprons”.

### 4.8.1. Based Aircraft Apron

Due to the wide variety of based aircraft sizes stored on the apron areas, spatial requirements have been identified to accurately quantify the area required for based aircraft parking. These apron spatial requirements are outlined in **Table 4-50**.

**Table 4-50 - Space Requirements for Based Aircraft Type**

| Aircraft Type | Space Required (Square Yards) |
|---|---|
| Single-Engine Piston | 300 |
| Multi-Engine Piston | 400 |
| Turboprop | 600 |
| GA Jet | 1,000 |
| Commercial Jet | 2,400 |

Source: Atkins, 2021

The L3Harris flight training operation has driven a large percentage of the based aircraft apron demand, as a total of 40 percent of the based aircraft fleet derives from the flight school. Due to the regular use of the flight school’s aircraft, it has been assumed that 100 percent of this fleet will be stored on their associated apron areas and not in aircraft storage hangars. The following list summarizes the based aircraft fleet storage allocations for apron parking:

- Single-Engine Based Aircraft: Due to the flight school's fleet accounting for 35 percent of the total single-engine based aircraft count, this share will be assumed to be stored on apron areas. The remaining 65 percent of single-engine based aircraft have been allocated to T-hangar storage.
- Multi-Engine Based Aircraft: Due to the flight school's fleet accounting for 60 percent of the total multi-engine based aircraft count, this share will be assumed to be stored on apron areas. The remaining 40 percent of multi-engine based aircraft have been allocated to T-hangar storage.
- Turboprop Based Aircraft: Due to the flight school's fleet accounting for 27 percent of the total turboprop based aircraft count, this share will be assumed to be stored on apron areas. The remaining 73 percent of turboprop based aircraft have been allocated to both conventional hangar and T-hangar storage.
- Jet Based Aircraft: Data gathered from Airport Staff and FBO staff has shown that approximately 28 percent of the jet based aircraft fleet is stored on apron areas. It has been indicated that the FBO currently has 3 GA jet aircraft based on their associated apron areas, accounting for the 5 percent of the total jet based aircraft count. Additionally, Airport staff has indicated that the primary commercial service operator currently has 14 commercial jets based at the Airport which accounts for 23 percent of the total jet based aircraft count. The commercial service operator utilizes several apron areas, specifically designated for their use, to store their aircraft that are not in current rotation for scheduled flights or require maintenance activity.

**Table 4-50** outlines the spatial requirements for each aircraft type requiring based apron parking. Due to the large footprint and spatial requirements for commercial service jets, the space requirements analysis for these aircraft will be separated from the single-engine, multi-engine, turboprop, and GA jet based aircraft apron requirements. This separation is to ensure that the general aviation based aircraft apron area demand analysis is not skewed by the vast quantity of apron required for commercial jet storage. **Table 4-51** outlines the existing apron space available for based aircraft. **Table 4-52** outlines the calculated demand for general aviation based aircraft apron areas throughout the established PAL GA thresholds. Due to the Commercial PAL thresholds not taking into consideration the based aircraft forecast, GA PAL thresholds were utilized. **Table 4-53** outlines the calculated demand for commercial jet based aircraft apron space throughout the established GA PAL thresholds.

**Table 4-51 - Existing Based Aircraft Apron**

| Apron Area | Approximate Area Space (Sq. Yds.) |
|---|---|
| L3 Harris Flight School | 38,900 |
| MillionAir (Based Aircraft Apron) | 4,500 |
| **Total General Aviation Apron** | **43,400** |
| Romeo Ramp | 35,400 |
| Apron Area along Facilities 145, 146, 147 | 25,400 |
| **Total Commercial Apron** | **60,800** |

Source: Atkins, 2021

**Table 4-52 – General Aviation Based Aircraft Apron Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Single-Engine Aircraft Requiring Apron Parking | 78 | 85 | 93 | 102 | 111 |
| Multi-Engine Aircraft Requiring Apron Parking | 28 | 31 | 34 | 37 | 40 |
| Turboprop Aircraft Requiring Apron Parking | 4 | 4 | 5 | 5 | 5 |
| GA Jet Aircraft Requiring Apron Parking (5% Jet Based Aircraft) | 3 | 3 | 4 | 4 | 4 |
| **Total Based Aircraft Apron Required (Sq. Yds.)** | **37,966** | **41,533** | **45,128** | **49,355** | **53,714** |
| Existing Based Aircraft Apron (Sq. Yds.) | 43,400 | 43,400 | 43,400 | 43,400 | 43,400 |
| **Surplus/Deficiency (Sq. Yds.)** | **5,434** | **1,867** | **1,728** | **5,955** | **10,314** |

Source: Atkins, 2021

**Table 4-53 - Commercial Jet Based Aircraft Apron Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Commercial Jet Aircraft Requiring Apron Parking (23% Jet Based Aircraft) | 14 | 15 | 16 | 17 | 19 |
| **Total Based Aircraft Apron Required (Sq. Yds.)** | **33,120** | **35,328** | **39,192** | **41,400** | **46,368** |
| Existing Based Aircraft Apron (Sq. Yds.) | 60,800 | 60,800 | 60,800 | 60,800 | 60,800 |
| **Surplus/Deficiency (Sq. Yds.)** | **27,680** | **25,472** | **21,608** | **19,400** | **14,432** |

Source: Atkins, 2021

Based on this analysis, there is an existing surplus for both general aviation and commercial jet based aircraft apron areas. However, a deficiency of space is anticipated between PAL GA 1 and PAL GA 2 for the general aviation aprons. This deficiency will exponentially increase as the Airport's based aircraft fleet grows, reaching approximately 10,314 square yards at PAL GA 4. This deficiency will be addressed during the creation of the development alternatives to ensure the future demand is met. No deficiency is anticipated for commercial jet based aircraft aprons throughout the PAL thresholds.

## 4.8.2. Itinerant Aircraft Apron

Itinerant apron space is intended for relatively short-term parking periods, usually less than 24 hours. For this study, it is assumed the average itinerant aircraft occupies the apron for five hours. Utilizing the peaking characteristics established in the Aviation Demand Forecast chapter and the FAA's recommended 360 square yards per itinerant aircraft space requirement, the total itinerant aircraft apron space requirement was calculated. The Airport's only FBO, MillionAir, has approximately 11,900 square yards of apron space available. With approximately 4,500 square yards allocated to based aircraft, this leaves approximately 7,400 square yards for itinerant aircraft parking. As outlined in the Section **4.7.1**, the FBO handles approximately 10 percent of the peak hour operations at the Airport. Out of the 10 percent share of operations handled by the FBO, approximately 70 percent of those have been identified as itinerant aircraft operations. Therefore, 7 percent of all peak hour general aviation and air taxi/commuter operations are assumed to be itinerant in nature and will be processed through the FBO. **Table 4-54** outlines the itinerant aircraft apron requirements.

**Table 4-54 - General Aviation Itinerant Aircraft Apron Requirements**

| | Baseline | PAL GA 1 | PAL GA 2 | PAL GA 3 | PAL GA 4 |
|---|---|---|---|---|---|
| Average Day Peak Hour Itinerant Operations (7% GA + Air Taxi/Commuter) | 11.06 | 13.09 | 13.23 | 13.30 | 13.44 |
| Itinerant Aircraft Positions Required (7 Hour Avg. Stay) | 55.30 | 65.45 | 66.15 | 66.50 | 67.20 |
| **Total Itinerant Aircraft Apron Required (Sq. Yds.)** | **19,908** | **23,562** | **23,814** | **23,940** | **24,192** |
| Existing Itinerant Aircraft Apron (Sq. Yds.) | 7,400 | 7,400 | 7,400 | 7,400 | 7,400 |
| **Surplus/Deficiency (Sq. Yds.)** | **12,508** | **16,162** | **16,414** | **16,540** | **16,792** |

Source: Atkins, 2021

Based on this analysis, there is an existing deficiency for itinerant aircraft apron area totaling 12,508 square yards. This deficiency will exponentially increase as each PAL GA threshold is passed, coming to a total deficiency of 16,792 square yards at the PAL GA 4 threshold. This deficiency will be addressed during the creation of the development alternatives to ensure the future demand is met.

## 4.9. Air Cargo Facility Requirements

The previous chapter, Aviation Demand Forecast, outlined the anticipated cargo tonnage throughout the planning period at SFB. The entirety of cargo which is handled through the Airport is in relation to commercial service cargo, otherwise known as belly cargo. This type of cargo is transported on scheduled commercial aircraft transporting passengers. The handling of this cargo is typically loaded and unloaded at the terminal gate positions, and then transported to and from a separate cargo facility at the airport. No commercial aircraft is parked directly at the Airport's existing cargo facility, located to the southwest of the commercial terminal. There is currently no sole-cargo operator established at the Airport. However, in the event that a sole-cargo operator commences operations at the Airport, it is recommended to complete an air cargo study to identify facility requirements for the newly established operator. During the Development Alternatives chapter of this report, an area for potential air cargo facilities will be identified.

## 4.10. Ground Transportation and Parking Requirements

This section summarizes requirements for key on-airport ground access and parking facilities, and describes the assumptions and methodology used to determine these requirements. This chapter addresses facility requirements for public and employee parking, rental car facilities, roadways, and curbsides. Requirements are primarily based on data and observations collected from 2016 to 2019 and the Aviation Demand Forecast.

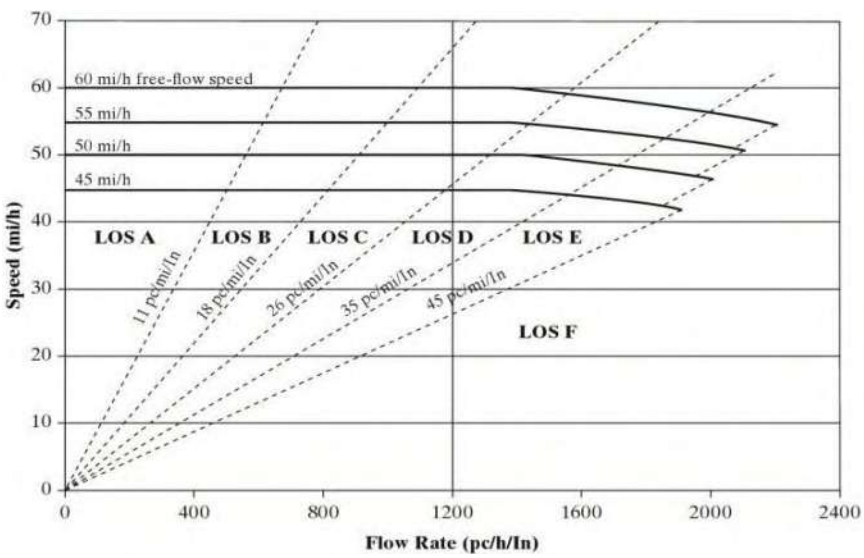
## 4.10.1. Access Roadways

### 4.10.1.1. Methodology

Future roadway requirements are determined using estimates of future peak-hour traffic volumes to and from key traffic generators in the terminal core and determining the number of lanes required to accommodate those levels of activity. Future volumes are estimated using forecasted growth in enplanements.

Roadway capacity is calculated using industry standards outlined in the Transportation Research Board's (TRP) Highway Capacity Manual. First, the desired level of service (LOS) is determined. Typical planning focuses on a Level of Service "C", which is defined as stable traffic flow with volume between 71 and 80 percent of roadway capacity. Using **Figure 4-25**, taken from the TRB manual, utilizes the roadway speed limit and desired LOS to determine the per lane capacity of the road. For example, many of the Airport roadways analyzed feature two lanes and speed limits of 35 miles per hour (mph). According to the figure, a 35-mph roadway performing at LOS "C" has a capacity of approximately 900 vehicles per hour, per lane, or 1,800 vehicles per hour on the roadway.

**Figure 4-25 - Highway Capacity Manual Roadway Capacity**




Mi/h – Miles per hour

Pc/h/ln – Passenger cars per hour per land

Source: TRB Highway Capacity Manual

A comparison of existing and future roadway volumes to calculated roadway capacities is achieved through a volume to capacity ratio (V/C). Traffic engineering principles generally dictate that when a roadway V/C ratio reaches 0.7, the roadway should be considered for additional lanes, and when V/C reaches 0.9, the roadway fails to effectively perform its function. With this methodology, the number of lanes required to meet future demand can be determined.

#### 4.10.1.1.1. Roadway Requirements

The two primary roadways leading into and out of the Airport are Red Cleveland Avenue and Airport Boulevard. In January 2016, SAA conducted a seven-day directional daily traffic count. Using this information and assuming an industry average of 15 percent of the daily volume is experienced in the peak-hour, a baseline peak-hour traffic volume was determined. As the Master Plan's baseline year is 2017, the traffic volumes are grown by 1 percent to represent growth from the 2016 count to 2017 baseline conditions. Future volumes are then grown across all PALs using an average of forecasted enplanements and operations growth. V/C ratios are shown for each direction of the two roadways under baseline and future conditions in **Table 4-55**. Yellow highlights indicate areas where the road is approaching its functional capacity, with red indicating that the road cannot accommodate the estimated volume of activity.

Table 4-55 - Access Roadway Volume/Capacity

| | Baseline | | PAL 1 | | PAL 2 | | PAL 3 | | PAL 4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Link | Peak-hour Volume | V/C Ratio | Peak-hour Volume | V/C Ratio | Peak-hour Volume | V/C Ratio | Peak-hour Volume | V/C Ratio | Peak-hour Volume | V/C Ratio |
| Red Cleveland NB | 539 | 0.26 | 646 | 0.31 | 776 | 0.37 | 931 | 0.44 | 1,117 | 0.53 |
| Red Cleveland SB | 538 | 0.26 | 645 | 0.31 | 774 | 0.37 | 929 | 0.44 | 1,115 | 0.53 |
| Airport Blvd EB | 682 | 0.76 | 818 | 0.91 | 982 | 1.09 | 1,178 | 1.31 | 1,414 | 1.57 |
| Airport Blvd WB | 661 | 0.73 | 794 | 0.88 | 952 | 1.06 | 1,143 | 1.27 | 1,372 | 1.52 |

Source: Sanford Airport Authority; Jacobsen Daniels, July 2020

This analysis indicates that Red Cleveland Avenue will be able to maintain at least LOS C in both directions throughout the planning horizon. Airport Boulevard, however, does not have sufficient capacity to accommodate future demand, and will need to be expanded.

## 4.10.2. Curbsides

### 4.10.2.1. Methodology

The curbside portion of the terminal roadways, where the primary pickup and drop-off functions are accommodated, is often the most constrained element of the access road system. For this analysis, the curbside roadways are divided into separate facilities according to:

- Whether users are predominantly dropping off, picking up, or a mix of both operations
- Whether users are private vehicles, commercial vehicles, airport shuttles, or a mix of multiple user types

Peak-hour vehicle volumes are estimated based on the forecast of peak-hour enplaning and deplaning passenger activity and airport ground access market shares.

Curbside length requirements are determined based on the peak-hour volumes of vehicles, the dwell time or amount of time the vehicle occupies the curb, and the length of curb the vehicle occupies. The required curbside space is calculated using the following equation:

$$Curbside\ Spaces\ Required = Design\ Hour\ Volume \frac{(Dwell\ time\ in\ min)}{60} * Peak\ activity\ factor$$

Finally, the required curb capacities are compared to existing facility size to determine future needs.

#### 4.10.2.1.1. Peak-Hour Volumes and Assumptions

Baseline peak-hour curbside traffic volumes are based on peak-hour enplaning and deplaning passengers. Ground access market share (i.e.; how passengers arrive at and depart the airport) are determined using available monthly transaction data for those modes that are tracked (parking, transportation network companies (TNC) (e.g. ridesharing), taxis, and rental cars), estimates for those modes which are not directly tracked (private vehicles and other commercial vehicles), and assumed passenger per vehicle ratios.

The peak-hour baseline vehicle volume estimates are developed by multiplying peak-hour arriving and departing passenger levels, of 2,058, by the ground access market share percentage, and dividing by an assumed vehicle occupancy (passengers per vehicle). The resulting baseline mode shares, assumed vehicle occupancies and resulting peak-hour vehicle volume are provided in **Table 4-56**.

**Table 4-56 - Baseline Passenger Distribution Assumptions**

| | Total Airport Ground Access Market Share (% of Passengers) | Vehicle Occupancy (Passengers per vehicle) | Peak-hour vehicle volume (departing + arriving passengers) |
|---|---|---|---|
| Private Vehicles | 20 | 1.3 | 312 |
| Parking | 31 | 2.0 | 324 |
| TNC | 13 | 1.3 | 199 |
| Taxi | 1 | 1.1 | 11 |
| Other CV's (Limo/Shuttle/Transit) | 1 | 3.0 | 7 |
| Charter Bus | 10 | 15.0 | 14 |
| Rental Car | 25 | 2.5 | 206 |

TNC – Transportation Network Companies (e.g. ridesharing)

CV – Commercial Vehicle

Source: Jacobsen Daniels, 2020

#### 4.10.2.1.2. Curbside Requirements

The peak-hour volumes are organized by the two curbside facilities at the Airport as they operate today. This separates the volumes according to whether passengers are being dropped off or picked up, and whether vehicle user groups are assigned to the main curbside or the ground transportation pickup area. Passengers arriving and departing the Airport via rental car or public parking do not generally stop on the curbside and are therefore not included in the curbside requirement calculation.

Vehicle dwell time assumptions follow the recommendations of ACRP Report 40, *Airport Curbside and Terminal Area Roadway Operations*, which recommends three minutes of dwell time per drop-off operation and four minutes per pickup operation, with an additional minute for multi-passenger shuttles.

Different user groups using the same curbside facility with no distinct space allocation, such as the primary Airport curbside, can be considered as a single stream of traffic with combined traffic volume and weighted average dwell time and vehicle length for each of the component user group, as shown on the left side of **Table 4-57**.

The curbside should accommodate the number of vehicles loading and unloading passengers at any time throughout the peak-hour. Therefore, the number of vehicles simultaneously occupying the curbside is calculated using the following equation, and is shown in **Table 4-57**.

$$Hourly\ Volume \times Dwell\ Time\ (min) \div 60$$

However, the average number of simultaneous vehicles does not account for the uneven arrival of vehicles throughout the peak-hour. A peak-hour factor of vehicle arrivals was applied to accommodate passenger drop-off and pickup activity throughout the hour.

Finally, the number of curbside loading spaces is multiplied by a typical vehicle length of 25-feet for private vehicles and TNCs, and 40-feet for buses and larger shuttles, to get a curbside length requirement, as shown in **Table 4-57**. An adjusted requirement of 5 vehicles, or 125 linear feet, is included at the main Airport curbside, to allow for SAA and law enforcement vehicles to park at the curbside, and is included in the calculation.

The requirements calculated are somewhat conservative in that, passenger drop-off and pickup often occur in multiple lanes of the curbside roadway. An adjustment to the requirements, which assumes 30 percent of curbside activity occurs in the second lane from the terminal, is also shown in **Table 4-57**.

**Table 4-57 - Baseline Curb Requirements**

| Curbside | Baseline Hourly Volume (vehicle trips) | Dwell Time (min) | Vehicle Length (ft) | Avg vehicles simultaneous (#) | Spaces Required (#) | Unadjusted Curbside Required (ft) | Adjusted Requirement (With 30% Second Lane Utilization) (ft) | Existing Curb Length (ft) |
|---|---|---|---|---|---|---|---|---|
| Private Vehicle Drop-off | 159 | 3.0 | 25 | - | - | - | - | - |
| Private Vehicle Pick-up | 153 | 4.0 | 25 | - | - | - | - | - |
| TNC Drop-off | 199 | 2.5 | 40 | - | - | - | - | - |
| Taxi / Limo / Shuttle Drop-off | 11 | 3.5 | 30 | - | - | - | - | - |
| Drop-off Curbside | 522 | 3.1 | 30.8 | 27.1 | 36 | 1,225 | 950 | 906 |
| | | | | | | | | |
| TNC Pick up | 98 | 4.0 | 25 | 6.5 | 12 | 300 | - | - |
| Taxi / Limo / Shuttle Pick up | 6 | 4.0 | 25 | 0.4 | 2 | 50 | - | - |
| Charter Bus Pick up | 7 | 20.0 | 40 | 2.3 | 2 | 80 | - | - |
| Commercial Vehicle Pick up Area | 111 | 5.0 | 25.9 | 9 | 16 | 425 | - | 500 |
| | | | | | | | | |
| **Airport Total** | - | - | - | - | - | **1,650** | **1,375** | **1,264** |

Source: Jacobsen Daniels, 2020

The baseline requirements are then projected into future PALs utilizing the forecast peak-hour arriving and departing passengers. The results of this methodology are in **Table 4-58**. All curbsides appear to be capacity constrained by PAL 1.

It should be noted that the layout of curbside facilities could alter the facility requirements significantly. The most obvious example being development of a new ground transportation center where efficiencies of space can be gained. As needed, these facility requirements will be updated during the alternatives phase of the master plan and applied specific development strategies.

**Table 4-58 - Curb Requirements Baseline - PAL 4**

| | Existing (ft) | Baseline (ft) | PAL 1 (ft) | PAL 2 (ft) | PAL 3 (ft) | PAL 4 (ft) | Surplus / (Deficiency) (ft) |
|---|---|---|---|---|---|---|---|
| Unadjusted Curbside Requirement (no use of second lane) | 906 | 1,225 | 1,450 | 1,675 | 1,950 | 2,250 | (1,344) |
| Adjusted Curbside Requirement (with 50% Activity in Second Lane) | | 825 | 975 | 1,125 | 1,325 | 1,525 | (619) |
| Ground Transportation Pickup | 500 | 425 | 500 | 575 | 675 | 775 | (275) |

Source: Jacobsen Daniels, 2020

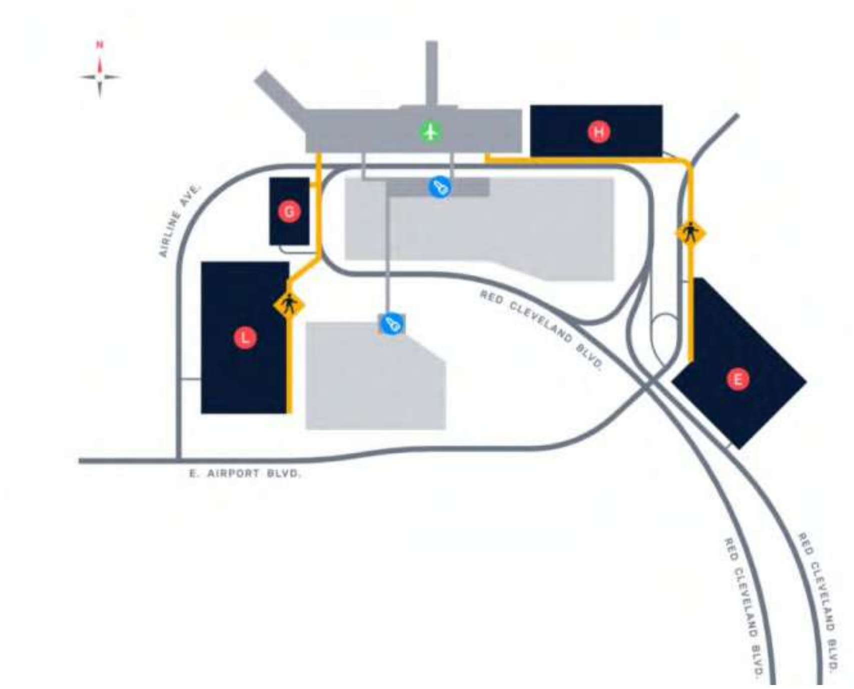
## 4.10.3. Public Parking Facilities

### 4.10.3.1. Methodology

There are six distinct parking facilities at the Airport:

- Hourly Lot (H) provides hourly parking.
- Garage (G), Long term (L) and Economy (E) provide long-term and economy parking.
- Lot 1 and the Overflow Grass Lot provide additional overnight parking to accommodate seasonal demand. Cell phone (C) lot provides temporary parking for passenger pick-up.

Below is a graphic showing the location of these parking options at the Airport.




Source: flysfb.com, 2021

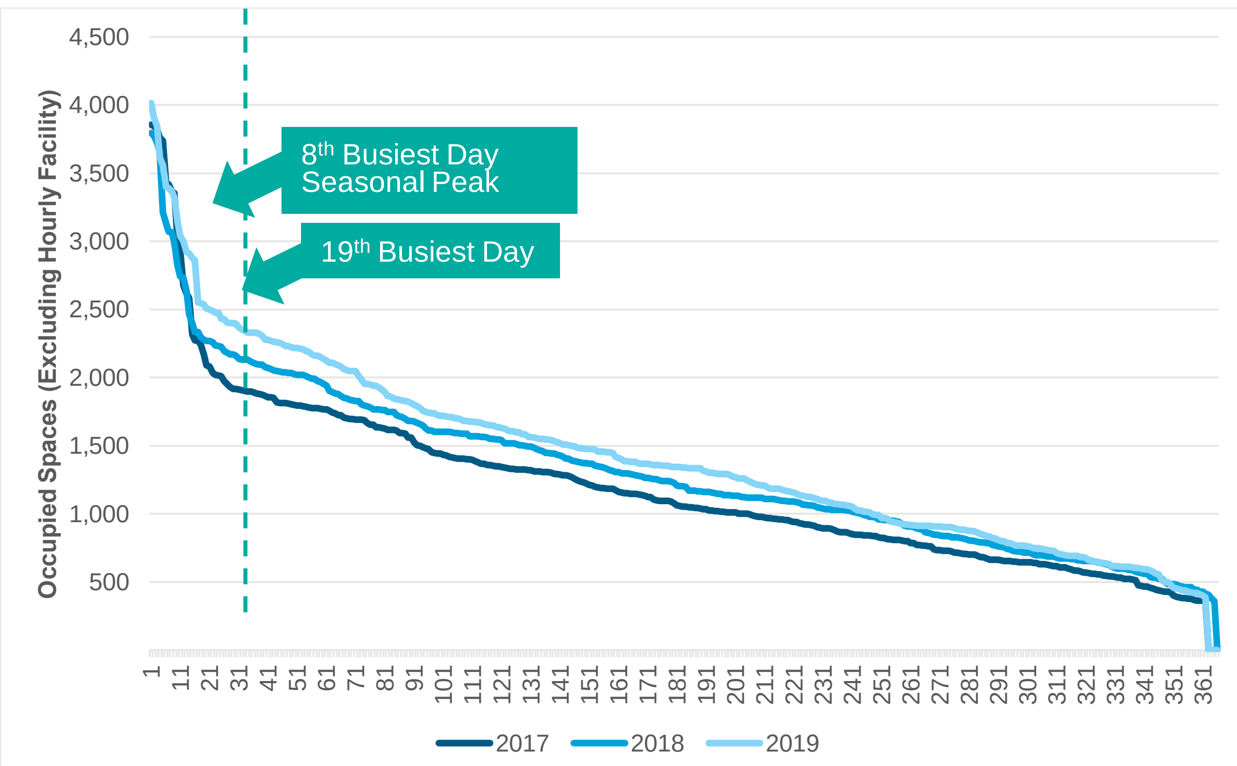
Parking requirements are divided into short-term parking for meters-and-greeters to park while dropping off or picking up passengers at the terminal building (referred to in this analysis as Hourly Parking), and longer-term (referred to in this analysis as Long-term Parking, encompassing long-term/economy and overflow) parking for airline passengers to park during their trip.

Baseline parking requirements are calculated using historical daily peak occupancies observed in each facility. Parking occupancy is recorded at SFB in each parking facility two times per day, once in the morning (daytime) and once in the evening (nighttime). For the purposes of this analysis, the larger of the two counts is used as the peak daily occupancy.

Typically, airport parking facilities are sized to meet demand on a day slightly below the peak day, but which can accommodate demand on 95 percent of the days throughout the year, (e.g. the 19th busiest day of the year). Airport leadership may make decisions based on customer service goals or net revenue projections to provide capacity higher or lower than this demand day and strike an effective balance between accommodating demand and not oversizing facilities.

SFB experiences a significant level of seasonal peaking, which is a challenge to accommodate with the existing facilities. As shown in **Figure 4-26**, there is a considerable difference between the 19th and 8th busiest days and even more of a difference to the busiest day. By sizing facilities to the 19th busiest day, SAA would be under serving passengers during these peak seasons, reducing customer service and foregoing parking revenue. SAA's approach to the overflow lots is a demonstration of striking the balance between customer service and cost to develop and maintain parking lots. For purposes of determining future facility requirements and to allow the discussion of permanent versus overflow facilities during the development alternatives phase of the Master Plan; demand was identified based on the 19th busiest day and a seasonal peak demand on the 8th busiest day in 2019.

**Figure 4-26 - Peak Parking Occupancy Curve**




Source: Jacobsen Daniels, 2020

#### 4.10.3.2. Long-Term Parking Requirements

The 8th highest recorded daily occupancy across all Long-term/Economy/Overflow parking products was 3,366 vehicles in 2019; and the 19th highest daily occupancy was 2,538 vehicles. This parking demand is converted to a baseline requirement by adding an industry standard 10 percent circulation factor intended to allow customers to find a parking space without undue search time.

Future parking demand is projected based on the forecast growth of enplanements. Although it was considered, no allowance for loss of parking due to potential increase in TNCs is applied to future parking demand. **Table 4-59** presents the total public parking requirements at SFB during the 19th busiest day, with the additional spaces that would be required to accommodate the 8th busiest day. The table also compares baseline future requirements to existing facility capacity of 2,244 spaces without the overflow facility and 3,304 spaces with the overflow facilities, to calculate a surplus or deficiency.

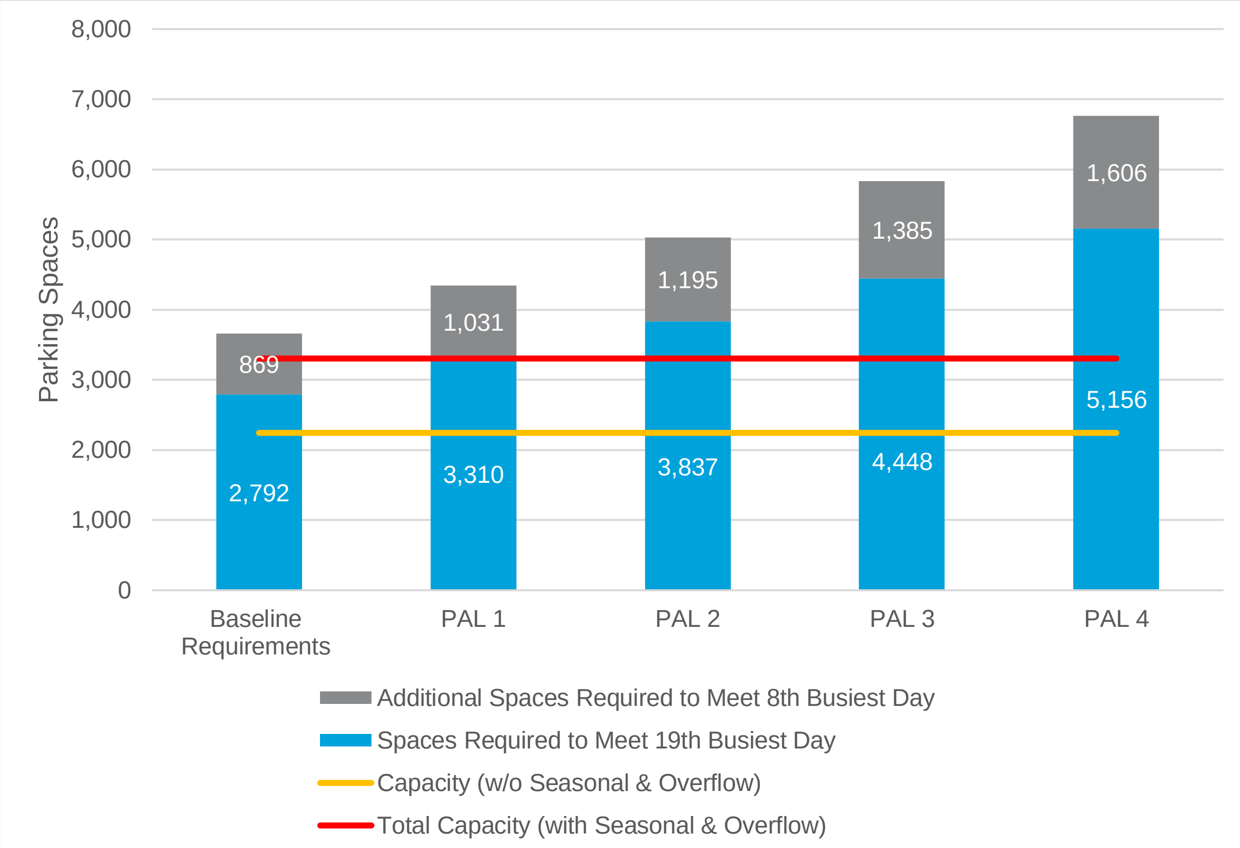
**Table 4-59 - Long-Term Parking Requirements**

| | Baseline Demand (spaces) | PAL 1 (Spaces) | PAL 2 (Spaces) | PAL 3 (Spaces) | PAL 4 (Spaces) |
|---|---|---|---|---|---|
| Peak Occupancy (19th busiest day) | 2,538 | 3,009 | 3,488 | 4,044 | 4,687 |
| Circulation (+10%) | 254 | 301 | 349 | 404 | 469 |
| Parking requirement | 2,792 | 3,310 | 3,837 | 4,448 | 5,156 |
| **Surplus / (Deficiency) to existing facilities without overflow 2,244 spaces** | **(548)** | **(1,066)** | **(1,593)** | **(2,204)** | **(2,912)** |
| **Surplus / (Deficiency) to existing facilities with overflow 3,304 spaces** | **512** | **(6)** | **(533)** | **(1,144)** | **(1,852)** |
| Seasonal Peak (8th busiest day) | 3,366 | 3,991 | 4,627 | 5,363 | 6,217 |
| Circulation (+10%) | 337 | 399 | 463 | 536 | 622 |
| Seasonal parking requirement | 3,703 | 4,390 | 5,090 | 5,899 | 6,839 |
| **Surplus / (Deficiency) to existing facilities without overflow 2,244 spaces** | **(1,459)** | **(2,146)** | **(2,845)** | **(3,655)** | **(4,594)** |
| **Surplus / (Deficiency) to existing facilities with overflow 3,304 spaces** | **(399)** | **(1,086)** | **(1,786)** | **(2,595)** | **(3,535)** |

Source: Jacobsen Daniels, 2020

**Figure 4-27** graphically depicts total overnight public parking demand at SFB showing the current capacity as well as future parking requirements. The data indicates that parking demand exceeds available capacity under baseline conditions.

**Figure 4-27 - Long-Term Parking Requirements Summary**




Source: Jacobsen Daniels, 2020

### 4.10.3.3. Hourly Parking Requirements

The SAA provides hourly parking in the terminal area with a total capacity of 230 spaces. Based on conversations with SAA, the baseline hourly parking demand is estimated to be 70 percent of the existing facility capacity, resulting in a baseline demand of 161 parking spaces.

The baseline demand is assumed to increase in proportion to the growth of enplaned passengers following the aviation forecast. With these assumptions, the hourly parking facility will need to accommodate 217 spaces by PAL 4, below the capacity of the existing lot. **Table 4-60** presents the hourly parking requirements.

**Table 4-60 - Hourly Parking Requirements**

| | Existing Capacity | Baseline | PAL1 | PAL2 | PAL3 | PAL4 | Surplus / (Deficiency) |
|---|---|---|---|---|---|---|---|
| Hourly Parking Demand | 230 | 161 | 173 | 187 | 201 | 217 | 13 |

Source: Jacobsen Daniels, 2020

## 4.10.4. Employee Parking

### 4.10.4.1. Methodology and Employee Parking Requirements

The SAA provides parking for Airport and tenant employees in the terminal area with a total capacity of 250 spaces. Based on conversations with SAA, the baseline employee parking demand is estimated to be 80 percent of the existing facility capacity, resulting in a baseline demand of 200 parking spaces.

For this analysis employee parking demand is assumed to grow at half the growth rate of forecast air carrier operations – or 1.5 percent annually. **Table 4-61** presents the employee parking requirements. Employee parking is estimated to be at capacity by PAL 3, with future expansion necessary to accommodate 269 parking spaces by PAL 4.

**Table 4-61 - Employee Parking Requirements**

| | Existing Capacity | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 |
|---|---|---|---|---|---|---|
| Employee Parking Demand | 250 | 200 | 215 | 232 | 250 | 269 |

Source: Jacobsen Daniels, 2020

## 4.10.5. Rental Car Requirements

### 4.10.5.1. Methodology

The methodology used to determine baseline or existing Rent-a-Car (RAC) facility needs was based on discussions with each RAC family (Hertz/DTAG, Enterprise/Alamo/National, and Avis/Budget) to estimate their current ability to accommodate demand in 2017, the baseline year for this Master Plan. A questionnaire was provided to RAC industry personnel asking for existing space and pre-COVID[9] estimates on whether facilities were adequately sized, undersized, or oversized. Data from the questionnaire was then used to estimate baseline facility needs. These baseline needs are then projected for PAL 1 and increased in proportion to the passenger enplanement forecast to estimate the facility requirements for each PAL.

### 4.10.5.2. Rental Car Requirements

**Table 4-62** presents the rental car requirements for each of the three functional areas of a rental car facility:

- Ready spaces for deplaning passengers to pick-up their car, which are presented as parking spaces
- Return spaces for enplaning passengers to return their car, which are presented as acres since these are normally rows of parking.
- Quick-turn-around (QTA), service sites and vehicle storage, which are presented as acres.

As shown in **Table 4-62**, SFB will need to increase the capacity of RAC facilities to meet future demand. Both the ready spaces and return rows are projected to be constrained in PAL 1, and the QTA/Service Sites/Storage are projected to be constrained by PAL 2.

It should be noted that the layout of the RAC facilities could alter the facility requirements significantly. The most obvious example being development of a consolidated rent-a-car facility (CONRAC) where efficiencies of space can be gained. As needed, these facility requirements will be updated during the alternatives phase of the master plan and applied specific development strategies.

[9] Coronavirus Disease (COVID-19) Pandemic

**Table 4-62 - Rental Car Facility Requirements**

| | Existing Capacity | % of Capacity Needed (Pre-COVID) | Baseline Requirements | PAL 1 | PAL 2 | PAL 3 | PAL 4 |
|---|---|---|---|---|---|---|---|
| **Ready Spaces** | | | | | | | |
| Hertz, DTAG | 150 | 60 | 90 | 108 | 130 | 156 | 187 |
| Alamo | 337 | 90 | 303 | 364 | 437 | 524 | 629 |
| Shared | 165 | 90 | 149 | 178 | 214 | 257 | 308 |
| **Sub Total** | **652** | - | **542** | **650** | **780** | **936** | **1,123** |
| **Return row area (acres)** | | | | | | | |
| Hertz, DTAG | 1.0 | 60 | 0.6 | 0.7 | 0.9 | 1.0 | 1.2 |
| Alamo | 1.5 | 90 | 1.4 | 1.6 | 1.9 | 2.3 | 2.8 |
| Shared | 0.8 | 90 | 0.7 | 0.8 | 1.0 | 1.2 | 1.4 |
| **Sub Total** | **3.3** | - | **2.6** | **3.2** | **3.8** | **4.6** | **5.5** |
| **QTA/Service Sites/Storage (acres)** | | | | | | | |
| Hertz, DTAG | 5.1 | 60 | 3.1 | 3.7 | 4.4 | 5.3 | 6.4 |
| Alamo | 4.8 | 90 | 4.3 | 5.1 | 6.2 | 7.4 | 8.9 |
| EHI Other | 2.2 | 90 | 2.0 | 2.4 | 2.9 | 3.5 | 4.2 |
| Avis/Budget | 2.0 | 90 | 1.8 | 2.2 | 2.6 | 3.1 | 3.7 |
| **Subtotal** | **14.1** | - | **11.2** | **13.4** | **16.1** | **19.3** | **23.1** |

Source: Jacobsen Daniels, 2020

### 4.10.6. Cell Phone Lot

#### 4.10.6.1. Methodology and Cell Phone Lot Requirements

SAA provides a 0.64-acre cell phone lot located on Red Cleveland Avenue, approximately ¾ of a mile prior to the terminal curb. This analysis assumes that the existing facility is adequate for baseline conditions and will need to grow to 1-acre by PAL 4. This could allow for basic amenities or a minor development such as a gas station to be integrated into the facility if desired. It is also recommended that locations closer, and more convenient, to the terminal curbs be considered to enhance the use and effectiveness of the lot. This could be an alternate strategy to reduce the need for curb capacity by reducing vehicle dwell times and looping of the roadways.

## 4.11. Aviation Support Facility Requirements

The following section analyzes the facility requirements for all airport support features which ensures the safe and efficient operations at the Airport.

### 4.11.1. Fuel Storage

The Airport's fuel storage facilities are developed and maintained by individual airport tenants to meet the specific needs of their business operations. Currently, fuel storage facilities located at the Airport range in size from 10,000 to 250,000 gallons. These tanks are found at numerous sites around the Airport near tenant facilities. A large number of the fuel tanks, however, are collocated along Carrier Avenue between E 29th Street and E 30th Street. These fuel tanks are owned and managed by a single tenant, OSI, INC.

Tenants Hill Dermaceuticals and South East Ramp both have fuel storage facilities located near their respective lease areas. Each tenant maintains adequate fuel storage capacity to accommodate their existing and future operational demands. However, this section will identify the expected fuel storage demand throughout the planning period both for GA and commercial service operations.

According to airport records, during the past five years, an average of 33,644,248 gallons of Jet-A fuel and 686,154 gallons of 100LL aviation gasoline (Avgas) were sold annually. During that time, an annual average of 96,581 and 178,505 operations were conducted by jet-powered and piston-powered aircraft, respectively. The average daily fuel flow (gallons sold per day) during the last five years was 92,176 gallons of Jet-A and 1,880 gallons of Avgas. Comparing the average number of aircraft operations to the average amount of fuel sales reveals that each turbine operation results in approximately 373 gallons of Jet-A fuel sales and each piston-powered operation results in approximately 4 gallons of Avgas sales.

The fuel storage facility requirements analysis utilized the gallons per aircraft type per operation metric to forecast the estimated fuel storage needs at each PAL throughout the planning period as presented in **Table 4-63**. Based on that analysis, there is currently a surplus of capacity for both AvGas and Jet-A fuel storage. However, to maintain seven days of Jet-A fuel storage capacity in relation to the Aviation Demand Forecast, the Airport would need additional Jet-A storage tanks throughout the planning period.

**Table 4-63 - Fuel Storage Facility Requirements**

| | Base Year | Forecast | | | |
|---|---|---|---|---|---|
| | Baseline | PAL 1 | PAL 2 | PAL 3 | PAL 4 |
| Annual Operations | | | | | |
| Piston-Powered Operations | 173,001 | 205,745 | 207,511 | 209,293 | 211,089 |
| Turbine Powered Operations | 130,009 | 154,547 | 159,407 | 164,872 | 171,036 |
| Fuel Flow per Operation (Piston) | | | | | |
| | 5 Yr. Avg. | Annual Fuel Storage Requirements (3.9 Gal./Piston Op.) | | | |
| AvGas (Gallons) | 3.9 | 805,113 | 812,024 | 818,998 | 826,026 |
| Fuel Flow per Operation (Turbine) | | | | | |
| | 5 Yr. Avg. | Annual Fuel Storage Requirements (373 Gal./Jet Op.) | | | |
| Jet-A (Gallons) | 373 | 57,718,804 | 59,533,812 | 61,574,754 | 63,876,871 |
| Daily Fuel Flow | | | | | |
| | 5 Yr. Avg. | Daily Fuel Storage Requirements | | | |
| AvGas (Gallons) | 1,880 | 2,206 | 2,225 | 2,244 | 2,263 |
| Jet-A (Gallons) | 92,176 | 158,134 | 163,106 | 168,698 | 175,005 |
| Fuel Storage Required (7 days) | | | | | |
| AvGas (Gallons) | 13,159 | 15,441 | 15,573 | 15,707 | 15,842 |
| Jet-A (Gallons) | 645,232 | 1,106,936 | 1,141,744 | 1,180,886 | 1,225,036 |
| Existing Fuel Storage Capacity | | | | | |
| AvGas (Gallons) | 72,500 | | | | |
| Jet-A (Gallons) | 1,082,500 | | | | |
| **Surplus / Deficiency** | | | | | |
| **AvGas (Gallons)** | **59,341** | **57,059** | **56,927** | **56,793** | **56,658** |
| **AvGas Storage Days** | **39** | **33** | **33** | **32** | **32** |
| **Jet-A (Gallons)** | **437,268** | **(24,436)** | **(59,244)** | **(98,386)** | **(142,536)** |
| **Jet-A Storage Days** | **12** | **7** | **7** | **6** | **6** |

Source: Atkins, 2021

### 4.11.2. Airport Rescue and Fire Fighting (ARFF)

The existing ARFF capabilities at the Airport are outlined in the Inventory of Existing Conditions. The following list outlines the current vehicles in use at the ARFF facility:

- (2) Oshkosh Striker 1500 (1,500-US-Gallon water capacity, dry chemical capability)
- (1) Oshkosh Striker 3000 (3,000-US-Gallong water capacity, dry chemical capability)

The ARFF facility and equipment at the Airport currently meets the FAA Index D (aircraft at least 159-feet but less than 200-feet in length) requirements, with limited Index E (aircraft at least 200-feet in length) certification criteria, in terms of the capacity of the equipment and staffing per 14 CFR Part 139.315. Index D requires three active vehicles with a combined water capacity of 4,000-US-Gallons, along with at least one vehicle carrying a dry chemical. The existing ARFF vehicle fleet is sufficient for that of Index D classification. Since the ARFF index determination is based on daily departures, and not annual operations, determining the future ARFF index cannot be based on the critical aircraft as other airport facilities typically are. As no information currently exists as to a change in air carrier fleet mix operating at the Airport, it is anticipated that ARFF Index D will be maintained throughout the planning period. Furthermore, the limited Index E certification will be maintained to ensure the Airport is prepared for operational conditions which require this upgrade in capabilities.

The other critical operational requirement outlined by 14 CFR Part 139.319 is regarding the response time of the ARFF vehicles to the midpoint of the furthest runway which serves air carrier aircraft. At least one ARFF vehicle must be able to reach the midpoint of the specified runway within three minutes from the time of an alarm. Additionally, all other required vehicles must be able to reach that same point within four minutes from the time of an alarm. The current location of the ARFF facility allows for such response times to the Airport's two air carrier runways (9L/27R and 18/36). The ARFF facility, built in 1998, is currently in fair condition.

### 4.11.3. Air Traffic Control Tower

The Air Traffic Control Tower (ATCT) at SFB is described in the Inventory of Existing Conditions. The current tower does not meet all FAA siting criteria as defined in Order 6480.4B, *Airport Traffic Control Tower Siting Requirements*. Apron areas along Taxiways B, C, and K, and approximately 660-feet of the westernmost section of Taxiway B, are not visible to air traffic controllers. This lack of positive visual control over all movement areas is non-standard. Relocation of the ATCT is recommended to achieve positive visual control and meet all FAA siting criteria. Further analysis regarding the proposed relocation and siting will be completed during the development alternatives analysis.

### 4.11.4. Airport Security Fence

The primary function of airport security fencing is to restrict the inadvertent entry to the airport by unauthorized individuals. Majority of airports have security fencing infrastructure to allow for the enhanced security and safety for its users and tenants. The existing AOA fence meets 14 CFR Part 139 requirements, and no deficiencies have been identified.

However, with nearly 12 miles of security fencing around the AOA, constant monitoring of the entire length can present an operational challenge. While barbed wire, chain-link fences are the most common method airports use to protect their perimeters, they do not notify authorities or completely stop an intrusion of a vehicle or person. Technological advances in the last decade have introduced systems that would alert authorities and perhaps even prevent such an intrusion. Several technological options are currently available, such as buried pressure sensor cables, fiber optic sensors, behavioral analytics, and thermal imaging with build-in analytics. The collection of those systems are referred to as Perimeter Intrusion Detection Systems (PIDS). While not currently required by the FAA, PIDS applications at the Airport should be explored as it could serve as a situational awareness tool to aid the missions of airport police, local law enforcement, operations, first responders, and security personnel.

Future development should incorporate airport security fence infrastructure to ensure that 14 CFR Part 139 requirements are upheld, as well as exploring potential applications of PIDS technology.

### 4.11.5. Airport Perimeter Fence

Most airports have some type of perimeter wildlife fencing to mitigate wildlife incursions on the airfield and to control wildlife movement from entering the property. The Airport currently does not have a specific wildlife fence, however, has indicated that such a fence would be desirable for wildlife management. The completion of a wildlife hazard mitigation plan would outline the specific justification and requirements for perimeter fence infrastructure. A wildlife hazard assessment must be conducted whenever wildlife hazards are detected.

### 4.11.6. Airport Maintenance Facilities

The existing airport maintenance facility was constructed prior to 1993 and has exceeded its useful life. However, the facility is currently still functional and utilized by Airport staff. The maintenance facility is made up of a main shop area with an open-bay equipment shelter. Based on interviews with airport operations and maintenance personnel, it was indicated that the storage area within this facility is currently insufficient. Additional storage bays to separate general maintenance storage from other areas of storage would allow for the efficient and safe storage of all maintenance equipment. An analysis for the expansion of the existing airport maintenance facility or siting of a new facility will be completed during the development alternatives analysis.

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# Development Alternatives

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# 5. Development Alternatives

The primary objective of the Development Alternatives chapter is to outline a logical development alternative for the Orlando Sanford International Airport which meets the aviation needs throughout the planning period as well as satisfying the established development goals previously identified in Chapter 1, *Introduction*, Section 1.2, *Goals and Visioning*. Airport development alternatives were established based on the information presented in the previous chapters of this Airport Master Plan (AMP) in conjunction with reasonable foresight into industry trends.

This chapter will present the development alternatives that were produced for evaluation. A preferred development alternative will be created following the evaluation of the three preliminary development alternatives. The alternatives and preferred development alternatives are based on the general criteria outlined in **Table 5-1**.

**Table 5-1 - Evaluation Criteria for Preferred Development Alternative**

| Criteria | Description |
|---|---|
| Operational Performance | Any selected development alternative should be capable of meeting the airport's facility needs as have been identified for the planning period. An airport's preferred alternative should achieve its operational performance with regards to safety, capacity, and efficiency. |
| Best Planning Tenets and Other Factors | The preferred development alternative should be feasible and justified based on a technical analysis of the airport's needs. Development should not exceed the identified demand; however, areas should be identified in which future development is feasible to ensure flexibility as demands change. These additional development areas will provide future growth beyond the planning period that can be integrated into the airport's overall strategic plan without impacting the potential for future airport design standard changes, to the best extent possible. |
| Environmental Factors | Airport growth and expansion has the potential to impact the surrounding environment. The preferred development alternative should seek to minimize environmental impacts in the areas within and outside the airport's boundaries, to the best extent possible. The preferred development alternative should also recognize sensitive environmental features that it may impact to ensure compliance with all applicable local and federal laws. |
| Fiscal Factors | Identification of cost efficient and effective development is paramount during the planning process. Costs should be considered during the alternatives analysis process to meet the identified demand in a reasonable and responsible financial matter. Development alternatives should consider the advantages and disadvantages of any option with respect to construction costs and future maintenance. |
| Sustainability | The four pillars of sustainability (human, social, economic, and environmental) should be referenced throughout all planning processes to ensure future airport development is completed in a method that promotes economic viability, operational efficiency, natural resource conservation, and social responsibility. Opportunities for integration of sustainable climate resilient development is crucial to minimizing the airport's impact on the environment and surrounding community, as well as ensuring the airport's long-term use. |

Source: Atkins

## 5.1. Airfield Enhancement

Airfield facilities are, by nature, the focal point of an airport. Because of their role, and the fact that the majority of airport property is allocated to such infrastructure, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. The runway system requires the greatest commitment of land area and often has the greatest impact on development of other airport facilities both airside and landside.

The potential for physical expansion of an airport to accommodate airfield development is the primary factor that determines an airport's future capabilities. The runway and taxiway systems directly affect the efficiency of aircraft movements both on the ground and in the surrounding terminal and regional airspace. These systems also dictate the types of aircraft that can be accommodated, which can directly affect the types of air service an airport can accommodate. In addition, the efficiency of aircraft movements is affected by local approach and departure procedures, which can be influenced by local restrictions due to noise, airspace congestion, natural and man-made obstructions, or other operational congestions. Necessary airfield modifications are directly correlated with forecasted aviation operations and fleet mix. These necessary modifications have been analyzed with the Demand Capacity and Facility Requirements chapter of this AMP. The Airport's existing capacity was found to be in excess of 60 percent threshold of the Airport's Annual Service Volume (ASV) at which planning for capacity improvements should commence. Necessary capacity enhancing modifications will be presented to ensure the mitigation of future operational delays. The following sections further analyze how the necessary modifications have been implemented in various alternatives, and ultimately, the preferred alternative.

## 5.2. Airside and Landside Facility Enhancement

Airside and landside facilities form a critical backbone to an airport's safe, efficient, and effective operations. While airside infrastructure typically drives the location and availability of developable land, landside facilities form the crucial interface between an airport and its surrounding community that it serves. Ensuring that landside facilities compliment airside infrastructure without interfering with planned future development is paramount, as it has the potential to limit an airport's future expansion opportunities if necessary.

Airside development incorporates those items required by capacity constraints identified in the Demand Capacity and Facility Requirements, as well as those items necessary to meet the current and future design standards as outlined by the FAA.

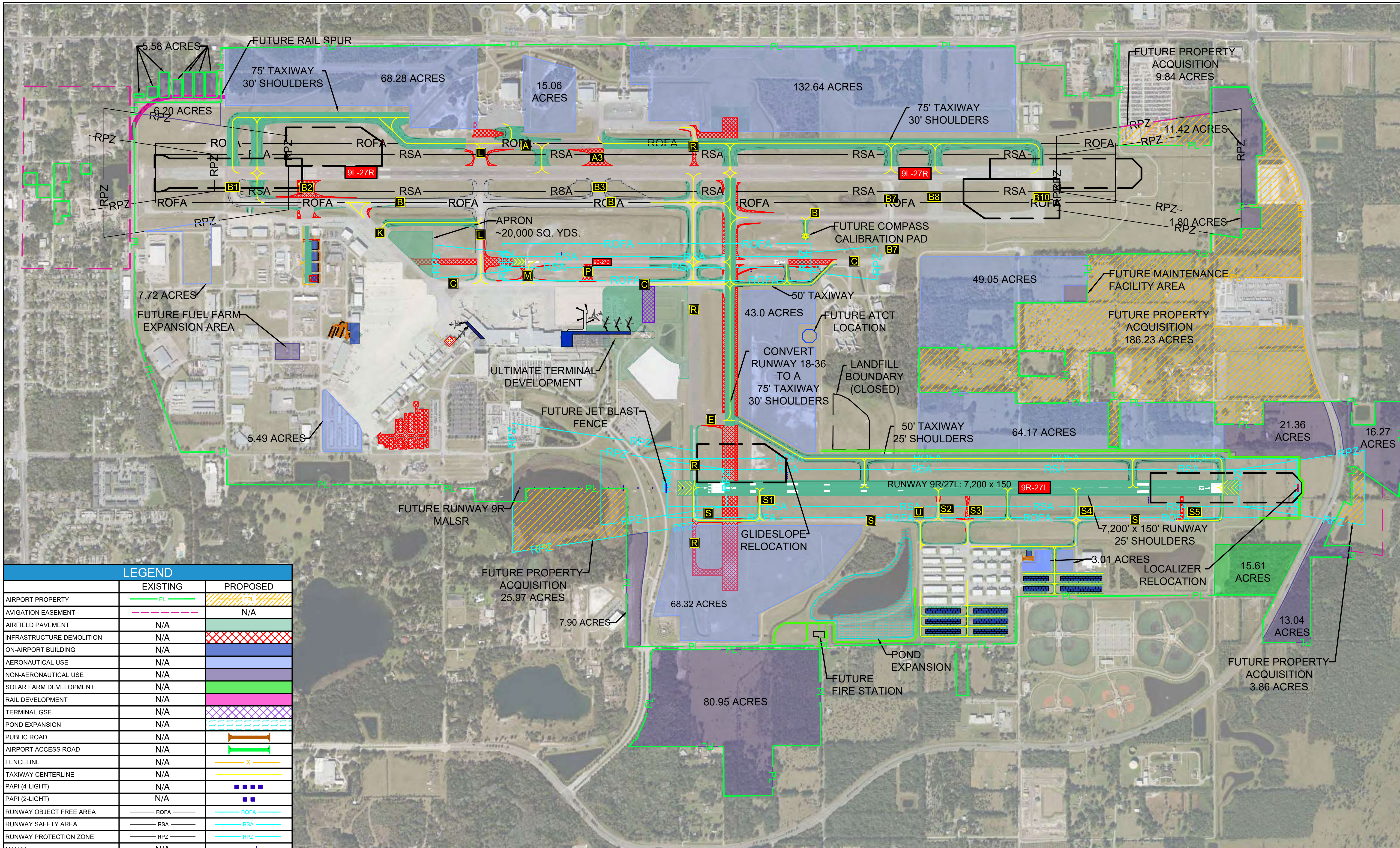
## 5.3. Airport Development Alternatives and Concepts

Airport development alternatives for airside and landside facility modifications were produced for evaluation. The following sections provide details on the three preliminary airport development alternatives. **Figure 5-1**, **Figure 5-2**, and **Figure 5-3** graphically depict the three preliminary airport development alternatives, including airfield and airside development. **Figure 5-4**, **Figure 5-5**, and **Figure 5-6** graphically depict the three preliminary airport landside development alternatives.

# ORLANDO SANFORD INTERNATIONAL AIRPORT

## AIRPORT MASTER PLAN UPDATE

2021




LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| AIRPORT PROPERTY | PL | FPL |
| AVIGATION EASEMENT | | N/A |
| AIRFIELD PAVEMENT | N/A | |
| INFRASTRUCTURE DEMOLITION | N/A | |
| ON-AIRPORT BUILDING | N/A | |
| AERONAUTICAL USE | N/A | |
| NON-AERONAUTICAL USE | N/A | |
| SOLAR FARM DEVELOPMENT | N/A | |
| RAIL DEVELOPMENT | N/A | |
| TERMINAL GSE | N/A | |
| POND EXPANSION | N/A | |
| PUBLIC ROAD | N/A | |
| AIRPORT ACCESS ROAD | N/A | |
| FENCELINE | N/A | X |
| TAXIWAY CENTERLINE | N/A | |
| PAPI (4-LIGHT) | N/A | |
| PAPI (2-LIGHT) | N/A | |
| RUNWAY OBJECT FREE AREA | ROFA | ROFA |
| RUNWAY SAFETY AREA | RSA | RSA |
| RUNWAY PROTECTION ZONE | RPZ | RPZ |
| MALSR | N/A | |

FIGURE 5-1: DEVELOPMENT ALTERNATIVE 1

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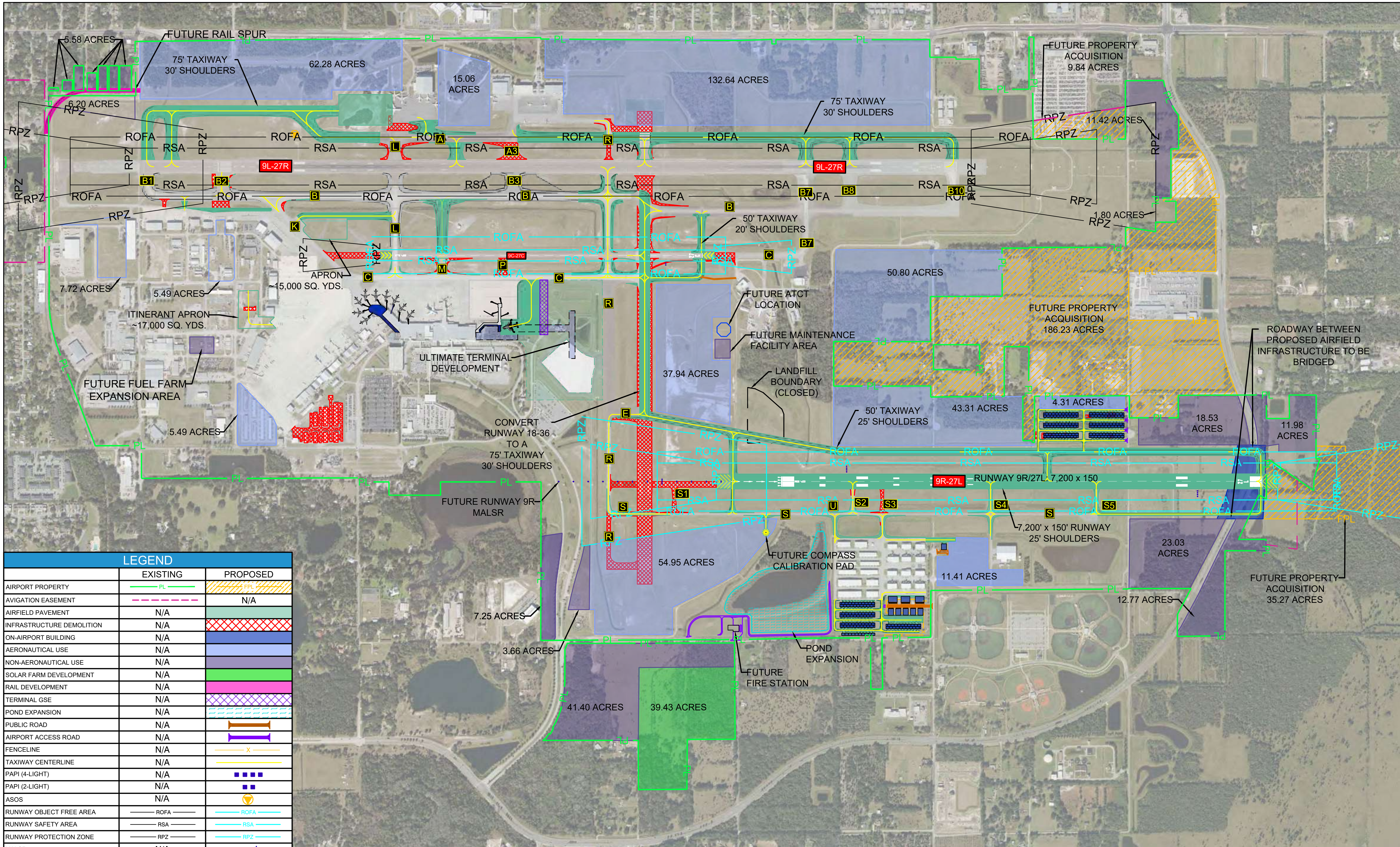


## LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| AIRPORT PROPERTY | PL | FPL |
| AVIGATION EASEMENT | | N/A |
| AIRFIELD PAVEMENT | N/A | |
| INFRASTRUCTURE DEMOLITION | N/A | |
| ON-AIRPORT BUILDING | N/A | |
| AERONAUTICAL USE | N/A | |
| NON-AERONAUTICAL USE | N/A | |
| SOLAR FARM DEVELOPMENT | N/A | |
| RAIL DEVELOPMENT | N/A | |
| TERMINAL GSE | N/A | |
| POND EXPANSION | N/A | |
| PUBLIC ROAD | N/A | |
| AIRPORT ACCESS ROAD | N/A | |
| FENCELINE | N/A | X |
| TAXIWAY CENTERLINE | N/A | |
| PAPI (4-LIGHT) | N/A | |
| PAPI (2-LIGHT) | N/A | |
| ASOS | N/A | |
| RUNWAY OBJECT FREE AREA | ROFA | ROFA |
| RUNWAY SAFETY AREA | RSA | RSA |
| RUNWAY PROTECTION ZONE | RPZ | RPZ |
| MALSR | N/A | |

FIGURE 5-2: DEVELOPMENT ALTERNATIVE 2

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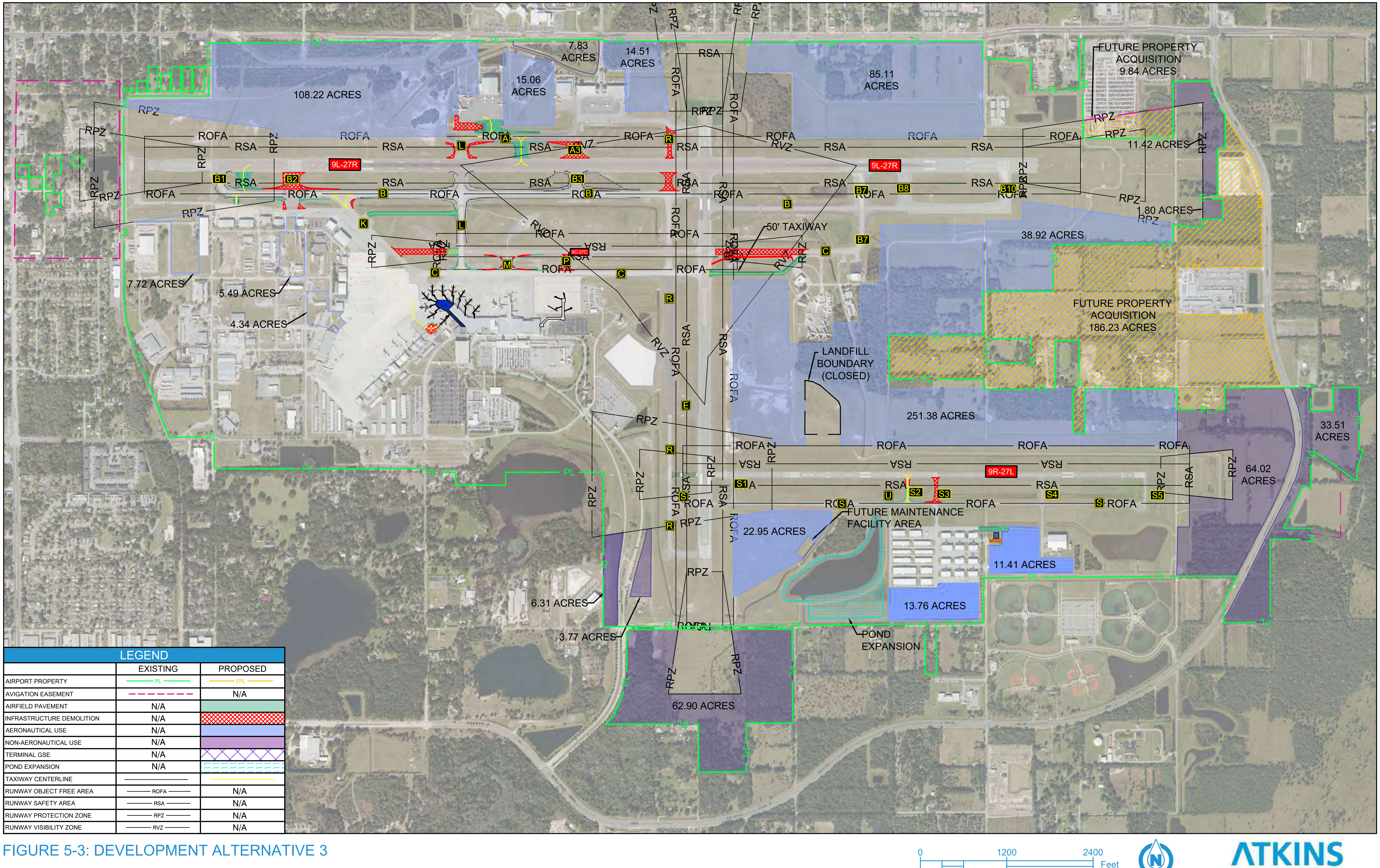
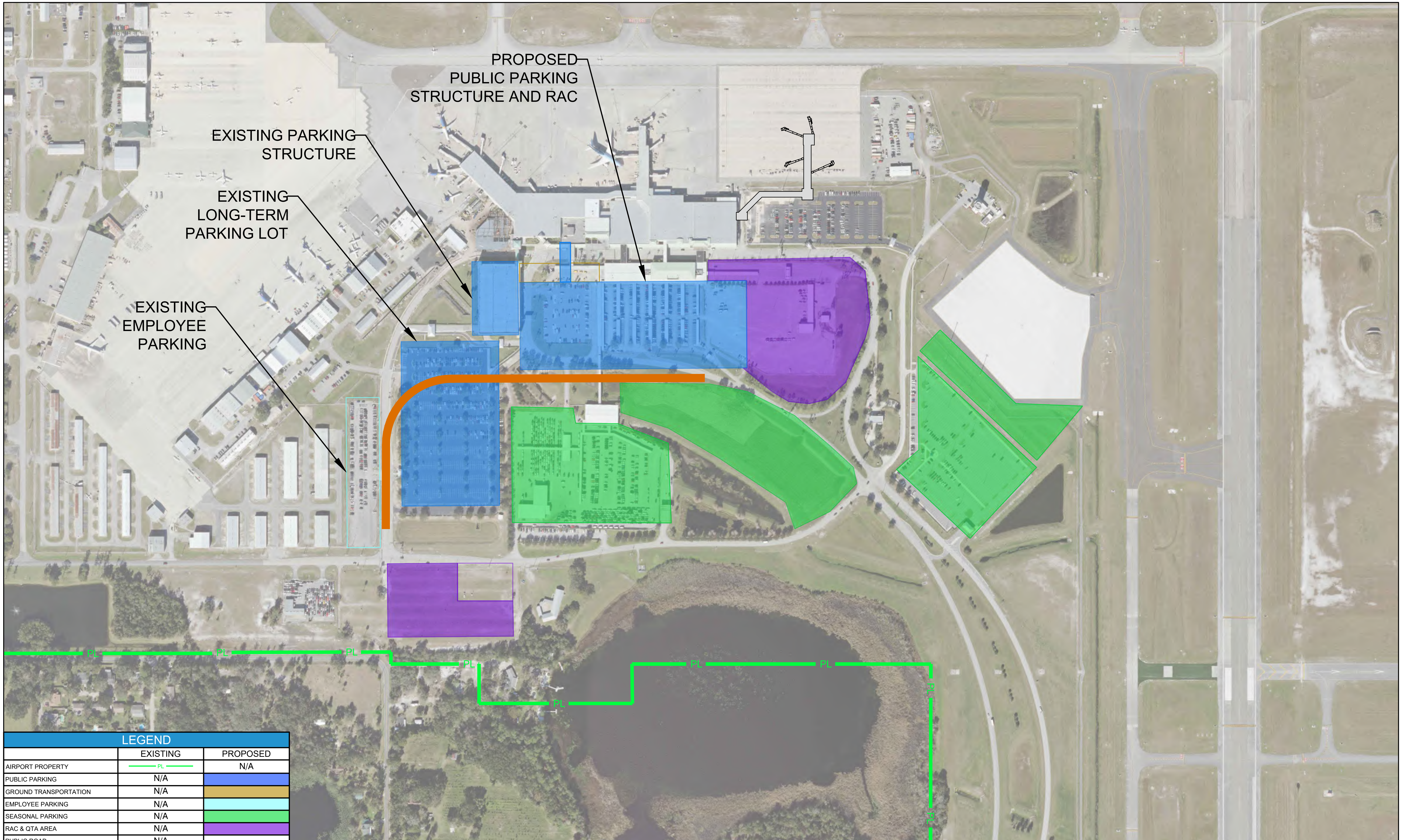



FIGURE 5-3: DEVELOPMENT ALTERNATIVE 3




LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| AIRPORT PROPERTY | PL | N/A |
| PUBLIC PARKING | N/A | |
| GROUND TRANSPORTATION | N/A | |
| EMPLOYEE PARKING | N/A | |
| SEASONAL PARKING | N/A | |
| RAC & QTA AREA | N/A | |
| PUBLIC ROAD | N/A | |

FIGURE 5-4: DEVELOPMENT ALTERNATIVE 1 - LANDSIDE ROADWAY AND PARKING

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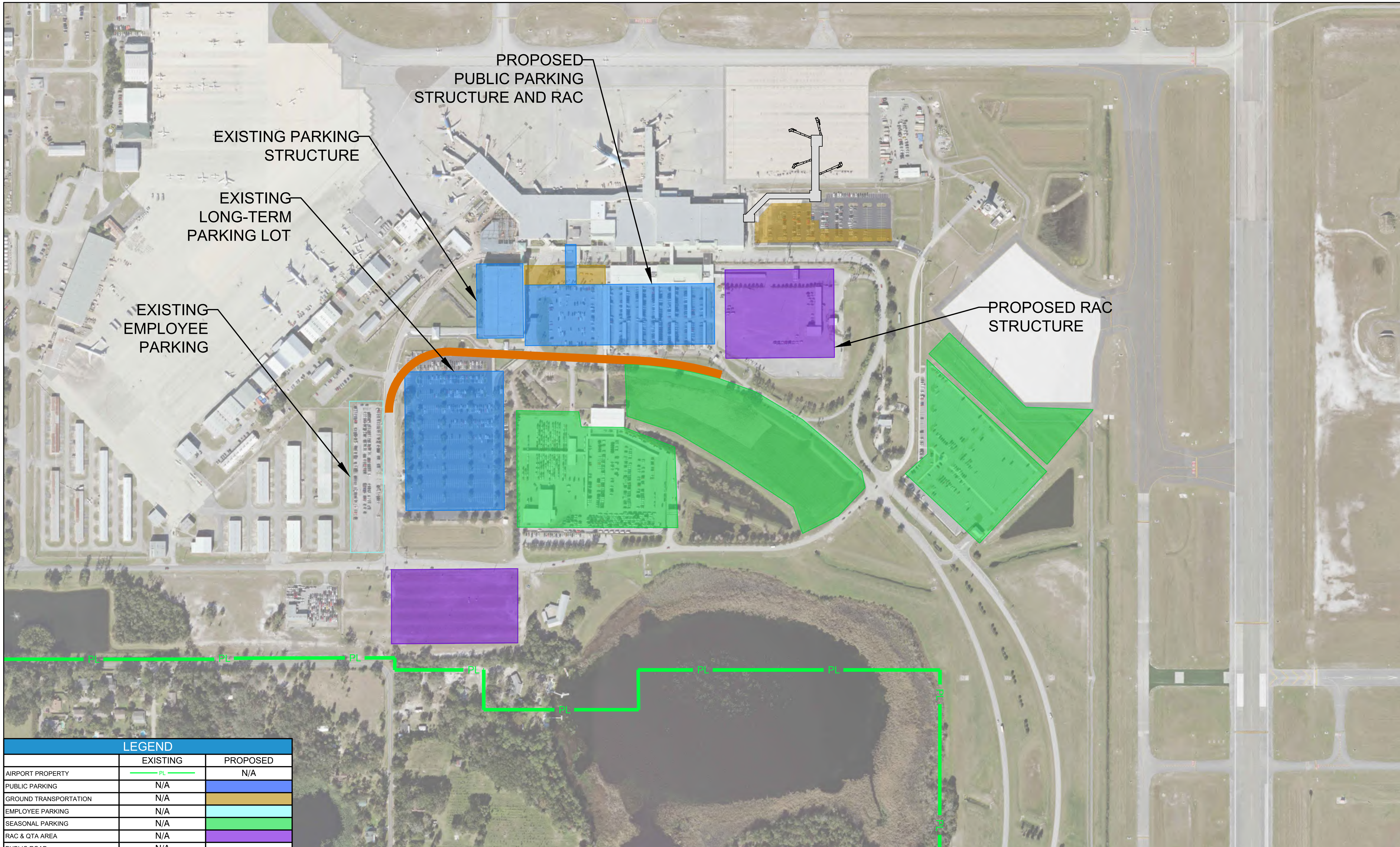


FIGURE 5-5: DEVELOPMENT ALTERNATIVE 2 - LANDSIDE ROADWAY AND PARKING

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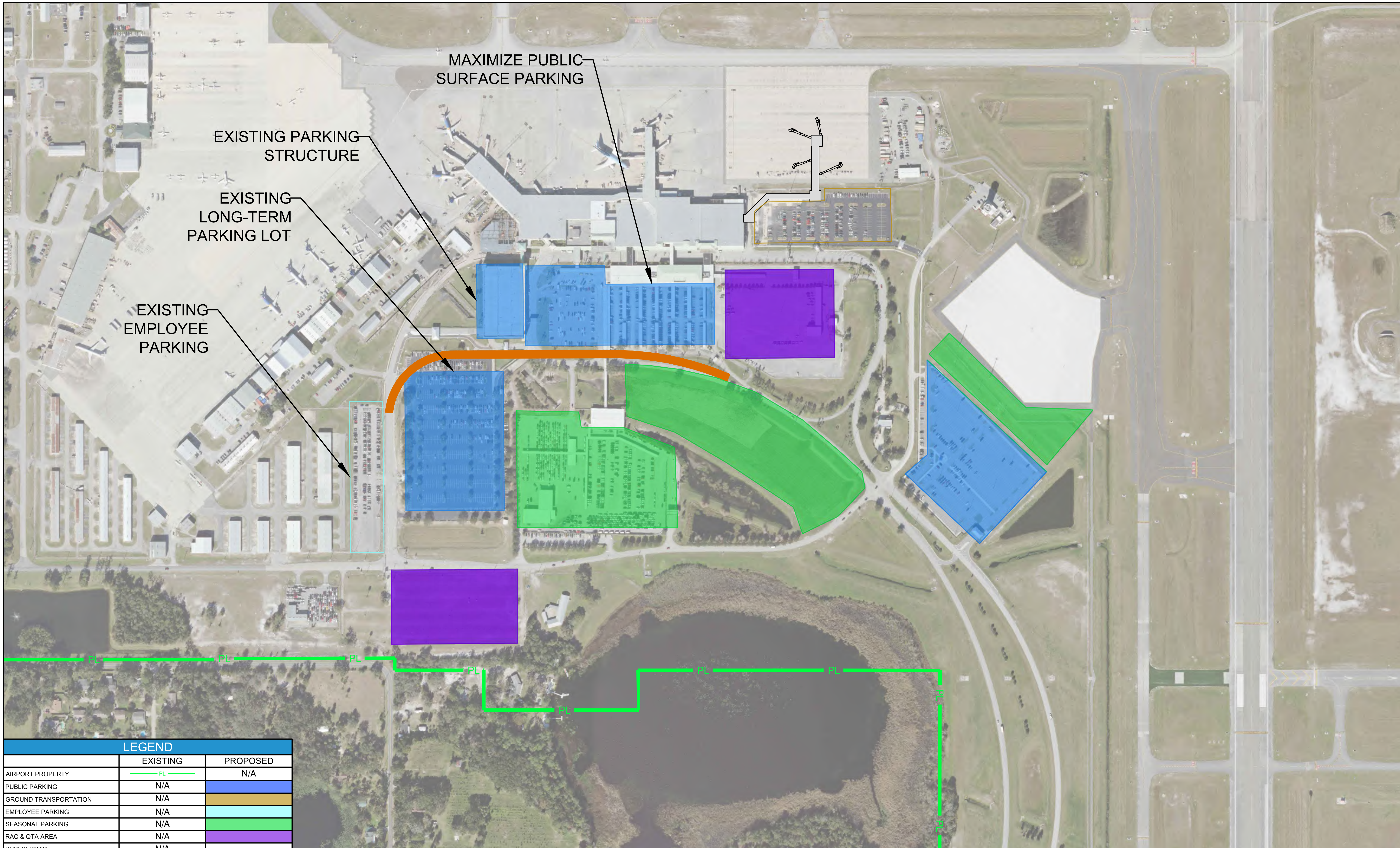


| LEGEND | | |
|---|---|---|
| | EXISTING | PROPOSED |
| AIRPORT PROPERTY | PL | N/A |
| PUBLIC PARKING | N/A | |
| GROUND TRANSPORTATION | N/A | |
| EMPLOYEE PARKING | N/A | |
| SEASONAL PARKING | N/A | |
| RAC & QTA AREA | N/A | |
| PUBLIC ROAD | N/A | |

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FIGURE 5-6: DEVELOPMENT ALTERNATIVE 3 - LANDSIDE ROADWAY AND PARKING

0 400 800 Feet

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## 5.3.1. Runway Modifications

The following sections will discuss recommended runway modifications to both mitigate identified safety hazards, enhance capacity and accommodate growth at the Airport. **Table 5-2** summarizes the proposed runway modifications for each runway for each development alternative.

**Table 5-2 - Runway Modifications Summary**

| Runway | Development Alternatives 1a & 1b | | Development Alternative 2 | Development Alternative 3 |
|---|---|---|---|---|
| Runway 9R/27L | 1a. Split extension for total length of 8,361 feet and Declared Distances | 1b. Split extension for total length of 7,200 feet | Eastward runway shift and extension for a total length of 7,200 feet | No Action |
| Runway 18/36 | Conversion to TDG 5, ADG V taxiway, partial removal | | Conversion to TDG 5, ADG V taxiway, partial removal | No Action |
| Runway 9C/27C | Eastward runway shift of 643 feet (both runway ends) | | Runway 27C end eastward relocation of 643 feet | No Action |
| Runway 9L/27R | No action | | No Action | No Action |

Source: Atkins Analysis

### Runway 9R/27L

The Demand Capacity and Facility Requirements analysis established the future critical aircraft for Runway 9R/27L will be upgraded from the existing King Air 200 (AAC B, ADG II) to the Airbus A320 family (AAC C, ADG III). This upgrade of future critical aircraft is primarily due to a forecasted increase in demand for commercial service operations and their induced capacity constraints should the Airport not provide a way for simultaneous commercial service operations to occur. Runway 18/36 is currently the Airport's secondary commercial service runway. However, due to several reasons such as prevailing winds and air traffic conflicts, it serves less than two percent of the Airport's total operations and could never be used simultaneously with the Airport's other runways. Therefore, enhancing Runway 9R/27L to ensure that two parallel runways at the Airport can meet the needs of forecast demands is vital. As such, it is recommended that Runway 9R/27L is extended to a total length of 7,200 feet and widened to a total width of 150 feet with additional 25-foot shoulders on each side of the runway. The existing runway location is constrained primarily within the landside roads of Red Cleveland Boulevard to the west and East Lake Mary Boulevard to the east, these constraints do provide challenges to future runway development.

#### Development Alternative 1a – Runway Extension to 8,361' and Declared Distances

Development Alternative 1a has been proposed to explore the feasibility of achieving Runway Protection Zones (RPZs) clear of roads or parking lots, which prior to the Fall of 2012 were accepted by the FAA as compatible land uses within an RPZ. The FAA issued their *'Interim Guidance on Land Uses Within a Runway Protection Zone'* Memorandum (RPZ Memo) in the Fall of 2012. This guidance states that the desirable condition is to clear the entire RPZ area of all above ground objects, and any project which introduces transportation facilities such as public roads, highways, and vehicular parking facilities into the RPZ requires coordination with the FAA in order to execute that project.

The intent of the RPZ Memo was to establish policy that addresses new or modified land uses to an RPZ or proposed changes to the size or location of an RPZ. Therefore, elements such as public roads or parking lots which were permissible by FAA standards prior to the RPZ Memo guidelines are considered as temporarily permissible due to the existing condition, or 'grandfathered' situations. Proposed changes to an RPZ resulting from shifts to a runway threshold or upgrades to approach procedure minima for example may allow for undesired elements such as public roads to enter or remain in an RPZ but require further FAA evaluation to ensure that there are no other viable alternatives to avoid introducing the compatible land use. Hence the exploration of this first alternative which is to clear public roads, Red Cleveland, and Lake Mary Boulevards, as well as parking lots from Runway 9R/27L's approach and departure RPZs by applying declared distances.

**Figure 5-7** depicts this declared distances alternative which entails extending the runway 1,716 feet to the east, widening it to 150 feet, and recapturing its original western end, in line with Taxiway Romeo. This alternative also includes displaced thresholds of 2,363 feet and 1,837 feet to the approach ends of Runway 9R and 27L, respectively. Those adjustments would result in an 8,361 feet long by 150 feet wide runway.

**Figure 5-7 - Runway 9R/27L Development Alternative 1a – Declared Distances**


Source: Atkins

The FAA requires declared distances to be published for all runways specified for commercial use, as well as those with certain operational conditions. In order to maintain proper dimensions of proposed runway protective surfaces, such as ROFAs, RSAs, and RPZs, declared distances could be implemented to mitigate issues such as the airport perimeter fence and public roads. **Table 5-3** lists the existing and proposed Runway 9R-27L declared distances for Alternatives 1a and 1b. The required distances needed to provide unrestricted takeoffs and landings by the critical aircraft are 7,200 and 6,520 feet, respectively. Alternative 1a would provide a maximum of 6,800 and 5,863 feet of runway for takeoffs and landings, respectively. As such, Alternative 1a would be deficient by 400 for takeoffs and 657 feet for landings. These deficiencies could require operators to accept load penalties and stage length reductions to utilize Runway 9R/27L.

**Table 5-3 - Existing & Proposed Runway 9R-27L Declared Distances**

| Runway | TORA[1] | TODA[2] | ASDA[3] | LDA[4] |
|---|---|---|---|---|
| Existing 9R | 5,839’ | 5,839’ | 5,839’ | 5,000’ |
| Alt 1a 9R | 6,525’ | 6,525’ | 7,422’ | 5,059’ |
| Alt 1b 9R | 7,200’ | 7,200’ | 7,200’ | 6,937’ |
| Existing 27L | 5,839’ | 5,839’ | 6,264’ | 5,839’ |
| Alt 1a 27L | 6,800’ | 6,800’ | 7,700’ | 5,863’ |
| Alt 1b 27L | 6,537’ | 6,537’ | 6,537’ | 6,537’ |

Source: Atkins analysis, 2021

*Notes:*
1. *TORA = Takeoff Run Available; the runway length declared available and suitable for the ground run of an aircraft taking off.*
2. *TODA = Takeoff Distance Available; the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA.*
3. *ASDA = Accelerate Stop Distance Available; the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff.*
4. *LDA = Landing Distance Available; the runway length declared available and suitable for an aircraft to land.*

**Development Alternative 1b - Split extension for a total length of 7,200 feet**

This alternative proposes to relocate the Runway 9R end approximately 808 feet west, and the Runway 27L end approximately 553 feet east to achieve a 1,361-foot runway extension for a total runway length of 7,200 feet. This split extension would allow for no proposed relocation to either landside road. However, due to the precision approach on the Runway 9R end, a displaced threshold of 263 feet is proposed to mitigate approach impacts to existing infrastructure. The runway centerline is proposed to be shifted 40 feet to the north which allows for each landside roadways to be further from the proposed runway ends.

FAA safety and design criteria provide the standards necessary to operate simultaneous landings and/or takeoffs on two or more parallel runways. Parallel runway centerline separation standards vary based on the type of simultaneous operations that are planned to occur. **Table 5-4** provides various required separation standards. As indicated in that table, the FAA recommends 5,000 feet separation between parallel runway centerlines to achieve unfettered simultaneous approaches and/or departures when it is practical to do so. Runways 9R-27L and 9L/27R are currently separated by 4,300 feet, which is the minimum separation that the FAA normally approves to conduct dual simultaneous precision approach operations. However, the FAA will consider proposals utilizing separations down to a minimum of 3,000 feet for dual precision instrument approaches on parallel runways on a case-by-case basis. Such a reduction would require the Airport's ATC to be equipped with a Precision Runway Monitor (PRM) which is comprised of high-update radar, high-resolution ATC displays, and PRM-certified controllers.

**Table 5-4 - FAA's Parallel Runway Design Separation Requirements**

| Simultaneous Operation(s) Type | Governing Flight Rule | Details | FAA Runway Centerline Separation (Ft.) Standard |
|---|---|---|---|
| Dual or Triple Approaches | IFR | Precision Approaches | 5,000[1] |
| Dual Approaches | IFR | Precision Approaches | 4,300[2] |
| Departures | Non-Radar Controlled | | 3,500 |
| Departures | Radar Controlled | | 2,500 |
| Approach/Departure | Radar Controlled | Runway Thresholds are not staggered | 2,500 |
| Approach/Departure | Radar Controlled | Runway Thresholds are staggered | 1,000 – 2,400[3] |
| Dual Approaches | VFR | Visual Approaches | 1,200[4] |
| Dual Approaches | VFR | Visual Approaches | 700[5] |

Source: FAA AC 150/5300-13A - Change 1, *Airport Design*

*Notes:*

1. *For airports at or below 1,000 feet elevation the FAA Recommends at least 5,000 feet where this is practical.*
2. *Dual simultaneous precision instrument approaches are normally approved on parallel runway centerline separation of 4,300 feet. On a case-by-case basis, the FAA will consider proposals utilizing separations down to a minimum of 3,000 feet where a 4,300-foot separation is impractical. Such a reduction of separation requires special high radar, monitoring equipment, etc.*
3. *When the approach is to the 'near end' (meaning approaching aircraft cross the landing runway threshold before passing by the parallel runway's end), the minimum centerline separation can be reduced by 100 feet for every 500 feet of threshold stagger. However, ADG V and VI runways require a separation of at least 1,200 feet.*
4. *For ADG V – VI aircraft operations. ATC typically treat runways with spacing less than 2,500 feet as single runways when wake turbulence is a factor. ATC practices, such as holding aircraft between the runways, frequently justify greater separation distances.*
5. *For ADG I – IV aircraft operations.*

Proposed declared distances are essential for maintaining FAA compliant Runway Safety Area (RSA) or Runway Object Free Area (ROFA); see **Figure 5-8** and Table 5-3. Unlike Alternative 1a, Red Cleveland Boulevard would remain in Runway 9R/27L's western RPZ surfaces, which is their current disposition and a 'grandfathered' condition by the FAA; depicted in Figure 5-3. However, the western shift removes the Airport's Economy Parking lot from the 9R approach RPZ, which would be an improvement from the current condition, as approximately a quarter of that lot is currently inside the RPZ.

**Figure 5-8 - Runway 9R/27L Development Alternative 1b – Declared Distances**


Source: Atkins

To provide jet blast erosion protection beyond each runway end, it is proposed to have a 200-foot by 200-foot blast pad directly beyond each proposed runway end. These blast pads will be paved and are dimensionally standard per the future Runway 9R/27L's design aircraft. Due to the proximity of Red Cleveland Boulevard to the Runway 9R end, it is proposed that a jet blast fence is placed directly beyond the runway's RSA and ROFA. This will ensure that jet blast does not negatively impact vehicles traveling north bound on Red Cleveland Boulevard.

The approach lighting systems (ALS) on both runway ends will be relocated as appropriate with the Runway 9R/27L split extension and centerline shift. The Runway 9R medium approach light system (MALSR) will be shifted as appropriate, with sections of the MALSR requiring installation within Golden lake. These sections of the lighting system can be supported with necessary equipment and infrastructure to be placed within the lake. The Runway 27L PAPI will be shifted east as appropriate to continue to support non-precision approaches to the Runway 27L end.

Property acquisition is along the inner approach corridor for both runway ends to ensure that all shifted RPZ surfaces are kept within airport property. This property acquisition of 25.97 acres primarily consists of Golden lake and the direct lake frontage. The Runway 27L proposed RPZ property acquisition of 3.86 acres consists of unimproved areas adjacent to the existing right of way for E. Lake Mary Blvd.

**Development Alternative 2 – Runway extension and eastern shift creating Lake Mary Boulevard Tunnel**

To analyze the extension of Runway 9R/27L to accommodate the anticipated future critical aircraft, it has been proposed on Development Alternative 2 to expand and shift the runway eastward. A proposed eastward shift and subsequent extension over Lake Mary Boulevard could provide a total runway length of 7,200 feet. Similar to Development Alternative 1b, it is proposed to shift the runway centerline 40 feet to the north and widen the runway to a total width of 150 feet with additional 25-foot paved shoulders on each side of the runway. It is then proposed to relocate the Runway 9R end approximately 876 feet east, with a 678-foot displaced threshold. This threshold configuration could accommodate the determined critical aircraft landing distance of 6,520 feet when landing on Runway 9R; the only proposed declared distance as depicted in **Figure 5-9**. These adjustments to the Runway 9R end could ensure that both the approach and departure RPZs do not impact Red Cleveland Boulevard.

Relocating the Runway 27L approach end 2,236 feet to the west would require the entire runway to be graded and properly raised to allow for the bridging of the necessary portions of Lake Mary Boulevard that are impacted by the proposed runway extension and associated taxiway extensions. This grading and raising of the runway would be required to be compliant with the FAA's *Airport Design* Advisory Circular 150/5300-13A to align with required runway grading to accommodate a minimum 17-foot roadway clearance. The approximate impacted length of Lake Mary Boulevard is 1,256 feet of roadway, with two pairs of combined lanes (four lanes total) requiring the overhead bridges for the airfield infrastructure. To provide jet blast erosion protection beyond each runway end, it is proposed to equip each runway end with a 200 by 200-foot blast pad. Those blast pads would be paved and are dimensionally standard per the future Runway 9R/27L's design aircraft. It is proposed to remove the existing runway pavement from the existing Runway 9R end to the proposed Runway 9R blast pad.

**Figure 5-9 - Runway 9R/27L Development Alternative 2 – Declared Distances**


Source: Atkins

The Runway's approach lighting systems (MALSR, PAPI, etc.) and instrument landing system (ILS) equipment (glideslope and localizer) would need to be relocated as appropriate with this proposed Runway 9R/27L shift and extension. The Runway 9R MALSR will be shifted as appropriate, with all pieces of the ALS system being retained on land.

Necessary property acquisition is proposed beyond the Runway 27L end to accommodate relocated airfield infrastructure and to ensure that the RSA, ROFA and RPZ surfaces are kept within airport property. This property acquisition of approximately 35 acres primarily consists of vacant and unimproved land owned by the St. Johns Water Management District.

#### Development Alternative 3 – No Action

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 9R/27L's existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period. This no-action alternative is presented for the evaluation of the financial costs and potential environmental impacts that could be associated with the proposed enhancement of Runway 9R/27L.

### Runway 18/36

#### Development Alternative 1 - Conversion to TDG 5, ADG V taxiway and partial pavement removal

The existing airport capacity is becoming constrained with increased annual demand. This trend is anticipated to continue throughout the planning period, with forecasted annual demand reaching 85 percent of existing capacity by 2037 as was reported previously in Table 4-14. Additionally, it was previously identified that the existing east-west runways (Runway 9L/27R, Runway 9R/27L, and Runway 9C/27C) have over 95 percent wind coverage for existing and projected operations. This wind coverage percent threshold identifies that the Airport does not require the support of a crosswind runway, therefore classifying Runway 18/36 as a secondary runway.

When Runway 18/36 is in operation, the Airport's capacity drops from a three-parallel runway to a single runway airport. As Table 4-13 previously depicted, the Airport's hourly capacity drops from 353 to 121 operations per hour during VFR conditions from Scenario 1 (three parallel runways) to Scenario 3 (single runway), respectively and from 118 to 60 operations per hour during IFR conditions from Scenario 2 to Scenario 4, respectively. As such, the Airport's Annual Service Volume (ASV) would increase if Runway 18/36 was decommissioned. As such, to increase capacity, Development Alternative 1 proposes that Runway 18/36 be decommissioned and converted into a TDG 5, ADG V taxiway. That taxiway would be 75 feet wide and be equipped with the required 30-foot-wide paved shoulders on each side. The existing Runway 18/36 pavement, including shoulders, is 200 feet wide, therefore it is required to remove 32.5 feet of pavement from each side to achieve the standard taxiway and shoulder pavement width.

This proposed runway to taxiway conversion would allow for the removal of all instances of intersecting runways at the Airport, therefore enhancing safety and capacity. In addition, decommissioning Runway 18/36 and converting it to a taxiway would substantially regain developmental airport property currently confined by the runway's multiple RPZ and Runway Visibility Zone (RVZ) surfaces. Developable areas to the north, south, and east of existing Runway 18/36 could be opened to aeronautical and non-aeronautical development. This change would also be necessary to ultimately extend the Airport's passenger terminal facilities linearly to the east.

The portion of Runway 18/36 pavement south of the proposed Runway 9R/27L extension is proposed to be removed, except for necessary pavement for Taxiway S. This pavement removal would allow for proposed aeronautical development south of Taxiway S.

The proposed TDG 5, ADG V taxiway would begin at the northern edge of the Runway 9R/27L extension where the runway extension intersects with the existing Runway 18/36 pavement. This taxiway will then continue north along the existing runway pavement, crossing Runway 9C/27C and Runway 9L/27R, connecting into the proposed Taxiway A extension. The remaining existing Runway 18/36 pavement north of the proposed Taxiway A extension is planned for removal to reclaim this portion of property.

#### Development Alternative 2 - Conversion to TDG 5, ADG V taxiway and partial pavement removal

Development Alternative 2 is similar to what is proposed and described within Development Alternative 1. However, it is proposed on Development Alternative 2 that the Runway 18/36 taxiway conversion does not provide a southern runway entrance onto Runway 9L/27R to avoid introducing a runway crossing within the middle one-third of the runway. The existing Runway 18/36 pavement would be utilized to provide necessary taxiway fillet geometry between the Taxiway B crossing the existing runway pavement. A northern runway entrance would be retained off of the proposed Taxiway A extension utilizing the existing Runway 18/36 pavement. Additionally, the southern portion of the existing Runway 18/36 taxiway conversion would cease at the proposed Runway 9R/27L north parallel End Around Taxiway (EAT), aligned with existing Taxiway E. All existing Runway 18/36 pavement south of this point is proposed to be removed excluding what will be necessary for the continuation of Taxiway S.

#### Development Alternative 3 – No Action

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 18/36 as existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period.

### Runway 9C/27C

#### Development Alternative 1 – Runway 'Shift'

Development Alternative 1 proposes a shift to the Runway 9C and Runway 27C ends approximately 643 feet to the east, maintaining the runway's existing length. That shift would allow for the future Runway 9C RPZ to be situated outside of the GA apron area and Taxiway K. The eastern portion of this proposed shift is currently in-line Taxiway C which maintains the runway's width and would not require improvements other than marking and signage to be converted to runway pavement. To analyze the configuration of Runway 9C/27C where the Runway 9C RPZ does not encompass a portion of GA apron, it is proposed within Development Alternative 1 to shift the Runway 9C and Runway 27C ends approximately 643 feet to the east. This will allow for the future Runway 9C RPZ to be shifted east and outside of Taxiway K and the portion of the GA apron area. The existing runway pavement from the relocated Runway 9C end to the eastern edge of existing Taxiway L is proposed to be removed eliminating the existing in-line Taxiway K1. Taxiway L would be preserved, but ATC would need to hold aircraft with tails higher than 19 feet from crossing through the 9C approach RPZ when aircraft have been cleared to land on 9C.

#### Development Alternative 2 – Runway Extension

The existing Runway 9C/27C is 3,578 feet long with a King Air 200 design aircraft. According to the aircraft performance manual for the King Air 200, the design aircraft requires 4,200 feet of available takeoff length at maximum takeoff weight (MTOW). In order to accommodate the takeoff requirements for the runway design aircraft a minimum extension of 622 feet to enhance is required. Alternative 2 proposes a 643 feet eastern 'shift', like

Alternative 1, to the Runway 27C approach end, with the Runway 9C approach end staying in its existing location. That runway end 'shift' would effectively extend Runway 9C/27C to a total of 4,221 feet. This alternative also includes 150 feet long by 95 feet wide blast pads be implemented at both ends of the runway.

**Development Alternative 3 – No Action**

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 9C/27C as existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period.

#### Runway 9L/27R

**Development Alternatives 1, 2, and 3**

Due to the adequate length and width of the Runway 9L/27R existing pavement in accordance with the identified runway design aircraft, there are no recommended modif8ications to the runway proposed for the planning period.

### 5.3.2. Taxiway Modifications

The following sections discuss both required taxiway modifications to mitigate high risk or non-standard taxiways, or recommended modifications to enhance the Airport's taxiway infrastructure to promote aeronautical growth. These presented modifications will be discussed in further detail between the three preliminary alternatives.

**Required Taxiway** Improvements

The following are existing taxiway configurations requiring modifications. If feasible, various methods of mitigation will be evaluated throughout the three development alternatives:

- Taxiway A3: Direct access provided from the existing north FBO apron to Runway 9L/27R
- Taxiway B2: Direct access provided from the GA apron south of Taxiway B to Runway 9L/27R
- Taxiway C (Western Portion): Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 27C end
- Taxiway K1: Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 9C end
- Taxiway P: Non-standard compass calibration pad location and fillet geometry
- Taxiway R: Portion of taxiway crossing Runway 9L/27R creates a middle-third configuration
- Taxiway S3: Direct access provided from the southeast general aviation area to Runway 9R/27L
- Avocet Taxiway Connector: Direct access provided from the existing Avocet apron to Runway 9L/27R via Taxiway L

#### Taxiway A

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

Taxiway A, a north partial parallel taxiway to Runway 9L/27R, currently extends approximately 1,600 feet between Taxiways A3 and L. To increase aircraft operational ground maneuvering flow and to promote aeronautical growth on the northern portion of the Airport, it is recommended in both Development Alternative 1 and Development Alternative 2 to extend Taxiway A along Runway 9L/27R creating a full north parallel taxiway. Taxiway A should be sized to accommodate the critical design aircraft Boeing 787-8 (ADG V, TDG 5) with a 75-foot taxiway width and 30 feet wide shoulders.

To eliminate direct access from Constant Aviation's aircraft parking apron onto Runway 9L/27R via Taxiway A3, it is proposed to relocate the A3 connector approximately 755 feet west. To eliminate direct access from the Avocet apron to Runway 9L/27R via Taxiway L, it is proposed to relocate this apron taxiway connector by approximately 422 feet to the east. Proposed Taxiway A connectors to Runway 9L/27R offer access to each end respectively, and runway crossings mirroring Taxiway B7 and Taxiway B8. A bypass connector is proposed on the Runway 9L end to allow for reduction in aircraft queuing delay by providing multiple runway entry points.

The proposed Taxiway A extension is separated from Runway 9L/27R's centerline by 400 feet in accordance with required design standards. However, this separation increases to 753 feet for the remaining 1,935 feet of the proposed Taxiway A pavement due to the proposed relocation and future enhancement of the glideslope antenna and associated shelter (located between Runway 9L/27R and proposed Taxiway A).

**Development Alternative** 3 (Figure 5-3)

Development Alternative 3 proposes only the necessary direct access mitigation of Taxiway A3 and the Avocet apron taxiway connector as described for the Development Alternatives 1 and 2. No additional changes for Taxiway A are proposed within this alternative.

### Taxiway B

**Development Alternatives 1 and 3** (Figures 5-1 and 5-3)

The existing location of Taxiway B2 creates a direct access configuration from the GA apron located south of Taxiway B to the Runway 9L threshold. To mitigate the direct access configuration, it is proposed to shift the Taxiway B2 connector west to create a bypass taxiway configuration parallel with existing Taxiway B1. This will allow for an additional runway crossing on Development Alternative 1 with the proposed extension of Taxiway A and the proposed bypass connector on the northern side of the runway. Additionally, this bypass would allow for the decrease of aircraft queuing times. The fillet geometry and shoulders are proposed to be enhanced per design standards on the connector from Taxiway B onto the GA apron, as well as at the intersection of Taxiway R.

**Table 5-5** summarizes the taxiway modifications for each development alternative.

### Required Taxiway Improvements

The following are existing taxiway configurations requiring modifications. If feasible, various methods of mitigation will be evaluated throughout the three development alternatives:

- Taxiway A3: Direct access provided from the existing north FBO apron to Runway 9L/27R
- Taxiway B2: Direct access provided from the GA apron south of Taxiway B to Runway 9L/27R
- Taxiway C (Western Portion): Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 27C end
- Taxiway K1: Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 9C end
- Taxiway P: Non-standard compass calibration pad location and fillet geometry
- Taxiway R: Portion of taxiway crossing Runway 9L/27R creates a middle-third configuration
- Taxiway S3: Direct access provided from the southeast general aviation area to Runway 9R/27L
- Avocet Taxiway Connector: Direct access provided from the existing Avocet apron to Runway 9L/27R via Taxiway L

### Taxiway A

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

Taxiway A, a north partial parallel taxiway to Runway 9L/27R, currently extends approximately 1,600 feet between Taxiways A3 and L. To increase aircraft operational ground maneuvering flow and to promote aeronautical growth on the northern portion of the Airport, it is recommended in both Development Alternative 1 and Development Alternative 2 to extend Taxiway A along Runway 9L/27R creating a full north parallel taxiway. Taxiway A should be sized to accommodate the critical design aircraft Boeing 787-8 (ADG V, TDG 5) with a 75-foot taxiway width and 30 feet wide shoulders.

To eliminate direct access from Constant Aviation's aircraft parking apron onto Runway 9L/27R via Taxiway A3, it is proposed to relocate the A3 connector approximately 755 feet west. To eliminate direct access from the Avocet apron to Runway 9L/27R via Taxiway L, it is proposed to relocate this apron taxiway connector by approximately 422 feet to the east. Proposed Taxiway A connectors to Runway 9L/27R offer access to each end respectively, and runway crossings mirroring Taxiway B7 and Taxiway B8. A bypass connector is proposed on the Runway 9L end to allow for reduction in aircraft queuing delay by providing multiple runway entry points.

The proposed Taxiway A extension is separated from Runway 9L/27R's centerline by 400 feet in accordance with required design standards. However, this separation increases to 753 feet for the remaining 1,935 feet of the proposed Taxiway A pavement due to the proposed relocation and future enhancement of the glideslope antenna and associated shelter (located between Runway 9L/27R and proposed Taxiway A).

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 proposes only the necessary direct access mitigation of Taxiway A3 and the Avocet apron taxiway connector as described for the Development Alternatives 1 and 2. No additional changes for Taxiway A are proposed within this alternative.

### Taxiway B

**Development Alternatives 1 and 3** (Figures 5-1 and 5-3)

The existing location of Taxiway B2 creates a direct access configuration from the GA apron located south of Taxiway B to the Runway 9L threshold. To mitigate the direct access configuration, it is proposed to shift the Taxiway B2 connector west to create a bypass taxiway configuration parallel with existing Taxiway B1. This will allow for an additional runway crossing on Development Alternative 1 with the proposed extension of Taxiway A and the proposed bypass connector on the northern side of the runway. Additionally, this bypass would allow for the decrease of aircraft queuing times. The fillet geometry and shoulders are proposed to be enhanced per design standards on the connector from Taxiway B onto the GA apron, as well as at the intersection of Taxiway R.

**Table 5-5 - Taxiway Modifications Summary**

| Taxiway | Development Alternative 1 | Development Alternative 2 | Development Alternative 3 |
|---|---|---|---|
| Taxiway A | • Taxiway A3 relocation<br>• Full north parallel taxiway to Runway 9L/27R<br>• Entrance taxiway bypass connector – 9L end | • Taxiway A3 relocation<br>• Full north parallel taxiway to Runway 9L/27R<br>• Entrance taxiway bypass connector – 9L end | • Taxiway A3 relocation |
| Taxiway B | • Taxiway B2 relocation<br>• Taxiway B apron connector enhancement | • Taxiway B2 enhancement<br>• Taxiway B apron connector relocation | • Taxiway B2 relocation<br>• Taxiway B apron connector enhancement |
| Taxiway C | • East taxiway jog & taxiway removal up to Runway 27C end | • East taxiway jog & taxiway removal up to Runway 27C end | • East taxiway jog & taxiway removal up to Runway 27C end |
| Taxiway E | • No action | • No action | • No action |
| Taxiway K | • Taxiway K1 relocation | • Taxiway K1 relocation | • Taxiway K1 relocation |
| Taxiway L | • N/A | • N/A | • N/A |
| Taxiway M | • Modification to accommodate Runway 9C end relocation – Runway end entrance taxiway | • Extension across Runway 9C/27C up to Taxiway B<br>• Fillet enhancement | • Fillet enhancement |
| Taxiway P | • Taxiway removal | • Taxiway removal | • Taxiway removal |
| Taxiway R | • Removal south of Taxiway S intersection | • Removal south of Taxiway S intersection | • Removal north of Runway 9L/27R |

| Taxiway | Development Alternative 1 | Development Alternative 2 | Development Alternative 3 |
|---|---|---|---|
| | • Removal north of Runway 9L/27R | • Removal north of Runway 9L/27R | |
| Taxiway S | • Taxiway S1, S2, and S4 fillet enhancement<br>• Taxiways S3, and S5 relocation | • Taxiway S2, and S4 fillet enhancement<br>• Taxiways S1, S3, and S5 relocation | • Taxiway S2 fillet enhancement<br>• Taxiway S3 removal |
| Taxiway U | • Fillet enhancement | • Fillet enhancement | • No action |
| Proposed Runway 9R/27L North Partial Parallel | • North partial parallel taxiway | • North partial parallel taxiway with EAT configuration | • No Action |

Source: Atkins Analysis

**Development Alternative 2** (Figure 5-2)

To mitigate the identified direct access created by Taxiway B2, Development Alternative 2 proposes to retain the existing location of Taxiway B2 and enhance the connector fillet geometry per design standards while removing the Taxiway B to GA apron connector. An enhancement of existing pavement west of the removed taxiway to apron connector will allow for a standard taxiway connector between Taxiway B and the GA apron.

### Taxiway C

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

The eastern portion of Taxiway C leading into Runway 9C/27C is considered an 'aligned taxiway' (also known as an 'inline taxiway') which no longer meets FAA design standards and poses a safety hazard. This aligned taxiway creates an operational hazard where aircraft can inadvertently taxi into the approach or departure paths of aircraft landing on or taking off from Runways 27C or 9C, respectively. Additionally, this configuration can create situational awareness issues for both pilots operating on Taxiway C and Runway 9C/27C. Two development alternatives were planned to mitigate this aligned taxiway condition. Both Development Alternatives 1 and 2 propose the western portion of Taxiway C be extended eastward across existing Runway 18/36.

The Development Alternative 1 plans that the Taxiway C extension make a 'dog leg' turn to tie into the eastern remaining portion of Taxiway C. That new taxiway alignment is planned to ensure that no Taxiway Object Free Area (TOFA) impacts are created to the existing ARFF station. The eastern portion of Taxiway C pavement is planned to be removed from the proposed taxiway 'dog leg' alignment west to the proposed relocated Runway 27C approach end. Even though not directly connected to Runway 9C/27C, this would leave approximately 760 linear feet of Taxiway C 'inline' with Runway 9C/27C and would require ATC to hold aircraft with tails higher than 12.5 feet from entering the Runway 27C approach RPZ when aircraft are cleared to land or depart to Runway 27C or 9C, respectively. A visual screen to eliminate false perceptions of runway incursions would be required between the 'dog leg' portion of the taxiway and the ROFA. A new taxiway connector is proposed south of the relocated Runway 27C approach end.

Development Alternative 2 proposes that the extension of Taxiway C end at the 90-degree runway-end connector, and includes an additional northern runway end connector to tie the Runway 27C approach end to Taxiway B. A portion of existing Taxiway C, approximately 275 linear feet long, would be removed between the proposed 27C blast pad and existing ARFF road connection, and a new portion of ARFF road would connect the ARFF's main facilities to the proposed new Taxiway C. The remaining portions of existing Taxiway C would only service the Seminole County Sheriff's operations and the occasional tugs of aircraft to the Avocet aircraft 'bone-yard' located southwest of the ARFF building. ATC would need to hold arrivals to 27C or departures from 9C while aircraft with tails higher than 31 feet being ferried to the 'bone-yard'.  Development Alternative 2 also plans to include 20-foot shoulders along the extended Taxiway C due to the ADG III design aircraft. Per FAA AC 150/5300-13A, taxiways serving a design aircraft of ADG III are 'recommended', not 'required', to have supporting taxiway shoulders.

**Development Alternative 3** (Figure 5-3)

In Development Alternative 3, Runway 9C/27C is preserved as its existing condition. To mitigate the aligned taxiway on the western portion of Taxiway C, it is proposed to extend the western portion of Taxiway C across Runway 18/36 and tie into the eastern portion of Taxiway C similar to Development Alternatives 1 and 2. However, the pavement removal on the western portion of Taxiway C will include all pavement from the extended Taxiway C jog up to the existing Runway 27C end.

### Taxiway E

**Development Alternatives 1, 2 and 3** (Figures 5-1, 5-2, and 5-3)

Taxiway E was found to be compliant of all current design standards in accordance with the established design aircraft. Therefore, there are no proposed modifications for Taxiway E on all three development alternatives.

### Taxiway K

**Development Alternatives 1, 2 and 3** (Figures 5-1, 5-2, and 5-3)

Existing Taxiway K1 is proposed to be relocated north approximately 530 feet. The purpose of that relocation is to eliminate the existing aligned taxiway configuration with Runway 9C/27C and FAA identified 'Hot Spot'. The relocated Taxiway K1 would be parallel to Taxiway B and their centerlines would be separated by 267 feet. Relocated Taxiway K1 would connect Taxiways K and L. The proposed Taxiway K1 relocation has a design aircraft of TDG 3, ADG III.

### Taxiway L

**Development Alternatives 1, 2 and 3** (Figures 5-1, 5-2, and 5-3)

Fillet enhancements and adjustments were just completed in 2020 for Taxiway L at its Taxiways A and C intersections. Those fillet enhancements meet the required taxiway fillet geometry standards, therefore no other modifications to Taxiway L are proposed.

### Taxiway M

**Development Alternative 1** (Figure 5-1)

Due to the proposed shift of Runway 9C/27C in Development Alternative 1, Taxiway M is proposed to be converted to a taxiway connector onto the Runway 9C approach end with fillet modification. Taxiway M will retain TDG 5, ADG V design standards, as it is planned to be used by the Airport's largest aircraft traversing between the terminal apron and Runway 9L/27R.

**Development Alternative 2** (Figure 5-2)

An extension of Taxiway M is proposed across Runway 9C/27C north to existing Taxiway B. This would allow for additional available taxi routes between the north side of the Airport to the commercial terminal area. This Taxiway M extension will accommodate a design aircraft up to TDG 5, ADG V which will require taxiway fillet enhancement for existing Taxiway M and Taxiway C intersection Due to the TDG 2 critical aircraft established on Runway 9C/27C, the Taxiway M intersection with Runway 9C/27C can accommodate TDG 5 crossing operations however the turnout operations onto the Runway is designed for TDG 2 operations. The proposed taxiway extension will impact the existing ASOS location, which will be required to be relocated. This relocation will be discussed in subsequent sections.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 proposes taxiway fillet enhancement to serve TDG 5, ADG V design standards. However, no other extension or modifications for Taxiway M is proposed on this development alternative.

### Taxiway P

**Development Alternatives 1, 2, and 3** (Figures 5-1, 5-2, and 5-3)

Due to the existing non-standard pavement geometry of Taxiway P and the redundant taxiway connector along Runway 9C/27C, Taxiway P is proposed to be removed from all three development alternatives. Relocation alternatives of the compass calibration pad currently located on Taxiway P are presented in section 5.3.7.3.

### Taxiway R

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

To mitigate the existing non-standard middle-third crossing on Runway 9L/27R, it is proposed to remove the portion of Taxiway R pavement north of the runway. Portions of this pavement will be retained and utilized as part of the proposed Taxiway A extension.

Taxiway R currently has insufficient shoulders to serve TDG 5, ADG V aircraft from Runway 9L/27R to the terminal environment. To correct this deficiency, 30-foot-wide compliant shoulders are proposed to be added on Taxiway R between Runway 9L/27R and Taxiway C. Additional 20-foot pavement shoulders are proposed for Taxiway R between Taxiway E and the proposed Runway 9R end. This portion of Taxiway R is anticipated to accommodate TDG 3, ADG III aircraft to support the future anticipated Runway 9R/27L commercial service operations.

The section of Taxiway R from the proposed Runway 9R approach end relocation on Development Alternative 1 and the proposed runway removal on Development Alternative 2 down to Taxiway S will be enhanced for TDG 2, ADG II design standards. Regarding the proposed Runway 18/36 taxiway conversion and partial Runway 18/36 pavement removal, it is proposed to remove the portion of Taxiway R south of Taxiway S. This area will then be reclaimed for future aeronautical or non-aeronautical development.

**Development Alternative 3** (Figure 5-3)

To mitigate the existing non-standard middle-third crossing on Runway 9R/27L, it is proposed to remove the portion of Taxiway R north of the runway.

### Taxiway S

**Development Alternative 1** (Figure 5-1)

Taxiway Connectors S1, S2, and S4 are proposed to have fillet enhancements to ensure compliance with design standards for TDG 2, ADG II aircraft. Due to the existing non-standard direct access configuration provided by Taxiway S3, it is proposed to relocate Taxiway S3 approximately 545 feet east along Runway 9R/27L. This placement will allow for increased exit factor along the south parallel runway due to the increased separation between Taxiway S2.

Due to the proposed Runway 27L eastward relocation, it is proposed to relocate Taxiway S5 in to accommodate the proposed runway end relocation.

**Development Alternative 2** (Figure 5-2)

Similar to Development Alternative 1, Taxiways S2 and S4 are proposed to have fillet enhancements. Additionally, Taxiway S5's fillet geometry is planned to be enhanced and Taxiway S3 be removed to mitigate its direct access configuration. Due to the proposed Runway 9R/27L eastward shift, Taxiway S1 is planned move to the relocated Runway 9R approach end and extend Taxiway S by 2,208 feet east providing access to the relocated Runway 27L approach end.

An EAT configuration is proposed on the Runway 9R/27L parallel taxiway to ensure that no impacts are caused to the approach surface for Runway 9R. The feasibility of an EAT configuration was analyzed for Taxiway S and was found that the configuration would not be practical due to existing environmental features. Therefore, it is proposed that Taxiway S is kept within the current location.

**Development Alternative 3** (Figure 5-3)

On Development Alternative 3, Taxiway S3 is proposed to be removed to mitigate its direct access configuration.

### Taxiway U

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

In Development Alternatives 1 and 2, taxiway fillet enhancement is proposed for existing Taxiway U to comply with fillet design standards for the design aircraft.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 proposes no modifications for Taxiway U.

### Proposed Runway 9R/27L North Partial Parallel Taxiway

**Development Alternative 1** (Figure 5-1)

To support the proposed enhancement of Runway 9R/27L to commercial service capability, it is proposed to develop a north partial parallel taxiway to increase capacity for this runway and to provide aeronautical development opportunities north of Runway 9R/27L. The proposed partial parallel taxiway is designed to accommodate the Runway 9R/27L critical aircraft with TDG 3 and ADG III design requirements. The parallel taxiway would provide access to the relocated Runway 27L approach end and would then extend west to the proposed Runway 18/36 taxiway conversion. The parallel taxiway provides two connector taxiways along Runway 9R/27L to enhance the runway's exit factor and decrease operation's runway occupancy time.

**Development Alternative 2** (Figure 5-2)

Like Development Alternative 1, it is proposed to develop a north partial parallel taxiway supporting Runway 9R/27L. However, with Development Alternative 2 proposing the eastward shift of Runway 9R/27L, the western portion of the proposed north taxiway will need to be configured as an EAT, which ensures that the taxiing aircraft do not impact the approach surface. The proposed taxiway is planned to run parallel to Runway 9R/27L until required to be angled to the northwest, connecting directly into Taxiway E and the proposed Runway 18/36 taxiway conversion. This proposed EAT taxiway alignment would impact the closed historical landfill area which is located north of Runway 9R/27L. The proposed taxiway development through this closed landfill would require an extensive environmental analysis and rigorous environmental mitigation. A proposed taxiway connector would provide north access to the relocated Runway 9R approach end via the proposed EAT.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed taxiway development. No Runway 9R/27L north partial parallel taxiway is proposed on this development alternative.

## 5.3.3. Apron Modifications

The following subsections and **Table 5-6** outline the proposed apron modifications as presented on each development alternative. As discussed in the Demand Capacity and Facility Requirements chapter, both based and itinerant aircraft apron areas are recommended to be expanded throughout the planning period to accommodate anticipated forecasted operational growth. The recommended apron expansions are only slated for general aviation aircraft, it was found that existing commercial jet-based aircraft apron was sufficient throughout the planning period.

**Table 5-6 - Apron Modifications Summary**

| Development Alternative 1 (Figure 5-1) | Development Alternative 2 (Figure 5-2) | Development Alternative 3 (Figure 5-3) |
|---|---|---|
| • ~20,000 square yard apron area south of Taxiway K1 relocation<br>• Increased itinerant apron area associated with proposed conventional hangar development south of Million Air facilities | • ~15,000 square yard apron area connected to the south of Taxiway K1 relocation<br>• ~17,000 square yard apron area connected to existing apron area south of Million Air facilities and expanding west then north | No Action |

Source: Atkins Analysis

**Development Alternative 1** (Figure 5-1)

Primary apron pavement expansion is proposed on the northeast side of Taxiway K, and south of the proposed Taxiway K1 relocation. This proposed apron area is approximately 20,000 square yards of pavement total. To allow for safe aircraft maneuvering around the apron area, taxilanes with appropriate separation will be required. These taxilanes with associated clearances will account for approximately 6,000 square yards of the proposed 20,000 square yard area.

Itinerant aircraft apron is assumed to be associated with the proposed hangar expansion south of the existing Million Air hangar row. Itinerant aircraft apron requirements, as analyzed in the Demand Capacity and Facility Requirements chapter, took into consideration the apron area frontage associated with the existing Million Air hangars. With the expansion of the additional hangar, it is assumed that the apron frontage with this hangar will accommodate the associated itinerant apron requirements throughout the planning period.

**Development Alternative 2** (Figure 5-2)

Similar to Development Alternative 1 for proposed based aircraft apron, an apron expansion is proposed northeast along Taxiway K and connected to the south of the relocated Taxiway K1. This apron expansion will account for the based aircraft requirements throughout the planning period. The 15,000 square yard pavement area will have approximately 11,000 square yards of storage space available, with the remaining 4,000 square yards associated with necessary taxilanes and clearance areas.

The existing apron area associated with the Million Air hangars is proposed to be expanded westward, running directly south of the southernmost existing Million Air hangar. This westward apron expansion will then turn north to fill in the existing landside area west of the Million Air facilities. The 17,000 square yard expansion will account for all required itinerant apron area throughout the planning period.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed apron expansions. No apron modifications or enhancements are proposed on this development alternative.

### 5.3.4. Proposed Commercial Service Terminal Modifications

As identified in the Demand Capacity and Facility Requirements chapter, the existing commercial terminal infrastructure is anticipated to be deficient through the planning period compared to forecasted growth. The measurement of maximum forecasted growth, also known as Planning Activity Level (PAL) 4, identifies that both aircraft gate infrastructure and commercial terminal square footage will be required to be expanded to accommodate the increased commercial operations. Following are the objectives related to the commercial service terminal modification alternatives:

1. Provide additional hold room, concessions, TSA queue, ticketing, and restrooms spaces with gate and/or terminal expansion alternatives.
2. Improve efficiency of overall space.
3. Provide additional ticketing on west side of terminal to access checkpoint and baggage handling facilities.

4. Consider consolidation of baggage claim on east side to allow ticketing expansion on west side.
5. Consider more reliance on self-service and self-baggage tagging options.
6. Consider the potential to expand beyond the planning horizon (PAL 4+, 2037+).
7. Minimize impact to apron facilities to the west.

The following subsections outlines the proposed airside gate expansions along with associated terminal expansions and the terminal services modifications.

#### 5.3.4.1. Airside Gate and Associated Terminal Modifications

The Facility Requirements analysis determined that to accommodate PAL 4 service levels, the Airport would require three additional gates within the planning period if existing Gate 16 is modified or replaced to accommodate the A320 family or similar aircraft. However, if existing Gate 16 is not upgraded to accommodate this larger aircraft family, the total required additional gates throughout the planning period would be four. The proposed gate expansions have been evaluated through three varying alternatives to accommodate the required expansion. Associated hold room, concessions, and rest room areas with each proposed gate expansion have been analyzed to ensure the adequate interior commercial terminal space is accounted for.

**Development Alternative 1** (Figure 5-1)

To accommodate the anticipated gate requirements through PAL 4, Development Alterative 1 proposes for an east gate expansion and enhancement of existing Gate 16 to support the A320 family or similar aircraft. The east terminal expansion would add approximately 61,400 square feet of terminal area and would provide three additional gates. This terminal expansion would accommodate the increased space requirements for the proposed three gates, which are capable to accommodate ADG III to ADG V aircraft. This expansion would include additional concessions, hold rooms, and restrooms. A Ground Support Equipment (GSE) storage area of 8,722 square yards is proposed on the eastern edge of the proposed apron pavement expansion. Associated apron pavement expansion of 37,447 square yards is required to accommodate the east terminal expansion and associated gates.

The enhancement of existing Gate 16 to support ADG III aircraft would require the relocation of the existing flight kitchen facility, currently located directly west of the terminal. Additionally, the west terminal would require an expansion of 12,600 square feet to accommodate expanded hold rooms. **Table 5-7** summarizes the gate alternative as presented on Development Alternative 1.

**Table 5-7 - Development Alternative 1: Gate Alternatives Summary**

| Criteria | Development Alternative 1 (Figure 5-1) | Outlook |
|---|---|---|
| Flexibility for various aircraft sizes | • New east concourse allows larger aircraft positions to be implemented | • Positive |
| Impact to other facilities | • Flight kitchen relocation<br>• Relocation of GSE storage | • Neutral<br>• Neutral |
| Walking Distance | • Highest additional walking distance | • Negative |
| Capital costs | • Most expensive with apron expansion and flight kitchen relocation<br>• Large building expansion | • Negative<br>• Negative |
| Constructability | • No impact to existing gates | • Positive |
| Balances flight line (gates) with terminal facilities | • Balances gates by adding to the east where the larger hold room and call to gate operations can be leveraged | • Positive |
| Supports ultimate expansion to east | • A logical first step toward all ultimate expansion options | • Positive |

Source: Jacobsen | Daniels Analysis

**Development Alternative 2** (Figure 5-2)

To accommodate the anticipated gate requirements through PAL 4, Development Alternative 2 proposes for a west terminal expansion and minor east terminal expansion. The west terminal expansion would provide three additional gates capable for ADG III aircraft, and the west terminal expansion would be approximately 39,400 square feet. This terminal expansion would accommodate the increased space requirements for the proposed three gates, including as previously mentioned associated concessions, hold rooms, and restrooms.

The additional proposed east terminal expansion would provide one additional gate capable for ADG III to ADG V aircraft. The additional minor east terminal expansion of 9,100 square feet will allow for required increase of circulation and restroom expansions associated with the additional east gate. Approximately 30,012 square yards of associated apron pavement will be required to accommodate the east terminal expansion. A GSE storage area of 8,722 square yards is proposed on the eastern edge of the proposed apron pavement expansion. **Table 5-8** summarizes the gate alternative as presented on Development Alternative 2.

**Table 5-8 - Development Alternative 2: Gate Alternatives Summary**

| Criteria | Development Alternative 2 (Figure 5-2) | Outlook |
|---|---|---|
| Flexibility for various aircraft sizes | • New east concourse allows larger aircraft positions to be implemented | • Positive |
| Impact to other facilities | • Flight kitchen relocation<br>• Push backs increase activity on taxilanes to/from GA areas to the west<br>• Relocation of GSE storage | • Neutral<br>• Negative<br>• Neutral |
| Walking Distance | • More additional walking distances | • Neutral |
| Capital costs | • More expensive with apron and building expansion | • Neutral |
| Constructability | • Some impact to existing gates | • Neutral |
| Balances flight line (gates) with terminal facilities | • Adds most of the new gates to west end where hold room area per gate ratios are smallest | • Negative |
| Supports ultimate expansion to east | • A logical first step toward all ultimate expansion options | • Positive |

Source: Jacobsen | Daniels Analysis

**Development Alternative 3**

To accommodate the anticipated gate requirements through PAL 4, Development Alternative 3 proposes for a primarily west terminal expansion with the enhancement of existing Gate 16 to support ADG III or similar aircraft. The west terminal expansion would provide three additional gates capable for ADG III aircraft, along with the enhancement of existing Gate 16. Similar to Development Alternative 1, the existing flight kitchen facility will be required to be relocated due to the enhancement. The total proposed west terminal expansion would be approximately 39,400 square feet.

**Table 5-9** summarizes the gate alternative as presented on Development Alternative 3.

**Table 5-9 - Development Alternative 3: Gate Alternatives Summary**

| Criteria | Development Alternative 3 (Figure 5-3) | Outlook |
|---|---|---|
| Flexibility for various aircraft sizes | • Least flexibility<br>• Limited to ADG III aircraft | • Negative<br>• Negative |
| Impact to other facilities | • Flight kitchen relocation<br>• Push backs increase activity on taxilanes to/from GA areas to the west | • Neutral<br>• Negative |
| Walking Distance | • Least additional walking distances | • Positive |
| Capital costs | • Least expensive (no major apron expansion but flight kitchen relocation to consider) | • Positive |
| Constructability | • Impacts to existing gates | • Negative |
| Balances flight line (gates) with terminal facilities | • Adds all new gates to west end where hold room area per gate ratios are smallest | • Negative |
| Supports ultimate expansion to east | • Does not preclude nor support ultimate expansion to east | • Neutral |

Source: Jacobsen | Daniels Analysis

### 5.3.4.2. Terminal Services Modifications

The previously completed facility requirements analysis determined that to accommodate PAL 4 operational levels, the Airport would require additional core terminal services. The proposed expansion and redevelopment of the interior core terminal services are presented on the three development alternatives to accommodate the projected growth of operations through forecasted PAL 4. The terminal services alternatives include:

- Ticketing & Check-In
- Security Screening Checkpoints (SSCP)
- Circulation
- Baggage Handling & Baggage Claim
- Restrooms
- Concessions
- Office Space

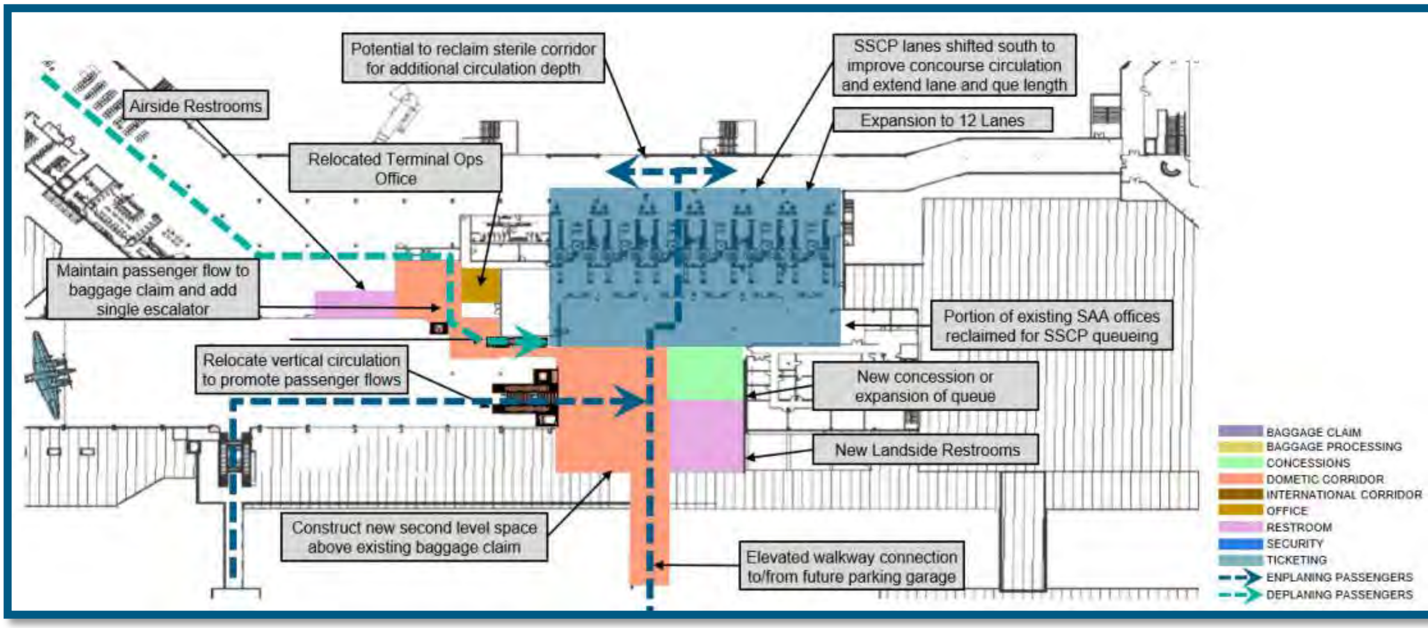
**All Terminal Services Alternatives – Provide 2nd Story Expansion**

Consistent throughout all three development alternatives is the proposed second story expansion to accommodate the additional terminal services requirements. As depicted in **Figure 5-10**, the expansion of the 2nd story terminal would relocate the existing Sanford Airport Authority (SAA) administration space to expand the SSCP area with increased queue area, lane length, a wider domestic corridor, and overall SSCP depth increase to 30 feet. Additionally, landside restrooms and concessions will be expanded on the second story along with an elevated walkway to a proposed landside parking garage. To accomplish this expansion, the SAA administration space will be relocated, and the existing escalator and elevator would require relocation.

The 2nd story expansion would provide the following:

- 17,000 square feet of total additional terminal floor space
- 10,000 square feet of total additional SSCP space
- 5,000 square feet of total additional landside restroom and concession areas

Figure 5-10 - All Terminal Services Alternatives - Provide Second Floor Expansion

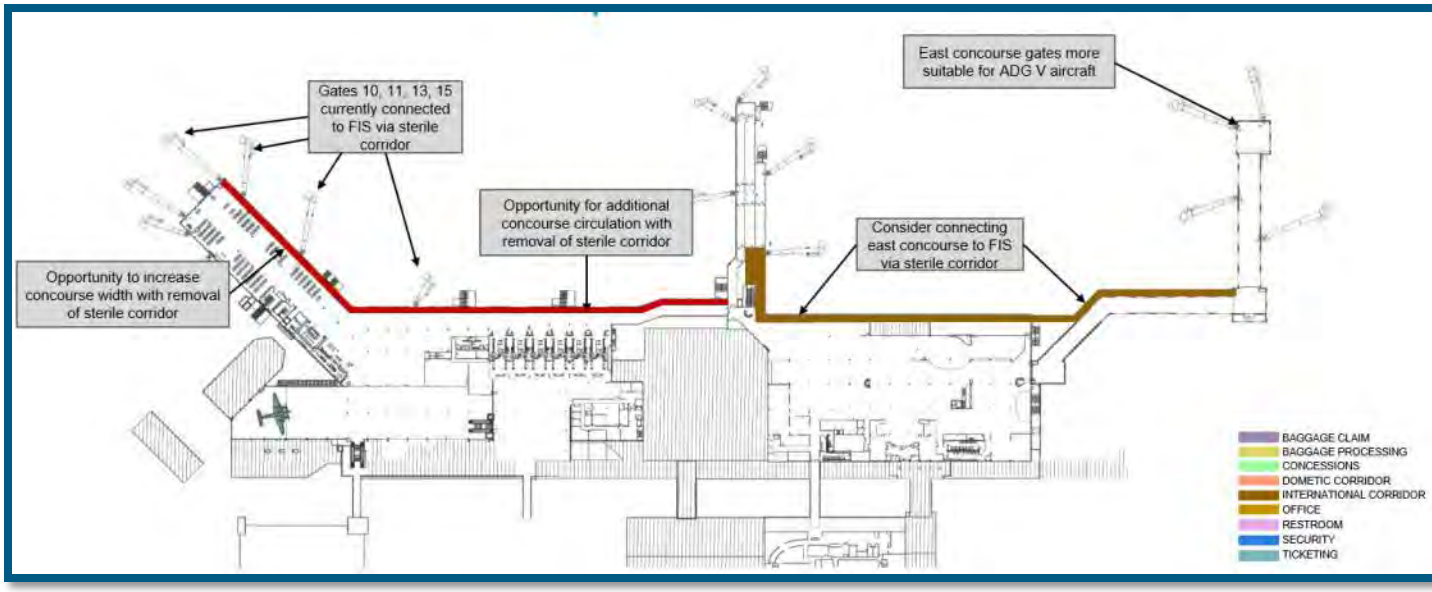



Source: Jacobsen | Daniels Analysis

### All Terminal Services Alternatives - International Arrivals Swap Alternative

An additional analysis was conducted to analyze the benefits and drawbacks from transitioning the international arrivals to the east side of the terminal to capitalize on the existing east concourse capability. **Figure 5-11** depicts the proposed transition. The east concourse currently has additional gate infrastructure that is capable to accommodate ADG V aircraft compared to the west concourse. This transition would primarily be completed through connecting the east concourse to the existing Federal Inspection Services (FIS) via the sterile corridor. With the removal of the west sterile corridor, this presents an opportunity to increase the overall width of the west concourse providing additional circulation area. To accomplish this relocation, elimination of international arrival gates on the west concourse for existing users would be required and a new sterile corridor be added to connect Gates 1 – 4 to the FIS.

**Figure 5-11 - International Arrivals Swap Alternative**

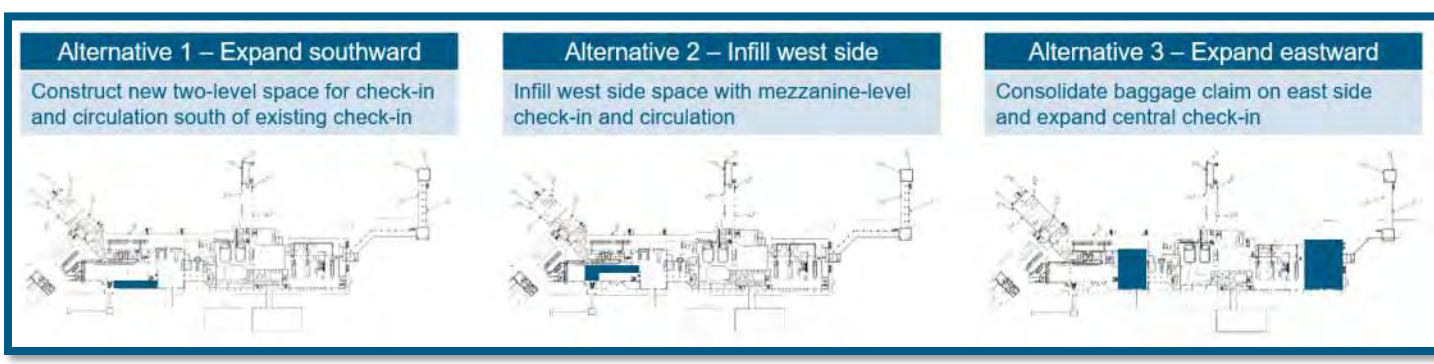



Source: Jacobsen | Daniels Analysis

### Terminal Services Development Alternatives

**Figure 5-12** depicts a summary of the three terminal services development alternatives and their respective expansions. The following subsections will detail the three development alternatives variations to accommodate the forecasted PAL 4 service demand.

**Figure 5-12 - Terminal Services Development Alternatives Summary**




Source: Jacobsen | Daniels Analysis

### Development Alternative 1

For the terminal services presented on Development Alternative 1, it is proposed on the terminal's first floor to upgrade the existing check-in areas with additional kiosk and bag drop facilities. A proposed two-level expansion for check-in and circulation south of the existing check-in area will allow for accommodation of increased service levels. It is proposed on the terminal's second floor to integrate the proposed two-level expansion for increased ticketing and circulation, which will connect into the proposed elevated parking garage walkway connection. A shift of the existing SSCP area south will allow for expanded queuing areas and other SSCP support areas required. Additional second floor restrooms and concessions will allow for passenger ease of access to these facilities after entering the terminal from the proposed elevated walkway and prior to entering the SSCP area.

Primary benefits of the terminal services presented on Development Alternative 1 is the connection of both parking garages to the second level via an elevated walkway, expanding first and second floor ticketing and kiosks, and not increasing passenger walk distances. However, drawbacks for the proposed terminal services include reduced curb width and entrance canopy, temporary construction impacts to the terminal entrance, and a complex bag belt placement from remote ticketing areas. **Figure 5-13** depicts the first-floor terminal services and **Figure 5-14** depicts the second-floor terminal services as presented on Development Alternative 1.

### Development Alternative 2

For the terminal services presented on Development Alternative 2, it is proposed on the terminal's first floor to upgrade the existing check-in areas with additional kiosk and bag drop facilities. The existing elevator is proposed to be maintained but it is proposed to rotate the existing down escalator to improve passenger flow and access to the baggage claim area. On the second floor, a proposed mezzanine-level infill check-in and circulation space would be constructed to support additional terminal services required. Like Development Alternative 1, this area would be connected to the future parking garage via an elevated walkway. A shift in the SSCP south and expansion of queuing area will allow to satisfy the forecasted demand.

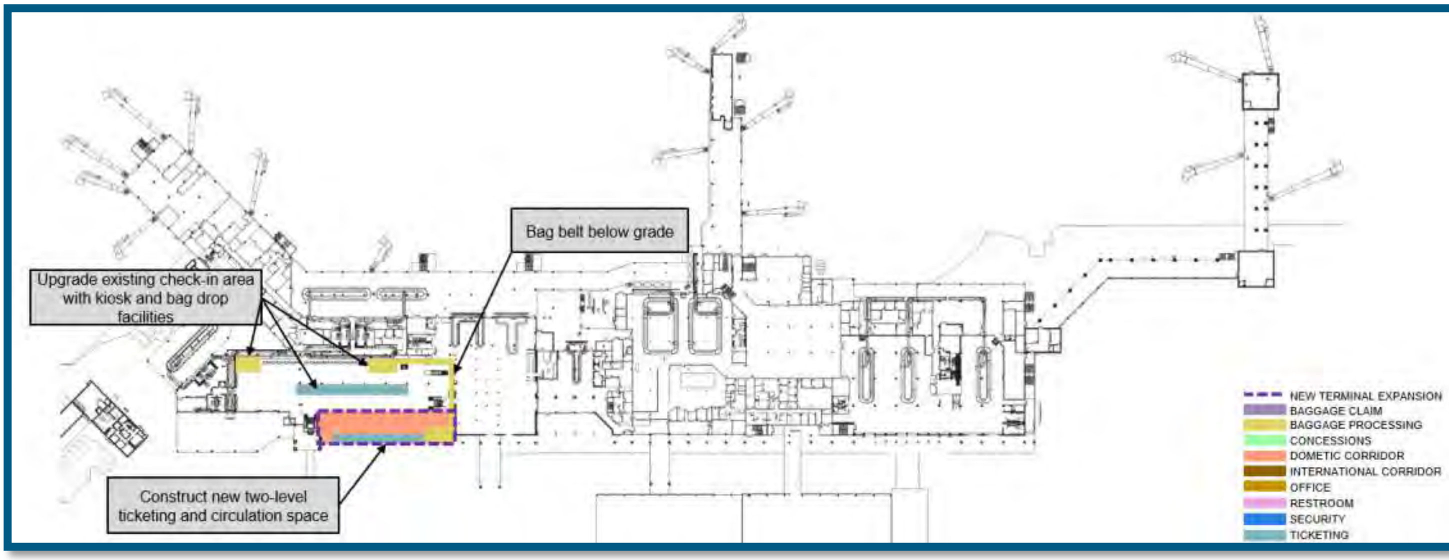
Primary benefits of the terminal services presented on Development Alternative 2 is the connection of both parking garages to the second level terminal, expanding the second floor ticketing capability, not increasing passenger walking distance, and no change to the overall terminal building footprint will be necessary. However, drawbacks for the proposed terminals services include temporary construction impacts to the main ticketing hall, split ticket counter operation, and does not meet the recommended ticketing area requirements as outlined at PAL 4 service levels. **Figure 5-15** depicts the first-floor terminal services and **Figure 5-16** depicts the second-floor terminal services as presented on Development Alternative 2.

### Development Alternative 3

For the terminal services presented on Alternative 3, it is proposed on the terminal's first floor to consolidate the baggage claim on the east side of the terminal replacing the existing baggage claim area with check-in, circulation, and office spaces. The consolidation of the baggage claim on the east would provide two new baggage claim carousels to replace the capacity lost in the central location. A new vertical circulation core and lower-level entry point for west and center concourse deplaning passengers is proposed into the future east baggage claim area. This new vertical circulation will allow for the ease of access to the proposed baggage claim consolidation on the east side of the terminal. On the west side of the terminal's first floor, it is proposed to upgrade the existing check-in area with additional kiosk and bag drop facilities. Additional landside restrooms are proposed both on the west and east sides of the terminal's first floor.

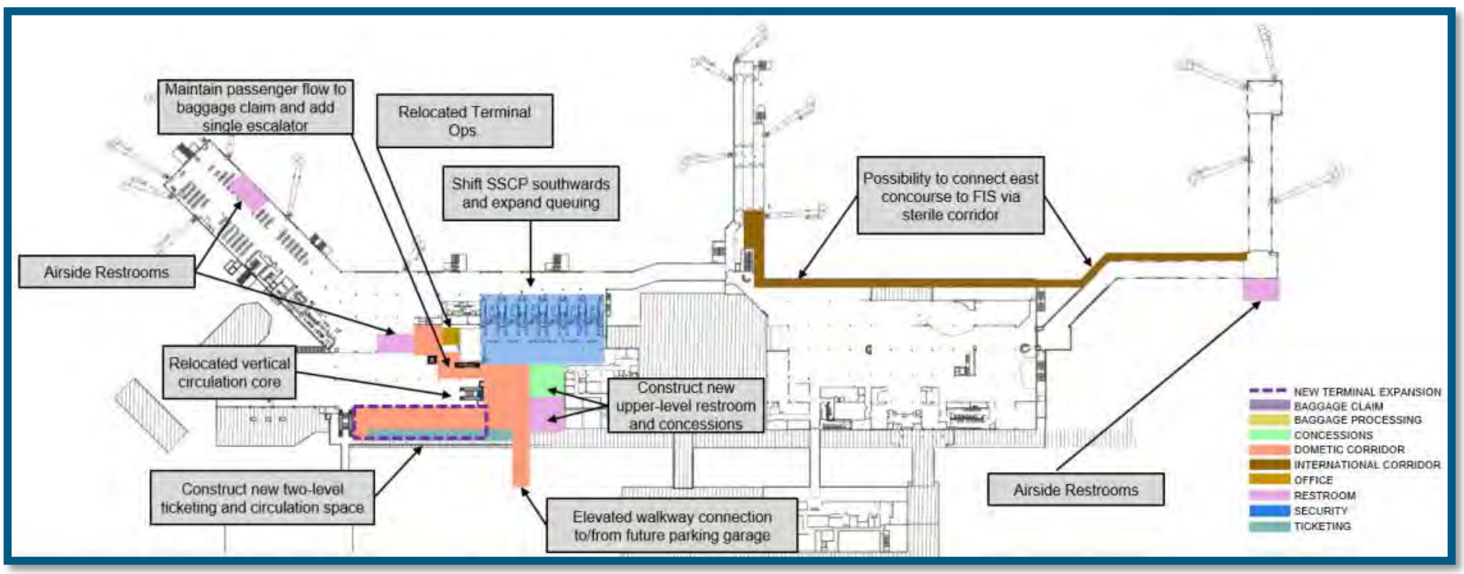
On the second floor, similar to previous development alternatives, it is proposed to have an elevated walkway connection to and from the future parking garage. Additional concessions and restroom areas are proposed upon immediately existing the proposed elevated walkway into the terminal's second floor. The SSCP is proposed to be shifted south and expanded to allow for additional queuing area. A proposed two-level expansion on the east end of the terminal will allow for the addition of hold rooms, concessions, and restrooms on the second floor. Additional airside restrooms are proposed on the northeast side of the main terminal area, towards the east concourse. Primary benefits of the terminal services presented on Development Alternative 3 is the expansion of the ticketing hall, consolidation of all ticketing operations on the terminal's first floor, separating the ticketing and baggage claim areas, minimal impact to airline operations during construction, and supports a proposed east gate expansion. However, drawbacks for the proposed terminal services include increased walking distances to baggage claim from the west gates, requires significant east terminal expansion, requires two new baggage carousels, and does not meet the recommended ticketing area requirement.

**Figure 5-13 - Terminal Services Development Alternative 1: First Floor**



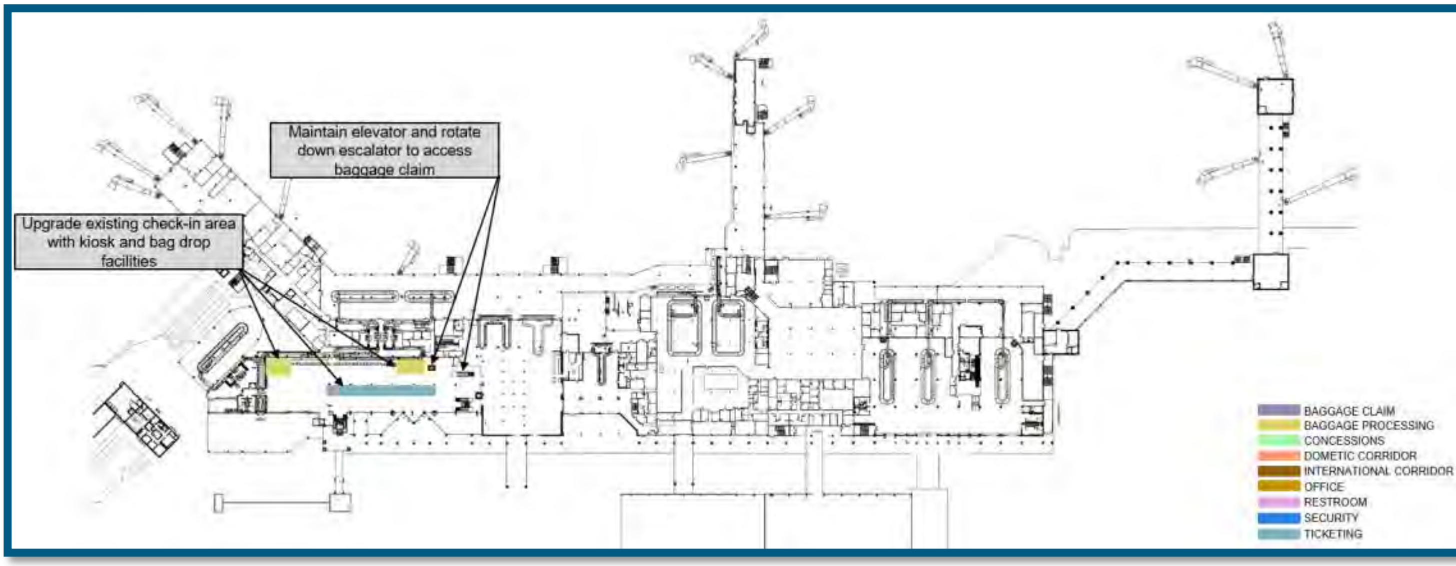

Source: Jacobsen | Daniels Analysis

**Figure 5-14 - Terminal Services Development Alternative 1: Second Floor**



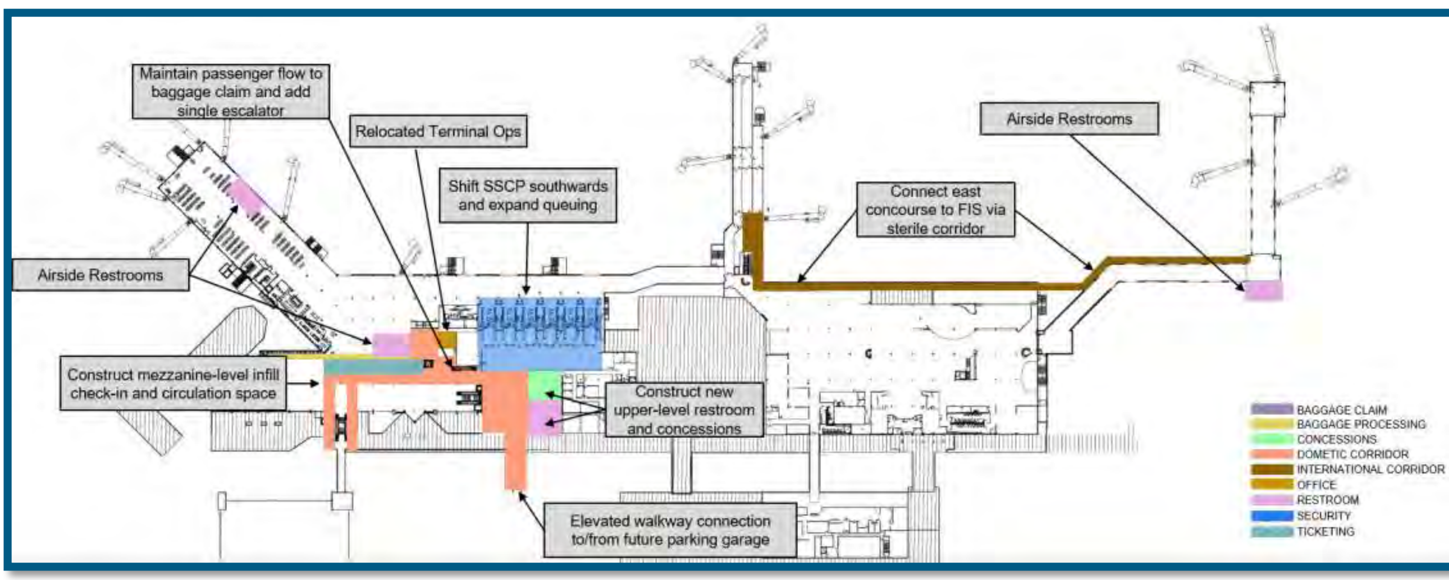

Source: Jacobsen | Daniels Analysis

**Figure 5-15 - Terminal Services Development Alternative 2: First Floor**




Source: Jacobsen | Daniels Analysis

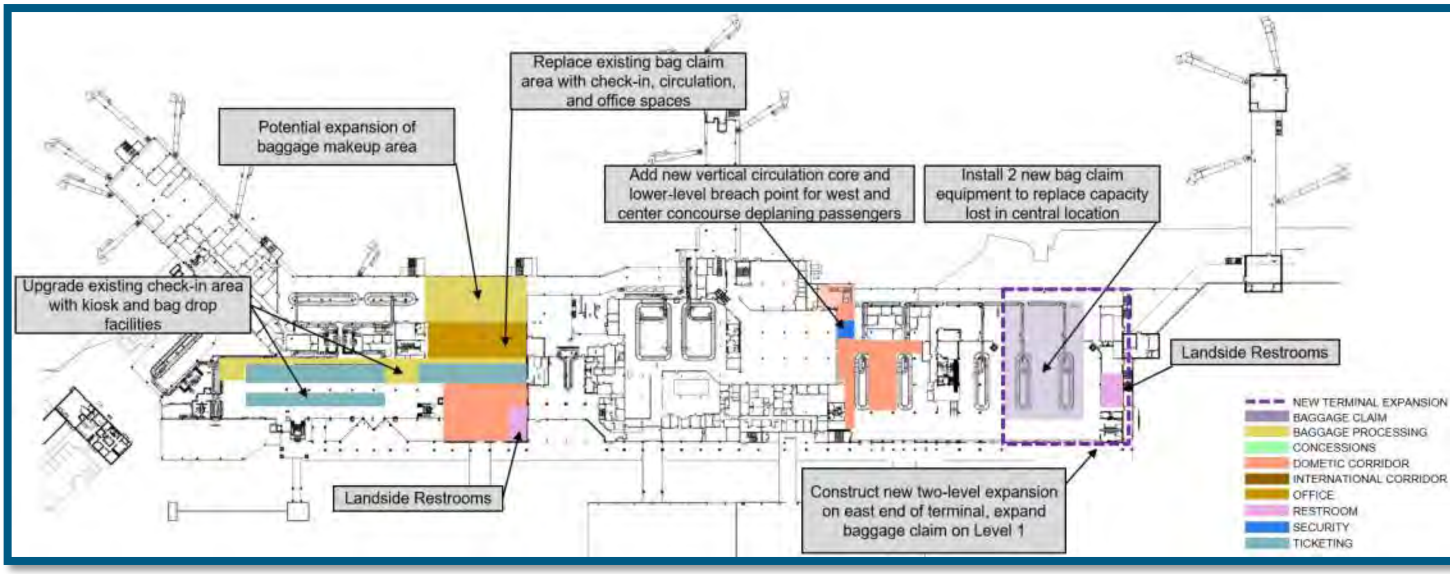
**Figure 5-16 - Terminal Services Development Alternative 2: Second Floor**




Source: Jacobsen | Daniels Analysis

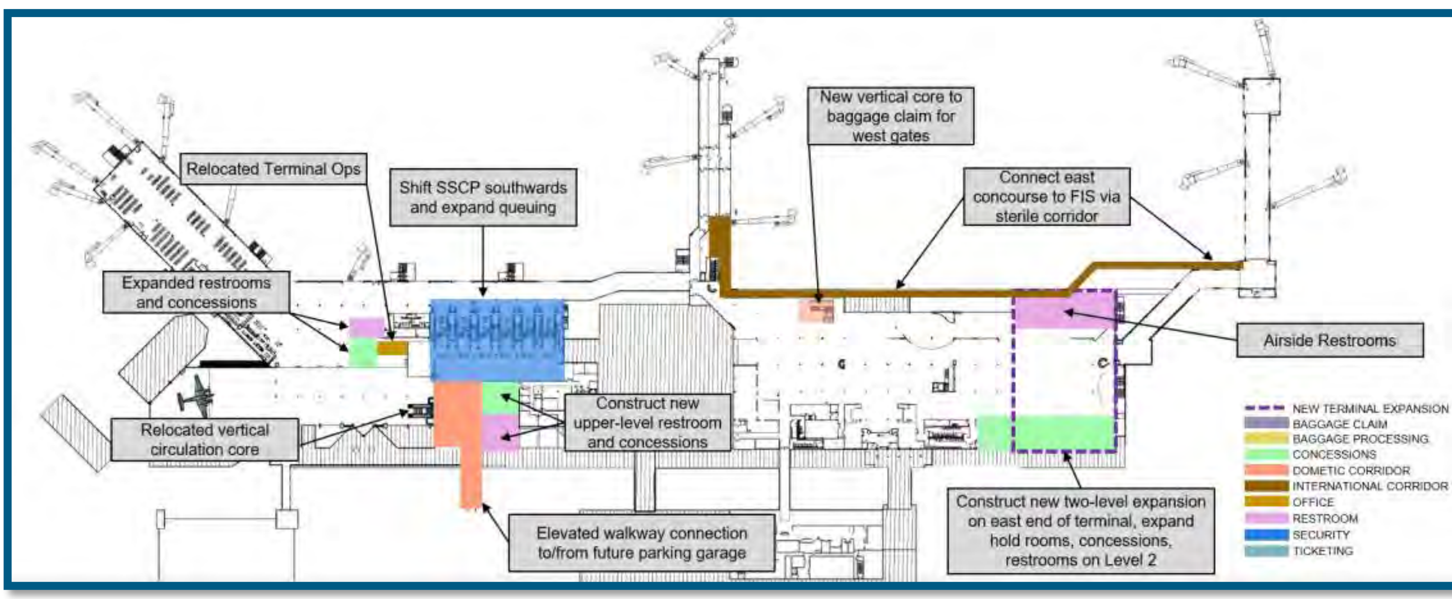
**Figure 5-17** depicts the first-floor terminal services and **Figure 5-18** depicts the second-floor terminal services as presented on Development Alternative 3.

### Figure 5-17 - Terminal Services Development Alternative 3: First Floor




Source: Jacobsen | Daniels Analysis

### Figure 5-18 - Terminal Services Development Alternative 3: Second Floor




Source: Jacobsen | Daniels Analysis

### 5.3.5. Proposed General Aviation Modifications

The following subsections will outline the proposed general aviation (GA) facility expansions as presented on each development alternative. As discussed in the Demand Capacity and Facility Requirements chapter, aircraft storage hangars are recommended to be expanded throughout the planning period to accommodate anticipated increase of demand. The proposed expansions primarily focus on both conventional hangar and T-hangar development. It was found that the existing general aviation terminal is adequate to serve the projected demand throughout the planning period, therefore no proposed expansion was presented for this facility. Expansion of aircraft storage facilities were primarily consolidated in the direct vicinity of existing aircraft storage facilities. **Table 5-10** summarizes the proposed general aviation development within the three proposed development alternatives.

**Table 5-10 - General Aviation Modifications Summary**

| Hangar Type | Development Alternative 1 (Figure 5-1) | Development Alternative 2 (Figure 5-2) | Development Alternative 3 (Figure 5-3) |
|---|---|---|---|
| Conventional Hangar | • (4) 9,600 Square Foot Facilities<br>• (1) 35,000 Square Foot Facility<br>• (1) 5,500 Square Foot Facility | • (5) 6,300 Square Foot Facilities<br>• (3) 9,600 Square Foot Facilities<br>• (1) 5,500 Square Foot Facility | • No Action |
| T-Hangar | • (4) 20-Unit Facilities<br>• (1) 8-Unit Facility | • (4) 20-Unit Facilities<br>• (1) 10-Unit Facility | • No Action |

Source: Atkins Analysis

#### 5.3.5.1. Conventional Hangar Development

As outlined in the previous chapter, the conventional hangar requirements result in a deficiency through PAL GA 4. Varying conventional hangar development configurations have been proposed to mitigate the forecasted deficiency. The three development alternatives have proposed differing expansions to allow for flexibility of aspects related to conventional hangar development such as site selection, hangar size, accessibility, and more.

**Development Alternative 1** (Figure 5-1)

In Development Alternative 1, the primary concentration of proposed conventional hangar expansion is on the western portion of the Airport in the vicinity of existing aircraft storage facilities. Additionally, a conventional hangar is proposed in the direct vicinity of the South East Ramp.

A large conventional hangar is proposed directly south and aligned with the existing Million Air hangar to expand the FBO's capabilities. This conventional hangar is sized to approximately 35,000 square feet and includes increased landside parking. A minimal apron expansion will be required to connect the existing apron to the full airside length of the conventional hangar.

An expansive existing area of property west of the airside facilities on the apron area along Taxiway K and south of the apron area along Taxiway B is solely utilized for landside use. This is primarily due to existing airside infrastructure outlining this area, effectively hampering any further airside expansion into the specified landside area. To convert a portion of this landside property into airside accessible property, it is proposed to develop a north-south TDG 2 taxilane situated between two existing conventional hangars on the apron south of Taxiway B. This taxilane is proposed to be aligned with the existing taxiway to apron connector onto Taxiway B and cross existing E 26$^{th}$ Place, disconnecting the roadway. With airside access established south of existing E 26$^{th}$ Place, it is proposed to develop four 9,600 square-foot conventional hangars along Carrier Avenue. These four conventional hangars would be supported by adequate landside access and parking off of Carrier Avenue for each proposed facility.

A 5,500 square-foot conventional hangar is proposed directly east of the existing South East Ramp, aligned with the existing northeast row of conventional hangars in the specified GA complex. This conventional hangar is provided with an apron expansion and adequate landside access and parking.

In total, proposed conventional hangar development as proposed in Development Alternative 1 equals approximately 78,900 square feet. This total exceeds the projected PAL GA 4 hangar requirement square footage by approximately 24,100 square feet.

**Development Alternative 2** (Figure 5-2)

In Development Alternative 2, the primary concentration of proposed conventional hangar expansion is in the direct vicinity of the existing South East Ramp complex.

Similar to Development Alternative 1, it is proposed to construct a standalone 5,500 square-foot conventional hangar directly aligned with the existing three conventional hangars on the northeast portion of the GA complex. Conserving the layout of the existing complex, it is proposed to expand conventional hangar development into the vacant area located directly south of the existing hangar infrastructure. The vacant land, cornered with Skyway Drive and Marquette Avenue, allows for readily developable property to accommodate the future conventional hangar requirements. It is proposed to mirror three 9,600 square-foot conventional hangars directly south of the existing three conventional hangars on the southern portion of the South East Ramp. These three proposed 9,600 square-foot hangars are proposed to be connected to the existing apron area with a partial southward expansion of the existing pavement area. To allow for diversification of aircraft types stored in conventional hangars, and to provide a lower financial barrier for conventional hangar storage, it is proposed to develop five 6,300 square-foot conventional hangars south of the proposed three 9,600 square-foot conventional hangars. These hangars will have landside access provided via Skyway Drive and an east-west roadway expansion. Landside parking will be accommodated at each proposed hangar individually. The east-west roadway expansion is proposed to be extended past the AOA fence into the proposed taxilane system expansion.

In total, proposed conventional hangar development as proposed in Development Alternative 2 equals approximately 65,800 square feet. This total exceeds the projected PAL GA 4 hangar requirement square footage by approximately 11,000 square feet.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed conventional hangar expansions. No conventional hangar development is proposed on this development alternative.

#### 5.3.5.2. T-Hangar Development

As outlined in the previous chapter, the analyzed T-hangar requirements result in a deficiency through PAL GA 4. Varying T-hangar development configurations have been proposed to mitigate such deficiency. The three development alternatives have proposed differing expansions to allow for flexibility of aspects related to T-hangar development such as site selection, unit per facility, accessibility, and more.

**Development Alternative 1** (Figure 5-1)

T-hangar development proposed in Development Alternative 1 is entirely concentrated within the existing South East Ramp complex. The vacant land south of the complex, situated along Skyway Drive and Marquette Avenue, is considered as prime developable land for aeronautical expansion. It is proposed to expand the T-hangar facilities into this vacant land, with four 20-unit T-hangar facilities and one 8-unit T-hangar facility. These facilities will be airside accessible via the existing taxilane system with necessary taxilane development being proposed around the five proposed T-hangar facilities. Landside access will be provided via the proposed east-west roadway expansion off of Skyway Drive.

In total, proposed T-hangar development as proposed in Development Alternative 1 equals 88 units. This total exceeds the projected PAL GA 4 T-hangar unit requirement by 1 unit.

**Development Alternative 2** (Figure 5-2)

Similar to Development Alternative 1, Development Alternative 2 has the entirety of proposed T-hangar development concentrated on the vacant land directly south of the existing South East Ramp complex. It is proposed to expand the T-hangar facilities into this vacant land, with four 20-unit T-hangar facilities and one 10-unit box configuration hangar. Three 20-unit facilities are aligned with the existing T-hangars located in the South East Ramp, while the fourth 20-unit facility is proposed to be south of the proposed five 6,300 square-foot conventional hangars. The 10-unit box hangar facility is proposed to be directly north of Marquette Avenue and south of the three 20-unit T-hangars.

In total, proposed T-hangar development as proposed in Development Alternative 2 equals 80 T-hangar units with 10 box hangar units. Totaling the T-hangar units with the proposed box hangar units, this total exceeds the projected PAL GA 4 T-hangar unit requirement by 3 units.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed T-hangar expansions. No T-hangar development is proposed on this development alternative.

### 5.3.6. Proposed Ground Transportation and Landside Parking Modifications

As discussed in the Demand Capacity and Facility Requirements chapter, the existing landside roadway requirements and automobile parking infrastructure is anticipated to be deficient through the planning period. The measurement of maximum forecasted growth, also known as PAL 4, identifies that both Red Cleveland Boulevard and the landside parking facilities will be required to be expanded to accommodate the increased forecasted demand.

The following are objectives related to the landside ground transportation and parking alternatives:

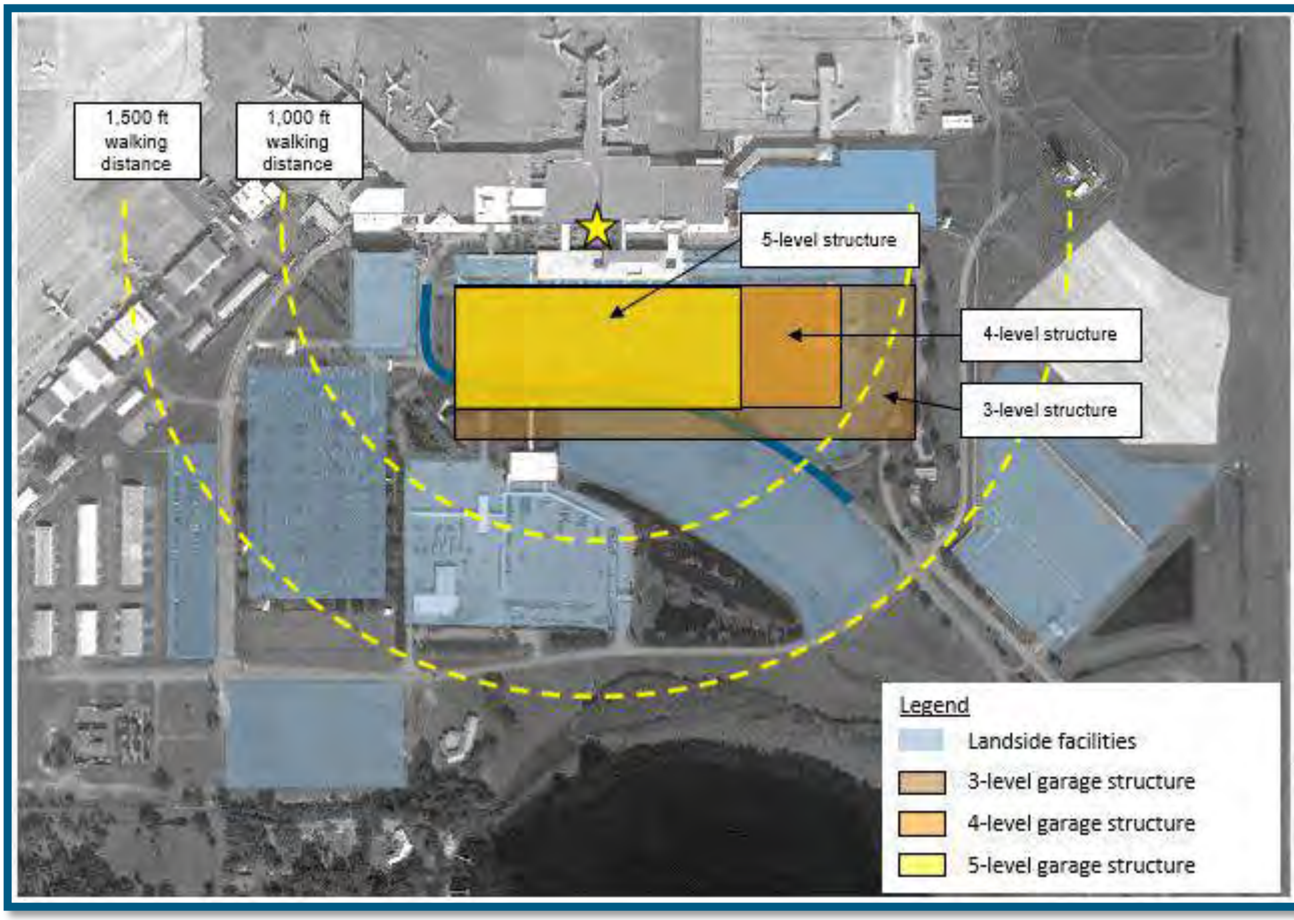
1. Focus development within walkable distance of passenger terminal.
2. Improve customer service by repurposing remote facilities, which require costly shuttle bus operations, where possible.
3. Consolidate similar facilities where possible for site efficiency.
4. Improve access and egress wayfinding in conjunction with roadway capacity improvements.
5. Balance capital investment in vertical structures with optimization of surface facilities on available landside parcels.

The proposed landside development has several considerations regarding both opportunities and constraints towards meeting the forecasted demand. Environmental factors such as wetland mitigation and floodplain mitigation were analyzed to ensure the least impact possible. It has been preliminarily determined that throughout the three development alternatives, no delineated wetlands would be impacted and minimal floodplain mitigation will be necessary. Customer service enhancements and parameters have been taken into consideration to optimize the passenger's overall experience while at the Airport. This is primarily accomplished through consolidation of parking operations into close proximity of the terminal, and reduce rental car traffic and consolidate Quick Turnaround (QTA) facilities related to rental car operations.

A proposed roadway reconfiguration within the terminal area could reshape the terminal core itself. Reducing traffic volume on the curbside roadway would improve loading and unloading operations. Creating a roadway access to the rental car facilities and other landside parking facilities could improve overall wayfinding.

Through the development alternatives analysis, it has been determined that at least one vertical structure is required to meet the forecasted demand. Potential vertical structures shown would maximize development within walkable distance of the passenger terminal building. Typical walking measurements of 1,000 to 1,500 feet are typically used to gauge walkability of airport landside facilities. Facilities further than 1,500 feet from the terminal building may require shuttle busing or should be used primarily as seasonal overflow areas. **Figure 5-19** depicts the landside walkability measurement as discussed.

**Figure 5-19 - Landside Facility Walkability Measurement**




Source: Jacobsen | Daniels Analysis

The following subsections outlines the proposed landside group transportation and parking facilities enhancements.

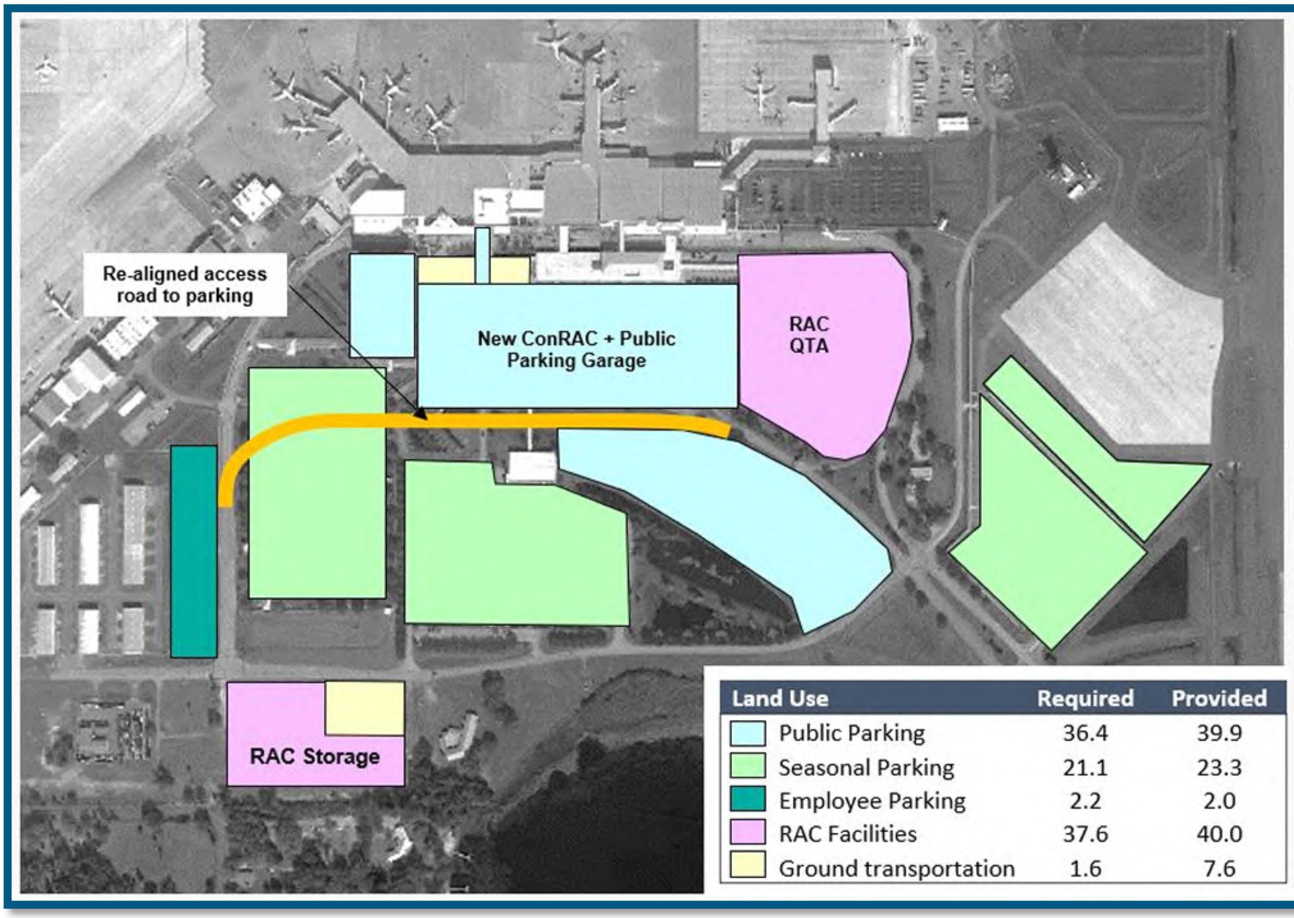
### Development Alternative 1

Development Alternative 1 proposes to construct a new combined public parking and Rent-A-Car (RAC) ready/return garage to satisfy a portion of the public parking requirements along with a new RAC facility centralized near the terminal building. A RAC QTA area is proposed directly east of the proposed garage to ensure efficient operations for rental car companies. The repurposing of the southwestern landside terminal area as year-round RAC storage will ensure that rental car companies can continue to meet the forecasted demand. The repurposing of the existing economy parking, long-term parking, and Alamo rental car facilities as seasonal parking will ensure seasonal overflow capacity is accounted for. Additionally, the partial conversion of existing Seasonal Lot 1 to a commercial vehicle hold lot and supplemental cell phone lot allows for a centralized area for such storage. Employee parking is retained west of Airline Boulevard due to its determined optimal location.

As stated previously, a roadway reconfiguration would reduce traffic volume on the curbside roadway to the terminal. Therefore, it is proposed to adjust Red Cleveland Boulevard to provide a roadway bypass to the proposed parking facilities and back to Airline Boulevard.

**Figure 5-20** depicts the proposed Development Alternative 1 landside roadway and parking facility modifications.

Figure 5-20 - Landside Development Alternative 1




| Land Use | Required | Provided |
|---|---|---|
| Public Parking | 36.4 | 39.9 |
| Seasonal Parking | 21.1 | 23.3 |
| Employee Parking | 2.2 | 2.0 |
| RAC Facilities | 37.6 | 40.0 |
| Ground transportation | 1.6 | 7.6 |

Source: Jacobsen | Daniels Analysis

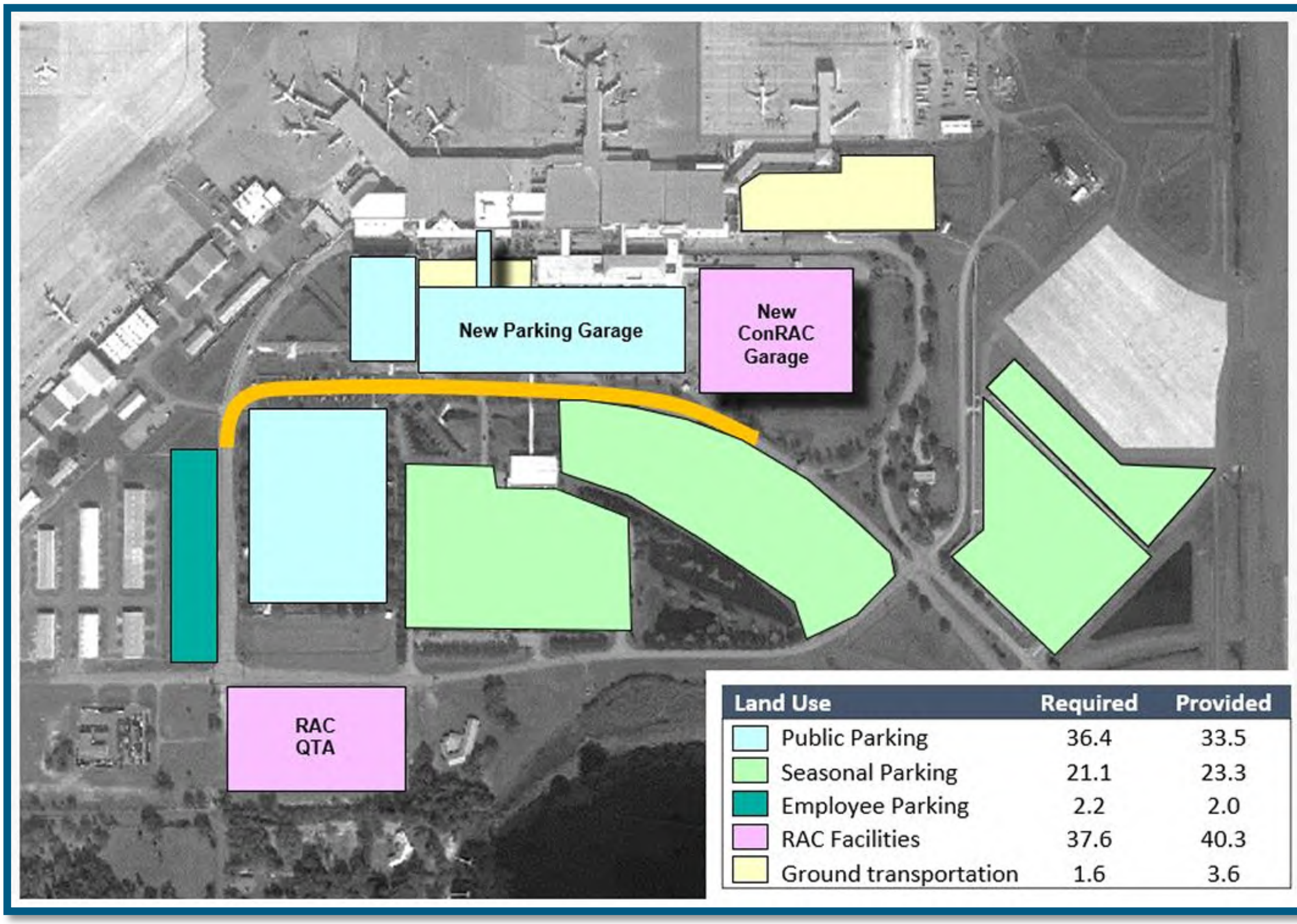
### Development Alternative 2

Development Alternative 2 proposes to construct a new public parking garage and a new ConRAC QTA facility separately. This split of operation will allow for improved customer service through the clear delineation of use. Both proposed structures are optimized for favorable walkability to and from the terminal building. However, the overall capital costs of two separate structures can be considerable. The split garages allows for the proper phasing of such expansion, compared to Development Alternative 1 where the combined garage would be required to be constructed entirely at once. Additionally, the phasing of Development Alternative 2 can minimize the temporary construction impacts by constructing one facility at a time, in contrast to Development Alternative 1 where the proposed large facility footprint would require substantial temporary construction impacts. Existing public parking and employee parking is utilized to meet the forecasted demand. Additional seasonal parking areas are proposed at various locations around the terminal's landside area to accommodate forecasted peak operations. A ConRAC QTA area is proposed south of East Airport Boulevard.

Similar to Development Alterative 1, a proposed roadway enhancement of Red Cleveland Boulevard will allow for the diversion of traffic from the curbside roadway to minimize traffic. This roadway enhancement will connect with proposed and existing parking areas, then ultimately join into Airline Avenue.

**Figure 5-21** depicts the proposed Development Alternative 2 landside roadway and parking facility modifications.

**Figure 5-21 - Landside Development Alternative 2**




Source: Jacobsen | Daniels Analysis

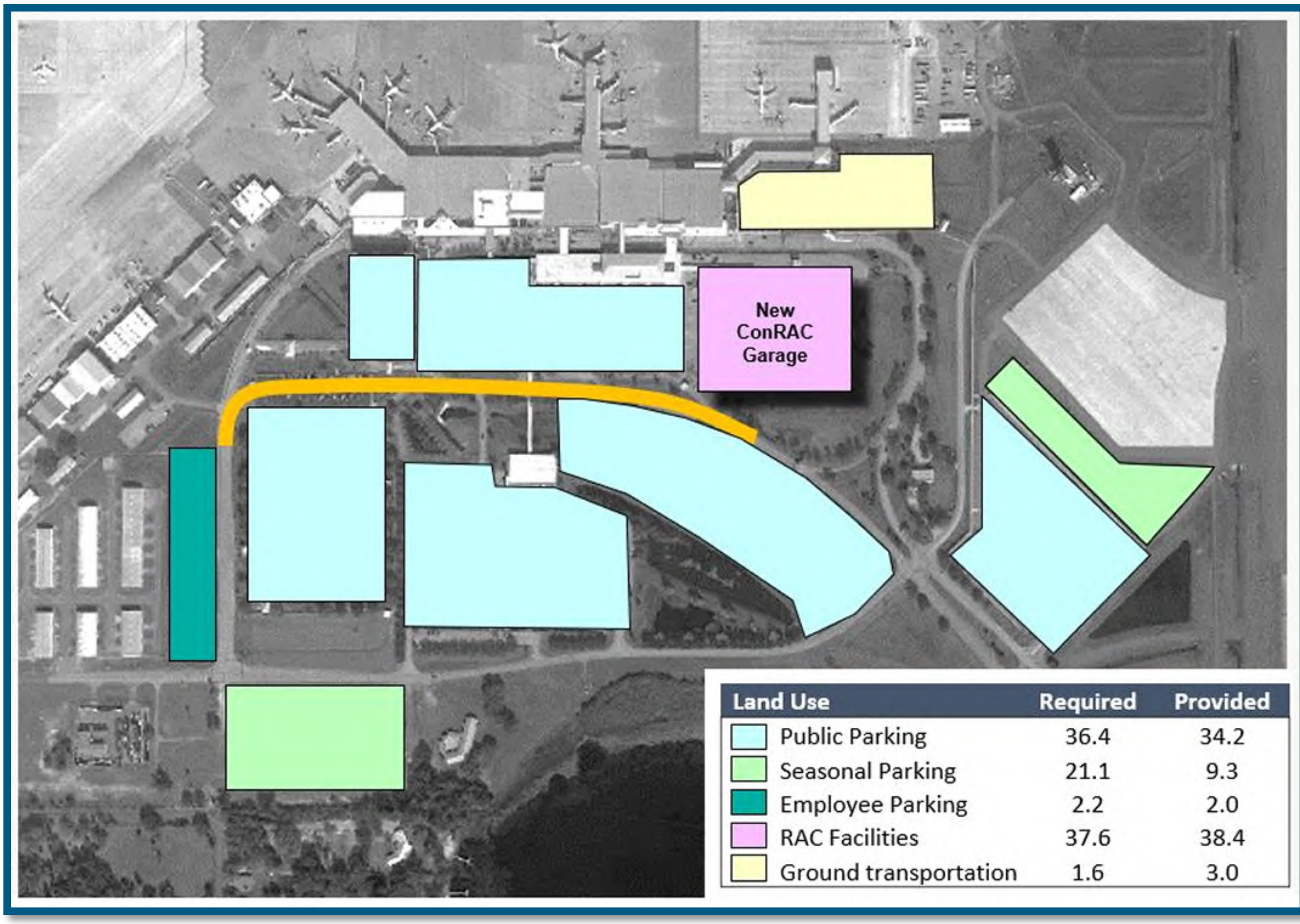
### Development Alternative 3

Development Alternative 3 proposes the maximization of surface parking around the terminal landside area. This is realized through the conversion of all available landside parking facilities to year-round surface parking. A new ConRAC garage structure is proposed to facilitate the growing demand for rental car facilities through the planning period. A new ConRAC QTA is proposed on the site of the existing Seasonal Lot 1. However, with the optimization of the existing surface level parking, it can be seen that the walkability to and from the terminal is unfavorable due to the significant increase. Additionally, with the conversion of existing landside parking facilities into year-round public parking, the seasonal parking demand is partially met. This alternative would minimize capital costs, construction phasing, and construction impacts.

Similar to the previous two development alternatives, a proposed roadway enhancement of Red Cleveland Boulevard will allow for the diversion of traffic from the curbside roadway to minimize traffic. This roadway enhancement will connect with proposed and existing parking areas, then ultimately join into Airline Avenue.

**Figure 5-22** depicts the proposed Development Alternative 3 landside roadway and parking facility modifications.

**Figure 5-22 - Landside Development Alternative 3**




Source: Jacobsen | Daniels Analysis

## 5.3.7. Proposed Support Facility Modifications

Support facilities ensure for the safe, efficient, and overall preservation of operations at the Airport. Due to proposed Airport modifications previously outlined and factors related to the specific support facilities in question, several facilities are proposed for relocation or expansion at the Airport. The following subsections outlines the proposed support facility modifications as presented on the three development alternatives. **Table 5-11** summarizes the support facility modifications presented on each development alternative.

**Table 5-11 - Support Facility Modifications Summary**

| | Development Alternative 1 | Development Alternative 2 | Development Alternative 3 |
|---|---|---|---|
| Automated Surface Observing System (ASOS) | No Action | Relocation to Runway 9L Glideslope Antenna / Shelter location | No Action |
| Air Traffic Control Tower[1] | • East relocation | • East relocation | • No Action |
| Airport Maintenance Facility | • Secondary maintenance complex: 1.75 acres | • Secondary maintenance complex: 1.20 acres | • Secondary maintenance complex: .85 acres |
| Compass Calibration Pad | • Relocation off Taxiway B | • Relocation off Taxiway S | • No Action |
| Fuel Storage | • Expand existing infrastructure site | • Expand existing infrastructure site | • No Action |

Notes: [1]Proposed in same location between development alternatives

Source: Atkins Analysis

### 5.3.7.1. Automated Surface Observing System (ASOS)

As discussed in previous sections, the existing location of the ASOS would be impacted by proposed development. Therefore, the ASOS equipment has been proposed to be relocated as appropriate.

**Development Alternative 1**

Due to the proposed extension of Taxiway M from Runway 9C/27C to Taxiway B, the existing ASOS location will be impacted. Therefore, per FAA Order JO 6560.20C, it is recommended to relocate the ASOS equipment to be collocated with the Runway 9L Glideslope Antenna and Shelter. This area is not impacted by any runway safety areas, taxiway safety areas, or instrument flight procedures surface.

**Development Alternatives 2 and 3**

The existing location of the ASOS equipment is not impacted on either Development Alternative 2 or Development Alternative 3 due to the proposed extension of Taxiway M being only proposed on Development Alternative 1. Therefore, the existing location of the ASOS equipment is recommended to be retained.

### 5.3.7.2. Air Traffic Control Tower

As discussed in the Demand Capacity and Facility Requirements chapter, the existing air traffic control tower (ATCT), located directly east of the existing commercial terminal, does not meet all current FAA siting criteria. Therefore, the ATCT facility has been proposed to be relocated.

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

The proposed site for the relocated ATCT facility is retained from the previous Airport Layout Plan (ALP), which was originally approved in 2012. This proposed relocation site is located east of existing Runway 18/36, south of existing Taxiway C, and directly southwest of the existing ARFF station. Landside access would be available via East Lake Mary Boulevard, to Moores Station Road, to Beardall Avenue South, and then to Don Knight Lane. A minor roadway expansion off of Don Knight Lane would be required. Through preliminary analysis and revalidation of the site, it has been found that positive visual line of sight can be obtained to all existing and future airfield infrastructure along with other key areas on the Airport. Further detailed analysis is required for validation of the proposed relocation site and to properly design the facility for the needs of the airport environment.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed ATCT relocation. No ATCT relocation is proposed on this development alternative.

#### 5.3.7.3. Airport Maintenance Facility

As discussed in the Demand Capacity and Facility Requirements chapter, the existing airport maintenance facility has exceeded its useful life. However, the existing facility is still functional and utilized by airport staff. While the existing facility is still utilized, the maintenance facility size has become insufficient. A secondary maintenance facility development area has been proposed on each development alternative. Each varying site is located east of existing Runway 18/36 to allow for a split maintenance operation and allow for the necessary staging of equipment on each half of the airport property.

**Development Alternative 1** (Figure 5-1)

To mitigate the existing maintenance facility space deficiency, it is proposed to develop a secondary maintenance facility. This proposed development has been reserved on approximately 1.75 acres of airport property. This portion of property is located directly east of the northern portion of Beardall Avenue South. This development area is centralized to the eastern portion of the Airport and has been deemed feasible for non-aeronautical use.

**Development Alternative 2** (Figure 5-2)

Development Alternative 2 proposes for a reserved area of approximately 1.20 acres of airport property. The proposed maintenance facility development area on Development Alternative 2 is located directly south of the proposed ATCT relocation. This allows for a centralized siting and development of non-aeronautical facilities on the Airport to maximize viable aeronautical property use. Additionally, the centralized location allows for the quick deployment of maintenance equipment and the proper staging on the east side of the airport property.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 proposed for a reserved area of approximately .85 acres of airport property, the least amount of space compared to the three development alternatives. This reserved development area is located east of the existing Runway 36 end and south of existing Taxiway S.

#### 5.3.7.4. Airfield Compass Calibration Pad

As discussed in the Demand Capacity and Facility Requirements chapter, the existing compass calibration pad located on Taxiway P is non-standard and is recommended to be relocated to a standard location. This standard location, based on siting requirements within FAA AC 150/5300-13A, Appendix 6, ensures that the testing and calibration completed on the compass calibration pad is valid with no interference with surrounding electrical and/or other magnetic infrastructure.

**Development Alternative 1** (Figure 5-1)

To ensure proper siting requirements are preserved while selecting property which otherwise would be not feasible for other aeronautical or non-aeronautical use, it was found that the aera between existing Taxiway B and existing Taxiway C is viable to satisfy both requirements. The compass calibration pad has been designed to accommodate TDG 2 aircraft. This proposed location is centralized on the airfield and allows for ease of access from tenants around the Airport.

**Development Alternative 2** (Figure 5-2)

Development Alternative 2 provides a proposed compass calibration pad south of existing Taxiway S, directly northwest of the existing storm pond west of the South East Ramp. The compass calibration pad has been designed to accommodate TDG 2 aircraft.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed compass calibration pad relocation. No compass calibration pad relocation is proposed on this development alternative.

#### 5.3.7.5. Fuel Storage

As discussed in the Demand Capacity and Facility Requirements chapter, the existing fuel storage is anticipated to become deficient through the planning period. Specifically, the Jet A storage will be deficient between PAL 1 and PAL 2 service levels. Existing AvGas storage is anticipated to be sufficient through the planning period. PAL 4 service levels have found that the existing Jet A storage will be deficient by 142,536 gallons.

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

It is proposed to expand the existing fuel storage facilities to 150,000 gallons of additional capacity. The area between East 29th Street, East 30th Street, and Carrier Ave has been identified as primarily developable land for fuel storage expansion. Therefore, this area should remain reserved for non-aeronautical use to ensure proposed preservation for future fuel storage infrastructure.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts related to proposed fuel storage expansions. No fuel storage expansion is proposed on this development alternative.

### 5.3.8. Proposed Ancillary Modifications

Ancillary modifications such as future property acquisition and storm pond expansion allows for the strategic future growth of the Airport through proper planning and the development of ancillary infrastructure. These items ensure that the Airport is planning for the future through land use analysis to reserve areas essential for this future growth. The following subsections outlines the proposed ancillary modifications presented in the three development alternatives. **Table 5-12** summarizes the ancillary modifications presented on each development alternative.

**Table 5-12 - Ancillary Modifications Summary**

| | Development Alternative 1 | Development Alternative 2 | Development Alternative 3 |
|---|---|---|---|
| Future Property Acquisition | • Required (RPZ): 39.67 acres<br>• Airport expansion: 186.23 acres<br>• Total: 225.90 acres | • Required (Airfield Development, RSA, ROFA. RPZ): 45.11 acres<br>• Airport expansion: 186.23 acres<br>• Total: 225.90 acres | • Required (RPZ): 9.84 acres<br>• Airport expansion: 186.23 acres<br>• Total: 196.07 acres |
| Storm Pond Expansion | • Approximate 13-acre expansion | • Approximate 13-acre expansion | • Approximate 13-acre expansion |
| Solar Farm Development | • 15.61 acres | • 39.34 acres | • No action |
| Rail Access Expansion | • Northwest expansion into airport property | • Northwest expansion into airport property | • No action |
| Future Aeronautical Development Area | • 460.11 total acres | • 431.40 total acres | • 587.51 total acres |
| Future Non-Aeronautical Development Area | • 165.87 total acres | • 130.85 total acres | • 189.53 total acres |

Source: Atkins Analysis

### 5.3.8.1. Future Property Acquisition

Planning future property acquisition not only ensures that an airport analyzes the proposed purchase, but the intention for the further growth of airport property to solicit both additional aeronautical and non-aeronautical expansions. Planning for future property acquisition within the master planning effort is key to ensure the preservation of this intention and to begin the documenting phase towards acquisition. Additionally, some future property acquisition may be required to comply with FAA guidance regarding land use surrounding the airport environment. The following subsections outlines the areas and quantity of proposed future property acquisition as presented in the three development alternatives.

**Development Alternative 1** (Figure 5-1)

It is required to show the intention of property acquisition for non-airport property that is encompassed by existing and future RPZs. There are currently three areas of proposed future property acquisition to ensure the Airport owns the full property encompassed by the RPZs. An existing portion of the north side of the Runway 27R Approach RPZ is depicted for future property acquisition. This area equates to 9.84 acres. With the proposed upgrades to Runway 9R/27L, the future RPZs associated with this runway encompass portions of non-airport property. The first area is 25.97 acres of non-airport property that falls with the majority of the southwest portion of the Runway 9R approach RPZ. The second area is 3.86 acres of future Runway 27L approach RPZ, on the east side of East Lake Mary Boulevard. This area is owned by the St. Johns Water Management District, and the Airport maintains an existing avigation easement for the entire portion of this property. As such, permanent RPZ compliance and land use may be maintained by that easement.

Additional future property acquisition depicted on Development Alternative 1 is primarily to promote the growth of the Airport through expanding the available developable land for both aeronautical and non-aeronautical use, as well as preventing non-compatible land uses from being developed near the Airport. The primary area for this secondary future property acquisition is located on the east side of the airport, encompassing the existing non-airport property between the property line and running long the west side of East Lake Mary Boulevard excluding the existing industrial area between Cameron Avenue and East Lake Mary Boulevard. This area equates to 186.23 acres. In summary, Development Alternative 1's total future property acquisition equals to 225.90 acres.

**Development Alternative 2** (Figure 5-2)

Similar to Development Alternative 1, future property acquisition is proposed for a portion of existing non-airport property that is encompassed within the existing approach RPZ for Runway 27R. This area equals 9.84 acres. Due to the proposed eastward shift and extension of Runway 9R/27L, a portion of property is proposed to be acquired totaling 35.27 acres. This proposed property acquisition may be substituted by an expansion of the Airport's avigation easement, and it is proposed to accommodate the relocated airfield infrastructure and its associated safety surfaces (RSA, ROFA, and RPZ). Additionally, the area previously described for airport expansion equaling 186.23 acres is presented on Development Alternative 2. In summary, Development Alternative 2's total future property acquisition equals 221.5 acres.

**Development Alternative 3** (Figure 5-3)

Like Development Alternatives 1 and 2, future property acquisition is proposed for a portion of existing non-airport property that is encompassed within the existing approach RPZ for Runway 27R. This area equals 9.84 acres. Additionally, the area previously described for airport expansion equaling 186.23 acres is presented on Development Alternative 3. In summary, Development Alternative 3's total future property equals 196.07 acres.

#### 5.3.8.2. Storm Pond Expansion

Proposed storm pond expansions are necessary for the enhancement of stormwater drainage capabilities. The following subsection outlines the proposed expansion of the existing stormwater pond location on the southeast portion of the Airport.

**Development Alternatives 1, 2, and 3** (Figures 5-1, 5-2, and 5-3)

The proposed expansion of the existing storm pond west of the South East Ramp and north of Marquette Ave is necessary for the containment of stormwater and proper drainage capacity during rain-weather events. The proposed expansion totals approximately 13 acres of additional pond.

#### 5.3.8.3. Solar Farm Development

To promote the growth of sustainability at the Airport and to offset energy dependence from local power grids, solar farm arrays are pinnacle to achieve both previously mentioned actions. Airport environments provide viable land available for solar farm infrastructure. This is primarily due to the typically clear and flat property that are located within airport properties. A specific siting analysis for the proposed solar farms at the Airport was completed to ensure that no glare impacts are caused to either aircraft operators or ATCT personnel. All proposed solar farm locations were validated to ensure that each site did not surpass the minimal impact threshold required for safe installation of a solar farm. Electrical yield and additional parameters associated with the proposed solar array infrastructure were not analyzed as part of this master plan process.

**Development Alternative 1** (Figure 5-1)

In Development Alternative 1, the proposed location for the future solar farm is located on the southeast portion of the Airport west along East Lake Mary Boulevard and directly northeast of the Boombah Sports Complex. The proposed area equals 15.61 acres. Primary benefits of this location include the ease of landside access and the marketability of the solar array for community outreach.

**Development Alternative 2** (Figure 5-2)

In Development Alternative 2, the proposed location for the future solar farm is located on the airport property south of Marquette Avenue and north of East Lake Mary Boulevard. The proposed area equals 39.34 acres. Primary benefits of this location include the ease of landside access via Sipes Avenue South and the primary land use restriction to non-aeronautical land use. This site is only viable with the proposed conversion of existing Runway 18/36 into a taxiway due to potential glare impacts to aircraft on approach to Runway 36.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed solar farm development. No solar farm development is proposed on this development alternative.

#### 5.3.8.4. Rail Access Expansion

Rail access is essential to ensuring a multi-modal transportation environment. With access to the airport infrastructure, roadway infrastructure and railway infrastructure, cargo and other goods can be transferred from one mode of transportation to another with ease, cutting down on operational costs and overall increasing logistical efficiency. The following subsections outlines the proposed rail spur expansion at the Airport.

**Development Alternatives 1 and 2** (Figures 5-1 and 5-2)

An existing rail spur runs along the west boundary of the existing airport property, with one piece of the rail spur turning into an industrial park located directly west of Mellonville Avenue. A similar rail spur expansion turning further into the airport property is proposed on the northwest portion of the Airport in the vicinity of Orange Avenue and Willow Avenue. This rail spur expansion would be supported with proposed future non-aeronautical development areas around the rail spur, with proposed future aeronautical development directly to the east.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed rail access expansion. No rail access expansion is proposed on this development alternative.

#### 5.3.8.5. Future Aeronautical Development Areas

Future aeronautical development areas provide the land use planning of airport property that is not yet justified for aeronautical development per the Demand Capacity and Facility Requirements chapter. Additionally, it provides the Airport flexibility for development within the identified areas. Aeronautical development areas are typically located where there is airside access, providing the highest and best use of finite airside adjacent parcels. Several areas have been identified for future aeronautical development presented within the three development alternatives. The following subsections discuss the areas and their total acreage.

**Development Alternative 1** (Figure 5-1)

Development Alternative 1 identifies 463.12 acres total for future aeronautical development. Primary areas include property between the proposed Taxiway A extension and East 25th Street, central/east portion of the airport property adjacent to the proposed 186.23 acres of future property acquisition, and south of Taxiway S where reclaimed land from the removal/conversion of Runway 18/36 could be developable. Other identified areas include expansions of existing aeronautical facilities onto adjacent land.

**Development Alternative 2** (Figure 5-2)

Development Alternative 2 identifies 431.40 acres total for future aeronautical development areas. These identified areas are similar to Development Alternative 1 with adjustments regarding factors such as the proposed Runway 9R/27L eastward shift and extension, maintenance facility location and size, specific Avocet apron facility expansion, and Development Alternative 1 proposed conventional hangar complexes shown as future aeronautical development on Development Alternative 2.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 identifies 587.51 acres total for future aeronautical development areas. In contrast to the first two development alternatives, Development Alternative 3 has been primarily utilized as a no-action alternative. The primary promotion of additional aeronautical developable land was gained with the proposed conversion of Runway 18/36 to a taxiway, effectively allowing for development off each runway end. Aeronautical development areas are still centralized south along East 25th Street, the central/east portion of the airport property around the proposed 186.23 acres of future property acquisition, and south of Taxiway S.

#### 5.3.8.6. Future Non-Aeronautical Development Areas

Future non-aeronautical development areas provide the land use planning preservation of airport property for development not directly associated with aeronautical use. These properties typically do not need airside access and development can include industrial, commercial, and other infrastructure facilities. Several areas have been identified for future non-aeronautical development as presented on the three development alternatives. The following subsections discuss the areas and their total acreage.

**Development Alternative 1** (Figure 5-1)

Development Alternative 1 identifies 167.90 acres total for future non-aeronautical development areas. Primary identified areas include existing airport property that has been deemed least viable for aeronautical associated development and more feasible for the types of development associated with non-aeronautical uses in airport environs. These non-aeronautical development areas include portions of airport property that are along or in direct vicinity major landside roadway infrastructure.

**Development Alternative 2** (Figure 5-2)

Development Alternative 2 identifies 130.85 acres total for future non-aeronautical development areas. These identified areas are similar to Development Alternative 1 with adjustments regarding factors such as the proposed Runway 9R/27L eastward shift and extension, proposed solar farm location and size, and the reduction of some future aeronautical development areas.

**Development Alternative 3** (Figure 5-3)

Development Alternative 3 identifies 189.53 acres total for future non-aeronautical development areas. These identified areas are similar to the first two development alternatives with minor adjustments. These minor adjustments are associated with the no-action alternative for Runway 18/36 and the land that is not reclaimed for future development. Additionally, with the no-action alternative for Runway 9R/27L, the land beyond Runway 27L is left open for development due to the preservation of the smaller existing RPZ.

## 5.4. Alternatives Evaluation Criteria

Alternatives' evaluation followed the criteria provided in the FAA's AC 150/5070-6B, *Airport Master Plan* which include the following:

- Operational Performance.
- Best planning Tenets and Other Factors.
- Environmental Factors; and
- Fiscal Factors.

In addition, sustainability was included as an evaluation factor given the global focus on sustainable development in aviation. Sustainability initiatives include a focus on reducing environmental impacts, achieving economic benefits, and increasing integration with local communities.

### 5.4.1. Operational Performance

An airport's ability to function as a system can be evaluated based on several factors:

- **Capacity** – The ability to accommodate future demand as determined in the facility requirements.
- **Capability** – The ability to meet airport design standards and ensure a safe operating environment.
- **Operational Efficiency** – How well the alternatives work as a system to avoid delays, inefficiencies, airspace conditions, etc. This also considers the coexistence of existing and future users.

### 5.4.2. Best Planning Tenets and Other Factors

Several best planning tenets were selected to determine the most responsible and viable alternative within this AMP. These include:

- **Flexibility** to accommodate unforeseen change (e.g., increases or decreases in activity levels, changes to fleet mix, new users, etc.)
- **Technically feasible** (e.g., considers site constraints and other limitations)
- **Conformance** to the Airport's goals, industry best practices, applicable state and federal laws, guidelines, and standards, local, regional, and state transportation plans.

### 5.4.3. Environmental Factors

As discussed in the Environmental Overview Chapter, there are several environmental resources that may be impacted by proposed airport development. Please refer to the Environmental Overview chapter of this AMP which details the National Environmental Policy Act (NEPA) environmental categories associated with the Airport. Following are the Airport's identified environmental criteria:

- Air Quality
- Biological Resources (Including Fish, Wildlife, and Plants)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Land Use
- Noise and Noise-Compatible Land Use
- Climate
- Department of Transportation Act, Section 4(f)
- Historical, Architectural, Archaeological, and Cultural Resources
- Visual Effects (Including Light Emissions)
- Water Resources (Including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

### 5.4.4. Fiscal Factors

This analysis considers impacts of an alternative in relation to the Airport's economic viability as well as surrounding community's. Furthermore, the analysis provides consideration of the estimated development costs associated with the various alternatives, along with prospective funding sources. Development cost estimates for the preferred alternative are provided in Chapter 7, Capital Improvement Plan. The following were assessed as a part of this analysis:

- **Development Costs** – Includes anticipated costs of development and potential alternative funding sources. Alternative funding sources include those other than the City, State, or FAA, such as private business owners and/or developers.
- **Job Creation** – The potential of each alternative to create employment and other economic development benefits for the Airport and immediate surrounding areas.
- **Financial Sustainability** – Anticipated opportunities for revenue generation through increased activity, new businesses, etc. to increase the Airport's ability to become more financially self-sufficient

### 5.4.5. Sustainability

The FAA is committed to making airports environmentally responsible with initiatives that affect facility operations, the aviation industry, and customers. Airports commonly follow the approach to sustainability codified by Airports Council International-North America (ACI-NA), known as 'EONS', which consider four key components when sustainability programs are designed and implemented:

- **E**conomic Viability
- **O**perational Efficiency
- **N**atural Resource Conservation
- **S**ocial Responsibility

## 5.5. Alternatives Evaluation Summary

The evaluation criteria described above were applied to each alternative based on initial input from the Airport. Based on the overall assessment, each criterium was assigned a rating for comparison. The rating system is based on the Consumer Reports method.

Each alternative was evaluated independently. As a result of the evaluations summary, depicted in **Figure 5-23**, both Development Alternative 1 and Development Alternative 2 tied for the first ranking at nine total points, while Development Alternative 3 held the second ranking with negative two points. Both Development Alternatives 1 and 2 are similar with proposed airfield, airside, and landside development items, therefore they are scored similarly. Minor adjustments between taxiway configurations and landside modifications did not constitute a substantial enough change to dictate varying total points. Development Alternative 3, mainly seen as the no-action alternative for majority of the proposed airfield and airside development, was ranked the lowest due to the shortsighted outlook and planning to meet forecasted demand thought the planning period.

**Figure 5-23 - Alternatives Evaluation Summary**

**Alternatives Evaluation Criteria**
**Orlando Sanford International Airport**

| ● = +1 ◒ = 0 ○ = -1 | Alt.1 | Alt 2. | Alt 3. |
|---|---|---|---|
| **Operational Performance** | | | |
| Capacity | ● | ● | ○ |
| Capability | ● | ● | ● |
| Operational Efficiency | ● | ● | ○ |
| **Best Planning Tenets** | | | |
| Flexibility | ● | ● | ◒ |
| Technically Feasible | ● | ● | ● |
| Conforms to County's Goals | ● | ● | ○ |
| **Environmental Factors** | | | |
| Air Quality | ○ | ○ | ○ |
| Biological Resources | ◒ | ◒ | ◒ |
| HazMat/Waste | ◒ | ◒ | ◒ |
| Land Use | ● | ● | ○ |
| Noise | ● | ● | ◒ |
| Climate | ◒ | ◒ | ◒ |
| DOT Section 4(f) | ◒ | ◒ | ◒ |
| Visual/Lighting Effects | ○ | ○ | ◒ |
| Water Resources | ● | ● | ● |
| **Fiscal Factors** | | | |
| Development Costs | ○ | ○ | ● |
| Job Creation | ● | ● | ○ |
| Financial Sustainability | ● | ● | ◒ |
| **Sustainability** | | | |
| Overall Support of Sustainability | ● | ● | ○ |
| **Evaluation** | | | |
| Score | 9 | 9 | -2 |
| **Summary** | | | |
| Ranking | 1 (Tie) | 1 (Tie) | 2 |

**Key**

| | |
|---|---|
| ● = 1 | This symbol represents a positive impact, an improvement or benefit, a lower anticipated cost, a higher level of flexibility, or a lower impact to the environment. |
| ◑ = 0 | This symbol represents maintaining a similar level or benefit, an average cost, an average level of flexibility, or average potential environmental impact. |
| ○ = -1 | This symbol represents an improvement that is not anticipated to meet the need, a higher cost, limited flexibility, and higher than normal environmental impacts. |

## 5.6. Preferred Development Alternative

The following section summarizes the preferred development alternatives based on the alternatives' evaluation presented in previous sections of this chapter. **Figure 5-24** presents the preferred development alternative and is based on the alternative with the highest evaluation score, while elements from the other alternatives may have been integrated into the preferred alternative to achieve the Airport's vision. **Figure 5-25** presents the preferred landside development alternative. Due to both Development Alternative 1 and Development Alternative 2 scoring similar within the alternatives evaluation matrix, elements from both alternatives have been integrated into the preferred alternative to optimize the airfield, airside, and landside development.

### 5.6.1. Preferred Runway Modifications

**Table 5-13** summarizes the selected preferred runway modifications. Preferred runway modifications were taken from both Development Alternatives 1 and 2.

**Table 5-13 - Preferred Runway Modifications Summary**

| Runway | Preferred Development Alternative |
|---|---|
| Runway 9R/27L | Split extension to a total length of 7,200 feet |
| Runway 18/36 | Conversion to TDG 5, ADG V taxiway and partial removal |
| Runway 9C/27C | Runway 27C end eastward relocation/expansion by 643 feet |
| Runway 9L/27R | No action |

Source: Atkins Analysis

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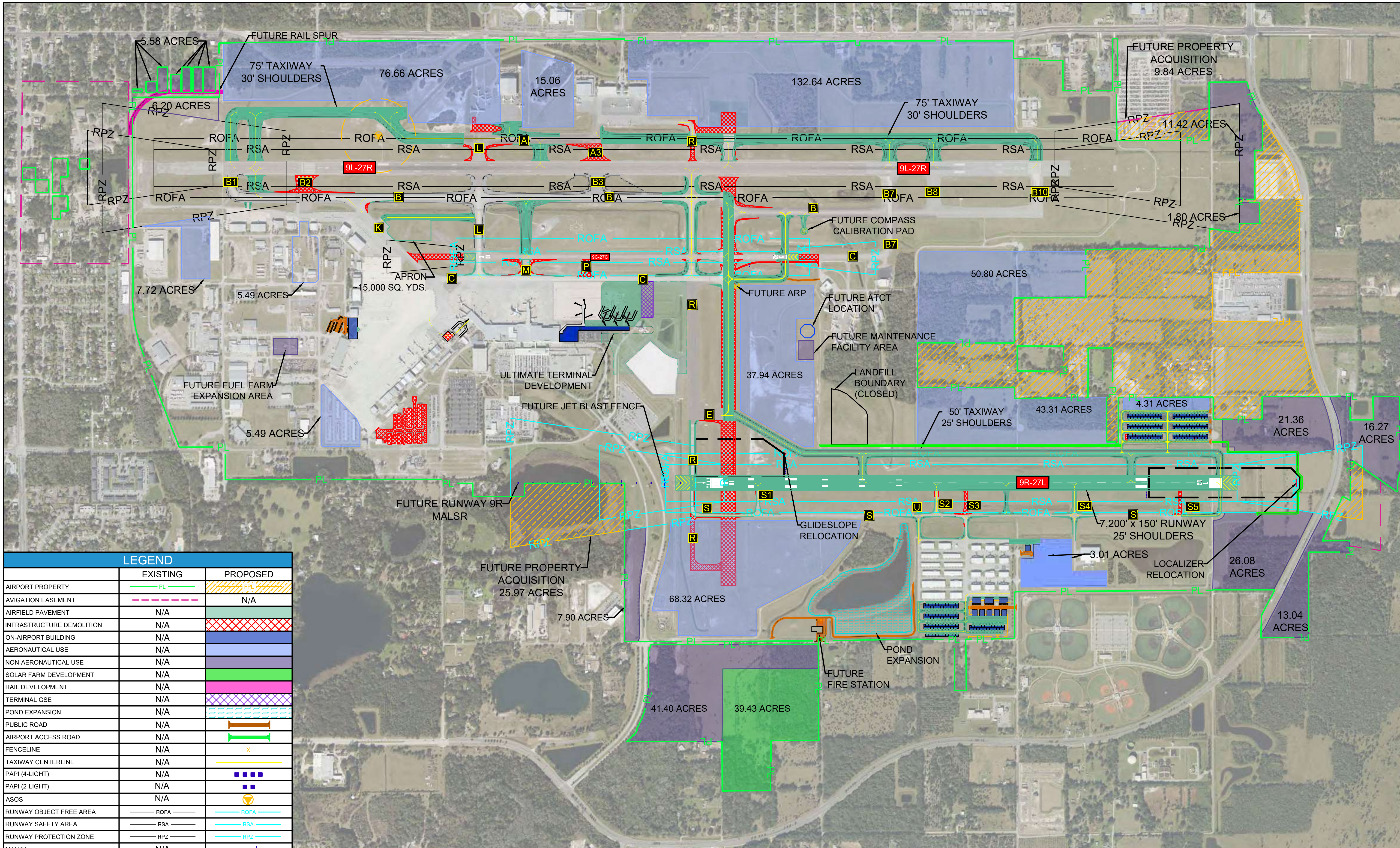


FIGURE 5-24: PREFERRED DEVELOPMENT ALTERNATIVE

ATKINS
MEMBER OF THE SNC-LAVALIN GROUP

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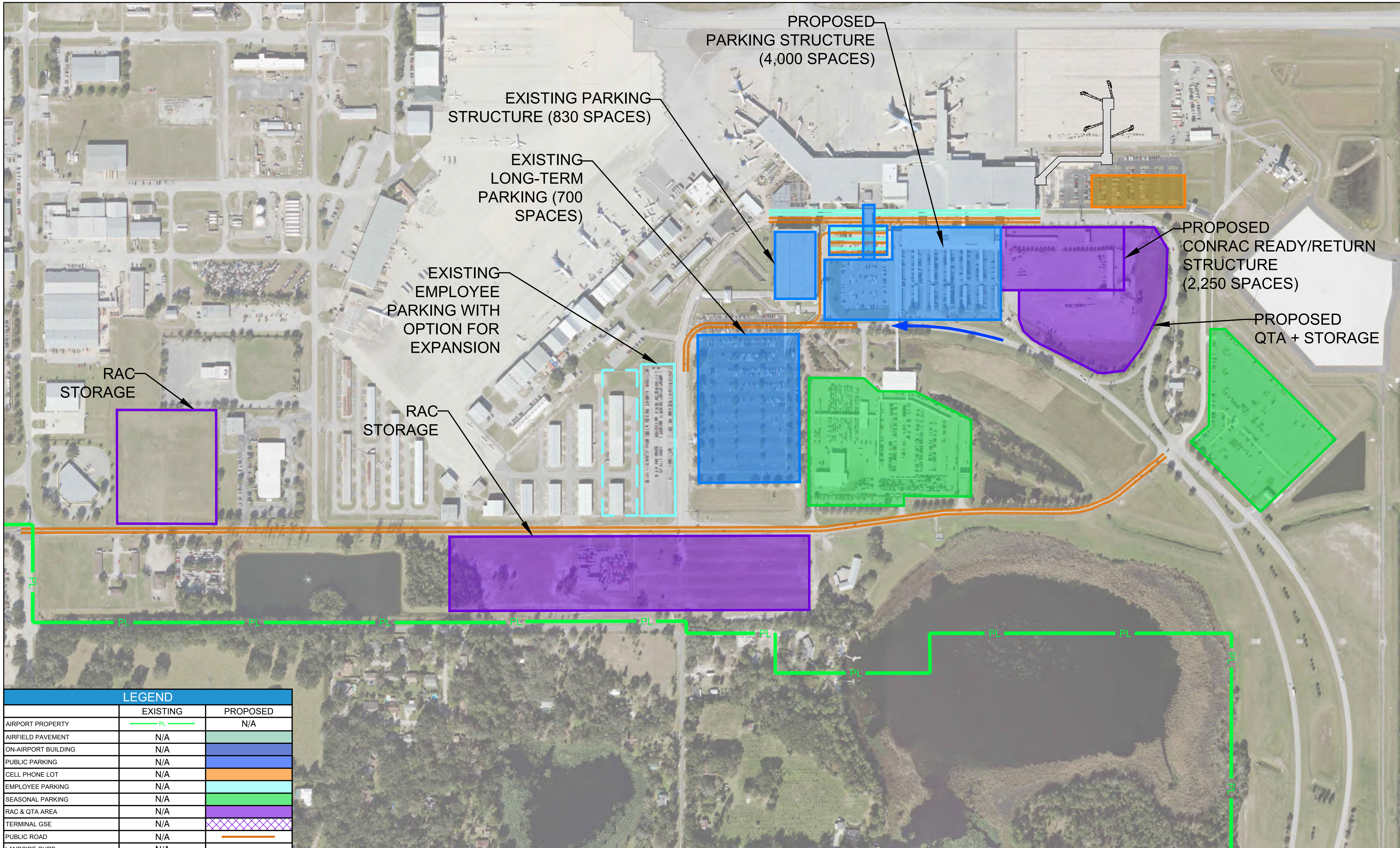


| LEGEND | | |
|---|---|---|
| | EXISTING | PROPOSED |
| AIRPORT PROPERTY | PL | N/A |
| AIRFIELD PAVEMENT | N/A | |
| ON-AIRPORT BUILDING | N/A | |
| PUBLIC PARKING | N/A | |
| CELL PHONE LOT | N/A | |
| EMPLOYEE PARKING | N/A | |
| SEASONAL PARKING | N/A | |
| RAC & QTA AREA | N/A | |
| TERMINAL GSE | N/A | |
| PUBLIC ROAD | N/A | |
| LANDSIDE CURB | N/A | |

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FIGURE 5-25: PREFERRED DEVELOPMENT ALTERNATIVE - LANDSIDE ROADWAY AND PARKING

0 400 800 Feet

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## 5.6.2. Preferred Taxiway Modifications

**Table 5-14** summarizes the selected preferred taxiway modifications. Preferred taxiway modifications were taken from both Development Alternative 1 and Development Alternative 2.

**Table 5-14 - Preferred Taxiway Modifications Summary**

| Taxiway | Preferred Development Alternative |
|---|---|
| Taxiway A | • Taxiway A3 relocation by approximately 750 feet west<br>• Full north parallel taxiway to Runway 9L/27R<br>• Entrance taxiway and bypass connector on the 9L approach end |
| Taxiway B | • Taxiway B2 relocation by approximately 700 feet west<br>• Taxiway B apron connector enhancement |
| Taxiway C | • East taxiway extension to relocated Runway 27C approach end, additional runway end connector to Taxiway B, and aligned taxiway removal up to proposed Runway 27C approach end |
| Taxiway E | • Extension of taxiway to new full parallel TDG 3 north of Runway 9R/27L |
| Taxiway K | • Taxiway K1 relocation |
| Taxiway L | • No action |
| Taxiway M | • Extension across Runway 9C/27C connecting to Taxiway B<br>• Fillet enhancement |
| Taxiway P | • Taxiway removal |
| Taxiway R | • Removal south of Taxiway S intersection<br>• Removal north of Runway 9L/27R |
| Taxiway S | • Taxiway S1, S2, and S4 fillet enhancement<br>• Taxiways S3 and S5 relocations |
| Taxiway U | • Fillet enhancement |
| Runway 18/36 | • Convert Runway 18/36 to a TDG 5 Taxiway T |

Source: Atkins Analysis

## 5.6.3. Preferred Apron Modifications

**Table 5-15** summarizes the selected preferred apron modifications. Preferred apron expansion was taken from both Development Alternatives 1 and 2.

**Table 5-15 - Proposed Apron Modifications Summary**

| Proposed Development Alternative |
|---|
| • ~15,000 square yard apron area connected to the south of Taxiway K1 relocation<br>• Increased itinerant apron area associated with proposed conventional hangar development south of Million Air facilities |

Source: Atkins Analysis

## 5.6.4. Preferred Commercial Service Terminal Modifications

**Table 5-16** summarizes the selected preferred commercial gate and associated terminal expansion. Preferred commercial gate and associated terminal expansion was taken from Development Alternative 1.

**Table 5-16 – Preferred Commercial Terminal Gate Modifications**

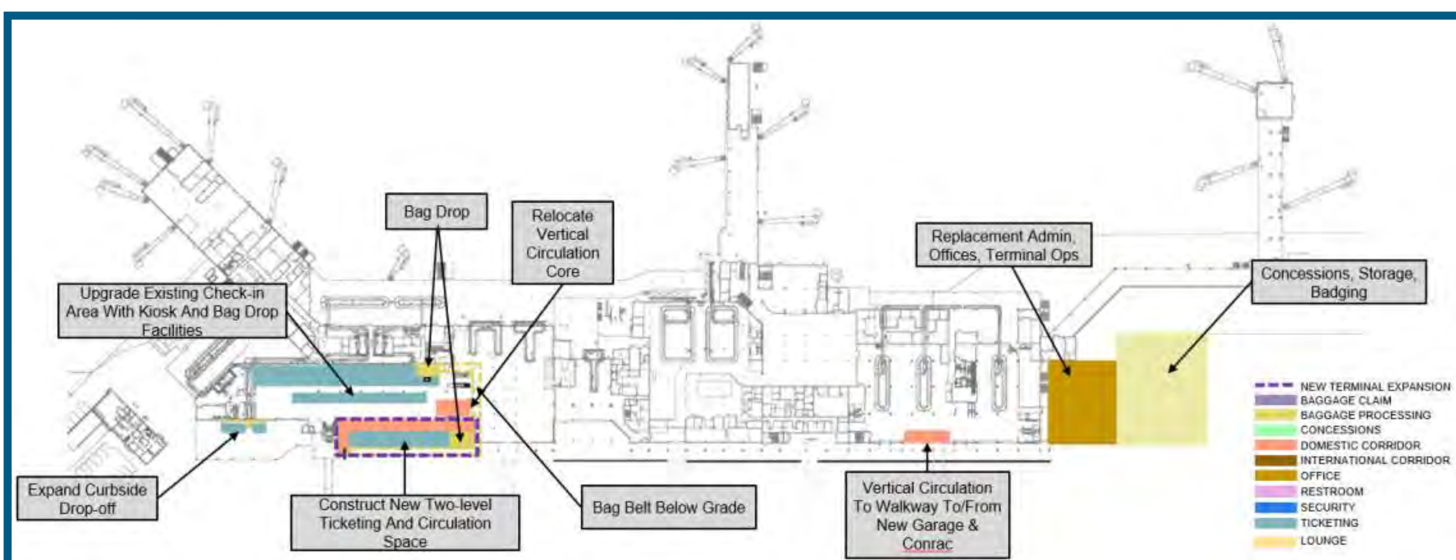
| Commercial Service Aspect | Preferred Development Alternative |
|---|---|
| Airside Gate Expansion & Associated Terminal Expansion | • Three (3) new gates capable of supporting ADG III to ADG V aircraft<br>o 61,400 square-foot east terminal expansion<br>o 37,447 square yard apron expansion<br>• Enhance existing Gate 16 to accommodate ADG III aircraft<br>o 12,600 square-foot west terminal expansion<br>o Relocation of existing flight kitchen facility |

Source: Jacobsen | Daniels Analysis

**Figure 5-26** and **Figure 5-27** depict the preferred terminal services modifications first floor and second floor configurations, respectively. The preferred terminal services modifications is a refined version taken from Development Alternative 1. Primary adjustments between Development Alternative 1 and the Preferred Development Alternative is the replacement of displaced administration offices and terminal operations offices to the east portion of the terminal. Additionally, concession, storage, and badging support areas are proposed to be expanded to the east of the proposed administration buildings. Within the primary check-in area on the first-floor terminal, it is proposed to further expand the kiosk and bag drop facilities compared to Development Alternative 1. Expanded curbside drop-off points will allow for enhanced passenger satisfaction and efficient throughput.

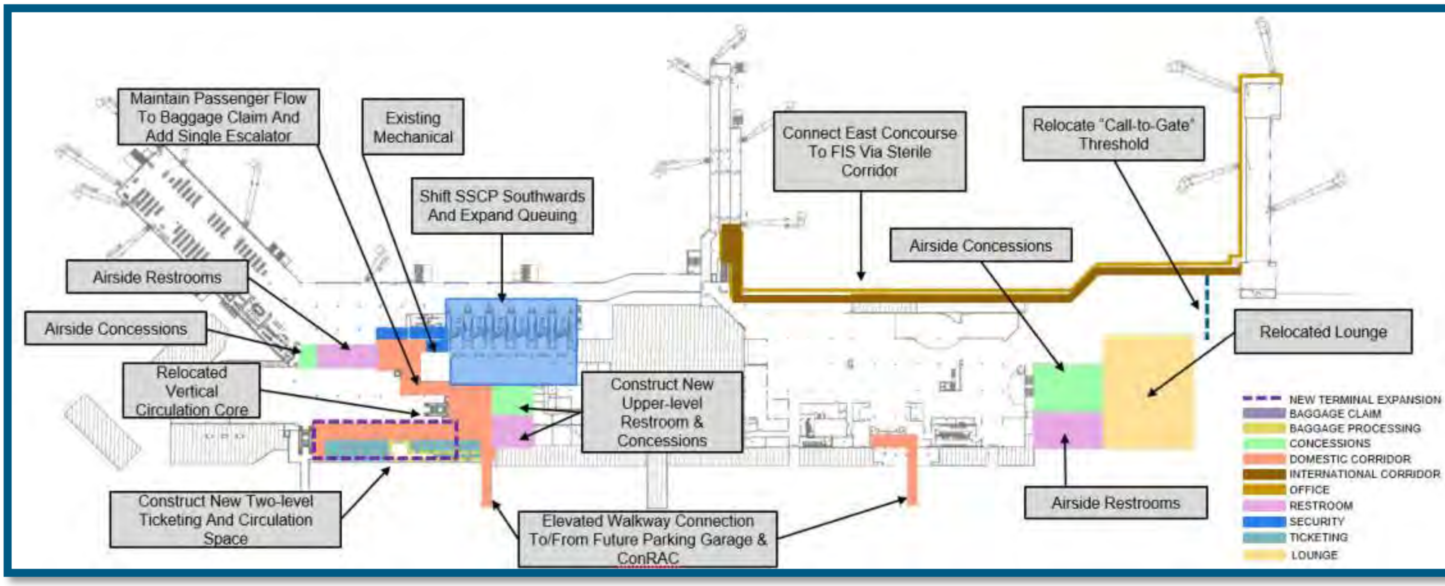
For preferred terminal services modifications on the second floor, it is proposed to have a secondary walkway on the eastern portion of the terminal connecting to the future parking garage. This walkway is in addition to the proposed elevated walkway that is proposed on Development Alternative 1 which ties into the check in area of the terminal. Above the proposed replacement administration offices, concessions, storage, and badging area, it is proposed on the second floor to provide a relocated airside lounge area, airside restrooms, and airside concessions. The proposed sterile corridor to the east concourse has been preserved within the preferred alternative.

**Figure 5-26 - Preferred Terminal Services Modifications - First Floor**




Source: Jacobsen | Daniels Analysis

Figure 5-27 - Preferred Terminal Services Modifications - Second Floor




Source: Jacobsen | Daniels Analysis

## 5.6.5. Preferred General Aviation Modifications

**Table 5-17** summarizes the selected preferred general aviation modifications. Preferred general aviation expansion was taken from both Development Alternatives 1 and 2.

**Table 5-17 - Preferred General Aviation Modifications Summary**

| Hangar Type | Preferred Development Alternative |
|---|---|
| Conventional Hangar | • (5) 6,300 Square Feet Facilities<br>• (3) 9,600 Square Feet Facilities<br>• (1) 35,000 Square Feet Facility<br>• (1) 5,500 Square Feet Facility |
| T-Hangar | • (4) 20-Unit Facilities<br>• (1) 10-Unit Facility |

Source: Atkins Analysis

## 5.6.6. Preferred Ground Transportation and Landside Parking Modifications

The preferred landside alternative is derived from a refinement of Development Alternative 2. Primary adjustments includes revisions to the proposed five level parking structure and four level ConRAC storage structure. The ConRAC structure includes approximately 158,000 square feet per level with approximately 10,000 square feet of rental car customer service integrated into the design. A RAC QTA and storage surface lot of 5.4 acres is proposed to encompass the east and south side of the proposed ConRAC storage structure to meet forecasted demand. The proposed five level parking structure has the capacity to hold approximately 4,000 spaces. Area to the northwest section of the proposed parking structure has been reserved and planned for taxi and commercial transportation areas. This area is proposed to have three curb and queue lanes for passenger pick up. Necessary parking expansion option has been proposed directly west of the existing employee parking lot in the event that additional parking is required.

## 5.6.7. Preferred Support Facility Modifications

**Table 5-18** summarizes the selected preferred support facility modifications. Preferred support facility modifications were taken from both Development Alternatives 1 and 2.

**Table 5-18 - Preferred Support Facility Modifications Summary**

| | Preferred Development Alternative |
|---|---|
| Air Traffic Control Tower | • East relocation |
| Airport Maintenance Facility | • Secondary maintenance complex: 1.20 acres<br>• South to proposed ATCT |
| Compass Calibration Pad | • Relocation off Taxiway B |
| Fuel Storage | • Expand existing infrastructure site |

Source: Atkins Analysis

## 5.6.8. Preferred Ancillary Modifications

**Table 5-19** summarizes the selected preferred ancillary modifications. Preferred ancillary modifications were taken from both Development Alternatives 1 and 2.

**Table 5-19 - Preferred Ancillary Modifications Summary**

| | Preferred Development Alternative |
|---|---|
| Future Property Acquisition | • Required (RPZ): 39.67 acres<br>• Airport expansion: 186.23 acres<br>• Total: 225.90 acres |
| Storm Pond Expansion | • Approximate 13-acre expansion |
| Solar Farm Development | • 39.34 acres<br>• South of Marquette Avenue |
| Rail Access Expansion | • Northwest expansion into airport property |
| Future Aeronautical Development Area | • 465.79 total acres |
| Future Non-Aeronautical Development Area | • 167.90 total acres |

Source: Atkins Analysis

# Environmental Overview

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# 6. Environmental Overview

## 6.1. General Overview

The purpose of this chapter is to present an overview of the existing environmental conditions at the Orlando Sanford International Airport (SFB). Such an overview does not constitute an Environmental Assessment (EA), as defined by the Federal Aviation Administration (FAA) Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, and 1050.1F Environmental Impacts: Policies and Procedures; however, the analysis in this section is conducted in accordance with the guidelines set forth in the aforementioned FAA orders. This document is intended to provide background information only. The Airport Layout Plan (ALP) will receive an Environmental "Conditional Approval" which will require a complete environmental analysis on a per project basis as indicated in the aforementioned FAA requirements.

According to the FAA orders, nineteen (19) categories have been determined as possible areas of impact and must be addressed. These categories include:

- Air Quality
- Coastal Barriers
- Coastal Zone Management
- Compatible Land Use
- Construction Impacts
- Section 4(f) Lands
- Prime and Unique Farmland
- Fish, Wildlife and Plants (biotic communities)
- Floodplains
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Light Emissions
- Natural Resources, Energy Supply, and Sustainable Design
- Noise
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks
- Water Quality
- Wetlands
- Wild and Scenic Rivers

In addition to the aforementioned Federal guidance, this chapter also includes governing practices set forth by the State of Florida's Department of Environmental Protection (FDEP) and the Florida Fish and Wildlife Conservation Commission (FWC). The FDEP is the lead agency in state government for environmental management and stewardship and *"protects air, water, and land. Florida's environmental priorities include restoring America's Everglades, improving air quality, restoring and protecting the water quality in springs, lakes, rivers and coastal waters, conserving environmentally sensitive lands and providing citizens and visitors with recreational opportunities."*

For the purposes of this study, the above-mentioned environmental categories will be addressed only as they apply specifically to SFB and will otherwise be noted as not applicable to this airport. In considering potential environmental impacts within this framework the following environmental overview points out the categories which may warrant more detailed analysis in a formal EA for the preferred development alternatives. Specifically, this section is an update to the Environmental Overview chapter in the previous Airport Master Plan for SFB.

## 6.2. Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.  The levels of pollutants are generally expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter (µg/m3).

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and Florida air quality standards to determine potential effects. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare, with a reasonable margin of safety. The NAAQS identify maximum allowable concentrations for the following criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO2), sulphur dioxide (SO2), particulate matter less than 10 microns in diameter (PM10), and lead (40 CFR 50). In the case of SO2, the State of Florida has established more stringent standards (F.A.C. 62-204-240).

Guidelines for regulating air quality have been established by the Federal Clean Air Act and all implementation and enforcement of these guidelines are the responsibility of the Environmental Protection Agency (EPA). Section 110 of the Act requires that states develop a State Implementation Plan (SIP) in an effort to comply with federal air quality standards. National ambient air quality standards have been established Under Section 109 of the Act to protect Public Health. The FAA must ensure that all federal airport actions, such as financial awards and grants, conform to the state plan for controlling air pollution impacts.

The FAA states that an air quality analysis required only if the forecast aircraft projected levels of general aviation activities are above 180,000 operations or 1.3 million passengers. As presented in the forecasts of aviation demand of this report, the current forecast level of GA operations and passengers at SFB exceeds these trigger thresholds. Therefore, an air quality analysis will be required as part of any environmental documentation for major proposed development. However, air quality standards at SFB and Seminole County as a whole meet those established by the above-mentioned Federal and State legislation.  Additionally, as initiated by the Airport Act of 1982, an air quality certification may be required prior to construction/ development in order to ensure that federal and state air quality standards are met.

Temporary impacts from construction related activities and their associated vehicles are expected during development initiatives at SFB. These impacts are anticipated to be minimal and could be mitigated by use of Best Management Practices (BMPs). Temporary air quality impacts during these periods are likely to include, but are not limited to, wind-blown dust and equipment exhaust.

## 6.3. Coastal Barriers

The Coastal Barriers Resource Act (COBRA) of 1982 prohibits the federal government from financial involvement associated with building and development in undeveloped portions of designated coastal barriers along the Atlantic and Gulf coasts. These areas were mapped and designated as Coastal Barriers Resources System (CBRS) units or otherwise protected areas.  They are commonly referred to as COBRA zones System and are available for inspection in the offices of the U.S. Fish and Wildlife Service.  COBRA banned the sale of NFIP flood insurance for structures built or substantially improved on or after a specified date. COBRA zones and their identification dates are shown on Flood Insurance Rate Maps (FIRMS).

Seminole County is located in north central Florida and is not considered a coastal county.  Therefore, SFB is not within any of the coastal barrier areas designated by the coastal barrier resource system.  However, since the entire state of Florida is within the coastal zone, a coastal zone consistency determination may be required for certain specific projects.

## 6.4. Coastal Zone Management

The Coastal Zone Management Act (CZMA) requires that all Federal projects occurring in the applicable coastal zones areas comply with management guidelines established in the Coastal Zone Management Program. The CZMA outlines three programs, the National Coastal Zone Management Program, the National Estuarine Research Reserve System, and the Coastal and Estuarine Land Conservation Program. Procedures for determining consistency with approved coastal zone management programs are contained in the National Oceanic and Atmospheric Administration (NOAA) Regulations (15 CFR Part 930).

The term “coastal zone” is defined as coastal waters and adjacent shore lands strongly influenced by each other and in proximity to the coastal states including islands, transitional and intertidal areas, salt marshes, wetlands and beaches. Coastal Waters refers to any water adjacent to a shoreline that contain a measurable amount of sea water, including, but not limited to sounds, bays, lagoons, bayous, ponds, and estuaries.

The limit of state waters is the outer boundary of the coastal zone, which is three nautical miles from shore for Florida's Atlantic Coast. The seaward boundaries of the state of Florida's coastal zones are defined in accordance with Section 304(1) of the CZMA, the Submerged Lands Act (43 U.S.C. 3101 et Seq.) and United States vs. Louisiana, 364 U.S. 502 (1960) as three nautical miles into the Atlantic Ocean and approximately nine nautical miles into the Gulf of Mexico. The landward boundaries of the state of Florida are defined by the state, in accordance with Section 306(d)(2)(A) of the CZMA, as the entire state of Florida, excluding only federally owned properties.

Federal agency activities potentially affecting the coastal zone are required to be consistent to the maximum extent practicable, with the approved state Coastal Zone Management Programs. Federal agencies make determinations as to whether their actions are consistent with approved state plans. Consistency determinations are submitted to the state for review and concurrence. All relevant state agencies must review proposed actions and issue a consistency determination. The Florida Coastal Management Program is composed of 23 Florida Statutes administered by 11 state agencies and four of the five Water Management Districts throughout Florida.

Approval of the Airport Layout Plan can, by definition in the NOAA Regulations, be a Federal permitting action subject to subpart D. Unless the recommended development has been specifically identified in Florida's Coastal Zone Management Program or unless the Department of Environmental Protection has specifically advised the Airport and Industrial District and the FAA that an approved airport layout plan action would significantly affect a coastal zone, subpart D of the NOAA Regulations would not apply and no further action would be needed. Additionally, Chapter 380, Part II, Section 23 – Federal Consistency of the Florida Statutes, states that only those federal activities that significantly affect Florida's coastal zone will be evaluated for consistency with the Florida Coastal Management Program.

Further coordination is required for specific projects to ensure that future plans of the airport are consistent with other plans to protect and manage the coastal zone, and that areas selected for future development are not situated within any federally assigned units included in the CBRS discussed in the previous sections. Chapter 253, Florida Statutes, requires the Department to grant an easement, dedication, submerged land lease or other form of documented consent for the use of state-owned or sovereignty lands.

In conclusion, Seminole County is not contiguous with any coastal waters that would be subject to high water. Furthermore, SFB is located approximately 60 miles from the east coast and 165 miles from the west coast of Florida. Therefore, the county does not meet the definition of a coastal county and SFB is not expected to be under the jurisdiction of the coastal zone management program. However, since the entire state of Florida is within the coastal zone, a coastal zone consistency determination will be required for certain specific projects.

## 6.5. Compatible Land Use

The properties near an airport are often affected by airport operations. Florida statutes, Chapter 333 requires that local governing entities establish future land use and zoning regulations to ensure compatible land use around airports. These regulations consider height, noise compatibility and safety. The current zoning map for the areas surrounding the airport was presented in Chapter 2 of this Master Plan.

A key goal of the master planning process is to ensure compatible land uses between the Airport and the surrounding community. During the planning period of this Master Plan, compatibility issues such as development on- and off-Airport, aircraft operations, or changes in aircraft type operating at SFB could arise. Therefore, future projects consider existing and future land use in the vicinity of SFB as provided by Seminole County.

### 6.5.1. City of Sanford Land Use

Incorporated lands in the vicinity of SFB are under the City's jurisdiction. These lands are addressed in the City of Sanford's Comprehensive Plan, Policy FLU 1.9. entitled “Airport Industry and Commerce Land Use Designation (AIC).” The AIC designation is intended to promote the development and expansion of industrial land uses in areas where airport noise inhibits residential development. Additionally, other areas for mixed-use development that are compatible with Airport operations are provided. Any and all new development within the AIC area must incorporate criteria to implement Objective 1.4 and Policy FLU 1.9, which include impact analysis requiring sound insulation and management plans for potential impacts on air operations.

### 6.5.2. Seminole County Land Use

Seminole County's Comprehensive Plan addresses land around the Airport in Policy Future Land Use 5.8 titled *Higher Intensity Planned Development – Airport (HIP Airport) Permitted Uses and Location Standards*. The HIP-Airport area provides higher intensity mixed-use development, in the vicinity of the Airport, that is compatible with the operation and expansion of SFB. The following land uses comprise the HIP-Airport designation:

- Industrial parks
- Corporate business parks
- Office complexes
- Commercial development
- Attendant retail
- Service and hotel uses
- Medium and high density development
- Residential development

The HIP-Airport designation requires that all residential developments comply with the guidelines issued by the FAA and Department of Transportation (DOT) relating to Airport compatible land uses.

## 6.6. Construction Impacts

During periods of development, extensive construction activities may occur. Construction activities may include but are not limited to earthmoving activities, vertical (structures) and horizontal (pavement) construction, delivery of equipment and materials, and removal of debris associated with runways and taxiways. The potential for impacts to off-Airport communities in the vicinity of the Airport is greatest during the initial phases of development. These impacts may consist of increased traffic on local roads, noise, mud, dust, and other effects associated with the activity of heavy construction vehicles. All possible impacts related to development projects are minor and temporary. Nevertheless, the Airport management will exercise best practices at SFB to contain and minimize the impact of construction during building phases of projects proposed in the development plan.

## 6.7. Section 4(f) Lands

The United States Code (USC) Title 49 – Transportation, Subtitle I _Department of Transportation (DOT), Chapter 3 – General Duties and Powers, Subchapter I – Duties of the Secretary of Transportation (DOT), Section 303 – Policy on lands, wildlife and waterfowl refuges and historic sites was formerly known as the DOT Act, Section 4(f). According to that law, it is the policy of the US Government that special effort be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges as well as historic sites.

It is the responsibility of the Secretary of Transportation to cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, the Department of Agriculture and with the state governments in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities.

The law provides that no approval be given by the Secretary of Transportation to a program or project which requires the use of publicly-owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance unless there is no prudent and feasible alternative to using that land, and the project includes all possible planning to minimize harm to such lands. Enforcement of this legislation is the primary responsibility of the Department of the Interior, though the U.S. Fish and Wildlife Service (USFWS) and U.S. Army Corps of Engineers may provide assistance.

A Section 4(f) property includes publicly-owned parks, recreation areas, and wildlife or waterfowl refuges, or any publicly- or privately-owned historic site listed or eligible for listing on the National Register of Historic Places (NRHP). There are no Section 4(f) historic places listed in the NRHP within the vicinity of the Airport.

Before approval of a project that uses Section 4(f) property is granted by the Secretary, it must be determined that any impacts are "de minimus" or a Section 4(f) Evaluation must take place. De Minimus is Latin for "about minimal things" and is defined legally as "lacking significance or importance". This impact is one that will not adversely affect the activities, features or attributes of the property. This determination does not require analysis to determine is avoidance alternatives are feasible and prudent, but consideration of avoidance, minimization, mitigation or enhancement measures should occur.

The Florida Fish and Wildlife Conservation Commission (FFWCC) was established in 1999 and has the mission of managing fish and wildlife resources for their long-term well-being and benefit of people." The FFWCC manages the Florida's Wildlife Management system, which includes more than 5.8 million acres of land established as WMAs or Wildlife and Environmental Areas (WEAs). The WMAs and WEAs identify wildlife and waterfowl refuges as well as public parks and recreation areas. At SFB, there are no WMAs or WEAs within the vicinity of the Airport.

There is one Section 4(f) resource on airport property which is:

- NAS Sanford Memorial Park

There are three Section 4(f) resource that shares a property boundary with the Airport:

- Lake Jessop Conservation Area
- Boombah Sports Complex at Seminole County
- Moore's Station Fields

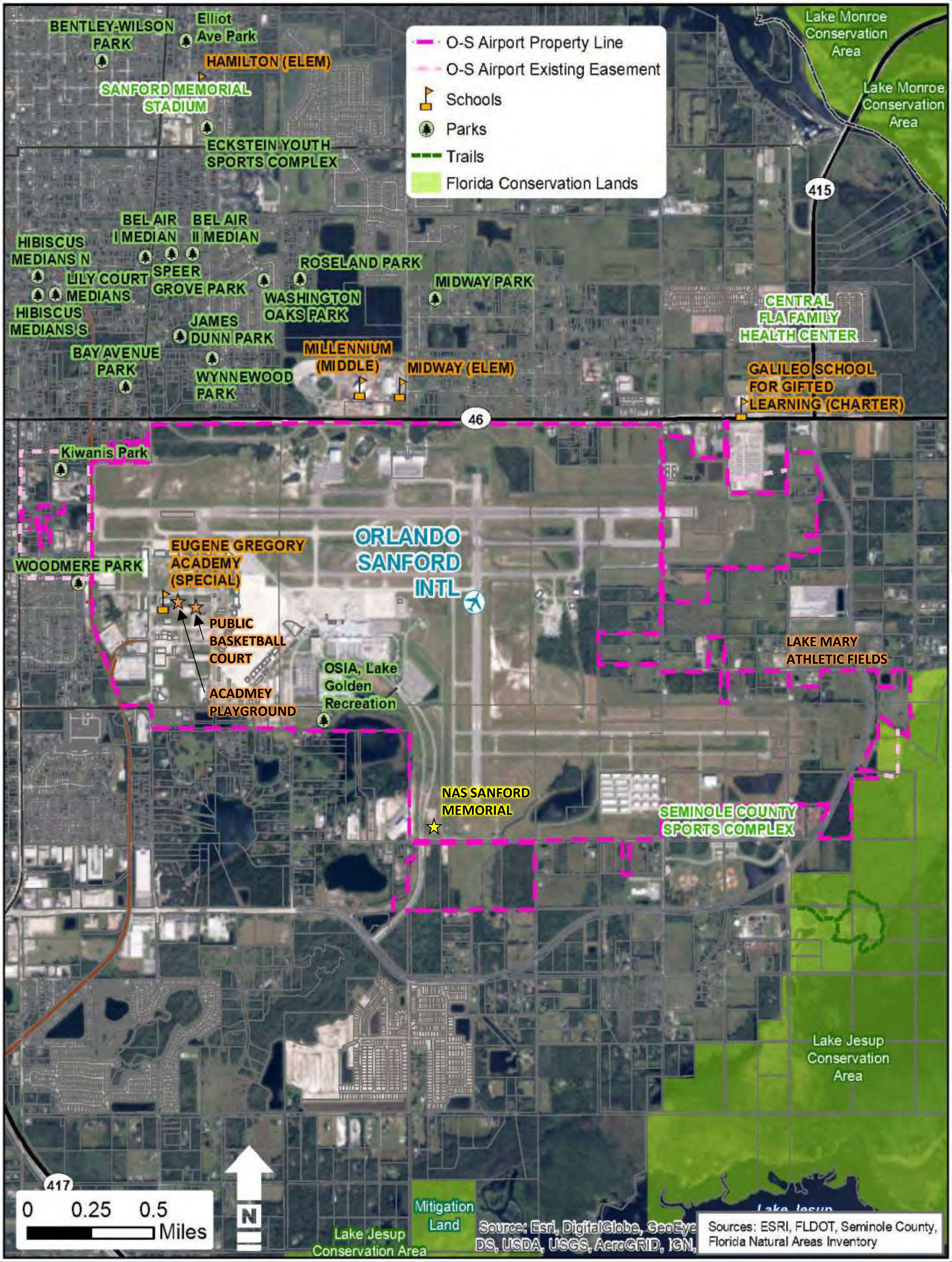
There are Section 4(f) resources in the vicinity of the Airport:

- Woodmere Park
- Kiwanis Park

The Midway Elementary School is in close proximity to Airport property; however, the recreational (playground) features are within the school boundary fence. These features are not considered publicly accessible and are therefore not a Section 4(f) resource.

The Florida Department of Environmental Protection (FDEP) maintains a Geographic Information Systems (GIS) database that compiles a myriad of various layers of data. The GIS database identifies items such as the air quality near air management sites (ARMS), conservation lands (including local, private, state, federal) state parks and recreation areas, NPDES storm water facilities, and Outstanding Florida Waterways (OFWs) sites.

The Airport development is not expected to impact any of the above-mentioned lands. **Figure 6-1** depicts all Section 4(f) classified lands in the vicinity of SFB.




2020 Orlando Sanford International Airport Master Plan Update
Section 4(f) Resources

**Figure 6-1**

## 6.8. Prime and Unique Farmlands

The FAA requires an EA for an airport project that would convert land protected under the Farmland Protection Policy Act (FPPA) to non-agricultural use when the total score on the USDA's Farmland Conversion Impact Rating Form (form AD-1006) exceeds 200 points. Prime farmland is defined as land best suited for producing food, feed, forage, fiber, and oilseed crops. This land has the quality, growing season, and moisture supply necessary to produce sustained crop yields with minimal energy and economic input.

According to FAA Order 1050.1F – environmental Impacts: Policies and Procedures, if farmland is to be converted to a non-agricultural use by a federally funded project, consultation with the U.S. Department of Agriculture, Natural Resources Conservation Service (NCRS) is necessary to determine whether the farmland is classified as "prime" or "unique". If it is, the Farmland Protection Act requires rating the farmland conversion impacts based on length of time farmed, amounts of farmland remaining in the area, level of local farm support services, and the level of urban land in the area.

According to the NRCS, the soils found on Airport property are classified as various types of sand, ranging from Felda Mucky Fine Sands to Wabasso Fine Sands. These types of soil have a low water capacity with rapid permeability. This severely limits the potential use of any such land for cultivated crops. Pasture and citrus groves are two possible agricultural uses that are most suited to this type of soil. Still, a supplemental water source would be necessary during dry conditions.

Therefore, the land on and in the immediate vicinity of SFB is not considered "prime farmland" according to the legislation. However, there are areas of soils that are considered "unique." Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate.

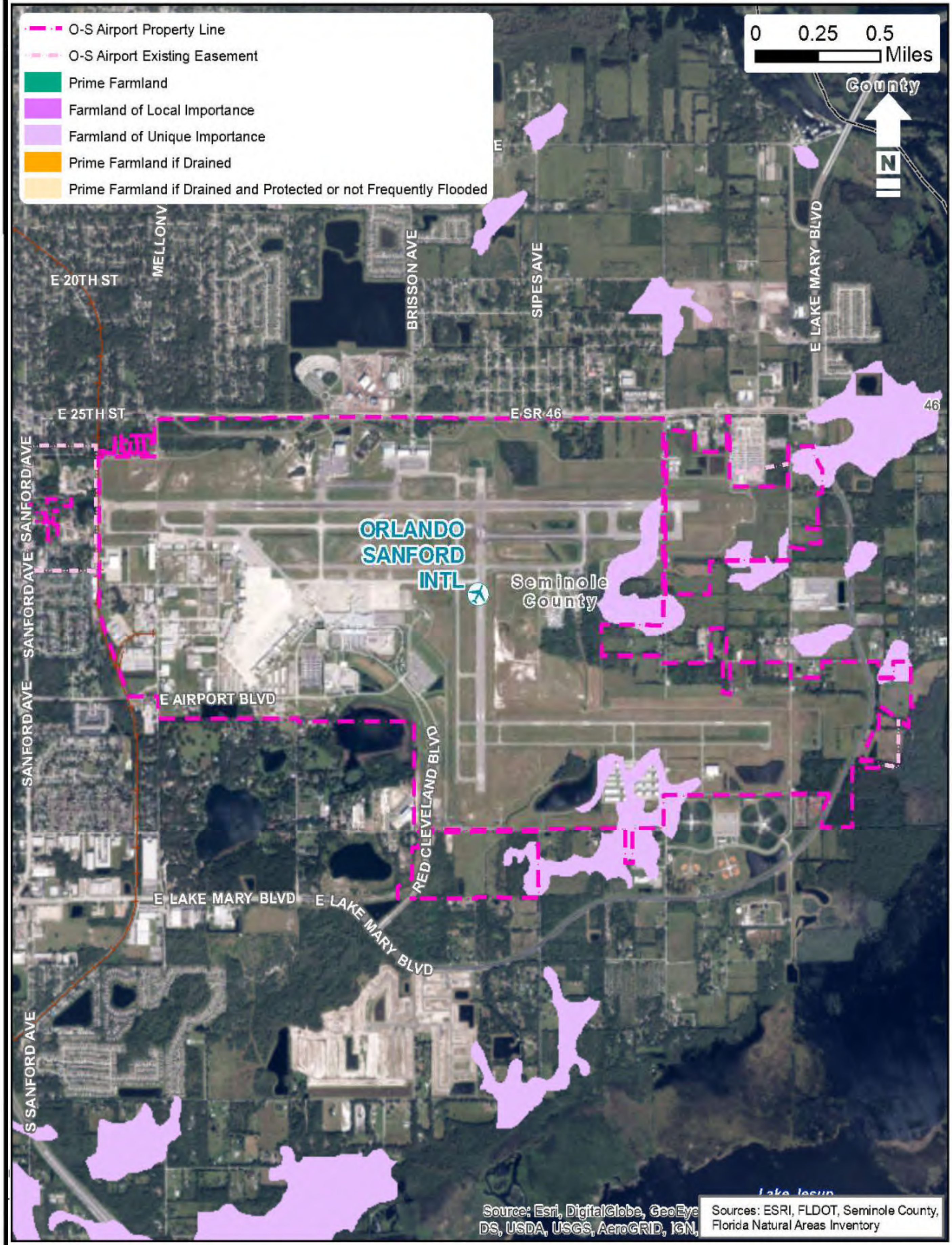
In conclusion, prior to any conversion of unique soils, the FPPA form AD-1006 will need to be completed and submitted to the NRCS to determine if impacts to these soils will be significant. **Figure 6-2** depicts the unique soils based on NRCS soil data.

## 6.9. Fish, Wildlife, and Plants (Biotic Communities)

The Fish and Wildlife Coordination Act (FWCA) (48 Statute 401 as amended; 16 USC 661-667e) provided the basic authority for the Fish and Wildlife Commission's (FWC) involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features, and requires that federal agencies that construct, license or permit water resource development projects to first consult with the FWC, the National Marine fisheries Service (NMFS) and the Florida Fish and Wildlife Conservation Commission regarding the impacts on fish and wildlife resources and measures to mitigate these impacts.

The FWCA takes into consideration the possible impacts that airport development projects may have on surrounding habitat and wildlife. Section 2 of that act requires consultation with the USFWS, The US Department of the Interior and any state agency that regulates wildlife and water resources, which in Florida is the FWC and the FDEP. In the case of water resources, this would apply to such instances where proposed development by any public or private agency would result in modification of the flow and or shape of watershed of any stream or body of water. Under this act the USFWS along with the EPA have authority to provide comments and recommendations concerning vegetation and wildlife resources.

Based on the size and location of future development at SFB, no significant impacts to biotic communities are expected as a result of planned growth to the site. However, some development plans may require a detailed analysis in the form of formal EA.




OrlandoSanford INTERNATIONAL AIRPORT We Are SFB: Simpler. Faster. Better.

ATKINS Member of the SNC-Lavalin Group

2020 Orlando Sanford International Airport Master Plan Update
Unique Soils

Figure 6-2

## 6.9.1. Endangered Species

The Endangered Species Act of 1973 requires each federal agency to ensure that actions authorized, funded, or carried out by that agency not jeopardize continued existence of any endangered or threatened species, or result in destruction or adverse modification of any endangered or threatened species' habitat. Section Seven of the Act states that federal agencies must review their actions; if those actions will affect a listed species or its habitat they must consult with the USFWS. The FWC has the responsibility of identifying, listing, and protecting endangered and/or threatened species.

According to the USFWS, there are 12 federally listed species (ten animal and two plant) with occurrences in Seminole County, Florida. Florida passed an Environmental Species Act in 1976, giving the FWC research and management authority for state listed species. The FWC currently lists 86 species as endangered, threatened and a species of special concern with occurrences in Seminole County. The Florida Natural Areas Inventory (FNAI) provides listed species by county.

**Table 6-1, Table 6-2, Table 6-3,** and **Table 6-4** include the listed species of vegetation, insects, animal, and miscellaneous life that are known to occur in Seminole County according to the USFWS and a review of the FNAI. Additional species may be present on SFB but have not been observed. A property survey using detailed species-specific methodology should be completed for each major development project in order to identify the specific types and numbers of threatened and endangered species present as well as any as. sociated mitigation measures necessary. Understanding the definitive presence, population density and location of all threatened and endangered species of interest is of utmost importance to any future development of the airport site. This would provide a detailed flora and fauna review as required by the National Environmental Policy Act (NEPA) guidelines in order to identify the specific types and numbers of threatened and endangered species present.

During the consultation process, the USFWS will determine the significance of potential impacts and methods to mitigate and/or eliminate them so that the involved agency's project may be completed. Prior to the commencement of any development activity, it is recommended that a detailed, site-specific, and species-specific survey be performed in order to establish actual populations of listed species and, thereby, determine what type and degree of mitigation may be required based on the extent of the disturbance represented by any given development project, as listed in the capital improvement program of this Master Plan.

**Table 6-1 - Seminole County Listed Species: Miscellaneous**

| Family | Scientific Name | Common Name | Federal Status | State Status |
|---|---|---|---|---|
| Clams | *Elliptio monroensis* | St. Johns Elephantear | | N |
| | *Villosa amygdala* | Florida Rainbow | | N |
| Snails and Allies | *Aphaostracon monas* | Wekiwa Hydrobe Snail | | N |
| | *Aphaostracon theiocrenetum* | Clifton Springs Hydrobe Snail | | N |
| | *Floridobia ponderosa* | Ponderous Spring Siltsnail | | N |
| | *Floridobia wekiwae* | Wekiwa Siltsnail | | N |
| Spiders | *Geolycosa xera* | McCrone's Burrowing Wolf Spider | | N |
| | *Latrodectus bishopi* | Red Widow Spider | | N |
| Crustaceon | *Procambarus acherontis* | Orlando Cave Crayfish | | N |

Source: Atkins

**Table 6-2 - Seminole County Listed Species: Insects**

| Family | Scientific Name | Common Name | Fed. / State Status |
|---|---|---|---|
| Mayflies | *Stenacron floridense* | A Mayfly | - / N |
| Dragonflies and Damselflies | *Didymops floridensis* | Maidencane Cruiser | - / N |
| | *Dromogomphus armatus* | Southeastern Spinyleg | - / N |
| | *Gomphaeschna antilope* | Taper-tailed Darner | - / N |
| | *Libellula jesseana* | Purple Skimmer | - / N |
| | *Nehalennia pallidula* | Everglades Sprite | - / N |
| | *Progomphus alachuensis* | Tawny Sanddragon | - / N |
| Grasshoppers and Allies | *Melanoplus forcipatus* | Broad Cercus Scrub Grasshopper | - / N |
| | *Melanoplus tequestae* | Tequesta Grasshopper | - / N |
| | *Schistocerca ceratiola* | Rosemary Grasshopper | - / N |
| Beetles | *Aphodius aegrotus* | Small Pocket Gopher Aphodius Beetle | - / N |
| | *Aphodius laevigatus* | Large Pocket Gopher Aphodius Beetle | - / N |
| | *Aphodius troglodytes* | Gopher Tortoise Aphodius Beetle | - / N |
| | *Copris gopheri* | Gopher Tortoise Copris Beetle | - / N |
| | *Cremastocheilus squamulosus* | Scaly Anteater Scarab Beetle | - / N |
| | *Haroldiataenius saramari* | Sand Pine Scrub Ataenius Beetle | - / N |
| | *Hypotrichia spissipes* | Florida Hypotrichia Scarab Beetle | - / N |
| | *Mycotrupes gaigei* | North Peninsular Mycotrupes Beetle | - / N |
| | *Peltotrupes profundus* | Florida Deepdigger Scarab Beetle | - / N |
| | *Philonthus gopheri* | Gopher Tortoise Rove Beetle | - / N |
| | *Selonodon mandibularis* | Large-Jawed Cebrionid Beetle | - / N |
| | *Serica delicata* | Delicate Silky June Beetle | - / N |
| | *Serica pusilla* | Pygmy Silky June Beetle | - / N |
| Caddisflies | *Cernotina truncona* | Florida Cernotinan Caddisfly | - / N |
| | *Hydroptila berneri* | Berner's Microcaddisfly | - / N |
| | *Nectopsyche tavara* | Tavares White Miller Caddisfly | - / N |
| | *Oecetis parva* | Little Oecetis Longhorned Caddisfly | - / N |
| | *Oecetis porteri* | Porter's Long-horn Caddisfly | - / N |
| | *Orthotrichia curta* | Short Orthotrichian Microcaddisfly | - / N |
| | *Oxyethira pescadori* | Pescador's Bottle-Cased Caddisfly | - / N |
| Butterflies and Moths | *Callophrys gryneus sweadneri* | Florida Olive Hairstreak | - / N |
| | *Enodia portlandia floralae* | Florida Pearly Eye | - / N |
| | *Euphyes dukesi calhouni* | Calhoun's Skipper | - / N |
| | *Idia gopheri* | Gopher Tortoise Noctuid Moth | - / N |

Source: Atkins

**Table 6-3 - Seminole County Listed Species: Animals**

| Family | Scientific Name | Common Name | Federal Status | State Status |
|---|---|---|---|---|
| Fishes | *Ameiurus brunneus* | Snail Bullhead | | N |
| | *Pteronotropis welaka* | Bluenose Shiner | | ST |
| Amphibians | *Lithobates capito* | Gopher Frog | | N |
| Reptiles | *Alligator mississippiensis* | American Alligator | SAT | FT(S/A) |
| | *Drymarchon couperi* | Eastern Indigo Snake | T | FT |
| | *Gopherus polyphemus* | Gopher Tortoise | C | ST |
| | *Graptemys ernsti* | Escambia Map Turtle | | N |
| | *Lampropeltis getula* | Common Kingsnake | | N |
| | *Pituophis melanoleucus* | Pine Snake | | ST |
| Birds | *Antigone canadensis pratensis* | Florida Sandhill Crane | | ST |
| | *Aphelocoma coerulescens* | Florida Scrub-Jay | T | FT |
| | *Aramus guarauna* | Limpkin | | N |
| | *Buteo brachyurus* | Short-tailed Hawk | | N |
| | *Calidris canutus rufa* | Red Knot | T | |
| | *Haliaeetus leucocephalus* | Bald Eagle | | N |
| | *Laterallus jamaicensis ssp. Jamaicensis* | Eastern Black Rail | PT | |
| | *Mycteria americana* | Wood Stork | T | FT |
| | *Picoides borealis* | Red-cockaded Woodpecker | E | |
| | *Pandion haliaetus* | Osprey | | N |
| Mammals | *Mustela frenata peninsulae* | Florida Long-tailed Weasel | | N |
| | *Podomys floridanus* | Florida Mouse | | N |
| | *Puma concolor coryi* | Florida Panther | E | FE |
| | *Sciurus niger niger* | Southeastern Fox Squirrel | | N |
| | *Trichechus manatus* | West Indian Manatee | T | FT |
| | *Ursus americanus floridanus* | Florida Black Bear | | N |

Source: Atkins

**Table 6-4 - Seminole County Listed Species: Vegetation**

| Family | Scientific Name | Common Name | Federal Status | State Status |
|---|---|---|---|---|
| Plants and Lichens | *Carex chapmannii* | Chapman's Sedge | | T |
| | *Centrosema arenicola* | Sand Butterfly Pea | | E |
| | *Chionanthus pygmaeus* | Pygmy fringe-tree | E | |
| | *Coelorachis tuberculosa* | Piedmont Jointgrass | | T |
| | *Cucurbita okeechobeensis* | Okeechobee gourd | E | E |
| | *Dennstaedtia bipinnata* | Hay Scented Fern | | E |
| | *Illicium parviflorum* | Star Anise | | E |
| | *Lechea cernua* | Nodding Pinweed | | T |
| | *Nemastylis floridana* | Celestial Lily | | E |
| | *Nolina atopocarpa* | Florida Beargrass | | T |
| | *Ophioglossum palmatum* | Hand Fern | | E |
| | *Pecluma plumula* | Plume Polypody | | E |
| | *Pecluma ptilota var. bourgeauana* | Comb Polypody | | E |
| | *Pteroglossaspis ecristata* | Giant Orchid | | T |
| | *Pycnanthemum floridanum* | Florida Mountain-mint | | T |
| | *Rhipsalis baccifera* | Mistletoe Cactus | | E |
| | *Salix floridana* | Florida Willow | | E |
| | *Zephyranthes simpsonii* | Redmargin zephyrlily | | E |

Source: Atkins

Therefore, based on the size and location of development initiatives proposed for SFB, there also may be associated impacts to these endangered flora and fauna communities and these studies must be completed before development impact. These issues may be compounded by the hazardous wildlife management regulations mandated by the FAA. Therefore, a species wildlife management expert may need to be consulted.

### 6.9.2. Biotic Communities

The Fish and Wildlife Coordination Act (48 Statute 401 as amended; 16 USC et seq.) takes into consideration the possible impacts that airport development projects may have on surrounding habitat and wildlife. Section Two of this act requires consultation with the USFWS, the U.S. Department of the Interior, and the state agencies that regulate wildlife and water resources. In the case of water resources, this would particularly apply to such instances where proposed development by any public or private agency would result in modification of the flow and/or shape or watershed of any stream or body of water. Under this act the USFWS has authority to provide comments and recommendations concerning vegetation and wildlife resources, and the FWC may provide comments and recommendations if deemed necessary.

The Airport lands can be characterized as a series of generalized vegetative communities, many of which are disturbed from their natural state for several decades by Airport or related facilities development, agricultural activity, or other human intervention. The character of vegetative communities is significant because the varying classes of vegetative cover provide habitat for wildlife, some of which are identified as species of note or of special concern by the relevant ecological legislation. Soil types, comparative elevation and drainage characteristics in turn help determine the wetland or upland characteristics and, thereby, the type of dominant vegetation and subsequent habitat provided.

A site survey that can be used to assess specific vegetative community types on-site and the possible presence of threatened and endangered species should be completed during an EA or Environmental Impact Statement (EIS) process for each project. It is recommended that a species-specific survey methodology be utilized over the entire Airport property to ascertain the definitive presence, population density, and location of all threatened and endangered species of interest.

## 6.10. Floodplains

Floodplains are defined in Executive Order 11988, "Floodplain Management." They include lowland areas adjoining inland and coastal waters, especially those areas subject to a one percent or greater chance of flooding in any given year.

The Federal Emergency Management Agency (FEMA) has produced Flood Insurance Rate Maps for communities participating in the National Flood Insurance Program. Detailed maps illustrate the 100- and 500-year base flood elevations. Descriptions of zones delineated on these maps include, Zone A and AE – areas of 100-year flood, Zone B – areas between limits of 100- and 500-year flood, and Zone X – areas outside of the 500-year floodplain.

The Flood Insurance Rate Map (FIRM) of Seminole County, Florida (Panels 45 and 65 of 260, Map Numbers 12117C0045 and 12117C0065, dated April 17, 1995) indicates that SFB is in Zone X and not within any base (500-year) floodplain. Areas off-Airport but in the vicinity that are located within the floodplain (Zones A and AE) include; Silver Lake, Golden Lake, Lake Onora, Lake Jessup, and area just north and along State Road 46 that extends from Mellonville Avenue to Brisson Avenue and the state preserve approximately 1.5 miles west of Airport property. Thus, no areas within the 100 or 500-year floodplain are expected to be impacted by the development proposed in this document. **Figure 6-3** depicts the floodplains located in the vicinity of SFB.

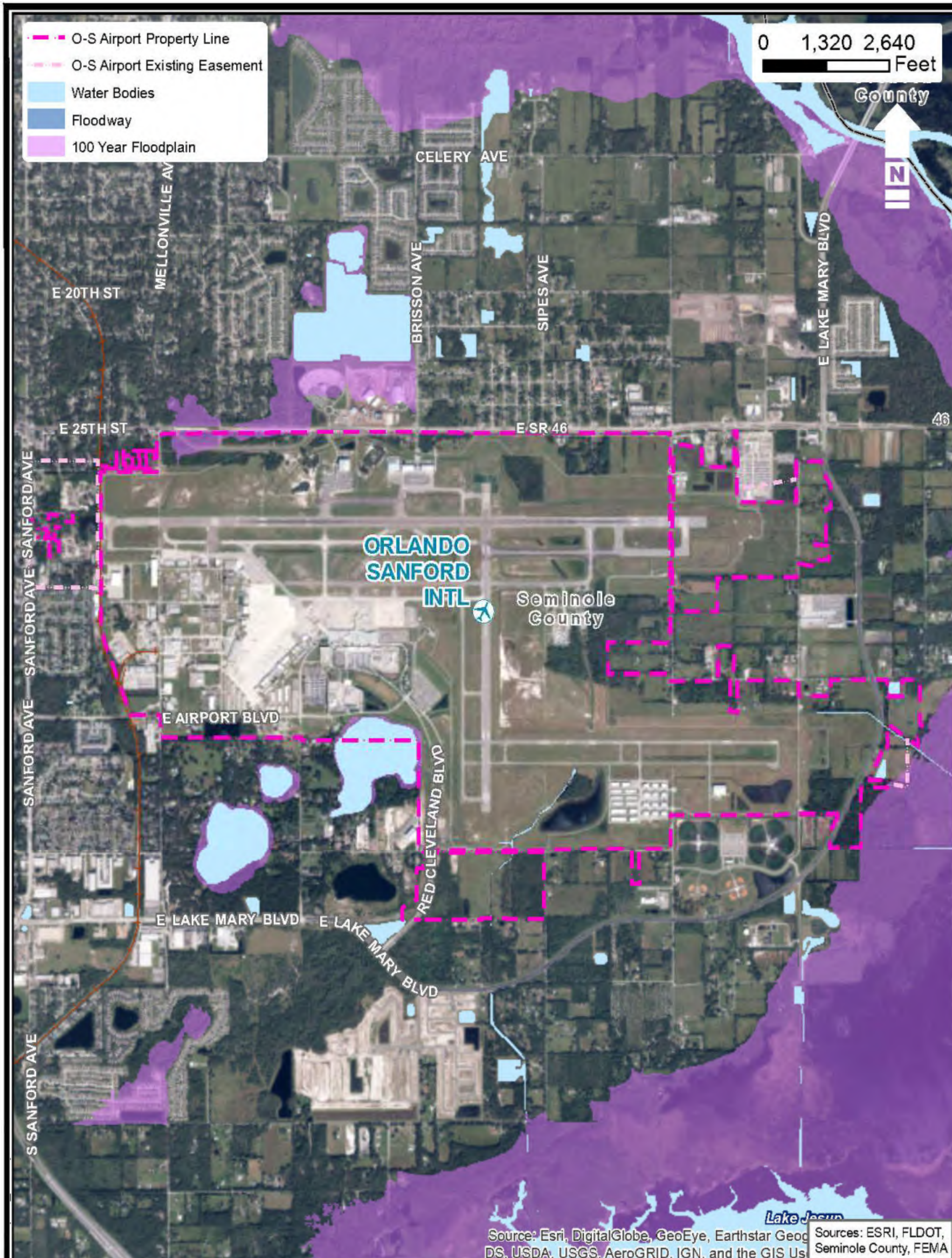
## 6.11. Hazardous Materials, Pollution Prevention

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facilities Compliance Act of 1992, and the Comprehensive Environmental Response, Compensation and Liability Act CERCLA), as amended by the Superfund Amendments Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and clean-up of any release of a hazardous substance, (excluding petroleum) into the environment.

FAA order 1050.1F defines hazardous materials as any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety and property when transported in commerce. Hazardous waste is defined by that order as a including ignitability, corrosiveness, reactivity, or toxicity. A hazardous substance is defined as any element, compound, mixture, solution, or substance under CERCLA and listed in 40 CFR Part 302. If released into the environment, hazardous substances may pose substantial harm to human health or the environment.

The potential for handling of hazardous waste must be evaluated when determining the impacts associated with Airport development. The Assistant Administrator for Security and Hazardous Materials (ASH) is responsible for considering the environmental impacts for all actions arising out of ASH initiatives that require NEPA compliance and other federal and departmental environmental laws, regulations, and orders.

Though none of the proposed development projects contained in this document are anticipated to create or require the handling of hazardous materials, certain existing areas on the Airport may have potential hazardous waste/environmental impacts on future development. Multiple sites were observed at the Airport. Specifically, these areas include clean-up sites with monitoring wells, which are no longer monitored based on Airport correspondence and an abandoned landfill which is located east of Runway 18-36, just north of Runway 9R-27L and south of Taxiway C.




2020 Orlando Sanford International Airport Master Plan Update
Floodplains

**Figure 6-3**

An Environmental Records Review was conducted that included all available records for facilities within the Airport property and 0.5 mile beyond. Most of the records are for facilities/incidents that have either been closed or are at a distance from the Airport that would not likely have an adverse effect on potential future development. **Table 6-5** includes listings for sites that are active within each respective database and are therefore considered Recognized Environmental Concerns.

These areas must be considered when evaluating the overall environmental, design and construction impacts, and costs associated with any future development in these areas. Proper coordination with federal, state, and local officials will be completed during the EA and/or EIS phases of each project to identify the potential environmentally sensitive waste impacts and ensure proper mitigation is completed as required by FAA and National Environmental Policy (NEPA) guidelines.

Therefore, an Environmental Site Assessment (ESA) should be conducted during the NEPA process and coordination with federal and local officials should be completed to identify any potentially hazardous waste impacts and endure proper mitigation is completed if required. Both NEPA and ESA guidance require consideration of exposure to hazardous materials and minimizing further contaminant released through NEPA environmental analysis. However, an EIS is not always required.

## 6.12. Historical, Architectural, Archaeological, and Cultural Resources

The Archaeological and Historic Preservation Act of 1974 provides for the preservation of historic American sites, buildings, objects and antiquities of national significance by providing for the survey, recovery and preservation of historical and archaeological data which might otherwise be destroyed, irreparably damaged or lost due to federal, federally licensed, or federally funded action.

Cultural resources consist of prehistoric and historic districts, sites, structures, artefacts and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious or other reasons. They include archaeological resources – prehistoric and historic – historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are either eligible for listing or listed in the National Register.

The National Historic Preservation Act (NHPA) of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would cause change in the historical, architectural, archaeological, or cultural qualities of the property. Under the NHPA, the airport sponsor is required to consider the effects of its undertakings on historic properties listed, or eligible for listing, in the National Register. NHPA obligation for a federal agency are independent from NEPA and must be complied with even when an environmental document is not required.

Other applicable guidance and directives associated with cultural resource management include EO 11593, *Protection and Enhancement of the Cultural Environment*; EO 13006, L*ocating Federal Facilities on Historic Properties in Our Nation's Central Cities; EO 13287, Preserve America,* and the Native American Graves Protection and Repatriation Act.

All development initiatives identified in Chapter 5 Development Plans are within the boundaries of airport properties. In conclusion, a review of the National Register of Historic Places database for the State of Florida (Single Property Listings, Multiple Property Listing, and National Historic Landmarks) indicates that there are seven properties in Sanford and an additional ten properties in Seminole County listed in the NRHP. However, none of these sites are on or in the vicinity of the Airport.

**Table 6-5 - Active Sites with Recognized Environmental Concerns**

| Database | Location | Address |
|---|---|---|
| Solid Waste Facility/Land Fill | Dollar Rent A Car | 1 Red Cleveland Blvd |
| Leaking Underground Storage Tank | Orland Sanford Airport | 1385 E 29th St |
| Leaking Underground Storage Tank | Orland Sanford Airport | 3 Red Cleveland Blvd |
| Leaking Underground Storage Tank | Aerosim Flight Academy | 1250 E 30th St |
| State Registered Tank | FAA Sanford ACT | 2100 Airline Ave |
| Underground Storage Tank | Sanford Airport Authority | 1345 E 20th Ave |
| Underground Storage Tank | Dollar Rent A Car | 1 Red Cleveland Blvd |
| Underground Storage Tank | Sanford Airport Authority | 2901 Aileron Cir |
| Underground Storage Tank | Hertz QTA Facility | 3050 Carrier Ave |
| Underground Storage Tank | National Rent A Car | 2500 E Airport Rd |
| Aboveground Storage Tank | Avocet | 2551 Hellcat Ln |
| Aboveground Storage Tank | Constant Aviation LLC | 100 Starport Way |
| Aboveground Storage Tank | Roth Aircraft Inc | 2650 S Mellonville Ave |
| Aboveground Storage Tank | Seminole Co Sheriff | 500 Don Knight Ln |
| Aboveground Storage Tank | Sanford Airport Authority | 1345 E 28th St |
| Aboveground Storage Tank | Million Air Orlando | 2841 Flightline Ave |
| Aboveground Storage Tank | Sanford Airport Authority | 1 Red Cleveland Ave |
| Aboveground Storage Tank | Million Air West | 1331 29th St |
| Aboveground Storage Tank | Orlando Sanford Intnl | 3 Red Cleveland Blvd |
| Aboveground Storage Tank | Sanford Airport Authority | 1200 Red Cleveland Blvd |
| Aboveground Storage Tank | Sanford Airport Authority | 2901 Aileron Cir |
| Aboveground Storage Tank | Aerosim Flight Academy | 1250 E 30th St |
| Aboveground Storage Tank | A&B Roofing | 3905 Moores Station |
| Aboveground Storage Tank | Avis Rent A Car | 1751 E Airport Rd |
| Aboveground Storage Tank | Okahumpa Groves Inc | 3001 Beardall Ave |
| Aboveground Storage Tank | Southeast Ramp | 2150 Spinner Ln |
| SPILLS | Sanford Airport Auth: Incident 60551 | 1200 Red Cleveland Blvd |
| SPILLS | Sanford Airport Auth: Incident 60224 | 1200 Red Cleveland Blvd |
| SPILLS | Sanford Airport Auth: Incident 59026 | 1200 Red Cleveland Blvd |
| Unexploded Ordinance | Small Arms Ranges | n/a |
| Unexploded Ordinance | Debris Disposal Area | n/a |
| FDEP Clean Up Site | Gator Dock & Marina | 2800 Mellonville Ave |
| FDEP Clean Up Site | Aerosim Flight Academy | 1250 E 30th St |
| DWM Contaminated Site | Aerosim Flight Academy | 1250 E 30th St |
| Responsible Party Site List | Gator Dock & Marina | 2800 Mellonville Ave |

Source: Atkins

## 6.13. Light Emissions and Visual Impact

There are no special purpose laws or standards for light emission impacts and visual impacts. This is primarily due to the relatively low levels of light intensity compared to background levels associated with most air navigation facilities (NAVAIDS) and other airport human activity or the use or characteristics of protected properties.

Whenever the potential for an annoyance exists, such as site location of lights or light systems, pertinent characteristics of the particular system and its use, and measures to reduce any annoyance, such as shielding or angular adjustments, information should be included in the appropriate environmental document.

Visual or aesthetic, impacts are inherently more difficult to define because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the development contracts with the existing environment and whether the jurisdictional agency considers this contrast objectionable. Public involvement and consultation with appropriate federal, state, and local agencies and tribes may help determine the extent of these impacts. The visual sight of aircraft, aircraft contrails or aircraft lights, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. The art and science or analyzing visual impacts is continuously improving and the responsible FAA official should consider, based on scoping or other public involvement, the degree to which available tools should be used to analyze subjective responses more objectively to proposed visual changes.

Standards do not exist for light emission impacts on residential areas. However, measures can and should be taken to mitigate any impacts on such incompatible areas within the vicinity of the Airport. Buffer zones consisting of vegetation or earthen berms should be constructed to shield residential areas. Likewise, non-Airport light emissions must be prevented from creating misleading and/or dangerous situations for aircraft operating at or in the immediate vicinity of SFB. This can be accomplished through the use of zoning and land-use planning in addition to local ordinances.

## 6.14. Natural Resources, Energy Supply, and Sustainable Design

Executive Order (E.O.) 13123, *Greening the Government Through Efficient Energy Management* (64 FR 30851, December 2000), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. E.O. 13123 also requires that each federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumption in its facilities.

The FAA's policy is consistent with NEPA and the County of Environmental Quality (CEQ) Regulations, which is to encourage the development of facilities that exemplify the highest standards of design including principles of sustainability. As such, all elements of the transportation system are encouraged to be designed with a view to their aesthetic impact, conservation or resources such as energy, pollution prevention, harmonization with the community environment and sensitivity to the concerns of the travelling public.

Future development at SFB could affect the energy supply and other natural resources. Therefore, changes could occur in demand for electrical power due to increased electrical requirements from airfield lighting, navigational equipment, and/or tenant facilities and business operations. Therefore, proper planning with the appropriate city and county officials will limit and/or eliminate any possible negative impacts associated with increased energy demands.

## 6.15. Noise

Noise contours were developed using the FAA's Aviation Environmental Design Tool (AEDT) to understand the Airport's current noise exposure environment. Noise contours were developed for the 2017 base year of the study, which will ultimately allow comparison to those developed for the future planning activity levels (PALs) based on the proposed airport improvements.

The FAA uses the day-night average sound level (DNL) noise metric for the purposes of determining compatibility with aircraft noise. The DNL represents a 24-hour time weighted average sound level and incorporates a 10 decibel (dB) weighting for activity between 10 p.m. and 7 a.m. to reflect the higher sensitivity to noise during 'night-time' hours. FAA land use guidance indicates that virtually all noise sensitive land uses are compatible with noise levels below 65 DNL. The base year noise exposure map (NEM) provided in **Figure 6-4** reflects the existing airfield configuration with the actual aircraft operational fleet mix that occurred in 2017.

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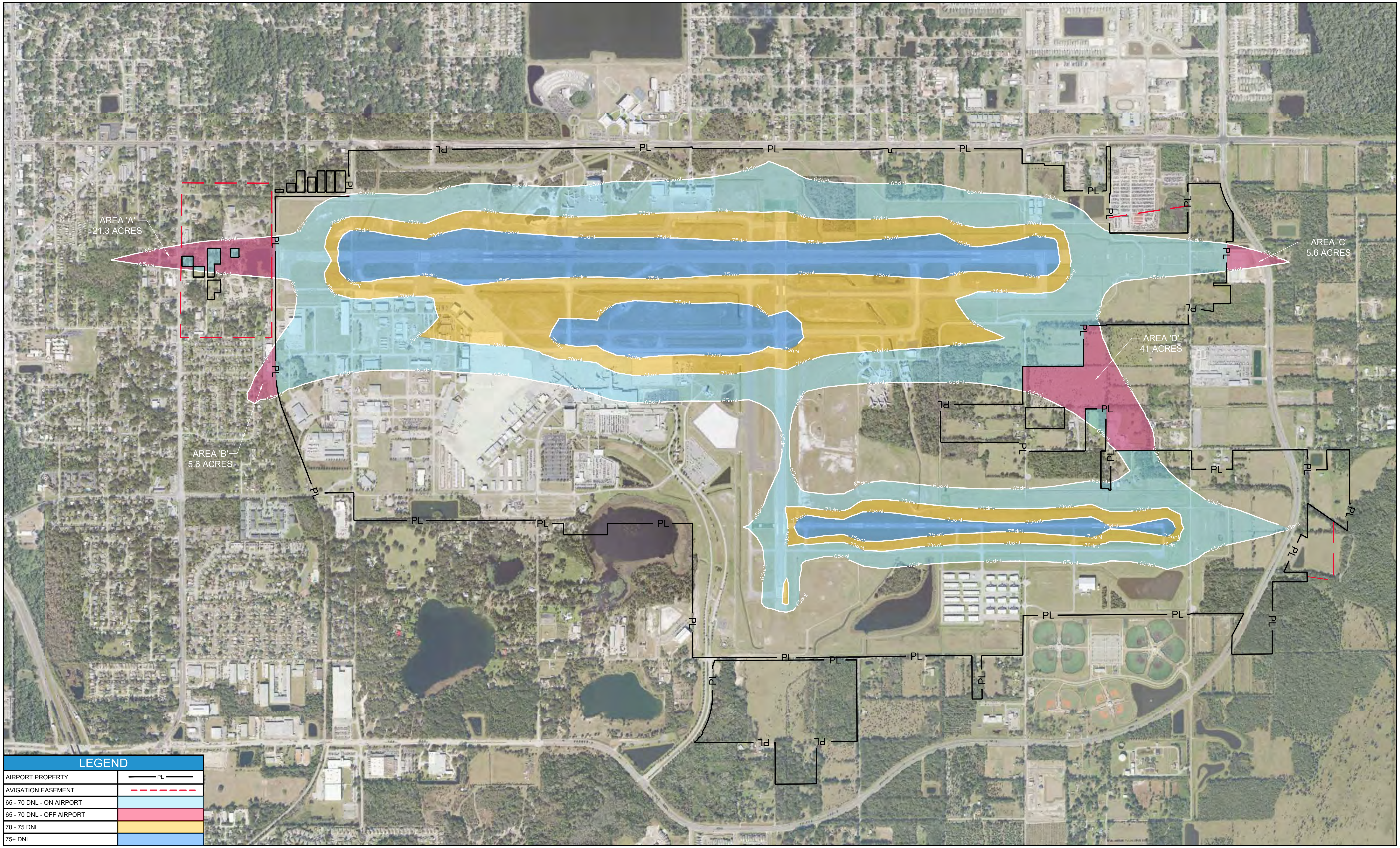


FIGURE 6-4: BASE YEAR (2017) NOISE EXPOSURE MAP (NEM)

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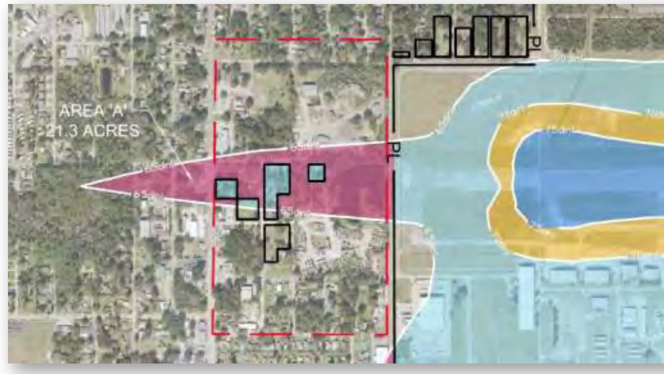
most of the noise contours remain entirely within the Airport's property envelope, however there are a few exception areas which are detailed in **Table 6-6** and in the following paragraphs.

**Area A (Figure 6-5)** consists of approximately 21 acres of non-airport property west of the Runway 9L approach end which is enveloped by the 65 DNL contour. The Airport maintains an avigation easement over most of that area, which could prevent the introduction of new incompatible land uses, however three residential structures in that easement are enveloped by the 65 DNL. In addition, approximately 6 acres of the 65 DNL contour west of Sanford Avenue envelops approximately 10 residential structures not on airport property.

**Figure 6-5 - 65 DNL Impacted Area A**

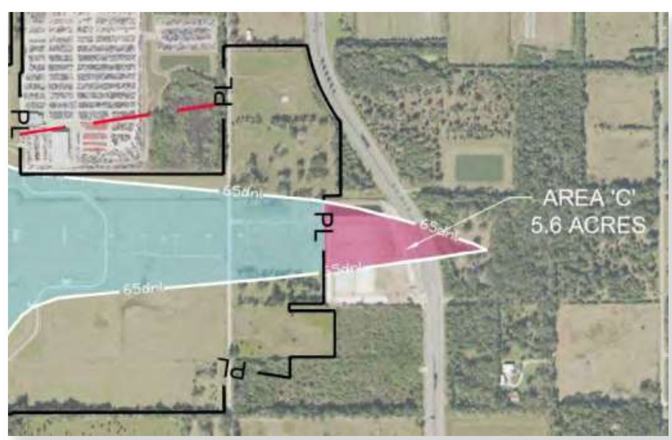



**Area B (Figure 6-6)** contains approximately 6 acres of off-airport land located east of Sanford Avenue between East Mattie and East 29th Streets and is encompassed by the 65 DNL contour. Area B is densely populated with approximately 12 residential homes along Grove Drive.

**Figure 6-6 - 65 DNL Impacted Area B**


**Area C (Figure 6-7)** consists of approximately 6 acres of non-airport property east of the Runway 27R approach end is enveloped by the DNL 65 contour. A relatively new storage complex at 3980 East Lake Mary Boulevard is included in Area C, however such land usage is not considered to be noise sensitive. The rest of Area C is undeveloped and should be prevented from allowing noise sensitive development from occurring in the future by way of land use zoning measures.

**Figure 6-7 - 65 DNL Impacted Area C**



**Area D (Figure 6-8)** is another off-airport area consisting of approximately 41 acres that is encompassed by the DNL 65 contour between the approach ends of Runways 27L and 27R. Area D is primarily undeveloped, though it does contain an industrial structure at 3918 Moores Station Road. Land use controls need to be implemented to ensure that no future noise sensitive structures are erected in Area D.

**Figure 6-8 - 65 DNL Impacted Area D**


## 6.15.1. Future Noise

To assess the potential change in noise exposure that would result from the projected aircraft activity levels and the proposed airport improvements, AEDT noise contours were developed for the planning activity level (PAL) periods discussed in subsequent chapters of this AMPU; 1. PAL 1, 2. PAL 2, 3. PAL 3, and 4. PAL 4. Table 6-6 presents the number of acres in each of the off-airport areas impacted by the 65 DNL contour as well as the number of noise sensitive areas (NSAs), such as residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites.

As **Table 6-6** indicates, the total off-airport area impacted by the 65 DNL contour is expected to grow from 73.5 acres and 22 NSAs in the base year to 229 acres and 121 NSAs by PAL 3. If the Airport implements the preferred airfield development alternatives presented in Chapter 5 of this AMPU between PALs 3 and 4, the off-airport area impacted by the 65 DNL contour is expected to retract from 229 acres and 121 NSAs to 146 acres and 59 NSAs. That noise impact reduction is expected to result from the following notable airfield changes during that period despite the Airport's operational activity expectation to continue increasing:

- Upgrade Runway 9R/27L by lengthening, widening, and strengthening it to accommodate the Airport's C-III commercial passenger aircraft fleet. Expected to accommodate 25 percent of the Airport's narrow body commercial passenger aircraft operations, thereby reducing the noise footprint on Runway 9L/27R.
- Decommissioning Runway 18/36 and converting it to a taxiway.
- Lengthening Runway 9C/27C to the east

**Figure 6-9**, **Figure 6-10**, **Figure 6-11**, and **Figure 6-12** depict the Airport's expected NEM's 65, 70, and 75 DNL noise contours associated with the projected airfield operations and configurations in PALs 1, 2, 3, and 4.

**Table 6-6 - AEDT Noise Contour 65 DNL Off-Airport Impact Areas**

| Area | Base Year (2017) | | PAL 1 (2022) | | PAL 2 (2027) | | PAL 3 (2032) | | PAL 4 (2037) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | NSA | Acres | NSA | Acres | NSA | Acres | NSA | Acres | NSA |
| Area 'A' | 21.3 | 13 | 36.3 | 35[1] | 43.3 | 44[1] | 52.0 | 61[1&2] | 46.0 | 52[1] |
| Area 'A2' | N/A | N/A | 0.5 | 0 | 0.7 | 0 | 0.9 | 0 | 0.75 | 0 |
| Area A3 | N/A | N/A | N/A | N/A | 0.16 | 0 | 0.8 | 0 | N/A | N/A |
| Area 'B' | 5.6 | 12 | 15.5 | 49 | 17.0 | 52 | 18.0 | 58 | 4.5 | 4 |
| Area 'C' | 5.6 | N/A | 15 | 1 | 19.0 | 1 | 24.0 | 1 | 21.8 | 1 |
| Area 'C2' | N/A | N/A | 1.0 | 0 | 1.8 | 0 | 2.6 | 0 | 2.2 | 0 |
| Area 'D' | 41 | N/A | 52.5 | 2 | 55 | 2 | 56.6 | 2 | 60.4 | 2 |
| Area 'D2' | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.37 | 0 |
| Area 'E' | N/A | N/A | 0.07 | 0 | 0.13 | 0 | 0.21 | 0 | 0.68 | 0 |
| Area 'F' | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 9.6 | 0 |
| Total | 73.5 | 25 | 121 | 87[1] | 137 | 99[1] | 229 | 121[1&2] | 146.3 | 59[1] |

Notes: [1]One school, Liberty Christian (2650 Magnolia Ave.), included in this figure.
[2]One Section 4(f) site, Woodmere Park (2800 Grove Dr.), included in this figure.

Source: Atkins Analysis

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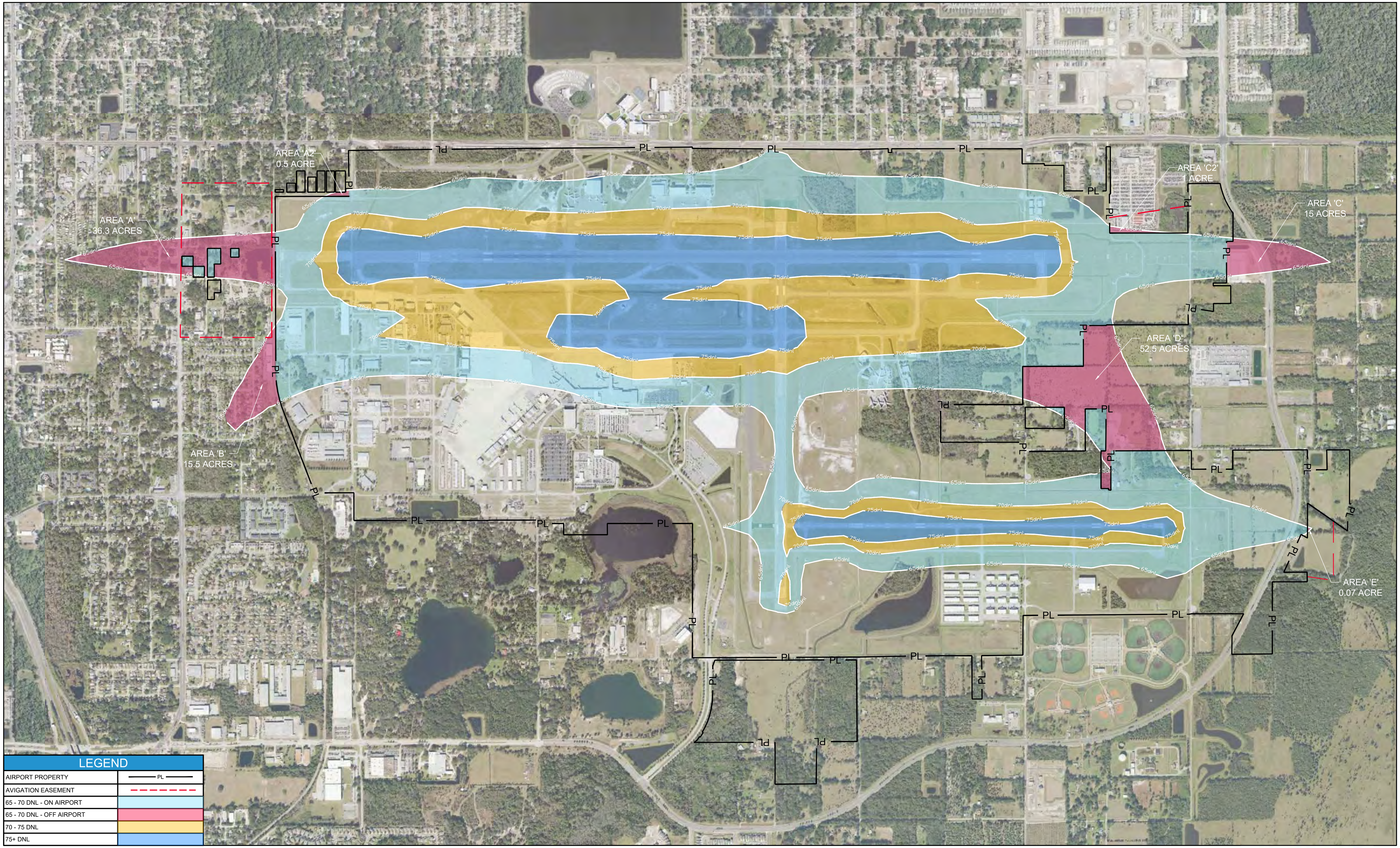



FIGURE 6-9: PAL 1 AEDT NOISE CONTOURS

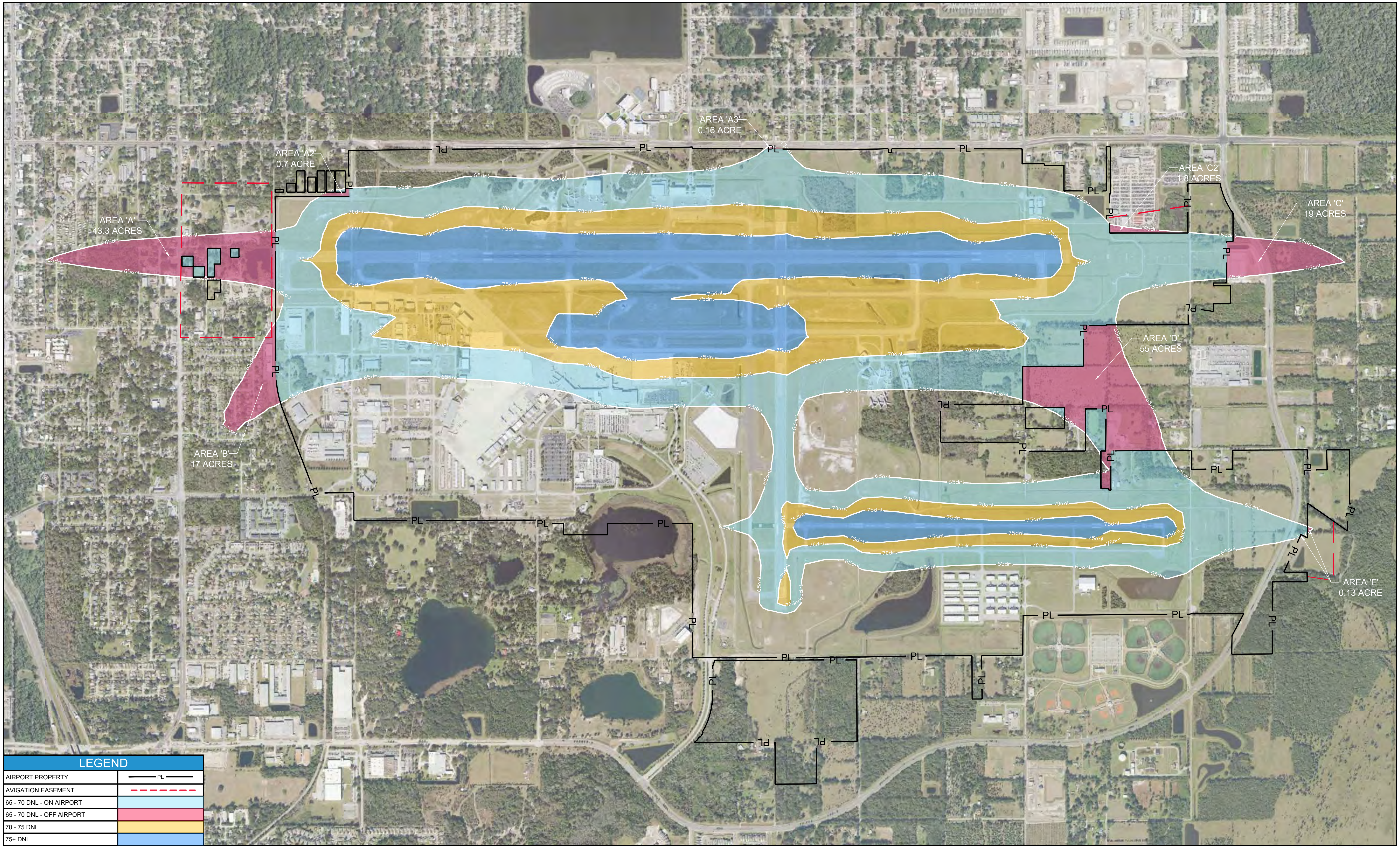



FIGURE 6-10: PAL 2 AEDT NOISE CONTOURS

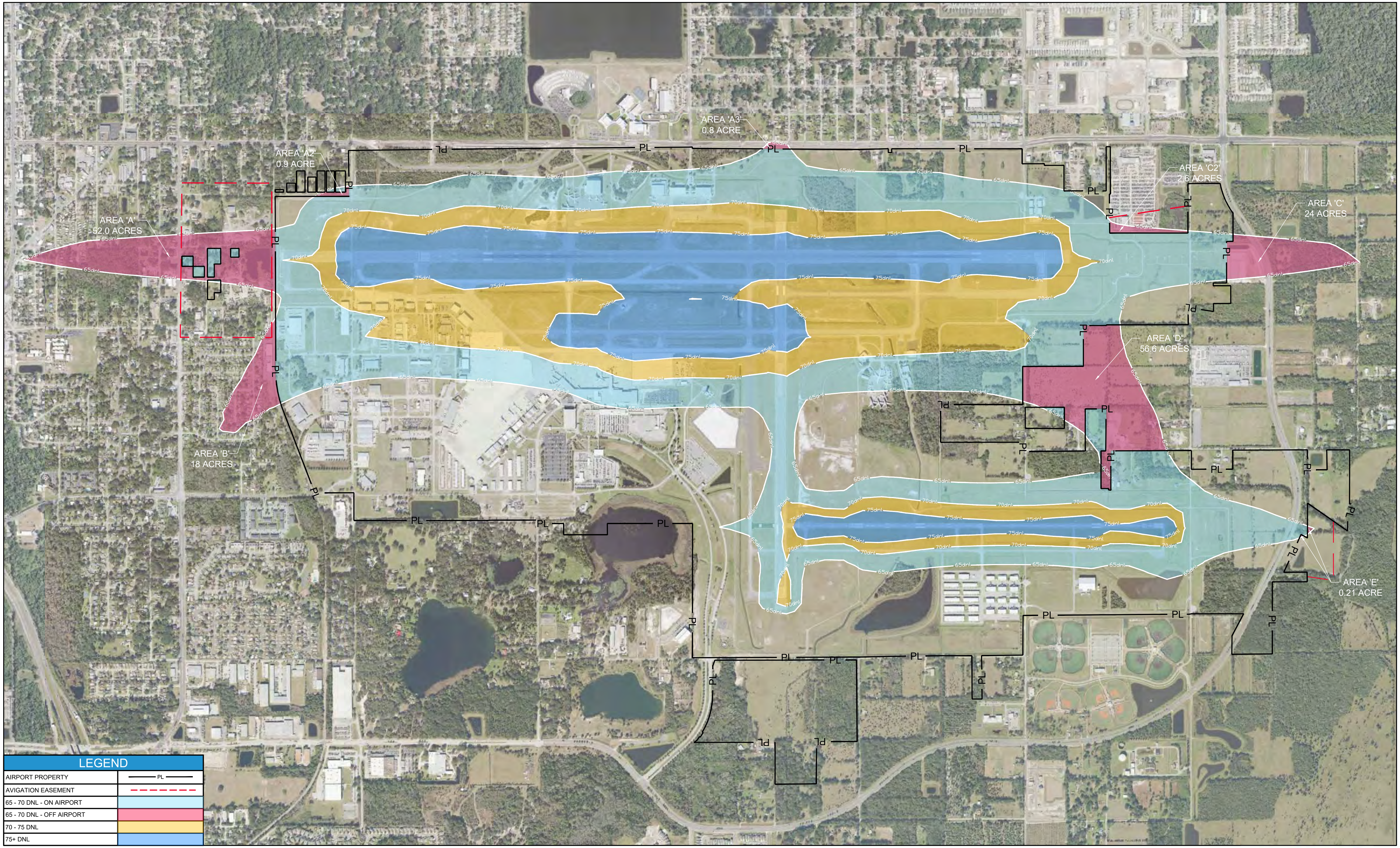



FIGURE 6-11: PAL 3 AEDT NOISE CONTOURS

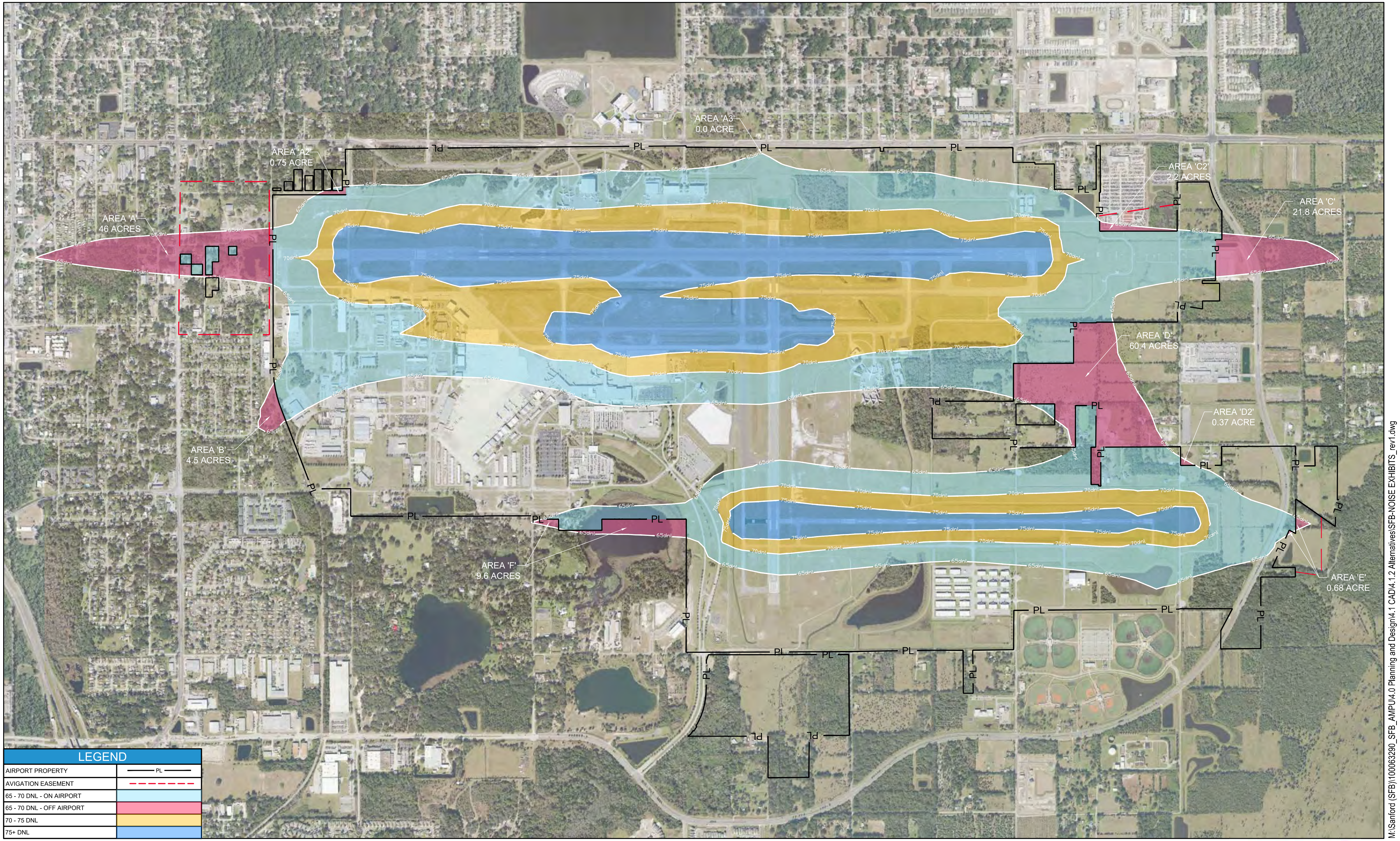



FIGURE 6-12: PAL 4 AEDT NOISE CONTOURS

As is presented in **Table 6-6, Figure 6-10**, **Figure 6-11**, and **Figure 6-12**, the four off-airport areas (A, B, C, and D) presented in **Figure 6-5**, **Figure 6-6**, **Figure 6-7**, and **Figure 6-8** (respectively) are expected to grow. In addition, the following new areas are expected to arise from the Airport's increased activity and/or proposed airfield changes associated with the preferred development alternative:

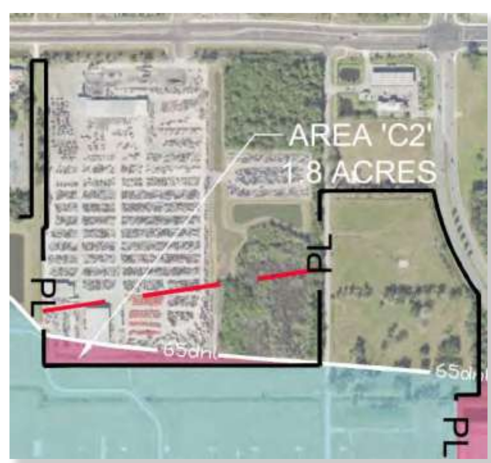
**Figure 6-13 - PAL 2 Area A2**


**Area A2 (Figure 6-13)** is technically 'off airport' property, although it is the road right-of-way (ROW) of Mellonville Ave. and East 25th Place and is surrounded by airport property. Area A2 is expected to nearly double in size between PAL 1 and 3 but remain smaller than an acre throughout PAL 4 and does not have any NSAs.

**Figure 6-14 - PAL 2 Area A3**

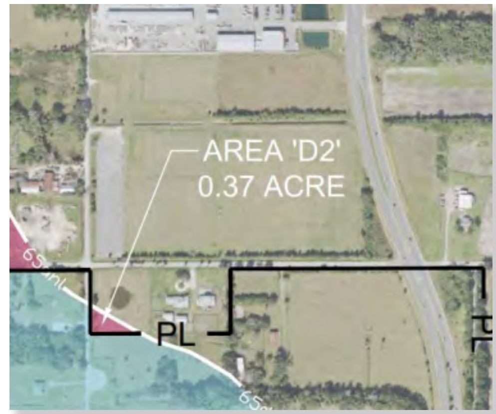

**Area A3 (Figure 6-14)** is introduced in PAL 2 at a mere 0.16-acre area consisting of State Road 46 and its ROW. Area A3 is expected to grow to 0.8 acres by PAL 3, however the decommissioning of Runway 18/36 in PAL 4 would cause the area to completely retract onto airport property. That retraction avoids impacting at least 3 NSAs located north of SR46.

**Figure 6-15 - PAL 2 Area C2**




**Area C2 (Figure 6-15)** is introduced in PAL 2 as an acre in the southwest corner of the Insurance Auto Auctions (IAA) lot, north of the Runway 27R approach end. The size of Area C2 is expected to grow along with the Airport's operations to over 2.5 acres by PAL 3 but retract to 2.2 acres in PAL 4. The commercial land usage of IAA's operation is not considered to be an NSA, therefore is compatible with the 65 DNL contour. Additionally, the Airport maintains an avigation easement over this area.

Figure 6-16 - PAL 4 Area D2




**Area D2 (Figure 6-16)** is introduced in PAL 4 and is the 0.37-acre, southwest corner of a residential lot north of the future approach end of Runway 27L. Area D2 is primarily undeveloped. Land use controls should be implemented to ensure that no future noise sensitive structure is erected in Area D2.

Figure 6-17 - PAL 1 Area E


**Area E (Figure 6-17)** is introduced in PAL 1 at a mere 0.13-acre area, west of Lake Mary Boulevard along the extended Runway 9R/27L centerline. Area E is expected to grow to over half an acre by PAL 4, however it is currently undeveloped, and the Airport already maintains an avigation easement that fully encompasses the area in all PALs. The Airport should maintain the avigation easement to ensure that no future NSAs are introduced in the area.

Figure 6-18 - PAL 4 Area F


**Area F (Figure 6-18)** is introduced in PAL 4, resulting from the expectation that 25 percent of the Airport's commercial passenger narrow body aircraft will operate to and from Runway 9R/27L following the upgrade of the runway. The vast majority of that nearly 10-acre area consists of Golden Lake. There are no NSAs in Area F, however the Airport should implement land use controls to ensure that no future NSAs are introduced. It should be mentioned that there is one residential structure on airport property and Golden Lake bordering Area F that the Airport recently acquired. The Airport should maintain ownership of that structure to ensure that no future NSA.

As this section describes, the Airport's anticipated off-airport 65 DNL noise contours are expected to increase from impacting 25 NSAs to nearly 230 by the end of PAL 3. The preferred airfield alternatives are expected to reduce the number of NSAs to below 60 by PAL 4.

The FAA actively supports several initiatives that have helped reduce the numbers of people exposed to significant aviation noise. One of those initiatives is to work with communities to eliminate or mitigate incompatible land use near airports via use of federal funds. Airports can collaboratively address their community noise impacts by using a voluntary program called Airport Noise Compatibility Planning or 'Part 150'. The program is known as 'Part 150' because the Aviation Safety and Noise Abatement Act of 1979 created the program under 14 Code of Federal Regulations (CFR) Part 150. The program began in 1981 and provides a structured approach for airport operators, airlines, pilots, neighboring communities, and the FAA to work together to reduce the number of people who live in significantly noise-impacted areas.

Through the Part 150 process, airport operators may consider a variety of different strategies to reduce noise. Changes in operational procedures such as take-offs or landings or routing flight paths over less noise sensitive areas can lower noise levels. Airports also may choose to purchase land near airports to maintain compatible land use or provide sound insulation for homes, schools and other buildings near the airport that meet the required standards. A Part 150 process leads to a Noise Compatibility Program (NCP) which identifies specific measures to reduce incompatible land uses. Based on the Airport's NEMs presented in this chapter, SAA may consider commencement of a full Part 150 process to establish and maintain an NCP.

## 6.16. Secondary Induced Impacts

Major development proposals often involve the potential for induced or secondary impacts on surrounding communities. Some examples include shifts in patterns of population movement and growth; public service demands; and changes in business and economic activity to the extent influenced by the airport development. Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts.

At SFB, the socioeconomic impacts of the proposed Airport development projects are expected to be positive in nature and would include direct, indirect, and induced economic benefits to the local area. Improved facilities are expected to enhance safety for the existing types of commercial, corporate and business aircraft utilizing the Airport. These Airport improvements are expected to attract additional users, which will, in turn, encourage business development, tourism, industry and trade to enhance the future growth and expansion of the community's economic base. As such, no induced socioeconomic or cumulative impacts are anticipated within the planning period that would require further analysis

## 6.17. Socioeconomic Environmental Justice, and Children's Health and Safety Risks

Analyses of socioeconomics include addressing the following: economic activity (employment and earnings), population, housing, and public schools. The principal social impacts that must be considered are the relocation of businesses and/or residences, alteration or surface transportation patterns division or disruption of established communities, disruption of orderly planned development, and the creation of an appreciable change in employment. Subsequently, if any relocation of residential or commercial properties is required, compensation shall be made under the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation and Uniform Relocation Act of 1987 and its implementing regulation (49 CFR Part 24).

If any potentially impacted properties cannot be acquired through a land acquisition program prior to the start of each specific project, the guidelines set forth in the documents described previously must be followed to mitigate impacts on the affected residences. Additionally, any areas with concentrated populations of people belonging to a single race, national origin, or low-income bracket must be identified and evaluated under the requirements of the Environmental Justice Act to ensure that they are not receiving a disproportionate share of adverse environmental impacts (e.g. high levels of noise exposure) in relation to other area in the vicinity of the airport.

### 6.17.1. Social Impacts

Concern that minority populations and/or low-income populations bear a disproportionate amount of adverse health and environmental effects led to the issuance of E.O. 12898 in 1994 32 CFR 989. *The Environmental Impact Analysis Process* addresses the need for consideration of environmental justice issues in the impact analysis process. The purpose of an environmental justice analysis is to identify disproportionally high and adverse human health and safety and environmental impacts on minorities and low-income communities and to identify appropriate alternatives. This E.O. also requires the application of equal consideration for American Indian populations.

The principle social impacts that must be considered are; the relocation of businesses and/or residences, alteration of surface transportation patterns, division or disruption of established communities, disruption of orderly planned development, and the creation of an appreciable change in employment. If any relocation of residential or commercial properties is required, compensation shall be made under the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation and Uniform Relocation Act of 1987 and its implementing regulations (49 CFR Part 24). If potentially impacted properties cannot be acquired through a land acquisition program prior to the start of each specific project, the guidelines set forth in the documents described above must be followed to mitigate impacts on the affected residences. Additionally, any areas with concentrated populations of people belonging to a single race, national origin or low-income bracket must be identified and evaluated under the requirements of Environmental Justice to ensure that they are not receiving a disproportionate share of adverse environmental impacts (e.g., high levels of noise exposure) in relation to other areas in the vicinity of the Airport.

The proposed development contained in the preferred alternative has the potential to impact residential properties in the vicinity of SFB. The areas where relocations of residences and/or businesses may be required to accord with the guidelines of the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, as discussed above, to mitigate impacts associated with the proposed development. Additionally, further analysis to identify the extent and total number of properties impacted must be completed in the environmental studies associated with each development project. Therefore, projects that require an Environmental Assessment would need to address such impacts.

### 6.17.2. Induced Socio-Economic Impacts

Induced socio-economic impacts are those impacts on surrounding communities that are generally produced by large-scale development projects. The scope of such development may create shifts in population movement and growth patterns, public service and demand, and changes in commercial and economic activity.

Airport development on this scale is likely to occur at SFB within the long-term of this study and impacts that may be associated with such development will need to be analyzed. Development projects that require an EA or EIS will study the possible impacts of such development and describe in detail the possible induced socio-economic impacts that may be expected.

### 6.17.3. Special Risk to Children

Former President Bill Clinton signed E.O. 13045, *Protection of Children from Environmental health Risks and Safety Risks* in 1997. That E.O. mandated that all federal agencies assign a high priority to addressing health and safety risks to children, coordinating research priorities on children's health, and ensuring that their standards take into account special risks to children. The E.O. states that "environmental health and safety risks" means "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to.)"

Children are more sensitive to some environmental impacts than adults, such as airborne asbestos and lead paint from demolition, safety with regard to equipment, trips/falls/traps within structures under demolition, and noise. Activities occurring near areas that tend to have a higher concentration of children than the typical residential area during any given time, such as schools, churches and community childcare facilities may further impact children.

None of the development alternatives proposed in this document should have adverse impacts upon the health or safety risks of children. However, development projects that require an EA/EIS would demand that further analysis is conducted to assess any potential adverse impacts.

### 6.17.4. Solid Waste

The Resource Conservation and Recovery Act (RCRA) and FAA Order 5200.5A regulate solid waste impacts. The RCRA grants authority to the EPA to control hazardous waste from the "cradle-to-grave" including its generation, transportation, treatment, storage, and finally, disposal. The RCRA also provides for a safe disposal of discarded materials, regulates hazardous waste, promotes recycling, and establishes criteria for sanitary landfills. An amendment was made to the RCRA in 1986 that enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous materials.

FAA Order 5200.5A provides guidance concerning establishment, elimination, or monitoring of landfills, open dumps, or waste disposal facilities on or near airports. Under this order, waste disposal sites within 10,000 feet of any runway end used by turbine-powered aircraft, are considered incompatible with Airport operations. However, the State Department of Environmental Protection has primary responsibility for regulating landfills and overseeing programs associated with solid wastes.

Increases in solid waste will likely be seen during periods of construction and upon completion of the proposed terminal, cargo, maintenance, and corporate facilities. These facilities will likely increase the production of solid waste and solid waste disposal at the Airport. However, coordination with state and local officials should be completed to ensure that adequate capacity for the increase in solid waste disposal exists and is readily available to support the new facilities at SFB.

An Airport Recycling, Reuse and Waste Reduction Program was developed for SFB, as per the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (2012 FMRA). The Airport and its tenants have shown great initiative in identifying practices that can reduce waste and increase recycling and reuse of materials. As the type and number of operations increase, both the type and waste volume will also increase. Therefore, by implementing additional strategies to monitor, reduce, recycle solid waste disposal, these efforts will reduce the overall environmental footprint of the airport, reduce overall costs, and possibly provide another revenue stream. However, an efficient and effective waste management program requires participation from all airport partners. Successful implementation will require a common set of definitions, procedures, and handling equipment needed. Further, control of waste streams along with training and user participation is essential for successful mitigation.

## 6.18. Water Quality

The Clean Water Act (CWA) (33 U.S.C. 1151 et seq., 1251 et seq) formally known as the Federal Water Pollution Control Act, is the basic federal legislation governing wastewater discharges. The implementing federal regulations include the National Pollutant Discharge Elimination System (NPDES) permitting process (40 CFR 122). General pre-treatment programs (40 CFR 403) and categorical effluent limitations, including limitation for pre-treatment of direct discharges (40 CFR 405, et seq).

To the extent possible, the FAA Order 5050.4B required consideration should be given to the following: storm and sanitary sewer design, requirement for additional water supply or water treatment capacity, erosion controls to prevent siltation, provisions for containing oil spills and wastewater from aircraft washing, designs to preserve existing drainage or minimize dredge and fill, and location with regard to surface and subsurface aquifers or sensitive ecological areas such as wetlands.

The Florida Air and Water Pollution Control Act (Florida Statutes, Title 28 Section 403) govern industrial and domestic wastewater discharges in the state. The water management district has been delegated as the enforcement authority by the Florida Department of Environmental Protection (FDEP). The implementing state regulations are contained in the F.A.C. 62. These regulations establish water quality standards, regulate domestic wastewater facility management and industrial waste treatment, establish domestic wastewater treatment plant monitoring requirements, and regulate storm water discharge.

At this time, no significant threats to water quality are anticipated resulting from the proposed development of SFB. However, water quality at SFB is regulated by federal and state legislation. The Federal Water Pollution Control Act, as amended by the Clean Water Act, provides the authority to establish water control standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredged or filled materials into surface waters. The Fish and Wildlife Coordination Act requires consultation with the U.S. Fish and Wildlife Service and appropriate State agency when any alteration and/or impounding of water resources is expected. Additionally, the Federal National Pollution Discharge Elimination System (NPDES) provides regulations that govern the quality of storm water discharged into the water resources of the U.S.

Permitting requirements for construction that exceeds five acres are specified by NPDES and are administered by the Florida Department of Environmental Protection (FDEP). Coordination with both the FDEP and the appropriate

Florida Water Management District is necessary to ensure water quality. Currently all necessary discharge permits are in place and water quality at SFB meets current standards. However, NPDES permits will be required for the proposed development.

## 6.19. Wetlands

Under E.O. 11990, *Protection of Wetlands* (1977), federal agencies are prohibited from undertaking or providing assistance for activities, including new construction, located in wetlands unless there are no practicable measures to minimize harm to wetlands have been implemented.

The two important federal laws regulating wetlands are the River and Harbors Act (RHA) of 1899, and the Clean Water Act (CWA). The focus of the RHA is protection of water navigation while the focus of the CWA is prevention of water pollution. Additionally, the North American Wetlands Conservation Act of 1989 assigns preservation responsibilities to all federal agencies whose jurisdiction may involve the management or disposal of lands and waters under their control.

The U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency share responsibility for wetland protection and permitting under the CWA. Additionally, the St. Johns River Water Management District (SJRWMD) aids in the protection and permitting of wetlands located within its jurisdictional district. Both define a wetland as, "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions." Such areas typically include swamps, bogs, marshes and wetland domes. Other agencies with non-regulatory responsibilities to create or protect wetlands include the USFWS, the National Marine Fisheries Service, and the NRCS.

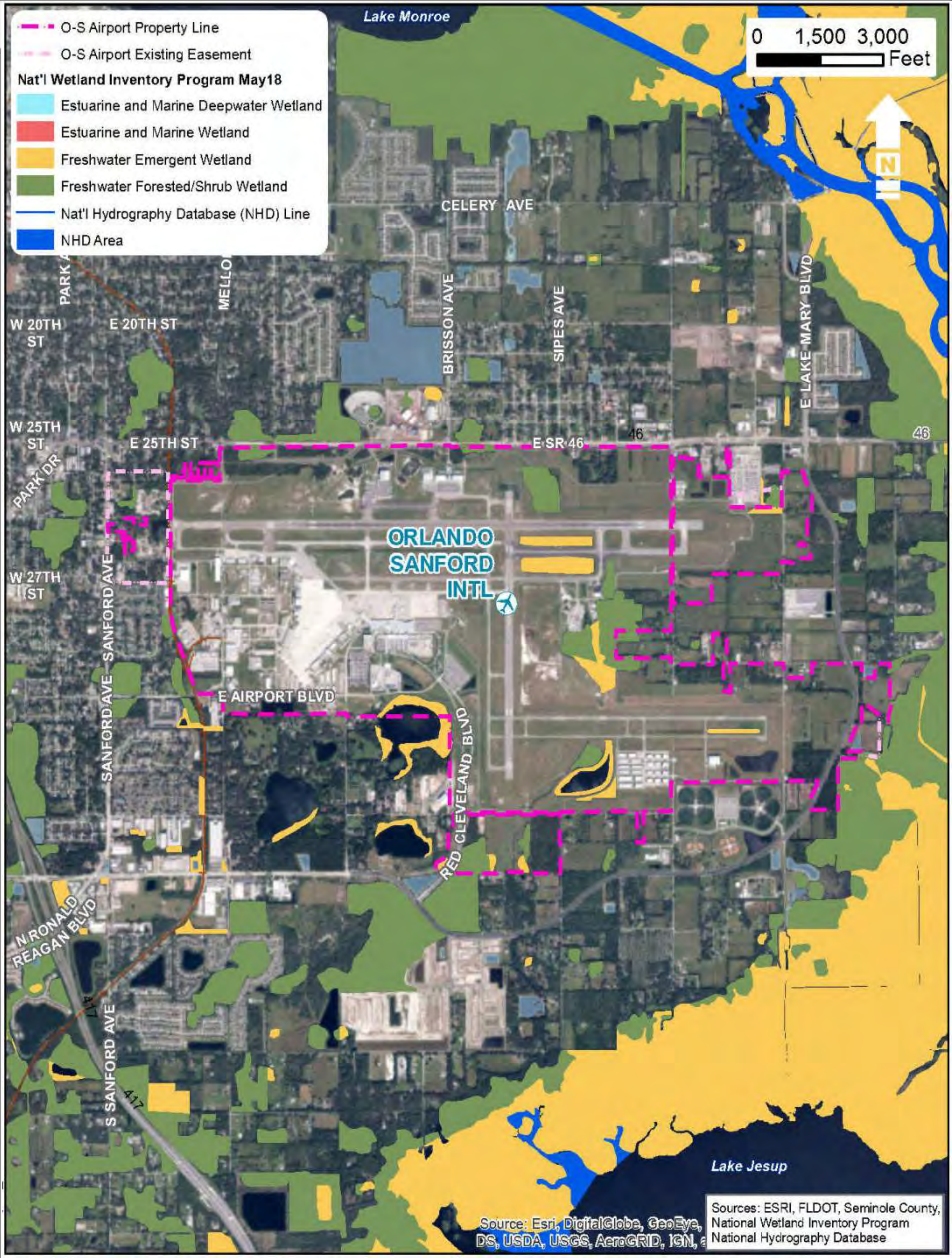
Any impacts to the wetlands by the proposed development projects should be minimized and/or mitigated to avoid any adverse impacts. This may be accomplished through the use if innovative project design and/or construction methods that achieve the ultimate development goal while eliminating adverse environmental impacts. Any unavoidable impacts must be mitigated and the type and amount of actual mitigation that is required should be coordinated with the appropriate oversight agency during the environmental permitting process. Further review of possible wetland impacts on and in the vicinity of the Airport must be conducted during an EA or EIS process for each project. **Figure 6-19** displays wetland data from the USFWS National Wetland Inventory (NWI) database. This dataset is used for preliminary planning and is not meant for jurisdictional determinations, impact assessment, permitting, or other regulatory purposes. Prior to any land disturbing activity, the formal location and boundaries of jurisdiction wetlands will need to be delineated and verified by FDEP, USACE, and SJRWMD.

## 6.20. Wild and Scenic Rivers

The National Wild and Scenic Rivers Act (NWSRA) of 1968 preserves certain rivers with outstanding natural, cultural, or recreational features. The Department of the Interior (DOI) National Park Service (NPS) River and Trail Conservation Assistance Program (RTCA) within NPS's National Center for Recreation and Conservation (NCRC) maintains a Nationwide Rivers Inventory (NRI) of river segments that qualify for inclusion in the National Wild and Scenic River System.

Under provisions of this act, federal agencies cannot assist, by loan, grant, license, or otherwise, in construction of any water resources project that would have direct and adverse impacts on river values. River segments protected under this legislation are administered by the U.S. Park Service.

The Florida Department of Natural Resources is the state agency charged with oversight of the wild and scenic rivers in the state. According to the official Federal National List of Inventory Rivers, the only two wild and scenic rivers in the State of Florida are the Loxahatchchee River located in Palm Beach County and the Wekiva River located in Seminole County. The Wekiva River is located approximately ten miles to the west of the Airport and is not expected to be impacted by the proposed development. Therefore, the regulations mandated by the above-mentioned legislation do not apply to SFB.

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ATKINS
Member of the SNC-Lavalin Group

2020 Orlando Sanford International Airport Master Plan Update
NWI Wetland Data

Figure 6-19

## 6.21. Cumulative Impacts

NEPA requires the evaluation of the environmental consequences, including secondary and cumulative impacts, of all federal actions. Secondary impacts are defined as those that are "caused by an action and are later in time or farther removed in distance but are reasonably foreseeable" (40 CFR 1508.8). Cumulative impacts are broadly defined as those that "result from the incremental impacts of an action when added to other past and reasonably foreseeable future actions" (40 CFR 1508.7).

The overall and total development plan included in the preferred alternative, as presented in the preceding pages of this document, will likely result in some level of future secondary and cumulative impacts as Airport capacity, operations, and overall activity increases. Such impacts are likely to include, but may not be limited to, areas such as, local transportation routes and traffic volumes, land use and community growth, industrial and commercial business activity, and overall demand for public services. Coordination with state and local officials will be necessary during each project to ensure any future secondary and/or cumulative impacts are identified, and adequate public facilities and services planned to meet the long-term needs of the Airport and local community.

## 6.22. Summary

This chapter serves as a cursory review of the potential for environmental impacts that may be associated with the proposed development in this document. Further environmental studies, such as an EA or EIS, will be necessary for some of the proposed development within this Master Plan/ALP as required by the NEPA. Project specific impacts and any necessary mitigation measures may be determined and identified in these environmental documents.

# Airport Financial Plan

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# 7. Financial Plan

This Chapter focuses on methods of financing Sanford Airport Authority's share of the capital improvement program, which have been identified by the Master Plan. The financial plan includes a forecast of revenues and expenses that can be used to determine whether net operational revenues will be available to pay for the local share of the capital development program over the planning period. This initial forecast assumes that the current rates and charges will keep pace with inflation and projects revenues and expenses into the future based upon a combination of historical trends and City policy objectives. The Chapter is organized to address the following topics:

- Methodology
- Capital Costs
- Historical Revenues and Expenses
- Forecast of Revenues and Expenses
- Findings and Recommendations

## 7.1. Methodology

Determining the financial implications of the Master Plan's capital improvement program began with a description of the specific development items and an assignment of each item to one of three development phases:

- Phase I (Short-Range): 2022 - 2026
- Phase II (Mid-Range): 2027 – 2031
- Phase III (Long-Range): 2032 – 2041

The current costs of each capital improvement item were then estimated in then-year dollars and totaled by development phase. Cost estimates were taken directly from the Capital Improvement Program, which was developed as a part of the Master Plan. Federal, State, sponsor and private shares of all costs were then estimated based upon expected government participation and assumed private development.

Orlando-Sanford International Airport's (SFB's) financial records for the period 2015-2020 were closely examined to identify any historical patterns as they might relate to operating revenues and expenses. Additionally, the Airport's current rate structure was reviewed to aid in the projections of potential revenue production. Then, relating estimated operating expenses and future revenues from forecasted aviation activity levels, annual revenues and expenses were projected through the planning period.

Using these projections, a net revenue analysis was conducted to determine if future operating surpluses, in amounts sufficient to finance the local share costs of development program, could be expected, without having to overhaul the rates and charges system. Consequently, the test of financial feasibility for the recommended development plan rests largely on the Airport's capability in the future to finance the local share of planned development for terminal building improvements, airfield improvements, and other master planning recommendations from airport revenue and Passenger Facility Charges (PFCs), combined with maximum use of Federal and State grants for eligible projects, and private investment.

### 7.1.1. Financial Policies

Orlando Sanford International Airport is owned by the City of Sanford and is operated by the Sanford Airport Authority (SAA) through a public/private partnership between the SAA and Orlando Sandford International, Inc. (OSI). OSI manages and operates the terminals and parking structure at SFB and pays SAA a portion of revenues from Parking Revenue (20 percent), Terminal Revenues (12.5 percent), and Ground Handling Services Revenue (1 percent).

The SAA is a dependent special district of the City of Sanford and a governmental entity that is operated as a business enterprise. The financial statements of the SAA are included in the financial statements of the City of Sanford as an Enterprise Fund. Enterprise Funds are used to account for services that are financed and operated in a manner similar to private business. The intent of the governing body is that costs of providing goods and services to the general public will be financed or recovered primarily through user charges.

Even with OSI to assist, the SAA is responsible for the operation, maintenance, and development of the Airport and its facilities and functions under the requirement that it will be self-sustaining and not be a burden upon local tax dollars. The Airport provides enough funding to pay for all current expenditures and other financial requirements related to the Airport. This includes regular costs such as operating expenditures, personnel costs, equipment purchases, and routine facilities maintenance and repair. In addition, the Airport pays the local share of capital development costs from its revenue base.

### 7.1.2. Pricing Concept

Generally, there are two basic pricing concepts at commercial service airports: the residual cost approach, and the compensatory cost method. The residual approach is the most common at larger commercial service airports and assumes that users of the airport will pay their fair share of costs. Under this approach, the total annualized costs of the airport are reduced by the amount of all non-airline revenues, and the remainder is proportioned among the airlines, based upon various activity measures for the commercial terminal and airfield usage. This type of cost recovery approach guarantees that the airlines will provide the revenues necessary to cover airport costs.

The second pricing concept is the compensatory cost method. Under this method, airport expenses are classified into distinct cost centers and apportioned to each user through an equitable rate structure. In some cases, expenses associated with certain cost centers can be assigned directly to users while the remaining costs are grouped to be shared by all users. Common methods used to set these rate structures include the Direct Usage Rental, the Direct Volume Commission, and the Economic Rent Principles. A brief description of each principle follows:

- ***The Direct Usage Rental*** principle requires the tenants or users to pay a rental charge for the use of the buildings and land. This method can also be applied regarding services. The tenant or user is charged a specified amount for a particular service. The more space that is leased, or the more services that are contracted for, the greater the costs.
- ***The Direct Volume Commission*** principle is most frequently associated with the charge to an airport's fuel provider. In most cases this is paid by the Fixed Base Operator (FBO) since the FBO usually is the authorized seller of aviation fuels. The fee itself is typically assessed on each gallon of fuel and/or lubricant delivered or sold.
- ***The Economic Rent*** principle is a method of collecting a reasonable fee from a lessee whose business depends on its unique location. The amount of "economic rent" paid is typically recovered through a percentage-of-gross sales lease. Since overhead does not generally increase proportionately with volume, this is a reasonable method for generating income in excess of the minimum space rental value. The economic rent principle is frequently utilized in airport use agreements with restaurants and rental car concessions.

SFB utilizes the Compensatory Cost method in establishing rates and charges for airlines serving the Airport. For general aviation (GA) or non-airline related tenants the Compensatory Cost method is also used. Thus, the collection of fees is based both upon the airport’s cost, and upon the amount of terminal space, building, or apron area leased or temporarily occupied and the specific service requested, the amount of airline landed weight, and the volume of aviation fuel purchased.

### 7.1.3. Historical Background Operating Statistics

The historical background operating statistics for SFB provide insight into the growth of the Airport and its potential growth in the future, once the COVID-19 threat has been eliminated or significantly diminished. From the data, the Airport has been in an upward trajectory for the past eight years and before. In particular, airline enplanements have grown by 85 percent over the period (2013-2020) – see **Table 7-1** and **Figure 7-1**. Similarly, landed weights (the measure for landing fees) has grown by roughly half that amount (43 percent).

Other measures such as annual aircraft operations, passenger airline costs per enplanement, and the number of full-time equivalent workers at SFB have all increased in recent years. From a financial forecasting perspective, these trends show an underlying soundness of the SFB brand, and an ability to attract market share in the Orlando region. If COVID-19 setbacks are temporary, given the recent rollout of vaccines, it is anticipated that a rebound from 2020 losses in passengers and operations will commence in mid-to-late 2021.

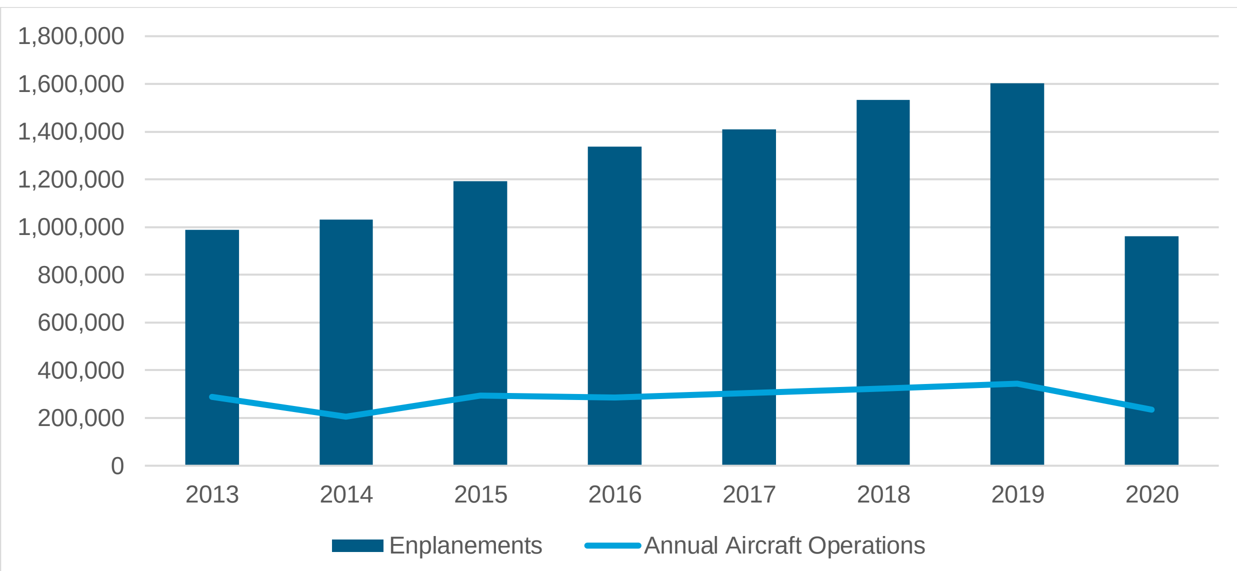
**Table 7-1 - Historical Background Operating Statistics**

| Category | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Enplanements | 988,898 | 1,032,326 | 1,192,831 | 1,337,667 | 1,409,916 | 1,531,881 | 1,603,220 | 962,527 |
| Landed weights in tons | 530,700 | 540,000 | 622,437 | 720,157 | 770,278 | 814,771 | 851,820 | 623,799 |
| Signatory landing fee rate per 1,000 lbs | $1.35 | $1.37 | $1.37 | $1.37 | $1.37 | $1.37 | $1.37 | $1.37 |
| Annual aircraft operations | 287,741 | 205,540 | 292,944 | 285,738 | 303,769 | 322,838 | 343,847 | 235,554 |
| Passenger Airline Cost/Enplanement | $2.08 | $2.12 | $2.03 | $1.87 | $2.13 | $2.30 | $9.11 | $12.78 |
| Full -Time Equivalent (FTE) jobs - end of year | 86 | 91 | 86 | 86 | 91 | 95 | 100 | 106 |

Source: Certification Activity Tracking System (CATS) for Federal Aviation Administration (FAA) Form 5100-127

It should be noted that there are different rates for "participating" and "non-participating" airlines for landing fees and certain passenger enplanement fees. Participating airlines are those which have lease agreements with the Airport, while non-participating airlines do not.

**Figure 7-1 - Historical Enplanements and Operations**




Source: Table 7-1

## 7.2. Capital Improvement Program

Previous chapters of this study have presented future forecasts of aviation activity and associated facility requirements based upon certain assumptions. The planned improvements are graphically depicted on the Airport Layout Plan (ALP) and Terminal Area Plan (TAP). The Capital Improvement Program (CIP) detailing both timing and cost for the three development phases is presented in **This Table** shows the funding eligibility for each item, based on potential Federal (FAA), FL State, SAA, and Private investment. It should be noted that eligibility for funding may be vastly different from how the item is ultimately paid for, depending upon the availability of funds in the eligible category. Later in the analysis, a table showing estimated funding availability will be compared to the project cost.

As shown, the total estimated cost for all development items in 2021 dollars is $855.35 million, with Phase 2 having the greatest cost at $539.8 million. The federal eligible share of the development costs is estimated at $256.2

million with the State financial eligibility assistance amounting for $113.8 million. The SAA's eligible share of these costs, including PFC funding, are estimated at $405.8 million. Private enterprise funding was estimated at $79.5 million, which is at the discretion of private developers.

When inflation factors are applied to these costs, (3 percent per year, taken at the midpoint of each phase), the revised totals include $109.0 million for Phase 1, $683.8 million for Phase 2, and $336.2 million for Phase 3, with a grand total of $1.13 billion. Thus, inflation adds almost $275 million to the capital costs. Of interest in this analysis is the impact of inflation on the local share/PFC funding needs, which increase from $405.8 million to $547.9 million. Inflated capital costs will be shown in detail later in the financial analysis.

**Table 7-2**. Detailed cost estimates are provided in Volume II, Appendix D, *Capital Improvement Program Cost Estimates*. This Table shows the funding eligibility for each item, based on potential Federal (FAA), FL State, SAA, and Private investment. It should be noted that eligibility for funding may be vastly different from how the item is ultimately paid for, depending upon the availability of funds in the eligible category. Later in the analysis, a table showing estimated funding availability will be compared to the project cost.

As shown, the total estimated cost for all development items in 2021 dollars is $855.35 million, with Phase 2 having the greatest cost at $539.8 million. The federal eligible share of the development costs is estimated at $256.2 million with the State financial eligibility assistance amounting for $113.8 million. The SAA's eligible share of these costs, including PFC funding, are estimated at $405.8 million. Private enterprise funding was estimated at $79.5 million, which is at the discretion of private developers.

When inflation factors are applied to these costs, (3 percent per year, taken at the midpoint of each phase), the revised totals include $109.0 million for Phase 1, $683.8 million for Phase 2, and $336.2 million for Phase 3, with a grand total of $1.13 billion. Thus, inflation adds almost $275 million to the capital costs. Of interest in this analysis is the impact of inflation on the local share/PFC funding needs, which increase from $405.8 million to $547.9 million. Inflated capital costs will be shown in detail later in the financial analysis.

### Table 7-2 - SFB Capital Improvement Program by Eligible Funding Source

| Phase | # | Project | Federal | State | Local/PFC | Private | Estimated Project Cost |
|---|---|---|---|---|---|---|---|
| Near Term Projects (0-5 Years) | 1 | Relocated Maintenance Complex | $0 | $3,950,000 | $3,950,000 | $0 | $7,900,000 |
| | 2 | Taxiway A3 Relocation | $4,770,000 | $265,000 | $265,000 | $0 | $5,300,000 |
| | 3 | Taxiway K1 Relocation | $2,610,000 | $145,000 | $145,000 | $0 | $2,900,000 |
| | 4 | Taxiway M Extension | $4,500,000 | $250,000 | $250,000 | $0 | $5,000,000 |
| | 5 | Taxiway P Removal & Relocate Compass Calibration Pad | $1,080,000 | $60,000 | $60,000 | $0 | $1,200,000 |
| | 6 | New 35,000 SF Conventional Hangar | $0 | $3,150,000 | $3,150,000 | $0 | $6,300,000 |
| | 7 | South East Ramp Expansions - Phase 1B and 2A | $0 | $0 | $5,500,000 | $7,100,000 | $12,600,000 |
| | 8 | Storm Pond Expansion | $11,340,000 | $630,000 | $630,000 | $0 | $12,600,000 |
| | 9 | New Fire Station | $0 | $0 | $4,100,000 | $0 | $4,100,000 |
| | 10 | Solar Farm Development | $0 | $0 | $4,000,000 | $21,600,000 | $25,600,000 |
| | 11 | Obstruction Survey | $225,000 | $12,500 | $12,500 | $0 | $250,000 |
| | 12 | Design & Construct FIS Improvements | $0 | $8,000,000 | $8,000,000 | $0 | $16,000,000 |
| | | **Subtotal Phase 1** | **$24,525,000** | **$16,462,500** | **$30,062,500** | **$28,700,000** | **$99,750,000** |
| Mid Term Projects (5-10 Years) | 13 | Taxiway A – Full Parallel Taxiway System | $43,200,000 | $2,400,000 | $2,400,000 | $0 | $48,000,000 |
| | 14 | Runway 9L-27R Reconstruction | $80,820,000 | $4,490,000 | $4,490,000 | $0 | $89,800,000 |
| | 15 | GA Apron Expansion | $0 | $0 | $3,100,000 | $0 | $3,100,000 |
| | 16 | Runway 9R-27L Upgrades – Split Extension to a Total Length of 7,200 Feet | $39,600,000 | $2,200,000 | $2,200,000 | $0 | $44,000,000 |
| | 17 | Construct New Parallel Taxiway North of Runway 9R-27L | $18,990,000 | $1,055,000 | $1,055,000 | $0 | $21,100,000 |
| | 18 | Runway 18-36 Conversion | $8,100,000 | $450,000 | $450,000 | $0 | $9,000,000 |
| | 19 | South East Ramp Expansions - Phase 1A, 2A, and 2B | $0 | $0 | $1,148,000 | $19,252,000 | $20,400,000 |
| | 20 | Construct 4-Level Consolidated Rental Auto Center (ConRAC) Garage | $0 | $0 | $148,800,000 | $0 | $148,800,000 |
| | 21 | Construct 5-Level Parking Garage | $0 | $74,600,000 | $74,600,000 | $0 | $149,200,000 |
| | 22 | Widen Airport Boulevard | $0 | $3,200,000 | $3,200,000 | $0 | $6,400,000 |
| | | **Subtotal Phase 2** | **$190,710,000** | **$88,395,000** | **$241,443,000** | **$19,252,000** | **$539,800,000** |
| Long Term Projects (10-20 Years) | 23 | Runway 9C-27C Eastward Extension and Taxiway C Improvements/Extension | $5,670,000 | $315,000 | $315,000 | $0 | $6,300,000 |
| | 24 | Taxiway B Improvements | $1,800,000 | $100,000 | $100,000 | $0 | $2,000,000 |
| | 25 | Taxiway S Improvements | $1,800,000 | $100,000 | $100,000 | $0 | $2,000,000 |
| | 26 | Taxiway U Improvements | $450,000 | $25,000 | $25,000 | $0 | $500,000 |
| | 27 | South East Ramp Expansions - Phase 2A, 3, and 4 | $0 | $0 | $2,165,000 | $28,635,000 | $30,800,000 |
| | 28 | Commercial Terminal Gate Modifications/Expansion | $20,000,000 | $5,625,000 | $86,875,000 | $0 | $112,500,000 |
| | 29 | Commercial Terminal Services Modifications | $0 | $2,160,000 | $41,040,000 | $0 | $43,200,000 |
| | 30 | Relocate ATCT | $11,250,000 | $625,000 | $625,000 | $0 | $12,500,000 |
| | 31 | Jet-A Fuel Storage Expansion | $0 | $0 | $1,050,000 | $1,350,000 | $2,400,000 |
| | 32 | Rail Access Expansion | $0 | $0 | $1,990,000 | $1,610,000 | $3,600,000 |
| | | **Subtotal Phase 3** | **$40,970,000** | **$8,950,000** | **$134,285,000** | **$31,595,000** | **$215,800,000** |
| **GRAND TOTALS** | | | **$256,205,000** | **$113,807,500** | **$405,790,500** | **$79,547,000** | **$855,350,000** |

Source: AVCON Estimates, 2021

Key to the financial analysis is a determination of the amount of Federal, State, and private funding that can be obtained, relative to the eligible amount. This amount will, in turn, determine how much the Sponsor Share costs will have to be in order to cover the capital improvement program. The eligible funding shares outlined above have been derived from the current funding formula as follows:

- Federal assistance, either through grants, or entitlement funds, of 90 percent on eligible items as per Federal Aviation Regulations Part 152, The Airport Improvement Program (AIP), assuming SFB remains a Small Hub throughout the forecast period. When the Airport moves from a small hub to a medium hub classification, its funding eligibility will drop from 90 percent to 75 percent.
- For State assistance, Florida Department of Transportation (FDOT) may provide up to 50 percent of the portion of eligible commercial service airport project costs when federal funding is available. For example, FDOT may provide up to 5 percent of project costs when the Federal Aviation Administration (FAA) provides 90 percent funding. When no federal funding is available, FDOT may provide up to 50 percent of the portion of eligible commercial service airport project costs. Other State assistance may come in the form of economic development grants or other State initiatives. For example, FDOT may provide up to 100 percent funding for commercial and general aviation airport projects that meet the following criteria:
  - Provide important access and on-airport capacity improvements;
  - Provide capital improvements to strategically position the state to maximize opportunities in international trade, logistics, and the aviation industry;
  - Achieve state goals of an integrated intermodal transportation system; and
  - Demonstrate the feasibility and availability of matching funds through federal, local, or private partners.
- The sponsor would be responsible for the remaining 5 percent of funded FAA and State projects and 100 percent of all other non-private projects.
- Private enterprise funding is assumed for certain revenue-producing projects such as aircraft hangars and fueling facilities.

## 7.3. Historical Revenues and Expenses

For purposes of this analysis, the most recent five-year financial history (FY2015 - FY 2020) is presented in **Table 7-3**, **Table 7-4**, and **Figure 7-2**, **Figure 7-3**, **Figure 7-4**, **Figure 7-5**. This information was taken from Financial Statements and Independent Auditors' Reports provided by Airport management. The fiscal year for SFB begins October 1st and ends September 30th.

Operating revenues for the Airport (**Table 7-3**) are derived from the following:

- **Commerce Park Revenues**: This category includes building and land lease revenue from non-aviation-based tenants in Commerce Park.
- **Other Leases & Revenues**: This category includes rental revenue from residential leases, security ID fees, Transportation Security Administration (TSA) Law Enforcement Officer (LEO) reimbursement, and other miscellaneous revenues and fees not attributable to the other categories.
- **Aviation Revenue (FBO/GA)**: This category includes lease revenue from general aviation-based tenants (building, land, ramp, and aircraft hangars), revenues from aviation related businesses operating at the Airport (fuel flowage fees, fuel storage fees, Free Trade Zone (FTZ) fuel permits, aircraft brokerage fees), and communications revenue from the sale of digital and analog communications services.
- **Terminal Revenues**: This category includes terminal leases, parking revenue, and Customer Facility Charges (CFC) from the car rental companies. An extensive rework of the Leases, Agreements and Contracts was completed and became effective on January 1, 2017. A result of this rework curtailed lease payments and changed the revenue stream.  FY 2017-18 is the first year to reflect these changes. CFCs are currently $2.25 per rental day with a cap of five days ($11.25).
- **Airfield Revenues**: This category contains both domestic and international airline landing fees, which are charged based on landed weights of the airline aircraft. These are currently $1.37 per 1,000 lbs. for non-participating airlines and 40 percent of that ($0.548) for participating airlines.
- **Public Safety Fees**: Public Safety Fees are fees levied on the airlines on a per passenger enplanement basis ($0.50 for non-participating airlines and $0.125 for participating airlines) to assist in defraying the Authority's cost of implementing the safety and security policies and procedures.
- **Ground Transportation Revenues**: This category includes ground transportation permit and access fees, as well as off-Airport and FBO rental car commissions.

Non-Operating Revenues (**Table 7-3**) include:

- **Capital Contributions**: Capital contributions consist primarily of grants and contributions from federal and state governmental agencies, airlines, and tenants toward Airport capital projects.
- **Investment Income**: These revenues are derived from interest on airport investments.
- **Passenger Facility Charges**: The current rate at SFB is $4 per enplaned passenger.
- **Settlement Proceeds**: These funds are revenues from legal settlements.
- **Gain (loss) on Disposal of Capital Assets**: This category of non-operating revenues includes any gains for disposal or trade ins of vehicles and equipment.
- **Miscellaneous Income**: All other non-operating income not previously classified is grouped in this category.

Operating expenses (**Table 7-4**) were made up of the following cost items:

- **Salaries and Benefits**: These expenses include salaries, wages, and benefits of Airport workers. From **Table 7-1**, there were 157 full-time-equivalent personnel at the end of 2020.
- **Office and Administrative**: This category contains all SAA travel, training, postage, professional dues & memberships, and telephone expenses.
- **Professional and Contract Services**: These expenses include engineering services fees for non-grant related capital projects, contract audit fees, professional fees, legal fees for general representation, and expenses for contractual services.
- **Marketing, Advertising & Community Relations**: This category includes marketing expenses, community event sponsorships, and advertising.
- **Uniforms, Tools and Supplies**: This expense category contains basic office supplies for all SAA departments, as well as operating supplies for Maintenance, Operations, Airport Rescue and Fire Fighting (ARFF), and Police. small tools, uniforms, janitorial supplies, and motor vehicle/equipment fuels and oil are also included in this category.
- **Repairs and Maintenance**: This category contains all expected maintenance of SAA facilities, such as streets, ramps, taxiways, runways, buildings, etc. that are not considered capital projects. In addition, this category contains expenses for fencing, keys and locks, wildlife management and control, signs, land clearing, and equipment/vehicle maintenance.
- **Utilities**: This includes telephone and data services, electrical service, water, sewer, and garbage collection.
- **Insurance**: This category includes all non-salary related insurance contracts.

Non-Operating Expenses (**Table 7-4**) typically include items such as depreciation, amortization, and debt service for capital improvements. For this analysis, the following items are included:

- **Grant Capital Projects Expense**: Normally, this would include debt service principal payments and any other non-interest expenses associated with grant capital projects.
- **Interest Expense**: This category includes debt service interest payments.

There is no schedule of loans or debt service currently. The only loan in place is the construction debt of the terminal expansion. That is a revolving line of credit and as such, the amount is fluid and the term, rate, and principal will not be determined until sometime in 2021.

It should be noted that depreciation is not included in Operating or Non-Operating Expenses because it is a non-cash expense. Depreciation is used to account for the loss of useful life value in capital investments. As such, depreciation is a good indicator on the balance sheet of asset value loss. As mentioned, the ability of SFB to generate revenues and cover operating costs is the primary concern. Surplus net revenues are a good measure of how much the Airport can generate on its own to invest in capital improvements. Expenses, therefore, are inclusive of actual cash expenses and not depreciation expense.

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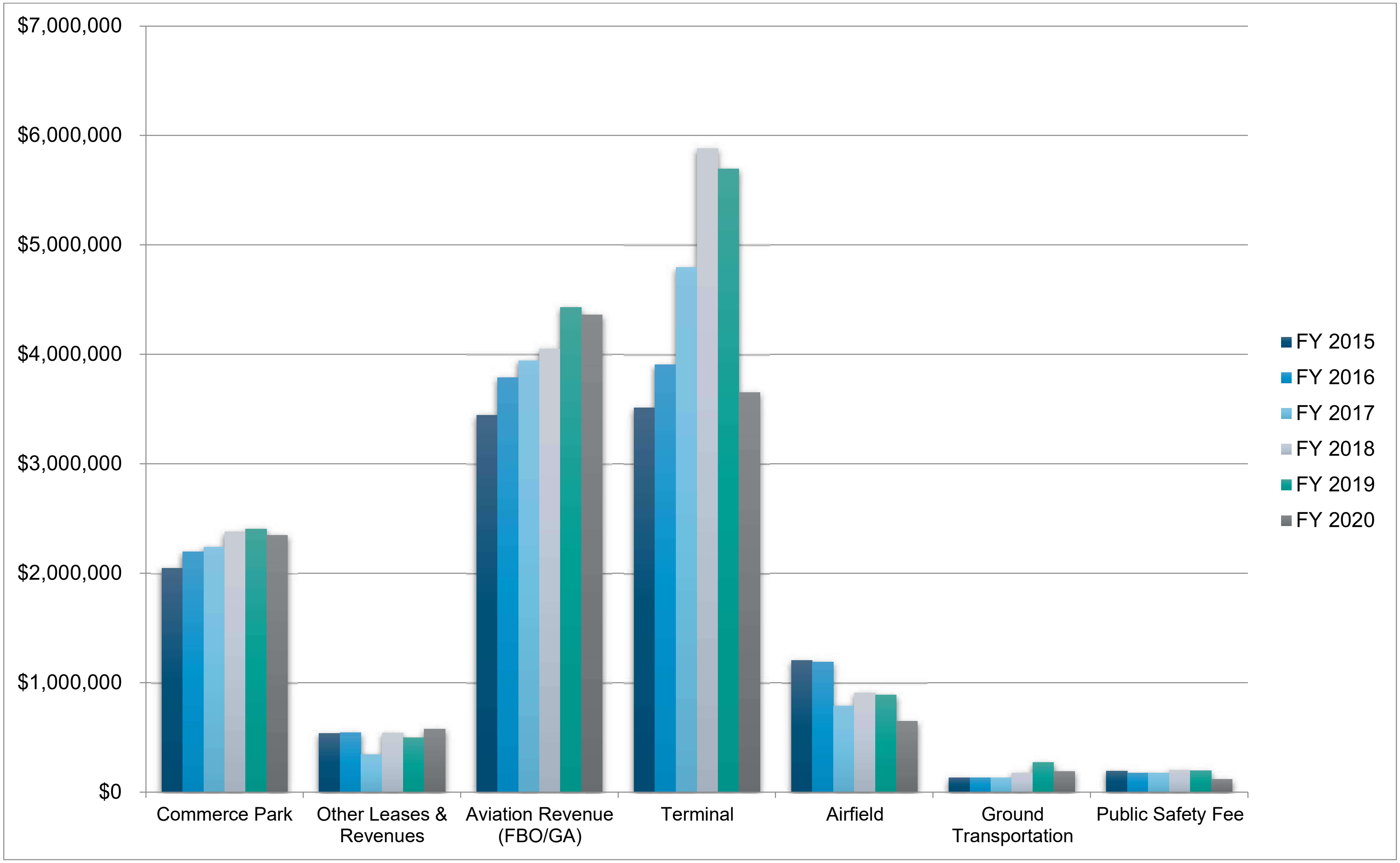
**Table 7-3 - SFB Historical Revenues: 2015-2020**

| Operating Revenues | Actual | Actual | Actual | Actual | Actual | Actual | CAGR | Growth |
|---|---|---|---|---|---|---|---|---|
| Category | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | 15-19* | 15-19* |
| Commerce Park | $2,047,089 | $2,196,434 | $2,241,395 | $2,378,424 | $2,404,658 | $2,347,859 | 4.1% | 17.5% |
| Other Leases & Revenues | $536,055 | $544,874 | $344,198 | $540,381 | $496,966 | $575,581 | -1.9% | -7.3% |
| Aviation Revenue (FBO/GA) | $3,446,416 | $3,789,698 | $3,943,855 | $4,051,527 | $4,430,062 | $4,360,346 | 6.5% | 28.5% |
| Terminal | $3,512,697 | $3,906,756 | $4,795,847 | $5,881,389 | $5,694,277 | $3,652,067 | 12.8% | 62.1% |
| Airfield | $1,203,407 | $1,188,172 | $789,809 | $907,127 | $890,728 | $648,211 | -7.2% | -26.0% |
| Ground Transportation | $131,489 | $130,036 | $129,809 | $176,261 | $274,062 | $190,555 | 20.2% | 108.4% |
| Public Safety Fee | $193,279 | $175,990 | $174,225 | $199,176 | $194,515 | $116,410 | 0.2% | 0.6% |
| **Total Operating Revenues** | **$11,070,432** | **$11,931,960** | **$12,419,138** | **$14,134,285** | **$14,385,268** | **$11,891,029** | **6.8%** | **29.9%** |
| | | | | | | | | |
| **Non-Operating Revenues** | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | 15-19 | 15-19 |
| Capital contributions | $9,765,867 | $13,137,595 | $2,473,057 | $11,716,088 | $9,803,342 | $12,628,555 | 0.1% | 0.4% |
| Investment income | $16,364 | $20,220 | $78,028 | $181,831 | $218,910 | $114,169 | 91.2% | 1237.8% |
| Passenger Facility Charges | $4,263,348 | $5,029,920 | $5,747,025 | $6,525,427 | $6,794,532 | $3,401,889 | 12.4% | 59.4% |
| Gain (loss) on disposal of capital assets | $0 | ($2,500) | $0 | $47,940 | $24,290 | $4,116 | n/a | n/a |
| Settlement proceeds | $0 | $0 | $1,871,265 | $305,757 | $0 | $0 | n/a | n/a |
| Miscellaneous income | $2,940 | $6,849 | $2,515 | $1,162 | $37,423 | $5,182,977 | n/a | n/a |
| **Total Non-Operating Revenues** | **$13,853,550** | **$18,027,101** | **$10,029,825** | **$18,634,932** | **$16,532,388** | **$21,331,706** | **0.2%** | **17.5%** |

influenced

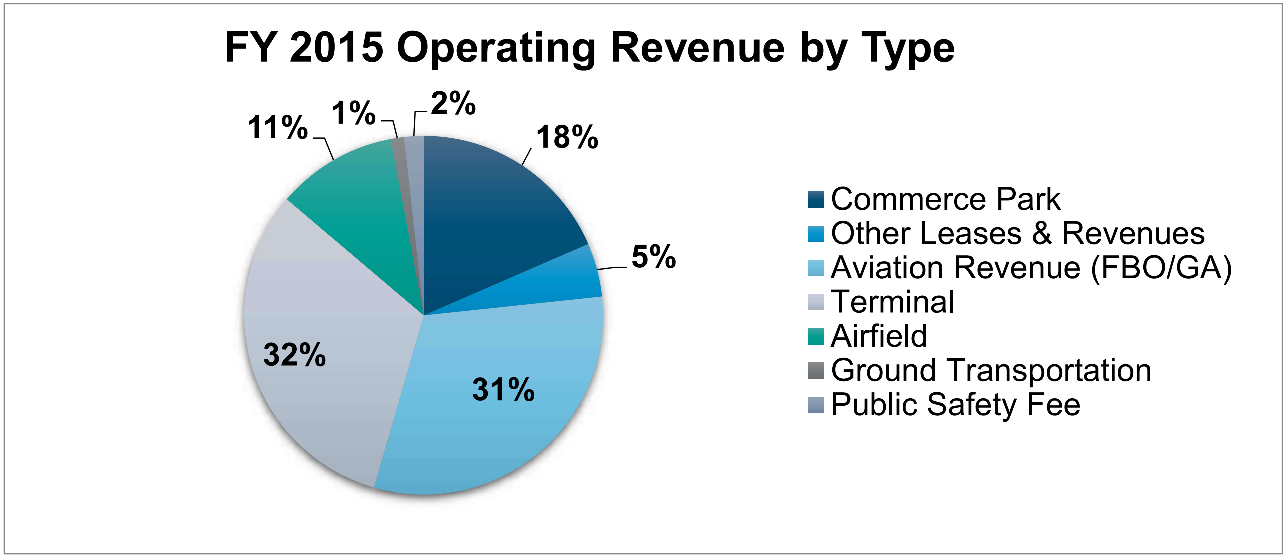
Source: Sanford Airport Authority. * Note that growth rates did not include 2020 results in order to show non-COVID-influenced growth.

**Figure 7-2 - Historical Operating Revenues by Source**




Source: Table 7-3

Figure 7-3 - Change in Revenue Shares over Time (data from Table 1-3)



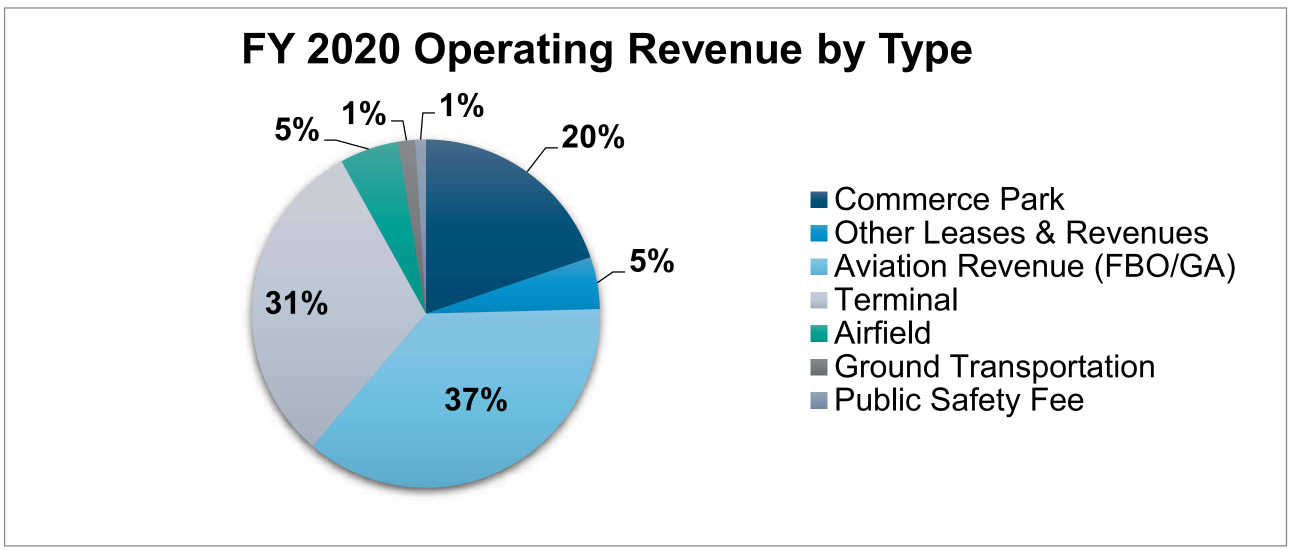
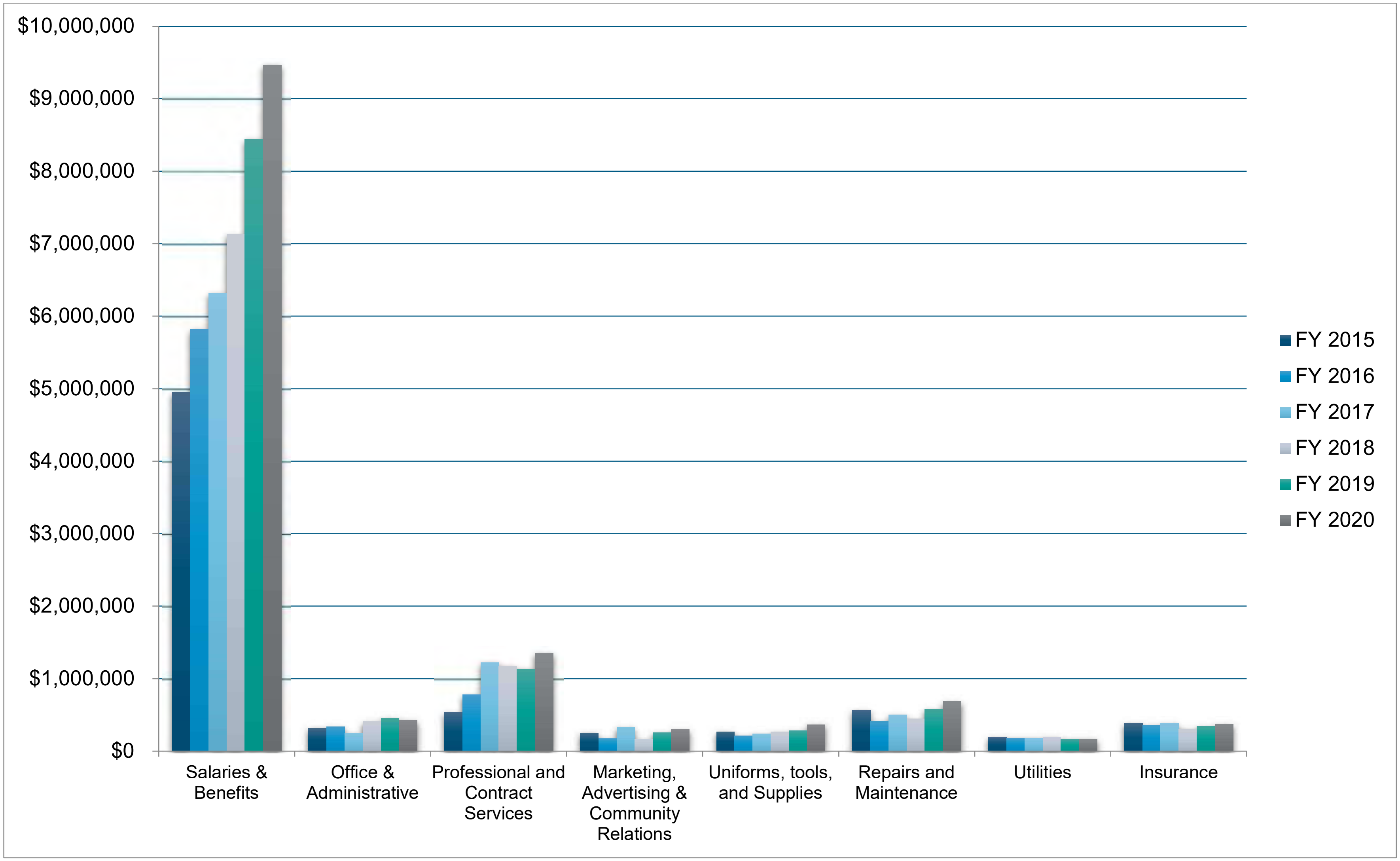



Table 7-4 - SFB Historical Expenses and Net Revenues: 2015-2020

| Operating Expenses | Actual | Actual | Actual | Actual | Actual | Actual | CAGR | Growth |
|---|---|---|---|---|---|---|---|---|
| Category | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | 15-19* | 15-19* |
| Salaries & Benefits | $4,955,427 | $5,823,397 | $6,315,727 | $7,127,698 | $8,443,258 | $9,468,551 | 14.3% | 70.4% |
| Office & Administrative | $320,209 | $335,494 | $247,318 | $409,681 | $459,537 | $427,749 | 9.5% | 43.5% |
| Professional and Contract Services | $537,871 | $780,990 | $1,222,988 | $1,172,584 | $1,137,554 | $1,356,685 | 20.6% | 111.5% |
| Marketing, Advertising & Community Relations | $252,962 | $177,008 | $329,909 | $166,228 | $258,705 | $300,579 | 0.6% | 2.3% |
| Uniforms, tools, and Supplies | $269,266 | $215,101 | $238,523 | $267,736 | $284,354 | $369,934 | 1.4% | 5.6% |
| Repairs and Maintenance | $566,749 | $416,086 | $500,845 | $446,999 | $582,795 | $689,277 | 0.7% | 2.8% |
| Utilities | $193,469 | $181,651 | $181,968 | $191,473 | $165,916 | $168,780 | -3.8% | -14.2% |
| Insurance | $386,871 | $362,811 | $382,457 | $307,870 | $346,507 | $373,211 | -2.7% | -10.4% |
| **Total Operating Expenses** | **$7,482,824** | **$8,292,538** | **$9,419,735** | **$10,090,269** | **$11,678,626** | **$13,154,766** | **11.8%** | **56.1%** |
| | | | | | | | | |
| **Non-Operating Expenses** | | | | | | | | |
| Capital Projects | - | - | - | - | - | - | - | - |
| Interest Expense | $194,969 | $164,983 | $142,065 | $143,273 | $346,109 | $0 | 15.4% | 77.5% |
| **Total Non-Operating Expenses** | **$194,969** | **$164,983** | **$142,065** | **$143,273** | **$346,109** | **$0** | **15.4%** | **77.5%** |
| | | | | | | | | |
| **Net Operating Revenues** | **$3,587,608** | **$3,639,422** | **$2,999,403** | **$4,044,016** | **$2,706,642** | **($1,263,737)** | **-6.8%** | **-24.6%** |
| | | | | | | | | |
| **Net Revenue** | **$24,923,982** | **$29,959,061** | **$22,448,963** | **$32,769,217** | **$30,917,656** | **$33,222,735** | **0.2%** | **17.5%** |

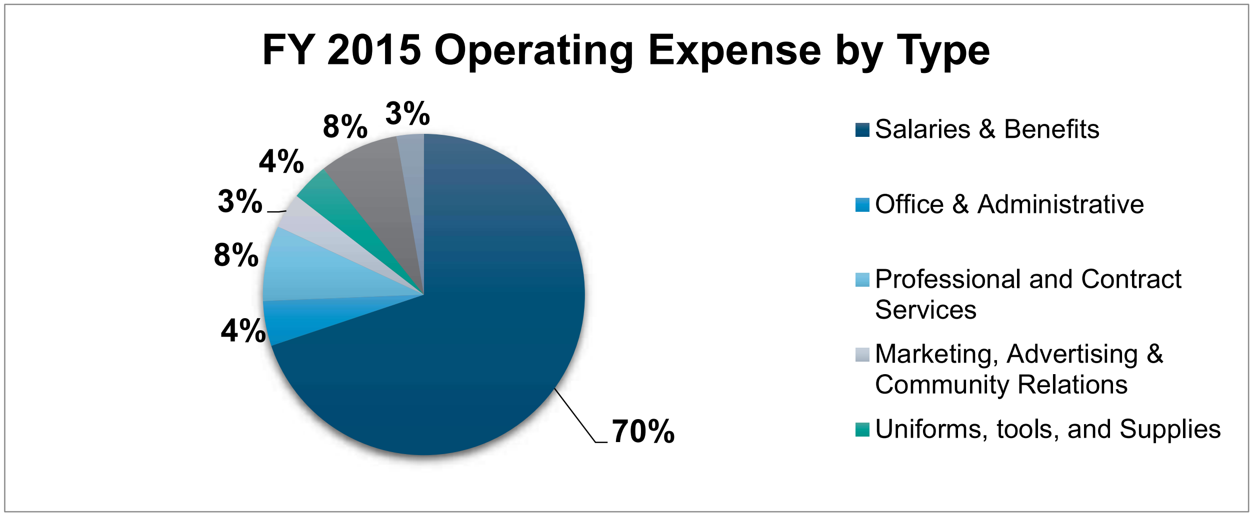
Source: Sanford Airport Authority. * Note that growth rates did not include 2020 results in order to show non-COVID-influenced growth.

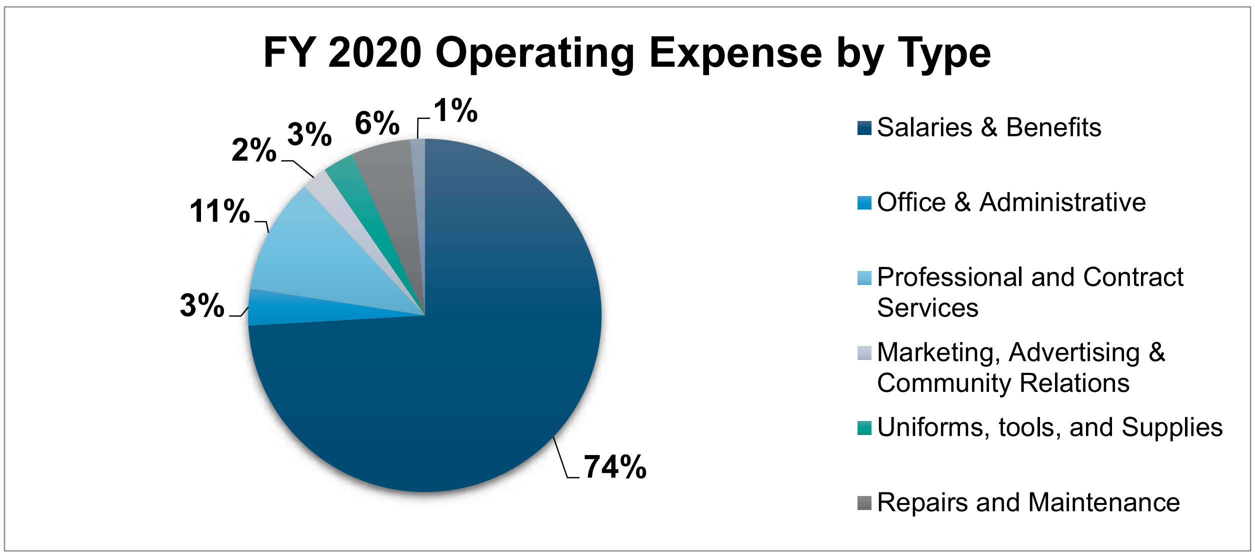
**Figure 7-4 - Historical Operating Expenses by Category**




Source: Table 7-4

**Figure 7-5 - Change in Expense Shares over Time (data from Table 1-4)**



## 7.4. Forecast of Revenues and Expenses

SFB has experienced significant growth based primarily on leisure traffic. The onset of COVID-19 has helped to prove the strength of SFB's financial and growth plans. While COVID-19 dealt a devastating blow to the airline business in 2020, SFB's reliance on leisure commercial passengers has proven to be an advantage over airports relying solely on business commercial travelers.

This section is organized to discuss revenue and expense forecasts for SFB individually as follows:

- Assumed Impacts of COVID-19
- Forecast of Airport Revenues
- Forecast of Airport Expenses
- Comparison of Net Revenues to Capital Needs

### 7.4.1. Assumed Impacts of Covid-19

COVID-19 has impacted the commercial aviation business like no other economic event in history. Examination of TSA records indicates that between March and December 2020, airline passenger check-ins at U.S. airports were down by 76.6 percent as compared to 2019. For the entire year, the difference between 2020 and 2019 was only a 61.8 percent decline because of the strong January and February 2020 months. Nevertheless, the impacts to the airline industry have been profoundly disruptive.

For this analysis, the following assumptions regarding impacts of COVID-19 have been adopted:

- **Factors Affecting Demand**: Social distancing, mandatory 14-day quarantines, and stay-at-home orders in 2020 have diminished airline demand significantly. When these restrictions are in place, demand for most other services are curtailed, which in turn, negatively impacts the demand for air transportation services. General aviation activity has not been impacted as negatively as airlines. In fact, some business travel has shifted to general aviation for both safety and convenience purposes.
- **Disruption Period**: The duration of the economic "lock down" began in March 2020 and has been relaxed in most states with the administration of vaccines. With this progress, it is believed that the summer of 2021 showed progress in airline travel returning to normal. However, the discovery of new COVID variants threatens to restrict travel, particularly for discretionary purposes. In the case of Orlando, large tourist parks such as Disney World and Universal Studios will dictate a major portion of air travel demand by either being open or closed.
- **Economic Restart**: The economic restart began in 2020, but has been unsteady, as supply chains in certain key industries have faltered, creating downstream displacements and some industry-specific negative shifts (chip shortage for auto production, jet fuel shortages). However, unless there is a resurgence of the virus, it is anticipated that continued positive economic progress will occur.
- **Recovery Time Period**: Return to demand levels of 2019 will take some time. It is assumed that it will take at least a full year (all of 2021) to recover to 2019 aviation activity levels. Thus, 2022 will be the first year to equal or surpass 2019 airline passenger enplanement levels.

Any of these assumptions could be proven wrong by actual events. However, for planning purposes, these assumptions will govern projections for aviation demand and revenue and expense generating purposes.

#### 7.4.1.1. Financial Impacts of COVID-19

The federal government's initial response to the COVID-19 impact on the airline industry was to provide funding in the CARE Act to assist airports through three revenue venues:

Debt Service Funding Assistance
100 percent funding of Airport Improvement Program (AIP) Grants
Funds to reimburse airports for operation and maintenance (O&M) expenditures

SFB was awarded $22.7 million of CARE Act funds. These funds were awarded based on current O&M expenditures and must be drawn within four years. It is the SAA's intent to draw the remaining balance of CARE funds during FY 2020-2021. As a result, the fund surplus is significantly larger than usual.

Consulting with airline and financial experts provided varying scenarios for the return of the airline industry to post COVID-19 levels. Domestic carriers believe that a three-to-five-year period will be necessary to rebound. Financial scenarios anticipate a duration of approximately three years. This is in line with our projection of 2022 being the first year to potentially match 2019 in terms of U.S. domestic passenger traffic.

Regardless of the scenario impacting the nation, SFB continues to be profitable. Considering the structure of CARE funding and professional market predictions, it was prudent to rely on the framework developed during the FY 2019-2020 budget. This reflects the outstanding financial planning and management at SFB relative to the industry at large.

The result of these factors is that the overall budget structure reflects the previous budget year with a significant fund surplus. This fund surplus will be used to support operations and debt service in future years if predictions fail to come to fruition.

## 7.4.2. Forecast of Airport Revenues

The forecast of Airport revenues examines each revenue component and explains the assumptions behind its growth rates. It should first be explained that the forecast of revenues is impacted primarily by changes in aviation activity and monetary inflation. For this study, the inflation rate was forecast at 3 percent. That is higher than historical inflation rates, but does consider the significant government spending that is ongoing for COVID economic impact relief.

Changes in aviation activity affect revenue producing sectors at the Airport. This includes airline passenger demand and aircraft operations, which in turn, drive terminal revenues, landing fees, fuel flowage fees, etc. Ordinarily, Master Plan forecasts would be used to estimate these activity levels. However, the normal forecast growth of these demand indicators has been impacted by COVID-19. Thus, the revenue forecasts will consider the impacts of the pandemic when using the longer-term Master Plan forecasts of aviation activity.

Monetary inflation, generally measured with the Consumer Price Index (CPI) or similar index, impacts revenues to the extent that various leases administered by the Airport have escalation clauses which allow price increases to offset the general devaluation of money in the economy. Some prices, such as fuel flowage fees and landing fees, will not grow as quickly as the inflation rate because of competitive market forces. That is, ultra-low-cost carriers are known to negotiate for the lowest airport operating costs. As a result, the growth in revenues from these sources will be primarily from increases in overall activity.

**Table 7-5**, **Table 7-6** and **Figure 7-6** summarize the entire forecast of revenues through the year 2041. It should be noted that four years were added to the Master Plan forecast, to enable the financial plan to properly phase the funding of the proposed development in the Master Plan. Each of the revenue generating line items are described in the following sections.

### 7.4.2.1. Forecast Operating Revenues

There are seven broad sources of Operating Revenues. They include income from the Commerce Park, Other Leases & Revenues, Aviation Revenue (FBO/GA), Terminal, Airfield, Ground Transportation, and Public Safety Fees. Forecast assumptions for these revenue items are described below.

#### 7.4.2.1.1. Commerce Park

The Commerce Park Development Zone is located at the intersection of Airport Boulevard and the CSX rail line. It consists of 215 acres of prime location for aviation and non-aviation related businesses. Commerce Park has more than 90 tenants and features a mix of existing older buildings from the former Naval Training Center, and a number of new buildings. Plans for this Development Zone include access for companies to import, export, manufacture, warehouse and distribute within a state-of-the art business campus.

Revenues from Commerce Park are based on leases of the facilities and parcels. There are still many open parcels and leasing opportunities available. From a revenue standpoint, the Park property is roughly 50 percent filled, leaving an upside of at least double the current revenue stream.

**Table 7-5** and **Table 7-6** shows the projected revenue for the Commerce Park Development Zone, assuming an absorption rate averaging four or five acres per year. In reality, some years will have exceptional growth while others will not.

Table 7-5 - Forecast of Operating Revenues and Expenses

| Revenues/Expenses | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenues | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
| Commerce Park | $2,525,520 | $2,596,513 | $2,670,486 | $2,747,563 | $2,827,873 | $2,911,553 | $2,998,741 | $3,089,584 | $3,184,232 | $3,282,842 |
| Other Leases & Revenues | $863,827 | $929,638 | $998,943 | $1,071,898 | $1,148,661 | $1,229,398 | $1,314,283 | $1,403,495 | $1,497,220 | $1,595,653 |
| Aviation Revenue (FBO/GA) | $4,814,051 | $5,770,468 | $5,943,582 | $6,121,889 | $6,305,546 | $6,494,712 | $6,723,375 | $6,925,076 | $7,132,829 | $7,346,814 |
| Terminal | $4,199,877 | $5,459,840 | $6,005,824 | $6,246,057 | $6,495,899 | $6,755,735 | $7,530,737 | $8,049,729 | $8,517,278 | $9,006,362 |
| Airfield | $897,005 | $923,816 | $951,560 | $980,069 | $1,009,418 | $1,039,757 | $1,070,868 | $1,102,969 | $1,136,063 | $1,170,151 |
| Ground Transportation | $253,046 | $265,550 | $278,527 | $291,993 | $305,966 | $320,462 | $335,499 | $351,095 | $367,270 | $384,043 |
| Public Safety Fee | $217,830 | $224,362 | $231,089 | $238,018 | $245,155 | $252,506 | $260,077 | $267,875 | $275,907 | $284,180 |
| Total Operating Revenues | **$13,771,156** | **$16,170,186** | **$17,080,011** | **$17,697,487** | **$18,338,518** | **$19,004,124** | **$20,233,580** | **$21,189,823** | **$22,110,799** | **$23,070,044** |
| | | | | | | | | | | |
| Operating Expenses | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
| Salaries & Benefits | $9,847,293 | $10,241,185 | $10,650,832 | $11,076,865 | $11,519,940 | $11,980,738 | $12,459,967 | $12,958,366 | $13,476,700 | $14,015,769 |
| Office & Administrative | $440,581 | $453,799 | $467,413 | $481,435 | $495,878 | $510,755 | $526,077 | $541,860 | $558,115 | $574,859 |
| Professional and Contract Services | $1,168,185 | $1,203,231 | $1,239,327 | $1,276,507 | $1,314,803 | $1,354,247 | $1,394,874 | $1,436,720 | $1,479,822 | $1,524,216 |
| Marketing, Advertising & Community Relations | $253,880 | $261,497 | $269,342 | $277,422 | $285,745 | $294,317 | $303,146 | $312,241 | $321,608 | $331,256 |
| Uniforms, Tools and Supplies | $384,731 | $400,121 | $416,125 | $432,770 | $450,081 | $468,085 | $486,808 | $506,280 | $526,531 | $547,593 |
| Repairs and Maintenance | $713,402 | $738,371 | $764,214 | $790,961 | $818,645 | $847,297 | $876,953 | $907,646 | $939,414 | $972,293 |
| Utilities | $173,843 | $179,059 | $184,430 | $189,963 | $195,662 | $201,532 | $207,578 | $213,805 | $220,220 | $226,826 |
| Insurance | $384,407 | $395,940 | $407,818 | $420,052 | $432,654 | $445,633 | $459,002 | $472,773 | $486,956 | $501,564 |
| **Total Operating Expenses** | **$13,366,324** | **$13,873,201** | **$14,399,502** | **$14,945,977** | **$15,513,408** | **$16,102,603** | **$16,714,406** | **$17,349,691** | **$18,009,366** | **$18,694,377** |
| **Net Operating Revenues** | **$404,833** | **$2,296,986** | **$2,680,510** | **$2,751,510** | **$2,825,110** | **$2,901,520** | **$3,519,174** | **$3,840,132** | **$4,101,432** | **$4,375,667** |

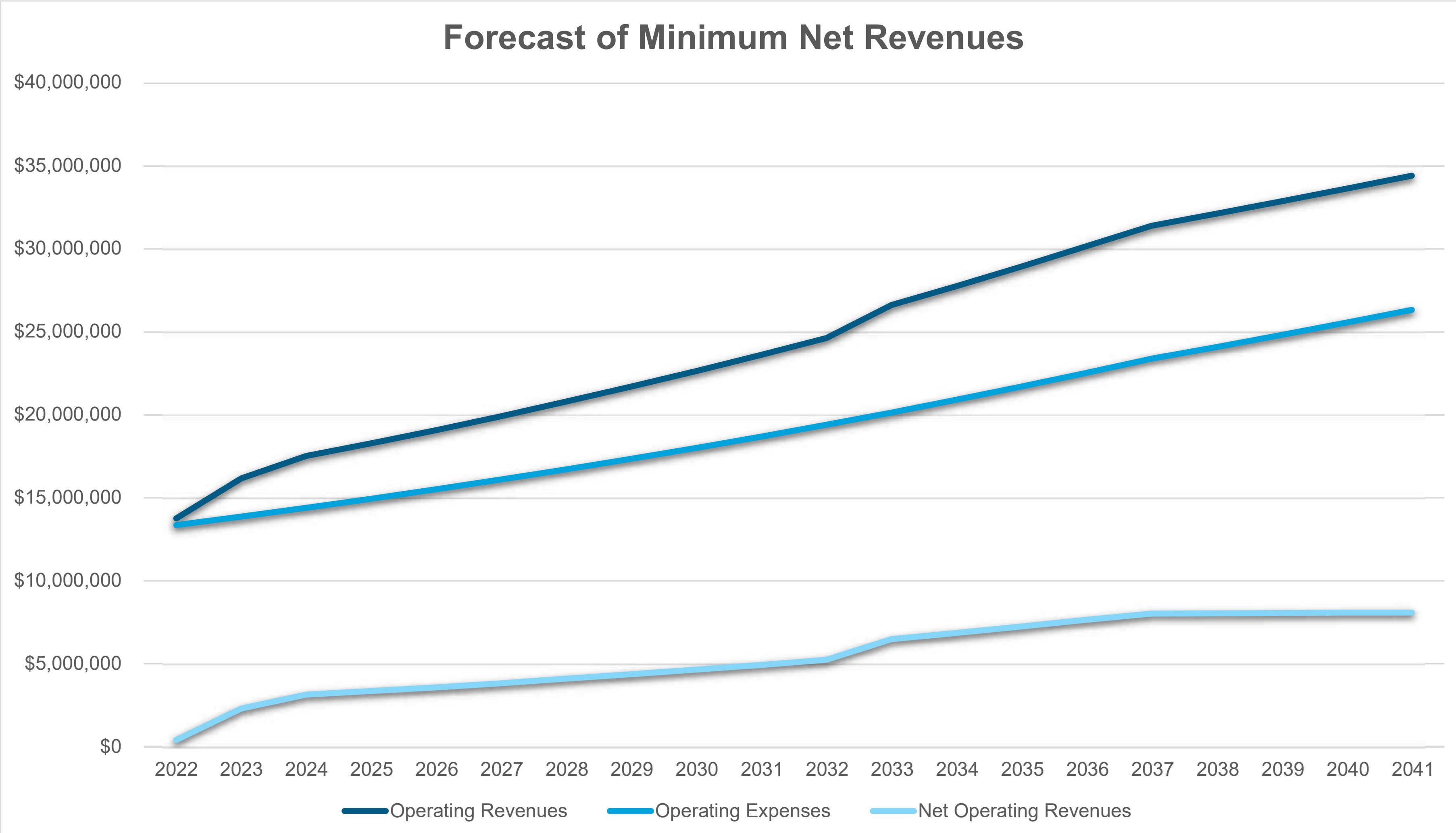
Source: R.A. Wiedemann & Associates, Inc. estimates

## Table 7-6 - Forecast of Operating Revenues and Expenses (Continued)

| Revenues/Expenses | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenues | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2032 |
| Commerce Park | $3,385,579 | $3,492,611 | $3,604,115 | $3,720,273 | $3,841,275 | $3,967,320 | $4,086,339 | $4,208,929 | $4,335,197 | $4,465,253 | $3,385,579 |
| Other Leases & Revenues | $1,698,994 | $1,807,455 | $1,921,251 | $2,040,610 | $2,165,766 | $2,296,963 | $2,365,872 | $2,436,848 | $2,509,953 | $2,585,252 | $1,698,994 |
| Aviation Revenue (FBO/GA) | $7,567,218 | $7,818,508 | $8,053,063 | $8,294,655 | $8,543,495 | $8,799,800 | $8,887,798 | $8,976,676 | $9,066,443 | $9,157,107 | $7,567,218 |
| Terminal | $9,517,879 | $11,040,489 | $11,724,489 | $12,440,529 | $13,189,954 | $13,880,087 | $14,587,181 | $15,024,796 | $15,475,540 | $15,939,806 | $9,517,879 |
| Airfield | $1,205,330 | $1,241,385 | $1,278,606 | $1,316,898 | $1,356,412 | $1,397,217 | $1,397,217 | $1,397,217 | $1,397,217 | $1,397,217 | $1,205,330 |
| Ground Transportation | $401,433 | $419,463 | $438,153 | $457,526 | $477,605 | $498,412 | $513,365 | $528,766 | $544,629 | $560,967 | $401,433 |
| Public Safety Fee | $292,701 | $301,477 | $310,517 | $319,828 | $329,417 | $339,295 | $349,473 | $359,958 | $370,756 | $381,879 | $292,701 |
| **Total Operating Revenues** | **$24,069,135** | **$26,121,388** | **$27,330,194** | **$28,590,319** | **$29,903,925** | **$31,179,093** | **$32,187,244** | **$32,933,189** | **$33,699,735** | **$34,487,481** | **$24,069,135** |
| | | | | | | | | | | | |
| Operating Expenses | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2032 |
| Salaries & Benefits | $14,576,399 | $15,159,455 | $15,765,833 | $16,396,467 | $17,052,325 | $17,734,418 | $18,266,451 | $18,814,445 | $19,378,878 | $19,960,244 | $14,576,399 |
| Office & Administrative | $592,105 | $609,868 | $628,164 | $647,009 | $666,419 | $686,412 | $707,004 | $728,214 | $750,060 | $772,562 | $592,105 |
| Professional and Contract Services | $1,569,943 | $1,617,041 | $1,665,552 | $1,715,519 | $1,766,985 | $1,819,994 | $1,874,594 | $1,930,832 | $1,988,757 | $2,048,419 | $1,569,943 |
| Marketing, Advertising & Community Relations | $341,194 | $351,430 | $361,973 | $372,832 | $384,017 | $395,537 | $407,403 | $419,626 | $432,214 | $445,181 | $341,194 |
| Uniforms, Tools and Supplies | $569,496 | $592,276 | $615,967 | $640,606 | $666,230 | $692,879 | $713,666 | $735,076 | $757,128 | $779,842 | $569,496 |
| Repairs and Maintenance | $1,006,324 | $1,041,545 | $1,077,999 | $1,115,729 | $1,154,779 | $1,195,197 | $1,231,053 | $1,267,984 | $1,306,024 | $1,345,204 | $1,006,324 |
| Utilities | $233,631 | $240,640 | $247,859 | $255,295 | $262,954 | $270,842 | $278,968 | $287,337 | $295,957 | $304,835 | $233,631 |
| Insurance | $516,611 | $532,110 | $548,073 | $564,515 | $581,451 | $598,894 | $616,861 | $635,367 | $654,428 | $674,061 | $516,611 |
| **Total Operating Expenses** | **$19,405,703** | **$20,144,365** | **$20,911,421** | **$21,707,971** | **$22,535,160** | **$23,394,174** | **$24,095,999** | **$24,818,879** | **$25,563,446** | **$26,330,349** | **$19,405,703** |
| **Net Operating Revenues** | **$4,663,432** | **$5,977,023** | **$6,418,773** | **$6,882,347** | **$7,368,765** | **$7,784,919** | **$8,091,245** | **$8,114,310** | **$8,136,289** | **$8,157,132** | **$4,663,432** |

Source: R.A. Wiedemann & Associates, Inc. estimates

**Figure 7-6 - Forecast of Minimum Net Revenues by Source**




Source: Table 7-5, 7-6

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#### 7.4.2.1.2. Other Leases and Revenues

Other Leases & Revenues refers to income from property not within the Commerce Park Development Zone. This excess property (not needed for aviation purposes) borders the Airport on three sides. A total of 462 acres is owned by SAA for the North Lots, Central, South Lots, and Gateway Development Zones. Discussions with Airport representatives indicated that roughly 25 percent of this property is developed or leased. Given the large amount of unleased acreage, the SAA will be able to leverage this property for many years. Reasonable growth over the next twenty years would assume a doubling of the current leaseholds.

**Table 7-5** and **Table 7-6** presents the projected revenue from Other Leases & Revenues for the planning period. The forecast shows a revenue stream growing from $863,800 in 2022 to $2,585,300 by the year 2041 – a 299 percent growth (5.6 percent annual rate), based mostly on additional leased properties and the development of the solar farm.

#### 7.4.2.1.3. Aviation Revenues (FBO/GA)

Aviation Revenues are those income streams derived from the Fixed Base Operator, Specialty Aviation Service Operators, and general aviation sources. The FBO, Million Air, pays fuel flowage fees and lease payments for their building space. General aviation revenues are generated by hangar leases, ramp leases, land leases, and other such leases. The forecasts include revenues from the projected growth in hangar space (190,000 square feet) to be developed in the various phases as shown in the ACIP.

Revenues from these sources are dependent, to some degree, on the activity of the Airport. The busier the facility, the higher the revenues. Thus, the forecast incorporates projected Master Plan growth in operations and based aircraft into the future estimates. **Table 7-5** and **Table 7-6** shows the projected revenue from Aviation Revenues for the planning period. As shown, the 2022 revenue stream of $4,814,100 is forecast to grow to $9,157,100 by the year 2041 – a 3.3 percent annual growth rate.

#### 7.4.2.1.4. Terminal

The forecast of Terminal revenues includes those from the airlines who rent space, along with federal agencies such as the TSA, FAA, etc., who require space for their functions. In addition, parking revenue, customer facility charges, and international land leases and fees are included in this forecast revenue category.

As mentioned, Orlando Sanford International (OSI) has been contracted by SAA to manage the international and domestic terminals, develop additional air service, and provide ground handling and cargo services. This partnership has created service benefits for both airline customers and passengers. SAA is entitled to specified percentages of the revenues that come through these income generators as follows:

- Air Cargo: OSI pays 1 percent of gross. Future revenues were determined using Master Plan forecast growth rate for air cargo tonnage.
- Ground Handling: OSI pays 1 percent as long as they are doing the ground handling. Future revenues were tied to forecast airline operations.
- Parking: OSI pays 20 percent of gross. Future revenues were tied to the forecast of enplanements and the development of additional garage parking space (4,000 spaces in Phase 1).
- Terminal Concessions: SAA collects 12.5 percent of gross. Similar to other airline-dependent businesses, the future revenue stream was tied to the forecast of enplanements.

For this analysis, the Master Plan forecast growth rates for air cargo tonnage and airline enplanements were applied to the associated revenue source. The forecast of revenues includes an increase in Terminal revenues, which are expected in Phase 1 from the development of new parking garage space, and in Phase 3 from a 15 percent increase in terminal space and the addition of three new gates. **Table 7-5** and **Table 7-6** presents the forecast of Terminal revenues through the planning period. As shown, Terminal revenues are anticipated to grow from $4,199,900 in 2022 to $15,939,800 in 2041 – a 6.9 percent annual growth rate.

#### 7.4.2.1.5. Airfield

Airfield revenues are derived primarily from landing fees and public safety fees. Landing fees in 2020 were $1.37 per 1,000 lbs. of the maximum gross landing weight of each air carrier aircraft. Participating airlines (which account for 99 percent of flights) pay 40 percent of the established landing fee. TUI, (International Airlines) a travel company, announced at the end of 2019 they were moving their flights from SFB to Melbourne Orlando International Airport by 2022. It is assumed that some other international flight service will take the place of TUI over the long-term future. The forecast of Airfield revenues shows an increase from $897,000 in 2022 to $1,397,200 by 2041 – a 2.2 percent annual growth rate.

##### 7.4.2.1.6. Ground Transportation

Ground Transportation revenues include permit and access fees, along with off-airport rental car companies and ride-sharing fees. This revenue category is relatively small compared to the other categories. Forecasts of revenues for this category used CPI plus half of the enplanement growth rates. Although self-driving cars and ridesharing will increase in the future (diminishing the need for on-airport parking), it is assumed that the airport industry will find reasonable ways to grow ground transportation fees. As shown, Ground Transportation revenues are forecast to increase from $253,000 in 2022 to $561,000 by the year 2041 – a 4.0 percent annual growth rate.

##### 7.4.2.1.7. Public Safety Fee

As mentioned, the public safety fee is $0.50 per enplaned passenger for non-participating airlines and $0.125 per enplaned passenger for participating airlines. With 99 percent participating airlines, revenue forecasts were developed based upon the Master Plan forecast of enplanements times an average of $0.13 per enplanement. The collection fee of 5 percent is removed from the revenue forecast, which shows a growth moving from $217,800 in 2022 to $381,900 by 2041 - a 2.8 percent annual growth rate over the period.

##### 7.4.2.1.8. CARES Act

The Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 included $10 billion in funds to be awarded as economic relief to eligible U.S. airports affected by the prevention of, preparation for, and response to the COVID-19 pandemic. The CARES Act provides funds to increase the federal share to 100 percent for Airport Improvement Program (AIP) and supplemental discretionary grants already planned for fiscal year 2020. In addition, Operating Costs are eligible for CARES Act funding. SAA was well prepared and requested funding to help weather the pandemic-induced reduction in airline travel. Orlando Sanford International Airport received $22,742,502 in CARES Act funding. It is unsure if this program will be repeated.

#### 7.4.2.2. Non-Operating Revenues

There are three current sources of non-operating revenues: Capital Contributions, Investment Income, and Passenger Facility Charges (PFCs). Capital contributions consist primarily of grants and contributions from federal and state governmental agencies, airlines, and tenants.

##### 7.4.2.2.1. Capital Contributions

The CIP listed the capital needs for each planning phase, by funding source. For this analysis, it was assumed that the non-Airport contributions listed in the CIP will be the non-operating revenue for Capital Contributions. It is recognized that funding requirements may not always be fulfilled by funding agencies. However, to adequately project the need for Airport self-funding, the assumption of full funding must be made.

One source of capital contribution is the annual federal primary airport entitlement funding. This funding is based on a formula and can be forecast for each year of the planning period. While this funding source is only a portion of the total contributed for capital improvements, it is predictable and can be quantified. What cannot be forecast is the amount of FAA discretionary funding that will go to SFB or the other capital contributions from local sources. These other capital contributions are based on what additional funding for development is needed after all revenue surpluses and federal and state grants have been applied.

The FAA's primary airport entitlement is set up with different formulas, depending upon whether the Airport Improvement Program is funded with more than $3.2 billion or less than that amount. If the federal program has more than $3.2 billion, the entitlements are twice the amounts of any year that is less than $3.2 billion. In 2019, $3.18 billion was allocated. Thus, for conservative forecasting purposes, it was assumed that less than $3.2 billion would be allocated in the out-years. Using that amount, along with the entitlement formulas, an average of $2.67 million per year was estimated between 2022 and 2041, for a cumulative total of $53.4 million. If funding allocations are increased by Congress in the future, this amount could be doubled to $106.8 million during the period.

##### 7.4.2.2.2. Investment Income

In recent years, Investment Income has fluctuated because invested amounts vary. Therefore, a conservative forecast of this revenue source was based upon an average of the historical annual revenues generated in this category.

##### 7.4.2.2.3. PFC Revenues

In the U.S., the federal PFC Program allows the collection of PFC fees up to $4.50 for every enplaned passenger at commercial airports controlled by public agencies. SFB has limited their PFC to $4.00 per enplaned passenger. Airports use these fees to fund FAA approved projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition. PFC revenues are then accounted as non-operating. The airlines collect and remit this revenue to the SAA and the SAA records this as non-operating revenue. The method used to forecast PFC revenues was based on the Master Plan enplanement forecasts times the $4.00 rate (minus an $0.08 administrative fee) with interpolations of between years. Revenues in this category are forecast to grow from $5,708,300 in 2022 to $10,769,500 by 2041.

##### 7.4.2.2.4. Summary of Non-Operating Revenue Forecasts

It is likely that in the future, the allowable PFC charge per passenger will be increased, and the Airport Improvement Program amounts will also be increased. In addition, no forecast was made of the non-FAA funded portion of capital contributions or miscellaneous income, primarily because one purpose of this financial plan is to estimate the amount of funds available for local share capital contributions from net revenue surpluses. Thus, the non-operating revenue forecasts shown in **Table 7-7** can be considered minimum numbers.

### 7.4.3. Forecast of Airport Expenses

The forecast of Airport expenses examined SFB's historical Operating Expenses and projected them into the future.  Non-Operating Expenses included any debt service and the proposed CIP costs. The forecast methods used for each expense category are described in the following sections.

#### 7.4.3.1. Forecast Operating Expenses

Forecast Operating Expenses are made up of eight categories of cost: Salaries and Benefits; Office and Administrative; Professional and Contract Services; Marketing, Advertising & Community Relations; Uniforms, Tools and Supplies; Repairs and Maintenance; Utilities; and Insurance. Assumptions used in the financial projections are described as follows:

- **Salaries and Benefits**: The projected growth of salaries and benefits used both the forecast growth of Airport employment and the effects of monetary inflation. In 2019, SAA averaged about 109 employees per million enplanements. It is important to note that much of the operational labor is provided by OSI and the FBO, which do not include SAA staff. Based on these factors, the staffing SAA level is forecast to increase from 175 FTE in 2019 to 250 FTE by the year 2041, which takes into account some economies of scale as enplanements increase. Salaries and Benefits expenses are anticipated to grow from $9,847,300 in 2022 to $19,960,200 by 2041 – a 3.8 percent annual growth rate.
- **Office and Administrative**: This category contains all SAA travel, training, postage, professional dues & memberships, and telephone expenses. A change from fleet ownership to leased vehicles has increased this category and reduced capital purchase needs. It was assumed that this operating expense will increase in accordance with this change and with CPI levels for the future. Office and Administrative expenses are anticipated to grow from $440,600 in 2022 to $772,600 by 2041 – a 3.0 percent annual growth rate.
- **Professional and Contract Services**: These expenses for engineering, professional, and legal fees, and expenses for contractual services are not expected to increase significantly above current levels throughout the planning period . This is due primarily to the extensive work being completed on the International Terminal and other Airport improvement projects that will satisfy demand for years to come. The forecast for this category was developed by using an average of the historical data, projected into the future using CPI increases. Professional and Contract Services expenses are anticipated to grow from $1,168,200 in 2022 to $2,048,400 by 2041 – a 3.0 percent annual growth rate.

- **Marketing, Advertising & Community Relations**: It is assumed that the current efforts regarding this expense will stay consistent throughout the planning period. The forecast for this category was developed by using an average of the historical data, projected into the future using CPI increases. Marketing, Advertising & Community Relations expenses are anticipated to grow from $253,900 in 2022 to $445,200 by 2041 – a 3.0 percent annual growth rate.
- **Uniforms, Tools and Supplies**: There is a slight increase anticipated in this expense category from the expansion of terminal building space and overall growth in Airport employment. Thus, the forecast used the growth percentage of FTE employees coupled with CPI increases to estimate the need for uniforms, tools, office supplies, etc. Uniforms, Tools and Supplies expenses are anticipated to grow from $384,700 in 2022 to $779,800 by 2041 – a 3.8 percent annual growth rate.
- **Repairs and Maintenance**: This category is sensitive to the development of more infrastructure, and as such, incorporated a growth rate slightly higher than the CPI into its forecasts. The rate reflects the minor increases in repairs and maintenance that would accrue because of more terminal building space and other Airport improvements. Repairs and Maintenance expenses are anticipated to grow from $713,400 in 2022 to $1,345,200 by 2041 – a 3.4 percent annual growth rate.
- **Utilities**: Although facilities such as the Terminal building are being expanded, the SAA does not pay those utility expenses, and instead, gets a percentage of the revenue generated by activities within the Terminal. Thus, Utilities expenses were forecast based upon CPI indexing over the planning period, growing from $173,800 in 2022 to $304,800 by 2041 – a 3.0 percent annual growth rate.
- **Insurance**: This category includes all non-salary related insurance contracts. Historically, this category has not grown significantly and as such, was forecast to increase with the rate of inflation (CPI). Insurance expenses are forecast to grow from $384,400 in 2022 to $674,100 by 2041 – a 3.0 percent annual growth rate.

#### 7.4.3.2. Non-Operating Expenses

Upon completion of the terminal expansion project, a transition from construction financing to permanent financing will take place. Estimated total costs and expected terms have been formulated and used to provide a budget figure of $1,117,717 in expected interest costs. The terminal expansion project commenced on April 2, 2018. Construction was underway in numerous parts of the terminal. A revolving line of credit loan for $60,500,000 was secured for the construction phase of this project. The FAA, through its PFC program is funding approximately 67.15 percent of this project and the remaining amount is funded through a FDOT grant and airport revenues. SAA has determined that $29 million of the terminal expansion costs will need to be financed via debt service over the next 10 years. PFC funds will be dedicated to paying this debt service. Because there is only one item in Non-Operating Expenses, it is shown in **Table 7-7** in the Subtotal Non-Operating Expenses line at $3,441,228 per year or $34.4 million over 10 years.

Other Non-Operating Expenses include Capital Contributions to the cost of the Capital Improvement Program. While these expenses are covered by grants, loans, or SAA direct spending, they are the subject of the Financial Plan. That is, the Financial Plan was undertaken to determine the best way to fund the CIP costs identified in the Master Plan. As such, Capital Contributions to the CIP is separated from the other financial forecasts and will be applied to the forecast of net revenues and expenses in **Table 7-8**, to determine the overall financial needs in funding the Master Plan recommendations at SFB.

**Table 7-7 - Forecast of Partial Non-Operating Revenues (Not including FAA discretionary or local funding)**

| Revenue Item | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast |
|---|---|---|---|---|---|---|---|---|---|---|
| Non-Operating Revenues | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
| Minimum FAA Entitlement Grants | $2,396,904 | $2,423,348 | $2,450,584 | $2,478,636 | $2,507,530 | $2,537,291 | $2,567,943 | $2,599,515 | $2,632,033 | $2,665,527 |
| Investment Income | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 |
| Passenger Facility Charges | $5,708,332 | $7,021,248 | $7,334,975 | $7,554,906 | $7,781,435 | $8,014,758 | $8,255,073 | $8,502,594 | $8,757,539 | $9,020,128 |
| **Subtotal Non-Operating Revenues** | **$8,230,236** | **$9,569,596** | **$9,910,558** | **$10,158,542** | **$10,413,965** | **$10,677,048** | **$10,948,016** | **$11,227,108** | **$11,514,572** | **$11,810,654** |
| **Subtotal Non-Operating Expenses** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** | **$3,441,228** |
| **Net Non-Operating Revenues** | **$4,789,008** | **$6,128,368** | **$6,469,330** | **$6,717,314** | **$6,972,737** | **$7,235,820** | **$7,506,788** | **$7,785,880** | **$8,073,344** | **$8,369,426** |
| | | | | | | | | | | |
| Revenue Item | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast | Forecast |
| Non-Operating Revenues | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 |
| Minimum FAA Entitlement Grants | $2,700,024 | $2,735,556 | $2,772,154 | $2,809,849 | $2,848,674 | $2,888,663 | $2,888,663 | $2,888,663 | $2,888,663 | $2,888,663 |
| Investment Income | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 | $125,000 |
| Passenger Facility Charges | $9,290,588 | $9,569,159 | $9,856,083 | $10,151,612 | $10,456,000 | $10,769,514 | $10,769,514 | $10,769,514 | $10,769,514 | $10,769,514 |
| **Subtotal Non-Operating Revenues** | **$12,115,612** | **$12,429,715** | **$12,753,237** | **$13,086,461** | **$13,429,674** | **$13,783,177** | **$13,783,177** | **$13,783,177** | **$13,783,177** | **$13,783,177** |
| **Subtotal Non-Operating Expenses** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** | **N/A** |
| **Net Non-Operating Revenues** | **$12,115,612** | **$12,429,715** | **$12,753,237** | **$13,086,461** | **$13,429,674** | **$13,783,177** | **$13,783,177** | **$13,783,177** | **$13,783,177** | **$13,783,177** |

Source: R.A. Wiedemann & Associates, Inc. estimates

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### 7.4.4. Net Revenue Forecasts

**Table 7-8** presents the forecast of operating revenues and expenses for SFB for the years 2022 through 2041. As shown, the Airport's Net Operating Revenues will increase in the long term. However, these operating revenues do not incorporate any repayment of debt which may arise from the investment in capital facilities, terminal expansions, or other revenue producing facilities. The Airport is anticipated to move from a relative breakeven financial operating position to an annual surplus of more than $8.0 million. Cumulative Net Operating Revenues for the period total $101.3 million.

**Table 7-8 - Forecast of Minimum Net Revenues Available for CIP**

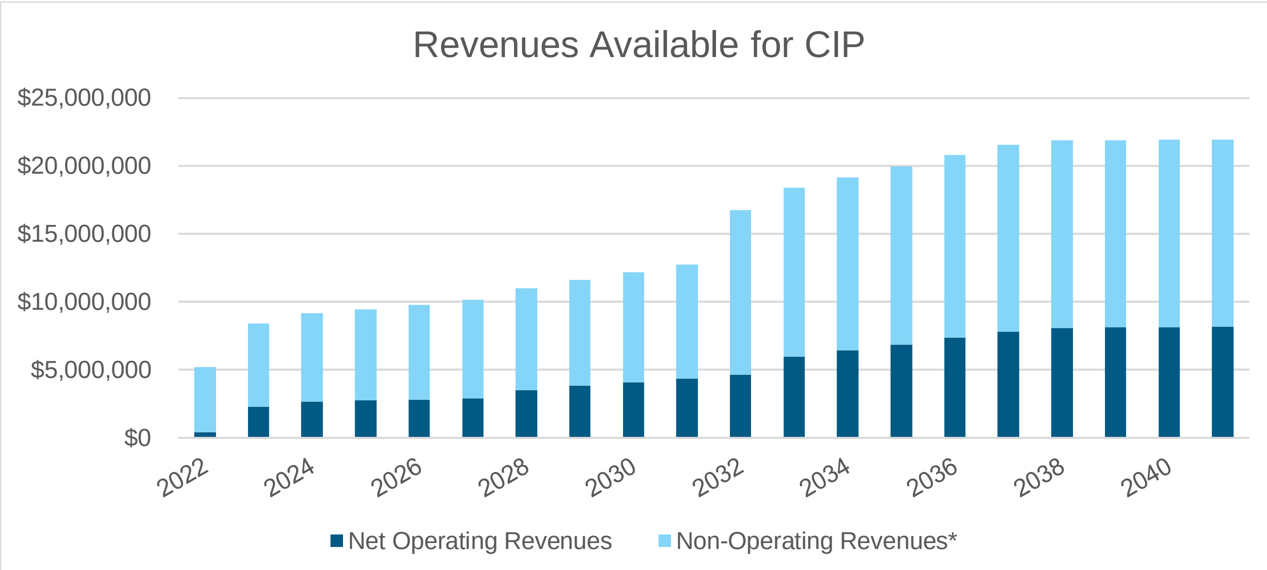
| Year | Operating Revenues | Operating Expenses | Net Operating Revenues | Non-Operating Revenues* | Minimum Net Available for CIP |
|---|---|---|---|---|---|
| 2022 | $13,771,156 | $13,366,324 | $404,833 | $4,789,008 | $5,193,841 |
| 2023 | $16,170,186 | $13,873,201 | $2,296,986 | $6,128,368 | $8,425,353 |
| 2024 | $17,080,011 | $14,399,502 | $2,680,510 | $6,469,330 | $9,149,840 |
| 2025 | $17,697,487 | $14,945,977 | $2,751,510 | $6,717,314 | $9,468,824 |
| 2026 | $18,338,518 | $15,513,408 | $2,825,110 | $6,972,737 | $9,797,848 |
| 2027 | $19,004,124 | $16,102,603 | $2,901,520 | $7,235,820 | $10,137,340 |
| 2028 | $20,233,580 | $16,714,406 | $3,519,174 | $7,506,788 | $11,025,962 |
| 2029 | $21,189,823 | $17,349,691 | $3,840,132 | $7,785,880 | $11,626,012 |
| 2030 | $22,110,799 | $18,009,366 | $4,101,432 | $8,073,344 | $12,174,776 |
| 2031 | $23,070,044 | $18,694,377 | $4,375,667 | $8,369,426 | $12,745,094 |
| 2032 | $24,069,135 | $19,405,703 | $4,663,432 | $12,115,612 | $16,779,044 |
| 2033 | $26,121,388 | $20,144,365 | $5,977,023 | $12,429,715 | $18,406,738 |
| 2034 | $27,330,194 | $20,911,421 | $6,418,773 | $12,753,237 | $19,172,010 |
| 2035 | $28,590,319 | $21,707,971 | $6,882,347 | $13,086,461 | $19,968,808 |
| 2036 | $29,903,925 | $22,535,160 | $7,368,765 | $13,429,674 | $20,798,438 |
| 2037 | $31,179,093 | $23,394,174 | $7,784,919 | $13,783,177 | $21,568,095 |
| 2038 | $32,187,244 | $24,095,999 | $8,091,245 | $13,783,177 | $21,874,421 |
| 2039 | $32,933,189 | $24,818,879 | $8,114,310 | $13,783,177 | $21,897,486 |
| 2040 | $33,699,735 | $25,563,446 | $8,136,289 | $13,783,177 | $21,919,466 |
| 2041 | $34,487,481 | $26,330,349 | $8,157,132 | $13,783,177 | $21,940,309 |
| Cumulative | **$489,167,432** | **$387,876,322** | **$101,291,110** | **$202,778,596** | **$304,069,707** |

Source: R.A. Wiedemann & Associates, Inc. Estimates

* Includes PFC Revenues, Entitlement Funding, and Interest Income

In addition to the net operating revenues, **Table 7-8** and **Figure 7-7** present the partial forecast of non-operating revenues which consist of PFC revenue, enplanement entitlements, and investment income. The non-operating revenues do not include forecasts of FAA discretionary funding or local contributions to capital programs at SFB.

**Figure 7-7 - Growth in Revenues Available for CIP Funding**




* Includes PFC, FAA Entitlement Funding, and Interest Income

As mentioned, the SAA's or the City's contributions to Capital Expenditures are not included in this forecast to better determine what is needed to fund the planned Master Plan improvements. The resulting forecast shows the minimum net revenues available for the CIP, based on aeronautical and enplanement activity at SFB. Cumulative Non-Operating Revenues for the 2022-2041 period total $202.8 million. Breaking these down into eligible shares, $53,568,900 is for FAA matching funding portions; $146,709,700 is for PFC funded projects; and $2.5 million is from interest income and applicable to the Local share of funded projects.

## 7.5. Financial Plan

**Table 7-9** presents a summary of the inflated ACIP, by funding share and phase. These are the projected costs that must be covered by SAA through grants and other means from federal, state, local, PFC, and private sources. As stated previously, Phase 1 included 2022-2026, Phase 2 included 2027-2031, and Phase 3 included 2032-2041.

**Table 7-9 - Summary of SFB ACIP with Monetary Inflation Escalators by Phase**

| Phase | Federal | State | Local/PFC | Private | Inflated Costs |
|---|---|---|---|---|---|
| Phase 1 | $26,799,100 | $17,989,100 | $50,056,300 | $31,361,300 | $126,205,800 |
| Phase 2 | $241,585,800 | $111,976,000 | $323,058,800 | $24,387,900 | $701,008,500 |
| Phase 3 | $63,829,800 | $13,943,800 | $209,211,700 | $49,224,000 | $336,209,300 |
| Totals | $332,214,700 | $143,908,900 | $582,326,800 | $104,973,200 | $1,163,423,600 |

It should be noted that the inflated ACIP is $34.4 million greater than the inflated cost of the Master Plan projects because debt service for the recently completed Terminal expansion has been assigned to PFC-generated revenues over the next 10 years.

When the funding needs are compared to the funding available, significant shortfalls are identified. The estimated Local/PFC funds available from Cumulative Net Operating Revenues, Interest Income ($103.8 million), and PFC Non-Operating Revenues ($181.1 million) is $284.9 million. Compared to the needed $582.3 million in inflated Local/PFC funding dollars, there is a gap of $297.4 million. For the Federal share, the $53.57 million in entitlement funding falls short of the needed $332.2 million (inflated costs), by $278.6 million. It is assumed that FAA Discretionary Funding must make up the balance. Similarly, the FDOT funding eligibility of $143.9 million is assumed to be met by State funding sources. Thus, without considering federal or State funding needs, the

Local/PFC shortfall in ACIP funding is estimated to total almost $300 million by the end of the Phase 3. Details of these estimates are explained in the following sections.

### 7.5.1. Entitlement Funding

FAA entitlement funding, summarized by phase, for SFB is shown in **Table 7-10**, separated from the overall Non-Operating Revenues. This funding is compared with the Federal share requirements shown in **Table 7-9**. For purposes of this Financial Plan, it is assumed that these will be met by FAA discretionary funding in the future. Section 1.5.7 addresses contingencies in the event full FAA funding is not available.

### 7.5.2. State Funding (FDOT)

State Funding from FDOT, summarized by phase for SFB, is shown in **Table 7-10**, and reflects the State share requirements shown in **Table 7-9**. It is assumed that all the FDOT funding needs will be met, and as such, there would be no funding deficits for any Phase shown for this source in the table. Section 1.5.7 addresses contingencies in the event full FDOT funding is not available.

### 7.5.3. PFC Funding

PFC funding, summarized by phase, for SFB is shown in **Table 7-10**, separated from the other Non-Operating Revenues. This funding is compared with the PFC-eligible share requirements of the CIP. PFC-eligible projects shown in the CIP include the Commercial Terminal improvements for which financing spans all three planning Phases. Previous terminal expansion work has left $34.4 million in debt service to be paid by PFCs over the first two phases. The Phase 3 Terminal improvements will cost $199.3 million. Together, these projects will require $233.7 million in inflated dollars from PFC sources, $12.1 million from State sources, and $31.2 million in FAA sources. The State and federal funding availability has already been addressed. However, only $181.1 million in PFC funding will be available by 2041. This leaves a shortfall of $52.6 million on these projects.

One potential option would be to increase rate for PFCs from the current $4.00 to the permitted limit of $4.50 per passenger. This $0.50 increase could add $23.1 million over the planning period – not enough to the fund the eligible projects. It is also possible that a national PFC rate increase to $7 or $8 per passenger could be implemented sometime in the future. The decision for such an increase would have to weigh the competitive advantage SFB has over other commercial service airports against its dampening effects on the business model used by low-cost existing and future tenant airlines in the Orlando market. This occurrence, if used by SFB to increase PFCs could increase the overall Non-Operating Revenues to fund predicted shortfalls for PFC-eligible projects.

### 7.5.4. Local Funding (Airport Generated)

Another source of Local share funding involves Airport-generated funds. These would include Net Operating Revenues plus Interest Income. **Table 7-10** shows the funding available from these sources. As shown, there are shortfalls in Phases 1 and 2 that is not eliminated in Phase 3 by the surpluses generated in Net Operating Revenues. The primary funding costs are for the parking structure and rental car facility scheduled for Phase 2, totaling $282.4 million of the $348.6 million in non-PFC eligible project funding need. As such, an overall shortfall of $244.8 million in Local share funding is forecast by the year 2041.

### 7.5.5. Private Funding

Private Funding, assumed to be generated by private enterprise, is summarized by phase for SFB and is shown in Table 7-10. It is assumed that all the Private Funding needs will be met, and as such, there are no funding deficits anticipated for any Phase shown for this source in the table.

### 7.5.6. Summary and Conclusions

In summary, it can be concluded that there will be financial needs for the ACIP above the ability of the Airport to generate within the 2041 timeframe, using the assumptions of the financial forecast (see **Table 7-10** and **Figure 7-8** and **Figure 7-9**). This includes a need for $52.6 million for PFC eligible projects and $244.8 million for non-PFC locally eligible projects – a total of $297.4 million. It is assumed that the unfunded federally eligible share of $278.6

million will be made up of FAA Discretionary Funding. Similarly, FDOT funding is assumed to be provided by State funding sources. Private funding needs are also expected to be provided from private enterprise sources.

Thus, not counting the potential shortfall in federal and State funding, SAA funding shortfalls of $297.4 million are anticipated over the planning period. To this point in the analysis, the Financial Plan assumed that Federal (FAA), State (FDOT), and Private Funding needs will be met by their respective funding sources. The SAA cannot influence these sources other than to request them. As in the past, funding from these agencies and private enterprise have occurred to get the Airport where it is today. The following section examines financial contingency plans in the event federal and State funding shares do not materialize at the level needed.

**Table 7-10 - Funding Needs by Phase and Eligible Source***

| Funding Component | Phase 1 | Phase 2 | Phase 3 | Totals |
|---|---|---|---|---|
| Federally Eligible | $26,799,100 | $241,585,800 | $63,829,800 | $332,214,700 |
| Federal Entitlement Funding | $12,257,000 | $13,002,300 | $28,309,600 | $53,568,900 |
| Federal Discretionary Funding | $14,542,100 | $228,583,500 | $35,520,200 | $278,645,800 |
| Funding Needs by Phase | $0 | $0 | $0 | $0 |
| | | | | |
| FDOT Eligible | $17,989,100 | $111,976,000 | $13,943,800 | $143,908,900 |
| FDOT Funding | $17,989,100 | $111,976,000 | $13,943,800 | $143,908,900 |
| Funding Needs by Phase | $0 | $0 | $0 | $0 |
| | | | | |
| PFC Eligible | $17,206,100 | $17,206,100 | $199,287,400 | $233,699,600 |
| PFC Funding | $35,400,900 | $42,550,100 | $103,171,000 | $181,122,000 |
| Funding Needs by Phase | ($18,194,800) | ($25,344,000) | $96,116,400 | $52,577,600 |
| | | | | |
| Local minus PFC Eligible | $32,850,200 | $305,852,700 | $9,924,300 | $348,627,200 |
| Local minus PFC Funding | $11,583,900 | $19,362,900 | $72,844,200 | $103,791,000 |
| Funding Needs by Phase | $21,266,300 | $286,489,800 | ($62,919,900) | $244,836,200 |
| | | | | |
| Private Eligible | $31,361,300 | $24,387,900 | $49,224,000 | $104,973,200 |
| Private Funding | $31,361,300 | $24,387,900 | $49,224,000 | $104,973,200 |
| Funding Needs by Phase | $0 | $0 | $0 | $0 |

Source: Consolidation of Previous Tables and Forecast Amounts

* Negative funding needs indicates a surplus in funding for that period.

**Figure 7-8 - PFC Eligible Versus CIP Available Funding**

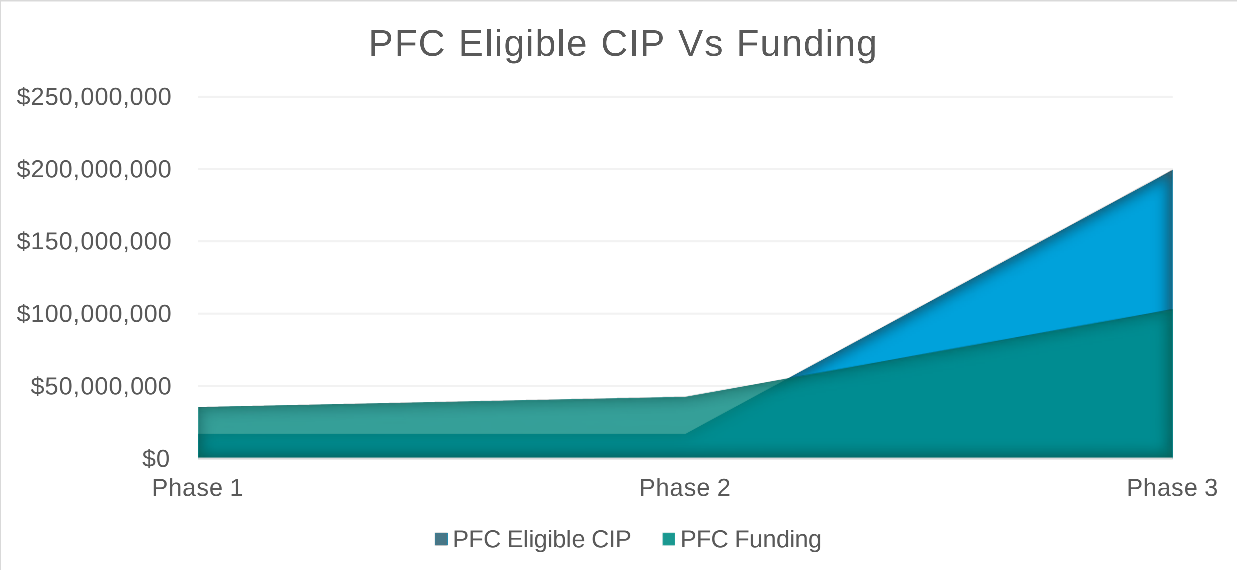
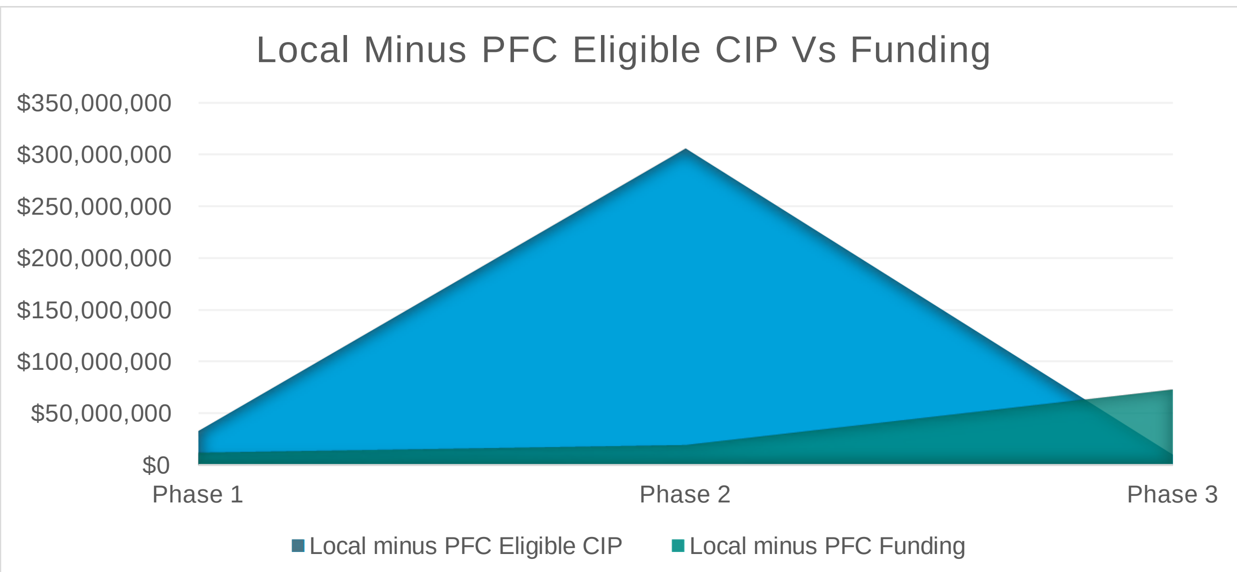



**Figure 7-9 - Local Share Minus PFC Eligible Versus CIP Available Funding**




## 7.5.7. Financial Contingency Plans

In the event that federal and State funding shares are not met, SAA needs to consider financial contingency plans. This section examines Local and PFC Funding, FDOT Funding, and FAA Funding strategies. **Table 7-11** presents funding needs by phase and eligible source for contingency planning purposes. As shown, there are significant shortfalls in funding from all but Private eligible sources.

**Table 7-11 - Funding Needs by Phase and Eligible Source for Contingency Planning***

| Funding Component | Phase 1 | Phase 2 | Phase 3 | Totals |
|---|---|---|---|---|
| Federally Eligible | $26,799,100 | $241,585,800 | $63,829,800 | $332,214,700 |
| Federal Entitlement Funds | $12,257,000 | $13,002,300 | $28,309,600 | $53,568,900 |
| Funding Needs by Phase | $14,542,100 | $228,583,500 | $35,520,200 | $278,645,800 |
| | | | | |
| FDOT Eligible | $17,989,100 | $111,976,000 | $13,943,800 | $143,908,900 |
| Estimated FDOT Funding | $15,000,000 | $15,000,000 | $30,000,000 | $60,000,000 |
| Funding Needs by Phase | $2,989,100 | $96,976,000 | ($16,056,200) | $83,908,900 |
| | | | | |
| PFC Eligible | $17,206,100 | $17,206,100 | $199,287,400 | $233,699,600 |
| PFC Funding | $35,400,900 | $42,550,100 | $103,171,000 | $181,122,000 |
| Funding Needs by Phase | ($18,194,800) | ($25,344,000) | $96,116,400 | $52,577,600 |
| | | | | |
| Local minus PFC Eligible | $32,850,200 | $305,852,700 | $9,924,300 | $348,627,200 |
| Local minus PFC Funding | $11,583,900 | $19,362,900 | $72,844,200 | $103,791,000 |
| Funding Needs by Phase | $21,266,300 | $286,489,800 | ($62,919,900) | $244,836,200 |
| | | | | |
| Private Eligible | $31,361,300 | $24,387,900 | $49,224,000 | $104,973,200 |
| Private Funding | $31,361,300 | $24,387,900 | $49,224,000 | $104,973,200 |
| Funding Needs by Phase | $0 | $0 | $0 | $0 |

Source: Consolidation of Previous Tables and Forecast Amounts

* Negative funding needs indicates a surplus in funding for that period.

Projected Local and PFC funding shortfalls total $297.4 million. One option to reduce this projection, strictly for the PFC funding, would be to increase the current PFC amount from $4.00 to the allowable $4.50 per passenger enplanement. Over the 2022-2041 period, this would raise an additional $23.1 million in funding – not enough to cover the projected $52.6 million shortfall. To cover this shortfall, a PFC of $5.50 would have to be instituted by 2027.

To estimate potential FDOT funding shortfalls, the following assumption was used:

- In the past, SFB has received between $2 - $4 million in FDOT funding per year. Using an average of $3 million per year, a total of $60 million in state funding could reasonably be assumed for the planning period. Given the funding needs of $143.9 million, more than $83.9 million will be needed above the historical average FDOT funding practice.

Thus, SAA may need to make up the $83.9 million in lacking funds with local funding.

For the Federal share, the $53.57 million in entitlement funding falls short of the needed $332.2 million (inflated costs), by $278.6 million. To estimate potential FAA funding shortfalls, the following assumption was used:

- FAA funding will be limited to annual entitlements only. No discretionary funding is assumed.

Under these constraints, the FAA funding availability will be limited to $53.57 million, the FDOT funding will be limited to $60 million ($3M times 20 years), and the Local and PFC funding will be limited to $284.9 million. If no FAA discretionary funding or State special project funding (such as economic development projects, etc.) is available, and Local and PFC funding limits remain, **the SAA could be faced with up to $660.0 million in unfunded projects, relative to the overall $1.163 billion need.**

There are few options aside from self-funding through bond issues or institutional borrowing. One possibility is that the Airport's Entitlement funding could increase by $2.4 - $2.9 million per year if the allocation for the FAA's Airport Improvement Program exceeds $3.2 billion for that year. With a cumulative total of $53.57 million through 2041, that number could potentially be doubled to $107.14 million. This still leaves $171.5 million in FAA eligible projects needing discretionary FAA funding.

Another possible option involves the PFC program. If the national PFC program permits an expansion to $8 per passenger in the future, an additional $150 - $200 million could be raised to pay the federally eligible projects at SFB, depending upon when the program was instituted.

Other options that could influence the financial production of the Airport include an acceleration of the passenger growth above forecast levels, the development of more non-aviation Airport property than planned, proactive development of new hangar space, or the attraction of a large aviation-related operator to the Airport. In addition, potential capacity-induced delays in the future at Orlando International, could result in the funneling of excess traffic to SFB. If those scenarios do not materialize, other options would be to postpone some of the non-critical capital projects that could be shifted to later phases.

As long as the SAA is aware of the future financial needs for the Airport's CIP, it can plan accordingly. As shown in this Plan, the projected shortfalls in funding could be significantly large – up to $660 million of the needed $1.163 billion capital program. If grant money is not available from other sources, local money would be the primary means of meeting the Airport's local share of the CIP. At that point, the SAA would have to determine what it could fiscally support through grants, bond issues, and other borrowing.

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# Public Involvement Program

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# 8. Public Involvement Program

The Public Involvement Program (PIP) aims to generate public awareness of the Airport Master Plan Update (AMPU) project and to promote public input regarding the produced project findings. Generating public input will ensure the planning effort meets the stakeholder’s needs. The level of public involvement in airport planning is proportional to the complexity of the planning study and the degree of public interest. The PIP process for the Airport involved public awareness through information via website, public presentation, and a feedback process to encourage information sharing between stakeholders and the planning team throughout relevant milestones of the AMPU process.

Copies of advertisements, handouts, and other elements of the public awareness campaign are available in Volume II, Appendix F, *Public Involvement Program Documentation*, as the official record of the PIP. The project team utilized a dynamic and interactive public forum. The selection of the specific PIP platform depended heavily on the complexities associated with the Airport, and the expected public interest in the master plan.

## 8.1. Technical Advisory Committee

The Technical Advisory Committee (TAC) is responsible for providing input and insight on technical matters. Committee members typically have a high level of technical competency associated with some aspects of aviation or airport operations and are major stakeholders in the airport’s operations. The TAC was comprised of Sanford Airport Authority (SAA) officials and staff. Additionally, the SAA Board was regularly updated throughout the process to allow for input at each major milestone, with two official updates from Atkins staff.

There were three TAC meetings facilitated throughout the Master Plan process:

- Facility Requirements TAC workshop: January 28th, 2021
- Alternatives TAC workshop (1): April 23rd, 2021
- Alternatives TAC workshop (2): July 26th, 2021

There were two official project updates to the SAA Board, excluding the public meeting. These updates took place within the scheduled SAA Board meetings. The following dates were of the official SAA Board updates:

- February 2nd, 2021
- July 13th, 2021

## 8.2. Public Information

### 8.2.1. Online Project Updates

Project materials, announcements, and other master plan related information were hosted on the Airport web page. This site hosted notifications related to the AMPU process, informational materials regarding the project, and methods to provide project feedback. Information can be found at flysfb.com/airport-master-plan/.

#### 8.2.1.1. Media Announcements

Media announcements are key components of the AMPU process to inform the public of various project milestones, meetings, and circulate project information. Media announcements were made by Airport staff using various mediums including press releases, website announcements, and social media posts. Copies of media announcements are provided in Volume II, Appendix F, *Public Involvement Program Documentation*. The following announcements were made regarding the AMPU project and associated public meeting:

- August 30th, 2021: Public meeting announcement press release from sanfordfl.gov/departments/communications-office
- August 30th, 2021: Public meeting announcement press release from City of Sanford Facebook page

- September 10th, 2021: Public meeting announcement press release from Orlando Sanford International Airport Facebook page
- September 14th, 2021: Public meeting highlight and AMPU highlight from Orlando Sanford International Airport Facebook page

### 8.2.2. Public Meeting


The project team facilitated a public outreach event open to all interested community members. The public meeting event was hosted subsequent an Airport Board Meeting on September 14th, 2021 at the Sanford City Hall located at 300 N Park Ave, Sanford, FL 32771. The Airport Board Meeting ran from 8:30AM to 10:30AM, with the AMPU public meeting beginning at 10:30AM. The purpose of the meeting was to inform the public of the project and its importance, present highlights from each primary section of the project, and to solicit public input regarding the project. The public meeting started with a presentation to highlight key material so far produced in the project. After the conclusion of the presentation, the floor was open to the public for comment. Three members of the community spoke their respective input regarding the project. After the conclusion of the open floor, the public was invited to view printed boards arranged around the venue highlighting primarily the forecast findings and the various development alternatives. Project staff was on-hand for the public to answer questions or to clarify specific points if needed. Project information handout packets were available for the public to take which included project highlights such as methods of public input, project facts, and FAQs. The project information handout is provided in Volume II, Appendix F, *Public Involvement Program Documentation*. The public meeting concluded at 12:30PM.

This meeting was advertised on the Airport website, the City of Sanford website, and each respective social media accounts.

## 8.3. Public Input

Public input is pinnacle for the continued community involvement with the Airport and to ensure the proposed development is aligned with community values. This input allows the Airport to ensure that the anticipated direction coincides with the surrounding communities' comprehensive ideal vision. Public input was solicited through the various media announcements previously mentioned, and two methods to communicate project input was provided. The first method was to mail written comments directly to SAA at the Orlando Sanford International Airport. The second method was to email written comments to SAA at *masterplan@osaa.net*.

In total, the Airport received three email comments. A comment towards the enhancement of Runway 9R/27L was recorded in all three comments, stating that the enhancement of the south parallel runway will increase the noise levels on neighborhoods in the vicinity of the Airport. All comments that were received are provided in Volume II, Appendix F, *Public Involvement Program Documentation*.

# Airport Layout Plan

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# 9. Airport Layout Plan

## 9.1. Introduction

The Airport Layout Plan (ALP) is a set of drawings that provides a graphical representation of the 20-year development plan formulated in this master plan. Each ALP can differ depending on the complexity of the airport and special focus areas. The ALP provides a blueprint for future airport development and should be used in conjunction with this master plan to gain a full understanding of the purpose and need for all development that has been identified.

The ALP is a requirement of 49 U.S.C. § 47107(a)(16). All development at the airport must follow the approved ALP to ensure safety, utility, and efficiency of the airport. The FAA requires that the ALP be kept up-to-date to ensure compliance with this law.

The following sheets are included in the ALP set. For clarity, all sheets presented in Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* have been reduced to 17 inches by 11 inches.

## 9.2. Cover Sheet

The cover sheet provides baseline information regarding the ALP set that is contained therein. The cover sheet includes the official airport name, airport owner, associated city and state, the party responsible for preparation of the ALP set, an index of drawings, and graphical representation of the airport's regional location. The cover sheet for this ALP set proudly highlights the State of Florida and the Airport's location in Seminole County.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the ALP Cover Sheet.

## 9.3. Airport Data Sheet

The airport data sheet provides all key data related to the overall airport location, runways, taxiways, imaginary surfaces, navigational aids, lighting, declared distances, wind coverage data, and any modifications to airport design standards, if applicable. All tables included on the airport data sheet present existing and future data.

Wind data analyzed for this master plan was compiled from the National Oceanic and Atmospheric Administration (NOAA) Integrated Surface Database for a 10-year period (2010 to 2019) from the Orlando Sanford Airport on NOAA's integrated surface observation database (ISD). The wind data was analyzed using the FAA Wind Analysis Tool located on the Airport Data and Information Portal (ADIP).

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the Airport Data Sheet.

## 9.4. Existing Facilities

The existing facilities drawing presents the airport, and its supporting facilities, as they are today. The drawing includes all areas and infrastructure of the airport including but not limited to runways, taxiways, aprons, buildings, on-airport roadways, fencing, air traffic control tower, etc. Additionally, all imaginary surfaces are shown, including but not limited to the Runway Safety Area, Runway Object Free Area, Runway Protection Zone, Precision Approach Path Indicator Obstruction Clearance Surface, Approach and Departure Surfaces, Taxiway Safety Area, and Taxiway Object Free Area.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the Existing Facilities Sheet.

## 9.5. Airport Layout Plan

The Airport Layout Plan (ALP) drawing presents the planned airport development over the following 20-year period. The drawing includes all elements of the existing facilities drawing but adds all future development and associated imaginary surfaces and labels. The ALP drawing is required by statute to be up-to-date and include any proposed AIP or PFC funded projects. Following all development on airport property, the ALP should be reviewed and, if necessary, updated to reflect the recent change.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the Airport Layout Plan Sheet.

## 9.6. Terminal Area Plan

The Terminal Area Plan (TAP) provides greater detail of the airport's existing and planned terminal and apron areas. To better illustrate existing and future facilities, multiple TAP sheets are typically created. As the existing and planned terminal areas are spread about the airfield, four (4) terminal layout plans were necessary to show the full extents. Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* present the Terminal Area Plan sheets. Additional detail such as apron dimensions, annotations, and offsets between various design elements are presented within the terminal layout plans.

## 9.7. Inner Approach Plan & Profile

The inner approach plan and profile drawings present critical natural and man-made features parallel to the extended runway centerlines. The inner approach plan and profile drawings include the inner portion of the approach, up until the approach surface reaches at least 100-feet above the established threshold elevation. The sheets assist in identification of any potential obstructions that may impact the safe and efficient operation of aircraft.

Each runway end is represented in both plan view and profile view to provide a thorough display of data elements. The profile views include the elevation of the extended runway centerline and the critical ground underlying the approach surface. A representative icon for all traverse ways, vegetation, poles, towers, etc. is used to depict significant objects in both plan and profile views. All objects identified on the inner approach plan and profile are detailed on the associated obstruction tables which are located on the corresponding sheet, and/or a supplemental data sheet. All objects within 20 feet of penetrating any surface were considered "significant" and included in the sheets. Pre-set adjustments of 23 feet, 17 feet, 15 feet, and 10 feet were made to identify the potential maximum elevation of railroads, interstates, public roads, and private roads respectively. Traverse ways found to be insignificant to this study were omitted for clarity.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* present the Inner Approach Plan and Profile sheets for each runway end and future runway end if applicable. Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the inner approach data tables.

## 9.8. Departure Surface Plan and Profile

The Departure Surface Plan and Profile sheets depict the critical natural and man-made features located within the 40:1 departure surface for each runway end. All obstructions are further identified on data tables included on the corresponding sheet, and/or a supplemental data sheet. Similar to the inner approach, identification of objects within the departure surface assist with mitigation of potential obstructions that may impact the safe and efficient operation of aircraft. The profile views include the elevation of the extended runway centerline and the critical ground underlying the departure surface. A representative icon for all traverse ways, vegetation, poles, towers, etc. is used to depict significant objects in both plan and profile. All objects within 20 feet of penetrating the departure surface were considered "significant" and included in the sheets. Pre-set adjustments of 23 feet, 17 feet, 15 feet, and 10 feet were made to identify the potential maximum elevation of railroads, interstates, public roads, and private roads respectively. Traverse ways found to be insignificant to this study were omitted for clarity.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* present the Departure Surface Plan and Profile sheets.

## 9.9. Airport Airspace (Part 77)

The Airport Airspace Surfaces sheets depict the critical natural and man-made features surrounding the airport, outside of the inner approach. The sheets depict the imaginary surfaces presented in Title 14 CFR Part 77, Safe, Efficient Use, and Preservation of Navigable Airspace, in relation to the existing and future runway ends and airport elevation. Objects that may impact the safe and efficient operation of aircraft are identified, and further details are provided in obstruction data tables included on the corresponding sheet, and/or a supplemental data sheet. The airspace surfaces include the primary, approach, transitional, horizontal, and conical surfaces based on the most demanding category and type of existing, or planned, approach.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* present the Airport Airspace sheet.

## 9.10. Airport Land Use Plans

The Airport Land Use Plan presents the on- and off-airport land uses surrounding the Airport. Off-airport land uses were obtained from Seminole County. The land use map provides the Airport, City, and County government an aid in future municipal planning efforts and zoning. Airports are encouraged to work with the neighboring City and County governments to ensure compatible land uses.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the existing Land Use Plan and future Land Use Plan.

## 9.11. Exhibit "A" Property Inventory Map

The Exhibit 'A' Airport Property Inventory Map provides an inventory of all parcels and easements that make up the dedicated airport property. The Exhibit 'A' documents how and when each parcel was acquired, the funding source used to acquire the property, or if the property was conveyed to the airport as Federal Surplus land or Government Property. The Exhibit 'A' also identifies any future land or easements needed for airport development, for protection of the runway approaches, or for the purpose of clearing obstructions. In addition to all parcels currently owned by the airport, the Exhibit 'A' must document all former parcels owned by the airport and when they were released/sold.

Volume II, Appendix H, *Airport Layout Plan (ALP) Sheet Set* presents the Exhibit "A" Property Inventory Map sheets.

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# Sustainability Plan

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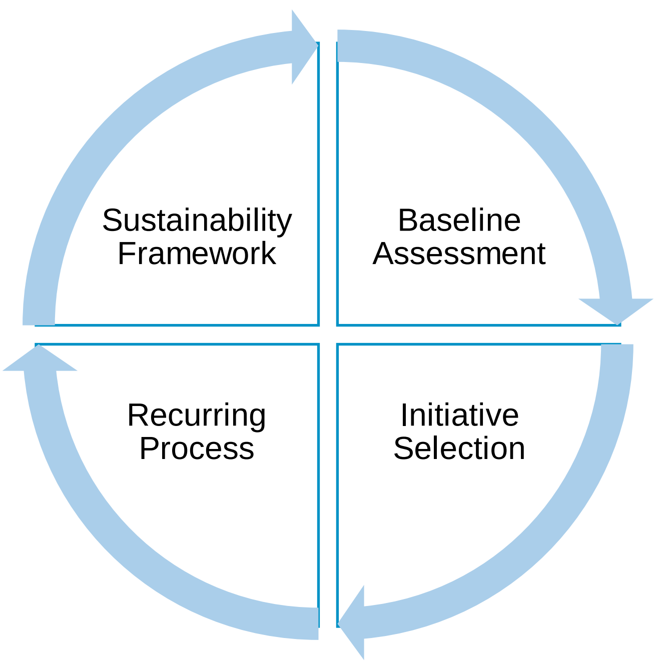
# 10. Sustainability Plan

*"Airport sustainability is a broad term that encompasses a wide variety of practices applicable to planning, design, building and operating airport facilities."*[10]

The Federal Aviation Administration (FAA) commenced a Sustainability Master Plan Pilot Program in 2010 with the goal of deriving unique and innovative airport approaches to sustainability planning. The successes and results of such were published in 2012 in their *Report on the Sustainable Master Plan Pilot Program and Lessons Learned*[11]. That report summarized the most useful practices utilized by airports during the pilot program. The pilot program and its lessons learned became the foundation for the practice of airport sustainability planning to be integrated into airport master planning efforts, and airports nationwide have been backed by local and state governments in implementing sustainability planning since the program's conclusion. Several state transportation organizations have refined sustainability planning into a repeatable, but still unique, process for airports. While sustainability planning is not yet a requirement, the FAA stresses the importance for airports to always consider sustainability as part of their decision-making process. In addition to outlining specific sustainability initiatives for the Orlando Sanford International Airport (Airport) to pursue in the future, this plan was developed to infuse creative thinking to ensure the best outcomes from its decision-making process. **Figure 10-1** depicts the four main sections of this sustainability plan, which are discussed in subsequent sections:

**Figure 10-1 - Sustainability Planning Process**




Source: Atkins 2021

## 10.1. Preliminary Data Collection

The first step taken by the Airport in this process was to formulate a sustainability committee that could provide sustainability insight. Airport management appointed the Airport Master Plan Update's (AMPU's) three-member Technical Advisory Committee (TAC) to serve as the sustainability committee. Once the sustainability committee was established, a survey was distributed with the purpose of gleaning their unique perspectives on airport sustainability. Survey questions were designed to set a baseline of the committee's goals, priorities, definitions, and

[10] Qtd. In Lessons Learned from Airport Sustainability Plans, Black, 2010
[11] https://www.faa.gov/airports/environmental/sustainability/media/SustainableMasterPlanPilotProgramLessonsLearned.pdf

familiarity with sustainability at airports. The following sections summarize the surveys conducted during this process.

### 10.1.1. Survey 1 Summary

The initial survey was distributed to the sustainability committee to identify the committee's goals and priorities, gain an understanding of the committee's familiarity with airport sustainability, and gather baseline information needed to develop the airports unique definition of sustainability. Key questions and responses from the initial survey are discussed below. The full survey is included in Volume II, Appendix B, *Airport Sustainability Plan Documentation*.

After the identification of key stakeholders to take part in the process, a survey was delivered to gather the initial perspectives of the stakeholders. The following are some of the main questions included in the first survey, which were intended to introduce airport sustainability ideas, establish a baseline of the committee's awareness of and familiarity with airport sustainability, and provide an open forum for respondents to highlight the Airport's recent or on-going sustainability efforts:

1. How would you briefly define airport sustainability?
2. Please elaborate on any on-going or recent Airport sustainability initiatives/projects at the Airport that you are aware of.
3. Do you have any sustainability initiatives in mind for the Airport to consider in its planning?
4. In your opinion, would it be beneficial to appoint a 'Sustainability Champion' to coordinate and track the Airport's future sustainability efforts?

Results from the survey indicate that the Airport has several on-going and recent airport sustainability initiatives which are listed in Section 10.3, *Baseline Sustainability Assessment,* of this report.

To gauge committee priorities, while simultaneously exposing members to potential sustainability initiatives, the survey presented fifteen initiatives to be ranked based on perceived effectiveness. Each initiative was assigned a value from zero ('Not Effective') to ten ('Extremely Effective') based on the committee members view of the initiatives effectiveness if implemented at the Airport. **Table 10-1** presents the initiatives from most effective to least based on the committee's ranking.

**Table 10-1 – Survey 1 – Airport Sustainability Initiative Rankings**

| RANK | INITIATIVE | AVERAGE SCORE |
|---|---|---|
| 1 (tie) | Install 'pay on foot' parking machines | 10 |
| 1 (tie) | Provide job experience and income by operating an on-airport apiary (beehives) to sell honey and honey-based products | 10 |
| 3 (tie) | Add a solar farm to produce renewable energy for the airport | 9 |
| 3 (tie) | Host an annual event in the terminal building to foster the local community, support small business, and enhance public relations (restaurant night, aviation-movie night, women in aviation event, etc.) | 9 |
| 5 | Develop a communication plan to report on sustainability performance that includes social media posts, website information, commercial advertisement in the terminals, stakeholder presentations, etc. | 8.5 |
| 6 (tie) | Request vendors to eliminate plastic from their service items and packaging where possible | 8 |
| 6 (tie) | Install an airside recycling center to collect and recycle deplaned waste from arriving aircraft | 8 |
| 6 (tie) | Schedule mobile food trucks to provide service in the cell phone waiting lot | 8 |

| RANK | INITIATIVE | AVERAGE SCORE |
|---|---|---|
| 6 (tie) | Provide an on-airport car wash valet service where cars are cleaned and ready for travels upon their return to the airport | 8 |
| 6 (tie) | Develop a reduced vehicle idling plan | 8 |
| 11 | Purchase, operate and maintain alternatively fueled, electric, and hybrid vehicles | 7.5 |
| 12 | Host the Aviation Merit Badge training for the Boy Scouts of America at the Airport | 7 |
| 13 | Begin on-airport composting to recycle food waste and generate fertilizer for landscaping | 6.5 |
| 14 | Install rainwater catchment systems and/or greywater re-use systems for watering on-airport landscaping | 5 |
| 15 | Provide dry cleaning services in the terminal | 3 |

Initiatives with an average score above 8 were further evaluated and analysed to determine if they could be implemented at the Airport. These initiatives were further discussed with the committee during the sustainability charrette.

### 10.1.2. Sustainability Charrette

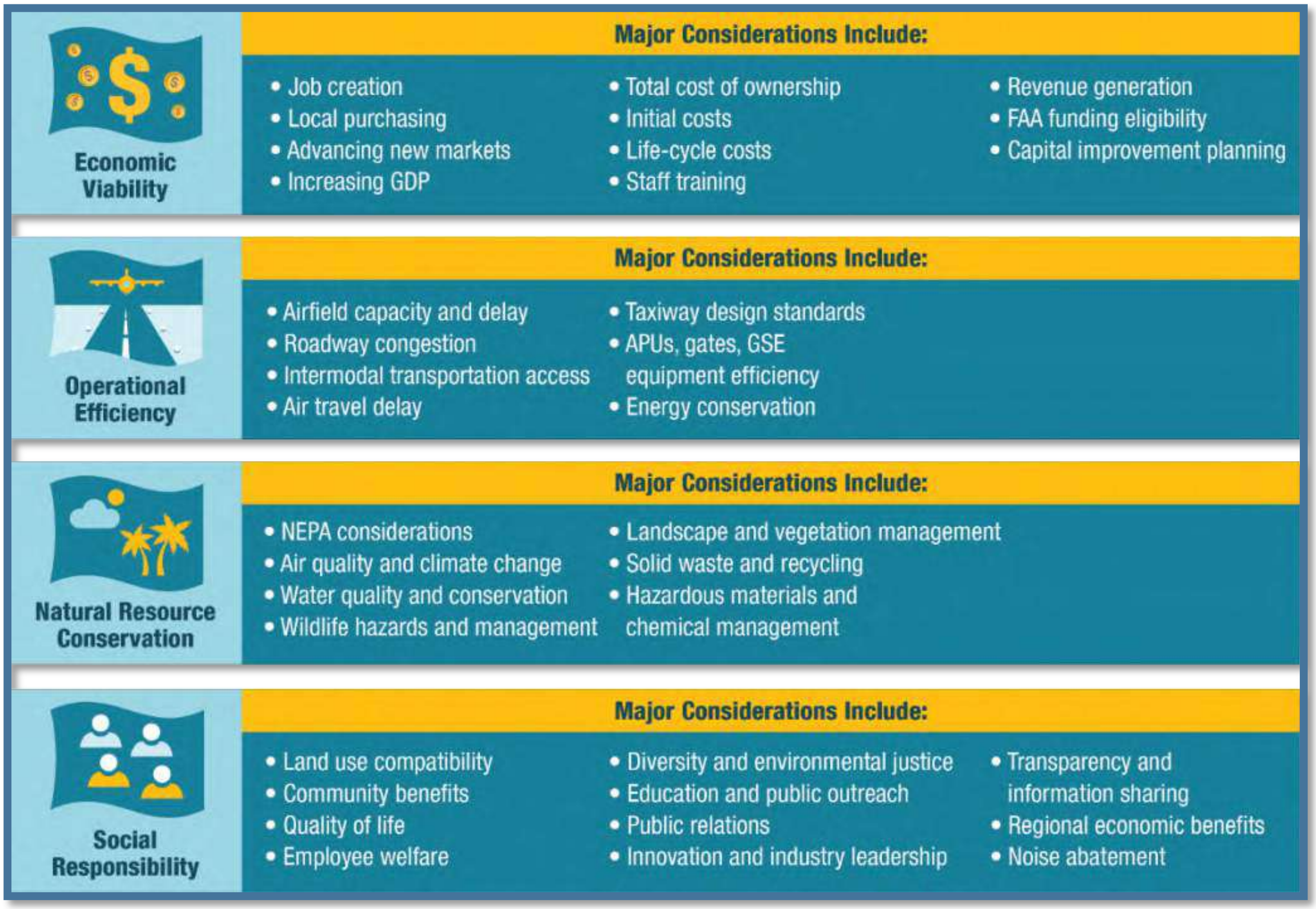
Upon completion of the preliminary data collection through the first survey, results were aggregated and analyzed, and presented to the sustainability committee during a sustainability charrette.

The sustainability charrette was hosted online, and its goals were to present the findings from the first survey, explain in finer detail what airport sustainability planning is, educate the committee on the current and past sustainability initiatives at the Airport, and prepare members for the second survey (discussed in a subsequent section). The presentation given during the charrette is provided in Volume II, Appendix B, *Airport Sustainability Plan Documentation*. The presentation explained the process of an Airport Sustainability Plan, focusing on the current stage of the process which was laying the framework for the Airport towards implementation and formulating its first airport sustainability plan.

The charrette presented the Sustainable Aviation Guidance Alliance (SAGA) database of sustainability initiatives to the committee members. That database is a comprehensive, searchable collection of nearly 950 sustainable aviation practices intended to be meaningful and useful for airports or other sectors when making sustainability decisions. Committee members were encouraged to explore the initiatives presented in the SAGA database, as it is a useful tool for identifying initiatives that could be implemented at the Airport and identified in the final/follow-up survey.

Lastly, the charrette presented the initiatives received in the open response section of Survey 1 which were categorized by Atkins into four categories of sustainability. Those categories correlate with the four focus areas of sustainability presented in the Florida Department of Transportation's (FDOT's) *Airport Sustainability Guidebook*, referred to as 'EONS'; 1. **E**conomic Viability, 2. **O**perational Efficiency, 3. **N**atural Resource Conservation, and 4. **S**ocial Responsibility. **Figure 10-2** depicts those four focus areas which guide the sustainability planning process for the airport environment to ensure that each category is taken into consideration.

**Figure 10-2 - Four Focus Areas of Airport Sustainability – EONS**




*Source: Atkins 2021*

**Table 10-2** depicts potential sustainability initiatives suggested by the committee and how they relate to the four EONS sustainability focus areas.

**Table 10-2 – Committee Suggested 'Open Response' Initiatives from Survey 1**

| INITIATIVE | ECONOMIC VIABILITY | OPERATIONAL EFFICIENCY | NATURAL RESOURCE CONSERVATION | SOCIAL RESPONSIBILITY |
|---|---|---|---|---|
| Place recycling bins for printer/copier cartridges and for batteries in offices and terminals | | | ✈ | |
| Add public electric vehicle charging stations | | | ✈ | ✈ |
| Increased recycling | ✈ | | ✈ | |
| Waterless urinals | ✈ | ✈ | ✈ | |
| Develop a comprehensive operation and maintenance (O&M) manual | ✈ | ✈ | | |

| INITIATIVE | ECONOMIC VIABILITY | OPERATIONAL EFFICIENCY | NATURAL RESOURCE CONSERVATION | SOCIAL RESPONSIBILITY |
|---|---|---|---|---|
| Develop anti-idling standards | ✈ | ✈ | ✈ | |
| Convert Ground Service Equipment (GSE) to electric | ✈ | | ✈ | |
| Develop non fossil fuel equipment standards | | | ✈ | |
| Strive to achieve plastic free concessions (bags, cups, plates, food containers, etc.) | | | ✈ | ✈ |
| Recycling of food and trash | | | ✈ | ✈ |

### 10.1.3. Follow-up / Final Survey Summary

The follow-up/final survey was distributed to the sustainability committee following the sustainability charrette, with the intent to re-evaluate committee members' perspectives and understanding of sustainability. The survey is included in Volume II, Appendix B, *Airport Sustainability Plan Documentation*. The expectation of the follow-up/final survey was that committee members would have a better understanding of sustainability and be better positioned to finalize the airports definition of sustainability, fine-tune the goals, and identify the best suited initiatives for the airport to undertake in the future. Open response questions were used to allow committee members to fully outline their ideas, perceptions, and attitudes towards sustainability. The following three questions were the primary drivers of the follow-up/final survey.

- From your own perspective, how would you define 'airport sustainability' on behalf of the Airport?
- Please provide goal(s) for the Airport to pursue in Airport Sustainability.
- Using the SAGA database link, please find initiative(s) you think the Airport should pursue and note them. Additionally, if you have your own ideas, feel free to add them here.

## 10.2. Sustainability Framework

This section develops and refines the Airport's unique framework towards sustainability planning. An important aspect of sustainability planning is customization of the sustainability plan to meet the unique needs of a specific airport. The first step in developing this framework is the creation of a tailored definition of what sustainability is. The airport's definition of sustainability is then used to identify priorities and define the Airport's goals and visions for sustainability planning.

'Environment' and 'resources' are two of the most common words typically used to define airport sustainability. This indicates a common mis-understanding that airport sustainability planning is primarily focused on environmental impacts.

### 10.2.1. Defining Sustainability

A primary component of the framework portion of a sustainability plan is developing a unique definition of sustainability for the Airport. It is important to discuss these definitions with the sustainability committee, as the views and perspectives of local community leaders should be integrated into the definition. The National cooperative Highway Research Program (NCHRP) Report 708, *A Guidebook for Sustainability Performance*

*Measurement for Transportation Agencies* outlines the steps involved in developing a definition of sustainability for entities in the transportation industry. The steps include the following:

Review Airport Principles → Consider the Context of the Airport → Identify Keywords → Develop Definition

Using the data collected in the previous section, the committee was able to synthesize and produce the following definition which specifically outlines the Airport's vision for what sustainability is.

> Airport sustainability is a holistic approach to manage an airport to ensure the integrity of the economic viability, operational efficiency, nature resource conservation, and social responsibility of the Orlando Sanford International Airport. Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

This definition leads with the EONS priorities of the Airport and focusses on meeting the Airport's current needs in a manner compatible with the needs of future generations. This definition is a key component of the sustainability framework and allows for the focused identification of goals.

### 10.2.2. Sustainability Goals

By establishing specific sustainability goals, the Airport is able to target initiatives for pursuit that are more likely to result in successful implementation. Several initial goals were identified through the data collection effort, such as the following:

- **Optimize** use of airport assets
- **Reduce** health and safety risks
- **Improve** work environment for staff and tenants
- **Garner** greater support by working with the community
- **Reduce** environmental impacts of the Airport's facilities
- **Reduce** energy demand by passengers and tenants
- **Reduce** water usage
- **Reduce** waste

It is important to note that the Airport's sustainability goals do not restrict the Airport with regards to the selection of sustainability initiatives. Instead, they serve as a guide in the selection of initiatives which are supported by the sustainability committee and are most likely to succeed.

## 10.3. Baseline Sustainability Assessment

Before moving forward to initiative selection and overall plan development, the next step in the sustainability plan is a review of the Airport's existing sustainability efforts and pursuits. Assessing each of the EONS focus areas' current standing is contingent upon identified airport needs as well as goals, objectives, performance measures, and performance initiatives. The baseline assessment contains a variety of airport system facets and identifies strengths and weaknesses. Ultimately the baseline assessment is used to create goals and objectives that form the foundation of the sustainability plan.

### 10.3.1. Economic Viability

The first initiative of the baseline assessment involves quantifying the airport's economic situation. Analyzing components such as current and potential funding opportunities can assist airport leaders' decision-making process regarding future sustainability initiatives. Outlining airport revenues (federal/state funding, aeronautical and non-aeronautical revenue, etc.) and how they can be utilized is a main component of the economic assessment.

Chapter 7 of the Airport Master Plan Update (AMPU) provides detailed focus on those elements. Following are the completed or ongoing initiatives that the committee recognized in the survey process, which relate to the Airport's economic viability:

1. PCA and ground power systems on all gates.
2. Control vegetation using grazing animals.
3. Window tinting.
4. LED lighting on the airfield.
5. LED lighting on airfield ramp lights
6. Terminal lights converted to LED.
7. Energy efficient chillers for HVAC.
8. Motion sensors on sink, faucets, soap dispensers and hand dryers.
9. Water efficient urinals.

### 10.3.2. Operational Efficiency

The Airport's day-to-day operations and maintenance (O&M) are the functions and activities performed by operations staff that routinely keep the airport facilities operating and in good condition. Those facilities include, but are not limited to maintaining buildings, grounds, utilities, pavement, and equipment. Operating public spaces such as terminal lobbies and bag claim areas and operating non-public secured areas such as baggage handling areas, aircraft aprons, taxiways, runways, and landscapes included within airport fencing are typical functions of an airport's O&M department.

Airport O&M departments are relied upon to support and maintain new systems, practices, or pieces of equipment as a result of integrating sustainability practices. It is important to assess the full lifecycle operational implications of various sustainability practices, as some may require more operational oversight, maintenance effort, and upkeep than originally anticipated. Following are the completed or ongoing initiatives that the committee recognized in the survey process, which relate to the Airport's operational efficiency:

1. PCA and ground power systems on all gates.
2. Building Management System for HVAC Lighting Control Sensors.
3. Native plantings in new landscaping that do not attract wildlife.
4. Wildlife Hazard Control Plan.
5. Foam Soap versus liquid soap.
6. Maintains a Stormwater Pollution Prevention Plan (SWPPP).
7. Control vegetation using grazing animals.
8. Boring instead of trenching on projects.
9. Installed two bottle refill stations post screening.
10. Bioswales installed along perimeter road.
11. Cell phone lot.
12. LED lighting on the airfield.
13. LED lighting on airfield ramp lights
14. Terminal lights converted to LED.
15. Energy efficient chillers for HVAC.

## 10.4. Natural / Environmental Resources

The Airport's natural / environmental resources include but are not limited to categories such as emissions, land use, noise, energy/water consumption, fuel usage, and waste disposal. Chapter 6 of this AMPU provides an extensive overview of the Airport's environmental resources and conditions. Energy and water consumption were identified previously as environmental resources that the sustainability committee considered being an on-going initiative at the Airport. Following are the completed or ongoing initiatives that the committee recognized in the survey process, which relate to the Airport's natural / environmental resources:

1. PCA and ground power systems on all gates.
2. Building Management System for HVAC Lighting Control Sensors.
3. Foam Soap versus liquid soap.
4. Support the use paperless ticketing.
5. Maintains a Stormwater Pollution Prevention Plan (SWPPP).
6. Control vegetation using grazing animals.
7. Window tinting.
8. Boring instead of trenching on projects.
9. Installed two bottle refill stations post screening.
10. Bioswales installed along perimeter road.
11. LED lighting on the airfield.
12. LED lighting on airfield ramp lights
13. Terminal lights converted to LED.
14. Energy efficient chillers for HVAC.
15. NoFoam testing of ARFF vehicles.
16. Two employee lot electric vehicle charging stations.
17. 'Pay on foot' parking machines.
18. Motion sensors on sink, faucets, soap dispensers and hand dryers.
19. Water efficient urinals.

## 10.5. Social / Community Responsibility

Airports are often identified positively when understanding that they serve as the gateways that can connect friends and families, the facilities from which vacations begin, or launching points to new and exciting experiences. However, others associate airports negatively, primarily from the noise associated with aircraft operations conducted to or from airports. Noise issues are of continued importance in airport management and are actively monitored and addressed by key airport staff. The Sanford Aviation Noise Abatement Committee (SANAC) was established with the purpose and mission to make recommendations to the Sanford Airport Authority (SAA) for establishing noise abatement procedures and for monitoring their implementation at the Airport. SANAC provides the community with multiple modes (website, phone, and quarterly public meetings) of issuing noise complaints. The Airport has sought to acquire property identified as being impacted by the DNL 65 dBA and higher noise contours, which are discussed in detail in Chapter 6 of this AMPU. Addressing the community's airport noise concerns should continue through the efforts of SANAC. As Chapter 6 of this AMPU identifies, the Airport's projected increase in air traffic, coupled with proposed future airfield improvements have the potential of significantly changing the Airport's noise footprint. As such, it is expected that noise would be the Airport's primary focus for community / social responsibility sustainability efforts.

The Airport Cooperative Research Program (ACRP) published the *Resource Guide to Airport Performance Indicators* which identifies other performance measures relating to community sustainability which include customer satisfaction, passenger perception of airport cleanliness, courtesy, ease of connection, and wayfinding. Those elements are consistently monitored and addressed by SAA staff as well as by the terminal operator, Orlando Sanford International, Inc. (OSI), and should continue to be focussed on when establishing future airport sustainability initiatives. Following are the completed or ongoing initiatives that the committee recognized in the survey process, which relate to the Airport's social / community responsibility:

1. Maintain a community noise resource website.
2. Track and respond to all noise complaints.
3. Airport Health and Wellness Clinics.

4. Foam Soap versus liquid soap.
5. Support the use paperless ticketing.
6. Window tinting.
7. Installed two bottle refill stations post screening.
8. Cell phone lot.
9. Scholarship fund for aviation students.
10. ‘Pay on foot’ parking machines.
11. Motion sensors on sink, faucets, soap dispensers and hand dryers.
12. Water efficient urinals.

The baseline assessment of the Airport’s completed or ongoing sustainability initiatives was used to aid the Airport in establishing future sustainability initiatives and efforts, which are discussed in the following **Chapter 10.6**, *Initiative Selection*.

## 10.6. Initiative Selection

With the framework built and the baseline established, potential sustainability initiatives were identified for the Airport to pursue as it progresses in sustainability. Those potential initiatives were gleaned from the sustainability committee’s survey responses, and the future pursuit of each will need to be decided by SAA, upon further review, screening, and evaluation. This section focuses on laying out initiatives the Airport could pursue to achieve its goals and priorities for sustainability. The initiatives are organized in the four EONS focus areas of airport sustainability planning. Initiatives were primarily derived from the SAGA database of sustainability initiatives, which was provided to the sustainability committee for selection of initiatives deemed relevant to the Airport.

**Table 10-3** illustrates potential initiatives identified by the sustainability committee. Those initiatives are primarily categorized in the economic viability and natural resource conservation focus areas, but many also exhibit benefits to the operational efficiency and social responsibility focus areas of airport sustainability. These initiatives were found to be the best representation of the committee’s collective intentions for the Airport’s future in sustainability.

**Table 10-3 – Potential Airport Sustainability Initiatives**

| INITIATIVE | ECONOMIC VIABILITY | OPERATIONAL EFFICIENCY | NATURAL RESOURCE CONSERVATION | SOCIAL RESPONSIBILITY |
|---|---|---|---|---|
| Continue upgrading airport lights to LED when practical | ✈ | ✈ | ✈ | ✈ |
| Develop an on-airport Solar Farm | ✈ | | ✈ | ✈ |
| Utilize water efficient bathroom fixtures in all new construction and any bathroom renovations | ✈ | ✈ | ✈ | |
| Place recycling bins for printer/copier cartridges and for batteries in offices and terminals | | | ✈ | |
| Develop anti-idling standards such as no vehicle idling for more than three minutes – turn vehicles off | ✈ | ✈ | ✈ | |
| Add public electric vehicle charging stations | | | ✈ | ✈ |
| Increase recycling efforts such as food and trash | ✈ | | ✈ | ✈ |

| INITIATIVE | ECONOMIC VIABILITY | OPERATIONAL EFFICIENCY | NATURAL RESOURCE CONSERVATION | SOCIAL RESPONSIBILITY |
|---|---|---|---|---|
| Develop a comprehensive operation and maintenance (O&M) manual, including record logs for all systems and operations | ✈ | ✈ | | |
| Convert Ground Service Equipment (GSE) to electric | ✈ | | ✈ | |
| Develop non fossil fuel equipment standards | | | ✈ | |
| Strive to achieve plastic free concessions (bags, cups, plates, food containers, etc.) | | | ✈ | ✈ |
| Purchase printers/copiers with power down or standby features | ✈ | | ✈ | |
| Utilize recycled paper | ✈ | | ✈ | |
| Explore fertilizing alternatives, i.e. repurpose used coffee grounds for fertilizer and insect control | ✈ | | ✈ | ✈ |
| Continue implementation of 'pay-on-foot' parking machines | | ✈ | ✈ | |
| Continue a scholarship fund for aviation students | | | | ✈ |
| Continue tracking/responding to noise complaints and maintain community noise resource website | | | ✈ | ✈ |

Note that the listed initiatives in **Table 10-3** are potential in nature. When selecting sustainability initiatives to be implemented, key airport leaders should take several factors into consideration. The FDOT's following best practices for initiative selection could be utilized prior to the Airport selecting official sustainability initiatives:

1. Identify initiatives appropriate to the Airport.
2. Focus initially on initiatives that achieve the objectives with low implementation costs.
3. Plan for initiatives that can be incorporated as the Airport expands.
4. Ensure thorough communication between the airport's upper management, airport staff, consultants, and any related city/county departments to approve and review initiatives before the screening process.
5. Incorporate existing and ongoing initiatives into any tools, data collection, documentation, etc.
6. Understand how utilities, waste, and water are monitored, collected, and utilized to be able to identify opportunities to increase efficiencies and track performance improvements.
7. Utilize sources such as the SAGA database or ACRP to assist in the identification of sustainability initiatives.

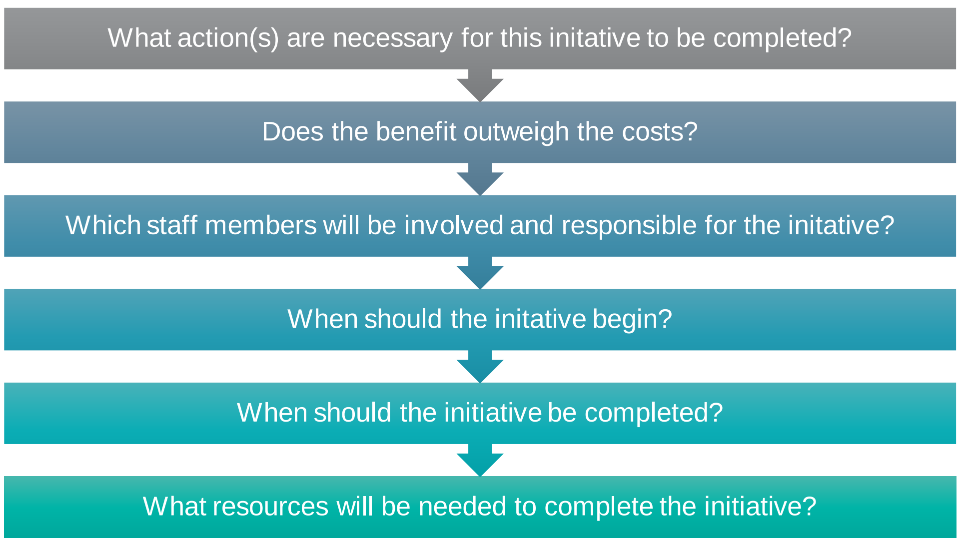
FDOT's *Airport Sustainability Guidebook* recommends that the initiative selection process be split into the four following steps:

1. Identify – This step consists of collaboration with airport staff, stakeholders, and the public during early visioning workshops.

2. Review – This step entails airport staffs' review of previously identified initiatives, consolidates similar actions, and adds new initiatives based on other airports' experiences and those in other industries too.
3. Screen – This step involves review and scrutiny of initiatives to determine those that are not feasible.
4. Evaluate – This step includes qualitatively evaluating the initiatives compared with criteria representative of the airport's goals, and final initiatives are identified for implementation.

The Airport's key sustainability decision makers should aim to gradually eliminate initiatives throughout that four-step process. Several tools are available to aid in the sustainability initiative selection process, which the Airport should utilize in the future. ACRP's *Report 80: Guidebook for Incorporating Sustainability into Traditional Airport Projects* contains the Airport Sustainability Assessment Tool (ASAT), which allows users to evaluate which sustainability practices would be most applicable based on airport conditions. ASAT includes a comprehensive list of suggestions for incorporating sustainable initiatives into traditional airport projects.

Before selecting a sustainability initiative, airport leaders should answer the following questions as specifically as possible to determine the feasibility of a chosen initiative at the time of desired pursuit:




Airport sustainability initiatives should be rigorously vetted to ensure that their benefits outweigh their costs. That vetting process should involve significant research and cost estimating. It should also include community outreach and acceptance to ensure that the initiatives *'meet the needs of the present without compromising the ability of future generations to meet their own needs,'* as the Airport's definition of sustainability states. Answering the complex questions above should aid airport leaders in determining the feasibility of a chosen initiative well in advance of its desired pursuit and implementation.

## 10.7. Sustainability Implementation Process

The final step in the sustainability plan process is the actual implementation of chosen initiatives. The beginning of this process should entail the designation of a sustainability champion to act as the head of the internal structure of sustainability and coordinate all sustainability efforts. That champion should collaborate with other key airport staff members to establish pre-determined, realistic timeframes or goals for when each initiative that can be achieved. Workshops and meetings should be held for specific initiative-related airport staff at the commencement of each initiative to clearly define how the implementation of such will rely on their input and involvement. As the Airport implements sustainability initiatives in the future, performance monitoring should take place to determine their overall effectiveness. The following sections provide more guidance related to the sustainability champion, initiative implementation performance monitoring and reporting, and action plan development.

### 10.7.1. Sustainability Champion

It is encouraged that the airport establishes a sustainability champion within senior leadership, should have an understanding and ambition towards sustainability initiatives. The sustainability champion is responsible for ensuring that the sustainability plan is implemented effectively within each area of the Airport. Opportunities for sustainable improvements or modifications should be considered during early planning efforts. The sustainability champion should routinely coordinate with internal and external stakeholders to ensure the goals and initiatives continue to reflect the overall goals of the Airport. Depending upon the ultimate complexity and evolution of the sustainability plan a sustainability team may be necessary to support the champion and assist in their day-to-day sustainability coordination efforts.

One of the first objectives of the sustainability champion should be their determination of a logical order for which initiatives should be pursued and implemented. Factors such as financial feasibility, competing needs, local community input, stakeholder opinion, organizational readiness, airport goals and priorities, and resource availability (financial, staff, and knowledge) should aid the champion in determining that order.

### 10.7.2. Performance Monitoring

Once the order of objectives has been established, the sustainability champion should develop a recurring performance monitoring and plan evaluation process to ensure the Airport's active pursuit of sustainability. Setting that process to recur at logical periods, such as monthly or quarterly intervals, can enable the Airport to remain focused on specific sustainability initiatives with specific due dates in mind. Those intervals should be selected by the SAA leadership. To accomplish this task, the sustainability champion would provide a simple and technical overview of how the airport is proceeding with its chosen sustainability initiatives. ACRP Report 119: *Prototype Airport Sustainability Rating System* was created to assist that process as it was developed to allow airports to track sustainability internally. That report also contains a best practices section which could aid the Airport's sustainability champion's and/or team's efforts in improving their sustainability implementation measures. Following are a few industry recognized benefits to tracking and reporting sustainability performance:

1. Tracking sustainability performance can lead to educational outreach efforts, both internally and externally.
2. Compliance with sustainability goals and objectives can be tied to contracts and leases with vendors, tenants, and service providers.
3. Building Information Modelling (BIM) systems can be used to gather valuable performance data if programmed and managed properly.
4. Utility Management Systems, EPA's Portfolio Manager, and ISO 50001 can be used to formalize environmental stewardship policies, identify responsible parties, and track environmental progress.

Airports are encouraged to develop a matrix to be used in sustainability performance monitoring. That matrix should include the initiative at the top with a brief description. Under that, numerous categories should be outlined to aid in the ranking of sustainability initiatives. **Table 10-4** is an example matrix developed to measure management sustainability performance and was provided in ACRP Synthesis 10: *Airport Sustainability Practices* (Appendix B of the ACRP Synthesis). It is recommended that the sustainability champion model that matrix, but tailor each initiative's matrix to be specific and include measures chosen by the project team. Utilizing a sustainable tracking tool can enable the Airport to efficiently keep record of how chosen sustainability initiatives are performing.

**Table 10-4 – Model Performance Tracking Matrix – 'Management Performance Scale'**

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Program and Policies | No formal policy or program in place | Limited program or policy in place to address issues | Policy or programs are well-developed and reflect good practice | Policy or program embedded in airport operations and reflects pest practice. | Industry-leading policy or program. Long-term planning horizon. |
| Performance Monitoring and Reporting | Risks have not been assessed and performance is not monitored | Risks have been assessed and a baseline established. No ongoing monitoring of performance | Goals and targets established. Performance is monitored but is not reported either internal or external to the organizations. | Continuous monitoring of performance against goals and targets that are updated regularly. Performance is reported internally within the organization. | Includes mechanism for continuous performance improvements. Performance goals aligned with strategic planning/corporate level goals and targets. Performance is reported externally to stakeholders and general public. |
| Incentives and Awareness | Issue not on radar screen, relevancy to the organization undetermined. No budget allocation for activity | Problems identified. Stakeholders take the lead in raising issue. Limited budget allocation for managing issue | Some awareness of issue inside organization. Policy or program is communicated and enforced. Funding allocation to manage issue established on annual basis. | Strong internal awareness, recognition and understanding of issue. Investment deemed a priority. | Feedback loops in place, continuous surveying of stakeholders. Performance goals incentivized. |

Source: ACRP Synthesis 10: Airport Sustainability Practices, 2021

Another recommendation of the FDOT's Airport Sustainability Guidebook is to utilize an OODA loop for performance monitoring. OODA is a decision-making cycle and an acronym for Observe, Orient, Decide, and Act. The OODA loop was designed by United States Air Force Colonel John Boyd, therefore is also known as Boyd's Cycle. Boyd's Cycle demonstrates that all decisions are based on observations of an evolving situation tempered with implicit filtering of the problem being addressed. Observations are the raw information (input) for which decisions and actions are determined (output). Observed information must be processed to orient it for making decisions. The loop is completed when action is taken based on the decisions made. The OODA loop or Boyd's Cycle is depicted in **Figure 10-3**, and can be a beneficial method for the Airport to observe their sustainability initiative performance and actively adapt to changing circumstances resulting from the pursuit of such.

The OODA loop is a tool that the airport can utilize to learn and adapt as sustainability initiatives are implemented and throughout their useful life. Lessons learned using this tool will assist in improving implementation of future initiatives and reduce overall costs, thus improving the initiatives benefit cost ratio.

The Airport can alter current initiatives or select more by re-assessing the performance metrics. This is referred to in FDOT's guidebook as the recurring check-in process. As was previously alluded to, the recurring process should be conducted at airport designated intervals based on chosen initiatives. ACRP Report 119: *Prototype Airport Sustainability Rating System* contains many resources, one of which is its Table 4-2, which can be utilized to track sustainability performance internally by establishing a scoring framework in a flexible and individualized manner to better evaluate sustainability performance.

**Figure 10-3 - OODA Loop / Boyd's Cycle**

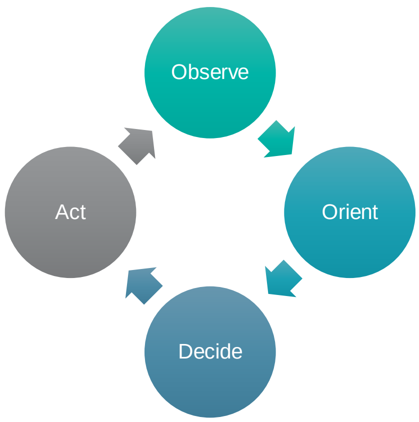



**Figure 10-4** depicts the first three of fifty sustainability activities detailed by the ACRP's table. The table covers sustainability activities grouped in eight different categories; 1. Energy and Climate (EC), 2. Water and Waste (WW), 3. Transportation (TR), 4. Natural Resources (NR), 5. Economic Performance (EP), 6. Human Well-Being (HW), 7. Design and Materials (DM), and 8. Engagement and Leadership (EL).

**Figure 10-4 – Excerpt of ACRP Report 119's Table 4-2 – Sustainability Activity List, Including Performance Metrics and Sources**

| Sustainability Activity | Performance Metric | Sources |
|---|---|---|
| **Energy and Climate (EC)** | | |
| **EC 1 Terminal Building Energy Use** | Percent reduction of building energy use intensity per square foot (Btu/ft$^2$) from a baseline. Building total square feet is derived from gross area, which is the net usable square feet plus structural square feet. (Airports without terminals will still evaluate administrative building energy use intensity.) | • GRI: Environment Indicator EN5-7<br>• STARS: Operations Credit 7: Building Energy Consumption<br>• ISI RA2.1: Reduce Energy Consumption<br>• Adapted by ACRP research team |
| **EC 2 Overall Airport Energy Use** | Percent reduction of total airport energy use intensity from a baseline. The energy intensity unit of output metric may be designated from one of the following: number of airport customers/employees, number of aircraft movements, tonnage of cargo handled, or another appropriate metric. | • GRI: Environment Indicator EN5-7<br>• STARS: Operations Credit 7: Building Energy Consumption<br>• ISI RA2.1: Reduce Energy Consumption<br>• Adapted by ACRP research team |
| **EC 3 Renewable Energy Use** | Percent of total airport energy consumed annually, including electricity and other fuels derived from renewable sources. | • GRI: Environment Indicator EN6<br>• STARS: Operations Credit 8: Clean and Renewable Energy<br>• ISI RA2.2: Use Renewable Energy<br>• PANYNJ: Energy IE-4<br>• Adapted by ACRP research team |

Source: ACRP Report 119: *Prototype Airport Sustainability Rating System, 2014*

### 10.7.3. Annual Sustainability Report

It is recommended that the Airport develop a sustainability reporting mechanism as a function of their recurring sustainability check-ins. That system can present information pertaining to the chosen sustainability initiatives to airport staff, customers, stakeholders, partners, the local community, and the sponsors, and can act to reengage interested stakeholders as well as be a platform to educate and inform those less familiar with the sustainability plan. It could also serve as a tool in communicating the Airport's sustainability accomplishments to those who may be interested. According to the FDOT guidebook, sustainability reports are typically visually grasping pamphlets which accurately reflect the progress and benefits of an airport's sustainability plan and are aimed at displaying the overall success of having developed a sustainability plan and therefore sustainable airport. It is recommended that an overall airport sustainability report be produced by the Airport on an annual basis.

Many airports issue annual sustainability reports, which could be modelled after. One of the more recent examples is the 2020 Los Angeles World Airports (LAWA) Sustainability Report. That report highlights LAWA's on-going efforts and successes in furthering sustainability while focussing on their airports' (LAX and VNY) economic, social, and environmental initiatives. LAWA manages one of the most active airports (LAX) in the world. As such, its copious report is referenced as an example of the amount of detail that could be provided. Another example of an effective annual sustainability report is the 2019 Reno-Tahoe Airport Authority (RTAA) Annual Sustainability Report which provides full page summaries highlighting each of RTAA's 29 sustainability initiatives, and provides full page matrices detailing each of their EONS sustainability indicators.

### 10.7.4. Action Plan

An action plan presents the incremental steps needed to achieve an airport's goals and objectives. It is important to develop an action plan which will serve as the sustainability plan's backbone and enable the Airport to implement the chosen sustainability initiatives. The sustainability champion should develop an action plan that details items that will lead to the ultimate achievement of the Airport's chosen sustainability initiatives. The ideal action plan should answer the four following questions for each initiative:

1. What action(s) are necessary for an objective to be accomplished?
2. Who on the project team or identified outside resource will be responsible for specific objectives?
3. When (timeframe) does the objective need to be achieved?
4. What resources are needed for the objective to be achieved?

It is important to answer those questions so that the project team has a clear understanding of the required elements of the action plan and what is required to implement the actions. **Table 10-5** provides the framework of the Airport's Sustainability Action Plan. The sustainability champion should utilize that framework to populate the 'who, what, and when' questions once the Airport has vetted and selected their final sustainability initiatives. The action plan should be reviewed, monitored, and updated as necessary by the sustainability champion. For the action plan to be properly utilized, the specific action steps identified by the sustainability champion should be clearly communicated to parties responsible for their implementation. Additionally, responsible parties identified by the 'who' questions should have a mechanism they can utilize to report the status of their efforts and share ideas or their need for required assistance from the sustainability team.

### 10.7.5. Sustainability Plan Summary

The Airport has clearly accomplished sustainability efforts in the past without an official Sustainability Plan. However, this Sustainability Plan is intended to establish a benchmark and provide guidance on the Airport's ongoing and future sustainability efforts to key airport personnel. The plan accomplishes this by outlining the background of airport sustainability, providing a sustainability framework, reviewing the Airport's baseline of past and on-going sustainability efforts, presenting potential future sustainability initiatives, and outlining the sustainability implementation process.

**Table 10-5 - SFB Airport Sustainability Action Plan**

| ACTION STEPS (How will the Airport arrive at its desired outcome?) | RESPONSIBILITY (Who will make it happen?) | TIMEFRAME (When is the desired outcome?) | RESCOURCE (What resources are needed?) |
|---|---|---|---|
| Continue upgrading airport lights to LED | | | |
| Develop an on-airport Solar Farm | | | |
| Utilize water efficient bathroom fixtures in all new construction and any bathroom renovations | | | |
| Place recycling bins for printer/copier cartridges and for batteries in offices and terminals | | | |
| Develop anti-idling standards such as no vehicle idling for more than three minutes – turn vehicles off | | | |
| Add public electric vehicle charging stations | | | |
| Increase recycling efforts such as food and trash | | | |
| Develop a comprehensive operation and maintenance (O&M) manual, including record logs for all systems and operations | | | |
| Convert Ground Service Equipment (GSE) to electric | | | |
| Develop non fossil fuel equipment standards | | | |
| Strive to achieve plastic free concessions (bags, cups, plates, food containers, etc.) | | | |
| Purchase printers/copiers with power down or standby features | | | |
| Utilize recycled paper | | | |
| Explore fertilizing alternatives, i.e. repurpose used coffee grounds for fertilizer and insect control | | | |
| Continue implementation of ‘pay-on-foot’ parking machines | | | |
| Continue a scholarship fund for aviation students | | | |
| Continue tracking/responding to noise complaints and maintain community noise resource website | | | |

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