LEE COUNTY PORT AUTHORITY
Southwest Florida International Airport

Southwest Florida International Airport

MASTER PLAN UPDATE

June 2023

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Chapter 1 Introduction

Southwest Florida International Airport (RSW or the airport) is the gateway to Southwest Florida. The airport is approximately 10 miles southeast of downtown Fort Myers in Lee County and encompasses approximately 6,431 acres. The Lee County Port Authority (LCPA) operates the airport and is governed by the Lee County Board of Port Commissioners. In calendar year (CY) 2019, RSW handled more than 10.2 million passengers. The effects of the COVID-19 pandemic on aviation activity have been substantial, however, Year-to-Date (YTD) enplanements for Fiscal Year (FY) 2021 at RSW suggest the beginning of a strong recovery.

The airport has evolved considerably since it opened in 1983. At the time of the previous Master Plan Update (MPU) in 2004, the commercial terminal and all airport support facilities were accessed via Daniels Parkway, located on the north side of the runway. Today, the airport offers a state-of-the-art passenger terminal, which opened in 2005, direct connection to Interstate 75, a modern Aircraft Rescue & Fire Fighting facility, and a new Airport Traffic Control Tower (ATCT) that is scheduled to open in 2022. This Airport Master Plan Update documents current conditions, coalesces the results of numerous recent technical studies and provides a vision for the airport over the next 20 years. The recommendations presented in this document are focused on maintaining a modern, safe, efficient, reliable, and resilient facility to accommodate increased growth in passenger, aircraft, and cargo movements.

This document is an update to the March 2004 Master Plan Update It has been prepared in accordance with the criteria and standards identified in Federal Aviation Administration (FAA) Advisory Circulars (AC) 150/5070-6B, Change 2, *Airport Master Plans*; AC 150/5300-13A, Change 1, *Airport Design*; and the Florida Department of Transportation *2020-2021 Guidebook for Airport Master Planning*. This user-friendly document is designed to be concise, clear easy to understand and it summarizes findings from detailed technical studies that are incorporated herein by reference and are provided in

a series of technical appendices. The content of the document generally follows the traditional master plan process and is divided into 10 parts:

1. Introduction
2. Existing Conditions
3. Forecasts and Planning Activity Levels
4. Demand Capacity and Facility Requirements
5. Alternatives Development and Evaluation
6. Environmental Overview
7. Sustainability Strategy and Airport Recycling, Reuse and Waste Reduction
8. Capital Improvement Program (CIP) and Implementation Plan
9. Financial Analysis
10. Airport Layout Plan

1.1 Study Goals

The primary goals for this MPU include the following:

- Create a 20-year development program for the airport to accommodate future passenger demand. Provide the short-term and long-term guidance to successfully satisfy the aviation demand in a financially feasible and responsible manner.
- Identify airside and landside improvements and leverage emerging technologies to optimize economic opportunities and the passenger experience.
- Establish an implementation schedule for financially feasible short-term, intermediate, and long-term airport improvements.
- Identify airport requirements and recommend actions to optimize funding opportunities.
- Ensure short-term recommendation and actions do not preclude long-term planning options.
- Incorporate the interests of the public, airport users and government agencies.
- Be sensitive to the overall environmental characteristics and needs of the area surrounding the airport.

1.2 Key Study Areas and Development Objectives

The Southwest Florida International Airport MPU is a guide for the growth of commercial and general aviation at Southwest Florida International Airport (RSW) and provides clear direction for developing airport facilities to support public access to national and international air transportation systems. Key study areas and development objectives in the development of this MPU include the following:

- Terminal Gate Capacity: Identify a preferred development option to add aircraft gate capacity
- Seasonality: Identify seasonal and peak-hour demand to size future terminal facilities to perform at an acceptable level of service during peak periods
- Passenger Amenities and Facilities: Provide balanced airside and landside facilities to accommodate existing and forecast passenger demand levels at an acceptable level of customer service
- Parking and Rental Car Facilities: Identify potential solutions for addressing capacity deficiencies and operational challenges associated with the parking and rental car facilities

- Non-Aviation Development Opportunities: Identify available land areas to broaden the range of economic activities on-airport property.
- Land Use Strategy for the North Ramp Area: Identify development strategies for the North Ramp area including air cargo and support facility development options, that maximize the use of the property while preserving existing buildings that are in good conditions.
- Parallel Runway Timing: Identify the timing and development trigger for the proposed parallel runway.
- Sustainability and Environmental Considerations: Provide economic and social benefits to the local community through long-term sustainable growth and investment that minimize impacts to the environment.
- Changes in Regulatory Guidance

1.3 Previous Studies

The last Master Plan Update for Southwest Florida International Airport (RSW) was completed in March 2004. As with the current study, the 2004 Master Plan Update provided a comprehensive analysis of the airport needs with the purpose of providing a 20-year outlook for the future development of the airport. The 2004 Master Plan Update was an update to the previous Master Plan conducted in 1992.

The MPU will leverage the findings and recommendations from recent and ongoing studies, analyses, and CIP initiatives that have been conducted for the airport in the past five years. These provide the technical foundation for this update and will be used to supplement, guide, or provide background analyses related to certain elements of this MPU (non-exhaustive list):

- Whitepaper on the Timing for a Second Runway at Southwest Florida International Airport, September 24, 2019, TransSolutions
- Rental Car and Parking Sizing Analysis, April 2019, Kimley Horn and Associates
- Baggage Handling System Assessment, November 2018, Vic Thompson Company
- Stormwater Management Summary, March 12, 2018, Johnson Engineering Inc.
- Airside Pavement - Pavement Condition Analysis and Recommendation, January 2018, Kimley Horn and Associates
- Existing Airfield Geometry Evaluation Study, January 2018, Kimley Horn and Associates
- Existing Parking Facility Capacity Evaluation, December 22, 2017, Kimley Horn and Associates
- Employee Parking Lot Assessment, December 2017, Kimley Horn and Associates
- Pavement Rehabilitation Evaluation, November 2017, Johnson Engineering Inc.

- Chamberlain Parkway Alignment Study,
  November 2017, Johnson Engineering Inc.
- Parallel Runway Program Close-out Report,
  August 21, 2017, AECOM
- Checkpoint Analysis - Demand Basis and Planning Assumptions,
  June 15, 2017, Ricondo & Associates
- Curb Front Roadway Assessment,
  December 2016, Kimley Horn and Associates
- Engineer's Report for Runway 6R-24L Site Preparation Package,
  October 28, 2016, AECOM and RS&H

Chapter 2 Existing Conditions

The development of a Master Plan Update for Southwest Florida International Airport (RSW or the airport) necessitates the collection and evaluation of information relating to the airport and the surrounding areas. This information serves as the baseline for subsequent analyses. Information summarized in this chapter includes an inventory of the facilities, structures, and environment at the airport. Historical context provides insight into the evolution of the airport.

2.1 Airport Setting

Southwest Florida International Airport (RSW) is located in the southwestern portion of the state of Florida approximately 10 miles southeast of downtown Fort Myers and encompasses approximately 6,431 acres. The airport's reference elevation according to the Florida Department of Transportation (FDOT) Florida Airport Directory is 30 feet above mean sea level (MSL). The Airport's Reference Point (ARP) coordinates are latitude 26˚32.170 N and longitude 081˚45.310 W and the magnetic variation at the airport is 0.1 degree west according to January 2020 measurements. Figure 2-1 depicts the general location of the Airport in relation to other major cities in the state.

Figure 2-1 RSW Location Map

The United States Department of Transportation publishes the National Plan of Integrated Airport Systems (NPIAS) approximately every two years with a planning horizon of five years. The NPIAS is submitted to Congress in accordance with Section 47103 of Title 49 of the United States Code and is utilized to define those airports that warrant federal investment. The current 2021-2025 NPIAS was published on September 30, 2020, and identifies 3,310 airports, including RSW, that are significant to national air transportation.

In the NPIAS, the role of each commercial service airport is identified as one of five basic service levels as seen in **Table 2-1**.

There are 519 commercial service airports throughout the United States. Of these, 396 have more than 10,000 enplanements and are classified as primary airports. RSW is designated by NPIAS as a Primary Medium Hub Airport.

RSW is also included in the FDOT's Florida Aviation System Plan (FASP) 2035 Update and is located in the Continuing Florida Aviation System Plan Process (CFASPP) Southwest Region. RSW is supported by FDOT District 1.

Table 2-1 Categories of Airport Activities

Statutory Definition	Criteria	Also referred to as:
COMMERCIAL SERVICE		
Publicly owned airports with at least 2,500 annual enplanements and scheduled air carrier service. Primary airports are a commercial service airport with more than 10,000 annual enplanements.		
Large Hub	Receives 1% or more of the annual U.S. commercial enplanements	Primary
Medium Hub	Receives 0.25% to 1.0% of the annual U.S. commercial enplanements	Primary
Small Hub	Receives 0.05% to 0.25% of the annual U.S. commercial enplanements	Primary
Non-Hub	Receives less than 0.05% but more than 10,000 of the annual U.S. commercial enplanements	Primary
Nonprimary commercial Service, Non-hub	Also referred to as non-hub nonprimary, these airports have scheduled passenger service and between 2,500 and 10,000 annual enplanements	Nonprimary
RELIEVER		
An airport designated by the Secretary of Transportation to relieve congestion at a commercial service airport and to provide more general aviation access to the overall community		Nonprimary
GENERAL AVIATION		
A public-use airport that does not have scheduled service or has scheduled service with less than 2,500 passenger boardings each year		Nonprimary

SOURCE: FAA, *Airport Categories*, 2021

Locale

All of the property comprising RSW is located within unincorporated Lee County. The airport occupies approximately 6,431 acres of land and is located south of Daniels Parkway, east of Interstate 75 and Treeline Avenue and north of Alico Road.

The airport is owned by Lee County and operated by the Lee County Port Authority (LCPA). Lee County includes some of the fastest-growing cities in the region, including Fort Myers, Cape Coral, Bonita Springs, and Fort Myers Beach. Additionally, the popular tourist destinations of Sanibel and Captiva Islands are located in the county. Lee County is bordered by Charlotte County to the north, Hendry County to the east, Collier County to the south and the Gulf of Mexico to the west. In 2019, the year before the COVID-19 pandemic, the airport handled 10,225,180 passengers.

RSW is the primary commercial airport in Southwest Florida, with Punta Gorda Airport having a more limited commercial role (**Figure 2-2**). In 2019, RSW ranked 43rd in the United States based on enplanements and 5th in Florida, accounting for 5.27% of enplanements in the state. In 2020, RSW maintained its 5th place position in Florida, but moved up in the national ranking to 36th in terms of passenger enplanements, despite the effects of the COVID-19 pandemic on the aviation industry. RSW also fared better in 2020 as compared to other Florida airports, representing 6.84% of all enplanements in Florida.

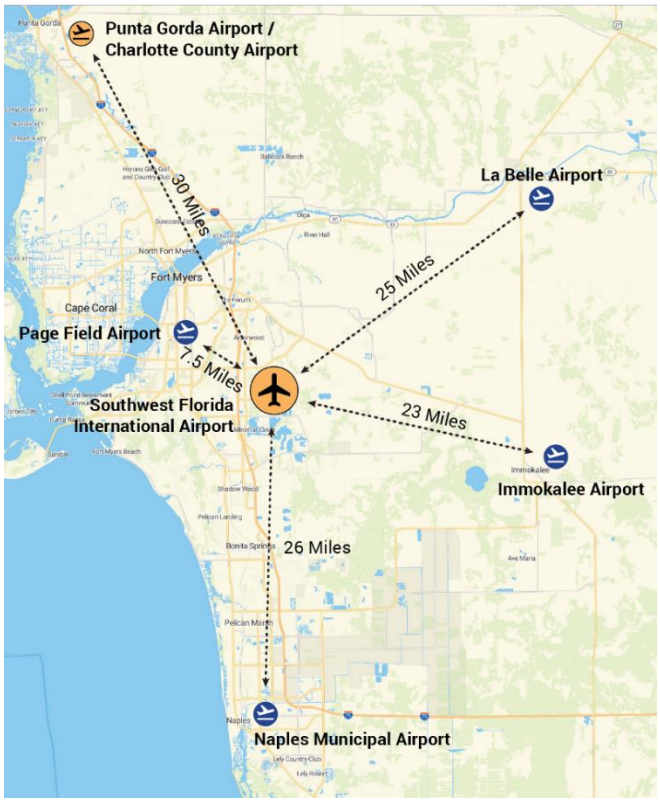


Figure 2-2 RSW Local Area Map

Airport History

Air carrier service has been available in some form in the Fort Myers/Southwest Florida area since 1937. After World War II, the U.S. Army Air Corps' Fort Myers training base (named Page Field in commemoration of World War I hero Captain Channing Page) was decommissioned and turned over to Lee County. For approximately 50 years, Page Field offered local area residents and visitors a full-service air transportation facility as the original commercial airport for Fort Myers. However, it was also recognized during this time that Page Field had limited space to meet expansion requirements for commercial jet aircraft operations and increased passenger volumes.

The 1972 State of Florida Aviation System Plan documented Page Field's limitations and recommended that a new air carrier facility be constructed. This plan also stated that the new airport should be adequate to serve the Southwest Florida region encompassing Lee, Collier, Charlotte, Glades, and Hendry counties. Shortly thereafter, a five-county advisory group was established to select a suitable site for the new aviation facility.

RSW was the nation's first new airport built since the opening of the Dallas/Ft. Worth Regional Airport in 1974. It was also the first airport to be built in compliance with National Environmental Protection Association (NEPA) regulations.

The airport officially opened on Saturday, May 14, 1983. With the opening of Southwest Florida Regional Airport, all air carrier and commercial operations were relocated to the new airport, relegating Page Field (FMY) to a "reliever airport" role.

Page Field (FMY)
SOURCE: Lee County Port Authority

On August 11, 1987, the Lee County Board of County Commissioners implemented the provisions of Chapter 63-1541, Laws of Florida, by adopting Lee County Resolution No. 87-8-9, creating the Lee County Port Authority as a body corporate to operate the two County airports, Page Field and Southwest Florida International Airport (then known as Southwest Florida Regional Airport). The Resolution was subsequently adopted as an ordinance, to be known as the Lee County Port Authority Ordinance, Lee County Ordinance No. 90-02, later repealed and replaced by Lee County Ordinance No. 01-14. The Board of Port Commissioners is made up of county commissioners who set policy and direct operations for the airports. The role of the Airports Special Management Committee is to serve in an advisory role to the Board of Port Commissioners. Each Commissioner appoints one member to the Airports Special Management Committee; plus one representative is selected from Collier County and one from Charlotte County. The Lee County Port Authority, the Board of Port Commissioners and the Airports Special Management Committee is the political structure that oversees the airport today.

Original 1983 Terminal under construction
SOURCE: Lee County Port Authority

Original 1983 Terminal after opening
SOURCE: Lee County Port Authority

In 1988, to accommodate increasing passenger demand, the original terminal was expanded by extending Concourse B and enlarging the terminal apron.

While the airport had served international passengers primarily traveling on Canadian charter flights since 1984, in the late 1980s LCPA initiated an expansion program to facilitate the airport accommodating nonstop transcontinental, as well as transatlantic international flights. As the numbers of foreign visitors soared, RSW officials petitioned the U.S. government to construct a Federal Inspection Station (FIS) at RSW to provide Customs, Immigration, Public Health and Agriculture services. An agreement was reached that the FIS would be a user-fee facility supported by airport operations revenue and, on December 20, 1993, the RSW FIS opened.

By 1992, two projects crucial to the international air carrier traffic initiative were underway. In the summer of 1992, work began to extend Runway 6-24 from 8,400 feet to 12,000 feet. This additional runway length allowed aircraft operating from RSW to increase fuel loads, thereby increasing flight ranges to transcontinental and international-transatlantic distances. The $20 million runway project was completed in the fall of 1994. In November 1992, construction began on a 48,211-square-foot terminal addition that would house expanded FIS facilities and additional passenger ticketing and waiting areas. The expanded and improved facilities, together with the runway extension, proved to be the catalyst for RSW to enter, initially by charter operations, into new international passenger and cargo markets.

In 1993, the new name of Southwest Florida International Airport was selected to reflect the emerging international status of RSW. This new name became official on May 14, 1993, which coincidently marked the 10-year anniversary of the official opening of the

- 1972: State of Florida Aviation System Plan identified the need for a new air carrier facility
- 1974-1975: Site selection process: Current site of RSW selected
- May 14, 1983: Airport officially opens
- 1988: Concourse B is extended, aircraft ramp is enlarged
- August 11, 1987: Lee County Port Authority is created
- December 20, 1993: Federal Inspections Station opens International (non-precleared) flights can operate
- 1992-1994: Runway 6-24 extension from 8,400ft. to 12,000ft.
- 1992: Terminal is expanded
- May 14, 1993: Southwest Florida International Airport name becomes official
- 1998: New concourse B opens
- 2004: Master Plan Update completed
- 2005: Midfield Terminal Opens
- July 2013: New ARFF Facility Opens
- 2015: Terminal Access Road connects directly to I-75
- 2022: Future Air Traffic Control enters service

airport. In the late 1990s, sustained passenger and aircraft operation increases at RSW necessitated further terminal expansion and expansion of Concourse B, which was completed in 1998.

In order to meet the ever-growing demand at the airport, multiple planning, design and construction projects were initiated in the early 2000s. In February 2002, construction began on a new Midfield Terminal Complex to replace the existing terminal, which in spite of multiple expansions, was experiencing a capacity limit and a degraded passenger experience. The new terminal opened on September 9, 2005, with three concourses serving 28 aircraft gates. The terminal plan has the possibility to add two additional concourses to provide a total of 65 gates.

New Midfield Terminal
SOURCE: Lee County Port Authority

The new terminal was constructed to the south of the existing runway to be centrally placed between the existing and future parallel runway. In 2015, a new airport interchange was completed that directly connects RSW to I-75.

In 2016, a new Aircraft Rescue & Fire Fighting (ARFF) station was inaugurated opposite the terminal. A new Airport Traffic Control Tower (ATCT) was built and is currently undergoing testing and certification and will began operations in 2022. Both the ATCT and the ARFF facility are centrally located to support the future airfield.

Future Airport Traffic Control Tower
SOURCE: Lee County Port Authority

2.2 Climate

Weather conditions play an important role in the planning and development of an airport. Temperature, along with other operating parameters, is an important factor in determining runway length. Wind direction and speed are essential in determining optimum runway orientation. The percentage of time rain and/or fog impairs or restricts visibility at an airport is a major factor in determining the need for aircraft navigational aids and runway lighting systems.

RSW is situated in the subtropical Southwest Florida climate, located approximately 13 miles from the Gulf of Mexico. The region is often influenced by the maritime air masses that move inland. Typical summertime weather conditions include daily afternoon thunderstorms caused by rapid convective heating exacerbated by high temperatures and excessive humidity. Based on 10-year meteorological data (2011-2020), RSW operated in Instrument Meteorological Conditions[1] (IMC) and Visual Meteorological Conditions (VMC)[2] 9.45% and 90.55% of the time, respectively.

Temperature

Temperature is one of the most important factors affecting aircraft performance. The direct impact of high temperatures is a marked increase in runway take-off distance requirements. Temperatures at RSW generally range from the low 60s Fahrenheit (F) in the winter to the low 90s (F) in the summer. Winters are typically mild, with many bright, warm days and

[1] IMC occur when the prevailing visibility is less than 3.0 statute miles or the cloud ceiling is lower than 1,000 feet above ground level (AGL).

[2] VMC occur when the prevailing visibility is greater than or equal to 3.0 statute miles and the cloud ceiling is 1,000 feet AGL or higher.

moderately cool nights. Occasional cold snaps bring temperatures in the 30s (F) but only rarely do temperatures drop into the 20s (F). However, light frost and minor freeze conditions do occur in the rural-inland areas a few times each year. In the summer, temperatures have reached 100 degrees (F), but these occurrences are rare. According to metrological data compiled by National Oceanic and Atmospheric Administration (NOAA), August is the hottest month of the year at RSW with an average maximum temperature of 92 degrees (F) and a mean temperature of 83 degrees (F). During the winter, RSW experiences the coldest average temperatures during the month of January, which has an average low temperature of 54 degrees (F) and a mean temperature of 65 degrees (F).

Precipitation

Precipitation occurs during all seasons in Southwest Florida, although rainfall is more abundant during the summer months. June, July, and August account for an average of 9.76 inches of rainfall per month at RSW. The driest months are January, February, November, and December with an average of only 1.94 inches of rainfall during each of these months. The average annual rainfall for the RSW station is 58.6 inches (2011-2020, Source: National Center for Environmental Information).

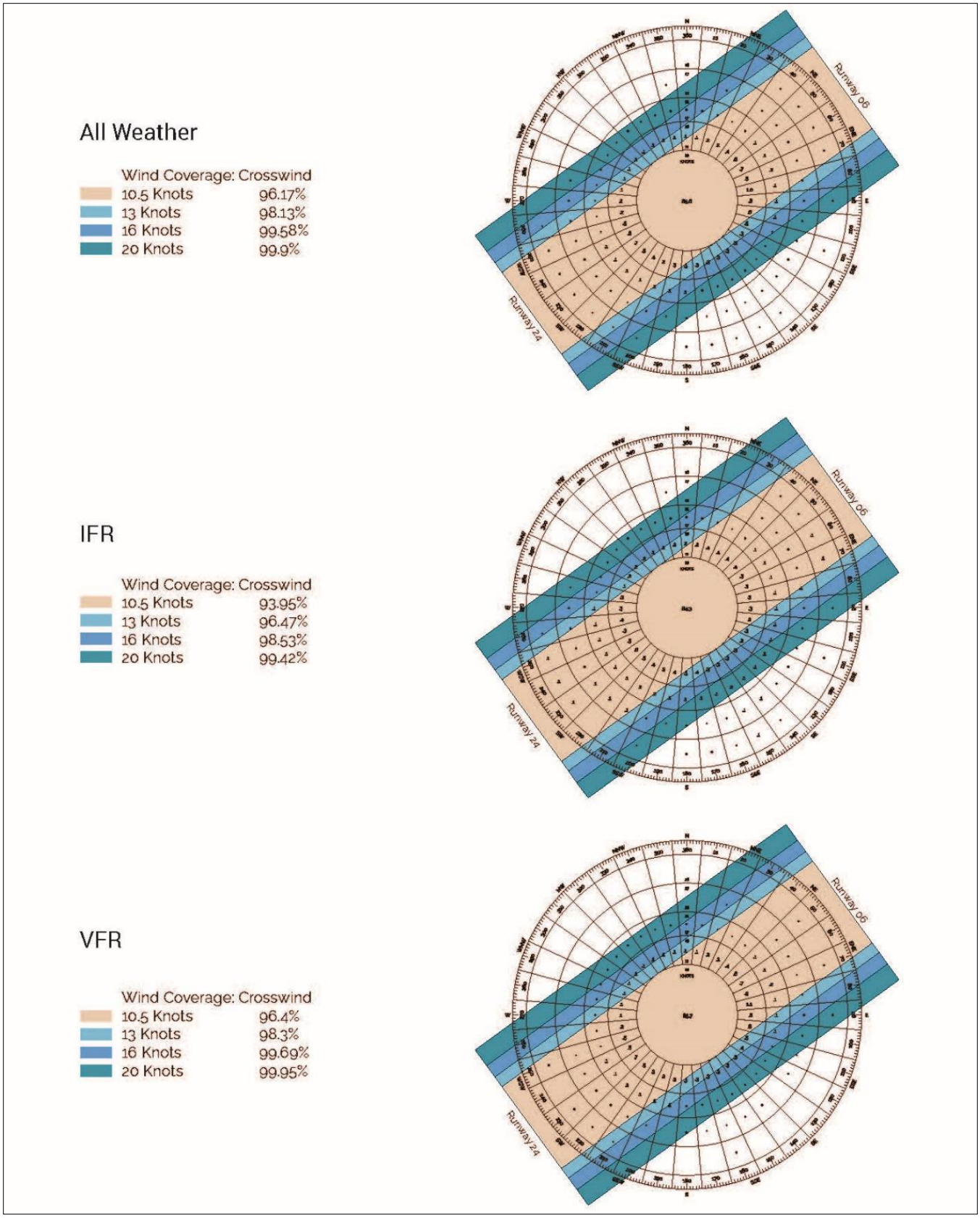
The amount of precipitation experienced by any airport impacts aircraft operations because of reduced braking action on wet runways and limited ceiling and visibility during storm conditions. About two-thirds of the annual precipitation in Fort Myers occurs during June through September. There are frequent long periods during the winter when only very light, or no rain falls. Most of the summer rain occurs during late afternoon or early evening thunderstorms. Although these showers seldom last long, they can yield large amounts of rain. During late summer and early fall, the Fort Myers area may experience rainfall from tropical depressions, tropical storms, or hurricanes nearby. These storms can result in heavy downpours. Totals of 6 to over 10 inches of rainfall within a 24-hour period have been recorded. Thunderstorms can occur at any time of the year but are typically infrequent from November to April. However, from June through September, thunderstorms occur every two out of three days on average. Heavy fog is rather infrequent and mainly confined to winter mornings.

Wind

Wind is a primary factor that influences the runway orientation and can subsequently affect runway capacity. Under ideal conditions, aircraft takeoffs and landings are determined by the prevailing winds and are conducted on the runway that provides the most head wind to operating aircraft. The Federal Aviation Administration (FAA) recommends that the runway orientation provided achieve 95% wind coverage. Wind coverage for a given runway is that percentage of time when the crosswind component is below an acceptable velocity. The crosswind component can be defined as the maximum permissible wind velocity occurring at right angles (or 90 degrees left or right) of the heading of a landing or departing aircraft. This is calculated by using a 10.5-knot (12-mile-per-hour [mph]) maximum crosswind component for the smaller, lighter aircraft, while a 13-knot (15 mph) and 16-knot (18 mph) maximum cross wind component is utilized for the larger jet aircraft. When carrying out an evaluation of this type, the FAA suggests that historical weather information for a period of at least five (ideally 10) years be used for determining runway wind coverage.

Using data provided by the National Climatic Data Center, wind conditions were analyzed for a 10-year period from 2011-2020. The orientation of Runway 6-24 provides 98.13% coverage at 13-knots under all weather conditions and 96.47% under IMC. For comparison purposes, more typical of air carrier airports, a crosswind component of 16-knots was analyzed and resulted in coverage of 99.58% for all weather conditions and 98.53% for Instrument Flight Rules (IFR) conditions.

Figure 2-3 graphically displays the All Weather Wind Rose for 10.5-, 13-, 15-, and 20-knot crosswind components based on combined weather conditions. Figure 2-3 also displays the Visual Flight Rules (VFR) Wind Rose and IFR Weather Wind Roses. Each segment of the wind rose represents a wind direction and speed grouping based on a percentage of the total recorded hourly observations for the Airport.



SOURCE: FAA Airport Data and Information Portal, RSW Weather Station 722108 1022-2020, data gathered 9/2021

Figure 2-3 RSW Wind Roses

2.3 Airfield

Airfield Overview

The airfield was developed in two phases (with several sub-phases), largely in line with the construction of the passenger terminal facilities:

- 1983-2005: North Terminal
- 2005-Present: Midfield Terminal

Unlike many commercial airports, the airfield has relatively few external constraints in the form of urban encroachment which allows the Airport to operate without displaced thresholds, declared distances, or modifications of standards to meet FAA design criteria with regards to runway and taxiway safety areas and centerline separation.

Table 2-2 FAA Airplane Design Group (ADG) Categories

ADG	Tail Height (ft.)	Wingspan (ft.)	Example Aircraft
Airplane Design Group (ADG) is defined by both wingspan and tail height of an aircraft.			
I	< 20'	< 49'	C-172, C-208
II	20' to < 30'	49' to < 79'	CRJ-200 E-145
III	30' to < 45'	79' to < 118'	E-170/175/190, B737, A320
IV	45' to < 60'	118' to < 171'	B757, B767, MD-11
V	60' to < 66'	171' to < 214'	A330, A340, A350, B747*,B787 , B777*
VI	66' to < 80'	214' to < 262'	B747-8*, A380

SOURCE: FAA, *Advisory Circular 150/5300-13A Change 1*, 2/26/2014

* Boeing 747-100, -200, -300, -400 aircraft are ADG-V;
Boeing 747-8i/f are ADG-VI;
Boeing 777-8, -9 are ADG-V aircraft on taxiways and aprons and are ADG-VI on runways due to folding wingtips

The FAA classifies aircraft by Airplane Design Group (ADG) based on a combination of wingspan and tail height as summarized in Table 2-2. During initial planning for RSW, larger aircraft design requirements were used to allow flexibility for larger ADG-IV and ADG-V aircraft to operate. The critical aircraft category used in the previous master plan and in subsequent studies was an ADG-V such as the Boeing 747 or Airbus A330/340. A more detailed discussion about the critical aircraft is provided in the "Facility Requirements" section of this plan.

Hot Spots and Airfield Geometry

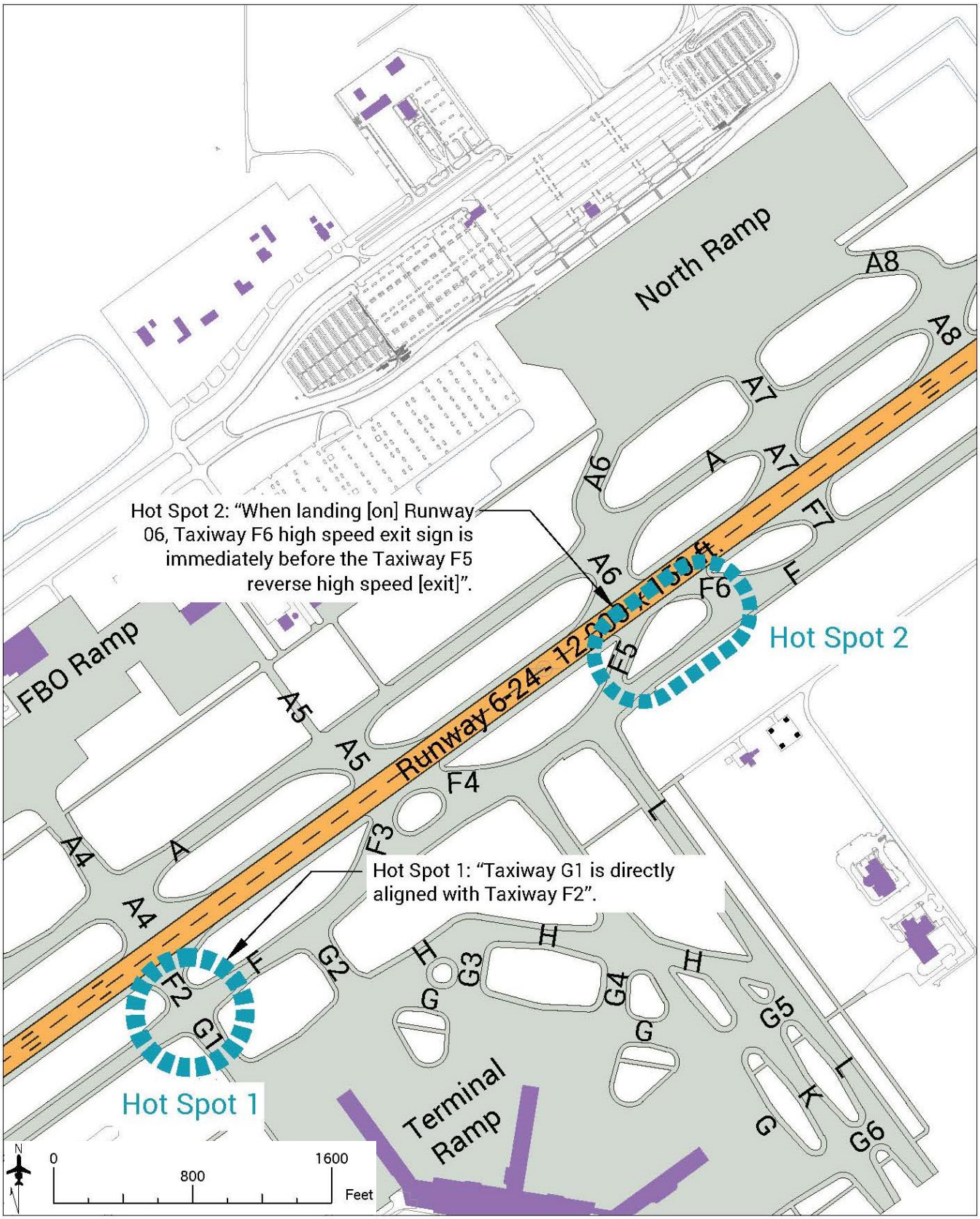
An increased focus has been placed in recent years on mitigating areas of concern on airfields where airfield geometry could potentially lead to an incident such as a runway incursion. In 2014, the FAA issued an update to Advisory Circular (AC) 150/5300-13A "Airport Design" which placed a strong focus on promoting design practices that reduced possibilities of runway incursions. Existing airfields were analyzed to identify areas of high concern that had a history of potential risk. The areas with the highest risk are called "Hot Spots" and are identified to pilots on Airport Diagrams. The FAA strongly encourages airports to mitigate any hot spots or any other areas of concern through design changes.

> "A hot spot is defined as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary."
>
> —FAA

There are currently two identified hot spots at RSW described[3] below and illustrated in Figure 2-4. Hot-spot 2 has been mitigated as part of an airside rehabilitation project, the hot spot mitigation portion was completed in July 2021 and the hot spot will be removed from the hot-spot list after FAA review:

- Hot Spot 1: "Taxiway G1 is directly aligned with Taxiway F2." This hot spot is in reference to avoiding direct access to or from an apron to a runway. It is recommended that access to the runway from an apron be indirect so that a pilot is forced to make a conscious maneuver prior to taxing onto a runway.

[3] SOURCE: FAA Airport Data and Information Portal



SOURCE: FAA, September 2021

Figure 2-4 RSW Hot Spots

- Hot Spot 2: "When landing [on] Runway 6, Taxiway F6 high-speed exit sign is immediately before the Taxiway F5 reverse high-speed [exit]." This hot spot references the position of a runway exit sign that precedes a reverse high-speed exit instead of the high-speed exit taxiway it is identifying. This could lead a pilot to attempt to use the reverse high-speed exit instead of the high-speed exit intended.

Efforts are underway at RSW to address these hot spots, and a more detailed discussion on the mitigation strategy is in the Alternatives Analysis section of this Plan.

Airfield Pavement Condition

FDOT conducts airfield inspections for Florida's public-use airports and publishes a Statewide Airfield Pavement Management Program (SAPMP) reports on a rotating three-year cycle. The last inspection conducted for RSW was in November 2018 and the results are published in the November 2019 SAPMP. The airport also conducted an in-depth pavement condition study in January 2018. Both the FDOT study and the airport-funded study can be found in Appendix A and Appendix B, respectively. It was determined that while the majority of the airfield was either considered to be in fair, satisfactory, or good condition; there were certain sections of the airfield that required rehabilitation. Figure 2-5 is a composite map showing the results of the FDOT November 2018 SAPMP inspection as well as pavement rehabilitations that have been conducted since the 2018 SAPMP inspection.

Runway

Currently, there is only one runway at RSW. Runway 6-24 is 12,000 feet long and 150 feet wide, constructed of asphalt concrete, and is grooved to help prevent aircraft hydroplaning when the runway is wet. The runway is equipped with high-intensity edge lights and centerline lights. In 1994, the runway was extended from 8,400 to 12,000 feet to accommodate the demand for larger, long-range aircraft associated with inter-continental and international-transatlantic flights. This 3,600-foot runway extension permitted aircraft originating at RSW to operate nonstop flights from Fort Myers, Florida to many destinations in Europe and Canada. Runway 6-24 is considered to be in good condition overall. The runway last underwent rehabilitation in 2007. Taxiway A was used as a temporary runway during the Runway 6-24 rehabilitation. The estimated gross pavement weight bearing strength for Runway 6-24 is shown in Table 2-3.

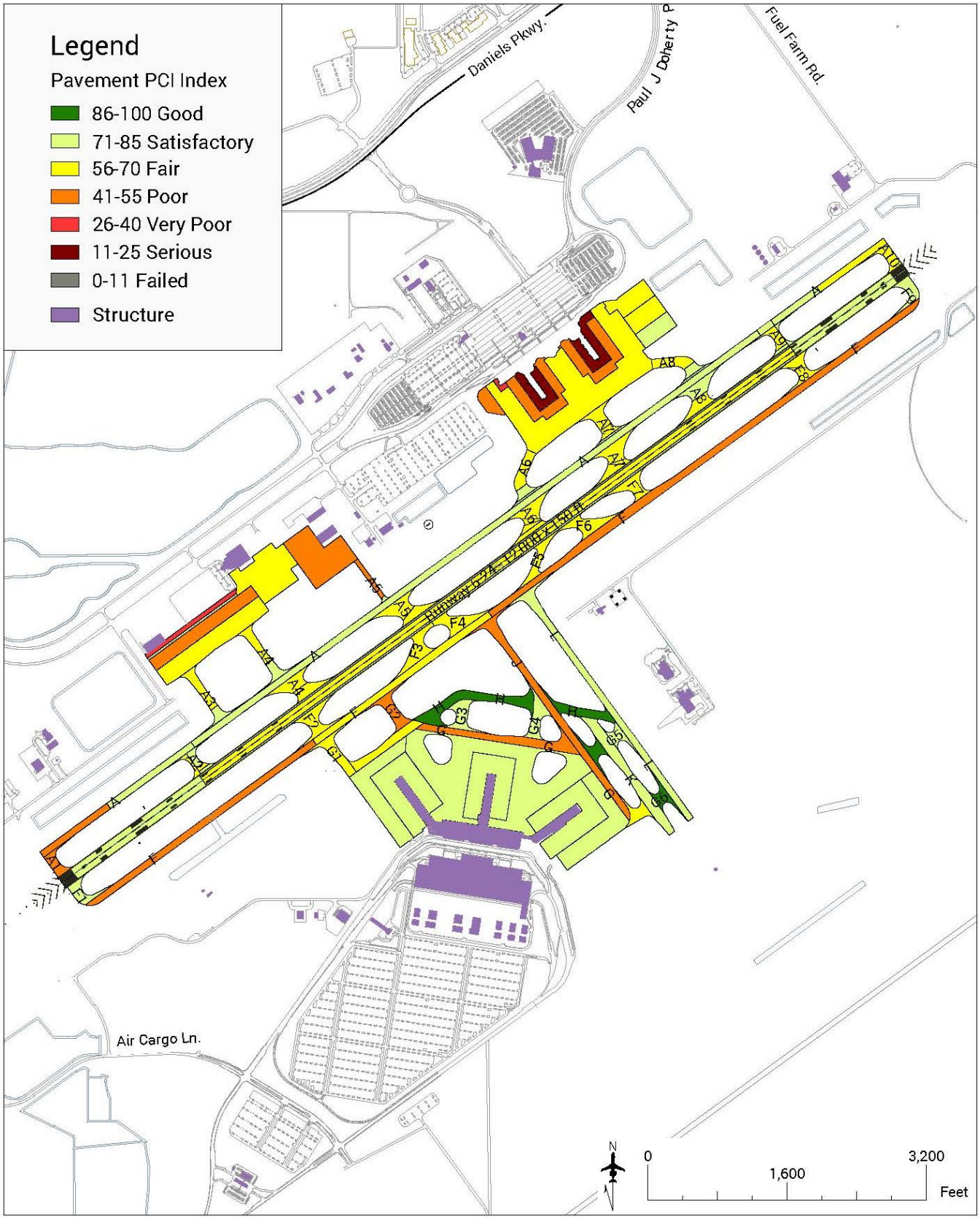
Table 2-3 Runway 6-24 Pavement Weight-Bearing Strength

Undercarriage Type	Weight (lbs.)
Single Wheel	120,000
Double Wheel	250,000
Double Tandem	538,000
Dual Double Tandem	1,045,000

SOURCE: FAA Airport Data and Information Portal

The pavement condition index (PCI) scores the condition of pavement at various locations on a 0-100 scale. The higher the score, the better the condition of the pavement. The last pavement condition inspection of Runway 6-24 was conducted in November 2018 with varying PCI findings ranging between 69 and 76 along the length of the runway. According to FAA standards, this range is mostly satisfactory with the exception of one area with a fair rating.

All Runway 6-24 markings and striping are considered to be in good condition and there are no close-in obstacles on either end of the runway.



SOURCE: FDOT, *District 1 Airfield Pavement Management Program Summary Report*, November 2019

Figure 2-5 Pavement PCI Index

Taxiways

Runway 6-24 is currently served by two full-length parallel taxiways. Prior to the opening of the Midfield Terminal, aircraft primarily used Taxiway A to access the runway and aircraft aprons (passenger terminal, cargo, and fixed-base operator [FBO]). A new south parallel taxiway, Taxiway F, was constructed, as well as crossfield taxiways and a terminal apron with access taxilanes to support the new terminal. Taxiway A now primarily serves cargo and general aviation traffic.

Most taxiways at RSW, whether from the first or the second phase of development, were designed with the capability to handle larger widebody aircraft (ADG-V) to allow for international trans-Atlantic or high-density domestic flights. Since the last master plan study, new aircraft have entered service that are primarily longer versions of existing aircraft. Though these aircraft share many of the same characteristics as the original shorter versions, their longer fuselage and wheelbase created ground maneuvering challenges with existing taxiway configuration standards. As a result, a new aircraft classification system was implemented in addition to the ADG classification for the purposes of taxiway design. The Taxiway Design Group (TDG) focuses on the landing gear configuration of aircraft to help determine taxiway pavement fillet requirements, each colored block in the table represents one section as reviewed by the FDOT consultant, their shapes and sizes can differ greatly.

There are seven categories of taxiways/taxilanes at RSW:

- Parallel: A parallel taxiway to a runway
- Runway connector: A taxiway that connects the runway to a parallel taxiway
- Highspeed exit: A taxiway used to exit a runway at a higher speed than a standard perpendicular runway connector. This type of exit helps reduce runway occupancy time.
- Apron connector: A taxiway/taxilane connecting a taxiway to an Apron
- Crossfield: A taxiway that is built to cross an airfield
- Terminal Area: A taxiway that serves to circulate aircraft in a terminal area
- Taxilane: Access to gates in the apron area in a non-movement area

Table 2-4 provides an inventory of the existing taxiway and taxilane system at RSW. The taxiway/taxilane type, aircraft (ADG/TDG) classification as well as the pavement condition are shown. Figure 2-5 provides a graphical depiction of pavement condition throughout the airfield.

PCI Index:	Failed	Serious	Very Poor	Poor	Fair	Satisfactory	Good

Table 2-4 RSW Taxiway Inventory

Taxiway	Width (ft.)	Length (ft.)	Type	ADG	TDG	Pavement Condition (Multiple sections)				
A	75	11,715	Parallel	V	5					
A1	102	269	Runway Connector	V	NS					
A2	105	325	Runway Connector	V	NS					
A3	78	765	Apron Connector	V	5					
A4	277	398	Highspeed exit	V	NS					
A4	78	765	Apron Connector	V	5					
A5	238	384	Highspeed exit	V	NS					

Table 2-4 RSW Taxiway Inventory

Taxiway	Width (ft.)	Length (ft.)	Type	ADG	TDG	Pavement Condition (Multiple sections)
A5	50	757	Apron Connector	III	NS	
A6	195	384	Highspeed exit	V	NS	
A6	104	625	Apron Connector	V	NS	
A7	200	384	Highspeed exit	V	NS	
A7	150	434	Apron Connector	V	NS	
A8	195	384	Highspeed exit	V	NS	
A8	105	625	Apron Connector	V	NS	
A9	105	325	Runway Connector	V	NS	
A10	103	325	Runway Connector	V	NS	
F	75	11,715	Parallel	V	NS	
F1	117	307	Runway Connector	V	5	
F2	130	330	Runway Connector	V	NS	
F3	116	660	Highspeed exit	V	NS	
F4	120	660	Highspeed exit	V	NS	
F5	75	660	Highspeed exit	V	NS	
F6	124	630	Highspeed exit	V	NS	
F7	125	325	Runway Connector	V	NS	
F8	130	325	Runway Connector	V	NS	
F9	400	325	Runway Connector	V	NS	
G	75	3,815	Terminal Area	V	5	
G1	104	640	Apron Connector	V	5	
G1		925	Taxilane			
G2	100	640	Apron Connector	V	5	
G2		670	Taxilane			
G3	127	580	Apron Connector	V	5	
G3		590	Taxilane			
G4	107	720	Apron Connector	V	5	
G4		590	Taxilane			
G5	125	680	Apron Connector	V	5	
G5		650	Taxilane			
G6	125	680	Apron Connector	V	5	
G6		820	Taxilane			
H	101	2,465	Apron Connector	V	5	
J	79	1,890	Crossfield	V	5	
K	82	1,780	Crossfield	V	5	
L	75	3,265	Crossfield	V	5	

SOURCES: ESA Analysis, 2004 Master Plan Update, FDOT SAPMP Report District 1, LCPA

NOTES:

Taxiway widths are measured at the narrowest point for each taxiway. Taxiway widths are based on taxiway edge markings and do not include shoulders.

"NS" referenced in TDG means that the taxiway intersections do not meet current FAA standards for TDG fillets described in AC 150/5300-13A

Taxilanes do not have TDG fillet standards

Shoulders are 25' except portions of TW G, G1, G2, G3, G4, G5, H, J, K, and L, which are between 25' and 40'.

The colored blocks represent the PCI index for each pavement section surveyed by the FDOT consultant. Each section varies in size and configuration.

Aprons

There are five aprons used for aircraft parking at RSW:

- Terminal Apron: The Terminal apron entered service in 2005 at the same time as the Midfield Terminal.
- Cargo Apron: The cargo ramp entered service in 1990 and was expanded in 2004. Both taxiway entrances are capable of handling ADG-V type aircraft.
- FBO Apron: The Fixed Base Operator (FBO) ramp was built in 2000 and used by PrivateSky, the sole FBO operator at RSW.
- General Aviation Apron: The General Aviation ramp was part of the original airport built in 1983 and served as the FBO ramp until the new FBO ramp was constructed in 2000.
- North Apron: The North Apron was originally used as terminal apron when the airport opened in 1983. Since the opening of the new Midfield Terminal in 2005, the North Ramp is used as parking for cargo carriers and irregular operations. The footprint of the original terminal remains unpaved and the paved area immediately adjacent is no longer used and is inaccessible to aircraft due to fencing.

Table 2-5 inventories the apron areas in more detail. Figure 2-5 provides a graphical depiction of pavement condition.

PCI Index:	Failed	Serious	Very Poor	Poor	Fair	Satisfactory	Good

Table 2-5 RSW Apron Inventory

Apron	Area (square feet)	Pavement Type	Pavement Condition (Multiple sections)
Terminal Ramp	2,592,924	AC/PCC	
Cargo Ramp	620,219	AAC/AC/PCC	
GA Ramp	306,945	AC	
North Ramp	1,811,062	AC/PCC	
FBO Ramp	309375	AC	

SOURCES: ESA Analysis, 2004 Master Plan Update, FDOT SAPMP Report District 1, LCPA

AAC: Asphalt overlay over asphalt concrete, AC: Asphalt concrete, PCC: Portland cement concrete

The colored blocks represent the PCI index for each pavement section surveyed by the FDOT consultant. Each section varies in size and configuration.

2.4 Navigational Aids

Airport navigational aids (NAVAIDs) are equipment that support the safe and efficient movement of aircraft on- and in the vicinity of an airport. For the purposes of this discussion, the NAVAIDs are classified as visual aids, electronic aids, or meteorological aids. The NAVAIDs at RSW are depicted in Figure 2-6 and summarized in Table 2-6.

Visual Approach Aids

Airport Rotating Beacon

An airport rotating beacon provides long-range visual identification of an airport by projecting alternating green and white lights on a rotating head spaced 180 degrees apart. The RSW airport rotating beacon is located atop the ATCT cab. The ATCT and rotating beacon were under construction at the time this document was written. The rotating beacon will become operational in 2022.

Table 2-6 Navigational Aids

Item	Runway 6	Runway 24	Airport Wide	Associated Instrument Procedure
VISUAL APPROACH AIDS				
Airport Rotating Beacon[a]	—	—	Yes	—
Windcone	Yes	Yes	—	—
Segmented Circle/Windcone	—	—	Yes	—
Precision Approach Path Indicator (PAPI)	Yes	Yes	—	—
Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR)	Yes	No	—	—
Runway End Identifier Lights (REILs)	No	Yes	—	—
ELECTRONIC AIDS				
Glideslope (GS)	Yes	No	—	Runway 6 ILS
Localizer (LOC)	Yes	No	—	Runway 6 ILS, RNAV (GPS)
Middle Marker (MM)	Yes	No	—	Runway 6 ILS
Compass Locator at the ILS Outer Marker (LOM)	Yes	No	—	Runway 6 ILS
Runway Visual Range (RVR)	Yes – Touchdown	Yes – Rollout	—	Runway 6 ILS, RNAV (GPS) Runway 24 VOR/DME
VHF Omnidirectional Range with Collocated Tactical Air Navigation (VORTAC)	—	—	Yes	Runway 24 VOR/DME
Airport Surveillance Radar (ASR)	—	—	Yes	—
Remote Transmitter/Receiver (RTR)[b]	—	—	Yes	—
METEOROLOGICAL AIDS				
Automated Surface Observing System (ASOS)	—	—	Yes	—
Low Level Windshear Alert System (LLWAS)	—	—	Yes	—

SOURCE: FAA 5010 Master Record; RS&H, 2021

a. Replacement beacon is under construction. Anticipated operational date: 2022
b. New RTR facility under construction near the future ATCT. Anticipated operational date: 2022

Windcones and Segmented Circle

A windcone provides quick visual reference to the current general wind conditions (speed and direction) at an airport. A segmented circle is paired with an airport's primary windcone and provides visual indication of current airport operations such as active landing direction and traffic patterns. The RSW segmented circle and primary windcone are lighted and are located northeast of the Taxiway A/Taxiway A5 intersection, near the Runway 6-24 midpoint. Each runway end is also equipped with supplemental windcones (without segmented circle), generally aligned with the runway aiming point markings. The Runway 6 windcone is located north of Taxiway A, and the Runway 24 windcone is located south of Taxiway F.

Precision Approach Path Indicator

A PAPI is a light array that provides visual indication of an aircraft's vertical position relative to the designated glidepath while on approach. The PAPI system consists of four equally spaced lights located near the runway aiming point markings. Both runway ends are equipped with PAPI systems. The Runway 6 PAPI is located on the north side of the runway, 1,350 feet from the runway end and the Runway 24 PAPI is located south of the runway, 1,355 feet from the runway end.

Medium Intensity Approach Light System with Runway Alignment Indicator Lights

MALSR is a type of Approach Lighting System positioned symmetrically along the extended runway centerline. Runway 6 is equipped with a MALSR. The MALSR configuration is a 2,400-foot system with light stations every 200 feet. The first 1,400 feet of the system is composed of steady burning white lights and the last 1,000 feet includes sequenced flashing runway alignment indicator lights. The system pairs with the ILS to help provide visual reference of the runway environment in low visibility conditions and help achieve the visibility minimums associated with a Category I (CAT-I) ILS.

Runway End Identifier Lights

Runway End Identifier Lights (REILs) consist of flashing white lights installed at the approach end of the runway. The lights enable pilots to visually identify the runway end while the aircraft is on approach. The Runway 24 end is equipped with REILs.

Electronic NAVAIDs

Global Positioning System/Wide Area Augmentation System

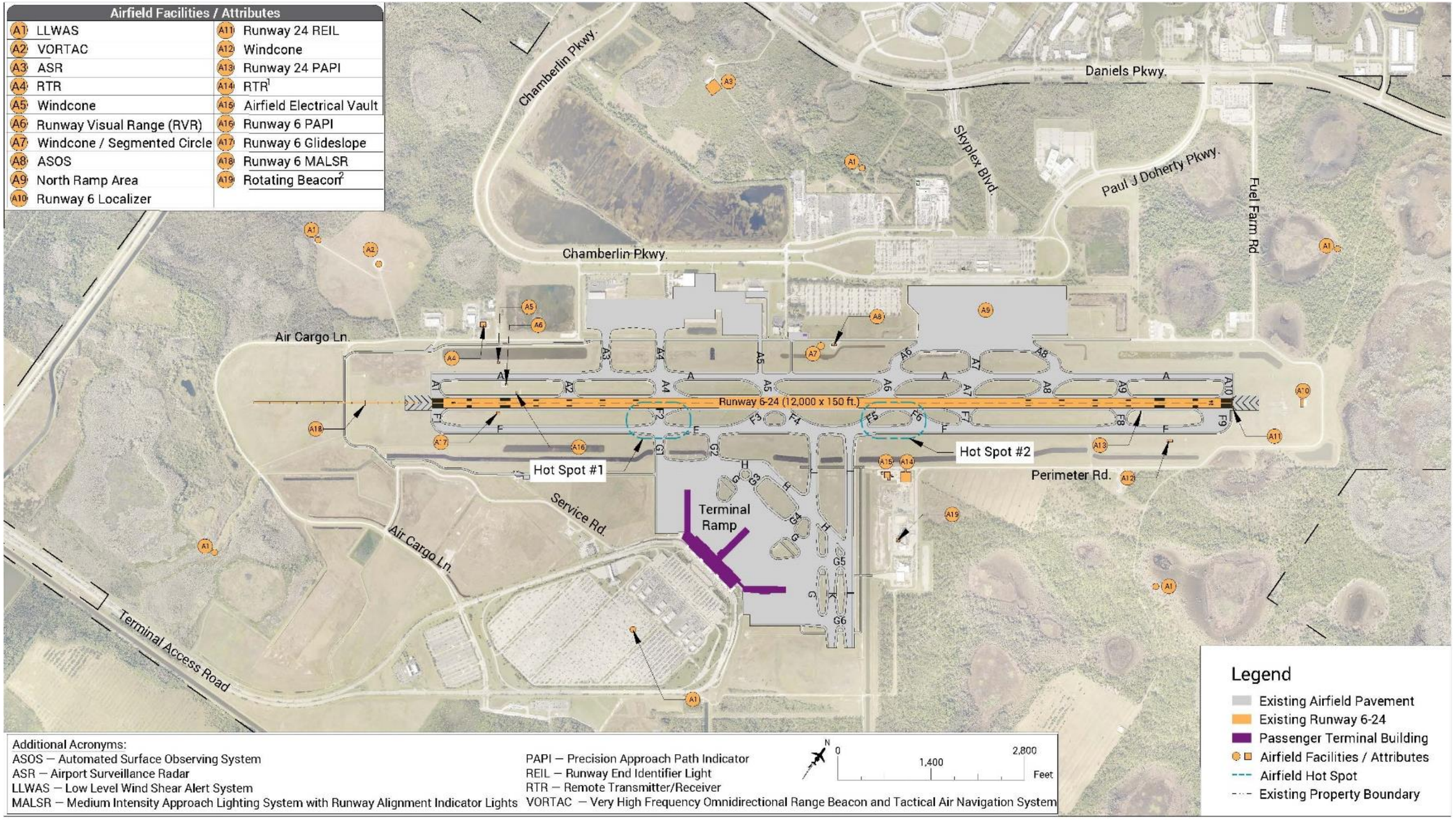
Global Positioning System (GPS) is a constellation of satellites used to identify aircraft location and velocity on a continual basis. This capability can serve aircraft while on approach to land using Area Navigation (RNAV) procedures based on input data from the GPS. RNAV instrument approach procedures are in place for approaches to Runway 6 and Runway 24. These RNAV instrument approach procedures replace less accurate procedures using ground-based Non-Directional Beacons (NDB). Both RNAV approaches are LPV approaches (Localizer Performance with Vertical guidance) which take advantage of the refined accuracy of Wide Area Augmentation System (WAAS).

The WAAS is a navigation system that provides horizontal and vertical guidance to aircraft on all phases of flight—including enroute navigation, airport departures, and airport arrivals. The WAAS provides a greater level of accuracy (similar to Category I ILS capabilities) to aircraft by supplementing data received from GPS satellites with location and velocity information of the aircraft relative to surveyed, ground-based equipment. The ground-based equipment—referred to as Wide Area Reference Stations—are widely spaced around the National Airspace System (NAS). There are no WAAS Area Reference Stations on or in the immediate vicinity of the Airport.

Instrument Landing System

Runway 6 is equipped with an Instrument Landing System (ILS). The Runway 6 ILS includes four elements—a glideslope (GS), localizer (LOC), Middle Marker, and Compass Locator at the ILS Outer Marker (LOM).

- A GS provides pilots with electronic guidance of descent gradient and vertical positioning relative to the runway end elevation while the aircraft is on approach. The Runway 6 GS antenna is located near the Runway 6 aiming point markings, on the north side of the Runway.
- A LOC provides pilots with electronic guidance of lateral positioning relative to the runway centerline while the aircraft is on approach. The Runway 6 LOC is located on the extended runway centerline, 1,040 feet beyond the Runway 24 end. The Runway 6 LOC is collocated with Distance Measuring Equipment (DME). DME is a Very-High Frequency (VHF) antenna that provides pilots with a range measurement of distance to the DME facility. The DME antenna is used to augment and enhance the capabilities of the Runway 6 LOC approach.
- Marker beacons are upward facing directive antennas that indicate known points along the approach path. The Middle Marker indicates the point along the approach where the pilot should be able to visually identify the runway environment. If visual identification is not made by this point, pilots should execute a missed approach. The Middle Marker beacon is located 2,600 feet from the Runway 6 end.



SOURCE: Lee County Port Authority, *Airport Layout Plan*, February 2011

Figure 2-6 Navaids

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- The LOM indicates the point along the approach path at which an aircraft should intercept the glideslope. The LOM is located approximately 4.3 nautical miles from the Runway 6 end.

Runway Visual Range

The Runway Visual Range (RVR) measures atmospheric visibility near the runway end and informs pilots of the range of visual distance that can be observed near the runway end. RSW is equipped with an RVR system located adjacent to the Runway 6 GS antenna on the north side of the Runway. This equipment serves dual purpose as the Runway 6 Touchdown RVR to enable the CAT-I ILS and as the Runway 24 Rollout RVR for supplemental visibility reporting.

VHF Omnidirectional Range with Collocated Tactical Air Navigation

A VHF Omnidirectional Range with Collocated Tactical Air (VORTAC) is a radio antenna that provides pilots directional information relative to the facility. It is the collocation of equipment typically used by civilian aircraft—VHF Omnidirectional Range (VOR)—and navigational equipment typically used by military aircraft—Tactical Air Navigation (TACAN). The TACAN includes DME capabilities which is used to augment and enhance the capabilities of the Runway 6 VOR approach and provides azimuth information to pilots. The RSW VORTAC is a low altitude facility that primarily provides non-precision instrument approach capability for RSW and neighboring airports. The VORTAC is located 2,260 feet northwest of the Runway 6 end.

Airport Surveillance Radar

The Airport Surveillance Radar (ASR) is used to detect the location, range, and elevation of aircraft within the terminal airspace (60 nautical miles) of an airport. The radar equipment allows for air traffic controllers to track aircraft 360 degrees around the facility to facilitate aircraft sequencing and maintain adequate airspace separation. RSW is equipped with an ASR Series 11 (ASR-11) antenna, which is located in a wooded area within the non-aviation support designated area north of Runway 6-24, approximately 1.05 nautical miles north of the Runway 6 endpoint.

Remote Transmitter/Receiver

A Remote Transmitter/Receiver (RTR) site is an air-to-ground radio communications system that relays transmissions from aircraft to the ATCT. RTR sites are unmanned and usually comprise several communications towers. There are two RTR sites at RSW. The original RTR site is located approximately 1,420 feet north of the Runway 6 end, adjacent to the airport field maintenance facility. The second RTR is located east of Taxiway L, proximate to the future ATCT, and will become operational in 2022. The new RTR facility includes an equipment shed and four antenna towers.

Meteorological Aids

Automated Surface Observing System

The Automated Surface Observing System (ASOS) is a collection of meteorological instruments that measure and automatically report conditions to pilots and air traffic controllers. The RSW ASOS is located northeast of the Taxiway A/Taxiway A5 intersection, adjacent to the segmented circle.

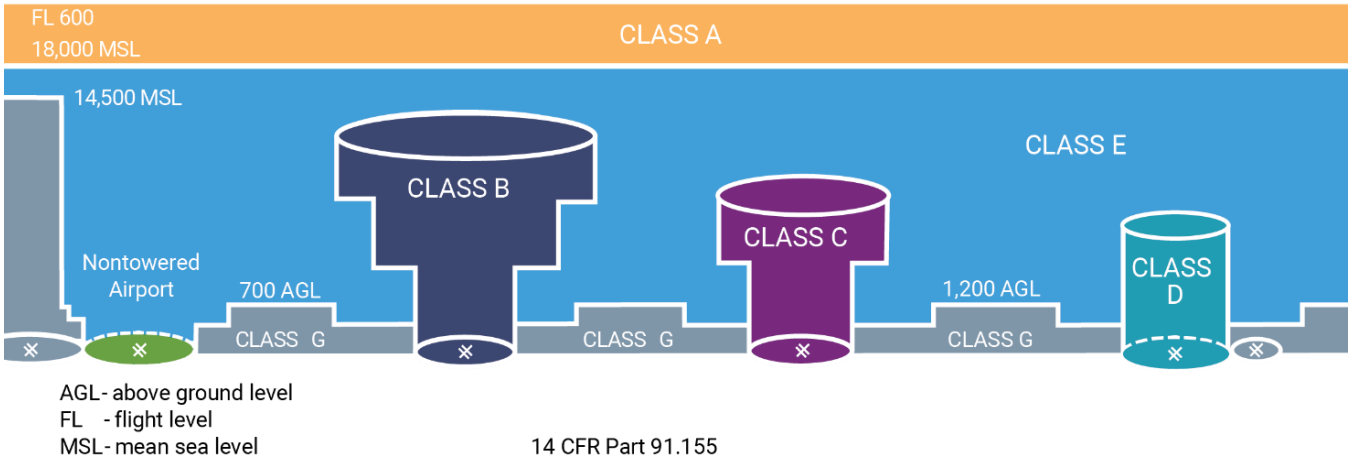
Low-Level Windshear Alert System

The Low-Level Windshear Alert System (LLWAS) is composed of anemometer stations that measure wind speed and direction. The LLWAS system at RSW is composed of six stations around the airport that automatically generate warnings when windshear or microburst conditions are detected.

2.5 Airspace Configuration/Approach Procedures

Airspace Classifications

The FAA has six classifications of airspace under the NAS. These classifications, which are designated as Class A, B, C, D, E, and G, are critical to the safety of all flights and to the efficient operation of all airport traffic control facilities. Based on the level of activity and type of operations, airports receive either a classification of B, C, D or E. Class A airspace only exists above 18,000 feet and Class G airspace is designated as uncontrolled airspace. **Figure 2-7** is a visual representation of the classification of the NAS.



SOURCE: FAA

Figure 2-7 National Airspace System Classification

Because RSW has an active FAA ATCT, is serviced by a radar approach control facility, and has a significant number of IFR operations, the RSW airspace has been designated Class C. In Class C airspace, pilots must establish and maintain two-way radio communications with the ATCT at that airport, prior to entering the airspace. In addition, the aircraft must be equipped with a Mode C transponder and operable ADS-B Out equipment that automatically sends GPS location, altitude, ground speed and other data to air traffic control ground stations and other aircraft. In Class C airspace, aircraft operating under VFR are typically separated from the IFR aircraft and VFR aircraft must still see and avoid other VFR aircraft.

Although Class C airspace can be tailored to meet individual airport needs, the airspace usually consists of two columns of airspace. The Class C airspace at RSW contains no modifications to the standard airspace configuration. The inner column of airspace encompasses an area that has a 5-nautical-mile radius from the airport and extends from the surface up to 4,000 feet above the airport elevation. The outer column of airspace encompasses an area that has a 10-nautical-mile radius but begins at 1,200 feet above the airport elevation and extends up to 4,000 feet above the airport elevation. The simplest way to visualize Class C airspace is to imagine a two-layer wedding cake turned upside down and centered on the airport.

RSW is in close proximity to the Class D airspace which surrounds FMY. The Class D airspace at FMY encompasses a single column of airspace, 5 nautical miles in radius from the surface up to 1,200 feet above the airport elevation. Class D airspace requires each pilot to establish two-way radio communication with the ATCT prior to entering the airspace and to maintain this communication while in the airspace. Although considered controlled airspace, Class D airspace does not provide any separation service to VFR aircraft. When the ATCT is closed, the airspace at the airport is designated as Class G, or uncontrolled airspace.

FMY also has a small portion of Class E designated airspace. Typically, this classification of airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace and is used to provide additional safety to aircraft transiting to and from the Airport. The small portion of Class E airspace at FMY provides additional controlled airspace for precision and non-precision instrument approaches to Runway 5 and the non-precision instrument approach to Runway 13. These approaches are controlled by the FAA facilities at RSW. The FMY Class E airspace has a floor beginning at 700 feet and extends up to 17,999 feet. Only a small portion of Class E airspace is required because most of the area surrounding FMY is encompassed by the RSW Class C airspace.

Figure 2-8 has been taken from the Miami Sectional Aeronautical Chart to illustrate the airspace relationships in the Fort Myers area. The two large magenta circles represent the inner and outer columns of Class C airspace for RSW. FMY falls between these two circles. This limits the ceiling for FMY's Class D airspace to 1,200 feet. At 1,200 feet, the Class D meets the overlying RSW Class C airspace that is more restrictive.

Published Instrument Approach Procedures

There are four published instrument approach procedures and one published visual approach at RSW. The primary difference between a precision and a non-precision instrument approach is that the precision instrument approaches provide some form of electronic glide slope or glide path information for vertical guidance. It is important to note that the minimum approach descent altitudes expressed in the following paragraphs are for Category C aircraft (those aircraft with approach speeds near 140 knots) as these are the most common aircraft utilizing RSW.

At RSW, the Category I ILS system for Runway 6 is one of four classifications of ILS approach systems in use at airports today (Table 2-7). The following delineates the typical approach minimums associated with the category of ILS approaches. These minimums may be adjusted higher based on specific circumstances at each individual airport.

Table 2-7 Instrument Landing System (ILS)

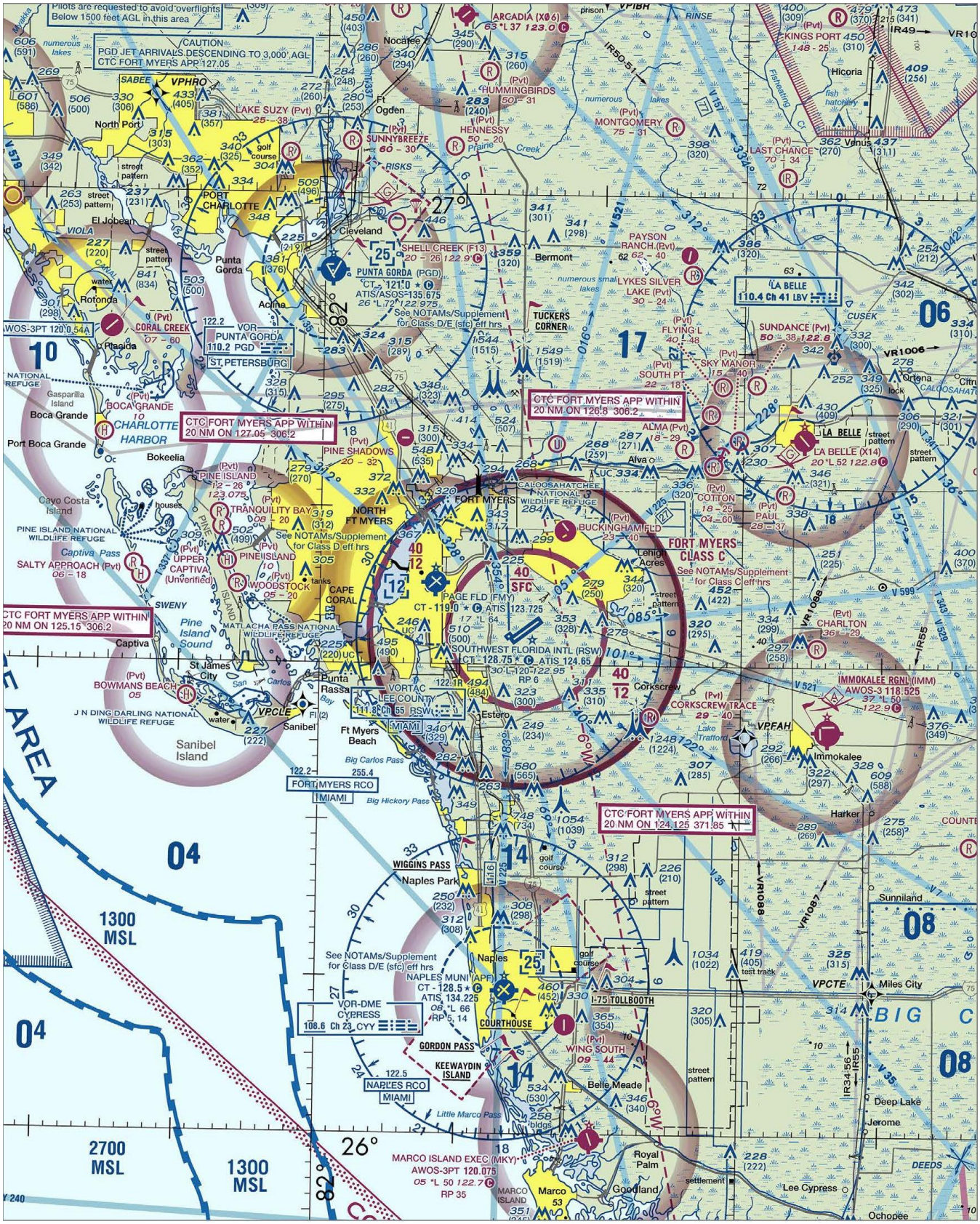
Category	Decision Height (ft.)	Runway Visual Range (RVR) (ft.)
I	> 200	> 1,800, or visibility > 2,600
II	100-200	> 1,000
IIIA	< 100	> 700
IIIB	< 50	150-700

SOURCE: FAA

The Runway 6 Category I ILS provides instrument rated pilots with a decision height of 227 feet MSL and visibility minimums of 1/3 mile (RVR 1,800). The approach also provides a straight-in non-precision approach utilizing the localizer only with a minimum descent altitude (similar to the precision approach decision height) of 380 feet MSL and visibility minimums of 0.5 miles. There is also a circle to land approach (visual approach) that provides a decision height of 500 feet MSL and visibility minimums of 1 mile for aircraft with approach speeds up to 140 knots. The approach plates can be found in Appendix C, Procedures and Charts.

A VOR straight-in instrument approach is available to Runway 24. This approach is created by the Lee County VORTAC and requires DME or TACAN equipment. This straight-in approach provides pilots with a minimum descent altitude of 400 feet MSL and visibility minimums of 1 mile. The approach also provides a circle to land approach with a 500 feet minimum descent altitude and a 1-mile minimum visibility. This approach plate can be found in Appendix C, Procedures and Charts.

The "Bay Visual" procedure provides a visual approach to Runway 6. The approach notes that "Radar Required" indicating that the crew can expect to be provided radar navigational guidance while transitioning through segments of the approach. This procedure is not valid at night. This approach plate can be found in Appendix C, Procedures and Charts.



SOURCE: FAA. September 3, 2021

Figure 2-8 Miami Sectional Chart (Focus RSW)

Both Runway 6 and Runway 24 have non-precision GPS approaches. These approaches have a minimum descent altitude of between 330 feet MSL to 280 feet MSL for Runways 6 and 24 respectively. Runway 6 has a 2,400 Runway Visual Range, while Runway 24 has a 0.75-mile visibility minimum. Both approaches have a circle-to-land approach with a minimum descent altitude of 500 feet MSL with a minimum visibility requirement of 1 mile. The GPS approach plates can be found in Appendix C, Procedures and Charts.

Standard Instrument Departures

A Standard Instrument Departure (SID) is an ATCT coded departure procedure that has been established at certain airports to simplify clearance delivery procedures. SIDs are carried out by the pilot without vectors from ATCT and are also established to assist pilots conducting IFR flight in avoiding obstacles during climb out to Minimum Enroute Altitudes (MEA). There are four SIDs at RSW (including one RNAV). These SIDs are listed below.

- ALICO SEVEN
- SCUBY SEVEN
- CSHEL SIX (RNAV)
- MOOKY SIX

Plates for these departures can be found in Appendix C, Procedures and Charts.

Standard Terminal Arrival Procedures

A Standard Terminal Arrival (STAR) is an ATCT coded IFR arrival route established for application to arriving IFR aircraft destined for certain airports. The purpose of a STAR is to simplify clearance delivery and facilitate transition between enroute and instrument approach procedures. There are three STAR procedures available for use at RSW:

- JOSFF FIVE
- SHFTY FIVE (RNAV)
- TYNEE TWO (RNAV)

Plates for these procedures can be found in Appendix C, Procedures and Charts.

2.6 Terminal Facilities

The terminal building completed in 2005 is a four-story 449,428-square-foot structure:

- Level 1 is approximately 204,910 square feet. and contains baggage claim, baggage make-up, Transportation Security Administration (TSA) checked baggage inspection systems (CBIS) and checked baggage reconciliation area (CBRA) (15,560 square feet), TSA offices (11.055 square feet) and miscellaneous building services and utility areas. There are 14 baggage claim devices in 36,026 square feet and 12 baggage make-up devices in 93,320 square feet.
- Level 2 is approximately 169,906 square feet and contains ticketing (112 check-in positions and 52 self-check-in kiosks), concessions, and miscellaneous building services. The connection to the concourses is at this level.
- Level 3 is the airport administration offices and a mechanical mezzanine totaling 61,468 square feet.
- Level 4 is a small mechanical area totaling 13,144 square feet.

There are three existing three-story concourses comprising a total of 371,570 square feet including 66,215 square feet of hold rooms:

- Concourse B:
  - First Level: 68,806 square feet
  - Second Level: 77,122 square feet
  - Third Level: 6,985 square feet
  - **Total: 152,913 square feet**
- Concourse C:
  - First Level: 41,405 square feet
  - Second Level: 53,540 square feet
  - Third Level: 1,985 square feet
  - **Total: 96,930 square feet**
- Concourse D:
  - First Level: 49,410 square feet
  - Second Level: 65,362 square feet
  - Third Level: 6,955 square feet
  - **Total: 121,727 square feet**

Each concourse contains the following:

- Level 1 contains airline operation spaces, concession storage, mechanical rooms, and other miscellaneous operations spaces.
- Level 1 also contains an FIS (only concourse B) capable of handling one international flight an hour consisting of 30,465 square feet). There is also a passenger holding area for international flights diverted to Fort Meyers (typically scheduled to land at MIA). The existing FIS processes passengers through a two-step process and contains 6 passport control stations. The facility can process Global Entry passengers, but the number of kiosks is indeterminate at this date as the existing FIS is not in use as of the writing of this report.
- Level 2 contains a TSA checkpoint at the entry to each concourse with 4 security lanes at each concourse, with 9 gates on each concourse along with concessions and other public building services.
- Level 3 contains mechanical and building maintenance spaces.
- Concourse B contains nine contact gates accommodating up to ADG IV aircraft. Three of the gates can accommodate aircraft up to ADG V. Two of the gates in Concourse B can service international flights with a sterile corridor to an FIS on the ground level. Concourse C contains nine contact gates. Six gates can accommodate aircraft up to ADG IV and three gates can accommodate up to ADG V aircraft. Concourse D contains nine contact gates and 1 commuter ramp with 1 gate ADG V capable.

The existing structure is comprised of cast-in-place concrete columns, beams, and a floor system with open web steel roof joists (both sloped top chord and flat parallel chord type) with either a curved metal deck roof system or a low slope roof system. The facility is designed to withstand 167 mph winds and is classified as a Group 3 hurricane facility. The facility is not slated for use as an emergency shelter during hurricanes.

Infill walls are either cast-in-place concrete or concrete masonry units with a stucco finish system or a glazed storefront system. Exterior doors are both hollow metal doors in hollow metal frames and upward acting roll-up doors. The existing facility is fully sprinklered and designed to meet the Florida Energy Conservation Code.

The terminal building will be undergoing a renovation and expansion as part of the Phase 1 Terminal Expansion Project. The primary driver behind the expansion is to consolidate the security checkpoint and increase the number of concessions available to passengers. No gates will be lost or gained in this expansion and renovation. The terminal will be expanded northward toward Concourse C. Central to this expansion project is the consolidation of the TSA Security Checkpoints from three separate checkpoints at the entry to each concourse to one 18-lane checkpoint in the terminal building consisting of 47,500 square feet. The expansion also will increase the existing concessions and concessions storage area of 38,479 by approximately 24,706 square feet with an open food court style venue to a total program concessions square footage of 63,185.

Other areas of the terminal will be expanded to provide additional offices, an airline passenger lounge, exiting stairs, vertical circulation and utility spaces. In total, the terminal expansion project includes 96,450 square feet of expansion and 164,805 square feet of renovation. Construction is expected to begin in October 2021 and will be completed in early 2025. The expansion and renovation of the terminal encompasses the following approximate square footages:

1st Level (Arrivals)	
Expansion	10,487 square feet
Renovation	46,759 square feet
1st Level Total	**57,246 square feet**

2nd Level (Departures)	
Expansion	56,911 square feet (includes international lounge)
Renovation	110,434 square feet
2nd Level Total	**167,345 square feet**

3rd Level (Administration & Mechanical)	
Expansion	23,232 square feet
Renovation	25,845 square feet
3rd Level Total	**49,077 square feet**

4th Level (Mechanical)	
Expansion	5,820 square feet (includes removal of open double-height space above the security screening checkpoint [SSCP])
Renovation	3,124 square feet
4th Level Total	**8,944 square feet**

Total All Levels	
Expansion	**96,449 square feet**
Renovation	**186,163 square feet**
Terminal Expansion Total	**282,612 square feet**

When the expansion and renovations are completed, the terminal and concourses will be a total of 917,448 square feet.

Post Terminal Expansion Total All Levels	
Terminal	**545,878 square feet**
Concourse B	**152,913 square feet**
Concourse C	**96,930 square feet**
Concourse D	**121,727 square feet**
Terminal Expansion Total:	**917,448 square feet**

The detailed breakdown of spaces is listed in in **Table 2-8**.

Table 2-8 Terminal Functional Areas

Function	Level 1	Level 2	Level 3	Level 4	TOTAL	Percentage
AIRLINE						
Check-In Hall	—	24,337	—	—	24,337	3%
Holdroom	2,467	66,215	—	—	68,682	7%
Baggage Handling System	93,230	3,608	—	—	96,838	11%
Domestic Baggage Claim	36,026	—	—	—	36,026	4%
Airline Support	16,964	11,617	—	—	28,581	3%
DEPARTMENT OF HOMELAND SECURITY						
Security Screening Checkpoint	—	47,489	—	—	47,489	5%
Checked Baggage Inspection System	15,561	—	—	—	15,561	2%
TSA Support	11,056	4,234	—	—	15,290	2%
Customs and Border Protection (CBP)	30,466	184	—	—	30,650	3%
International Baggage Claim	5,190	—	—	—	5,190	1%
COMMERCIAL PROGRAM						
Concessions	161	62,252	—	—	62,413	7%
Concessions Support	14,763	156	—	—	14,919	2%
AIRPORT SUPPORT AND SERVICES						
Airport and Amenities	44,175	1,520	44,430	—	90,125	10%
Restrooms	12,915	15,795	—	—	28,710	3%
Building Services	23,835	4,576	49,971	18,081	96,463	11%
Circulation	56,083	168,569	2,306	498	227,456	25%
Structure/Walls/Void	12,126	12,289	3,918	385	28,718	3%
Total	**375,018**	**422,841**	**100,625**	**18,964**	**917,448**	**100%**

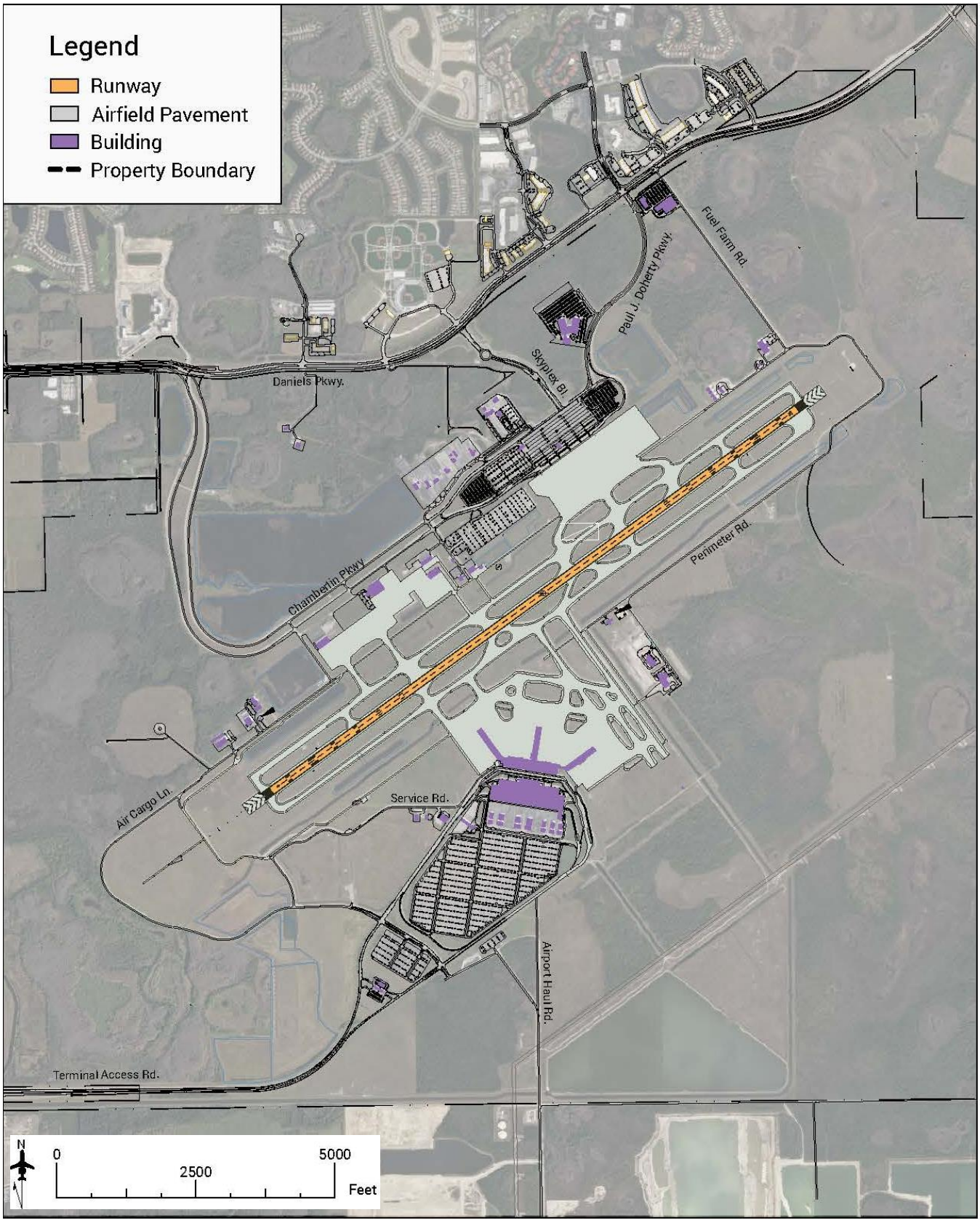
2.7 Landside Facilities

The following section summarizes the ground access roadway system and commercial vehicle areas that serve RSW, such as on-airport access roads, circulation and service roads, parking and curb fronts. This section also summarizes existing rental car facilities and associated activity. Several studies have been completed for RSW in recent years and were reviewed as part of this Master Plan Update process. Information from these prior studies is sourced for reference, these studies can be found in Appendix D, Landside Studies.

Landside and Non-Aviation Area Roads

The RSW internal roadway network provides access to landside facilities including the terminals, parking lots, rental car facilities and LCPA support facilities. Primary access to RSW is provided from the west by I-75, via Exits 128 (Alico Road) and 131 (Daniels Parkway). Access is also provided from the east by State Road 82. Daniels Parkway and Terminal Access Road are the primary on-airport access roads that provide ingress and egress to the landside facilities from the north and south.

The following sections outline the defining characteristics for each roadway in the internal RSW network. The roadways at the Airport are depicted on **Figure 2-9**.



SOURCE: ESA, September 28, 2021

Figure 2-9 Roadways

Access Roads

Chamberlin Parkway

Chamberlin Parkway is a 2.7-mile, four-lane divided roadway that connects the internal RSW roadway network to Daniels Parkway to the northwest. Chamberlin Parkway also intersects Paul J. Doherty Parkway and Skyplex Boulevard. This roadway, located north of the airfield, circulates the perimeter of the overflow parking facility and provides access to various LCPA support facilities. According to the 2017 RSW Pavement Rehabilitation Evaluation, the roadway consists of two 12-foot lanes with 4-foot paved shoulders along the outside of the travel lanes and a 2-foot paved shoulder along the inside of the travel lanes. The roadway utilizes an open swale drainage system and has posted speed limits of 25, 35, and 45 mph.

Terminal Access Road

Terminal Access Road circulates the terminal facility and provides passengers with access to the departures and arrivals curb front. The Terminal Access Road system at RSW is a one-way "return loop" type system and runs in a counterclockwise direction. Originating at the I-75 access ramp, southwest of the terminal building, this roadway narrows from four to two travel lanes in the terminal area and provides access to both long-term and short-term parking.

Skyplex Boulevard

Skyplex Boulevard is a four-lane divided roadway that connects Daniels Parkway to Chamberlin Parkway. This newly constructed connector road extends 0.5 miles and includes a roundabout, sidewalks, and bike lanes.

Circulation and Service Roads

Air Cargo Lane

Air Cargo Lane is a two-lane undivided roadway that follows the southern perimeter of the airfield and terminates south of the long-term parking lot. As referenced in the 2017 RSW Pavement Rehabilitation Evaluation, this corridor has 12-foot travel lanes and flush unpaved shoulders. North of the airfield, Air Cargo Lane provides access to the Aircraft Observation Area, LCPA Vehicle Maintenance Facility and other LCPA support facilities. The roadway also provides access to several lots on airport property including the Employee Parking Lot, the Transportation Network Companies (TNCs) Ground Transportation Staging Area and the Commercial Ground Transportation Staging Lot. The posted speed limit is 35 mph.

Paul J. Doherty Parkway

According to the 2017 RSW Pavement Rehabilitation Evaluation, Paul J. Doherty Parkway is an existing four-lane divided suburban roadway that connects the internal RSW Chamberlin Loop to Daniels Parkway to the north. The corridor is approximately 0.7 miles long and consists of two 12-foot travel lanes in both directions separated by F-curb and a 22-foot median. The roadway includes 5-foot paved shoulders, an open swale drainage system, and posted speed limit of 40 mph.

Fuel Farm Road

Fuel Farm Road is a two-lane undivided connector roadway in the northeast quadrant of the Airport property. The roadway is 0.8 miles in length and extends from Daniels Parkway to Perimeter Road. Fuel Farm Road provides access to the LSG Sky Chefs facility. The roadway consists of two 12-foot travel lanes with flush unpaved shoulders.

Perimeter Road

Perimeter Road is an approximate 5.1-mile, two-lane undivided roadway that circulates the entire perimeter of the airfield. The roadway intersects several taxiways and provides airside access to aircraft maintenance facilities, fixed based operators, and various LCPA support facilities. The roadway consists of two 12-foot travel lanes with flush unpaved shoulders.

Service Road

Service Road is a two-lane undivided roadway that consists of two 12-foot travel lanes with flush unpaved shoulders. It is located south of the airfield, between the runway and the long-term parking lot. It originates at the intersection with Perimeter Road and terminates at the terminal building. Service Road provides access to the rental car fuel storage area and is approximately 1.1 miles in length.

Rental Car Lane

Rental Car Lane is an existing two-lane two-way rural roadway that serves as an access to the rental car agencies on the north side of Chamberlin Parkway. Rental Car Lane spans approximately 0.5 miles, beginning at Regional Lane to the southwest and terminating at Chamberlin Parkway to the east. The roadway consists of two 12-foot travel lanes, a 3-foot paved shoulder on the northern most lane, and flush unpaved shoulder on the southern lane.

Regional Lane

Regional Lane is a two-lane undivided roadway just south of the overflow parking lot. The roadway is approximately 0.25 miles in length and connects Chamberlin Parkway and Perimeter Road. Regional Lane provides access to the RSW Control Tower.

Terminal Curb Fronts

Upper-Level Curb Front/Roadway

As referenced in the 2016 RSW Curb Front Roadway Assessment, the upper-level curb front serves departures for all three Concourses (B, C, and D). The upper level is divided into six zones, Zone 1 through Zone 6, each serving different airlines. Two pedestrian crosswalks (located within Zones 2 and 5) connect the departures curb front with the parking garage and ground transportation curb front on the lower level (via stairs and an elevator).

The traffic lanes on the upper level are divided into two functions. The curb front lanes, or inside lanes closest to the terminal, are used for passenger loading and unloading. The outside lanes, or exit lanes, are used for orbiting and circulating traffic throughout the Airport. Two lanes approach the upper-level curb front and expand into five lanes, comprised of two curbing lanes and three thru traffic lanes. The two southernmost lanes are designated with pavement markings as thru lanes. The curb front lanes merge as vehicles exit the curb front. The posted speed limit through the upper-level curb front is 10 mph and lane widths are 12 feet wide.

Lower-Level Curb Front/Roadway

The lower-level curb front serves as the arrivals level of RSW. The lower level at the terminal is divided in six (6) zones, Zone 1 through Zone 6, each serving different airlines. Each of the zones is serviced by a pedestrian crosswalk that connects the arrivals curb front with the ground transportation curb front and with the parking garage.

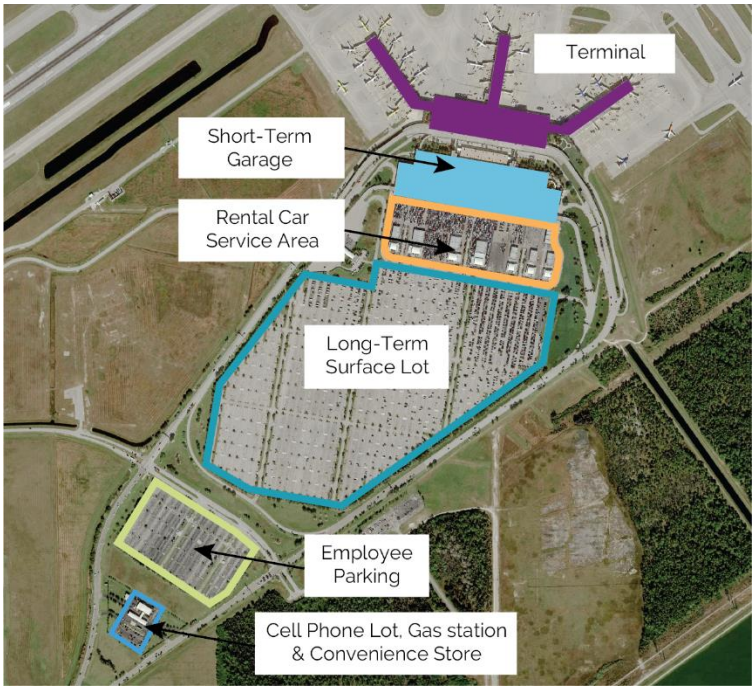
Based on the 2016 RSW Curb Front Roadway Assessment, two lanes approach the lower-level curb front and expand into four lanes, comprised of three curbing lanes and one lane designated with pavement markings as the exit lane. The three curbing lanes merge as vehicles exit the curb front. The posted speed limit through the lower-level curb front is 10 mph. The location of the speed limit sign is approximately 200 feet before the two lanes entering the curb front lanes begin to diverge. Lane widths are 12 feet wide.

Parking and Rental Cars

Cell Phone Lot, Convenience Store and Gas Station

The Cell Phone Lot is located on the airport property at Airport Service Plaza, between the inbound Terminal Access Road and the outbound Terminal Access Road. It is adjacent to a 7-Eleven/Mobil gas station. This facility provides free temporary parking for vehicles of users picking up passengers who communicate via cellphone once their plane has landed. The Cell Phone Lot consists of 85 marked parking spaces, 2 of which are reserved for Americans with Disabilities Act (ADA) accessible parking.

Airport Service Plaza offers many services to Cell Phone Lot users such as gas, restrooms, a connected fast-food restaurant, additional parking, air for tires and a car wash. The convenience store is approximately 6,000 square feet with 20 fueling positions. **Figure 2-10** shows the location of the cell phone lot, gas station and convenience store. The convenience store has of 36 marked parking spaces, 2 of which are reserved for Americans with Disabilities Act (ADA) accessible parking.

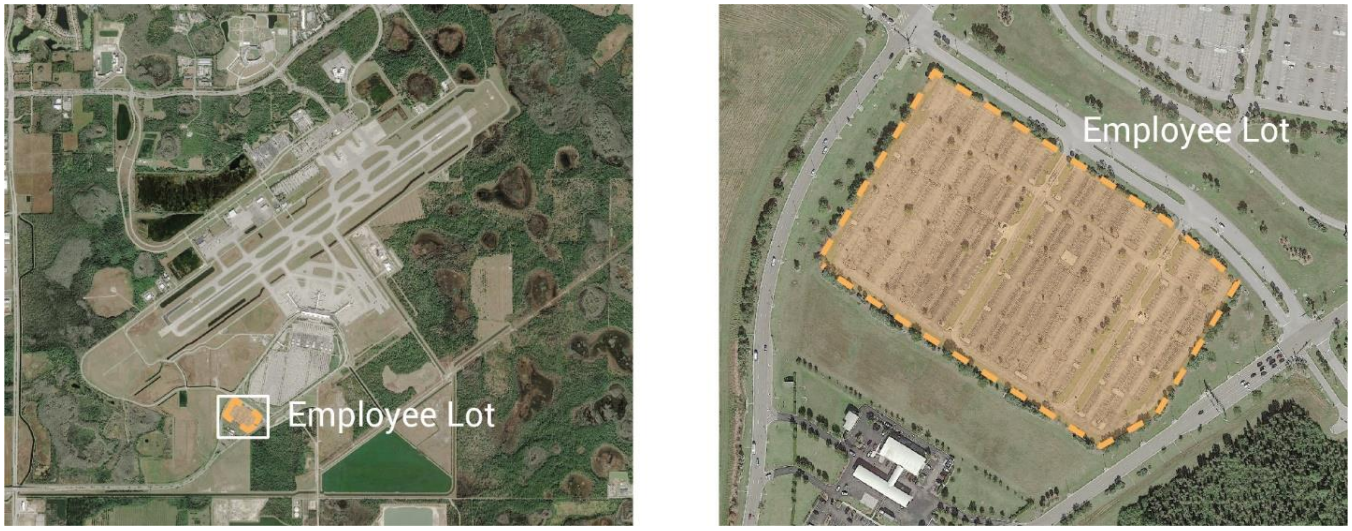


SOURCE: Kimley-Horn, *RSW Existing Parking Facility Capacity Evaluation*, 2018 [Appendix D-01]

Figure 2-10 Parking Facilities

Employee Parking (Surface Lot)

The RSW Employee Parking Lot is located southwest of the airport terminal between the long-term parking lot and the 7-Eleven/Mobil gas station. The employee lot can be accessed from Gate 21 and Gate 22 via Air Cargo Lane. Based on the 2017 RSW Employee Parking Facility Capacity Assessment (Appendix D-01), both access locations to the parking lot are gate controlled. This requires badged employees to scan their badge to access the lot and requires unbadged employees to scan a parking lot access card to enter and exit the lot. There are 1,297 spaces within the employee parking lot, 23 of which are reserved for Americans with Disabilities Act (ADA) accessible parking. The employee lot is estimated to comprise 540,000 square feet **Figure 2-11** illustrates the location of the Employee Parking Lot at RSW.



SOURCE: Kimley-Horn, *RSW Employee Parking Facility Capacity Assessment*, 2017 [Appendix D-02]

Figure 2-11 Employee Parking Lot Location

Public Parking, Short-Term Parking (Garage)

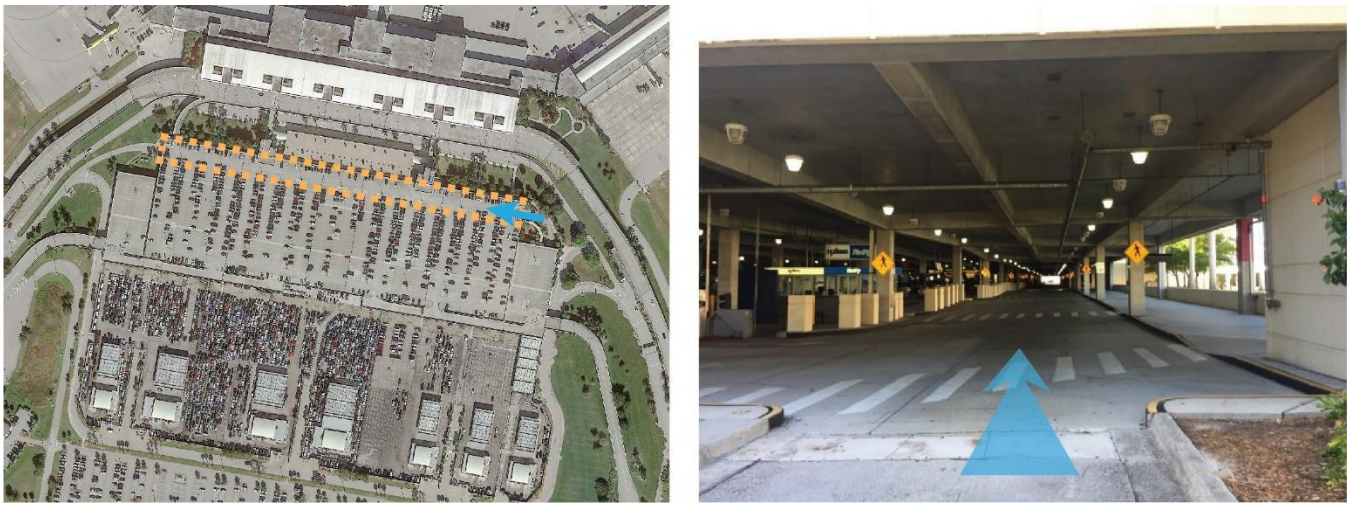
The Short-term Parking facility is a three-level parking garage, located directly across from the terminal entrance. Based on the 2018 RSW Existing Parking Facility Capacity Evaluation, the rental car center is located on the ground floor of the garage, with the second and third levels available for public parking. The majority of the second level of the garage provides covered parking and the third level (rooftop level) is uncovered. There are two access points to short-term parking. One access point is via two lanes from the entry plaza, located off Terminal Access Road and the other, secondary access point is via one lane from the upper-level roadway. There is one exit location in the short-term parking area which has two lanes and is located on the second level. From this exit point, users are funneled to the exit plaza. This facility is open 24 hours a day, 7 days a week, and does not require reservations to use. Figure 2-11 illustrates the location of the short-term parking facility.

There is a total of 2,432 public parking spaces in the short-term parking garage with 1,273 parking spaces on the second level and 1,159 parking spaces on the third/rooftop level.

Ground Level Exit Lane

On the ground level of the short-term parking garage, one lane is used by vehicles exiting the rental car center. Based on the 2018 Garage Ground Level Curb Front Assessment (Appendix D-03), the roadway is undivided, unstriped, and provides one direction of travel to exit the garage from east to west. The travel lane is approximately 32 feet wide and a total of 1,075 feet in length. This ground level exit lane is only accessible by vehicles exiting one of the six rental car facility exit points located within the garage. The rental car gated exit points provide direct access to the exit lane of the garage for passengers renting vehicles. No other private vehicle or commercial access to the ground level exit lane is available. Along the travel lane, there are 10 crosswalk locations spaced between 60 and 120 feet apart, each with ADA ramps.

Figure 2-12 provides a location map and photo of the ground level exit lane curb from the east end, looking west.



SOURCE: Kimley-Horn, *RSW Garage Ground Level Curb Front Assessment*, 2018 [Appendix D-03]

Figure 2-12 Ground-Level Exit Lane of the Short-Term Parking Garage

Public Parking, Long-Term (Surface Lot)

The long-term parking facility is a surface parking lot located to the south of the short-term garage and separated by the rental car service center. A complimentary shuttle service is offered for passengers between the terminal and parking lot. This facility is open 24 hours a day, 7 days a week, and does not require reservations to use. Figure 2-10 illustrates the location of the long-term parking facility.

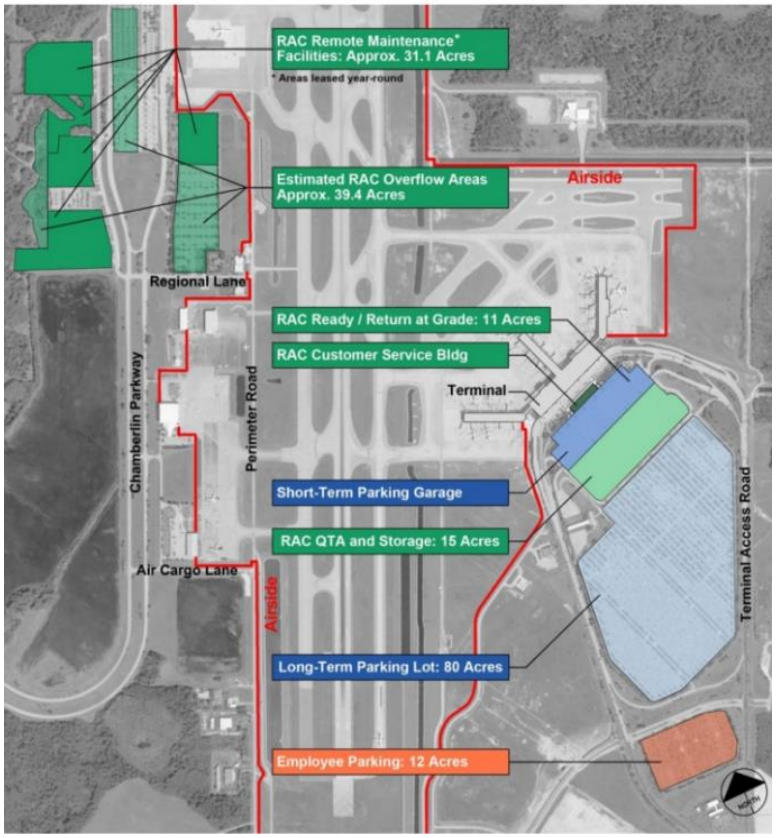
Based on the 2019 RSW Existing Parking Facility Capacity Evaluation (Appendix D-01), the long-term parking lot is divided into four sections: Red, Blue, Green, and Gold. A total of 8,762 spaces are available for public parking in the long-term surface parking lot.

Rental Car Facilities

The existing rental car service and storage facility operates in close proximity to the location of the original, now demolished, terminal north of Runway 6-24. These facilities are approximately 3.5 miles from the airport terminal. Rental car agencies shuttle cars between the existing service and storage facility and the terminal. Based on the 2019 Rental Car & Public Parking Sizing Analysis (Appendix D-04), there are nine brands and three brand families using the rental car facilities. The existing remote facilities are undersized for current operations and are in need of repair and/or replacement. Figure 2-13 shows the locations of the existing rental car facilities. Table 2-9 shows the existing supply of the rental car vehicle spaces and facilities.

Ready/Return

The existing rental car ready/return area is located on the ground level of the three-story parking structure and has pedestrian path connectivity to the terminal building. The ready/return area with the adjacent customer service building provides rental car patrons with convenient access to rental cars. Based on the 2019 Rental Car & Public Parking Sizing Analysis, the existing ready/return area has a capacity of 1,200 stalls. Figure 2-14 and Figure 2-15 show each rental car brand family's secured location and market share.



SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

Figure 2-13 Existing Rental Car Facilities

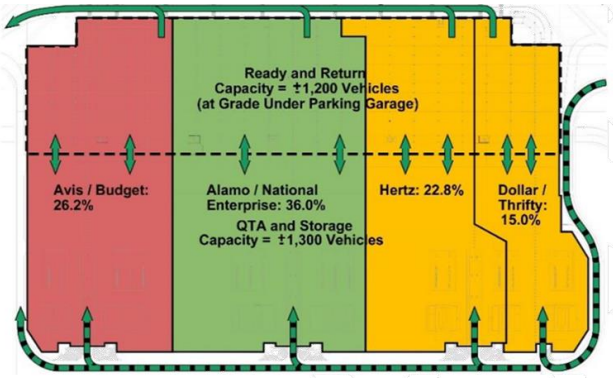
Table 2-9 Rental Car Existing Facilities

Rental Car Facility	Existing Supply
R/R &QTA[a]	
Ready/Return Spaces	1,200
Fueling Positions	68
Wash Bays	17
Vehicle Stacking Spaces	1,300
CUSTOMER SERVICE[a]	
Service Counters	66
REMOTE SERVICE[b]	
Maintenance Bays	*Not Specified*
Wash Bays	*Not Specified*
Leased Vehicle Storage Spaces	3,500[c]
Overflow Spaces	4,500
Total All Vehicle Storage Spaces	**10,500[d]**

SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

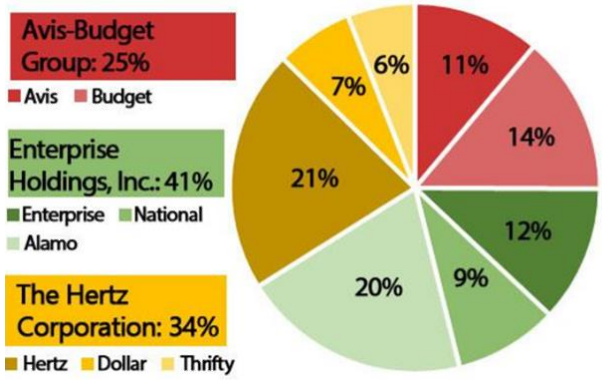
NOTES:

a. Midfield Terminal Complex Parking Garage Construction Package, September 2002
b. Estimated via Google Earth Pro.
c. Includes remote areas leased year-round, does not include overflow lots
d. Total of R/R spaces, vehicle stacking spaces, and remote spaces



SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

Figure 2-14 Ready/Return and QTA/Storage



SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

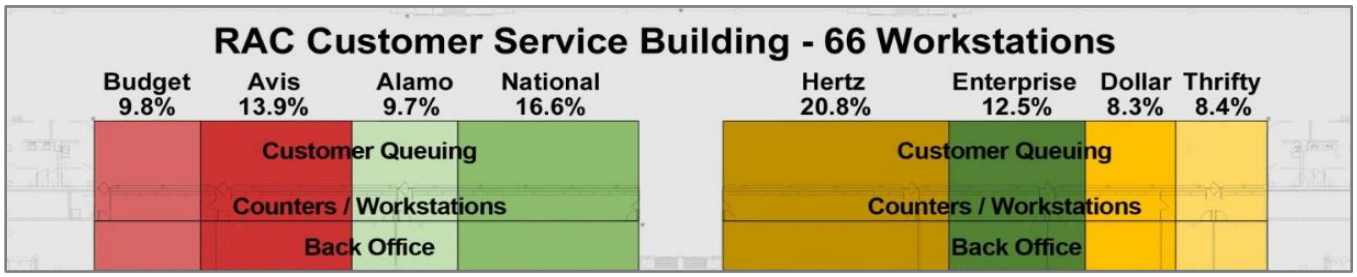
Figure 2-15 Rental Car Agency Market Share

Quick Turn-Around Facility

The Quick Turn-Around Facility (QTA) and vehicle stacking area is located at grade and contiguous with the ready/return area. Similar to the ready/return area, the QTA space is allocated based on market share. The continuity between the ready/return area and the QTA makes it possible for each brand family to shuttle rental cars without leaving the secured area.

Customer Service Building

The Rental Car Customer Service Building (CSB) is located adjacent to and contiguous with the ready/return area. The customer service building contains customer service counters and a waiting area with seating and restrooms. Unlike the ready/return area, the customer service counters are allocated by brand instead of brand family, as shown in **Figure 2-16**.



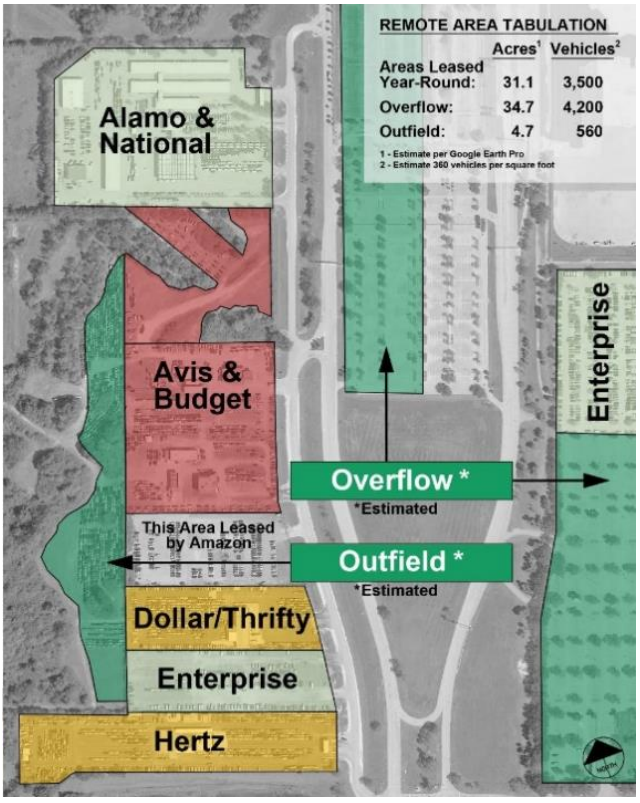
SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

Figure 2-16 Rental Car Customer Service Building

Maintenance and Storage Facilities

The existing maintenance and storage area is currently located north of the terminal area in the vicinity of the former main terminal, which was demolished in 2006. Based on the 2019 Rental Car & Public Parking Sizing Analysis (Appendix D-04), the existing storage area contains space for vehicles to park when space at the new Midfield Terminal is fully occupied. Because the current storage area was the former rental car facility for the old terminal (when customers were shuttled), it contains all the components of a fully operational facility including car wash bays, maintenance bays, fueling, and office space.

During periods of high demand, the leased area does not meet the storage needs of the RSW rental car market and, as a result, the rental car agencies park and store vehicles in areas outside of the lease area (paved areas near the old main terminal site), as shown in **Figure 2-17**.



SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 [Appendix D-04]

Figure 2-17 Remote Service and Storage Sites

2.8 Aviation Support Facilities

The airport support facilities include the general aviation (GA) and fixed base operator (FBO) facilities; airport maintenance buildings; air cargo and airline freight facilities; aircraft fuel storage facilities; airline catering facilities; aircraft maintenance, repair and overhaul (MRO) facilities; Airport Traffic Control Tower (ATCT); and Aircraft Rescue & Fire Fighting Station. Many of these facilities are located on the north side of the airfield, as illustrated on **Figure 2-18**. The aviation support area is accessible via Chamberlin Parkway, which connects to Daniels Parkway (State Road 876).

General Aviation and Fixed Base Operator Facilities

PrivateSky Aviation operates the only FBO facility at the airport. In 2001, a two-story FBO terminal building (**S5**) encompassing 57,000 square feet was constructed to replace the original 8,000-square-foot FBO terminal that has since been demolished. The FBO/GA apron provides approximately 34,000 square yards for aircraft parking and ground support activities. According to the SAPMP, dated November 2019 (Appendix A), the PCI rating for the FBO terminal apron is 74, or satisfactory. The FBO/GA apron area abuts the main air cargo apron and the GA aircraft hangar apron. Taxiway A4 provides direct access to the FBO/GA aircraft apron, with secondary access via Taxiway A5. Landside access to the FBO terminal is provided via two-lane roadway PrivateSky Way, which connects to Chamberlin Parkway. The automobile parking includes 106 spaces.

Private Sky Aviation Hangar and FBO/GA Apron
SOURCE: Lee County Airport Authority

The 26,000-square-foot PrivateSky Aviation GA aircraft hangar (**S6**) built in 1996 is located east of the FBO terminal and south of the passenger airline freight forwarding facility. It is used for aircraft maintenance services and aircraft storage. There is no landside access to the GA aircraft hangar. The associated GA aircraft apron encompasses 35,000 square yards and provides 25 to 30 aircraft tiedown spaces for single-engine and multi-engine aircraft. The PCI rating for the GA aircraft apron is 57, or fair. Taxiway A5 provides direct access to the GA aircraft apron, with secondary access via Taxiway A4.

Lee County Port Authority Airport Maintenance Department Facilities

The Airport Maintenance Department operates three maintenance facilities: the Airport Maintenance Warehouse and Vehicle Maintenance facilities, which are located north of the Runway 6 end (**S1** and **S2**), and the Airfield and Landside Maintenance facility (**S11**) located north of Taxiway A5, adjacent to the existing ATCT. The two facilities north of the Runway 6 end are accessible via two-lane Air Cargo Lane, which connects to Chamberlin Parkway. The Airfield and Landside Maintenance facility is accessible via Regional Lane.

Airport Maintenance Warehouse

The 12,000-square-foot Airport Maintenance Warehouse (**S2**) was constructed in 1989 and is used for grounds maintenance operations and storage as the primary airport maintenance warehouse. The facility provides four drive-through vehicle bays with an additional 4,800 square feet of detached covered vehicle and equipment storage. Parking consists of 28 automobile spaces.

Vehicle Maintenance Facility and Sign Shop

The second Airport Maintenance Facility (S1) comprises an Airport Maintenance building and detached covered vehicle and equipment storage. The 16,300-square-foot maintenance building is used primarily for airport vehicle and equipment maintenance, welding and fabrication operations, and signage development. The building also includes administrative spaces including 12 offices, two open workspaces, one conference room, and one training room. The 7,800 square feet of detached covered vehicle and equipment storage includes three drive-through vehicle bays. Parking consists of 36 automobile spaces. The facility was expanded by 6,000 square feet and existing spaces were renovated in February 2020. Airfield and Landside Maintenance Facility

The third 13,100-square-foot Airport Maintenance Facility (**S11**) was formerly the original ARFF station built in 1983. The Airport Maintenance Department repurposed the ARFF station into a maintenance facility used for airfield and landside maintenance operations. The facility includes eight apparatus bays and the parking consists of 38 automobile spaces.

Air Cargo Facilities

The air cargo facilities include two buildings, two aircraft aprons, landside air cargo loading/unloading infrastructure and automobile parking.

Main Air Cargo Facility

The main cargo building (**S3**) consists of approximately 24,000 square feet of floor space and is occupied by two tenants: Federal Express (FedEx) and United Parcel Service (UPS). The facility is accessible via PrivateSky Way, which connects to Chamberlin Parkway. The landside facility supports pick-up and delivery operations via 10 cargo truck docking stations. Parking consists of 50 automobile parking spaces, six double trailer truck parking spaces and six 53-foot trailer truck parking spaces.

The ramp adjacent to the cargo building provides approximately 69,000 square yards for on-apron cargo loading and unloading operations, the staging of trailers and other Ground Support Equipment (GSE), and aircraft parking. The air cargo apron area includes six aircraft parking positions served by Taxiways A3 and A4, with direct access to parallel Taxiway A. The air cargo area apron underwent a pavement rehabilitation which was completed in 2021, the condition of the pavement is good. The Airport initiated a Cargo Ramp Rehabilitation project in October 2020. The project includes rehabilitation of the concrete and asphalt apron areas and Taxiways A3 and A4. The construction phase of the project is expected to be completed in December 2021.

Passenger Airline Freight Forwarding Facility

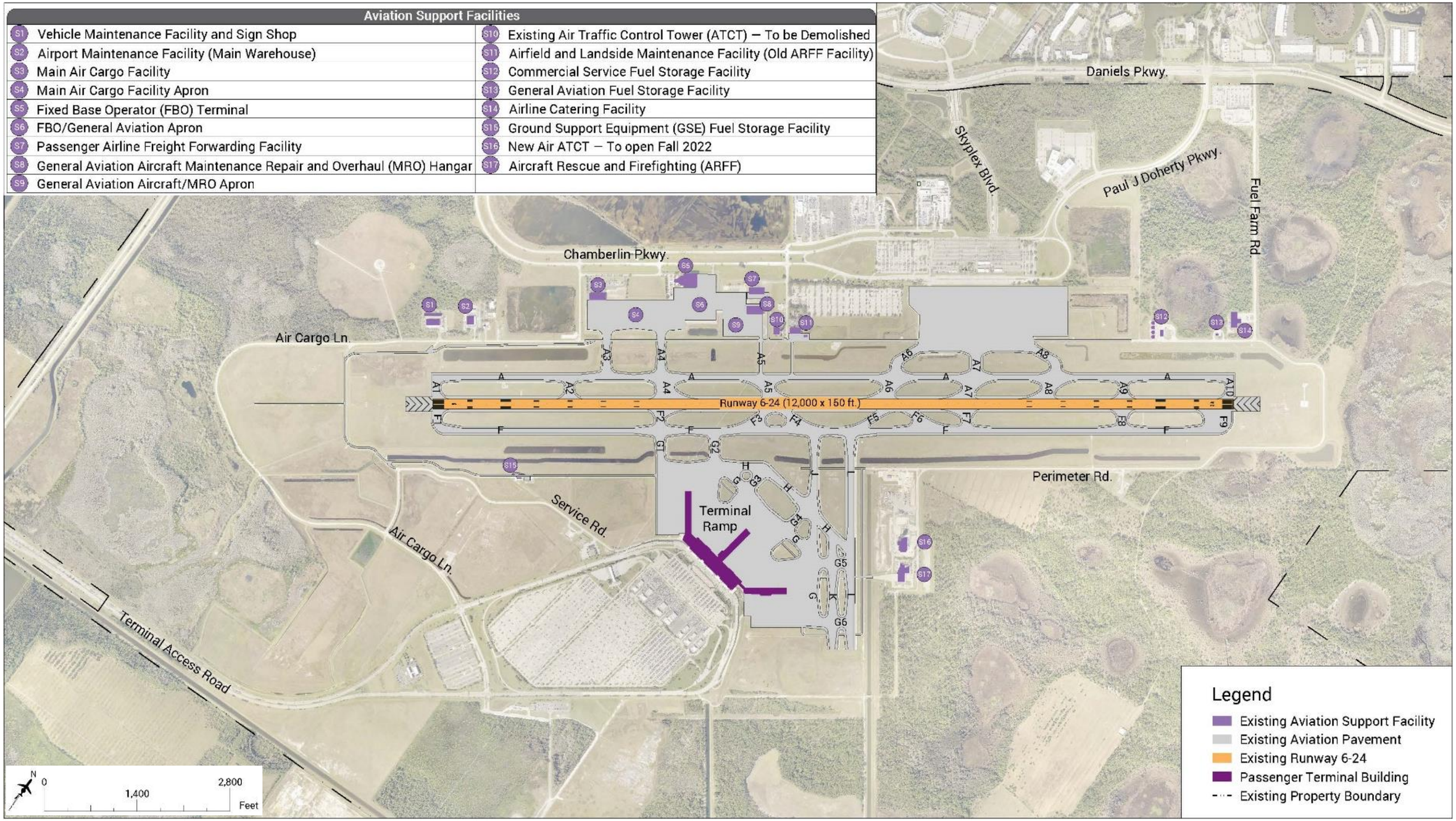
The 13,600-square-foot passenger airline freight forwarding facility (**S7**) is used primarily for the airlines' belly-haul air cargo processing. The facility is split into multiple tenant units with each unit including administrative offices and maintenance, storage, and/or receiving areas. Passenger airline freight is transported via the airfield service roads directly to the passenger aircraft parked at the passenger terminal. This building is occupied by five tenants: Delta Air Lines, Airport Terminal Services, Swissport, American Airlines and Hall Technical Services. **Table 2-10** presents the space and tenant allocations within the passenger airline freight forwarding facility.

Table 2-10 Passenger Airline Freight Forwarding Facility – Space Utilization by Tenant

Lessee	Allocated Space (square feet)
Delta Air Lines (Unit 1)	4,480
Airport Terminal Services (Unit 2)	2,960
Swissport (Units 3 and 4)	2,920
American Airlines (Unit 5)	420.5
Hall Technical Services (Unit 6)	1,460

SOURCE: Lee County Port Authority, August 2021

Aviation Support Facilities	
S1 Vehicle Maintenance Facility and Sign Shop	S10 Existing Air Traffic Control Tower (ATCT) – To be Demolished
S2 Airport Maintenance Facility (Main Warehouse)	S11 Airfield and Landside Maintenance Facility (Old ARFF Facility)
S3 Main Air Cargo Facility	S12 Commercial Service Fuel Storage Facility
S4 Main Air Cargo Facility Apron	S13 General Aviation Fuel Storage Facility
S5 Fixed Base Operator (FBO) Terminal	S14 Airline Catering Facility
S6 FBO/General Aviation Apron	S15 Ground Support Equipment (GSE) Fuel Storage Facility
S7 Passenger Airline Freight Forwarding Facility	S16 New Air ATCT – To open Fall 2022
S8 General Aviation Aircraft Maintenance Repair and Overhaul (MRO) Hangar	S17 Aircraft Rescue and Firefighting (ARFF)
S9 General Aviation Aircraft/MRO Apron	



SOURCE: Lee County Port Authority, *Airport Layout Plan*, February 2011

Figure 2-18 Aviation Support Facilities Composite Map

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The landside portion of the facility provides 10 cargo truck docking stations, including five recessed bays and five ground-level bays. The facility's parking lot also provides 21 automobile parking positions. Landside access to the passenger airline freight forwarding facility is via Regional Lane, which connects to Chamberlin Parkway.

The airside portion provides eight ground-level docks and approximately 3,600 square yards of pavement for cargo vehicle movement and storage, including 3,830 square feet of covered loading area.

Fuel Storage Facilities

There are three fuel storage facilities on the airport property. The commercial service (**S12**) and GA fuel storage (**S13**) facilities are located east of the North Ramp area and north of the Runway 24 end; they are accessible via Perimeter Road, a two-lane road. The GSE fuel storage facility (**S15**) is located south of the Runway 6 end and is accessible via Perimeter Road.

Commercial Aviation Fuel Storage Facility

The existing commercial service fuel storage facility (**S12**) is owned by LCPA and operated by FSM Group LLC. The most recent upgrades to the fuel storage facility were completed in 2010 and included the addition of a fourth aboveground 420,000-gallon Jet A fuel storage tank. Fuel is pumped underground to the terminal apron area and transported via a hydrant fuel system to parked commercial service aircraft at each gate.

General Aviation Fuel Storage Facility

PrivateSky Aviation owns and operates the GA fuel storage facility (**S13**), which was upgraded in 2010 and consists of four aboveground 15,000-gallon Jet A fuel storage tanks and one aboveground 12,000-gallon Avgas fuel storage tank. PrivateSky Aviation operates four 5,000-gallon Jet A trucks, one 2,200-gallon Avgas truck, and two 500-gallon unleaded gasoline/Jet A trailers to deliver fuel to the aircraft.

Ground Support Equipment Fuel Storage Facility

As part of the fuel storage facility upgrades completed as part of the opening of the midfield passenger terminal in September 2005, a GSE fuel storage facility (**S15**) was constructed. The GSE fuel storage facility is accessible via Perimeter Road and is adjacent to Taxiway F to the south. It includes one aboveground 10,000-gallon diesel fuel storage tank and one 10,000-gallon unleaded gasoline fuel storage tank operated by FSM Group LLC. **Table 2-11** provides a summary of the fuel storage facilities at RSW.

Table 2-11 Summary of Fuel Storage Facilities

Fuel Storage Facility	Number of Tanks and Capacity (gallons)
Commercial Aviation	4 x 420,0000
General Aviation Jet A	4 x 15,000
General Aviation Avgas	1 x 12,000
GSE Diesel	1 x 10,000
GSE Unleaded Gasoline	1 x 10,000

SOURCE: Lee County Port Authority, August 2021

Airline Catering Facilities

The 25,000-square-foot airline catering facility (**S14**) was built in 1990 and is operated by LSG Sky Chefs. LSG Sky Chefs provides full-service in-flight meal catering programs to the airlines at RSW. The airline catering facility is located east of the GA fuel storage facility and is accessible via two-lane Fuel Farm Road. The airline catering facility provides four landside truck docking stations, four airside truck docking stations and 55 automobile parking spaces.

Aircraft Maintenance, Repair and Overhaul Facility

The 26,000-square-foot MRO hangar (**S6**) is located south of the passenger airline freight forwarding facility. Approximately 13,000 square feet of the aircraft hangar space are dedicated to aircraft maintenance and related services, and the other 13,000 square feet are reserved for aircraft storage. PrivateSky Aviation, the current hangar operator, specializes in aircraft maintenance services for Gulfstream aircraft, including MRO, detailing, refurbishment (interior and exterior), engine and airframe repair, inspections and modifications, avionics, and parts and pilot supplies.

According to the previous 2004 Master Plan Update, and consistent with the FAA-approved ALP dated August 2011, a new commercial service MRO facility is planned for development on the eastern portion of the North Ramp area. The proposed facility would be equipped with the necessary infrastructure to provide services such as heavy aircraft maintenance, airframe inspections, interior modifications, avionics upgrades and testing and aircraft painting.

In 2020, Intrepid Aerospace, Inc. proposed the construction of a 340,000-square-foot facility that would accommodate up to 11 narrowbody aircraft or four to six widebody aircraft. In addition, a paint booth hangar is planned to accommodate one widebody aircraft. The proposed facility was originally planned to open in 2023.

Airfield Electrical Vault

A new airfield electrical vault was constructed in June 2021, east of Taxiway L and north of the future ATCT facility and existing ARFF facility. The vault contains electrical infrastructure supplying power to the airfield lighting system at the airport and has been built to accommodate airfield lighting needs related to the future parallel runway and associated taxiways.

Federal Aviation Administration Airport Traffic Control Tower

The existing ATCT and Terminal Radar Approach Control (TRACON) facility (**S10**) are located north of Runway 6-24, north of Taxiway A5. The ATCT operates daily between 6 a.m. and 12 a.m. According to the *Air Traffic Controller Workforce Plan*, dated September 2020, the existing ATCT and TRACON facility accommodates 26 Certified Professional Controllers (CPCs), six CPCs in training (CPC-ITs), and one developmental controller. The landside area of the facility is accessible via Regional Lane. The parking lot includes approximately 60 automobile spaces.

According to the *Safety Risk Management Document, Comparative Safety Assessment for ATCT Siting*, dated February 2011, it was determined that a new ATCT and TRACON facility would be necessary to meet the siting criteria in FAA Order 6480.7, *Airport Traffic Control and Terminal Radar Approach Control Facility Design Guidelines*, to accommodate a future parallel runway configuration. The *Air Traffic Control Tower Siting Report*, dated June 2012, determined that a new site centrally located north of the new ARFF facility between (existing) Runway 6-24 and future Runway 6R-24L would meet all required ATCT siting criteria for the future airfield geometry.

New Airport Traffic Control Tower
SOURCE: Lee County Airport Authority

Construction began on the future ATCT (**S16**) in July 2019. As of September 2021, the completion date is anticipated to be December 2022. The future ATCT is being constructed with a final tower height of 215 feet AGL measured to the top of the tower lightning rod. The total area for each floor of the ATCT will be approximately 12,300 square feet, including the 550-square-foot cab area. The TRACON portion of the facility will encompass approximately 15,500 square feet. The existing ATCT facility is planned to be demolished following the opening of the new facility. The future ATCT will serve the same hours of operation as the existing ATCT.

Aircraft Rescue and Fire Fighting Facility

The 31,000-square-foot ARFF Station (**S17**) is located between (existing) Runway 6-24 and future Runway 6R-24L, east of the existing passenger terminal building. The ARFF facility provides five drive-through apparatus bays capable of housing 10 ARFF vehicles.

The ARFF facility is typically staffed 24 hours per day, 365 days per year by 10 LCPA ARFF operations personnel. The ARFF facility is accessible via Perimeter Road and includes 51 automobile parking spaces.

Code of Federal Regulations (Part 139) publishes minimum safety standards for emergency response personnel and equipment needed at commercial service airports. Requirements related to the minimum amount of personnel on duty, equipment, and aqueous film forming foam (AFFF) agent are based on the longest commercial passenger aircraft having an average of five or more daily operations. **Table 2-12** lists the ARFF Index categories and associated aircraft length included in Part 139.

Table 2-12 ARFF Index

ARFF Index Category	Overall Aircraft Length
A	Less than 90 feet
B	More than 90 feet but less than 126 feet
C	More than 126 feet but less than 159 feet
D	More than 156 feet but less than 200 feet
E	More than 200 feet

SOURCE: Federal Aviation Administration, *14 Code of Federal Regulations Part 139*

RSW is rated as an ARFF Index D airport based on the current level of scheduled air service. This index level requires the facility to have a minimum of three vehicles that can carry at least 500 pounds of sodium-based dry chemical and produce 4,000 gallons of AFFF. The ARFF department operates the following emergency response vehicles:

- Three 2008 Oshkosh Strikers
- One 2021 Rosenbauer Panther 1500
- One 2012 Rosenbauer Panther 3000
- One 1997 Oshkosh T-1500 (to be decommissioned in 2023)
- One 2022 Rosenbauer Panther High Reach Extendable Turret (HRET) will be added to the fleet in 2023.

Additional ARFF support vehicles include the following:

- One primary Class A fire engine
- One secondary National Fire Protection Association 414 fire engine
- One fleet brush truck
- Three utility service vehicles
- Four staff vehicles

ARFF Station and part of the emergency response fleet
SOURCE: Lee County Airport Authority

2.9 Non-Aviation Support Facilities

Non-Aviation Support lands are designated on RSW property. Non-Aviation Support development is recognized by the local government comprehensive plan (the "Lee Plan") and on the adopted Airport Layout Plan as an opportunity for compatible uses that support the continued development of the airport by providing a supplementary revenue source and economic growth for the community.

Local zoning approvals are in place with entitlements for roughly one million square feet of industrial, office, commercial and hotel development potential on approximately 344 acres north of Runway 6-24 (known as Skyplex) and on approximately 51.6 acres designated for non-aviation development in the midfield area along Terminal Access Road. In addition to the Skyplex area and the midfield non-aviation support area, there is a third area totaling 487 acres designated for potential future development in the southeast quadrant of the RSW property. While designated on the adopted Airport Layout Plan, this area currently has no infrastructure or zoning entitlements for any activity or use.

Skyplex

The commercial and industrial designated land north of Runway 6-24, known as Skyplex, includes approximately 843 acres of development area. This non-aviation support designated area extends approximately 2 miles along Daniels Parkway, from Chamberlin Parkway on the west to beyond Fuel Farm Road to the east. In 2021, two parcels on the north side of Daniels Parkway along Commerce Lakes Drive totaling 22.1 acres were released from federal obligations. One 7.1-acre non-aviation designated parcel remains on the north side of Daniels Parkway opposite Chamberlin Parkway (known as the Chana Court parcel), while all remaining RSW property is south of Daniels Parkway. Approximately 44.3 acres within Skyplex are currently occupied by rental car maintenance and storage facilities, which are anticipated to relocate to be more centrally located in the future. The following infrastructure and development in Skyplex is existing or has received permits for development:

- Skyplex Boulevard (approximately 2,400 linear feet of 4-lane divided roadway to create a direct connection between Chamberlin Parkway and Daniels Parkway, constructed)
- Chamberlin Parkway Realignment (transition of the former north terminal loop road to a two-way traffic collector road, designed and permitted)
- Sky Walk Shopping Plaza (67,225 square feet, constructed)
- Gartner Office Complex (87,260 square feet, constructed; 87,260 square feet, planned and permitted)
- Alta Resources Office Building (97,338 square feet, permitted and under construction)

LCPA handles marketing and leasing with non-aviation support tenants and manages the common infrastructure and the unleased lands. In anticipation of additional growth and development, LCPA is in the process of soliciting a real estate and development advisor to assist with planning, brokering, and advancing the goals for industrial and commercial development at Skyplex.

Midfield

Approximately 51.6 acres along Terminal Access Road are designated for non-aviation development in the midfield area. A gas station and convenience store known as Airport Plaza is constructed and a Cell Phone Lot is positioned to the west of the gas station. Approximately 40.1 acres are cleared and available for potential commercial, office or hotel use with access from the outbound Terminal Access Road and from Air Cargo Lane.

Future Potential Development Area

A 487-acre area is designated as "Future Potential Development" on the adopted Airport Layout Plan. This area is located in the southeast quadrant of the airport property, south of the planned alignment of the future parallel runway. While designated "Potential Future Development Area" on the adopted Airport Layout Plan, this area currently has no infrastructure and zoning entitlements for any activity or use. Access to the site is currently limited by substandard roadways, including Airport Haul Road and a roadway that borders the southern boundary of the site, used for accessing Green Meadows Water Plant that is east of airport property.

2.10 Utilities

This section describes the existing electrical power, communications, fiber optic, water and sewer utilities serving the Airport. A more in-depth analysis of existing utilities including figures can be found in Appendix D, Utilities.

Electrical power infrastructure is provided by Florida Power & Light (FPL). An existing major 230 kilovolt (kV) high voltage transmission line is routed along Daniels Parkway on the northern border of the RSW property, and several transmission lines branch from the main line into Airport property. There is also a major FPL 230kV high voltage power line that enters the property from the south and is routed through the southeastern portion of the property.

Communications infrastructure is primarily provided by T-Mobile and to a much lesser extent, CenturyLink, located between the runway and Daniels Parkway in the aviation support and non-aviation support area known as Skyplex. Fiber optic infrastructure is limited to most of the perimeter of the runway.

Potable water is provided through the Lee County Utilities system. All five of Lee County Utilities Water Treatment Plants are interconnected and feed the airport from the south and west. An existing 30-inch water transmission main that crosses Airport property from south to north connects Daniels Parkway to Airport Haul Road. A second water service line and fire line have been added on the east end of the terminal as part of the RSW Terminal Expansion Project.

Sanitary sewer service is provided by Lee County Utilities using traditional gravity sewer, force main, and pump stations. There is one Master Lift Station (3307) that takes in all the wastewater south and west of Skyplex Boulevard and discharges due north. Wastewater flow is then directed east along Daniels Parkway within a 24-inch force main, which discharges into Gateway Wastewater Treatment Plant.

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Chapter 3 Forecast of Aviation Demand

3.1 Introduction

Southwest Florida International Airport (RSW) has experienced strong historic growth trends, including a record-breaking year in 2019 when record passenger enplanements were recorded in every month of the year. In 2019, RSW enplanements surpassed the 5 million passenger mark for the first time. The COVID-19 pandemic began during the formulation of this forecast and is ongoing as this project progresses. Following a period of decreased activity due to pandemic impacts, RSW has set monthly enplanement records for each month from April through December 2021, and ultimately 2021 passenger activity surpassing 2019. As a result, additional forecasting was conducted for purposes of comparison and consideration in planning the next 20 years and beyond for RSW. This process and results of the forecasting effort are discussed in detail later in this chapter.

RSW is the primary commercial service airport that serves a five-county trade area that includes Lee County where the airport is located, as well as Charlotte, Collier, Glades, and Hendry counties. The RSW Trade Area has experienced significant growth in recent years, which has stimulated increasing demand for Airport services. Despite COVID-19, continued growth is expected in the RSW trade area for the foreseeable future.

The peak season at RSW runs from late winter through spring - the degree of seasonality at RSW is considered non-traditional because seasonal fluctuations in passenger volumes are much more pronounced than at most U.S. airports. This pattern has become increasingly amplified in recent years. RSW's terminal facilities have become stressed as passenger volumes continue to increase, particularly during peak travel periods.

Given this context, a current set of passenger projections and updated comprehensive planning approach for RSW are needed to support the airport's sustained growth and quality of passenger

experience. This forecasting effort builds upon previous studies and uses a variety of FAA approved forecasting methods to project future annual enplanement passenger levels and aircraft operations for the 2021–2041 timeframe. An analysis of peak month and peak month average day levels based upon a preferred forecast are identified for this timeframe.

3.2 Historical Activity and Context

Historical passenger enplanement trends at RSW are shown in **Figure 3-1**. In 2019, RSW passenger traffic was at record levels with over 5 million enplanements. This growth has been significant, and since 1986 when RSW first exceeded 1 million enplanements, growth has continued to over 2 million enplanements in 1994, 3 million enplanements in 2004, 4 million in 2007, and 5 million in 2019. Reaching the mark of 5 million enplanements was delayed by the Great Recession of 2008–2009, which temporarily slowed growth before increasing again steadily after 2013.

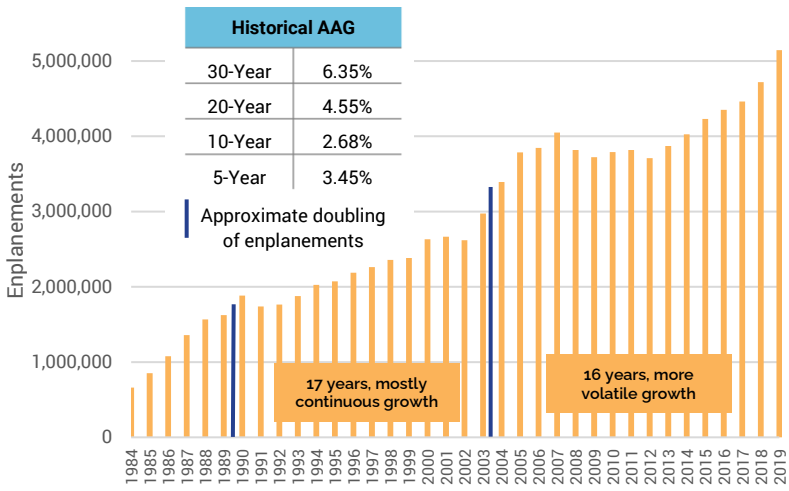
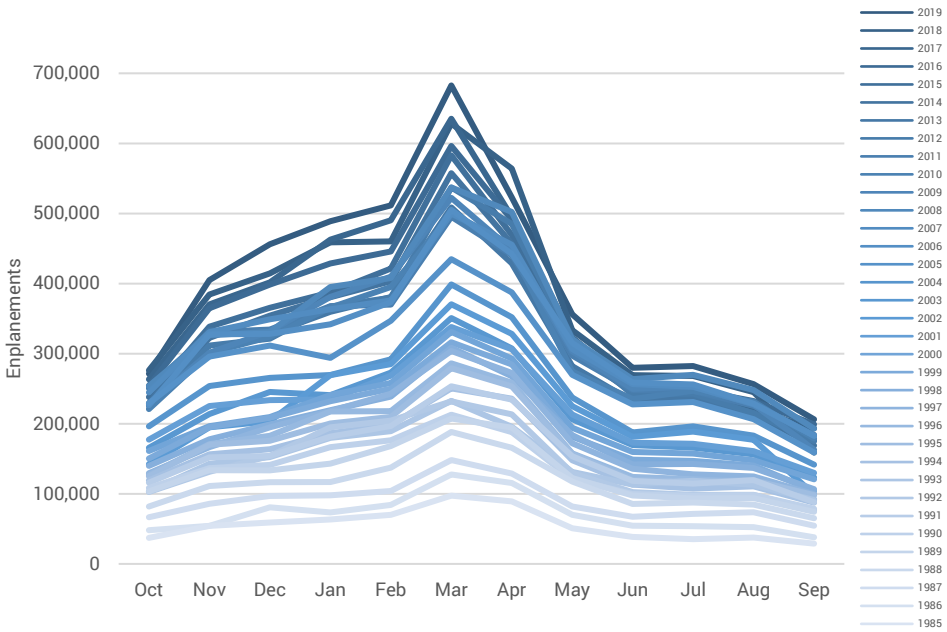


Figure 3-1 Historical Enplanements and Average Annual Growth (AAG) Rates

Figure 3-2 shows the historical monthly distribution of RSW enplanements over the course of the fiscal year. It should be noted that the 20-year historical average annual growth rate is 4.55%, the same 20-year timeframe being considered in this Master Plan. The peak season running from January-April is significant and has become increasingly amplified in recent years. RSW's distribution of annual enplanements is considered non-traditional because it exhibits much greater seasonal fluctuation in enplanements than most U.S. airports. This pattern is caused by an influx of seasonal residents and tourism activity in the region from late winter through the spring months.

March is the peak month at RSW. The most recent five-year (2015–2019) average percentage of annual enplanements for March is 14.3%, and the most recent 20-year (2000–2019) average percentage is 13.7%. The four-month January–April peak season period represents 46.9% of RSW's annual enplanement volume for the five-year average (2015–2019) timeframe and 45.8% for the 20-year average (2000–2019) timeframe.

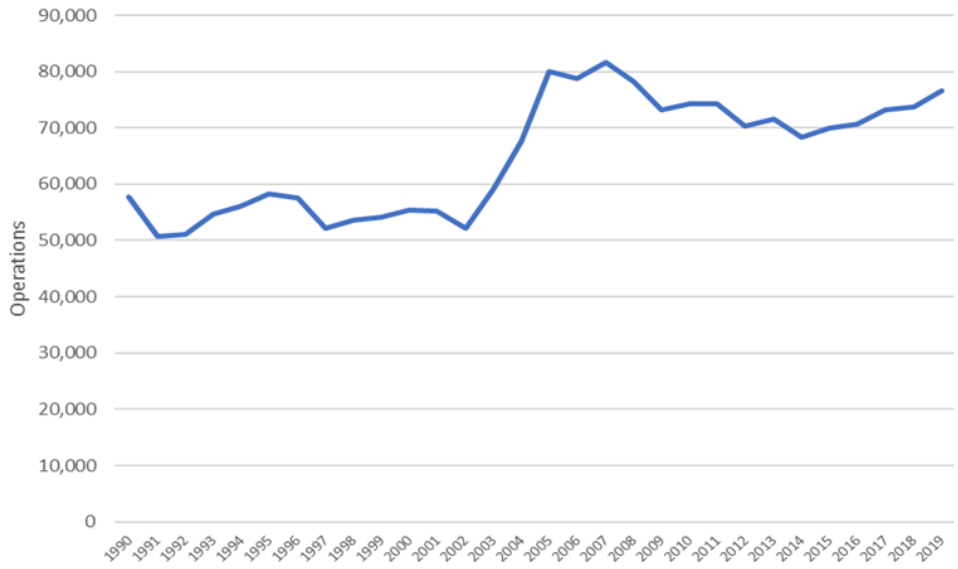
Historical annual aircraft operations at RSW were reviewed starting in 1990 to provide overview and context. In-depth monthly analysis was conducted using available Official Airline Guide (OAG) data from 2017 through 2019. **Figure 3-3** depicts total commercial operations at RSW since 1990. There is a relatively flat period of operations growth between 1990 and 2002, followed by a sharp increase between 2002 and 2007, a mild decrease to 2014, and then a steady increase of roughly 4% per year. Given the overall trend of increased operations between 1990 and 2019, it can be assumed that long term forecasts of operational growth when compared to the expected increase in passenger enplanements will follow the same general upward trend.



Historical Peak % of Annual Enplanements	
March 20-Year Avg.	13.70%
March 5-Year Avg.	14.30%
Jan-Apr 20-Year Avg.	45.80%
Jan-Apr 5-Year Avg.	46.90%

SOURCE: Lee County Port Authority and C&S Engineers Inc.

Figure 3-2 Historical Monthly Enplanements Distributed by Monthly %



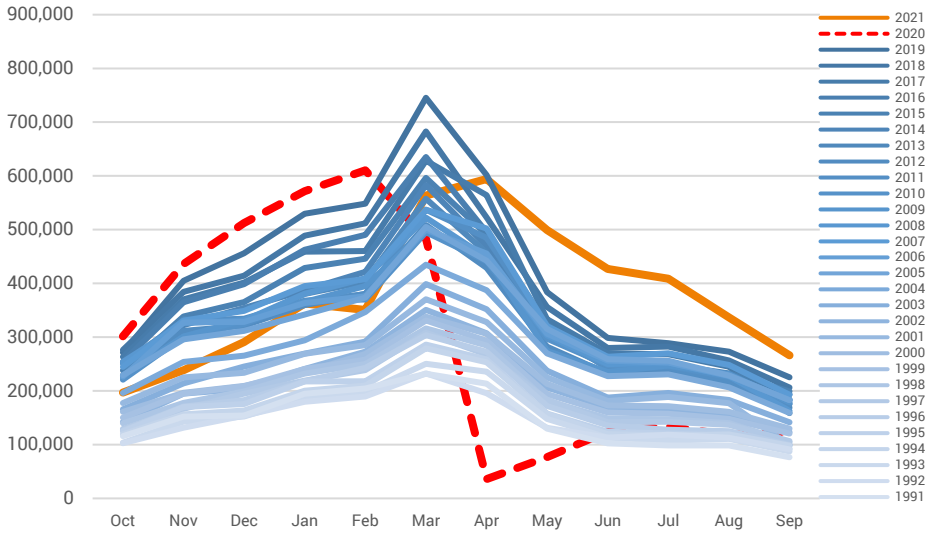
SOURCE: Federal Aviation Administration, Air Traffic Activity Data System (ATADS)

Figure 3-3 Historical Total Annual Commercial Operations

3.3 Recent Enplanement and Operations Trends

As a result of COVID and some uncertainty during this forecasting effort, this section provides an overview of monthly enplanements and operations activity at RSW for Fiscal Years 2019, 2020 and 2021. RSW's fiscal year runs from October through September.

As noted in **Figure 3-4** and in **Table 3-1**, enplanements have trended upward and at the end of FY2021, were at 90% of FY2019 levels. Calendar year (CY) 2021 passenger activity has exceeded CY 2019 levels. Of specific note is that RSW has had 6 consecutive months of all-time high monthly enplanements since April of 2021 indicating that the recovery of passenger activity is robust and one of the strongest in the country. This trend has continued to date in FY 2022 through December.



SOURCE: Lee County Port Authority and C&S Engineers Inc.

Figure 3-4 Updated Historical Monthly Enplanements Distributed by Monthly %

Table 3-1 Updated Historical Monthly Enplanements

FY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	% of 2019
2019	271,412	404,957	456,013	529,581	548,463	745,324	601,658	383,653	298,690	288,809	272,874	225,241	**5,026,675**	–
2020	301,511	436,243	512,420	571,428	610,381	483,206	35,897	76,908	124,389	133,335	117,851	124,707	**3,528,276**	70%
2021	196,905	238,433	290,947	362,528	350,655	563,497	594,163	499,207	426,802	408,815	336,758	266,266	**4,534,976**	90%

SOURCE: Lee County Port Authority and C&S Engineers Inc.

For operations, the recovery has exceeded FY 2019 levels as indicated in **Table 3-1a**. Monthly operations started to exceed 2019 levels in March 2021 and have consistently been higher with FY2021 operational levels being 114% of FY2019 levels.

Table 3-1a Updated Historical Monthly Operations

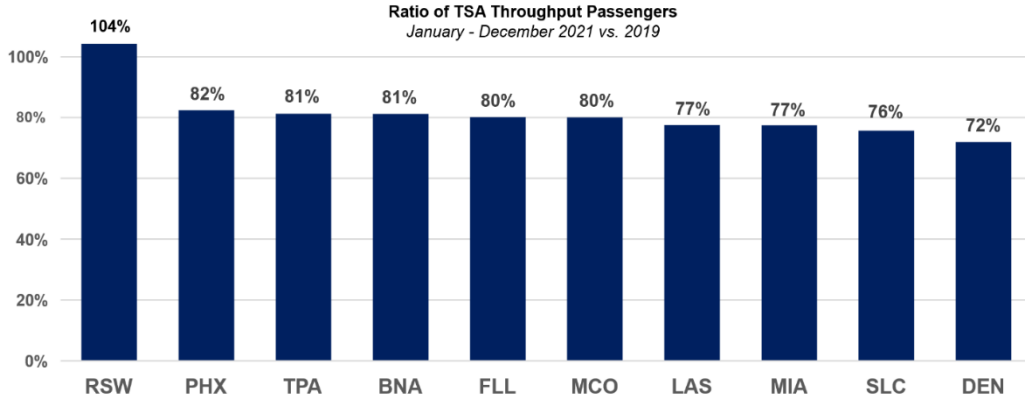
FY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	% of 2019
2019	5,379	7,252	8,504	9,338	9,079	11,202	8,970	6,018	4,804	4,675	4,439	4,127	**83,787**	–
2020	5,451	7,810	9,314	10,162	10,181	10,669	3,471	3,350	3,860	4,623	4,240	3,375	**76,506**	91%
2021	5,384	7,112	8,474	8,628	7,875	11,472	10,612	9,203	7,374	7,020	6,664	5,624	**95,442**	114%

SOURCE: Lee County Port Authority and C&S Engineers Inc.

Notes on the COVID-19 Pandemic

As previously noted, in early 2020 the worldwide COVID-19 pandemic shut down most non-essential businesses including the vast majority of airport activity. With the uncertainty of the novel coronavirus and related policy actions which have at times included quarantine protocols for airport users, it has been difficult to ascertain the exact trajectory of the industry. While many of the data sources used in this forecast report reflect long-term trend forecasts, there continues to be uncertainty surrounding the virus and the impacts it could have for the short-term or potentially beyond.

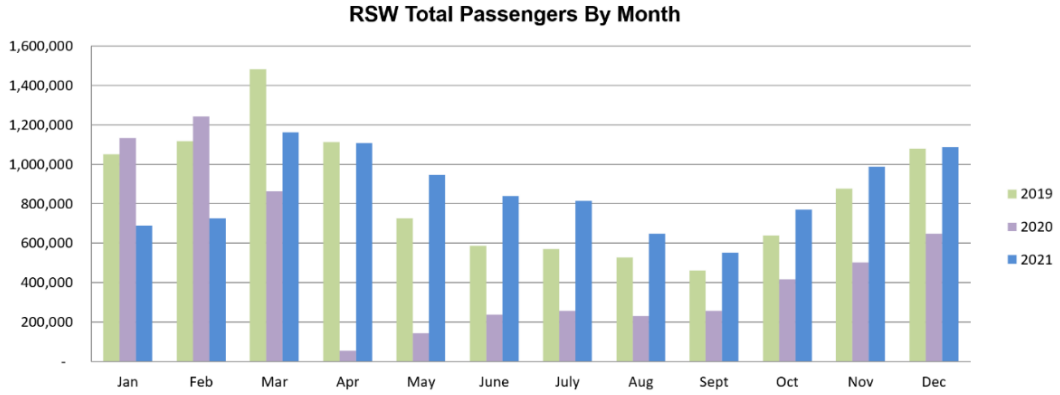
A decrease in activity levels at RSW can be linked to impacts of the COVID-19 pandemic, but also noted is a stronger recovery in 2021 going into 2022. In fact, RSW has been throughout the pandemic period the number one recovery airport of the top 60 airports in the US. For calendar year 2021, RSW was the top recovery airport finishing the year with 104% of its CY 2019 passenger activity with 10.3 million passengers as noted in Figure 3-5, an all-time record for the Airport. The next closest airport was PHX with 82% recovery. Other Florida airport rankings were 81% recovery for TPA, 80% for FLL and MCO and 77% for MIA. The fact that RSW is the only airport in the US to recover its passenger traffic to greater than CY 2019 levels for CY 2021 makes a unique case that RSW will experience short term growth (2021–2025) at a greater rate than what is projected to be seen nationally as seen in Figure 3-6.



SOURCE: Assembled by Lee County Port Authority

Figure 3-5 Passenger Recovery at Top 50 U.S Airports in 2021

RSW has recorded eight consecutive months of record-breaking traffic and set a new annual record of more than 10.3 million passenger in 2021



SOURCE: Assembled by Lee County Port Authority

Figure 3-6 Monthly Passenger Comparisons at RSW between 2019 and 2021

3.4 Socioeconomic Conditions

Demographic and socioeconomic conditions play an important role in determining levels of aviation demand within a region. This section provides an overview of key demographic and socioeconomic conditions and projected trends in five-year increments, covering a 20-year planning timeframe through 2040 (the time periods available when the data were pulled).

Population

Table 3-2 provides total population values for the five-county RSW Trade Area, State of Florida, and United States for the years 2010, 2020, 2025, 2030, 2035, and 2040. Compounded annual growth rate (CAGR) values are provided for each planning interval and geography. Total population values for 2010 and 2020 are based on historical data, and population values for 2025–2040 reflect projected growth.

Table 3-2 Total Population/Compounded Annual Growth Rate (CAGR)

Year	RSW Trade Area	Florida	United States
2010	1,155,000	18,846,000	309,320,000
2020	1,421,000 / 2.10%	21,695,000 / 1.42%	329,940,000 / 0.65%
2025 (est.)	1,544,000 / 1.67%	23,010,000 / 1.18%	341,470,000 / 0.69%
2030 (est.)	1,674,000 / 1.63%	24,361,000 / 1.15%	352,910,000 / 0.66%
2035 (est.)	1,811,000 / 1.59%	25,735,000 / 1.10%	364,070,000 / 0.62%
2040 (est.)	1,954,000 / 1.56%	27,113,000 / 1.08%	374,700,000 / 0.60%

SOURCE: Woods & Poole Economics Inc.; C&S Engineers Inc.

The RSW Trade Area has experienced significant population growth, increasing from 1,155,000 residents in 2010 to 1,421,000 in 2020. The region's CAGR over this 10-year timeframe is 2.10%, which is higher than the Florida statewide rate of 1.42% and the overall United States population growth rate of 0.65%.

Population growth is projected to continue at rates exceeding statewide and national levels in coming years. Based on these projections, the region's total population would increase by 37% over the 20-year period from 2020 to 2040. Rapid population growth in the RSW Trade Area has contributed to increased aviation demand at the Airport in recent years. The region's population is projected to continue this trend of growth at rates slightly lower than what was experienced between 2010 and 2020, but significantly higher than statewide and national growth rates. Total population data reference an individual's primary residence, meaning that seasonal residents are not included in Table 3-2 values, and the population counts represent a low-end accounting of the region's population especially during the peak travel months in late winter through spring. Continued population growth will provide fundamental support for aviation demand over the 20-year planning horizon.

Income

Per-capita income (PCI) values[1] for the RSW Trade Area, State of Florida, and United States are provided in **Table 3-3** for the years 2010, 2020, 2025, 2030, 2035, and 2040. CAGR values allow a comparison of income growth rates between geographies for each planning interval. PCI values for 2010 and 2020 are based on historical data and population values for 2025, 2030, 2035, and 2040 reflect projected growth.

Table 3-3 Per-Capita Income/Compounded Annual Growth Rate (CAGR)

Year	RSW Trade Area	Florida	United States
2010	$44,000	$38,500	$40,500
2020	$65,300 / 4.02%	$54,400 / 3.52%	$58,400 / 3.71%
2025 (est.)	$80,700 / 4.34%	$67,000 / 4.27%	$71,500 / 4.14%
2030 (est.)	$102,600 / 4.91%	$85,000 / 4.87%	$90,200 / 4.75%
2035 (est.)	$131,400 / 5.07%	$108,600 / 5.03%	$114,600 / 4.92%
2040 (est.)	$168,200 / 5.07%	$138,900 / 5.04%	$145,800 / 4.93%

SOURCE: Woods & Poole Economics Inc.; C&S Engineers Inc.

In the RSW Trade Area, PCI grew at an annual rate of just more than 4% between 2010 and 2020. This income growth is stronger than in the State of Florida (3.52%) and United States overall (3.71%). 2020 PCI was $65,300 for the region—this is 20% higher than in the State of Florida and 12% higher than the national level. In 2040, the RSW Trade Area PCI is projected to be $168,200, which is 21% higher than the statewide level and 15% higher than in the United States overall.

Income levels are relatively high in the RSW Trade Area and are projected to continue stronger-than-average growth through 2040. Higher income is often associated with greater levels of disposable income and spending on leisure travel, as well as the presence of industries that may involve business travel. The projected stability and growth of income levels in the RSW Trade Area are indicators of continued market support for aviation demand in the region.

Employment

Following is a summary of employment data for the five-county RSW Trade Area[2]. **Table 3-4** provides a row for each major North American Industry Classification System (NAICS) industry category, and Total Employment represents the number of jobs for each industry within the five-county region.

Table 3-4 also provides location quotient (LQ) values for each industry category within the RSW Trade Area. Location quotients provide a measure of each industry's concentration within the subject region (RSW Trade Area), in comparison to the same industry's concentration in a larger reference geography. In this case, the State of Florida and the United States are used as reference geographies for LQ calculations.

[1] Defined as total income divided by total population.

[2] Based on 2019 county-level employment data.

Table 3-4 RSW Trade Area Employment by Industry and Location Quotients

Industry	Employment	Location Quotient State of Florida	Location Quotient United States
Retail Trade	**86,800**	**1.14**	**1.25**
Health Care & Social Services	71,100	0.89	0.85
Construction	**70,500**	**1.53**	**1.72**
Accommodations & Food Service	**70,000**	**1.10**	**1.26**
Real Estate	**63,900**	**1.32**	**1.79**
Government (Federal, State, Local)	**62,500**	**1.12**	0.86
Administrative & Waste Services	51,400	0.88	1.12
Other Services	**51,000**	**1.02**	**1.19**
Professional & Technical Services	47,400	0.88	0.88
Finance & Insurance	**40,200**	0.88	**1.01**
Arts, Entertainment, Recreation	**25,500**	**1.15**	**1.44**
Warehousing & Transportation	21,300	0.60	0.64
Wholesale Trade	16,200	0.69	0.68
Manufacturing	15,100	0.61	0.31
Forestry, Fishing, Related Activities	**10,500**	**2.87**	**2.93**
Education	8,600	0.62	0.49
Agriculture	**6,900**	**1.53**	0.73
Information	6,900	0.65	0.55
Management of Companies and Enterprises	5,600	0.63	0.55
Military	2,600	0.48	0.36
Mining	2,300	2.46	0.56
Utilities	1,300	0.93	0.63
Total Employment	**741,200**	—	—

SOURCE: Woods & Poole Economics Inc.; C&S Engineers Inc.

With reference to Table 3-4, an LQ value greater than 1 indicates that an industry is concentrated in the RSW Trade Area in comparison to the state and/or national levels. Values significantly higher than 1 are used to identify regional specialization in a given industry, and this is often referred to as an "industry cluster". Industries with LQ values less than 1 are less prevalent in the RSW Trade Area than in the state and/or national reference geographies.

Total employment in the five-county RSW Trade Area is 741,200. The five industries with the highest number of employees, in descending order, are: Retail Trade, Health Care & Social Services, Construction, Accommodations & Food Service, and Real Estate. Several industries hold LQ values greater than 1 relative to both state and national reference geographies, indicating regional strength and/or specialization in these industries. This set of industries includes Forestry, Fishing, and Related Activities; Construction; Retail Trade; Real Estate; Arts, Entertainment, and Recreation; Accommodations and Food Service; and Other Services.

The employment information summarized in Table 3-4 highlights some important features of the RSW Trade Area's economy. Notably, employment is concentrated in tourism-related industries such as retail, entertainment, hospitality and food service. The Airport serves a robust tourism economy, which supports employment and associated income in

these industries. Employment is highly concentrated in the construction and real estate industries, as well. This reflects the region's continued population growth, as well as the development and economic activity associated with tourism and seasonal visitation to the area.

As population growth continues and the Trade Area experiences demographic shifts through the in-migration of residents and businesses from elsewhere in the US, there appears to be potential for growth in knowledge-based or other industries that are not currently concentrated in the region. As examples, such industry sectors could include Professional & Technical Services, Finance & Insurance, Education, Information, and Management of Companies and Enterprises. Quality-of-life considerations and Florida's favorable business climate are important business location factors that support the region's potential for growth across a diverse set of industries.

In summary, the Trade Area is characterized by high concentrations of service, tourism, and real estate-oriented industry, and holds potential for future growth in knowledge-based or other industries moving forward. These conditions indicate that the region's economy features a concentration of industries associated with high demand for air travel, and future growth opportunities imply a likelihood of increased demand as economic development occurs across a diverse set of industries.

Tourism

Leisure travel represents a significant share of commercial air traffic at RSW and contributes to the Airport's unique degree of seasonal fluctuation in aviation demand. Beachfront destinations in Lee County drive much of the region's tourism activity. The Lee County Visitor & Convention Bureau (VCB) reports annually on key tourism-related statistics for the county's primary tourist destinations. Following are some key points from the VCB's *2019 Visitor Tracking, Occupancy & Economic Impact Study*.

- The beaches of Fort Myers and Sanibel attracted 4.9 million visitors in 2019.
- Sixty-six percent of visitors traveled to the region by air; of these visitors who flew, 72% traveled through RSW. This means that 47.5% of all visitors to Lee County flew to and from RSW.
- Visitors spent $3.2 billion on accommodations, food, entertainment, and other tourism-related services in Lee County in 2019. This spending had a total economic impact of $5.3 billion.
- Tourism supported more than 44,000 Lee County jobs providing $1 billion in wages and salaries in 2019.
- Tourist visitation to the region increased by 0.2% overall from 2015 to 2019, while associated spending increased by 9% over this timeframe.

Tourism is a major driver of economic activity in Lee County and the RSW Trade Area, and nearly half of all visitors to the region fly through RSW. Visitation to the region increased steadily in the years leading up to the COVID-19 pandemic. Leisure travel is a vital source of aviation demand, and its importance has heightened in the pandemic recovery period. RSW plays a critical role in supporting the region's tourism industry and associated economic benefits.

Socioeconomic Conditions Summary

The RSW Trade Area has experienced significant population and economic growth in recent years, and growth trends are projected to continue at rates outpacing state and national levels over the next twenty years. The region is a major tourist destination that attracts nearly 5 million visitors and $3.2 billion in direct spending each year. These demographic and socioeconomic conditions provide a foundation for continued aviation demand as RSW serves this flourishing air trade area.

3.5 Forecasts of Activity

A number of forecasting methodologies were used to develop planning-level enplanement and operations projections for RSW over the 2021–2041 timeframe. The projection scenarios are based on a variety of industry resources and airport-specific records, and demographic data. Projections based on demographic data assumed the five-county catchment area consisting of Lee, Charlotte, Collier, Glades, and Hendry Counties.

Taken together, the set of planning-level projections allows an understanding of how RSW's enplanements and operations are related to key factors associated with passenger demand - while considering airline strategy based on observed practices at the Airport. Each methodology used to derive RSW passenger projections is listed below.

- FAA Aerospace Forecast (2019–2039) – The Aerospace Forecast is a comprehensive industry forecast used at the national level. Specifically for this projection, the enplanement scenario growth rates were considered and evaluated for RSW. The baseline scenario uses an average annual growth rate of 1.8% a year (1.6% domestic and 3.0% international); an optimistic scenario uses an average annual growth rate of 2.5% (2.4%/3.4%); and a pessimistic scenario is based on a 1.3% annual growth rate (1.1%/2.6%). Values were extrapolated through 2041 based on the rate of growth under each scenario. The optimistic scenario was chosen as it was in the range of recent historical activity.
- Market Share Analysis – Generally speaking, this method calculates an individual or group's historical share of a larger population, then uses that share to project the future share of the larger forecasted population. In this case, the market share analysis utilizes RSW's historical share of overall enplanements nationally and applies this share forward to project the airport's enplanements for the subject time period (2019–2039). Market share scenarios of 0.60%, 0.61%, and 0.62% were calculated for RSW. The highest percentage was chosen as it was within reason and a conservative approach for planning purposes.
- Regression Analysis – Regression is a statistical method that measures demonstrated historical relationships between a dependent variable (enplanements in this case) and independent socioeconomic variables including population, per-capita personal income (PCPI) and employment in the five-county RSW market catchment area. Regression calculations were conducted to measure historical relationships between enplanements and each of these three variables, with projections based on the outcome of these calculations.
- Historic Average Annual Growth/Trend Analysis – This method uses historical activity at RSW to project future enplanement levels. Time is used as the independent variable in a regression equation, with projections essentially carrying forward historical rates of growth. Generally, this methodology uses the extrapolation of the most-recent 10-years for the analysis, as well as consideration of 5-, 10-, and 20-year historical average growth rates. In addition, in reviewing historical years 2018 and 2019 (pre-COVID), the average annual growth rate was 7.5%. Therefore, considering the robust recovery growth rate experienced for FY 2021, and the first 3 months of FY 2022, a 20 year scenario was also prepared using a blended historical growth rate of 7.0% through 2026 (first five years), with an average 2.5% annual growth rate from 2027 through 2041 thereafter. This was derived from the 10-year average historical growth rate.

Various scenarios for RSW enplanements and operations from 2021 to 2041 are included in the following summary of results. These scenarios represent a broad range of the perspectives and factors considered under the various projection methodologies, illustrating a range of outcomes based on these considerations.

Passengers

Ten projection scenarios for RSW enplanements from 2021 to 2041 are included in the following summary and discussion of results. These scenarios represent a broad range of the perspectives and factors considered under the various projection methodologies acceptable by the FAA, illustrating a range of outcomes based on these considerations. In viewing the summary of RSW annual enplanement forecasts (Table 3-5 and Figure 3-7), several observations can be made.

- For 2041, enplanement forecasts range from 6,258,267 (Market Share) to 8,714,104 (Blended Historical growth), a difference of 2,455,837 enplanements.
- The compounded annual growth rates range from 1.62% (Market Share) to 3.32% (Blended Historical growth)
- RSW has a planning platform from all forecast scenarios starting in 2021 of approximately 9 million annual air passengers (4.5 million enplanements) to a potential of almost 17.5 million annual air passengers (8.7 million enplanements) in 2041.

Table 3-5 Enplanement Forecasts by FAA Methodology

FY	Blended Historical AAG	Historical 20-Year AAG	Historical 10-Year AAG	Historical 5-Year AAG	10-Year Trend Analysis	Aerospace Optimistic	Market Share (0.62%)	Regression Population (R^2 = 0.98)	Regression Employment (R^2 = 0.98)	Regression PCPI (R^2 = 0.96)
2021 Actual	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976	4,534,976
2026	6,131,288	5,566,683	5,142,663	5,317,259	5,065,568	5,101,848	4,965,799	5,095,046	5,090,511	5,208,420
2031	6,909,961	6,598,390	5,750,350	6,099,543	5,596,160	5,668,720	5,396,621	5,655,115	5,646,045	5,881,864
2036	7,801,346	7,630,097	6,358,036	6,881,826	6,126,753	6,235,592	5,827,444	6,215,185	6,201,580	6,555,308
2041	8,714,104	8,661,804	6,965,723	7,664,109	6,657,345	6,802,464	6,258,267	6,775,254	6,757,114	7,228,752
AAG	4.61%	4.55%	2.68%	3.45%	2.34%	2.50%	1.90%	2.47%	2.45%	2.97%
CAGR	3.32%	3.29%	2.17%	2.66%	1.96%	2.05%	1.62%	2.03%	2.01%	2.36%

SOURCE: Federal Aviation Administration, Woods & Poole, C&S Engineers Inc.
AAG: Average Annual Growth, CAGR: Compound Annual Growth Rate

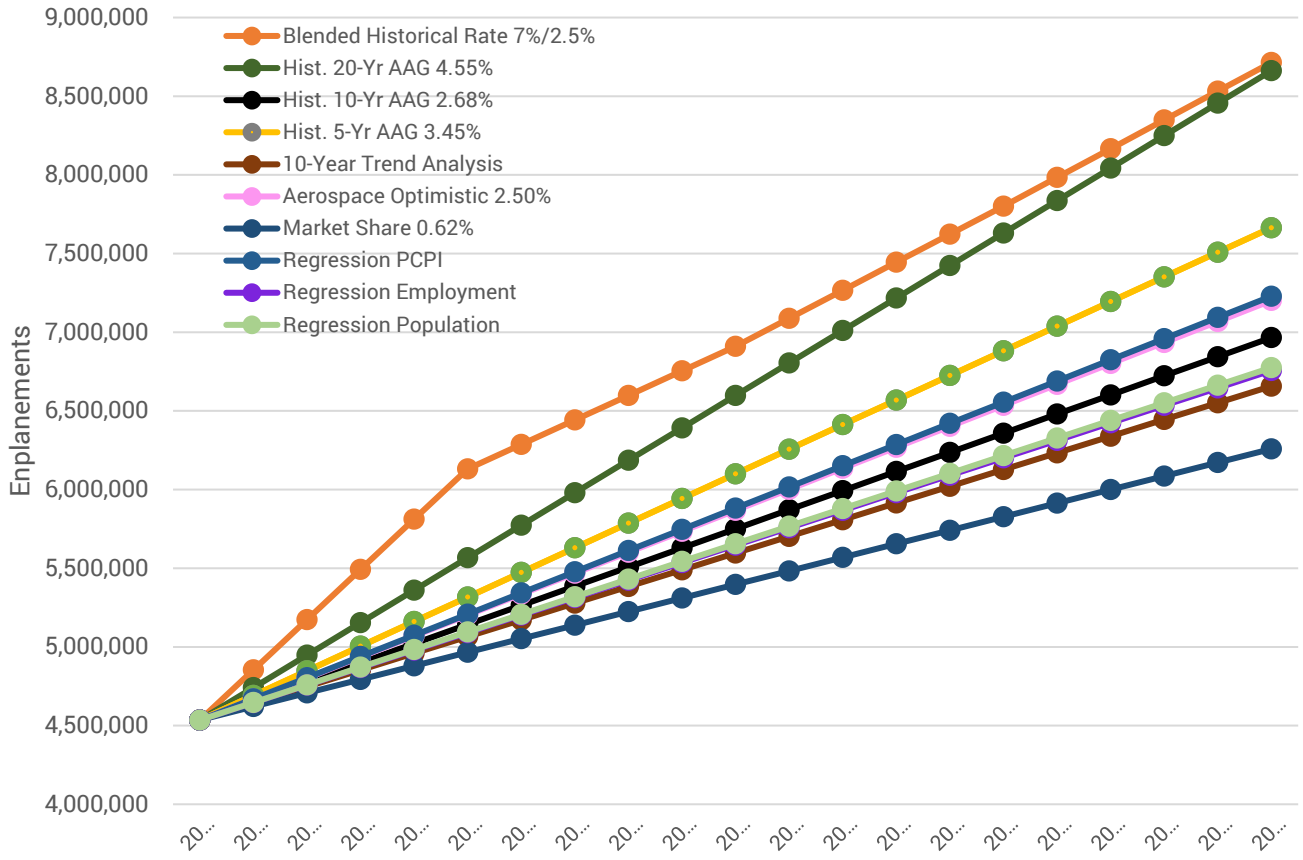
Based on the analyses conducted under this effort, positive socioeconomic conditions, and the robust on-going recovery, the Blended Historical growth forecast methodology is recommended as the preferred enplanement forecast for RSW. This methodology provides the highest 2021–2041 enplanement projections from among the set of forecasting methodologies evaluated and results in a compound annual growth rate of 3.32% over the forecast period. As a planning practice, it is beneficial to project future facility needs based upon a conservative (generally higher) forecast in order to allow for flexibility as needs may evolve under future conditions.

Table 3-6 provides preferred forecast enplanement values at five-year intervals over the 2026–2041 timeframe to be utilized during the master planning process.

Table 3-6 Annual Enplanements, Preferred Forecast

Year	Enplanements
2026	6,131,288
2031	6,909,961
2036	7,801,346
2041	8,714,104

SOURCE: C&S Engineers Inc.



SOURCE: Federal Aviation Administration, Woods & Poole, C&S Engineers Inc.

Figure 3-7 Annual Enplanements Forecast Summary, 2021–2041

Operations

Operations are forecasted for the 20-year planning horizon and used to develop design day flight schedules for peak periods at five-year intervals through 2041. Like the enplanement forecast, several forecast methods were considered for the operations over the 20-year planning horizon at RSW. A comparison was made of annual operation estimates derived from different forecasting methodologies determined to produce a range of results for use in this effort:

- FAA Aerospace Forecast (2019–2039) – The three annual growth rates representing Baseline, Optimistic, and Pessimistic were applied and extended through 2041 using a constant rate. The Baseline estimate assumes 1.1% annual growth; the Optimistic estimate uses 1.8% annual growth; and the Pessimistic estimate uses 0.6% annual growth.
- Linear regression – A forecast based on itinerant air carrier operations from 1990 to 2019 estimates an average annual growth rate of 1.79%.
- Trend Analysis – This method uses historical activity at RSW to project future operations levels. Generally, this methodology uses the extrapolation of the most-recent years for the analysis, in this case, the 5-, 20-, and 25-year historical average growth rates. The 10-year historical average produced a negative growth rate and was not used for this analysis.

Seven projection scenarios for RSW operations from 2021 to 2041 are included in the following summary and discussion of results. These scenarios represent a broad range of the perspectives and factors considered under the various

projection methodologies acceptable by the FAA, illustrating a range of outcomes based on these considerations. In viewing the summary of RSW annual operations forecasts (**Table 3-7** and **Figure 3-8**), several observations can be made.

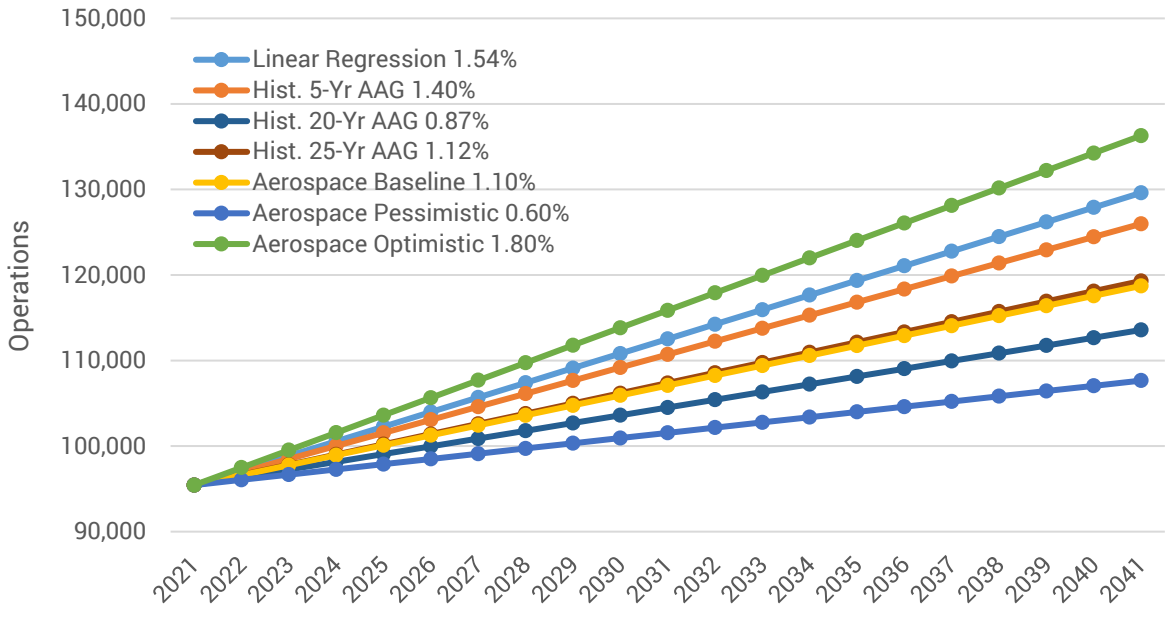
- For 2041, operations forecasts range from 136,291 (Aerospace Optimistic) to 107,659 (Aerospace Pessimistic), a difference of 28,632 operations.
- The compounded annual growth rates range from 1.80% (Aerospace Optimistic) to 0.60% (Aerospace Pessimistic).
- Starting with 2021, RSW has a planning platform level of approximately 95,000 annual operations to a potential of just over 135.000 annual operations.

The Optimistic Aerospace Forecast reflects the strong growth that RSW continues to experience and is in line with the robust operations recovery manifest to date, with 2021 operations standing at 114% of 2019 levels.

Table 3-7 Operations Forecasts by FAA Methodology

FY	Linear Regression	Historical 5-Year AAG	Historical 20-Year AAG	Historical 25-Year AAG	Aerospace Optimistic	Aerospace Pessimistic	Aerospace Baseline
2021 Actual	95,442	95,442	95,442	95,442	**95,442**	95,442	95,442
2026	103,984	103,077	99,975	101,407	**105,654**	98,496	101,264
2031	112,526	110,713	104,509	107,372	**115,867**	101,550	107,086
2036	121,068	118,348	109,042	113,337	**126,079**	104,604	112,908
2041	129,610	125,983	113,576	119,303	**136,291**	107,659	118,730
AAG	1.79%	1.60%	0.95%	1.25%	**2.14%**	0.64%	1.22%
CAGR	1.54%	1.40%	0.87%	1.12%	**1.80%**	0.60%	1.10%

SOURCE: Federal Aviation Administration, Woods & Poole, C&S Engineers Inc.
AAG: Average Annual Growth, CAGR: Compound Annual Growth Rate



SOURCE: Federal Aviation Administration, TransSolutions, C&S Engineers Inc.

Figure 3-8 Annual Operations Forecast Summary, 2021–2041

Based on the analyses conducted under this effort, positive socioeconomic conditions, and the robust on-going recovery, the Aerospace Optimistic forecast methodology is recommended as the preferred operations forecast for RSW. Table 3-8 provides the preferred forecast operations values at five-year intervals over the 2026–2041 timeframe to be utilized during the master planning process.

Table 3-8 Annual Operations, Preferred Forecast

Year	Operations
2026	105,654
2031	115,867
2036	126,079
2041	136,291

SOURCE: C&S Engineers Inc.

Peak Periods

Airline activity is subject to peak-period movements—as described previously, RSW experiences extreme seasonal fluctuations in passenger enplanements and commercial operations between peak and off-peak months. The monthly distribution of enplanements at RSW follows a non-traditional, highly pronounced seasonal pattern with strong peak demand in the late winter through spring months. This unique degree of seasonal fluctuation poses a challenge for facility planning and design, as future facilities must be scaled to accommodate peak demand while balancing the reduced needs during off-peak months.

Design Month Average Day and Peak Month Average Day Peak Day projections were analyzed for RSW at five-year intervals for the 2026–2041 planning timeframe. Historically speaking, April at RSW represents a traditional airport peak month with 11.7% of the annual enplanements is typical. RSW is not typical and has unique peaking characteristics, and March represents the Airport's true Peak Month with 14.3% of annual enplanements. These values are used in planning to estimate the size, configuration, and features of terminal buildings and other airport facilities.

Because of a continuing trend in recent years of March representing an increasingly higher percentage of annual enplanements, a monthly trend analysis was conducted to project monthly shares of annual enplanements for the 2026–2041 timeframe. For the Peak Month of March, the analysis indicates a continuing trend with monthly shares increasing from 14.3% in 2019 to 15.6% in 2041. Table 3-9 provides the results of the monthly trend analysis and the recommended distribution percentages to be used for further peaking analysis.

Table 3-9 Monthly Distribution Trends - % Enplanements

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2026	10.8%	11.3%	15.0%	11.6%	7.2%	5.5%	5.4%	5.0%	3.9%	5.7%	8.5%	10.3%
2031	11.1%	11.5%	15.2%	11.6%	7.0%	5.3%	5.2%	4.9%	3.8%	5.6%	8.5%	10.6%
2036	11.2%	11.7%	15.4%	11.6%	6.9%	5.2%	5.0%	4.8%	3.6%	5.5%	8.5%	10.9%
2041	11.4%	11.9%	15.6%	11.6%	6.8%	5.1%	4.9%	4.7%	3.5%	5.4%	8.5%	11.1%

SOURCE: C&S Engineers Inc.

Typically, Design Day Flight Schedules (DDFS) are determined by identifying an average day in the peak month for the Airport. RSW's peak month is March. To develop the DDFS, the OAG for March 2020 was used as the base schedule. This March 2020 schedule was established prior to any major schedule adjustments by the airlines due to COVID 19. After evaluation, the average day chosen for March was Friday, March 13. Additionally, the non-daily international operations were included in the base schedule. The base monthly OAG schedules were adjusted to match the annual operations and enplanement forecasts for each forecast year. The enplanement forecast was allocated to commercial flight operations, yielding the projected annual, monthly, and design day operational levels.

The peak month (March) average day should be utilized for facility planning. This recommendation is summarized in Table 3-10.

Table 3-10 Recommended Peak Month (March) Average Day

Year	Peak Month Enplanements	Peak Month Average Day Enplanements	Peak Month Average Day Operations	Peak Month Peak Hour Enplanements	Peak Month Peak Hour Departures
2026	898,700	28,990	381	3,131	20
2031	1,026,528	33,114	427	3,576	22
2036	1,175,535	37,920	481	4,095	25
2041	1,329,986	42,903	538	4,633	28

SOURCE: C&S Engineers Inc., TransSolutions

Cargo, International, General Aviation, and Military

Cargo

Freight is carried at RSW by passenger carriers as belly cargo, and by cargo carriers FedEx (FX) and UPS (5X). For a number of years prior to 2018, cargo carriers carried less than 85% of the freight at RSW, while German carrier Air Berlin regularly carried more than 10% of the total freight as belly cargo. After Air Berlin ceased operations during the last quarter of 2017; however, the share of freight carried annually by cargo carriers increased to 95% in 2018 and has remained above 96% since. The total amount of freight carried annually by all carriers at RSW peaked from 2006 to 2008, exceeding 38 million pounds during each of those three years. From 2008 through 2018, freight carried was down from the peak to an average of 33 million pounds per year before rebounding in 2019. From January through June 2021, freight carried was just over 20 million pounds and is projected to exceed 42 million pounds for the full year based on the percentage of annual freight historically carried at RSW during the first six months.

Cargo operations forecasts were developed for the future planning years 2026, 2031, 2036, and 2041. The forecasts were developed by leveraging historical RSW freight data against the Preferred Operation Forecast to initially develop forecasts of freight for years 2021 - 2041. The cargo carrier operations forecast then were developed by determining the number of operations needed to carry the forecasted freight, based on the cargo carriers' average freight carried per operation.

Five methodologies were considered and analyzed to develop freight forecasts. Linear regression was used to develop two forecasts based on historical freight carried annually at RSW over a specific period of years. Two additional forecasts were developed utilizing the FAA's Aerospace forecasts of domestic cargo growth. A fifth freight forecast was developed using Boeing's World Air Cargo forecast of U.S. cargo growth.

- The first linear regression utilized historical annual freight carried at RSW for a 25-year period from 1995 to 2020 to forecast future freight pounds. The years utilized in the regression account for periods of year-over-year growth, stability and decline in freight pounds carried at RSW. This approach results in the most conservative forecast of freight growth, with an average annual growth rate of 0.9% and just under 50 million freight pounds in 2041.
- The second linear regression utilized historical annual freight carried at RSW for a 15-year period from 1990 to 2005, which represents a period of consistently high year-over-year growth in freight pounds carried at the airport. While aggressive, this high growth rate has been experienced during RSW's history. This approach results in the most optimistic forecast of freight growth, with an average annual growth rate of 3.2% and just over 77 million freight pounds in 2041.

- Two forecasts were developed utilizing FAA's Aerospace forecasts for domestic growth in cargo revenue ton miles (RTM). The Aerospace 2020 forecast was developed prior to the impact of COVID and forecasts an average annual growth rate in RTM's of 1.9% through 2041. The Aerospace 2021 forecast, which accounts for the impact of COVID, projects an average annual growth rate in RTM's of 1.6% through 2041. Utilizing the 1.9% and 1.6% annual growth rates results in forecasts of just over 60 million, and just under 57 million freight pounds in 2041, respectively.
- The fifth forecast of freight was developed using Boeing's 2020 World Air Cargo forecast for U.S. growth in cargo revenue ton kilometers (RTK). The forecast accounts for the impact of COVID and projects a 20-year average annual growth rate in RTK's of 2.7%. Utilizing the 2.7% annual growth rate results in a forecast of just over 70 million freight pounds in 2041.

Table 3-11 summarizes the forecast of cargo carrier operations developed using each of the five forecasting approaches for the future planning activity levels. Note that each forecast includes 188 operations by Western Global.

Table 3-11 Cargo Carrier Operations Forecast

Forecasting Approach	Average Annual Growth Rate	2021 Actual	2026	2031	2036	2041
Linear Regression (15 Year)	3.2%	1,726	1,997	2,339	2,682	3,024
Linear Regression (25 Year)	0.9%	1,726	1,785	1,859	1,934	2,008
FAA Aerospace 2021 Forecast	1.6%	1,726	1,833	1,977	2,119	2,269
FAA Aerospace 2020 Forecast	**1.9%**	**1,726**	**1,852**	**2,025**	**2,197**	**2,384**
Boeing 2020 Forecast	2.7%	1,726	1,980	2,349	2,576	2,758

SOURCE: TransSolutions

The forecast of cargo carrier operations developed using the Aerospace 2020 forecast, which projects an average annual growth rate of 1.9% in operations through 2041, is recommended for use by LCPA in airport planning. Strong near-term, pre-COVID growth in freight suggests that RSW is on track to sustain a period of longer-term, consistent freight growth. The Aerospace 2020 forecast projects moderate growth over time, while accounting for possible fluctuations in demand for cargo carrier services during the 20-year forecast period.

International Activity

Commercial carriers at RSW have served markets primarily within the United States, with domestic service in 2019 accounting for 97.2% of operations. In recent years, RSW has supported international service to markets in Canada and to Germany, with increased service during the peak winter travel period. The number of international operations has fluctuated as a result of COVID-19 travel restrictions, but are anticipated to return. LCPA anticipates significant growth in service to international markets in the coming years, with an increase in operations to Canada and new service to markets in Europe, Latin America, and the Caribbean. As a result and depending on timing of service implementation by the airlines, RSW could see international operations range from 4% in 2026 up to 8% by 2041.

General Aviation and Military

The general aviation (GA) and military forecasts, as incidental to the overall aviation activity, is expected to be relatively constant throughout the planning period. GA activity is expected to maintain between approximately 7,000 and 8,000 annual operations through 2041, while military aircraft operations are expected to be maintained between 1,000 and 2,000 annual operations throughout the 20-year planning period.

3.6 Preferred Forecast Comparison to FAA TAF

The COVID-19 pandemic has caused severe disruption to the aviation industry worldwide. While major pandemic-related impacts continue at the time of this master plan update, signs of recovery appear to be taking hold in the United States and rates of air travel are trending upward.

In May 2021, the FAA released the 2020 TAF for RSW, which reflects the impacts of COVID-related air travel disruption and includes a multi-year recovery period before airport traffic again reaches pre-pandemic levels. RSW is one of a few airports leading the recovery with passengers at 90%, and operations at 114% of 2019 fiscal year levels. Since calendar year (CY) 2019 passenger and operations levels have already been surpassed in CY 2021, it can be expected that both passenger and operations will exceed FY 2019 levels in FY 2022.

The FY 2020 FAA TAF is filled with uncertainty due to the COVID pandemic and does not account for the extraordinary recovery experienced at RSW. However, when comparing the Preferred Passenger and Preferred Operations Forecasts to the 2020 FAA TAF, the trend comparison is within several percentage points. It is expected that future annual updates to the FAA TAF will more accurately reflect the unique growth trends and peaking characteristics at RSW. Therefore, it is recommended that the LCPA continue to actively review and provide comments and statistical information regarding annual draft FAA TAF updates, and for the LCPA to use the updated annual FAA TAF as an interim guide for future planning level activities until updated forecasts can be prepared as needed.

Comparison

With signs of strong current and near-term growth suggesting that - assuming no further disruptive events—RSW is already exceeding 2021 TAF enplanement projections. RSW holds a unique and favorable market position and is likely to continue to outperform national trends through the recovery era and potentially beyond. **Table 3-12** and **Table 3-13** provide a comparison of the preferred forecast and the 2021 TAF forecast for enplanements, and operations, respectively.

Table 3-12 Comparison of Forecast Enplanements, Preferred and 2021 TAF

Year	Preferred Forecast	TAF 2021	% Change, TAF 2021 to Preferred
2026	6,131,288	5,812,243	5.4%
2031	6,909,961	6,648,359	3.9%
2036	7,801,346	7,509,553	3.8%
2041	8,714,104	8,328,145	4.6%

SOURCE: C&S Engineers Inc. and FAA, 2021Terminal Area Forecast (TAF), published March 2022

Table 3-13 Comparison of Total Operations, Preferred and 2021 TAF

Year	Preferred Forecast	TAF 2021	% Change, TAF 2021 to Preferred
2026	105,654	111,837	(5.5%)
2031	115,867	122,068	(5.1%)
2036	126,079	132,318	(4.7%)
2041	136,291	147,180	(7.4%)

SOURCE: C&S Engineers Inc., TransSolutions, and FAA, 2021 Terminal Area Forecast (TAF), published March 2022

As a matter of sound planning practice and because the preferred and 2020 TAF forecasts are within FAA guidelines to be within 10% of each other, it is appropriate and recommended for the Airport to continue to develop facility requirements based on the preferred forecasts, peak period forecasts, and design day flight schedules (DDFS) for facility and master planning at RSW.

Chapter 4 Demand Capacity and Facility Requirements

This chapter summarizes the analyses conducted, based on the approved Forecast, on how to meet the anticipated demand for activities at RSW throughout the Master Plan horizon. These include airfield, terminal, cargo, support facility improvements as well as other opportunities for development among others.

4.1 Airfield Demand/Capacity Assessment

The purpose of the airfield demand/capacity analysis is to determine the ability of an airfield to accommodate projected demand. This is measured both in terms of hourly and annual capacity. FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, outlines the methodologies for determining both hourly and annual capacity for the purposes of airport planning. Airfield capacity improvements have been the subject of numerous studies at RSW.

Planning for a south Parallel Runway at RSW dates back nearly to the origins of the airport. A widely spaced south runway and Midfield Terminal Complex was the focus of a 1994 Environmental Assessment (EA). The new terminal (Midfield Terminal Complex) opened in 2005 and various actions have been taken to both enable and prepare the Airport for development of the new Parallel Runway. Because the investment is substantial, it is important that the timing of the runway is calibrated with the actual operational need.

There have been numerous evaluations of capacity for RSW over the past decade as part of an effort to refine the implementation timeline for the new runway. In September 2019, a *White Paper on the Timing for a Second Runway at Southwest Florida International Airport (RSW)* was prepared by GRA, Inc. and TransSolutions (Timing White Paper). The Timing White Paper included an analysis of various factors influencing capacity at RSW. The White Paper is located in Appendix G, Airfield Demand/Capacity Assessment.

Hourly Capacity

An airport's hourly capacity is defined as the number of operations an airfield can process during continuous demand. The hourly capacity is dependent on the general configuration of the runway system, the type of aircraft operating at the airport, the percentage of touch-and-go (pattern) activity, the number and placement of taxiway exits, wind direction and the percentage of time the airport operates under poor weather conditions. RSW is currently a single runway system served by a homogeneous mix of Category C commercial aircraft (aircraft in the range of 12,500 to 300,000 pounds) with little touch-and-go activity. As a result, touch-and-go activity has little influence on capacity at RSW. Based on a single runway configuration and fleet profile (and excluding consideration of taxiway exits), the estimated hourly capacity would range between 53 and 55 operations per hour for Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) conditions, respectively. Because the VFR and IFR capacities are very similar, changes in the percentage of time that the airport operates under IFR conditions has very little effect on capacity.

Reviewing the specific airfield layout indicates that there are nine taxiway exits connecting the parallel taxiway to Runway 6-24. Two airfield taxiway exits are located in optimum range for the fleet (5,000–7,000 feet from the landing threshold). This corresponds to an FAA taxiway exit factor of 0.92 under IFR conditions or 0.94 under VFR. Applying these factors would provide an estimated hourly capacity for the actual airfield configuration at RSW of 48.76 operations under IFR conditions or 51.7 operations under VFR conditions. Based on FAA methodology, the weighted hourly capacity when considering the taxiway exit configuration would be 51.4 operations per hour. Since the fleet is very similar and the number of taxiway exits has not been noted as a capacity concern for current operations, the weighted hourly capacity without consideration of taxiway exits was used for the purposes of determining the theoretical capacity for the airfield as outlined in the subsequent sections.

Annual Service Volume

Annual Service Volume (ASV) is an airport's practical operational capacity. As activity at an airport approaches its ASV, delays begin to escalate exponentially and have the potential to inhibit additional demand. FAA Order 5090.5, Formulation of the NPIAS and Airport Capital Improvement Plan (ACIP), indicates that planning for capacity improvements should begin in earnest when an airport reaches between 60% of its ASV and implementation of improvements should begin when it reaches 80% and is within 5 years of reaching its ASV. As a result, the rate of growth is a key consideration in informing how quickly an airport should proceed with capacity improvements. ASV reflects the product of the weighted hourly capacity (Cw), the daily ratio (ratio of annual demand to average daily demand during the peak month or D), and the hourly ratio (ratio of daily demand to average peak hour demand during the peak month or H):

$$ASV = Cw \times D \times H$$

As average daily demand and peak hour demand fluctuate, the ASV will vary accordingly. Review of historic ASV calculation in the Timing White Paper indicates that the actual daily ratio since 2009 has ranged between 231.96 and 254.2 and was estimated at 234.42 for 2018 in the 2019 Timing White Paper calculation. Actual hourly ratio calculations have ranged between 9.8 and 11.36 during the same period, with 11.36 estimated for 2018. Overall, ASV calculations between 2004 and 2019 have ranged between approximately 125,000 and 146,000 operations. In 2019, the ASV was estimated at just over 146,000 operations. **Table 4-1** provides the daily and hourly ratios and resulting ASV for 2019, the most recent year of normal activity. Table 4-1 also indicates that RSW exceeded 60% of its current ASV for a single runway configuration in 2021 and will approach 80% of ASV in the PAL 2 or around 2033. While demand will continue to grow throughout the planning period the airport is not currently expected to reach 100% ASV until 2043.

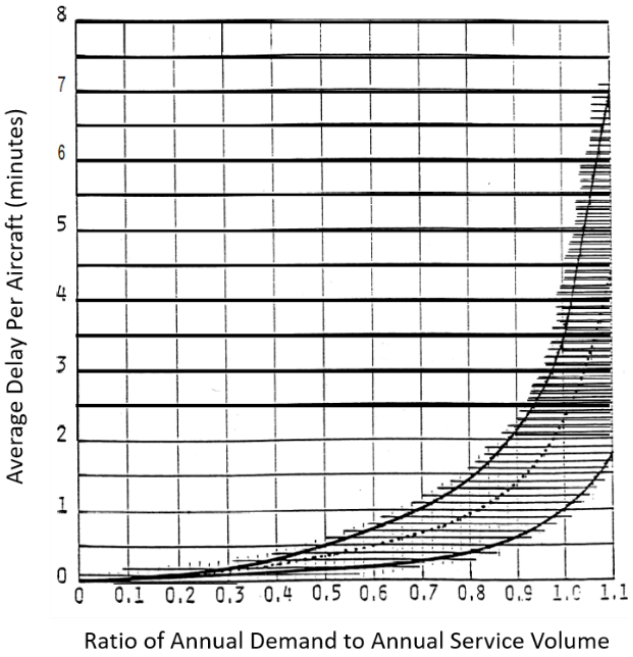
Table 4-1 Estimated Annual Service Volume

Component	2019 (Est.)	2021	PAL 1/2026	PAL 2/2030	2033 (Est.)	PAL 3/2036	PAL 4/2041	2043
Total Operations	85,227	60% of 2019 ASV reached	105,654	115,867	80% of 2019 ASV reached	126,079	136,291	100% of 2019 ASV reached

SOURCES: ESA, C&S Companies, TransSolutions, 2021; FAA Air Traffic Activity System (ATADS), 2019

NOTES: 2019 EST based on 2019 Timing White Paper calculations. Non-commercial peak month average day based on 2019 actuals. Non-commercial peak-hour activity based on commercial aircraft profile. Assumes no military aircraft in peak hour.

As demand exceeds 80% of ASV, airfield delays will escalate rapidly, especially during peak periods. Figure 4-1 (from the FAA *Advisory Circular 150/5060-5, Airport Capacity and Delay*) reflects the estimated delay per aircraft based on the ratio of demand to ASV. With RSW's considerable seasonal activity profile, delays during the peak months/periods will be much higher than those during the balance of the year. Based on current FAA Guidance and RSW activity projections and peaking characteristics, design and development of the new runway should be planned within 5 years of reaching ASV or around the 2038 time period. Activity and peaking characteristics should be monitored periodically to further calibrate the timing of the new facility.



SOURCE: FAA AC 150/5060-5, Figure 2-2

Figure 4-1 Average Aircraft Delay for Long-Range Planning

4.2 Critical Design Aircraft and Airport Reference Code

A critical design aircraft is usually the most demanding type of aircraft that regularly uses or is projected to regularly use an airport. The characteristics of this aircraft will help determine the Airport Reference Code, which is a categorization that summarizes the type of facility the airfield should be designed to handle. While being a simple categorization, there is more nuance behind the critical design aircraft and the Airport Reference Code.

Critical Design Aircraft

The determination of the critical design aircraft (critical aircraft) is an essential component of airport planning. For example, runway, taxiway, apron, and terminal facilities are designed to be able to handle existing and future critical aircraft. Furthermore, FAA AC 150/5000-17 mentions that "The critical aircraft is the most-demanding aircraft type or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, including both itinerant and local operations, but excluding touch-and-go operations. An operation is either a takeoff or landing."

> "The critical aircraft is the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, including both itinerant and local operations but excluding touch-and-go operations. An operation is either a takeoff or landing."
>
> —FAA

While many airports have one specific aircraft type designated as the critical aircraft, it is possible to create a composite critical aircraft that combines the most-demanding specifications of different aircraft that regularly use an airport. For example, while aircraft with the largest wingspan would require the largest amount of spacing between taxiways, another smaller aircraft could require a runway designated to handle faster approach speeds if it has a higher approach speed than the larger aircraft. It is also possible to group aircraft with similar dimensions and operational characteristics as one type of aircraft.

It should be noted that there is no requirement to build all airport facilities including runways, taxiways and terminals to meet the needs of the critical aircraft. In many cases, the critical design aircraft is not the majority aircraft type operating at an airport. Often, smaller categories of aircraft constitute the bulk of operations. Airfield and terminal planning should program future facilities to provide flexibility balancing the needs of the future fleet mix with operational and cost concerns.

Characteristics of the Critical Design Aircraft

The FAA has three aircraft categories that are used to classify the characteristics of a critical aircraft. These categories help airport sponsors determine the appropriate facilities that need to be planned and designed to handle the aircraft.

- Aircraft Approach Category (AAC): The aircraft approach category is determined by the aircraft manufacturer approach speed when landing the aircraft at the maximum certificated landing weight (V_{ref}). The AAC categorizations can be seen in **Table 4-2**. The AAC is one of the factors used to determine runway-design characteristics.

Table 4-2 FAA Aircraft Approach Categories (AAC)

AAC	VREF/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 Advisory Circular 150/5300-13B

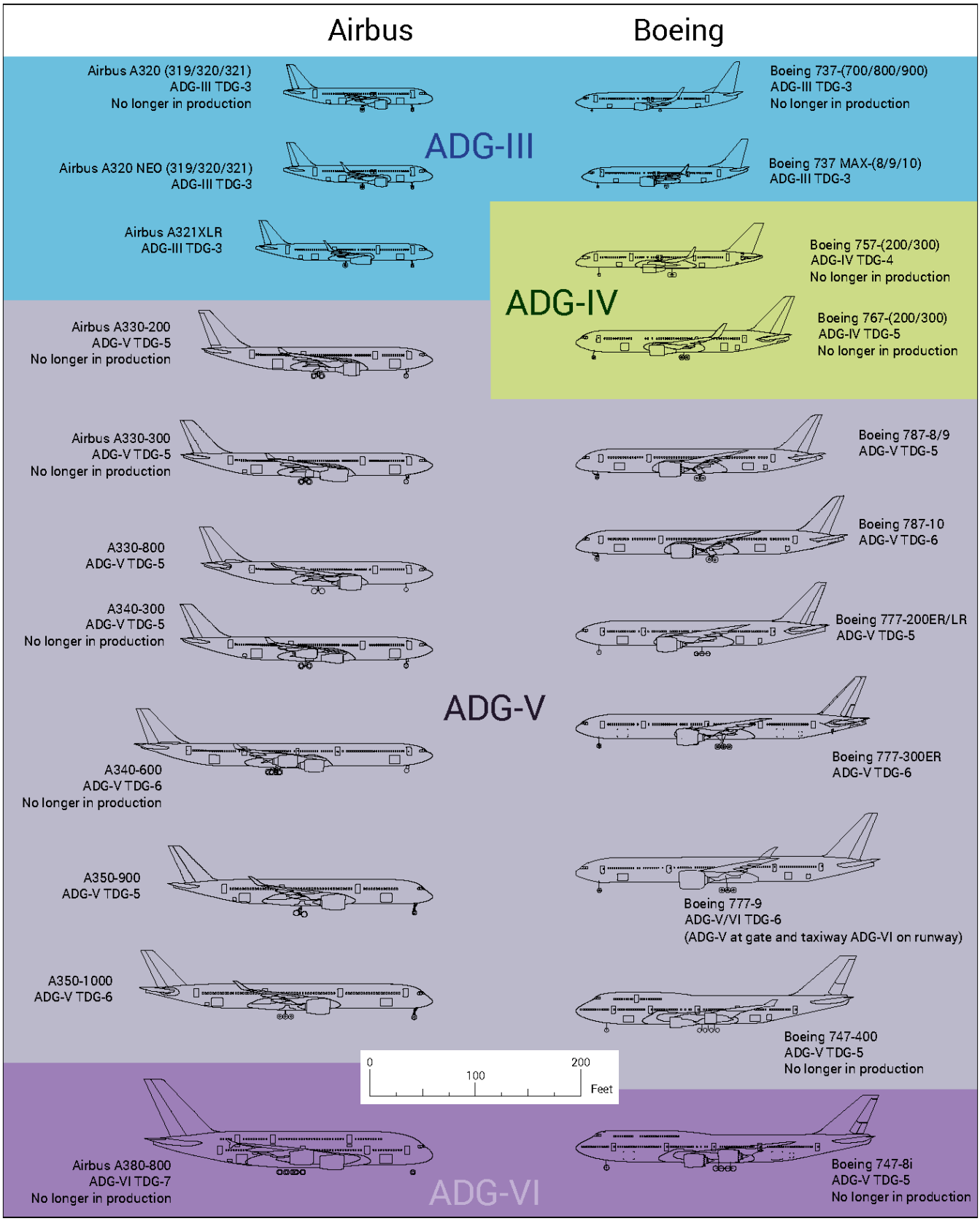
- **Aircraft Design Group (ADG):** The ADG classification is based on two exterior dimensions of an aircraft: the wingspan and the tail height. The ADG is one of the factors used to determine runway-design characteristics; runway, taxiway and taxilane centerline separations; safety area requirements; aircraft parking requirements; and terminal planning requirements. The ADG classification can be seen in **Table 4-3** and examples of different aircraft in different ADG categories can be seen in **Figure 4-2**.

Table 4-3 Aircraft Design Group Categories (ADG)

Group #	Tail Height (ft [m])	Wingspan (ft [m])
I	< 20′ (< 6 m)	< 49′ (< 15 m)
II	20′ to < 30′ (6 m to < 9 m)	49′ to < 79′ (15 m to < 24 m)
III	30′ to < 45′ (9 m to < 13.5 m)	79′ to < 118′ (24 m to < 36 m)
IV	45′ to < 60′ (13.5 m to < 18.5 m)	118′ to < 171′ (36 m to < 52 m)
V	60′ to < 66′ (18.5 m to < 20 m)	171′ to < 214′ (52 m to < 65 m)
VI	66′ to < 80′ (20 m to < 24.5 m)	214′ to < 262′ (65 m to < 80 m)

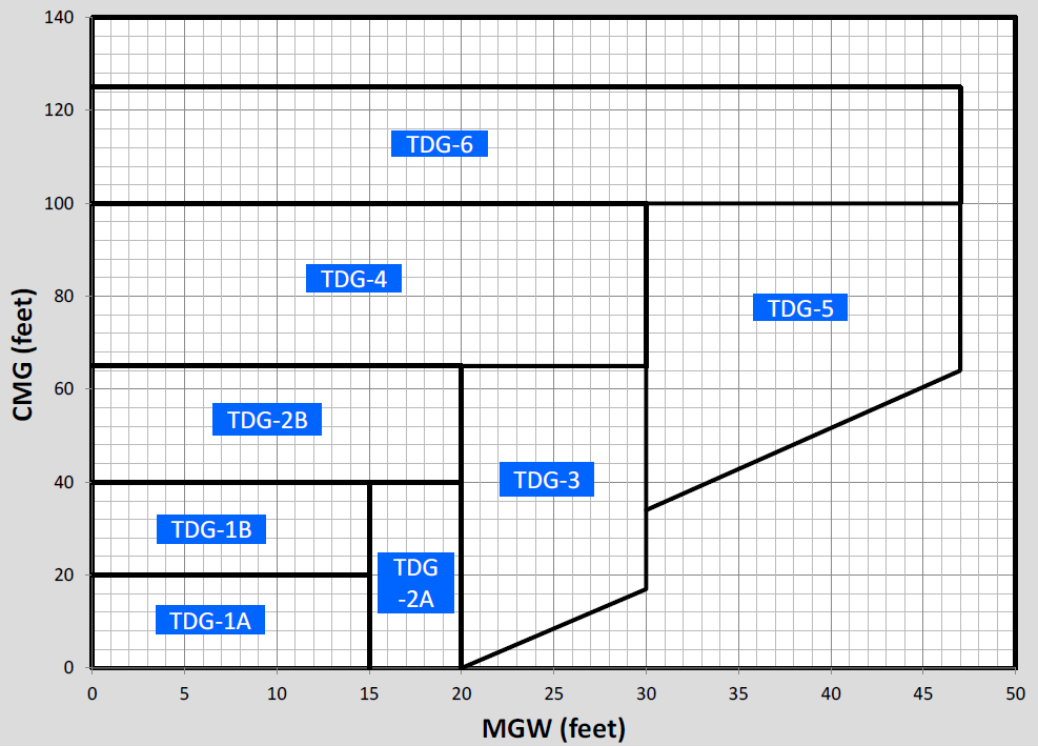
SOURCE: FAA Advisory Circular 150/5300-13B

- **Taxiway Design Group (TDG):** The TDG classification was implemented within the last decade to address new aircraft that entered service, which were primarily longer versions of existing aircraft. Though these aircraft share many of the same characteristics as the original shorter versions, their longer fuselage and wheel-base created ground maneuvering challenges when using airfields with then-existing taxiway design standards. As a result, a new aircraft classification system was implemented in addition to the ADG classification for the purposes of taxiway design. The TDG focuses on the landing gear configuration of aircraft to help determine taxiway pavement fillet requirements. The new TDG classification led to updated pavement filler designs for taxiway turns and intersections by widening them to avoid aircraft movement into non-paved areas. **Figure 4-3** delineates the TDG categorization.



SOURCE: ESA Analysis, October 8, 2021

Figure 4-2 ADG Category Examples



SOURCE: FAA Advisory Circular 150/5300-13B

Figure 4-3 FAA Taxiway Design Group Classification

Existing RSW Critical Design Aircraft

The 1992 and 2004 RSW Master Plan Updates recommended that the critical aircraft be designated as a composite ADG-V aircraft referring to the Boeing 747, Airbus A330 and A340 families. However, based on a pre-COVID traffic count, the existing critical design aircraft for RSW would be a Boeing 757/767 combination with approximately 7,040 operations between October 2018 and September 2019. For the AAC rating, RSW saw 18,206 operations for AAC Category D aircraft during the same time period. A summary of operations by aircraft category can be seen in Table 4-4. The resulting existing critical aircraft categories would be ADG-IV, TDG-5 and AAC-D.

Table 4-4 Pre-COVID One-Year Passenger Aircraft Operations

Aircraft Category		ADG-III	ADG-IV	ADG-V	AAC-D
2018	Oct	3,604	512	32	908
	Nov	5,290	584	24	1,606
	Dec	6,642	642	34	1,900
2019	Jan	7,196	762	22	1,922
	Feb	6,906	750	24	2,702
	Mar	8,794	1,134	26	2,146
	Apr	7,106	766	26	1,788
	May	4,564	482	28	1,482
	Jun	3,710	382	20	982
	Jul	3,512	372	24	818
	Aug	3,370	262	28	1,064
	Sep	3,018	392	20	888
Total		**63,712**	**7,040**	**308**	**18,206**

SOURCE: LCPA, ESA Analysis, October 2021

Future RSW Critical Design Aircraft

International widebody aircraft, traditionally large ADG-IV or V aircraft have been operating at RSW since 1994. For example, Air Berlin (followed by Eurowings) operated up to four weekly flights to Germany in 2018. Flights to Germany are expected to resume in 2022 with Eurowings Discover (a Deutsche Lufthansa subsidiary) Airbus A330-300. As the Southwest Florida region continues to grow demographically and economically, passenger growth for domestic and Canadian markets is forecasted to be strong, leading airlines to potentially upgauge aircraft in operation at RSW.

The largest domestic aircraft that regularly operates at RSW is the Boeing 757-200 and 757-300. The Boeing 757 and 767 families are the only commercial aircraft still in use by U.S. airlines that are classified as ADG-IV aircraft. However, the 757 and 767 aircraft types have not been produced for U.S. commercial airlines since 2004 and 2003, respectively, and have already been permanently retired by some airlines. It is assumed, based on average fleet age and average aircraft retirement age, that the rest of these aircraft will be retired within a decade. These retirements are included in the forecasting analysis found in Appendix F, Passenger and Operations Forecast, 2020, C&S Companies & TransSolutions. All the 767 and 757 aircraft types were phased out by 2030. In the case of Air Canada, an Airbus 330 with 285 seats, was substituted for their 767 with 282 seats. There are no ADG-IV aircraft currently being designed by any western aircraft manufacturer.

As part of Chapter 3, Forecast of Aviation Demand, a design day schedule was created for the peak months of March and April using existing schedule information for 2020 and then forecasted for 2025, 2030, 2035 and 2040. RSW has different peaking characteristics than most airports in the United States, which results in most passenger activity occurring during peak months. Based on the peak month schedule for those two months, there are 488 operations projected for ADG-V aircraft in 2025. That number increases to 894 in 2040, with a complete phase-out of ADG-IV flights projected between 2025 and 2030. It is anticipated that the majority of ADG-V flights will be operated with the Airbus A330 family of aircraft. Table 4-5 shows the forecasted operations for the peak months of March and April for ADG-IV and V aircraft.

Table 4-5 Forecasted ADG-IV/V Peak Month Operations

Year	2020	2025	2030	2035	2040
ADG-IV (B757, B767)					
March	310	46	0	0	0
April	214	52	0	0	0
ADG-V (B747, B787, B777, A330, A340, A350)					
March	4	298	390	412	554
April	4	190	292	340	340
PEAK MONTHS TOTAL					
ADG-IV	524	98	0	0	0
ADG-V	9	488	682	752	894

SOURCE: TransSolutions and C&S, ESA Analysis, October 2021

The Airbus A330, currently the dominant ADG-V aircraft at RSW, first entered service more than 30 years ago is expected to remain in service until the 2030s. For long-term planning, it can be anticipated that its eventual replacement by more modern aircraft of similar size and capacity will most likely start in the 2030s and into the 2040s. Similar aircraft in size and capacity should be considered when determining the critical aircraft, such as the Airbus A350 or Boeing 787 family or even modernized and larger versions of the A330. Although these aircraft are of a newer design, they are of also ADG-V and are AAC-C aircraft like the A330.

For future critical-aircraft planning purposes, a composite aircraft meeting dimensional requirements of an A330-300, A350-900 or B787-9 should be used. These aircraft are all ADG-V and TDG-5. For the AAC rating, RSW saw 18,206 operations for AAC Category D aircraft between October 2018 and September 2019. Based on this flight history, we assume that the number of operations of Category D aircraft will continue to largely exceed 500 annual operations. The resulting composite critical aircraft should use the characteristics detailed below.

- Aircraft Approach Category: D (B737-800/900)

- Aircraft Design Group: ADG-V (A330, A350, B787)
- Taxiway Design Group: TDG-5 (A330, A350, B787)
- Wingspan: 212.42' (A350-900)
- Length: 219' (A350-900)

Airport Reference Code

The Airport Refence Code (ARC) is composed of the ADG and the AAC of the future critical aircraft combined into one code. Having determined that the critical aircraft for RSW is a composite aircraft being ADG-V and AAC-D, the resulting ARC is D-V (a combination of ADG-V and AAC-D).

Summary of findings for Critical Design Aircraft

- The existing Critical Design Aircraft is considered to be a composite aircraft with the following categorizations: ADG-IV, TDG-5 and AAC-D.
- The future Critical Design Aircraft starting in 2024 will be ADG-V, TDG-5 and AAC-D type aircraft.
- The future ARC is D-V.

4.3 Airfield Requirements

Runways

This section addresses the specific requirements relative to Runway 6-24, as well as a new Parallel Runway. As a primary airfield facility at any airport, a runway must have the proper width, length, and strength to safely accommodate the critical aircraft expected to use the airfield.

Runway width requirements for airport design are included in FAA AC 150/5300-13B. The design standards are based on the critical aircraft's Approach Category, Design Group, and the approach visibility minimums at the airport.

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidelines to determine the ultimate runway length required at an airport facility. These guidelines consider airfield conditions, such as the elevation, mean daily maximum temperature, and effective runway gradient. Length determinations also consider critical aircraft data, such as takeoff weight, length of haul, and payload, using individual aircraft performance manuals published by the manufacturers.

The runway's pavement strength is also an important factor to consider in future runway requirements. Airport pavement strength is evaluated to establish load-carrying capacity for expected operations, to assess the ability of pavements to support significant changes from expected volumes or types of traffic, and to determine the condition of existing pavements for use in the planning or design of improvements, which may be required to upgrade a facility.

Runway 6-24

Runway Width

The current width of Runway 6-24 is 150 feet. Criteria contained in FAA AC 150/5300-13B, states that for the D-V designation, a runway width of 150 feet is adequate.

Runway Length Analysis

Runway 6-24 is 12,000 feet long and is capable of handling long-range flights by large ADG-V type aircraft, the most common type in the Airbus A330 family. Using Airport Planning and Aircraft Performance manuals from aircraft manufacturers (Airbus and Boeing), the 12,000-foot runway is capable of handling all the types of aircraft currently and project to use RSW. This includes the newer short-haul jets such as the 737 MAX, A220 and A320NEO families; and larger long-haul aircraft such as the B777, B787, B747-8 and A350 families. As such, no improvements are recommended with regard to the Runway 6-24 length.

Runway Pavement Strength

As indicated in Chapter 2, Existing Conditions, the Runway 6-24 pavement is currently strength rated at 120,000 pounds single wheel loading (SWL); 250,000 pounds double wheel loading (DWL); 538,000 pounds dual-tandem loading and 1,045,000 pounds double-dual-tandem loading (DDTL). The 1,045,000-pound, double-dual tandem strength rating satisfies the demands of the heaviest double dual tandem aircraft that could serve RSW. As such, the pavement strength of Runway 6-24 is considered to be adequate throughout the planning period for all aircraft currently serving or projected to serve RSW.

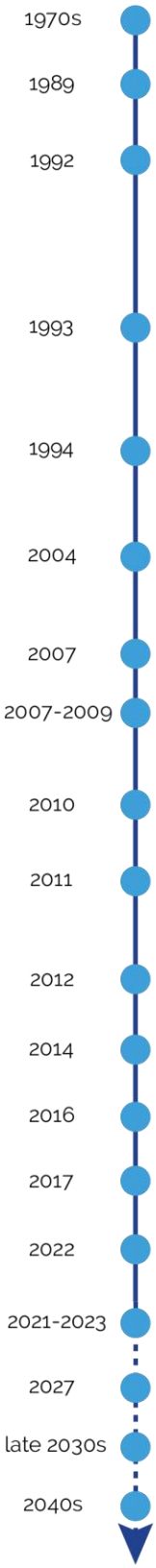
Runway Condition

The existing runway is generally noted in satisfactory or fair condition. The runway was last rehabilitated in 2007, during which Taxiway A was converted into a temporary runway for the duration of the runway rehabilitation (approximately six months). A runway rehabilitation has been programmed within the Airport Capital Improvement Plan to be completed by the end of 2027.

New Runway

Planning for a Parallel Runway at RSW dates back to the original concepts for the airport proposed in the 1970s. The original airport plan provided for a general aviation-only parallel runway located north of Runway 6-24. Updated activity projections, along with a change in aircraft fleet-mix projections outlined in the 1992 Master Plan resulted in a proposed longer widely spaced south Parallel Runway that could accommodate air carrier aircraft and provide for simultaneous instrument approaches. This configuration would allow RSW to maximize its long-range flexibility in serving the growing demand for air service in the Southwest Florida region. The 2004 Master Plan forecasted the need for the new runway to be operational by 2020, the point at which the existing runway was projected to reach capacity. In the following years, several planning studies, preliminary design of site preparation and permitting work was done in order to prepare for full the design and construction.

The Great Recession and resulting airline consolidation resulted in the upgauging of aircraft (larger capacity narrow body aircraft) at RSW. This resulted in more passengers being moved with less aircraft and slower growth in aircraft operations, delaying the operational need for a new Parallel Runway. Based on the updated forecast and capacity analysis, a new runway will be needed by the early 2040s. More information on the new runway can be found in Appendix H, Parallel Runway Close-Out Report, 2017, by AECOM.



1970s	Initial planning for RSW included a parallel general aviation runway located north of Runway 6-24
1989	Runway Extension Justification Study concludes that Runway 6-24 should be extended from 8,400 feet to 12,000 feet to accommodate the projected future fleet mix
1992	Master Plan concluded that a new commercial runway located south of existing Runway 6-24 with a spacing of 5,875 feet from the existing runway, to allow for a new midfield terminal, to be constructed in between both runways
1993	Parallel Runway Length and Separation Refinement Study reviewed the proposed Parallel Runway's length and spacing and determined the spacing should be reduced to 5,385 feet, so as to reduce the impact on the FPL Transmission power lines located to the southeast The length of the runway would also be impacted by the presence of power lines. In order to clear the all airspace surfaces and provide sufficient take-off run for a majority of the projected fleet at RSW, a minimum runway length of 9,100 feet was deemed to be sufficient
1994	An Environmental Assessment (EA) is prepared to address the long-term development needs of the airport. The future Parallel Runway location was determined in the March 1994 Finding of No Significant Impact (FONSI) by the FAA in review of the EA
2004	2004 Master Plan maintained the previously identified runway dimensions (9,100 x 150 feet) and spacing of 5,385 feet and identified the need for the new runway to be built and operational by 2020 to support projected flight activity
2007	FAA revalidation of the 1994 FONSI on the configuration and location of the future Parallel Runway
2007-2009	Parallel Runway Program Study is initiated to plan and design certain enabling projects and initial planning of the new runway itself
2010	Certain western portions of the Parallel Runway and taxiway footprint were cleared, grubbed and graded under the Limited Site Preparation Projects
2011	80-foot shift of the Runway Alignment is included in the 2011 ALP Update and approved by the FAA. The 80' shift allows a second parallel taxiway to be built between the new runway and the terminal area. The spacing between runways increases to 5,465 feet.
2012	New centrally located ARFF Station, in between the existing and future runway, is commissioned
2014	Crossfield Taxiways serving the new Midfield Terminal Complex and future runway is commissioned
2016	Runway operations decrease below original projections, delaying the need for new runway construction
2017	In May, easement through private land was acquired for the partial future relocation of the FPL Transmission line
2022	New centrally located ATCT, in between the existing and future runway, is completed by the Lee County Port Authority and turned over to FAA for commissioning activities
2021-2023	Master Plan Update forecasts need for a new runway around 2040 time frame requiring advanced planning, final land acquisition, design and permitting to be started in the late 2030s
2027	Existing Runway 6-24 programmed rehabilitation
late 2030s	Future runway advanced planning, final land acquisition, design and permitting to begin
2040s	Existing Runway 6-24 reaches 100% of its capacity, new runway is commissioned

The additional operational capabilities provided by a new runway are not necessarily proportional to the number of runways but is dependent on a number of factors that impact the use of each runway in the system. These include:

- Runway orientation/configuration
- Runway length
- Runway width
- Runway strength

A runway's utilization is determined in part by its length, strength, instrumentation, and separation from and orientation to, the other runways at the airport. For example, adding a shorter, commuter-length runway will limit its utility since larger aircraft will not be able to use it.

Similarly, new runways oriented in a parallel manner to an existing runway system generally provide greater utility since aircraft approaches will not intersect with approaches to other runways. Runway spacing is also a major factor in determining runway system capacity as it affects the dependency of runway operations, meaning that inadequate spacing between two parallel runways dictates that the use of one runway is dependent or constrained by activity on the other.

The following sections outline key factors in developing a new runway to serve RSW.

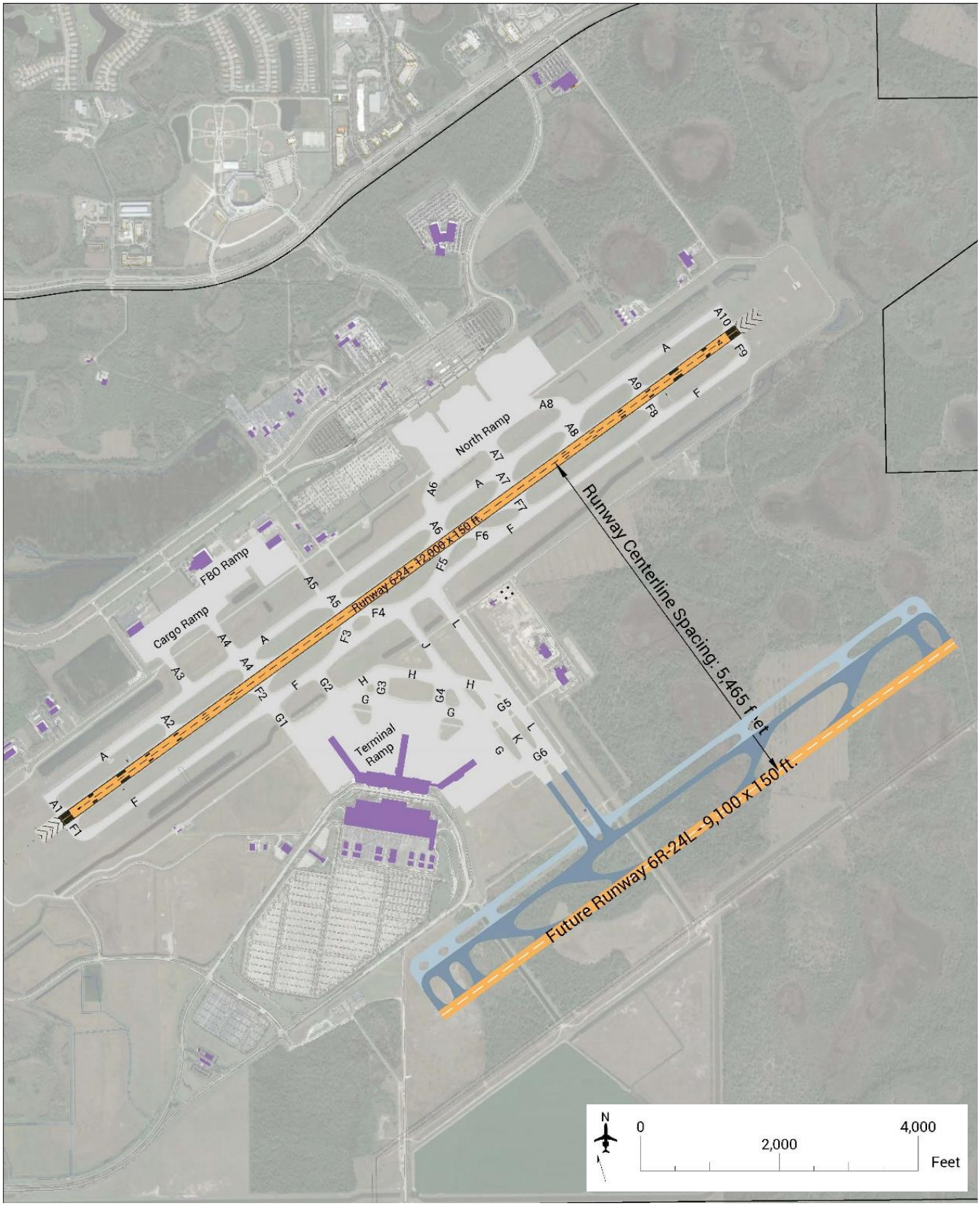
Orientation/Configuration

As mentioned in the existing conditions chapter, wind conditions are ideally suited to provide for such a configuration with 98.13% wind coverage for the 6-24 orientation. Thus, a parallel runway would be the optimal choice for a new runway. The 1992 Master Plan concluded that a parallel runway of the same length as the existing runway should be planned, with a 5,875-foot spacing from the existing runway. This spacing was to allow the maximum possible development area for a midfield terminal without impacting the major inland slough to the south, as well as meet the FAA's minimum recommended separation of 4,300 feet required for simultaneous instrument approaches.

In 1993, the Parallel Runway Length and Separation Refinement Study reviewed the proposed new parallel runway's length and spacing to determine if development costs and impacts could be reduced. Based on this review, the Refinement Study suggested a reduction in spacing to 5,385 feet from the 5,875-foot spacing originally proposed. By doing so, it was determined the Florida Power & Light (FPL) triple row of 230 Kv power lines to the south would not require relocation along the length of the runway, only where they passed beyond the new runway's northern end. The 5,385-foot spacing provided 1,095 feet of horizontal clearance from the 88-foot MSL power line poles, plus an additional 6-foot clearance margin of safety. According to the 1994 Environmental Assessment, the reduced parallel runway spacing would reduce the length of power lines requiring relocation from approximately 19,000 feet to 4,500 feet. The future parallel runway location was initially determined in the March 1994 Finding of No Significant Impact (FONSI), which the FAA later revalidated in 2007. The spacing was later increased by 80 feet to 5,465 feet in order to accommodate a potential second parallel taxiway to the new runway. This shift would have minimal impact to the power line relocation and was included in the 2011 ALP update that was approved by the FAA the same year. The general layout of the new runway can be seen in **Figure 4-4**.

Runway Width

As the new runway will be planned to accommodate simultaneous precision instrument approaches and the same commercial aircraft serving the current runway, the width of the new runway should adhere to Aircraft Design Group D-V as stipulated in FAA AC 150/5300-13B, which states that for D-V designations, a runway width of 150 feet is adequate.



SOURCE: ESA Analysis

Figure 4-4 Future Proposed Runway Configuration

Runway Length

The 1992 Master Plan Update and the 1993 New Runway Length and Separation Refinement Study initially looked at replicating the existing 12,000 by 150-foot runway, so as to have maximum air-traffic control flexibility with runway assignments. As the studies progressed, the presence of the FPL high-voltage transmission lines to the east of the planned runway area presented a constraint that had to be mitigated. A solution was found by reducing the runway length to 9,100', establishing the runway separation at 5,465', as well as relocating a portion of the FPL transmission lines to avoid airspace interference issues.

Existing intercontinental traffic at RSW has historically been to/from Germany. Potential future intercontinental routes to/from RSW are most likely to be less than 5,000 nautical miles (NM) in length (enough for most of Western Europe including all of Germany and South America). Original plans accounted for heavier and less efficient ADG-V aircraft to fly routes between 5,000 and 6,500 NM. The 12,000-foot length of the runway was optimized for this type of traffic. Using data from airport planning manuals provided by Airbus, the A330-300, the aircraft forecasted to be used for most intercontinental flights, could depart to intercontinental destinations of 5,000 NM or less at commercial weight using 9,100 feet of runway. Based on a review of current and projected activity, it is anticipated that a length of 9,100 feet would provide the necessary capacity and capability to accommodate more than 95% of current and projected aircraft departures through the year 2040. Therefore, 9,100 feet is recommended as the minimum runway length to satisfy demand throughout the planning period. In the rare case where more take-off run would be required, the existing runway with 12,000 feet of take-off run could be used. Using **Figure 4-5**, Runway Takeoff performance chart for an Airbus A330-300; and calibrating performance for routes for a maximum of 5,000 NM based on historical international routes (**Figure 4-6**) such as Germany, a takeoff performance analysis supports these findings.

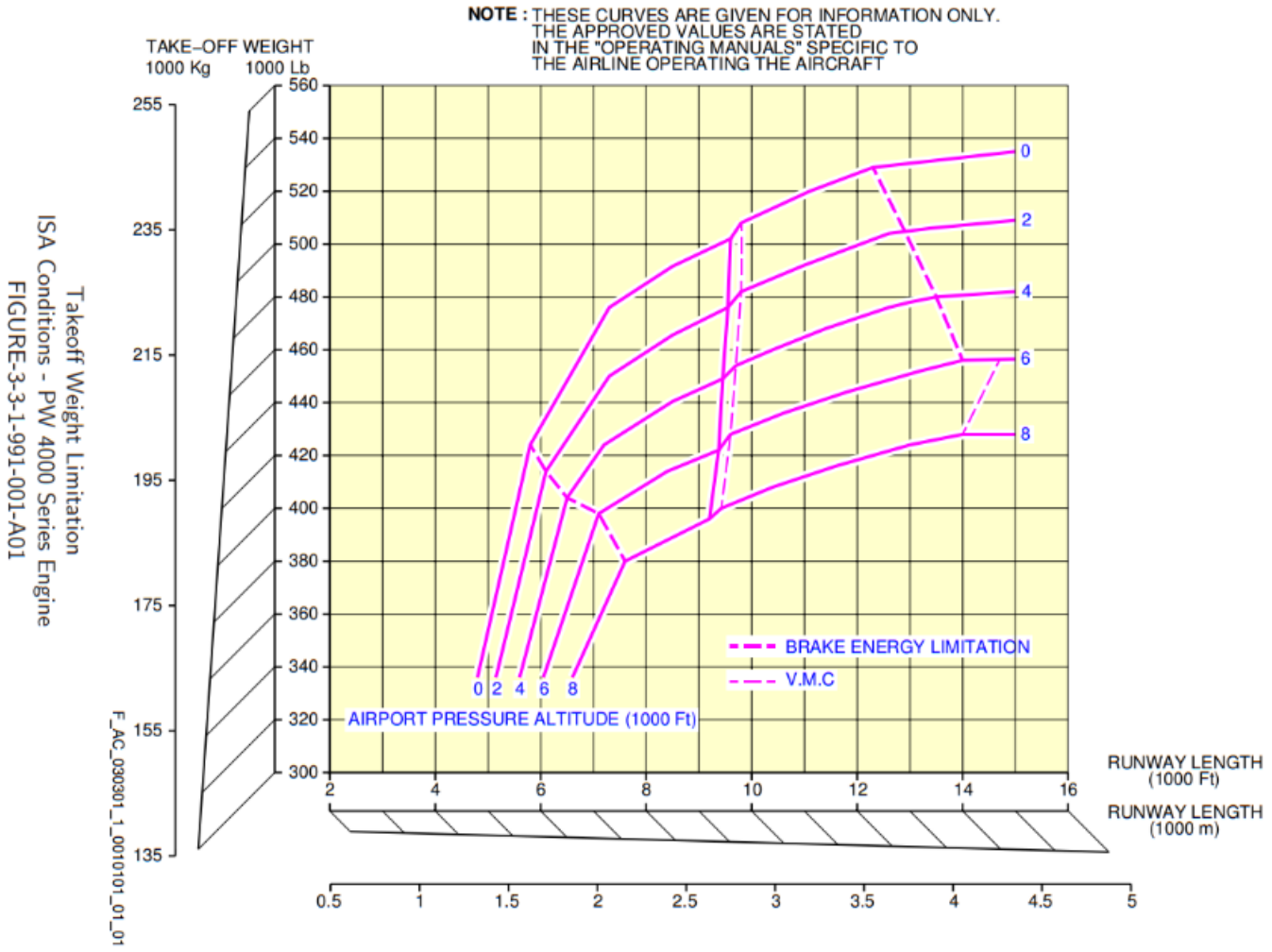
Runway Strength

The strength of the existing runway at RSW is designed to accommodate aircraft within the ADG-V category. As this designation represents the critical aircraft expected to use the facilities, it is recommended that the new runway be designed to the same D-V standards similar to that of the existing runway.

FPL Transmission Line Relocation

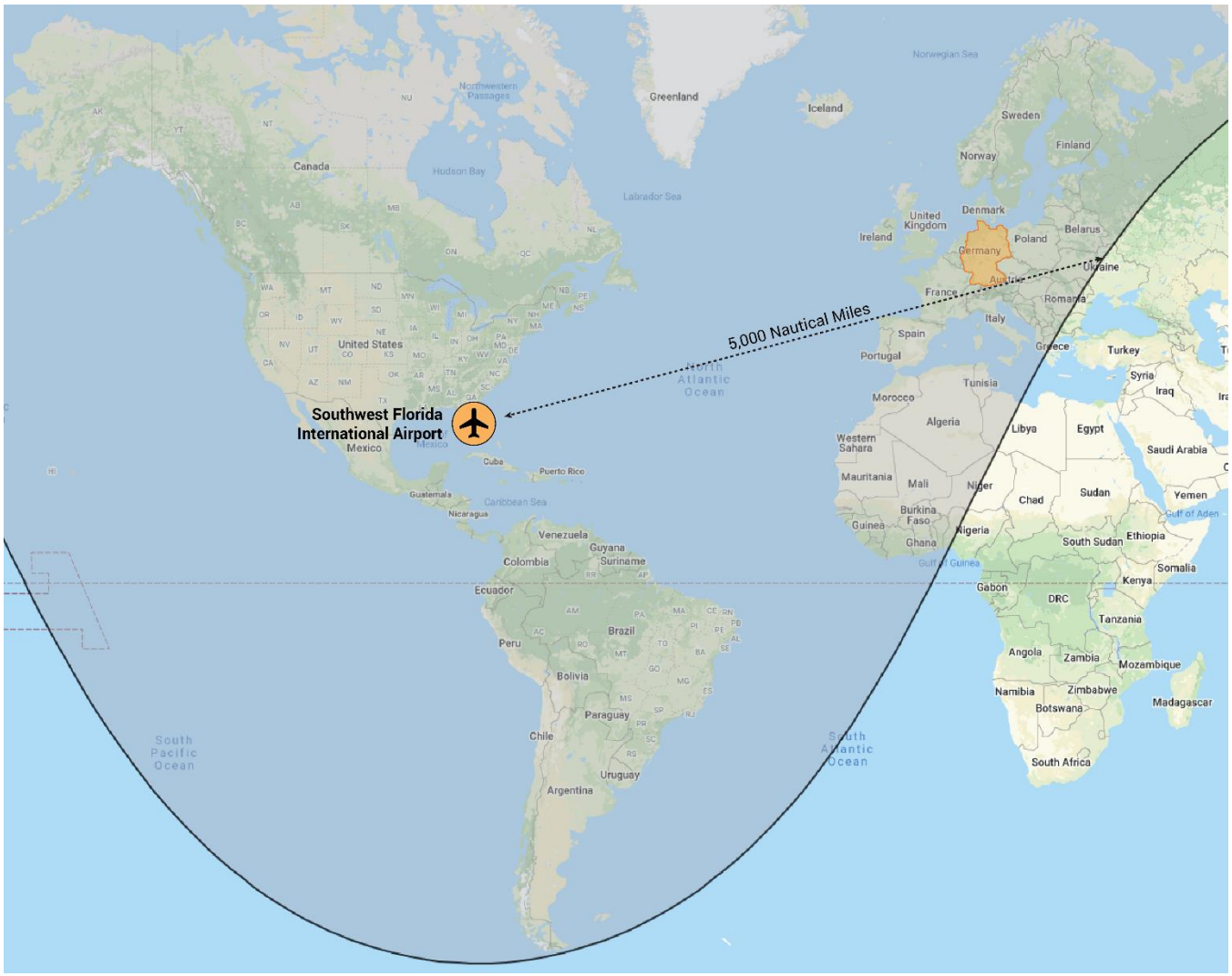
An existing FPL transmission line corridor is located southeast of and parallel to proposed Runway 6R-24L. This existing facility was analyzed in the Parallel Runway Close-Out Report, 2017,by AECOM (Appendix H) both for potential interference with navigational aids (NAVAIDs) as well as for any penetrations to protected approach and departure surfaces for the proposed runway. The majority of the existing corridor posed neither interference for CAT-I instrument landing systems, nor any airspace impact to the proposed runway; however, a 5,450 linear-foot segment of the corridor that crossed the eastern extended runway centerline would pose an impact to airspace. A variety of routes were evaluated and options were proposed before determining the most cost-effective and least environmentally invasive route. The proposed new alignment was coordinated with FPL transmission line engineering staff (**Figure 4-7**) and a non-binding estimate was received.

To address the airspace issues, preliminary environmental surveys were performed, and the reviewing agencies were identified. A portion of the required realignment lies within the boundaries of Lee County Conservation 20/20 lands, so a Lee County review process was necessary to secure approval of the alignment, the acquisition of these lands will need to be finalized prior to design and construction. Another portion of the realignment lies on privately owned property. Initial discussions with the private landowner indicated their willingness to discuss granting a right-of-way through their property. The required easement was identified, for which a legal sketch and description was secured. Coordination with the Lee County Department of Lands led to a fair appraisal value for acquisition. A negotiation to purchase the easement was initiated and an agreement on the purchase was executed in May 2017.



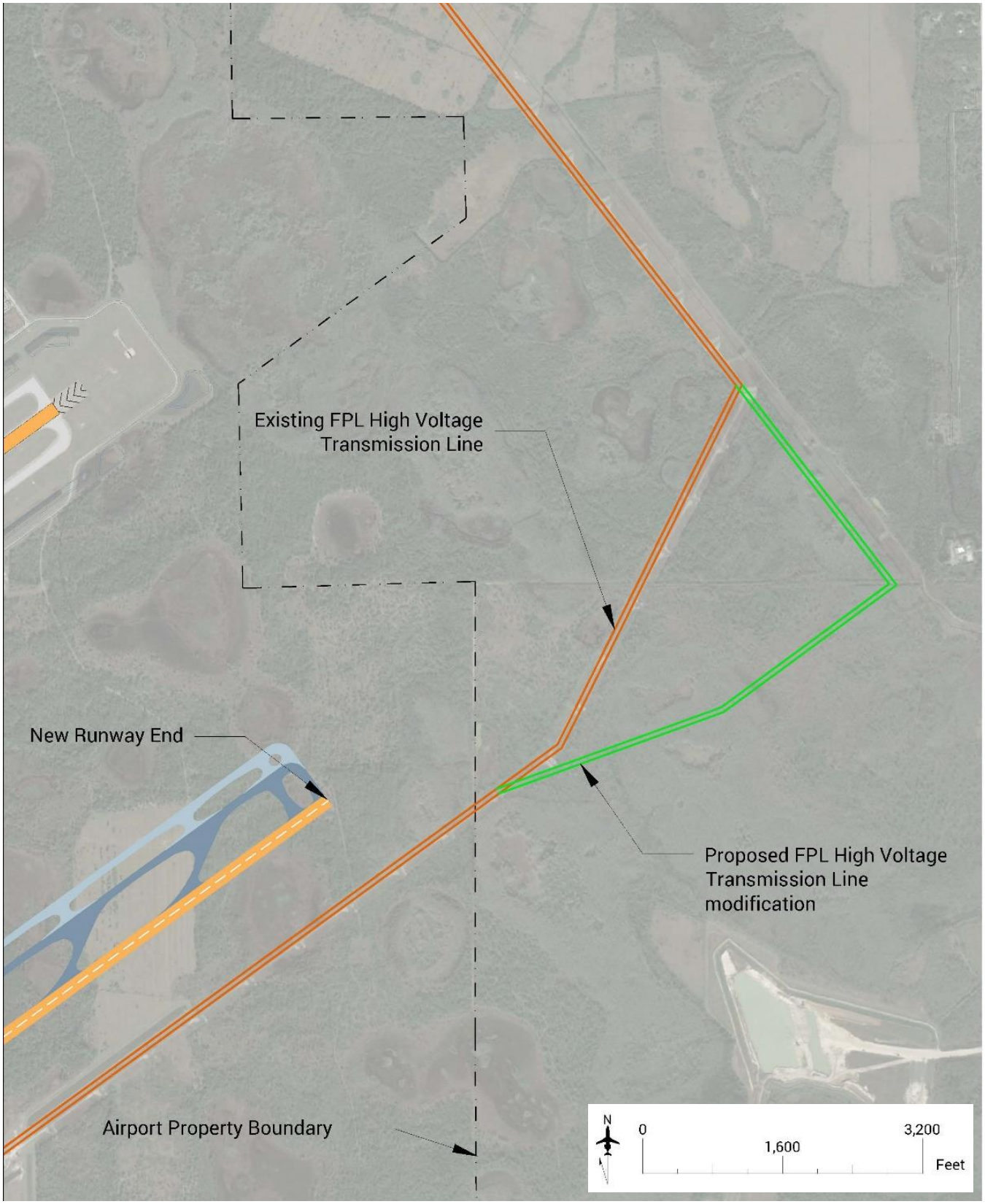
SOURCE: Airbus A330 Aircraft Characteristics Airport and Maintenance Planning, July 2021

Figure 4-5 Airbus A330-300 Runway Takeoff Performance Chart



SOURCE: ESA Analysis

Figure 4-6 5,000-Nautical-Mile Range from RSW



SOURCE: AECOM, Parallel Runway Close-Out Report, 2017

Figure 4-7 Florida Power & Light High-Voltage Transmission Lines

During meetings with FPL representatives, the procedure for design and execution of a relocation of this magnitude was discussed. FPL requires the entity whose activity precipitates the need for relocation, in this case LCPA, to obtain the easement and secure all required local, state and federal agency approvals (permits) by designing a corridor footprint that meets FPL requirements. LCPA would also be responsible for designing and constructing the new corridor embankment and agree to pay FPL's design and construction fees for the actual construction of transmission line towers and lines along with development of all documents necessary to remove the existing lines and towers and vacate the existing easement.

At the time of the coordination in 2016, projected operations did not warrant construction of runway 6R-24L in the near future; therefore, the relocation of FPL facilities would be delayed until a later time in coordination with commissioning of the Parallel Runway.

As part of the facility requirements analysis, a preliminary recommendation is that at least one of the runways, either existing or the future planned runway, should be equipped with equipment to allow a CAT-II approach during strong instrument meteorological conditions (IMC). CAT-II IMC occurs approximately for 100 hours spread out over the course of a year. In 2008, Ohio University studied the compatibility of a new parallel runway with either a CAT-I or CAT-II approach with the FPL transmission line. The study found that a CAT-I approach on the new parallel runway would not be impacted by the existing FPL transmission line. However, the FPL transmission line would interfere with the approach equipment needed to handle a CAT-II approach. Should a CAT-II approach be required on the new parallel runway, the section of FPL line that runs parallel to the new runway would need to be relocated in addition to what would be required to mitigate airspace issues.

Taxiways

A proper taxiway system should provide freedom of movement to and from the runways of an airport under a variety of operating conditions. This includes entrance and exit taxiways, taxiway run-up areas, apron taxiways, and taxilanes. Some of the basic design principles for an efficient taxiway system includes the following:

- Provide each active runway with a full parallel taxiway.
- Construct as many by-pass, multiple access, or connector taxiways as required to ensure efficient access to each runway and runway end.
- Provide taxiway hold areas for each runway end.
- Build all taxiway routes as direct as possible while avoiding direct connections between the runway and the parking aprons.
- Provide adequate curve and fillet radii.
- Avoid developing areas which might create ground traffic congestion.
- Ensure taxiways are adequate to serve projected aircraft ARC.

Improvements to a taxiway system can be warranted for more than just capacity enhancement reasons. A key consideration for taxiway enhancements is the safety of aircraft movements, as well as the efficiency of aircraft movements on the airfield and to access developing portions of the Airport.

The taxiway system at RSW was largely built before new taxiway design standards were codified in FAA AC 150/5300-13B. While taxiway separations and fillets were previously based on the ADG rating of the critical aircraft for that taxiway; the new AC created a new categorization system called Taxiway Design Group (TDG). Under the new system, aircraft are

categorized into different TDG categories based on a combination of wheel-base length and width. The purpose of the new TDG categorization system is to avoid taxiway excursions of newer aircraft being designed with longer or wider wheelbases. The new TDG requirements detail new taxiway fillets that generally provide increased pavement area to allow an aircraft to turn without leaving the pavement area.

The following sections outline requirements needed for the existing and potential future taxiway system at RSW.

Taxiway A

Taxiway A is the full-length parallel taxiway serving Runway 6-24. This taxiway, which is located on the north side of Runway 6-24, has been constructed to a width of 75 feet, and meets the design Group V's minimum taxiway width. Taxiway A's runway centerline to taxiway centerline spacing of 400 feet also meets the separation standards for Design Group V aircraft. The parallel taxiway has a total of nine taxiway connectors, all of which provide access to and from the parallel taxiway and the runway. Five of these taxiways, Taxiways A4 through A8, are high-speed exit taxiways. Only two (A3 and A5 connecting to the Cargo Ramp) of the nine connector taxiways meet TDG-5 fillet requirements. Any future rehabilitations or improvements should be made to TDG-5 standards. As noted in the Existing Conditions chapter, the full-length taxiway is in "fair" condition with the end sections including Taxiways A1 and A10 in "good" condition having completed pavement rehabilitation in 2020-2021.

Further in this chapter, a discussion will focus on potential airside development opportunities on the North side of the airfield. As part of this study, a close parallel taxiway could be needed. The area that would be required for such a parallel taxiway meeting ADG-5 and TDG 5 taxiway design standards should be protected for future study and development.

Taxiway F

Taxiway F is the full-length parallel taxiway serving Runway 6-24. This taxiway, which is located on the south side of Runway 6-24, has been constructed to a width of 75 feet, and meets the design Group V's minimum taxiway width. Taxiway F's runway centerline to taxiway centerline spacing of 400 feet also meets the separation standards for Design Group V aircraft. The parallel taxiway has a total of nine taxiway connectors, all of which provide access to and from the parallel taxiway and the runway. Five of these taxiways, Taxiways F3 through F6, are high-speed exit taxiways. Only Taxiway F1 meets TDG-5 fillet requirements, any future rehabilitations or improvements to the other taxiways should be made to TDG-5 standards. As noted in the Existing Conditions chapter, the full-length taxiway is in "good" overall condition having completed pavement rehabilitation in 2020-2021.

Taxiway F is the primary parallel taxiway to Runway 6-24 for commercial operations. The majority of operations at RSW are commercial aircraft and, all departing and arriving commercial aircraft use Taxiway F. As traffic increases, Taxiway F will reach capacity with the need for a second parallel taxiway to allow for improved aircraft queueing as well as removing aircraft from the queue in case of irregular needs. This taxiway should be designed to meet ADG-V and TDG-5 taxiway design standards.

Cross-Field Connector Taxiways

After the completion of the Midfield Terminal in 2005, a pair of "Cross-Field" taxiways were constructed. In the short to medium-term, these connector taxiways would allow easier access from the existing runway to the terminal area. In the long-term, their configuration was optimized so as to be extended and reach the new parallel runway whenever it would be activated. A potential third parallel crossfield taxiway to the east of the existing crossfield taxiways has been planned

and its location is depicted on the latest approved ALP. As these taxiways were built after the implementation of FAA AC 150/5300-13A Change 1, their configuration meets TDG-5 fillet standards.

New Runway North Parallel Taxiway(s)

In reviewing projected demand and the configuration of the ultimate midfield program, it is recommended that the new runway be configured with at least a single parallel taxiway. A second parallel taxiway could improve aircraft flow and operations at peak times. Provisions should be made that if only one taxiway is initially built, a second parallel should be protected for and included in its design. It is recommended that the taxiways be built on the north side of the new runway to provide easy access to and from the midfield terminal. The new taxiways should be built to meet TDG-5 taxiway design standards.

New Terminal Apron for Concourse E

The proposed Concourse E will require appropriate aircraft apron and taxiway/lane access for aircraft. The description and configuration of this apron will be further discussed in the Terminal Facility requirements section.

Airfield Geometry Study

In January 2018, an "Existing Airfield Geometry Evaluation Study" was commissioned to identify potential issues with the existing taxiway pavement geometry (Appendix I).

The study placed taxiway issues into two groups; taxiways that did not need immediate attention, and taxiways where mitigation was proposed.

While dimensionally the airfield meets the taxiway width and centerline separations for ADG-V aircraft requirements; as noted in the Existing Conditions chapter in Table 2-5, many of the taxiway intersections or turns do not meet TDG-5 pavement fillet requirements. The 2018 study in most cases generally found that taxiways, while not meeting TDG-5 requirements, for the most part did not require immediate modification to meet standards. Through simulation it was found that the identified aircraft used for modeling, an A330-200 did in most cases navigate the taxiways without much issue. However, it should be noted in certain cases that the aircraft taxi track reached the limit of acceptable use of pavement and that the aircraft used for simulation is shorter than the aircraft that will be used by European carrier EuroWings to replace the legacy RSW-Germany route flown previously by Air Berlin. The new aircraft is 16 feet longer and a has more demanding taxi track. In addition, cargo aircraft such as the MD-11 operated by Western Global are TDG-6, (which requires more pavement that TDG-5). While the MD-11 is not the level critical aircraft, the use of RSW by MD-11 type aircraft reinforces the need for improved turning fillets meeting at least TDG-5 requirements.

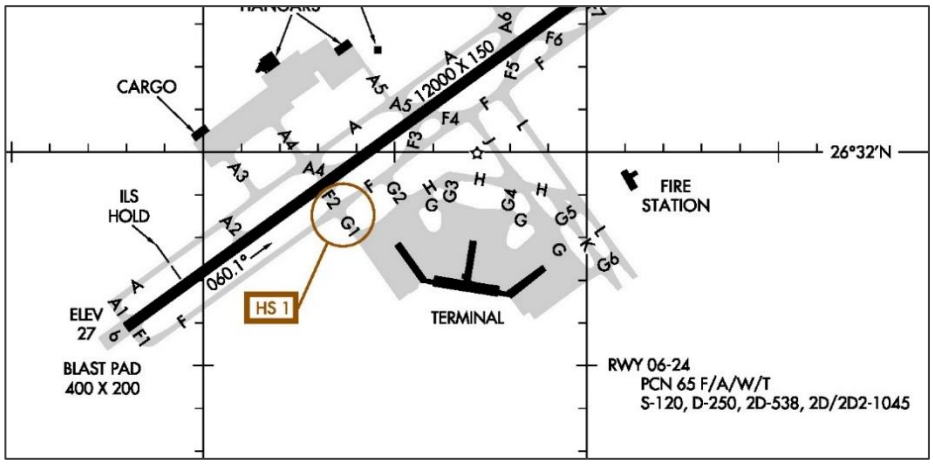
While maintaining the overall recommendation to keep taxiway fillets in their current configuration, it is also recommended for them to be upgraded to TDG-5 standards whenever there is significant pavement or rehabilitation work on these taxiways, or if a pattern of aircraft incidents due to pavement excursions arise.

The 2018 study had more immediate recommendations for the following identified issues.

Location 1: Taxiways G1 and F2

This area has been designated as a hot spot (No. 1 in the current Airport Diagram, **Figure 4-8**) due to the entrance of taxiway leading directly from the apron onto the runway without requiring a turn. This configuration can lead to a confusion when a pilot typically expects to encounter a parallel taxiway but instead accidently enters a runway.

To improve the current situation in this area, the location of Taxiway G1 should be moved.



SOURCE: FAA RSW Airport Diagram (valid December 29, 2022, to January 26, 2023)

Figure 4-8 Hot Spot 1 at RSW, Taxiway G1

Location 2: Runway 6-24 and Taxiways F3 and F4

Taxiways F3 and F4 are closely spaced high-speed exit points from Runway 6-24. F3 is a high-speed exit for Runways 24 and F4 is a high-speed exit for Runway 6. Advisory Circular 150/5300-13A Change 1 recommends the addition of a "no-taxi" island at the intersection of Taxiways F3 and F and at the intersection of Taxiways F4 and F. This island would prevent aircraft from performing judgmental oversteer movements. This addition should be considered as an improvement to this intersection.

Location 3: Runway 6-24 and Taxiways F5 and F6

This area has been designated as a hot spot (No. 2 in the current Airport Diagram) due to the entrance of Taxiway F6 high-speed exit sign being located immediately before the Taxiway F5 reverse high-speed exit. This configuration can lead to a confusion when a pilot typically expects to encounter a taxiway but instead accidently enters another taxiway. To improve the situation, the Taxiway F6 sign should be moved after the reverse Taxiway F5 exit when possible to avoid any confusion with the high-speed exit of Foxtrot 6 for the pilots. This recommendation has been designed and is awaiting construction.

The current Advisory Circular recommends the addition of a "no-taxi" island at the intersection of Taxiways F and F6. This island would prevent aircraft from performing judgmental oversteer movements. The addition of this "no taxi" island should be considered as an improvement to this intersection.

Additional Possible Airfield Enhancements

In addition to the "hot-spot" areas shown in the Airport Diagram, the Airport has identified additional areas that could enhance safety.

LOCATION A: TAXIWAY F1 AND RUNWAY 6

Aircraft traveling on Taxiway F west toward the Runway 6 threshold will stop at the runway hold position marking and turn into Taxiway F1. In order to increase safety, the improvement to this area should include in-pavement runway guard lights. Elevated runway guard lights will be evaluated during the design phase to determine if additional enhancement is required. These additions should be considered as improvements to this intersection.

LOCATION B: TAXIWAY A4 AND RUNWAY 6-24

Taxiway A4 intersection connects to Runway 6-24. This taxiway intersection, or taxiway connector, is a wide throated runway entrance, at a 45-degree angle in reference to the runway. FAA guidance recommends all design turns to be 90 degrees wherever possible. In order to increase safety, the improvement to this area should include in-pavement runway

guard lights. Elevated runway guard lights will be evaluated during the design phase to determine if additional enhancement is required. These additions should be considered as improvements to this intersection.

LOCATION C: TAXIWAY A5 AND RUNWAY 6-24

Similar to Taxiway A4, the Taxiway A5 intersection connects to Runway 6-24. This taxiway intersection, or taxiway connector, is a wide throated runway entrance, at a 45-degree angle in reference to the runway. FAA guidance recommends all design turns to be 90 degrees wherever possible. In order to increase safety, the improvement to this area should include in-pavement runway guard lights. Elevated runway guard lights will be evaluated during the design phase to determine if additional enhancement is required. These additions should be considered as improvements to this intersection.

LOCATION D: TAXIWAY A7 AND RUNWAY 6-24

Similar to Taxiways A4 and A5, the A7 intersection connects to Runway 6-24. This taxiway intersection, or taxiway connector, is a wide throated runway entrance, at a 45-degree angle in reference to the runway. FAA guidance recommends all design turns to be 90 degrees wherever possible. Aircraft traveling on Taxiway A7 onto crossing Runway 6-24, will stop at the runway hold position marking. In order to increase safety, the improvement to this area should include in-pavement runway guard lights. Elevated runway guard lights will be evaluated during the design phase to determine if additional enhancement is required. These additions should be considered as improvements to this intersection.

LOCATION E: TAXIWAY F9 AND RUNWAY 24

Similar to the issues at Taxiways F and F1, this area has been designated as a possible area for runway incursion. Aircraft traveling on Taxiway F in direction to Runway 24 threshold will stop at the runway hold position marking and turn onto F9. In order to increase safety, the improvement to this area should include in-pavement runway guard lights. Elevated runway guard lights will be evaluated during the design phase to determine if additional enhancement is required. These additions should be considered as improvements to this intersection.

Electronic, Visual, and Satellite Aids to Navigation Requirements

Runway Approaches, Lighting, and Instrument Landing Systems

Based on the inventory conducted in the Existing Conditions chapter, Runway 6-24 is equipped with a Category I ILS/GS and medium intensity approach light system with runway alignment indicator lights (MALSR) on the Runway 6 approach end, and has RNAV Category I (CAT I) approaches approved for either Runway 6 or 24. With increased future operations and the likelihood of more extreme weather conditions, the 2019 ALP update recommended that at least one approach on the existing runway be upgraded to Category II to allow landing in more demanding inclement weather conditions.

For consideration of the future parallel runway, based on the Parallel Runway Close-Out Report (Appendix H), both runway ends will be served by at least CAT I precision approach systems using either ILS or GPS technology. The 2019 FAA Approved ALP depicts MALSR approach lights on either end of the new runway as well as an ILS Critical Area and Glide Slope.

There was a concern in the preliminary planning of the new runway in the early 90s that the FPL High Voltage Transmission Lines could create interference with an ILS Navaid system so as to render it unusable. An ILS modeling study, performed by Ohio University Avionics Engineering Center (OUAEC), determined the necessary Category I ILS operational requirements are attainable within the acceptable FAA signal interference tolerances with the power lines. This study evaluated the potential impacts of the lines on the proposed ILS localizer array and the glide slope antenna signals; GPS approaches would not be subject to potential power line interference.

New approach/departure procedures will need to be designed for the new runway to meet similar CAT requirements as the existing runway. In addition, the existing approaches and departures to Runway 6-24 should be reviewed and/or revised in parallel to the design of the new runway procedures so as to ensure simultaneous non-conflicting operation of both runways for an ARC D-V type aircraft (same as existing).

In 2016, RSW commissioned an Airfield Electrical Site Investigation & Associated Recommendations Study by Atkins (Appendix J), which included a comprehensive survey of the electrical system at RSW. The report made several recommendations which have been implemented, including significant upgrades to the airfield electrical and lighting infrastructure, upgrading airfield signage to light-emitting diode (LED) systems as well as several operational improvements to be carried out by the Airport within its organization.

As previously mentioned earlier in this chapter, the installation of runway guard lights is recommended at certain taxiway/runway intersections to reduce the likelihood of a runway incursion.

Airport Beacon

The current airport rotating beacon (or airport beacon) is located in between taxiways northeast of the Terminal area. With potential future development in the Terminal area, a new location for the airport beacon may need to be studied to ensure site compatibility.

Summary of Findings for Airfield Requirements

Existing Runway

A runway rehabilitation is currently planned to occur on or before 2027.

New Runway

- A new parallel 9,100- by 150-foot runway is recommended to be built to the south of the Terminal complex.
- The runway design should commence in the mid-2030s and be operational by the early-2040s.
- A portion of the FPL High Voltage Transmission Lines to the east of the Airport will need to be relocated in order to clear the future runway airspace.

Runway NAVAIDS

Improving the approach to CAT-II on at least one arrival approach is recommended for continuity of operations. Further study is recommended to determine benefit and feasibility.

Taxiways

- Taxiway intersections and turns should be brought up to TDG-5 standards when significant work is required.
- Potential new parallel taxiways to Taxiway A and Taxiway F.
- New elevated and in-pavement runway guard lights are proposed at runway/taxiway intersections.

Apron

A new Concourse E will require, a new aircraft parking apron to accommodate this new facility.

4.4 Airspace Requirements

Instrument Approach Procedures

Instrument approach procedures provide pilots with instructions for transitioning from the beginning of an initial approach to specific runway ends, or in some cases the Airport environment, during periods of poor visibility. Runway 6 has a precision instrument approach, which utilizes ground-based navigation equipment to provide both vertical and horizontal guidance to pilots on approach to the Airport. Runway 24 has a non-precision instrument approach, which uses global positioning system (GPS) technology to provide guidance to pilots approaching the runway end. The instrument approach procedures for RSW are discussed in detail in Section 2.5. **Table 4-6** summarizes the published instrument approach information, along with the lowest vertical and horizontal visibility minimums, available for each runway end. This information is critical to identifying the appropriate approach and departure surface requirements.

Table 4-6 Existing Instrument Approach Procedures

Runway	Approach Type	Approach Classification	Visibility Minimum	Vertical Minimum (Above Ground Level)
6	ILS CAT-I	Precision	RVR of at least 1,800 feet	200 feet
6	RNAV (GPS) LPV	Non-Precision	2400 feet	303 feet
6	Visual	Visual	5 miles	4,000 feet
24	RNAV (GPS) LPV	Non-Precision	0.75 miles	250 feet
24	VOR/DME or TACAN	Non-Precision	1 mile	370 feet

SOURCE: Federal Aviation Administration, https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/application/?event=procedure.results&nasrId=RSW#searchResultsTop (accessed November 18, 2021).

NOTES: CAT: Category; DME: Distance Measuring Equipment; GPS: Global Positioning System; ILS: Instrument Landing System; RNAV: Area Navigation; RVR: Runway Visual Range; TACAN: Tactical Air Navigation System; VOR: Very High-Frequency Omi-Directional Range

As mentioned in the previous section, Airfield Requirements: Electronic, Visual and Satellite Aids to Navigation Requirements, when a new runway is built, new approaches that meet existing CAT-I requirements should be designed for the new runway and existing approaches for the existing runway should be revised to ensure compatibility with the new runway approaches. It is also recommended to design at least one CAT-II approach on the existing runway (as it will be the longest) at some point in the future to ensure continuity of operations during IMC conditions. A CAT II approach can provide a decision height as low as 100 feet and visibility minima as low as RVR 1200.

Airspace Surface Analysis

This section identifies the existing and future airport airspace surfaces for Runway 6-24 and the future parallel Runway 6R-24L. The airspace surfaces prescribed in the following documents will be discussed in the sections below:

- Title 14 *Code of Federal Regulations* (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*
- Federal Aviation Administration (FAA) *Engineering Brief 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, Airport Design*

Title 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace

To enhance the safe operation of aircraft in the airspace around airports, the FAA has adopted Title 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace* (Part 77). Subpart C of Part 77 establishes imaginary surfaces for determining obstructions to air navigation. Part 77 surfaces are utilized in zoning and land use planning adjacent to the Airport to protect the navigable airspace from encroachment by hazards that would potentially affect the safety of airport operations. The specific imaginary surfaces which should be protected from obstructions include:

- **Primary Surfaces** – Longitudinally centered on each runway, this surface extends 200 feet beyond each end of the runway and has an elevation equal to that of the runway centerline. The width of the primary surface is that prescribed for the most precise instrument approach procedure, existing or planned, for either end of the runway. The primary surfaces for the existing and future runways at RSW are 1,000 feet wide.
- **Approach Surfaces** – These surfaces begin at the end of the Primary Surface (200 feet beyond the runway end) and slope upward at a ratio determined by the runway category and type of approach available to the runway. The width and elevation of the inner ends of the approach surfaces conform to that of the Primary Surface. The length and width of the outer ends are governed by the runway category and approach procedure available. **Table 4-7** summarizes the dimensions of the existing and future approach surfaces at the Airport.

Table 4-7 Approach Surface Characteristics at RSW

Runway	Overall Length (feet)	Outer Width (feet)	Slope
6 – Existing and Future	50,000	16,000	50:1[a]
24 – Existing	10,000	4,000	34:1
24 – Future	50,000	16,000	50:1[a]
6R – Future	50,000	16,000	50:1[a]
24L – Future	50,000	16,000	50:1[a]

SOURCE: Federal Aviation Administration, https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/application/?event=procedure.results&nasrId=RSW#searchResultsTop (accessed November 18, 2021)

[a] The precision instrument approach surface slope is 50:1 for the inner 10,000 feet and 40:1 for an additional 40,000 feet.

- **Transitional Surfaces** – These surfaces extend outward and upward from the lateral edges of all primary and approach surfaces at a slope of 7:1. The transitional surface extends until intersecting the Horizontal and/or Conical Surfaces.
- **Horizontal Surface** – This surface is a horizontal plane located 150 feet above the established Airport elevation of 30 feet. At RSW, the perimeter of the horizontal surface consists of arcs with a radii of 10,000 feet, connected by lines tangential to the arcs. The arcs are centered on the midpoint of the ends of all primary surfaces.
- **Conical Surface** – This surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1, for a horizontal distance of 4,000 feet.

The Part 77 surfaces, along with other pertinent approach and departure surfaces, were evaluated as a part of the airspace drawings in the February 2011 ALP drawing set. These drawings present plan views and profile views of obstructions to these surfaces by type (e.g., tree, pole, building, etc.), their elevation, surface penetrated, and proposed disposition. In 2011, there were 14 obstructions to the Part 77 surfaces for Runway 6-24. Of these 14 obstructions, four were in the approach surface, three were in the primary surface, six were in the transitional surface, and one was in the horizontal surface. Of the identified obstructions, seven are classified as a tree or vegetation and seven are manmade structures. The drawings also identified potential obstructions to the future parallel Runway 6R-24L. A total of 71

obstructions were identified, including 26 trees and 45 man-made structures. The manmade structures include light poles, power poles, and signs.

The airspace drawings referenced above are a snapshot of obstructions at the time the data was collected for the development of the drawings, in this case prior to 2011. Given trees have the potential to grow, are trimmed, removed, or subject to damage from high winds or other natural causes, it is important to develop new mapping and surveying to assess airspace impacts. Therefore, as a part of this Master Plan Update, new mapping and surveying is being obtained to assess penetrations to the Part 77 surfaces, as well as other approach and departure surfaces. This information will be detailed on the airspace sheets of the ALP drawing set and submitted to the FAA for inclusion into their databases. The FAA utilizes the information for the development of approach procedures and evaluation of future airspace case studies. This section will be updated when the current ALP update effort will be completed in early 2023.

Threshold Siting Surfaces

The FAA has developed threshold siting surfaces to aid in the identification of obstructions that could impact existing and future approach surfaces. Maintaining clear threshold siting surfaces in accordance with FAA guidance is critical to retaining existing approach capabilities and ensuring approaches are published with the lowest possible minima. Threshold siting surfaces have a trapezoidal shape that extends away from the runway along the extended centerline at a specific slope, with a starting point at the runway threshold elevation. The most recent threshold siting surface guidance is found in *FAA Engineering Brief 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, Airport Design* (EB 99A).

Table 4-8 lists the threshold siting surface dimensions for the existing (and future) Runway 6-24 and future Runway 6R-24L.

Table 4-8 Threshold Siting Surface Characteristics at RSW

Runway	Distance from Threshold (feet)	Inner Width (feet)	Outer Width (feet)	Overall Length (feet)	Slope
6 – Existing and Future	200	800	3,400	10,000[a]	34:1
24 – Existing	200	400	3,400	10,000[a]	20:1
24 – Future	200	800	3,400	10,000[a]	34:1
6R – Future	200	800	3,400	10,000[a]	34:1
24L – Future	200	800	3,400	10,000[a]	34:1

SOURCE: Federal Aviation Administration, *Engineering Brief 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, Airport Design*, July 24, 2020

[a] According to FAA criteria, 10,000 feet (3,048 meters) represents a nominal value for planning purposes.

All instrument approach types with vertical guidance, including instrument landing system (ILS) and localizer performance with vertical guidance (LPV) require evaluation and clearing of an additional surface, the Glideslope Qualification Surface (GQS). This protected area is intended to provide assurance to the pilot that once the aircraft acquires the runway during a vertically guided approach that no obstacle will interfere with the continuous descent to the runway threshold. At RSW, both existing runway ends require a clear GQS to maintain their existing approach capabilities with vertical guidance. It would also be prudent to protect the airspace at the ends of the future parallel Runway 6R-24L to provide a clear GQS and approaches with vertical guidance. The GQS begins at the runway threshold, has an inner width of 350 feet, an outer width of 1,520 feet, and extends outward for a distance of 10,000 feet at a slope of 30:1.

The threshold siting surfaces and GQSs for the existing and future runway ends will be evaluated as part of this Master Plan Update and detailed on the airspace drawings in the ALP set. As discussed above, new mapping and surveying are being collected to provide the necessary data for analyses.

Instrument Departure Surfaces

The instrument departure surface, when clear, allows pilots to follow standard departure procedures. The departure surfaces start at the elevation of the Departure End of the Runway (DER) and rise at a slope of 40:1. If the departure surface is penetrated, several possibilities exist for mitigation including, but not limited to, decreasing takeoff distance available to preclude object penetration and/or modifying the required departure minimums/climb gradients or departure procedures. The departure surface is applicable to all existing and future runways at RSW. The most recent FAA guidance regarding instrument departure surfaces is found in EB 99A. Impacts to the departure surfaces will be evaluated as part of the ALP drawing set.

4.5 Terminal Demand/Capacity and Requirements

Terminal Requirements

This section details the demand/capacity analysis and the future facility requirements for each of the individual functions associated with the Southwest Florida International Airport commercial passenger terminal building.

The following sections provide more explanation on the major functional areas including:

- Aircraft Gates
- Ticketing/Check-in Area
- TSA Passenger Screening and Federal Inspection Services (FIS)
- Baggage Handling
- Hold Rooms
- Concessions
- Terminal Services
- Circulation

Methodology and Basis of Planning

Terminal facilities planning involves the application of industry standards and guidelines and reasonable assumptions about current and future trends. 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 11th Edition; 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 (PAL 1 – 2026, PAL 2 – 2031, PAL 3 – 2036, and PAL 4 – 2041). Using PALs allows for the requirements to be implemented based on the specific demand levels as activity warrants, and not necessarily the specific year. Assumptions regarding passenger types and origins; future flight schedules, and peaking characteristics; as well as desired levels 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 of the Peak Month (PHADPM) passenger profiles and operations for each PAL. These were derived from the FAA March 2020 flight schedule (March 13, 2020) and the Forecast of Aviation Activity. The 2020 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 4-9 presents PAL peak hour passenger profile, peak hour operations characteristics, and the anticipated aircraft and load factor.

Table 4-9 Peak Hour Passenger, Commercial Operations, and Aircraft Assumptions

	Baseline (2020)	PAL 1 (2026)	PAL 2 (2031)	PAL 3 (2036)	PAL 4 (2041)
Annual Enplanements	5,354,436	6,131,288	6,909,961	7,801,346	8,714,104
Departing Peak Hour Passengers	2,472	3,131	3,576	4,095	4,633
Assumed Aircraft Types	ADG-III/IV/V	ADG-III/IV/V	ADG-III/V	ADG-III/V	ADG-III/V
Load factor	85–87%	85–89%	85–91%	85–92%	85–92%
Departing Peak Hour Operations	17	20	22	25	28
Total Peak Hour Operations	**33**	**34**	**39**	**44**	**49**

SOURCE: Atkins, 2022

In addition, numerous changes in terminal planning and design have taken place since the midfield terminal was originally designed. New technologies, expanded security requirements, and increased demand for passenger amenities are just a few of the factors that have influenced the evolution of terminal design. The facility requirements outlined in this chapter consider current and projected trends in terminal design including:

- Improved passenger check-in and processing technologies
- Increased passenger and baggage security requirements
- Increased demand for airside concessions and retail
- Increased amenities including restroom parity
- Modified passenger flows to maximize revenue generation opportunities

Aircraft Gate Requirements

The gating analysis determines the number of gates required to accommodate the existing (2020) and future design day flight schedules (DDFSs). The number of gates required to meet demand is a primary driver for the terminal requirements in the secure airside portions of the facility.

The Airport terminal currently has 28 aircraft gates; however, Gate D9 can only accommodate ground loaded regional jets in its current configuration. There are 27 contact gates, or aircraft parking positions with passenger boarding bridge connections between the aircraft and the concourse. The capabilities of each existing gate to accommodate international flights, widebody aircraft, and current airline assignments are described in Table 4-10. All gates accommodate narrow-body (ADG III) aircraft unless otherwise noted.

The methodology used to generate gate and terminal space requirements utilized the forecasts of future aviation activity and DDFSs developed to represent the operational profile of that activity on an average weekday in the peak month. The analysis of gate requirements utilized a proprietary modelling software application that is designed to define requirements based on appropriate gating configurations and operational characteristics.

The model, vGates, utilizes a hierarchical decision tree methodology to assign gates iteratively by (1) gate availability based on defined operational buffer times between flight departures and flight arrivals, (2) airline gate assignments, (3) aircraft size (apron capacity), and (4) flight origin (typically domestic or international). The model analyzes each DDFS and assigns specific flights to specific gates ensuring that the candidate flights/aircraft can be accommodated on the assigned gates. Any flights that cannot be accommodated are identified as unassigned/ungated, reflecting a requirement of additional gate(s) or operational changes to allow the accommodation of the flight(s). Manual iterations and specific assumptions are applied to reassign flights as necessary to increase or decrease gate utilization and to reflect the unique physical and operational environment at the Airport.

The amount of time a gate is unoccupied between operations (buffer time) reflects airline practices/operations

Table 4-10 Existing Commercial Aircraft Gate Capabilities and Airline Assignments

Gate	Airline Assignment
CONCOURSE B	
B1 (Widebody)	Common use and International
B2	Southwest
B3 (Widebody)	Common use and International
B4	Southwest
B5 (Widebody)	Common use
B6	Southwest
B7	Frontier
B8	Southwest
B9	Common use
Subtotal Concourse B	*9 Contact Gates*
CONCOURSE C	
C1	Common use
C2	Delta
C3	United
C4 (767)	Delta
C5	United
C6 (Widebody)	Delta
C7	Common use
C8 (Widebody)	Delta
C9	Common use
Subtotal Concourse C	*9 Contact Gates*
CONCOURSE D	
D1	American
D2	Spirit
D3	American
D4	Spirit
D5	American
D6	JetBlue
D7	Common use
D8	JetBlue
D9A/B	Common use
(Commuter Ramp)	
D10 (767) – D10A	Common use
Subtotal Concourse D	*9 Contact Gates; 1 Commuter Ramp*
Total All Concourses	**27 Contact Gates; 1 Commuter Ramp**

SOURCE: Atkins, 2022

and/or aircraft types. Since airlines use different scheduling parameters and strategies, there can be variations in buffer times among airlines. For this gating analysis, a 30-minute minimum buffer time was assumed.

Depending on utilization requirements defined by the Airport, aircraft with ground times greater than three hours can be towed off the gate to a remote parking position to allow other operations to utilize the gate. In these instances, the aircraft would subsequently be towed from the remote parking position to a vacant gate (typically operated by the same airline) for boarding prior to its subsequent departure. A minimum of 60 minutes is assumed to be required following arrival to tow a domestic aircraft from a gate to a hard stand and the domestic aircraft would be towed back onto one of the airline's gates 60 minutes prior to departure. International flights require 90 minutes for towing operations.

The average daily aircraft turns per gate was calculated to check the reasonableness gate utilization. A "turn" is a metric that defines the number of times that an aircraft arrives and subsequently departs or is towed to or from a gate. As airline schedules grow, future flights are accommodated within the operational gaps (unoccupied periods) on existing gates prior to the development of future gates or remote parking locations.

Manual iterations limit the average turns per gate for each airline on a concourse to approximately 6.2 turns per gate. During the gating analysis, if the average turns per gate on a concourse or by airline on a concourse exceeded the maximum turns per gate, aircraft were removed from gates and assigned to a "virtual" gate. These utilization thresholds are typical of an airport operating in the United States. Exceeding these levels of gate utilization may introduce operational challenges, such as the inability to effectively accommodate delays or irregular operations.

This methodology identified a need for 45 total gates by PAL 4, not including Gate D9, which is only capable of ground loading. The results of this methodology are depicted in **Table 4-11**. Up to five remote overnight stands are required by PAL 4 as shown in **Table 4-12**.

Table 4-11 Aircraft Gate Requirements

2020 Daily Average Turns per Gate	2020 Annual Average Enplanements per Gate	Existing Gates 2021	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
6.2	19,790	27	32	35	41	45	(18)
ADG-III		0	27	30	36	39	(39)
ADG-IV		23	1	0	0	0	23
ADG-V		4	4	5	5	6	(2)

SOURCE: Atkins, 2022

Table 4-12 Aircraft Remote Overnight Stand Requirements

PAL 1	PAL 2	PAL 3	PAL 4
5	5	3	5

SOURCE: Atkins, 2022

Hold Rooms

Within the concourse, hold room area requirements define the amount of space needed to accommodate the waiting area, boarding queue, egress aisles, and agent counter for the largest aircraft occupying each gate throughout the planning horizon. Dimensional criteria based on LOS criteria and spatial guidelines for hold room depth, agent counter areas, boarding and egress aisles, and adjacency are applied to the required waiting area to derive the initial space program. Hold rooms are sized based on the following factors:

- Largest aircraft type operating at the gate and number of aircraft seats
- Average narrow-body aircraft assumed to have 175 seats; average widebody aircraft assumed to have 293 seats

- 90% passenger load factor
- 70% occupancy factor – number of passengers sitting or standing in the hold room waiting area
- 42% of passengers assumed to be seated occupying 21.5 square feet per seat
- 28% of passengers assumed to be standing occupying 14.5 square feet per passenger
- 30% of passengers occupy a pre-boarding queue area during the boarding period, each occupying 11 square feet

In addition to the seating and standing areas, space is provided for two gate podiums for narrow-body aircraft and four gate podiums for widebody aircrafts as well as an egress corridor to/from the passenger boarding bridge door. Based on this methodology, space required per narrow-body gate hold room should be approximately 3,300 square feet and 5,400 square feet for widebody aircraft. A summary of the hold room requirements based on the projected gate requirements is shown in **Table 4-13**. **Figure 4-9** shows the indicative layout and area calculations for narrow-body and widebody hold rooms.

Table 4-13 Holdroom Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
Total Hold Room Area (SF)	70,800	86,400	89,100	99,000	118,800	132,000	(61,200)

SOURCE: Atkins, 2021

Ticketing/Check-in Area

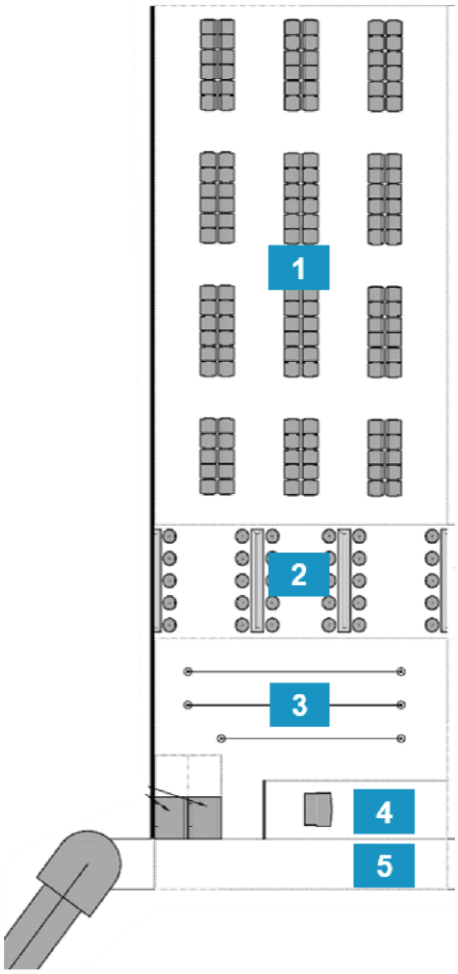
Check-in is the process by which passengers obtain boarding passes and/or bag tags and check bags prior to going through the security screening checkpoint (SSCP). Passengers may check-in via one of four different channels:

- **Bypass (Internet/Mobile Device) Check-In** – Passengers who do not check bags and check in remotely prior to arriving at the terminal and, consequently, do not need to use terminal check-in facilities.
- **Kiosks Only (No Bags)** – Passengers acquiring boarding passes at standalone kiosks located in front of in-line positions or located remotely from the check-in counter.
- **Bag-Drop** – Passengers acquiring boarding passes and/or printing bag tags at standalone kiosks and providing bags to airline staff at baggage acceptance points (BAPs).
- **Full-Service Counter Positions** – Passengers using full-service agent counter positions (economy, premium, curbside, or remote) where airline staff assist passengers with obtaining boarding passes, checking bags, rebooking flights, and other services.

The Check-in processes are transitioning away from passengers using full-service check-in counters. A growing number of passengers use personal mobile devices and self-service kiosks to check-in, obtain boarding passes and check bags. The terminal configuration should accommodate modern technologies such as self-service kiosks and automated bag drop systems (ABDs). Space requirements for check-in facilities are driven by the need to locate processing areas adjacent to bag induction belts. Bag induction belts are flanked by BAPs where agents or passengers introduce checked bags into the bag handling system. Each BAP has spatial requirements for queuing, equipment, circulation, and active processing to accommodate passenger demand at a given LOS.

Narrowbody Holdroom		90% Load Factor
Element		Mid Optimum
1	Seated Pax	1,419 sf
2	Standing Pax	638 sf
3	Boarding Queue*	517 sf
4	Gate Counter**	360 sf
5	Exit Aisle***	360 sf
	Holdroom Area Total	**3,294 sf**

Widebody Holdroom		90% Load Factor
Element		Mid Optimum
1	Seated Pax	2,387 sf
2	Standing Pax	1,037 sf
3	Boarding Queue*	869 sf
4	Gate Counter**	720 sf
5	Exit Aisle***	360 sf
	Holdroom Area Total	**5,373 sf**



SOURCE: International Air Transport Association, *Airport Development Reference Manual*, 11th edition, March 2019

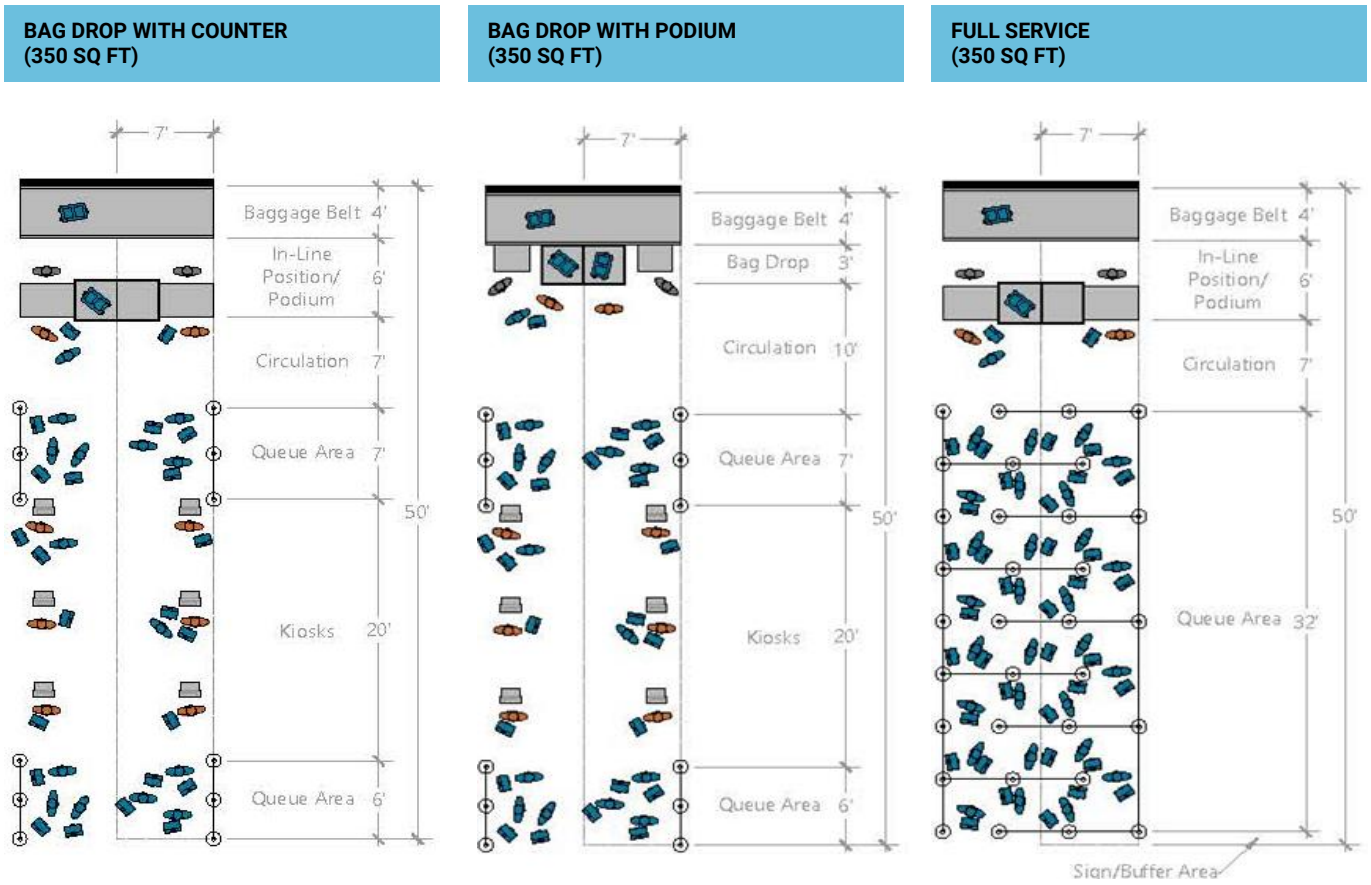
NOTES: * Boarding Queue: 11 sf/pax
** Gate Counter: Gate Counter per Position (30' x 6') | Narrowbody 2 pos. / Widebody 4 pos.
*** Exit Aisle: Assumed 30' x 12' Exit Aisle

Figure 4-9 Hold Room Templates

Figure 4-10 shows typical configurations for different types of check-in processes. The template allows for various arrangements of the check-in including kiosk or bag drop. All typical check-in configurations have a presentation width of 7 feet. These templates were used to estimate check-in spatial requirements.

Check-in facility resources are allotted using a preferential-use model within the Terminal. In this model, each carrier's check-in requirements are assessed separately. The check-in requirements are based on the sum of all carriers' requirements.

Airline Ticket Offices (ATO) directly support the check-in facilities. The ATO spatial requirements for support of the check-in are based on the total presentation length of all the BAPs. Each linear foot of presentation length requires 20 square feet of ATO support space.



SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 10th Edition, 4th Release, October 2016 (LOS); Airport Cooperative Research Program, *Report 25: Air Passenger Terminal Planning and Design*, Volume 1: Guidebook, 2010 (critical dimensions); Benchmarked from comparable airports, Ricondo, January 2018 (space template).

Figure 4-10 Indicative Check-in Configurations

Table 4-14 summarizes the ticketing/check-in requirements. Based on BAP requirements, the current ticketing/check-in area is insufficient to accommodate the demand anticipated for PAL 3 and PAL 4. Additional ticketing space will be required to accommodate demand by 2035. 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 periods.

Table 4-14 Ticketing/Check-In Area Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
BAPs	113	92	96	105	114	125	(12)
BAP Length (lf)	620	478	528	578	627	687	(67)
BAP Area (sf)	24,340	31,075	26,400	28,875	31,350	34,375	(10,035)
Airline Ticket Office Area (sf)	11,620	12,880	13,440	14,700	15,960	17,500	(5,880)
Total Ticketing Area (sf)	**35,960**	**43,955**	**39,840**	**43,575**	**47,310**	**51,875**	**(15,915)**

SOURCE: Atkins, 2021

Airline or Airport Lounges

The need for lounges is subject to airline and airport initiatives and policies related to level of service, and ultimately the availability of space and interest of airlines in operating their own lounges. Currently, Delta Airlines operates a 10,000 sf lounge in Concourse C. The decision to open a lounge at a non-airline hub destination remains a business decision exclusive to each individual airline. Should an airline request lounge space, an analysis will be conducted based on the airline's requirements and space available or potential new construction. Airline decisions to open a lounge typically are dependent on front of cabin enplanement counts passenger dwell times and passenger profiles and are more commonly located in hub airports where layovers occur. A typical lounge ranges from 8,000 to 12,000 square feet plus depending on the level of service offered. RSW, which is situated in southwest Florida is a destination, "end of route" location, does not experience any scheduled layovers. As a result of its location, passenger demand will likely drive the decision for an airline to add a lounge to the facility. The planned addition of a common use lounge capable of servicing a broad profile of passengers, is an increasingly common approach used at other airports. Table 4-15 summarizes the airline and airport lounge requirements.

Table 4-15 Airline and Airport Lounge Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
VIP Airline Lounge (sf)	10,000	10,000	10,000	10,000	10,000	10,000	0
VIP Common Use Lounge (sf)	0	4,025	4,370	4,671	5,016	5,369	(5,369)

SOURCE: Atkins, 2022

Baggage Handling Facilities

Baggage handling facilities include outbound baggage makeup areas, TSA checked baggage inspection systems, inbound baggage facilities, and baggage claim. Outbound baggage facility requirements are based on peak hour departing passengers that check-in bags and flights staging for departure. Inbound baggage facilities are based on peak hour deplaning passengers that retrieve baggage at the bag claim after their flight.

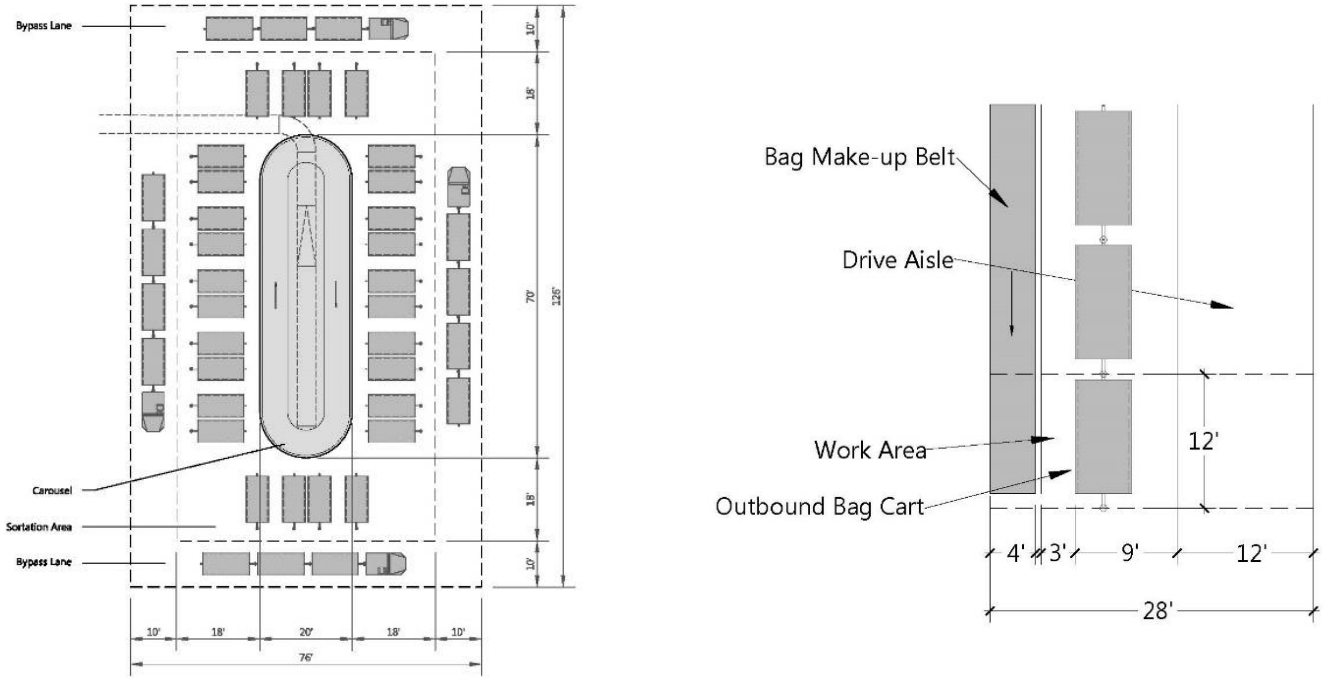
Outbound bag makeup devices can consist of piers or chutes that extend directly from the bag conveyance and sorting system, or they can be carousel units that allow bags to circulate continuously. The latter configuration provides higher bag storage capacity and more staging area for carts than the former. Carousels can be flat-plate or sloped plate units. Sloped plate units provide greater capacity than flat-plate carousels with the same footprint because they have more surface area. However, some airlines prefer flat plate units because they provide better ergonomics for workers.

Bag carts can be staged either parallel or perpendicular to makeup devices if there is sufficient width between devices. An area of 40 feet by 12 feet per cart, or 480 square feet, is suggested for a functional outbound bag makeup area. Critical dimensional clearances for the components of outbound makeup devices include:

- Bag Carts – Bag carts have lengths of 11 feet and 15 feet (with tow bar down). The cart width ranges from approximately 5 feet, 7 inches to 5 feet, 9 inches.
- Bag Containers/Dollies – Containers/dollies are more commonly used for widebody aircraft. Containers are carried on dollies and are approximately 13 feet, 6 inches long (with tow bar down) and approximately 6 feet wide.

- **Work Area** – The area between the carousel and the staged bag carts used by workers to load bags should provide the following clearances:
  - Work aisle width: 3 feet
  - Clear height: 7 feet

Figure 4-11 depicts typical outbound baggage makeup layouts for both perpendicular and parallel configurations. Bag carts and bag containers cover approximately the same areas, so these typical layouts are applicable for both bag cart and bag container staging.



SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 11th Edition, March 2019 (LOS); Airport Cooperative Research Program, *Report 25: Air Passenger Terminal Planning and Design*, Volume 1: Guidebook, 2010 (critical dimensions).

Figure 4-11 Outbound Bag Makeup – Perpendicular and Parallel Configurations

Bag makeup facility requirements were based on the maximum number of carts staged for all flights during the peak 10-minute period of the DDFS and the minimum area required per cart, including the outbound bag device. **Table 4-16** lists the maximum bag carts recommended for each aircraft type. For each domestic departure, the maximum number of bag carts was assumed to stage in the make-up area between 90 and 30 minutes prior to the flight's scheduled departure. For each international departure, the maximum number of bag carts was assumed to stage in the make-up area between 90 and 40 minutes prior to the flight's scheduled departure. These assumptions are based on benchmarks from comparable airports.

Table 4-16 Outbound Baggage Cart Staging per Aircraft Gauge

Aircraft Design Group	Maximum Cart Positions
II	2
III	3
V	8

SOURCE: Atkins, 2021

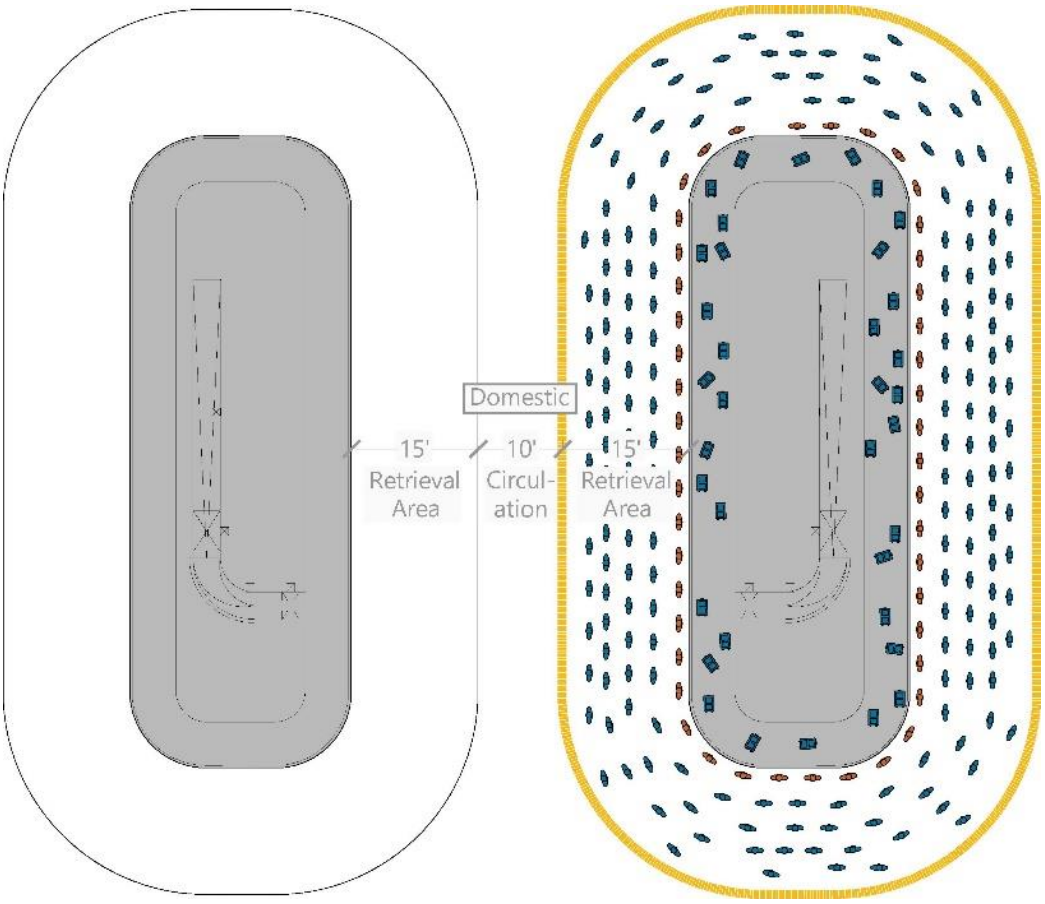
Outbound baggage screening demand is based on these passenger characteristics applied to the DDFS:

- 70% of passengers check bags
- 1.1 bags checked per passenger checking bags
- In accordance with TSA requirements, a CBIS with an Explosive Detection System (EDS) is required for all baggage screened throughout the facility. TSA will have an on-screen resolution (OSR) room contained within its support areas where all suspicious baggage images are reviewed. Bags that cannot be cleared via this process are sent to the Checked Baggage Reconciliation Area (CBRA). The CBIS and CBRA must have the following:
  - Dedicated room or locations for TSA's EDS servers and active network components (typically two or three racks),
  - TSA-provided workstations and other peripherals to receive EDS images,
  - Video Surveillance System (VSS) cameras installed on either side of each EDS screening machine and at fail safe locations connected to the existing VSS,
  - Workstation and associated monitors in OSR room for TSA to monitor the CBIS related cameras, and
  - Airport phones installed at each EDS machine and in the OSR and CBRA rooms.
- All necessary CBIS and CBRA equipment, staging, conveyor, and workspace is included in the area required by each EDS machine, totaling 6,500 square feet per device.
- The EDS requirements are based on the peak hour check-in baggage demand, EDS screening rates at 600 bags per hour processing rate per inline screening device. Requirements include a redundant EDS device, known as (n+1).

Inbound baggage:

- 48-foot input area length
- 18-foot input area width
- 1,760 square feet per baggage claim carousel
- Bag claim requirements include the number of claim units, linear feet (LF) of presentation frontage, retrieval areas, and circulation. Bag claim requirements are based on the peak accumulation of passengers in the active area during a 20-minute period. **Figure 4-12** depicts a typical bag claim device, including the following elements:
  - **Bag Claim Device and Retrieval Area** – Spatial area allocated for a single claim device including: the equipment area; the clearance between the equipment; and the adjoining devices, walls, or circulation corridors. Device size and equipment type is based on the configuration of the bag claim area and predominant aircraft size. A minimum of 15 feet of clearance from the face of the device for passengers to retrieve their bag is recommended for domestic units to maintain appropriate processing areas and meet LOS requirements.
  - **Circulation** – A circulation corridor of 10 feet for passengers and non-passengers moving between bag claim devices. The corridor must be free of any obstructions and active retrieval areas to accommodate cross-circulation for passengers and non-passengers.

  The existing claim area uses flat-plate claim units with an average of 200 LF of claim frontage per unit. Each baggage claim device and adjacent retrieval area occupy approximately 3,600 square feet.



SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 11th Edition, March 2019 (LOS); Airport Cooperative Research Program, *Report 25: Air Passenger Terminal Planning and Design*, Volume 1: Guidebook, 2010 (critical dimensions).

Figure 4-12 Baggage Claim Space Template

Table 4-17 summarizes the bag claim operating assumptions for domestic flights. Facility requirements were based on a range of 70 to 90% accumulation of passengers with bags during the peak 20-minute period to reflect fluctuations in bag delivery times relative to the passenger arrival rate to the claim area. Baggage Service Offices are usually directly adjacent to the Baggage Claim Hall with a requirement of 150 square feet per claim unit.

Table 4-17 Domestic Baggage Claim Operating Assumptions

Operating Assumptions	Maximum Cart Positions
Passengers with baggage	0.70
Passengers retrieving baggage	0.95
Area per passenger at the baggage claim	17.25 sf
Linear baggage claim frontage per passenger	1.38 lf
Circulation area per device	1,500 sf
Baggage office area per device	150 sf

SOURCE: Atkins, 2022
NOTES: lf: linear feet; sf: square feet

Table 4-18 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 4-18 Baggage Facilities

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
Baggage Makeup Units (#)	11	11	12	12	15	16	(5)
Outbound Baggage Area (sf)	60,100	51,840	51,840	57,600	67,200	71,040	(10,940)
EDS Machine (#)	4	4	5	5	5	6	(2)
BHS (lf)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
TSA CBRA # Positions/sf	13	13	15 / 6,500 sf	15 / 6,500 sf	15 / 6,500 sf	15 / 6,500 sf	(2)
Baggage Claim Units (#)*	10	8	9	11	12	14	(4)
Inbound Baggage (sf)	26,790	14,080	15,840	19,360	21,120	24,640	2,150
Baggage Claim Public Circulation (sf)	36,030	28,880	32,490	39,470	43,320	50,540	(14,510)

SOURCE: Atkins, 2022

* Baggage claim carousel requirements for PAL 1 through PAL 4 were determined based on a planning factor determined using the Baseline requirements.

Airline Support Space

Airline operations and support facilities include spaces within the terminal building leased to airlines for various functions, including employee break and locker rooms, staff offices, and maintenance. Airline support area requirements were calculated based on industry benchmarks for planning purposes. In design and construction phases of the project, these areas will be refined based on the needs of the tenant airlines. The operating parameters used to size airline operations and support facilities were based on a factor of 1,000 square feet per gate. Table 4-19 summarizes the airline operations and support operating requirements.

Table 4-19 Airline Support Services

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
Airline BSO (sf)	2,600	2,600	2,860	3,120	3,640	3,900	(1,300)
Airline Airside Ops (sf)	9,321	9,320	11,046	12,081	14,151	15,531	(6,210)

SOURCE: Atkins, 2022

TSA Passenger Screening

The Transportation Security Administration (TSA) is responsible for screening all ticketed passengers and their carry-on baggage at security screening checkpoints prior to passengers entering secure gate boarding areas. While the TSA has direct responsibility for determining the size and configuration of the passenger security screening checkpoints at the Airport, TSA typically collaborates with Airport management to plan checkpoint locations and programs. Checkpoint Requirements and Planning Guide (CRPG), September 30, 2021, provides guidelines for developing the requirements for checkpoints in the terminal.

Unit requirements for SSCPs were based on TSA targets for passenger processing rates. Although none are currently in use at the Airport, checkpoint property screening system (CPSS) lanes, which combine computed tomography (CT) scanner technology with automated screening lanes (automated bin return, remote screening, alternate viewing stations at secondary screening, and automatic divert for alarm bags), provide increased passenger throughput, improved screening capabilities, and greater system efficiency. CPSS lanes are included in the requirements analysis to reflect future adoption of this emerging technology.

Screening technology and passenger eligibility for Trusted Traveler programs continue to evolve, and future processing rates and program participation are unknown. To simplify processing variables and to provide a realistic assessment of lane and area requirements over time, an average throughput rate was adopted to represent a blended rate for ASLs, TSA Pre-Check, families, passengers with oversized carry-on, and passengers requiring special assistance. This methodology allowed for the randomization of processing times for individual passengers that result in a blended average throughput rate of a collective checkpoint based on TSA goals and observed performance of each lane type. The assumptions used to generate SSCP requirements are shown below:

- Screening Channel
  - 67% passengers will be screened at standard lanes
  - 33% passengers will be screened at Pre-Check lanes
- Throughput
  - 185 passengers per hour per standard lanes
  - 210 passengers per hour per Pre-Check lanes
- Wait Time Goals
  - 10-minute wait time goal at standard lanes
  - 5-minute wait time goal at Pre-Check lanes

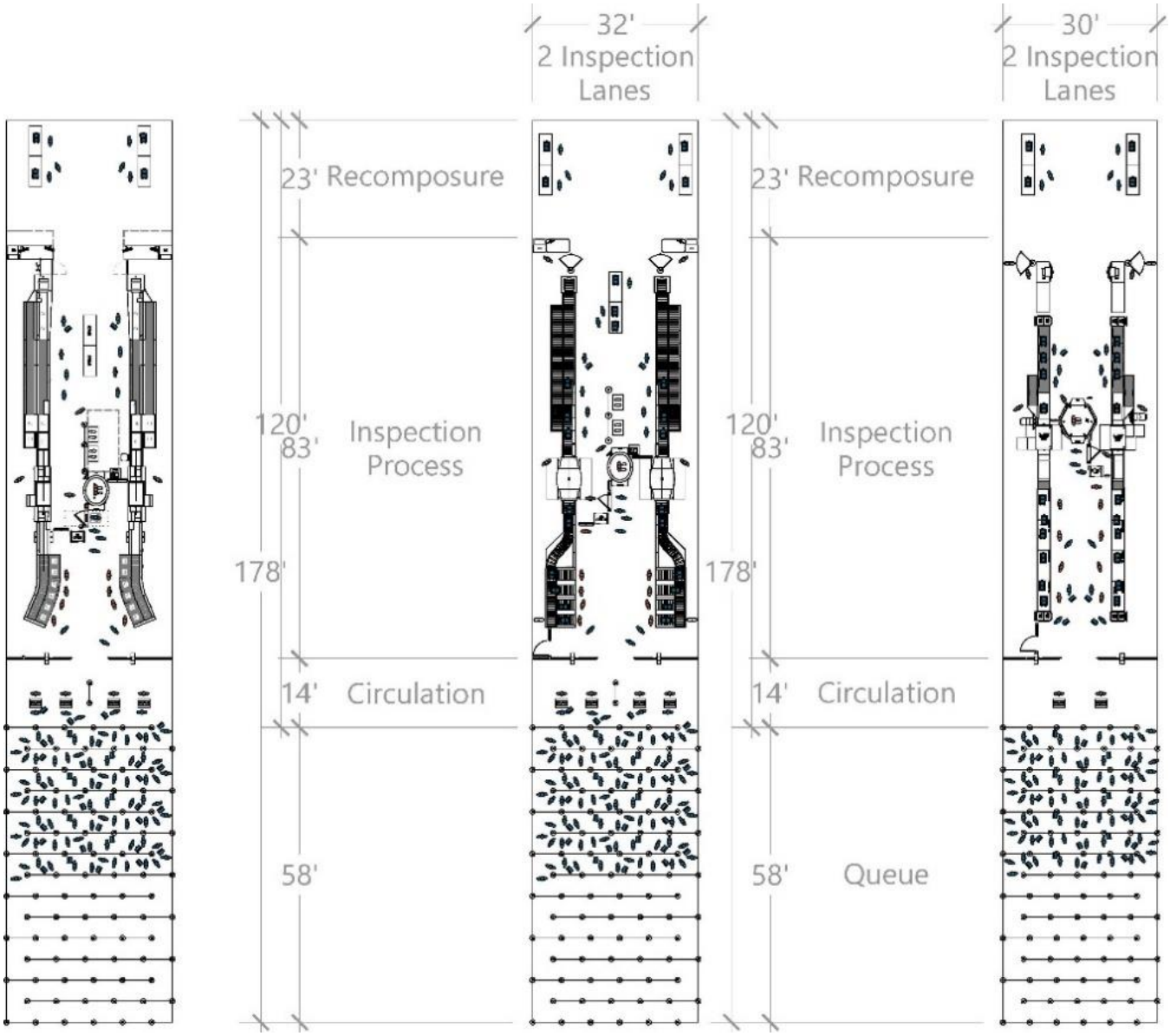
Figure 4-13 depicts a typical layout for a two lane SSCP. Overall dimensions of the area as shown are approximately 178 feet by 32 feet.

Based on the stated assumptions, eleven (11) CPSS lanes are adequate for the baseline forecast; however, the lane requirement will need to increase to 18 lanes by PAL 4.

TSA guidelines recommend a minimum of 600 square feet of passenger queue per lane. However, many airports find an increase up to approximately 900 square feet per lane better absorbs passenger surges and irregular operations should lanes not open in a timely manner.

Over the past twenty years or so there has been a trend to consolidate TSA security checkpoints, at the same time, there has also been a focus by the TSA to increase the throughput of passengers at checkpoints to create greater ease in the process and eliminate long queue lines. This has led to the need for more IT infrastructure and an increase in space required at checkpoints for the new advanced equipment. It is expected this trend will continue with the goal of a very rapid and less onerous security screening process. Another added benefit to checkpoint consolidation has been TSA staffing. By staffing one checkpoint, instead of several, it allows for the highest utilization of TSA staff and avoids imbalance in staffing between understaffed and overstaffed checkpoints.

RECOMMENDED CHECKPOINT LAYOUTS
2,850 sf total per lane (includes 930 sf of queue)



SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 11th Edition, March 2019 (LOS); Airport Cooperative Research Program, *Report 25: Air Passenger Terminal Planning and Design*, Volume 1: Guidebook, 2010 (critical dimensions)

Figure 4-13 Typical Two-Lane SSCP with AIT

It should be noted that as airports grow with increased passenger demand, the distance between the consolidated security checkpoint and any new gates may increase. With the increased focus at US airports on customer service and higher levels of service, the passenger experience is very important to airport operators. If the distance between the consolidated security checkpoint and the passenger's aircraft boarding gate becomes too great, the use of satellite consolidated checkpoints could become essential to maintaining a positive passenger experience. The same can be noted for the location of baggage claims, ticketing check-in and from an airport operations perspective, the location of baggage make-up devices. Even as these trends continue to evolve, all the airport planning principles outlined here would still be employed.

Federal Inspection Services Facility

The existing FIS facility is 35,660 square feet, including one international baggage carousel. The Primary immigration and international baggage claim are sized to accommodate 400 peak hour international arriving passengers. However, the overall facility area exceeds Custom and Border Protection program requirements for a 400 passenger per hour facility.

The DDFS indicate a maximum of one peak-hour international flight throughout the planning horizon with a 283 seat A330-300 flight carrying approximately 255 peak hour international arriving passengers. The FIS facility is adequately sized to accommodate peak hour passengers through PAL 4.

Table 4-20 presents the recommended security checkpoint requirements and FIS for the future PALs.

Table 4-20 Security Screening Checkpoint

	Existing[a]	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
Standard Lanes[a] (#)	11	7	8	9	11	11	-
PreCheck Lanes[a] (#)	5	3	4	5	5	6	(1)
Total Lanes[a] (#)	16	10	12	14	16	17	(1)
Queue Area[b] (SF)	14,800	6,000	7,200	8,400	9,600	10,200	4,600
Total SSCP[c] (SF)	47,500	28,500	34,200	39,900	45,600	48,450	(950)
Office/Admin Support (SF)	15,350	15,350	17,835	19,850	23,480	25,900	(10,550)
FIS[d]	35,660	21,150	21,150	21,150	21,150	21,150	14,510

SOURCE: Atkins, 2022

NOTES:

a Existing SSCP lane count based on 2019 Terminal Expansion Consolidated Checkpoint Project with 16 lanes and expansion capability to 18 lanes.
b Existing queue area based on 2019 Terminal Expansion Consolidated Checkpoint Project.
c Existing total SSCP area based on 2019 Terminal Expansion Consolidated Checkpoint Project.
d Includes international baggage claim hall.

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.

The RSW Terminal was planned and designed pre-9/11. At that time, the flow of passengers from a secure to non-secure side of the facility was less restrictive. There was no boarding-pass check or requirement that only ticketed passengers could go through security to the airside. As a result, most concession offerings in the original design were located landside as passengers and meeter/greeters could quickly flow between landside and airside with little difficulty. After 9/11, only passengers were permitted through security screening checkpoints, which eliminated the unobstructed flow between landside and airside. Psychologically, the addition of TSA Security Checkpoints created what is known as a 'pain point' introducing an unknown delay on the passenger's journey through an airport. Passengers typically want to transition through all pain points as quickly as possible and remain within easy access to their departure gate. Consequently, concession operators located pre-security on the landside experienced a significant decrease in revenue while demand for concessions post security surged.

Concessions are an important component for an airports' fiscal health and a passenger's satisfaction with the airport experience. As a result, airports across the US have trended toward consolidated security checkpoints and placing most concession offerings on the post-checkpoint (secure) airside of the airport where passengers can once again easily flow from concessions to the gates with no concern of a security delay in between. At airports which have made this shift, there has been a significant and notable increase in concession revenue. RSW's planned consolidation of the security checkpoints and significant increase in post security concessions will not only greatly improve concession revenue but contribute to a higher level of customer satisfaction and level of service. Post security concessions have also brought about further advantages in level of service at airports in that they tend to spread passengers waiting to board aircraft out inside the terminal and concourses eliminating overcrowding of hold rooms and crowding of circulation routes.

Since the move to place most concessions post security, airports have developed even more advanced concepts in concession layouts. The recent trend is moving concessions to the center of the main circulation path in a concourse as well as dispersing them more throughout the concourses. This has allowed passengers to enjoy concession offerings for longer dwell times closer to their gates. When a passenger can enjoy a concession venue with their 'eyes and ears' in the line of sight of their hold room, hold room crowding is reduced and secondary and tertiary spending at concessions by passengers is increased. In airports that have employed these more advanced planning opportunities, there has been a significant increase in concessions revenue and a higher level of service, thus increased passenger satisfaction.

The concessions analysis includes the space required to accommodate the three concession types: food and beverage concessions, retail, and specialty retail. These three concessions space areas and concession storage comprise the commercial requirements. Commercial space requirements are typically generated by assuming an area per million annual enplaned passengers (MAEP). The analysis assumes that arriving passengers do not patronize food and beverage concessions upon arrival. Concession requirements were delineated by concession type and pre- and post-secure area location. Unit requirements for each concession type are based on the 2019 RSW Concessions Master Plan assumptions. Table 4-21 shows the breakdown of requirement factors by type and location.

Table 4-21 Concessions Operating Assumptions

	Unit	Airside	Landside
Food and Beverage	SF/MAEP	7.90	0.50
Retail	SF/MAEP	1.60	0.10
Specialty Retail	SF/MAEP	1.00	0.10
Total	**SF/MAEP**	**10.60**	**0.70**

SOURCE: Atkins, 2022

Concession area requirements are based on the activity level that can support them. An assumption of 11.2 square feet per 1,000 MAEP is used to identify the total concession requirements. The results of this methodology are detailed in Table 4-22.

Table 4-22 Concessions Requirement

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Landside (sf)	**3,000**	**2,700**	**3,000**	**3,400**	**3,800**	**4,300**	**(1,300)**
Food and Beverage (sf)	—	2,700	3,000	3,400	3,800	4,300	—
Airside (sf)	**63,424**	**56,700**	**65,057**	**73,301**	**82,795**	**91,100**	**(27,676)**
Food and Beverage (sf)	—	42,525	48,793	54,976	62,096	68,325	
Retail (sf)	—	11,340	13,011	14,660	16,559	18,220	
Specialty Retail (sf)	—	2,835	3,253	3,665	4,140	4,555	
Total Concessions (sf)	**66,424**	**59,400**	**68,057**	**76,701**	**86,595**	**95,400**	**(28,976)**
Storage and Support (sf)	**16,606**	**12,700**	**17,014**	**19,175**	**21,649**	**24,182**	**(7,576)**

SOURCE: Atkins, 2022

Terminal Services

Terminal services include public restrooms, offices, meeter/greeter areas, rental car counters, and areas for public information and storage of carts and wheelchairs.

Restrooms

The restroom requirements include restrooms for both the airside and landside portion of the terminal. The area provided for restrooms is calculated based on the guidelines described in ACRP Report 226, Planning and Design of Airport Terminal Restrooms and Ancillary Spaces. The airside restrooms requirements are based on the quantity of narrow-body and widebody gates. Support, mothers' nursing rooms, companion/gender-neutral rooms, and family rooms are included, and are usually adjacent to each restroom module. Restrooms should be sized to avoid excessive queuing for use. The landside restroom requirements are based on passenger demand, both inbound and outbound. These assumptions for airside and landside include:

- Airside
  - 90% load factor
  - 50% passenger utilization rate
  - 20% peak 20-minute demand
  - 3:4 male/female fixture ratio
  - 95 square feet per fixture to account for ambulatory stalls, Americans with Disabilities Acts stalls, maintenance plumbing chases, etc.
  - 1 lactation room per concourse with an area of 100 square feet
  - 1 janitorial closet per restroom with an area of 100 square feet
- Landside
  - 1.1 visitors per each peak-hour deplaning passenger
  - 1.1 visitors per each peak-hour enplaning passenger
  - 1 male fixture per 70 peak hour deplaning passengers for first 400 passengers, and 1 male fixture per 200 peak hour deplaning passengers in excess of 400 passengers
  - 1.5 female fixtures per male fixture
  - 95 square feet per fixture to account for ambulatory stalls, Americans with Disabilities Acts stalls, maintenance plumbing chases, etc.
  - 1 lactation in the landside area with an area of 100 square feet
  - 1 janitorial closet in the landside area with an area of 100 square feet

Table 4-23 provides the recommended requirements for airside and landside restrooms based on these assumptions.

Table 4-23 Restroom Requirements						
Fixture	**Existing**	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**	**PAL 4 Surplus/(Deficiency)**
AIRSIDE						
Male Fixtures	116	52	57	66	72	44
Female Fixtures	92	70	75	87	95	(3)
Family Fixtures	12	11	14	14	14	(2)
Total Fixtures	**220**	**133**	**146**	**167**	**181**	**39**
Total Area SF	**14,585**	**13,735**	**14,970**	**17,195**	**18,525**	**3,705**
LANDSIDE						
Male Fixtures	46	25	27	32	34	12
Female Fixtures	41	34	37	43	46	(5)
Family Fixtures	5	5	7	7	7	(2)
Total Fixtures	**92**	**64**	**71**	**82**	**87**	**5**
Total Area SF	**8,420**	**12,360**	**13,690**	**15,780**	**16,730**	**950**

SOURCE: Atkins, 2021

Meeter/Greeter Area

The meeter/greeter area requirements are based on arriving passengers and assumes 15% of arriving passengers have a meeter/greeter occupying 25 square feet per occupant in the waiting area in the two central atriums near to the airside passenger exit for domestic arrivals, and near the FIS exit for international arrivals. The results of this methodology are shown in **Table 4-24** and **Table 4-25**.

Table 4-24 Domestic Meet and Greet Area Requirements							
	Existing	**Baseline**	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**	**PAL 4 Surplus/(Deficiency)**
Peak Hour Domestic Arrivals	2,610	2,610	3,046	3,442	3,818	4,596	
Meeters/ Greeters	392	392	457	516	588	690	
SF Required	12,400	9,800	14,720	16,100	18,860	20,700	(8,300)

Table 4-25 International Meet and Greet Area Requirements							
	Existing	**Baseline**	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**	**PAL 4 Surplus/(Deficiency)**
Peak Hour International Arrivals	255	255	255	255	255	255	
Meeters/ Greeters	38	38	38	38	38	38	
SF Required	4,450	1,170	1,170	1,170	1,170	1,170	3,280

SOURCE: Atkins, 2022

Airport Offices and Support Space

The office space includes space for the Airport operations and administration as well as tenant offices, such as TSA administrative offices and the LCPA Police Department. Airport offices include supporting space, such as non-public restrooms, locker and dressing rooms, maintenance rooms as well as storage space. Current office and support space accounts for about 12.7% of occupiable terminal areas, or 17 square feet per 1,000 annual enplaned passengers. Based on discussions with the Airport staff, the current office space is inadequate. Office space requirements are determined by a factor of 18 square feet per 1,000 annual enplanements, which allows for growth as the passenger demand increases over time. Table 4-26 shows the requirements for airport office and support space throughout the planning period.

Table 4-26 Office and Support Space Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Airport Admin	90,125	91,800	102,000	113,900	129,200	144,500	(54,375)
Ops	6,000	6,000	7,110	7,776	9,108	9,996	(3,996)
Maintenance	7,555	7,555	8,955	9,795	11,475	12,595	(5,040)
APD	13,551	13,551	16,051	17,551	20,551	22,551	(9,000)
AirCom	1,860	1,860	2,220	2,420	2,840	3,120	(1,260)
ID Office	1,941	1,941	2,301	2,571	2,949	3,237	(1,296)
Terminal Services Total (sf)	**121,032**	**128,285**	**133,427**	**140,903**	**155,708**	**165,624**	**(44,592)**

SOURCE: Atkins, 2022

Airport Amenities Space

Airport amenities include services that provide attractions and services for passengers. These may include companion waiting areas, children's play areas, sensory rooms, art exhibition spaces, or meditation/worship areas, Service Animal Relief Areas, and information desks. The selection of such attractions is at the Airport's discretion; the spatial requirements do not indicate whether any of these attractions is preferable. The total area required for airport amenities was assumed to be 2% of the total space accessible by the public, based on guidelines in ACRP Report 25: Airport Passenger Terminal Planning and Design, Volume 1.

Service Animal Relief Areas (SARAs) are also FAA mandated essential facilities. SARAs are designed for service animals, primarily service canines. An area of 15 feet by 15 feet, or 225 square feet, is suggested for each SARA. SARAs should have an accessible, artificial turf area with an automatic flushing system and floor drain below. A sink node should be provided with a mop sink, and a fold-down seat to rinse soiled paws is recommended. Table 4-27 provides a summary of the terminal requirements for each PAL.

Table 4-27 Airport Amenities Space Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Amenities (sf)	3,680	5,760	6,600	7,370	8,440	9,310	(5,630)
SARA (sf)	—	225	225	225	225	225	(225)

SOURCE: Atkins, 2022

Circulation Space

Circulation includes area in the terminal that is provided to allow for the safe, comfortable, and efficient movement of passengers, staff, or vehicles. Area requirements were calculated for general circulation (public and non-public), a secure bus platform, and tug drive circulation.

Circulation interconnects the different terminal functions via pedestrian access, allowing passengers and non-passengers to move about the terminal. Minimum dimensions for main circulation corridors should conform to local building codes. Public circulation requirements are based on the total space accessible by all passengers, well-wishers, and meeter/greeters. The operating requirements for public space is 30% of all publicly accessible space.

Non-public circulation requirements are based on the total space only accessible by employees, crew, and airport support staff. The operating requirements for public space is 20% of all non-publicly accessible space. Table 4-28 provides the requirements for public and non-public circulation.

Table 4-28 Circulation Space Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Public Circulation (sf)	204,100	83,680	95,320	106,480	121,240	134,170	69,930
Non-Public Circulation (sf)	24,310	28,271	36,070	40,830	45,920	51,120	(26,810)

SOURCE: Atkins, 2022

Summary of Terminal Building Requirements

Table 4-29 provides a summary of the terminal requirements for each PAL. 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% was used to calculate the mechanical requirements and 20% was used to calculate the circulation area requirements.

Table 4-29 Terminal Requirements Summary

	Existing**	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Number of Gates (#)	27	N/A	32	35	41	45	(18)
Ticketing/Check-In (BAP and ATO) (sf)	35,960	43,955	39,840	43,575	47,310	51,875	(15,915)
Airline Lounge (sf)	10,000	10,000	10,000	10,000	10,000	10,000	0
Common Use Lounge (sf)	0	4,025	4,370	4,671	5,016	5,369	(5,369)
TSA Passenger Screening (sf)	47,500	28,500	34,200	39,900	45,600	48,450	(950)
FIS*	35,660	21,150	21,150	21,150	21,150	21,150	14,510
Hold Rooms (sf)	70,800	86,400	89,100	99,000	118800	132,000	(61,200)
Concessions	66,424	59,400	68,057	76,701	86,595	95,400	(28,776)
Outbound Baggage Facilities	60,100	51,840	51,840	57,600	67,200	71,040	(10,940)
Inbound Baggage Facilities	62,820	42,960	48,330	58,830	64,440	75,180	(12,360)
Terminal Services	121,032	128,285	133,427	140,903	155,708	165,624	(44,592)
Circulation	228,410	112,131	131,390	147,310	167,160	167,160	(61,250)

SOURCE: Atkins, 2022

* Includes international baggage claim hall.

As shown in Table 4-29, 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 may be reused for other functional needs.

4.6 Support Facilities Demand/Capacity and Requirements

General Aviation and Fixed Base Operator Facility

The existing general aviation (GA) area at Southwest Florida International Airport is located north of Runway 6-24 and is approximately 34 acres. This area accommodates one FBO and includes a terminal building, aircraft parking apron, ground support activities, and vehicular parking. Between fiscal years (FYs) 2017 and 2021, RSW averaged approximately 9,000 annual GA operations[1]. According to the FAA Airport Master Record, as of December 2021, RSW was home to three based aircraft.

One of the components of this Master Plan Update (MPU) is to evaluate the developable space north of Runway 6-24 and create a future land-use plan that identifies areas suitable for a variety of demand-driven development, such as GA. In addition to developable space, RSW has several facilities, navigational aids (NAVAIDs), and physical characteristics, such as a runway with a length of 12,000 feet, that could be attractive to future corporate GA tenants.

In order to estimate and quantify areas needed to accommodate future GA activity, it is helpful to understand RSW's proximity to nearby airports and their physical and operational characteristics. **Table 4-30** provides a summary of airports within 40 NM of RSW, as well as their service level, runway length, NAVAIDs, and other key comparators. The location of the surrounding airports is illustrated on **Figure 4-14**.

There are seven public-use airports with at least one runway longer than 5,000 feet within 40 NM of RSW. Page Field (FMY) and Punta Gorda Airport (PGD), however, are the only two airports with an air traffic control tower (ATCT) and precision instrument approach capabilities. An ATCT and a precision instrument approach are two key items that would be considered by GA operators, corporate tenants, and/or FBOs when evaluating the merits of an airport for the development of a new hangar or facility. FMY, which is also owned and operated by the Lee County Port Authority (LCPA) is a designated reliever to RSW. FMY is approximately 588 acres and is constrained by nearby commercial development and residential development, as well as major roadways. As of December 2021, FMY has over 200 based aircraft and limited opportunities to construct additional GA facilities, including hangars and FBO facilities.

According to the 2035 Florida Aviation System Plan, based aircraft in the southwest region are projected to increase at an annual growth rate of 1.56% through 2035. This growth rate exceeds the projected statewide annual growth rate of 1.49% over this same time. Applying the average annual growth rate to FMY, based aircraft are projected to increase to 252 aircraft by 2035. Given FMY's existing constraints, a portion of that demand is likely to be accommodated at RSW if suitable facilities are available. There are limited GA airports/facilities in the region and RSW, with a 12,000-foot runway, offers prime facilities and developable space for the accommodation of additional GA activity. Therefore, for planning purposes, an additional 35 acres of property, north of Runway 6-24 will be reserved to meet future GA demand throughout the planning horizon.

[1] Federal Aviation Administration, *2021 Terminal Area Forecast*, https://taf.faa.gov/ (accessed December 16, 2021).

Table 4-30 Nearby Airport Physical and Operational Characteristics (2021)

	Southwest Florida International (RSW)	Page Field Airport (FMY)	Punta Gorda Airport (PGD)	Immokalee Regional Airport (IMM)	La Belle Municipal Airport (X14)	Naples Municipal Airport (APF)	Marco Island Executive (MKY)	Airglades Airport (2IS)
Distance to/from RSW		6.5 NM	26.2 NM	20.0 NM	21.4 NM	23.0 NM	32.8 NM	39.6 NM
Service Level	Primary	Reliever	Primary	General Aviation	General Aviation	General Aviation	General Aviation	General Aviation
Total Airport Acreage	6,431	588	1,934	1,330	160	732	140	2,560
Number of Paved Runways	1	2	3	2	1	2	1	1
Runway Length (feet)	12,000	6,406	7,193	5,000	5,254	6,600	5,000	5,902
		4,910	6,286	4,550		5,001		
			2,636					
Air Traffic Control Tower on Site	Yes	Yes	Yes	No	No	Yes	No	No
Approach Type	Precision	Precision	Precision	Non-Precision	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Based Aircraft in 2021	3	203	384	56	71	368	33	33
Single Engine	0	152	312	46	59	215	29	27
Multi Engine	0	34	43	6	11	40	1	4
Business Jet	2	14	20	3	0	93	1	0
Helicopters	1	3	9	1	1	20	2	2
Total Operations	71,693	114,863	79,405	37,850	22,000	112,262	58,430	11,527

SOURCE: Federal Aviation Administration, AIRPORTIQ 5010, accessed December 1, 2021, https://www.airportiq5010.com/5010Web/
NOTE: This table includes public-use airports within 40 NM of RSW with at least one 5,000-foot paved runway.

To estimate land area requirements to accommodate future GA tenants and operators, a review of GA/FBO facilities at six commercial airports in the U.S. was conducted. The analysis focused on airports that experience or will experience enplaned passengers with activity levels of 8.5 million or more (consistent with RSW 2041 projected enplanement levels). Figure 4-15 provides a summary of the airports that were benchmarked, and their activity levels expressed in Million Enplaned Passengers (MEP), annual general aviation operations, and based aircraft. Figure 4-15 also includes CY 2018 population data associated with the Metropolitan Statistical Area (MSA) surrounding each airport.

The benchmarking analysis indicates that the GA/FBO areas at these airports range between 32 and 79 acres. For planning purposes, 50 acres north of Runway 6-24 should be reserved to meet future GA demand throughout the planning horizon, consistent with the six benchmarked airports average GA/FBO area. The analysis also indicates that the size of the hangars at these airports varies between 12,000 to 64,000 square feet.

SOURCE: FAA AIRPORTIQ 5010, December 2021

Figure 4-14 Surrounding Airports

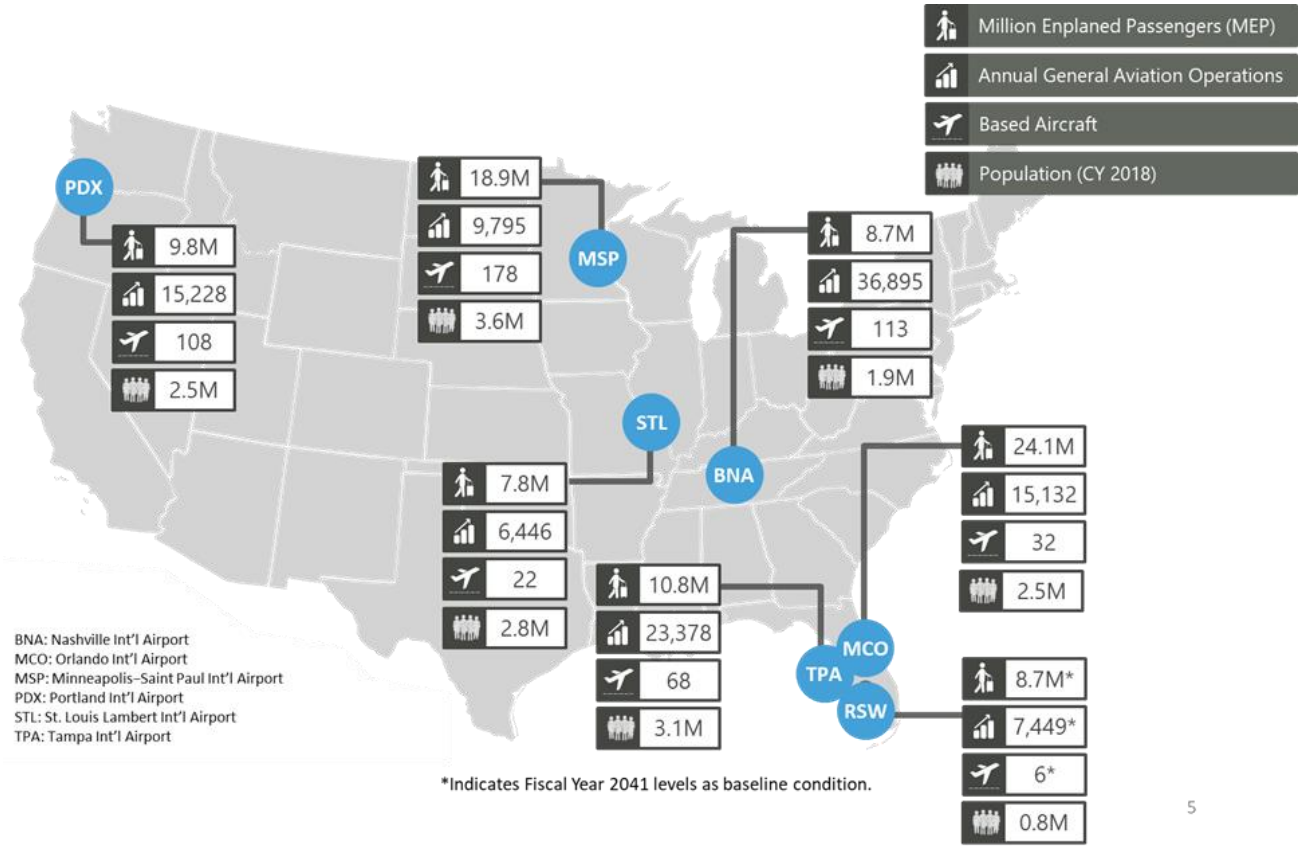


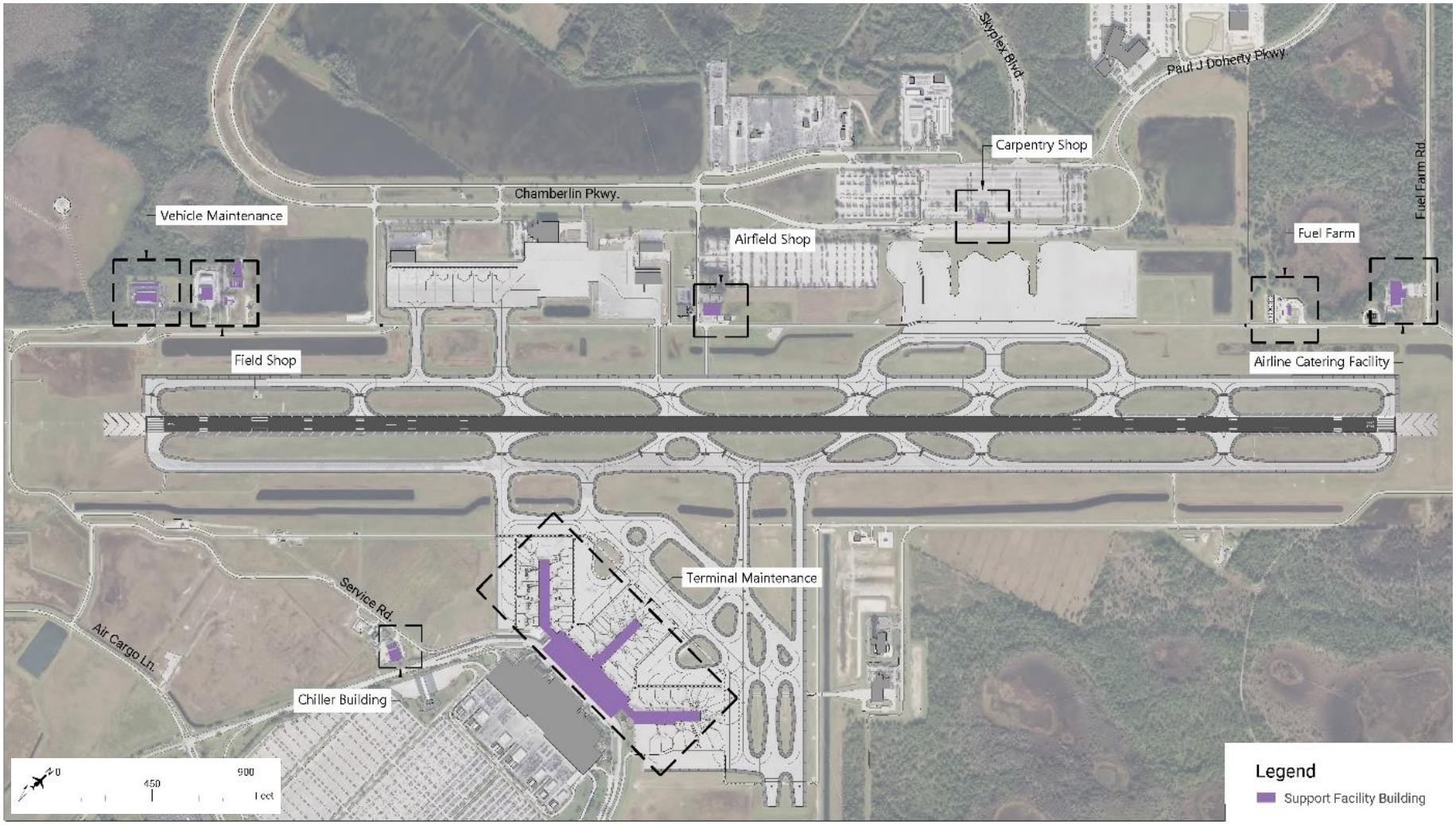
Figure 4-15 Benchmarked Airports

Airline Catering Facility

The reduction in food service beyond snacks and beverages on most domestic flights has resulted in less demand for catering/flight kitchen facilities at airports. The catering facility operated by LSG/Sky Chefs is considered adequate through the planning horizon and no additional space requirements were identified as part of this Master Plan Update.

Aircraft Maintenance, Repair, and Overhaul Facility

To estimate land area requirements to accommodate future aircraft maintenance tenants and operators, a review of MRO facilities at six commercial airports in the U.S. was conducted. These airports are the same as the ones that were benchmarked for the GA/FBO facilities and are noted in **Figure 4-16**. The benchmarking analysis indicates that the MRO areas at these airports range between 31 and 53 acres. For planning purposes, 40 acres north of Runway 6-24 should be reserved to meet future MRO demand throughout the planning horizon, consistent with the six benchmarked airports average MRO area. The analysis also indicates that the aircraft maintenance hangars at these airports vary in size from 24,000 to 110,000 square feet.



SOURCE: Martinez Geospatial Inc., Base Mapping and Aerial Photography, April 2021; Ricondo & Associates, June 2022

Figure 4-16 Maintenance Facilities

The new commercial service MRO facility that is planned for development on the eastern portion of the north ramp area encompasses approximately 40 acres. The proposed facility would be equipped with the necessary infrastructure to provide services such as heavy aircraft maintenance, airframe modifications, avionics repairs, testing, and painting. The 340,000-square-foot proposed facility would include the following:

- 175,000-square-foot heavy maintenance MRO aircraft hangar
- 72,000-square-foot paint booth hangar
- 27,000-square-foot materials receiving and storage space
- Three-story 66,000-square-foot main operation building (22,000 square feet per floor)

The facility and associated apron is proposed to accommodate up to 11 narrowbody aircraft or four to six widebody aircraft at a given time. The paint booth hangar is planned to accommodate up to one widebody aircraft at a time. The proposed facility is anticipated to meet the long-term demand for MRO services. No additional facilities are recommended throughout the planning period.

Fuel Storage Facilities

As noted in the Inventory Chapter, there are three fuel storage facilities at the Airport. The commercial service and GA fuel storage facilities are located east of the north ramp area and north of the Runway 24 end. The GSE fuel storage facility is located south of the Runway 6 end.

Commercial Aviation Fuel Storage Facility

With a forecasted strong increase in commercial flight activity through the planning horizon, the need for additional fuel farm facilities was analyzed to determine the need (if any) for expansion.

Every fuel farm requires a minimum number of days of storage capacity each location strives to have and maintain. Most often this is driven by a number of variables which are site specific. Examples of these variables can include the method of fuel delivery, how reliable the fuel supply chain is, weather conditions, historical data, etc.

For RSW's peak month, the usage by day was reviewed to determine the peak average use observed in that month over several days. That usage was then spread over the number of current gates to find the average usage at each gate. This gate usage average combined with the projected aircraft mix is applied to the highest potential number of new gates (19), in order to best project what the future fuel usage may look like.

Other factors that went into the projections include operational limitations of the tanks such as safe fill levels, tank bottoms, out of service inspections that are required, current peak demand (how much fuel the ramp requires at one time), maximum fuel offloading capability, lag time when placing fuel orders vs when they arrive, and more.

Based on the assumptions and calculations in **Table 4-31**, it is recommended to build a total of three 25,000 Barrel of crude oil (BBL) tanks (1,050 gallons per tank) based on the schedule in **Table 4-32**.

Table 4-31 Fuel Farm Requirements Assumptions		
Facility Name	**Requirement**	**Units**
Peak Monthly Usage	11,760,000	gallons (per Historical Data)
Calculated Daily Usage	379,355	gallons (per Historical Data)
Peak Daily Usage	450,000	gallons (per Historical Data)
Peak Daily Usage per Gate	10,714	gallons (Estimated Average)
Peak Daily Usage plus (19) Gates (2027)	653,571	gallons
Total Recommended Usable Storage (2027)	—	gallons
Peak Daily Usage plus (19) Gates (2042)	857,143	gallons
Total Recommended Usable Storage (2042)	—	gallons
SOURCE: FSM Group Analysis,2022		

Table 4-32 Fuel Farm Concept			
Tank	**Nominal (BBL)**	**Usable (gal.)**	**Percentage (%) Usable)**
Tank 1 (existing)	10000	355,110	85%
Tank 2 (existing)	10000	354,522	84%
Tank 3 (existing)	10000	355,236	85%
Tank 4 (existing)	10000	356,790	85%
Tank 5 (2027)	25000	881,143	84%
Tank 6 (2027)	25000	881,143	84%
Tank 7 (2042)	25000	881,143	84%
Recommended Volumes		**Usable (gal.)**	**Percentage (%) of Forecasted Use**
2027 Usable Volume		2,565,818	98%
2042 Usable Volume		3,446,961	101%
SOURCE: FSM Group Analysis, 2022			

General Aviation Fuel Storage Facility

In addition to the existing GA fuel farm with storage for 60,000 gallons of Jet A fuel and 12,000 gallons of aviation gas (AvGas), an area should be preserved for a secondary fuel farm to be located close to the existing and future general aviation facilities to reduce the number of fuel truck operations. The reduction in fuel truck movements on the airfield would increase safety, reduce air emissions, and reduce environmental risks, including surface fuel spills.

Air Cargo Facilities

As noted in Existing Conditions Chapter, the air cargo facilities at the Airport include two primary buildings. The main cargo building consists of approximately 24,000 square feet of floor space and is occupied by Federal Express (FedEx) and United Postal Service (UPS). The airline freight forwarding facility, which encompasses 13,600 square feet, is used primarily for the airlines' belly-haul cargo processing. These buildings will continue to serve the short and midterm demand for air cargo. As such, future development plans for the north ramp area should assume these buildings will remain in place in the future.

To estimate land area requirements to accommodate future air cargo tenants and operators, a review of cargo facilities at six commercial airports in the U.S. was conducted. These airports are the same as the ones that were benchmarked for the GA/FBO facilities. The benchmarking analysis indicates that the cargo areas at these airports range between 37 and 116 acres. On average, the cargo areas at these airports encompass 70 acres. Therefore, for planning purposes, approximately 70 acres north of Runway 6-24 should be reserved to meet future cargo demand throughout the planning horizon.

Future cargo facilities are likely to include:

- Cargo buildings
- Truck loading docks and apron
- Truck staging/storage area
- Automobile parking
- Aircraft apron
- Ground support equipment (GSE) storage areas

Electronic Commerce Logistics Facilities

The anticipated growth of electronic commerce (e-commerce), driven by increasing concentration of population in urban areas and technological advancements to enable globalized commerce, presents significant opportunities for airport owners to contribute to regional economic development. The U.S. is the second largest online market in the world (following China)[2] and many U.S. retailers are investing in e-commerce. According to the US Department of Commerce Retail Indicator Division, e-commerce represented 14.3% of all retail sales in the first quarter of 2022 (compared to 5.2% in the first quarter of 2012).

To estimate land area requirements to accommodate future e-commerce tenants and operators for their logistics facilities, a review of existing e-commerce logistics facilities at Lakeland Linder International Airport (LAL) and Chicago Rockford International Airport (RFD) was conducted. The e-commerce/sort logistics facilities at LAL encompass approximately 40 acres and include a 223,000-square-foot distribution/sort and office building, aircraft parking areas, truck loading docks and apron, GSE support buildings, and parking and operational support areas. A plan to expand Amazon Air's e-commerce hub at LAL was approved in 2021 and will include a 464,600-square-foot expansion of the existing distribution/sort and office building, approximately 69,000 square yards of paved truck court to accommodate 370 additional truck bays, additional automobile parking spaces, and a concrete apron capable of accommodating three additional Boeing 767-300 aircraft parking positions. The e-commerce logistics facilities at RFD encompass approximately 33 acres and include a 200,000-square-foot distribution/sort and office building, aircraft parking areas, truck loading docks and apron, GSE support buildings, and parking and operational support areas. Based the layout of the logistics facilities at both LAL and RFD and for planning purposes, it is recommended that approximately 40 acres be reserved for future e-commerce logistics facilities at RSW.

2 E-commerce Market Analysis, https://ecommercedb.com/en/markets/us/all, accessed June 20, 2022

Airfield Electrical Vault

As documented in the Existing Conditions Chapter, a new airfield electrical vault was constructed in June 2021. The new vault was designed to accommodate the airfield long-term needs including the new runway and no changes to this equipment are anticipated throughout the Master Plan horizon.

Air Traffic Control Tower

As discussed in Section 2, a new ATCT and terminal radar approach control (TRACON) are being constructed between Runway 6-24 and future Runway 6R-24L, north of the aircraft rescue and firefighting (ARFF) facility. The tower is anticipated to become operational in September 2022. The location of the ATCT was sited in accordance with FAA guidance and considered line-of-sight and other criteria necessary to accommodate the future airfield geometry, including the Runway 6R-24L. Given the facility will be in excellent condition, there are no additional ATCT improvements recommended throughout the planning period.

Aircraft Rescue and Firefighting Facility

The existing ARFF station was constructed in 2012 and is approximately 31,000 square feet. The facility is located between Runway 6-24 and future Runway 6R-24L, east of the existing passenger terminal building. This location is consistent with the FAA ARFF siting criteria that include providing immediate access to the airfield, ensuring non-interference with the ATCT's line of sight, adhering to the building restriction line (BRL), and meeting requirements for emergency response time. As detailed in Title 14 CFR Part 139 (Part 139), the first ARFF response vehicle must be able to maneuver to the midpoint of any runway within 3 minutes. The location of the ARFF facility provides optimal access to the existing runway and future parallel runway.

The ARFF facility provides five drive-through apparatus bays capable of housing ten ARFF vehicles. The facility and equipment meet the requirements of Part 139 for Index D operations. Index D represents an aircraft length of 159 feet or greater but less than 200 feet. The index determination is based on the length of the longest air carrier aircraft performing five average daily departures at the Airport. In March 2020, there was an average of four daily departures of aircraft classified as Index D. These aircraft included the Boeing 757-300 and Boeing 767-300. According to a design day flight schedule developed in support of the May 2020 *Passenger and Operations Forecast*, the number of average Index D departures is forecast to increase to 23 by 2040. The increase in departures of Index D aircraft is due to evolving airline business models, such as upgauging and phasing out of older aircraft, as well as an overall increase in operations.

The basic equipment and extinguishing agent requirements of an Index D ARFF facility are three crash response trucks with:

- One vehicle carrying extinguishing agents of either 500 pounds of sodium-based dry chemical, halon 1211, or cleaning agent or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of aqueous film forming foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF application
- Two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons.

The ARFF facility at RSW is adequately sized to accommodate to the equipment, agents, and personnel to meet Index D requirements. RSW's Part 139 classification of Index D is expected to remain constant throughout the planning horizon. Aircraft more than 200 feet long are not anticipated to account for the minimum of five daily departures within the MPU 20-year horizon; therefore, according to current regulations, ARFF Index D is adequate.

Secondary Fire Station

Fire and rescue operations currently originate from the ARFF station, which is located between (existing) Runway 6-24 and future Runway 6R-24L, east of the existing passenger terminal building. While this location provides efficient access to airside emergencies, access to terminal facilities and other landside areas on the airport campus including 1 million square feet of industrial, office, commercial, and hotel development potential in Skyplex is limited by security egress/ingress checkpoints and runway crossings. The constraints of the existing location and the projected growth of vehicle trips on primary and secondary access routes in the Skyplex development area is likely to result in unacceptable emergency response times for service delivery objectives based on the National Fire Protection Association (NFPA) time standards for the deployment of fire suppression, and rescue and emergency medical resources/services.

Specifically, NFPA Standard 1710 titled Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2020 Edition includes the following fire department time objectives:

- Turnout time (The time that begins when units acknowledge notification of the emergency to the beginning point of response time): 80 seconds turnout time for fire and special operations response and 60 seconds turnout time for EMS response
- Fire response time (The time that begins when units are en-route to the emergency incident and ends when units arrive at the scene):
  - 240 seconds (4 minutes) or less for the arrival of the first engine company at a fire suppression incident
  - 360 seconds (6 minutes) or less for the arrival of the second engine company at a fire suppression incident
  - 480 seconds (8 minutes) or less for the deployment of an initial full alarm assignment at a fire suppression incident for facilities other than high-rise
  - 610 seconds (10+ minutes) or less for the deployment of an initial full alarm assignment at a fire suppression incident for high-rise

First responder or higher emergency medical response time: 240 seconds (4 minutes) or less for the arrival of an advanced life support (ALS) unit at an emergency medical incident, where this service is provided by the fire department provided a first responder with an AED or basic life support (BLS) unit arrived in 240 seconds or less travel time.

The standard states that the fire department shall establish a performance objective of not less than 90% for the achievement of each response time objective.

Preliminary analyses by LCPA fire station staff indicate that response times from the ARFF station to facilities along Daniels Parkway will not meet NFPA standards. Thus, to improve response times on the airport campus and the Skyplex development area, LCPA should protect for the construction of a secondary fire station on the north side of the Airport.

Public Safety Building

The Terminal complex is the facility that experiences by far the most public use of any facility at the Airport. Accordingly, if a security or safety incident were to occur, there is higher probability that it would occur in this facility. Based on discussions with law-enforcement personnel, co-locating police headquarters in the terminal facility presents potential response challenges should a situation emerge requiring law-enforcement personnel. A situation severe enough could render onsite personnel incapable or incapacitated to respond to a situation, similarly police resources could be

unavailable if police headquarters are impacted by an incident. Locating the bulk of law-enforcement resources nearby, while retaining a smaller terminal police office allows the police to have a hardened and timely response to most security or safety scenarios.

In addition, with continuing rapid passenger growth at RSW, the already limited terminal space commands a high premium. Coupled with increased security requirements and police staffing to match passenger growth, the need for more Lee County Port Authority Police Department (APD) space competes with the need for more terminal space to accommodate the growing passenger demand.

In order to leverage terminal resources to the best and highest use for airline and airport operations; and to allow for the APD to continue to grow, a new Public Safety Building hosting the APD, a multi-use Airport Emergency Operations Center, and redundancy locations for limited Airport Badging and Communications functions is planned independent of the terminal.

LCPA Police training gun ranges

The LCPA has an indoor (enclosed but open roof) and outdoor gun range. These gun ranges are a benefit to APD training as they do not have to book time and travel to other shared facilities. These facilities are recommended to be maintained in their current locations with periodic upgrades.

Lee County Port Authority Airport Maintenance Department Facility

The existing airport maintenance facilities supporting RSW are spread throughout the Airport campus, with facilities located north and south of Runway 6-24, as well as within the Terminal Building. Figure 4-16 illustrates the location of the maintenance facilities. The primary use associated with each facility, the year constructed, and the approximate size is listed in Table 4-33.

Table 4-33 Maintenance Facilities

Facility Name	Year Constructed/ Renovated	Approximate Size of Facility[a]	Primary Use
Vehicle Maintenance Facility	1998/2020	30,100 sf	Vehicle Maintenance, Administrative Space, Sign Shop, Welding and Fabrication Shop, and Storage
Airfield Shop	1981	13,100 sf	Airfield Equipment Storage, Photometric Testing Lab, Exercise Facilities, and Auditorium
Field Shop	1981	16,800 sf	Warehouse Space, Large Equipment Storage, Fuel Facilities, and Chemical Storage
Carpentry Shop	1981	3,400 sf	Carpentry Related Functions and Storage Space
Chiller Building	2005	10,359 sf	Powder Coating Operations, Parts Cleaning and Preparation, and Bulk Storage
Terminal Building	2005	9,632 sf	Locksmith Shop, Carpentry Shop, Paint Storage, Terminal Maintenance Storage, Administrative Office Space, Locker Rooms, Breakrooms

SOURCES: Lee County Port Authority, December 2021; Ricondo & Associates, Inc., December 2021
[a] Approximate facility size includes covered storage for vehicles, equipment, and materials.

As of December 2021, the Maintenance Department has 105 approved positions. From a historical staffing perspective, the number of employees in the Maintenance Department has doubled since moving to the Midfield Terminal Complex in 2005 and is projected to grow by approximately 10 staff by PAL 1, 2026.

The size of the maintenance facility space within the Terminal Building has decreased since 2005 to accommodate the needs of airlines, concessionaires, and other tenants. According to Airport staff, there is an immediate need for additional breakroom, locker room, storage, and administrative office space in the terminal. The Airport has a short-term plan to utilize additional space within the Terminal Building at the ends of Concourses B and D.

To accommodate maintenance needs in the mid-and long-term planning horizons, as well as future staffing projections, additional space is needed for a variety of maintenance functions. Due to the age and condition of the existing facilities, particularly the Airfield Shop, Field Shop, and Carpentry Shop, opportunities for the expansion of these facilities are limited.

Representatives from the Maintenance Department have indicated a preference to develop a consolidated maintenance facility to accommodate the majority of the maintenance staff and functions of the department. In addition to increasing the overall efficiency of the department, the construction of a consolidated maintenance facility would allow several existing functions and staff currently located within the terminal building to be relocated. The maintenance facilities within the terminal building would be limited to staff, equipment, and functions specifically related to the terminal core.

The proposed consolidated maintenance facility would include the following:

- Administrative office space and conference/training rooms
- Kitchen, breakrooms, locker rooms, showers, and exercise facilities
- Warehouse, paint and chemical storage, equipment storage, bulk storage
- Tool room, sign shop, lock shop, systems shop, system testing lab, carpentry shop, powder coat shop, photometric testing lab
- Employee parking
- Electric charging stations for airport maintenance, employee, and visitor vehicles

Maintenance personnel have also indicated the need for two additional fuel storage tanks (one 6,000-gallon unleaded gasoline tank, one 1,000-gallon ethanol-free gasoline tank) to support the small equipment, mowers, and carts used throughout the campus.

The existing maintenance facilities, including employee parking, currently occupy approximately 5.8 acres. The estimated future space requirements for all maintenance functions at RSW, including a consolidated maintenance facility, are approximately 6.6 acres.

Remote Loading Dock

Currently the Terminal building receives commercial goods through a loading dock accessible to unsecured delivery vehicles. The location of the loading dock within the Terminal presents a security issue as it allows a large-size commercial vehicle to approach and dock within the Terminal with no safety area in between the building and the vehicle. A new facility is being designed and will be located away from the Terminal area to allow for commercial deliveries to occur without contact with the Terminal. Goods will be off-loaded at the new facility, inspected for safety and then transferred to secure airside vehicles that will deliver the goods to the Terminal via the secure airside. This will allow for the removal of the landside loading dock and improve the hardening of the Terminal. This facility will be sized to match the current and future needs of the Terminal facility. A similar facility was built at San Diego International Airport with the addition of belly cargo facilities for airlines. Table 4-34 shows the remote loading dock requirements over the planning horizon.

Table 4-34 Remote Loading Dock Space Requirements							
	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/ (Deficiency)
SF	15,185	13,010	14,887	16,771	18,934	21,149	(5,964)

SOURCE: Atkins, 2022

4.7 Landside: Roadways, Curbside, Parking, and Rental Cars

The following section summarizes the forecasted demand and capacity for the internal RSW roadway network and commercial areas that serve the Airport, such as on-airport access roads, parking, and curbsides. Data from previously completed forecasts of RSW aviation activity were reviewed as part of this Master Plan Update. The May 2020 *Passenger and Operations Forecast Study* by C&S Companies and TransSolutions was compared against activity growth projections used in previous studies, which showed that previous projections are still valid with the 2020 forecast update. Findings from the previous studies were referenced to determine the extent to which each facility type (roadways, curbsides, parking, etc.) is expected to meet the projected demand. If future non-aeronautical development is expected in any of the internal RSW and commercial areas that serve the airport, then a future traffic impact study would be necessary to determine the level of service of the roadways affected by the developments.

Landside Roadways

Based on available past studies there are no requirements identified to address capacity deficiencies through the planning horizon. The following subsections summarize the findings from these studies.

Chamberlin Parkway and Paul J. Doherty Parkway (North Access)

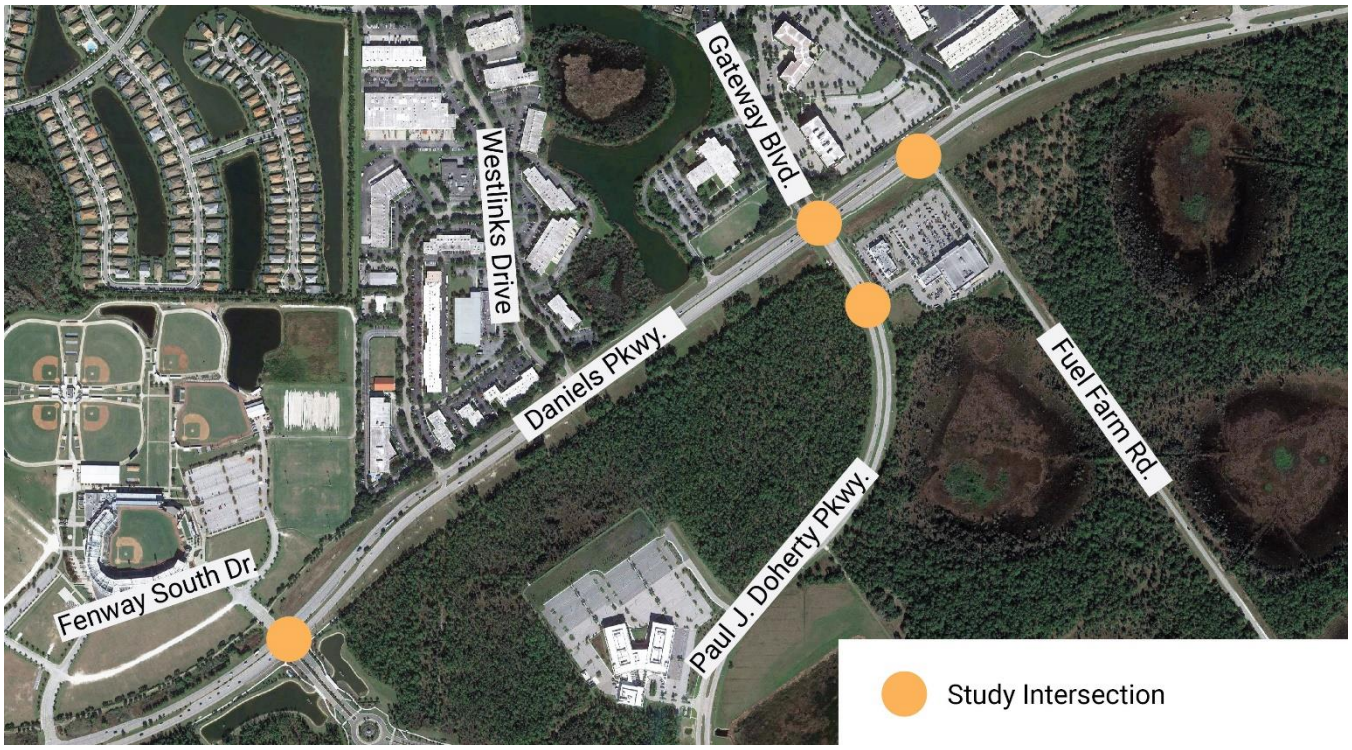
The development of non-aviation uses on airport property is subject to local government review of traffic impacts. The trip generation associated with roughly 1 million square feet of industrial, office, commercial and hotel development potential in Skyplex (non-aviation support lands north of Runway 6-24) and in the midfield area along Terminal Access Road have been preliminarily assessed. Through the Lee County review process, approval has been issued and the landside roadways are expected to have capacity to accommodate an anticipated 1,741 new PM peak hour trips in Skyplex area and 392 new PM peak hour trips in the midfield area, subject to final review on a site-by-site basis at time of development. If future additional non-aviation development is proposed, then a future traffic impact study would be necessary to assess impact to the levels of service of the roadways affected by the developments.

The 2017 Chamberlin Parkway Alignment Study (Appendix M) developed by Johnson Engineering, Inc. summarized the existing vehicular demand of Chamberlin Parkway and Paul J. Doherty Parkway based on data collected at three roadway segments in November-December 2016. The traffic counts indicated average daily traffic was 578 vehicles for Chamberlin Parkway and 2,115 vehicles for Paul J. Doherty Parkway.

The Chamberlin Parkway Alignment Study did not quantitatively determine deficiencies in terms of roadway capacity. If updated existing and future LOS is desired, then a new demand/capacity analysis would be required for these roadways. However, the study does outline improvements to be made in terms of safety and other benefits to the overall area in concern. Based on this study, the proposed alignment changes were identified to address safety and operational efficiency for the corridor. A total of three roadway realignments were proposed as part of the study and will be discussed in Chapter 5, Alternatives Development and Evaluation.

The 2019 Daniels Parkway and Paul J. Doherty Parkway Assessment (Appendix N) developed by Kimley-Horn summarized an intersection capacity analysis at four intersections based on data collected during the AM and PM peak periods on Thursday, February 21, 2019.

The four study intersections are identified in Error! Reference source not found.**4-17**. The study determined that Daniels Parkway/CR 876 at Paul J. Doherty Parkway required intersection improvements to accommodate then-current existing traffic conditions. The recommended improvements, from the Option 1 scenario, have since been implemented. No future LOS or queue conditions were determined as part of the study; therefore, additional demand/capacity analysis would be needed to determine future LOS conditions for these roadways and intersections. The LOS results for the study intersections with Option 1 Improvements existing are included in Appendix N.



SOURCE: Kimley-Horn, *Daniels Parkway and Paul J. Doherty Parkway Assessment*, 2019 (Appendix N)

Figure 4-17 Location Map

While no capacity deficiencies were identified for Fuel Farm Road, pavement conditions and geometrics for maneuverability should be assessed and accounted for to support any future expansions to the fuel farm or non-aviation development along this corridor.

Terminal Access Road

The RSW Terminal Access Road Traffic Study developed by Johnson Engineering Inc. in August 2011 summarized the traffic analysis for Terminal Access Road and its intersections. Florida Department of Transportation (FDOT) historical data for Terminal Access Road shows an Annual Average Daily Traffic (AADT) of 27,500 vehicles during the year of 2019, which is approximately 23% lower than the 35,580 vehicles that were projected in the referenced study for 2019. This may indicate that, based on the average annual growth rate obtained from the RSW Passenger and Operations Forecast dated May 2020, conditions for this roadway may take longer to reach the operational level of service deterioration projected by the 2011 study since activity is growing slower than previously projected. As a result, the Terminal Access

Road and its intersections are experiencing conditions that are better than originally anticipated in the 2011 RSW Terminal Access Road Traffic Study from Johnson Engineering, Inc. As of the 2011 study, no recommended or required improvements were identified. Therefore, no geometric/capacity changes appear to be required based on the 2011 study or current conditions.

Terminal Access Road at Treeline Avenue

As a result of the of the I-75 interchange constructed after the August 2011 study was performed, the analysis included in the referenced study is no longer applicable to current conditions. Therefore, it is recommended that a new demand/capacity analysis be performed for the Terminal Access Road and Treeline Avenue intersection.

Terminal Access Road at Air Cargo Lane (Inbound)

No geometric or lane configuration changes appear to be required based on the August 2011 study or current conditions.

Terminal Access Road at Air Cargo Lane (Inbound) Demand/Capacity Validation

When then-proposed development traffic is accounted for, this intersection is projected to experience degradation only for the north-eastbound left turn movement. This movement would exceed the projected demands shown in the 2011 RSW Terminal Access Road Traffic Study prepared by Johnson Engineering. All other movements would remain similar or less than the traffic volumes projected during the 2011 study. For more details, see Appendix O.

Terminal Access Road at Air Cargo Lane (Outbound)

No geometric or lane configuration changes appear to be required based on both the August 2011 study and current conditions.

Terminal Access Road at Air Cargo Lane (Outbound) Demand/Capacity Validation

When then-proposed development traffic is accounted for, this intersection is projected to experience degradation only for the eastbound right turn and westbound through movements. These movements would exceed the projected demands shown in the 2011 RSW Terminal Access Road Traffic Study. All other movements would remain similar or less than the traffic volumes projected during the 2011 study. For more details, please see Appendix O.

Multi Modal Considerations

Any future new roadways or updates to existing roadway configurations should consider a wide variety of travel modes such as walking, bicycling and public transit. The prior RSW master plan update identified an Ultimate Passenger Multi-Modal area along Treeline Avenue. It was uncertain at that time what, if any, multi-modal facility should be planned at the airport, so a place was merely reserved on the Airport Layout Plan for ultimate (beyond 2025) development. RSW itself is a multimodal facility serving to transition people and goods from air to land transportation. Passengers land via aircraft, walk to the front terminal curb, and board a surface vehicle to reach their final destination, whether personal vehicle, hired vehicle or public bus transportation. The entire RSW terminal is a multi-modal facility. This is also the case for the RSW Airline Freight and Air Cargo facilities, transitioning goods from air to land transportation. Sea and rail access is currently limited due to geographic constraints.

The Lee County Port Authority engages in ongoing coordination with the Lee County Metropolitan Planning Organization (MPO) and with the local public transit agency, LeeTran, to identify and address public transportation demands. The terminal is served by a LeeTran bus stop (Route 50 of the Lee Tran connects RSW to Lee County). Pedestrian paths and future potential bus stops are identified on the Airport Operations Planned Development (AOPD) master concept plan to

serve the northern non-aviation development area (Skyplex) along Daniels Parkway. The emerging technology of electric vertical take-off and landing (eVTOL) is considered with potential eVTOL development siting incorporated in the North Area Vision Plan (see Figure 5-11). Even though further multi-modal opportunities may exist in the future for RSW, and the airport should continue to be open to their investigation, this Master Plan Update does not recommend identifying a specific location on the Airport Layout Plan for additional multimodal facilities at this time.

Terminal Curbside Requirements

Methodology

The curbside portion of the terminal roadways, where the primary pickup and drop-off functions are accommodated, is often a constraining component of a terminal 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.

To accommodate these operations and mix of vehicles, RSW has three curbside locations: the upper level (departures), the lower level (arrivals), and the Ground Transportation Area (GTA) that is located adjacent to the arrivals curbside on the lower level.

Future peak-hour vehicle volumes were estimated based on the forecast of total annual enplaning and deplaning passenger activity and based on airport ground access market shares observed from the base year curbside traffic counts.

Curbside length requirements are generally 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 Quick Analysis Tool for Airport Roadways (QATAR), as outlined in Airport Cooperative Research Program's (ACRP) *Report 40: Airport Curbside and Terminal Area Roadway Operations*, was used to assess the curbside LOS for the base year and for future scenarios. The curbside inventory and data collection information compiled for RSW was used as inputs to calibrate the QATAR spreadsheet analysis tool. Using this tool, a capacity, demand, and LOS assessment was completed for the base year and future scenarios to determine terminal curbside requirements.

Base Year Traffic Conditions

Curbside operational observations were completed on Thursday, March 17, 2016, as part of the *RSW Terminal Curb Front Roadway Assessment* (Appendix P) completed by Kimley-Horn in December 2016. Based on historical RSW passenger data, March was determined to be the peak month of the year and Thursday was determined to be the peak day of the week. The landside data is summarized under two categories: roadway traffic counts and terminal curbside observations. Twenty-four-hour vehicle classification counts were collected and are summarized below. Curbside operational observations were completed during a two-hour period (11 a.m. to 1 p.m.) associated with peak arrival and peak departure times. All curbside observations were conducted on both the upper and lower levels. The terminal curbside observations included:

- Vehicle classification counts
- Loading/Unloading dwell times for a variety of vehicle types, including but not limited to, private autos, taxis, service vehicles, shuttles, and buses

- General observations included observed congestion/conflict areas and amount of enforcement
- The traffic data collected, such as traffic counts, vehicle occupancy, and dwell times, were used as model inputs for the QATAR tool.

Curbside roadways provide access for a variety of travel modes that include both commercial and private vehicles. This section summarizes the travel modes that currently utilize the curbside and the characteristics of the curbside roadways. In an airport environment, vehicle mix (or vehicle classification) refers to the breakdown of the traffic volume by individual travel modes, as defined by both the type of service each mode provides (e.g., taxicab, courtesy vehicle, charter bus) and the type of vehicle used (e.g., sedan, passenger van, minibus, full-size bus). A number of different types of vehicles were identified as utilizing the curbside roadways at RSW. The vehicle classification and dwell times take into consideration various vehicle types that frequented the Airport during the peak period. Table 4-35 summarizes the documented vehicle types at RSW. It should be noted that due to the difficulty of identifying TNC vehicles apart from private vehicles, TNC vehicles were included in the private vehicle count.

Table 4-35 Base Year Vehicle Classification

Vehicle Type	Vehicle Examples	Airport Utilization
Private Vehicles	Automobile, pick-up truck, SUV	Upper level and lower level
Taxis	Taxi	GTA and upper level
Luxury Limo	Lincoln town cars and Expeditions	Upper level and lower level
Buses	Public bus, charter and tour busses	Public transit, Route 50 of the Lee Tran service from RSW GTA to Lee County
Shuttles	Hotel and motel shuttles, super shuttles, surface parking lot shuttle, employee shuttle	On-airport shuttles circulate between the GTA or Upper level and either the long-term (surface) parking or the employee lot. Hotel/Motel shuttles have pick up stations at the GTA
Private Transportation Vehicles	Apple Airport Transportation, Superior Airport Shuttle	Upper level and lower level
LCPA Vehicles	Lee County trucks and cars	Upper level and lower level
Law Enforcement	Police ambulance, airport security	Recirculating (orbiting) trips on upper level, lower level and GTA

SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Vehicle classification counts were collected at three locations during the identified two-hour period (11 a.m. to 1 p.m.) for the traffic data collection effort on March 17, 2016. The vehicle counts were collected at the following key airport entries:

- Upper level (departures) curbside entry
- Lower level (arrivals) curbside entry
- GTA curbside entry

Table 4-36 summarizes the total vehicle count (characterized by vehicle type) at each of the three locations listed above. "Percent Total Traffic" summarizes the traffic composition (in percent) by vehicle type during the two-hour period. The specific peak hour traffic within the two-hour period for the upper level and for the lower level was identified and used for the QATAR LOS analysis.

Table 4-36 Base Year Curbside Two-Hour Peak Period Vehicle Classification Counts

Type of Vehicle	Upper Level		Lower Level		GTA		All	
	Total	Percent Total Traffic	Total	Percent Total Traffic	Total	Percent Total Traffic	Total	Percent Total Traffic
Automobile, Pick-up, SUV	1,038	90.1%	1,059	97.5%	3	1.8%	2,100	87.2%
Taxi	30	2.6%	9	0.8%	96	56.1%	135	5.6%
Luxury Limousine	0	0.0%	3	0.3%	0	0.0%	3	0.1%
Public Bus	0	0.0%	0	0.0%	1	0.6%	1	0.0%
Hotel/Motel Shuttle	9	0.8%	0	0.0%	13	7.6%	22	0.9%
Supershuttle	3	0.3%	0	0.0%	0	0.0%	3	0.1%
Surface Parking Lot Shuttle	29	2.5%	1	0.1%	28	16.4%	58	2.4%
Employee Shuttle	0	0.0%	1	0.1%	24	14.0%	25	1.0%
Private Transportation Vans	35	3.0%	2	0.2%	0	0.0%	37	1.5%
Delivery Trucks	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Law Enforcement Vehicle	7	0.6%	4	0.4%	0	0.0%	11	0.5%
LCPA Trucks/Cars	0	0.0%	3	0.3%	2	1.2%	5	0.2%
Charter & Tour Busses	0	0.0%	2	0.2%	0	0.0%	2	0.1%
Other	1	0.1%	2	0.2%	4	2.3%	7	0.3%
Total	**1,152**	**100.0%**	**1,086**	**100.0%**	**171**	**100.0%**	**2,409**	**100.0%**

SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)
NOTE: Totals may not add up to 100% due to rounding.

Dwell time is the amount of time a vehicle spends parked at a curbside lane (or other passenger loading or unloading area). Typically, the dwell time is the length of time between when the driver parks (i.e., the vehicle comes to a complete stop) and when the driver first attempts to re-join the traffic stream (it does not include any time during which the driver may be ready to depart but is prevented from doing so by other vehicles). "Active" dwell times, the length of time a vehicle remains at a curbside while actively loading/unloading passengers and their baggage were also collected. The "total" dwell time reflects the time difference between when a vehicle first stops at a curbside until it leaves the curbside. Dwell time data is required to analyze curbside roadway operations. The dwell times were collected at two locations at each of the three curbside roadways. The first location collected data for the first half of the terminal curbside (Zones 1 to 3) and the second location collected data at the second half of the terminal curbside (Zones 4 to 6). The average dwell times by vehicle type, per location (Zones 1 to 3 and Zones 4 to 6), as well as the total average dwell time per curbside, are summarized in Appendix P (Table 4-32).

The capacity of the three curbsides at RSW were evaluated using the ACRP methodology and applying the corresponding QATAR spreadsheet modeling tool. This tool calculated the LOS for each curbside, per zone, taking into account the various curbside characteristics and factors discussed previously in this section. The QATAR analysis provides both quantitative and qualitative results and displays the results as a curbing LOS output and as a roadway (travel lanes) LOS output. The curbing LOS considers factors such as peak hour volume, vehicle length, dwell time, number of curbing lanes, and curbside length. The roadway LOS considers number of through lanes and the friction between the curbing vehicles and the vehicles on the travel lanes. The resulting curbside LOS is reported as the lesser (worse) LOS between the curbing and roadway LOS outputs. For this RSW curbside analysis, the curbing LOS is worse than the roadway LOS for each given zone in all scenarios; thus, curbing operations is generally a greater constraint than roadway through capacity at the existing RSW curbsides. A LOS of C or better (i.e., yellow or green in the appendix

figures) is used as the benchmark for acceptable LOS for the planning of proposed improvement for the RSW curbside. Appendix P (Figure 4-20) shows the graphical LOS results of the QATAR analysis for the upper level (departures) curbside for the peak hour in the base year 2016. The QATAR analysis shows that over half of the departure's curbside operates at LOS D during the peak hour in the year 2016.

Appendix P (Figure 4-21) shows the graphical LOS results of the QATAR analysis for the lower level (arrivals) curbside for the peak hour in the base year 2016. The QATAR analysis shows that a portion of the arrival's curbside operates at LOS D during the peak hour in the year 2016.

Appendix P (Figure 4-22) shows the graphical LOS results of the QATAR analysis for the GTA curbside for the peak hour in the base year 2016. The QATAR analysis shows that all areas of the GTA curbside will operate at LOS A in the year 2016 except for one area which is used for the taxi staging curbside. Taxis are called to arrive to the curbside on demand resulting in no observed congestion at the time data was collected. Because the QATAR model does not allow an option for documenting staging areas for vehicles, the resulting LOS is F when the model is run.

Curbside Requirements

In an effort to determine the planning of improvements, QATAR was also utilized in the *RSW Terminal Curb Front Roadway Assessment* completed by Kimley-Horn in December 2016, with the same input factors and assumptions used for the base year 2016 curbside analysis (except for the traffic volumes). This was performed to determine the operations of the curbside roadways in the future if no improvements were implemented. Based on historical RSW passenger trends, a 4% growth rate in total passengers was applied to the ten-year forecast period. In order to relate the number of passengers with the total traffic volume entering the curbside roadways, the same methodology used to grow the passenger counts was used to grow the vehicle counts. Projected vehicle counts through year 2025 were obtained by multiplying the existing vehicle count by the same growth factor (i.e., based on 4% growth per year) corresponding to the forecasted year. This process provided the growth number of vehicles using each curbside for the forecasted years.

Appendix P (Figure 4-23) shows the graphical LOS results of the QATAR analysis for the upper level (departures) curbside for the peak hour for the years 2017 through 2025 without any improvements. The QATAR analysis shows that by 2019 a portion of the departure's curbside operates at LOS E during the peak hour if no improvements are implemented, and by 2025 all of the departure's curbside will operate at LOS D, E, or F during the peak hour, if no improvements are implemented.

Appendix P (Figure 4-24) shows the graphical LOS results of the QATAR analysis for the lower level (arrivals) curbside for the peak hour for the years 2017 through 2025 without any improvements. The QATAR analysis shows that by 2020 over half of the arrival's curbside operates at LOS D during the peak hour if no improvements are implemented, and by 2025, all of the departure's curbside will operate at LOS D or E during the peak hour if no improvements are implemented.

The GTA displays LOS A throughout the entire curbside during the base year in 2016. The number of buses and shuttles at the GTA curbside are not forecasted to grow in the foreseeable future since the average occupancy for each of these vehicle modes did not go above half of the capacity according to the data collection performed. The taxi demand will increase, but congestion will be mitigated by operations of calling taxis to enter the GTA based on demand allows for sufficient vehicles to be staged at the taxi curbside. Therefore, the GTA curbside is expected to remain at acceptable levels of service (i.e., LOS C or better) during the forecasted 2016-2025 period and as well as through PAL 4.

Next, the peak hour traffic counts were forecasted out to PAL 3 and PAL 4 based on the same growth rates forecasted for annual passengers at RSW for PAL 3 and PAL 4. The QATAR analysis tool was used to determine the LOS with the PAL 3 and PAL 4 peak hour traffic if no improvements were implemented.

Appendix P (Figure 4-25) shows the graphical LOS results of the QATAR analysis for the upper level (departures) curbside for the peak hour for PAL 3 and PAL 4 without any improvements. The QATAR analysis shows that in PAL 3 approximately half of the departure's curbside will operate at LOS F during the peak hour if no improvements are implemented, and by PAL 4 almost all of the departure's curbside will operate at LOS E or F during the peak hour if no improvements are implemented.

Appendix P (Figure 4-26) shows the graphical LOS results of the QATAR analysis for the lower level (arrivals) curbside for the peak hour for PAL 3 and PAL 4 without any improvements. The QATAR analysis shows that in PAL 3 over half of the arrival's curbside will operate at LOS E during the peak hour if no improvements are implemented, and by PAL 4 all of the departure's curbside will operate at LOS E or F during the peak hour if no improvements are implemented.

Based on QATAR analysis for PAL 3 and PAL 4 without improvements, the QATAR analysis tool was then used to determine the length of curbside required for the departures and arrivals curbsides to operate at LOS C for PAL 3 and PAL 4. For the departures curbside, a total of 1,566 feet is required to operate at LOS C for PAL 3 and a total of 1,810 feet is required to operate at LOS C for PAL 4. For the arrivals curbside, a total of 1,244 feet is required to operate at LOS C for PAL 3 and a total of 1,505 feet is required to operate at LOS C for PAL 4. All of these curbside requirements are given as end-to-end lengths and assume a minimum of two curbing lanes and two through lanes. Table 4-33 shows the scenarios that were evaluated to achieve the required length for the departure's curbside. It should be noted that all the total lengths presented in the table for each scenario are also curbside end-to-end lengths, not total linear feet of curbing space; therefore, the number of curbing lanes is accounted for accordingly in the analysis.

As seen in **Table 4-37**, the existing curbside plus the new Concourse E departure's curbside will not provide the required curbside length for either PAL 3 or PAL 4 during the peak hour. However, adding an additional two-lane or three-lane outer curbside to the existing Concourse B/C/D curbside will provide the required curbside length for both PAL 3 and PAL 4. It should be noted that the proposed outer curbside capacity is discounted by 25% because it is assumed that it will not be used as much as the inner curbside. Also, the two-lane and three-lane outer curbside capacities are discounted by another 25% to account for having only one curbing lane instead of two (half the space) while also considering differences in utilization/efficiency between a single-lane and dual-lane curbing environment. Also, it should be noted that the QATAR analysis shows that the LOS for the inner curbside for the existing Concourse B/C/D is the same whether it is four lanes or five lanes. However, it is recommended that if the inner curbside is reduced from five lanes to four lanes, the proposed outer curbside should be implemented as a three-lane outer curbside to accommodate through traffic that may choose to pass through the outer curbside rather than the inner curbside. In summary, both the two-lane and three-lane outer curbsides will have the same effective curbing capacity since they both assume only one curbing lane. Therefore, the only difference between the two-lane and three-lane outer curbsides is that the three-lane outer curbside proposes a designated through-lane in order to accommodate through traffic if the inner curbside is reduced from five lanes to four lanes. The scenario with a modified four-lane inner curbside and new three-lane curbside is recommended because it provides greater flexibility for through traffic. Note: this geometric recommendation is preliminary and schematic in nature for the purposes of clarifying curbside requirements; roadway/curbside recommendations will be further assessed in the alternatives analysis.

Table 4-33 shows the scenarios that were evaluated in order to achieve the required length for the arrival's curbside. As seen in **Table 4-38**, the existing curbside plus the new Concourse E curbside will provide the required curbside length for PAL 3 but not for PAL 4 during the peak hour. However, adding an additional two-lane outer curbside to the existing Concourse B/C/D curbside will provide the required curbside length for both PAL 3 and PAL 4.

Table 4-39 shows the terminal curbside lane requirements for both the upper-level departures and the lower-level arrivals through PAL 4.

Table 4-37 Departures Curbside Requirements for PAL 3 and PAL 4

Geometric Scenario	Existing or Assumed Active Curbside End-to-End Length, Assuming Dual-Lane Curbing, for Each Concourse (feet)					PAL 3, 15.2 M PAX		PAL 4, 17 M PAX	
	Existing Concourses B/C/D	New Concourse E	New Outer Curbside Available	50% Discount of Outer Curbside[a]	Total	Needed for LOS C or Better Active Curbside End-to-End Length Assuming Dual-Lane Curbing (feet)[b]	Deficit or Surplus (feet)	Needed for LOS C or Better Active Curbside End-to-End Length Assuming Dual-Lane Curbing (feet)[b]	Deficit or Surplus (feet)
Existing	910	—	—	—	910	1,566	(656)	1,810	(900)
With New Concourse E	910	515	—	—	1,425	1,566	(141)	1,810	(385)
With New Concourse E and with New 2-Lane Outer Curbside (1 Curbing Lane + 1 Maneuver Lane) Assuming Existing Lane Inner Curbside	910	515	1,225	613	2,038	1,566	472	1,810	228
With New Concourse E and with New 3-Lane Outer Curbside (1 Curbing Lane + 1 Maneuver Lane + 1 Through Lane) Assuming Reduced 4-Lane Inner Curbside	910	515	1,225	613	2,038	1,566	472	1,810	228

SOURCE: Atkins, 2021

a The proposed outer curbside capacity is discounted by 25% because it is assumed that it will not be used as much as the inner curbside. Also, the two-lane and three-lane outer curbside capacities are discounted by another 25%, for a total discount of 50%, to account for having only one curbing lane instead of two (half the space) while also considering differences in utilization/efficiency between a single-lane and dual-lane curbing environment.

b The curbside requirement for all geometric scenarios is based on future passenger demand and is independent of the concourses that are provided.

Table 4-38 Arrivals Curbside Requirements for PAL 3 and PAL 4

Geometric Scenario	Existing or Assumed Active Curbside End-to-End Length (feet)					PAL 3, 15.2 M PAX		PAL 4, 17 M PAX	
	Existing Concourses B/C/D	New Concourse E	New Outer Curbside Available	50% Discount of Outer Curbside[a]	Total	Needed for LOS C or Better Active Curbside End-to-End Length Assuming Dual-Lane Curbing (feet)[b]	Deficit or Surplus (feet)	Needed for LOS C or Better Active Curbside End-to-End Length Assuming Dual-Lane Curbing (feet)[b]	Deficit or Surplus (feet)
Existing	835	—	—	—	835	1,244	(409)	1,505	(670)
With New Concourse E	835	515	—	—	1,350	1,244	106	1,505	(155)
With New Concourse E and with New 2-Lane Outer Curbside (1 Curbing Lane + 1 Maneuver Lane)	835	515	1,065	533	1,883	1,244	639	1,505	378

SOURCE: Atkins, 2021

a The proposed outer curbside capacity is discounted by 25% because it is assumed that it will not be used as much as the inner curbside. Also, the two-lane and three-lane outer curbside capacities are discounted by another 25%, for a total discount of 50%, to account for having only one curbing lane instead of two (half the space) while also considering differences in utilization/efficiency between a single-lane and dual-lane curbing environment.

b The curbside requirement for all geometric scenarios is based on future passenger demand and is independent of the concourses that are provided.

Table 4-39 Terminal Curbside Lane Requirements

	Existing	Baseline	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Departures Upper-Level	5	5	5	5	7	7	(2)
Arrivals Lower-Level	7/8[a]	7/8[a]	7/8[a]	7/8[a]	7/8[a]	8	(1)

SOURCE: Atkins, 2022

[a] Lane count varies depending on location relative to terminal curbside.

Parking and Rental Cars

Cell Phone Lot

Like many other RSW facilities, the Cell Phone Lot exceeds its capacity during (84 spaces) the peak season and has excess capacity in the off-season. In the peak season, the commercial vehicle lot (81 spaces) is also used as an overflow cell phone lot as a contingency to handle the peak season demands. In comparison to other US airports, the RSW Cell Phone Lot is much closer to the terminal building and offers great convenience for RSW patrons. The 2011 *RSW Cell Phone Lot Activity Analysis* conducted by Johnson Engineering determined that if all Cell Phone Lot parkers were to park in the Short-Term garage, the airport would gain approximately $396,000 in airport revenue. Even though this would be an extreme case as many Cell Phone Lot parkers would never use the Short-Term garage even if the Cell Phone Lot parking was not available at the airport, it demonstrates that there is a loss of airport revenue by providing airport cell phone lot parking. However, the offsetting benefit of the Cell Phone Lot is observed by a reduction in recirculating vehicle traffic and reduces the numbers of illegally parked vehicles along this side of active roadways. So, while the Cell Phone Lot impacts parking revenues, it provides a beneficial amenity to the airport and the public.

The 2011 *RSW Cell Phone Lot Activity Analysis* summarizes the recorded occupancy of the lot and the vehicle activity on the nearby roadways. Since the study was conducted in 2011, the lot has since been moved from the southeast quadrant of the Terminal Access Road and Air Cargo Lane intersection to the area adjacent to the 7-Eleven/Mobil gas station, southwest of the employee lot.

Due to certain aspects of the study, such as the age of the data, the relocation of the cell phone lot, the occupancy data being restricted to just the marked spaces, and the rise in TNC usage in the past ten (10) years, it was determined that the study reference data has too many limitations to use for the sizing of the cell phone lot. Therefore, the best approach to sizing the cell phone lot was to leverage the *ACRP Synthesis 62, Cell Phone Lots at Airports* in combination with a benchmark comparison of various airports in Florida.

The ACRP 62 looked at various airports across America to determine if there was any correlation between the size of a cell phone lot and other variables such as the number of arriving passengers. The only relationship found was that the ratio of cell phone lot spaces to total airport spaces across the various airports ranged from just under 0.5% to 2.5% which is shown in **Table 4-40**. This relationship indicates that airports generally increase their cell phone lot size as they increase total parking capacity to accommodate growing passenger demand.

Table 4-40 Ratio of Cell Phone Lot Spaces to Total Airport Parking Spaces

Airport	Cell Phone Lot Spaces	Estimated Total Airport Controlled Parking Spaces	Percent of Cell Phone Lot Spaces
Austin-Bergstrom International	65	11,500	0.57%
Boston Logan International	61	16,072	0.38%
Denver International	203	41,683	0.49%
Indianapolis International	231	23,000	1.00%
John F. Kennedy International	373	15,000	2.49%
Lambert-St. Louis International	180	8,800	2.05%
Louis Armstrong New Orleans Int'l	25	6,325	0.40%
Metropolitan Oakland International	30	6,563	0.46%
Newark Liberty International	150	18,400	0.82%
Phoenix Sky Harbor International	262	22,168	1.18%
Pittsburg International	150	13,200	1.14%
Portland International	30	14,230	0.21%
Ronald Reagan Washington National	35	9,180	0.38%
Salt Lake City International	82	11,824	0.69%
San Antonio International	83	8,582	0.97%
San Francisco International	70	8,648	0.81%
Seattle-Tacoma International	330	13,330	2.48%
Tampa International	350	23,300	1.50%
Toronto Pearson International	115	23,000	0.50%

SOURCE: ACRP, *Synthesis 62 Cell Phone Lots at Airports*, 2015

a Denver and Indianapolis cell phone spaces include spaces associated with third party concessions associated with cell phone lots.
b Total airport-controlled parking spaces obtained from individual airport websites.
c Cell phone lot spaces obtained from Online Survey by KRAMER aerotek inc. (2014).

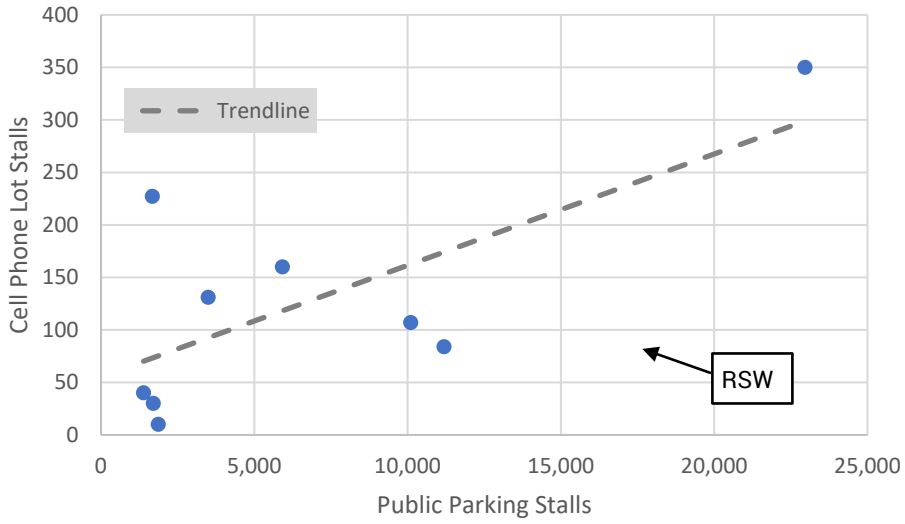
A similar approach was taken when looking at RSW and other airports within Florida. The findings are presented in **Table 4-41**. The findings are also shown graphically in **Figure 4-18**. These results indicate a finding similar to that of the analysis in the ACRP 62 insofar as the ratio of cell phone lot spaces to total airport spaces is generally in a range between 0.5% to just over 2.5%. RSW has a ratio of 0.8%. Of the airports in Florida that were reviewed, only Northwest Florida Beaches International Airport (ECP) had a lower ratio of cell phone lot spaces to public parking spaces. Based on this and operational observations, it has been determined that the cell phone lot's current size is not sufficient to handle the current demand and the amount of space should be increased from 84 cell lot spaces plus 81 overflow spaces to 140-200. This brings the ratio of cell phone lot spaces to total spaces to 1.1%–1.6%. This increase will not only bring the airport more in line with other Florida airports but accommodate anticipated growth in public parking demand and the associated development of facilities to handle that demand.

Table 4-41 Cell Phone Lot Size at Other Florida Airports

Airport	Approx. No. of Cell Phone Lot Stalls	Estimated Total Airport-Controlled Parking Spaces[a]	Percent of Cell Phone Lot Spaces	2019 Enplanements	Cell Phone Lot Stalls per 1,000 Enplanements
Daytona Beach International (DAB)	40	1,390	2.9%	340,815	0.18
Tallahassee International (TLH)	30	1,710	1.8%	415,272	0.07
Northwest Florida Beaches International (ECP)	10	1,870	0.5%	621,406	0.02
Sarasota Bradenton International (SRQ)	230	1,680	13.5%	979,810	0.23
St. Pete-Clearwater International (PIE)	130	3,500	3.7%	1,143,483	0.12
Palm Beach International (PBI)	110	10,110	1.1%	3,449,515	0.03
Jacksonville International (JAX)	130	5,920	2.7%	3,479,923	0.05
Southwest Florida International (RSW)	**84**	**11,914**	**0.8%**	**5,144,467**	**0.02**
Tampa International (TPA)	350	22,970	1.5%	10,978,756	0.03

SOURCES ACAIS, *Commercial Service Airports (Rank Order) based on Calendar Year 2019*, September 25, 2020, https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/passenger_allcargo_stats/passenger/cy19-commercial-service-enplanements.pdf; ACAIS, *Final Calendar Year 2020 Enplanements at Commercial Service Airports, Rank Order*, November 8, 2021, https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/passenger_allcargo_stats/passenger/cy20-commercial-service-enplanements.pdf

[a] Total airport-controlled parking spaces obtained from aerials



SOURCE: Kimley-Horn

NOTE: Total airport-controlled public parking stalls and cell phone lot stalls obtained from aerials.

Figure 4-18 Cell Phone Lot Stalls vs. Public Parking Stalls at Other Florida Airports

In order to project the required cell phone lot stalls for future PALs, the relationship between enplanements and cell phone lot stalls was analyzed for RSW and other airports within Florida. This information is presented in Table 4-35 and shown graphically in Figure 4-18. The results indicate that as enplanements increase, airports generally provide additional cell phone lot stalls. The trendline used for this data set was used to project the required cell phone lot stalls at the projected PALs and shown in **Table 4-42**.

Table 4-42 Cell Phone Lot Size Requirements at RSW

	Existing	PAL 1	PAL 2	PAL 3	PAL 4	PAL 4 Surplus/(Deficiency)
Required Cell Phone Lot Stalls	84	200	220	250	280	(196)

SOURCE: Kimley Horn Analysis

The ACRP 62 describes issues with cell phone lots that various airports experience. These issues include congestion at the entrance and exit of the cell phone lot if striping is not clearly marked, the potential for a loss of revenue due to would be hourly parking users using the free cell phone lot instead, inadequate signing to the cell phone lot resulting in driver confusion, and commercial vehicles using the cell phone lot. The benefits include improving customer experience for greeters who would not likely wait in a parking lot or garage, reducing curb congestion and parking on access roads, improving safety, lessening vehicle emissions, addressing parking space shortages by directing ultra-short-term customers to the cell phone lots, and meeting TSA and FAA security requirements. Effective locations for cell phone lots are next to a road with direct access to arrivals drive lanes, located before the main terminal, located so as not to take away from the generation of revenue, and are within a 2-minute driving time of the terminal.

Employee Lot

The 2017 RSW Employee Parking Facility Capacity Assessment (Appendix Q) evaluated the parking demand and capacity of the employee parking lot. This study evaluated the employee entry and exit data from August 23, 2016, to March 8, 2017, to determine the parking facility's existing usage. During the peak months, January 2017 to March 2017, there were an average of 3,767 registered employees at the Airport. During non-peak months, the total number of registered employees averaged 3,400, 10% less than during the peak. Figure 2 in Appendix Q summarizes the total number of known registered employees per month between April 2016 and March 2017. January 2017 had the highest number of registered badged employees totaling 3,798, this total includes temporary employees.

January 2017 entry and exit data for the employee parking was evaluated as it correlated with the highest number of registered employees for the month. It was observed that weekday employee occupancy percentages within the employee parking lot were higher than weekend activity. Thursday, January 12, 2017, had the highest peak demand for the month at 11 a.m., with 1,034 total vehicles parked, representing 79.7% of total supply (263 spaces available). Figure 4 from Appendix Q provides the estimated number of vehicles parked, by hour in the employee parking lot for the peak day in January, Thursday, January 12, 2017.

Table 1 in Appendix Q provides the projected increase in total number of employees during the peak season over a 10-year planning horizon starting in 2017, applying a compounded 2.0% annual growth rate. An average peak season total of 3,767 registered employees was used as the base year estimate for 2017.

The employee parking facility is estimated to be operating at approximately 79.7% capacity with current staffing levels during the highest employment month (January) at the peak midday period. If staff levels increase annually by 2%, the employee parking lot is projected to be operating below 86% capacity in the short term and below 90% capacity within a five-year (2027) planning horizon. Expansion of the existing employee parking lot was not proposed within the planning horizon of the study in Appendix Q. With increased growth in operations and expansion of terminal facilities, it is anticipated that the current employee lot will exceed its capacity by PAL 2.

Table 4-43 shows the existing employee lot supply and peak occupancies for the projected PALs.

Table 4-43 Existing Employee Parking Lot Supply & Peak Occupancies					
	2018	PAL 1	PAL 2	PAL 3	PAL 4
Peak Season Estimated Employees	3,767	4,414	4,873	5,380	5,940
Peak Occupancy	1,034	1,275	1,408	1,555	1,717
Total Parking Supply	1,297	1,297	1,297	1,297	1,297
Effective Parking Supply (95%)	1,232	1,232	1,232	1,232	1,232
SOURCE: Kimley Horn Analysis					

Public Parking, Short-Term (Garage) and Long-Term (Surface Lot)

Overnight Vehicle Occupancy

Figure 2 of the 2018 RSW Existing Parking Facility Capacity Evaluation from Kimley-Horn (Appendix R) summarizes the total overnight vehicle occupancy totals for the short-term parking garage from October 2016 to July 2017. Figure 3 in Appendix R summarizes the total overnight vehicle occupancy totals for the long-term parking garage from October 2016 to July 2017.

Design Day Parking Demand

March 7, 2017, had the highest non holiday midday accumulation total and was used to calculate the parking facilities design day parking demand. The design day represents a typical day of the year the full range of parking options should be available to parking patrons. Design days are used to size parking structures to satisfy paring demand 90% of the days of the year and provide less expensive surface parking for the remaining 10% of the days.

In March, the parking occupancy increased between 2 a.m. (overnight inventory) and 1 p.m. (midday peak) by 43% in the short-term parking garage and by 15% in the long-term surface parking lot. Figure 4 in Appendix R illustrates the parking accumulation on March 7, 2017, by hour, generated by evaluating the processed short and long-term occupancies during that day.

Short-Term Design Day Peak

The calculated design day parking demand for the short-term parking garage is 1,592 vehicles, 65% parking occupancy at midday peak. From onsite observations and discussions with staff the second level of the garage is the preferred parking level by customers and stays full throughout the day. The second level is mostly covered and is the first level customers typically enter of the garage. The third level/roof top is uncovered and is underutilized by customers as most of the unoccupied spaces are located on the third level of the garage.

The parking supply within the garage (2,432 spaces) meets the current design day parking demands but may not meet the needs of the customers wanting to park in a covered parking space. Due to high volumes of daily/overnight parkers occupying the high demand parking spaces on the second level, hourly parkers may find it difficult to locate a covered space close to the elevators.

Long-Term Design Day Peak

The calculated design day parking demand for the long-term surface parking lot is 2,792 vehicles, 32% parking occupancy at midday peak. Customers entering the long-term parking lot are directed to park by the parking

management company, SP+. The management of customer parking within the long-term lot enhances efficiency of customer parking shuttling operations between the parking lot and the terminal.

Parking supply for the long-term surface parking lot (8,762 spaces) meets the current design day parking demands during peak season and off-peak season, at the time of the study.

Absolute Peak Day Assessment

On December 25, 2016, the short-term parking garage midday peak was 58% occupancy (1,024 available parking spaces in the garage) and the long-term parking lot midday peak was 84% occupancy (1,369 available spaces in the surface lot). The combined parking occupancy at the midday peak was 79% (2,393 available parking spaces on site).

The current parking supply for the short and long-term parking facilities supports the current parking demands for each facility type as well as for the overall parking demand for the Airport during off-season and peak season trends.

Projected Demand – Non-Holiday Peak Parking Demand

The calculated design day parking demand on March 7, 2017, was 4,384 parked vehicles, 1,592 vehicles in the garage and 2,792 vehicles in the surface parking lot. A 4% annual growth factor was applied to project the parking demand for the Airport for a minimum 5-year and 10-year planning horizon, between years 2017-2018. Table 3 in Appendix R summarizes the projected effective parking supply needs (95% of total supply) associated with the estimated non-holiday (design day) parking demand onsite and for each parking facility between years 2017 and 2028.

Figure 4-19 summarizes the projected effective parking supply needs (95% of total supply) associated with the estimated non-holiday (design day) parking demand onsite and for each parking facility between for each PAL.

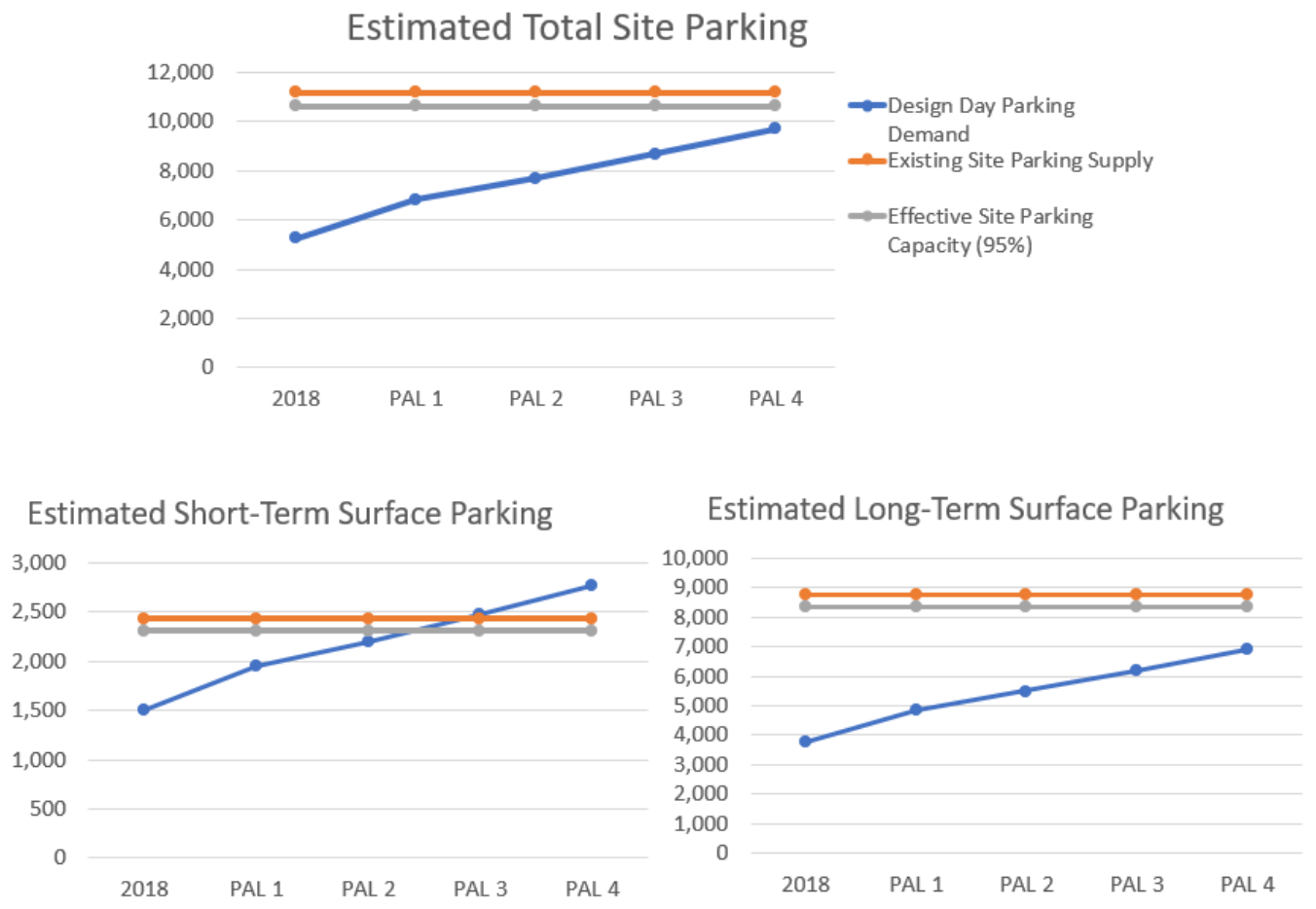
It is projected that the long-term parking facility and combined current parking supply will support the non-holiday peak parking demand through PAL 4 if current parking demand stays consistent. The short-term parking garage is estimated to exceed the existing parking supply by PAL 3.

Projected Demand – Absolute Peak Demand (Holiday Demand)

On the identified absolute peak parking demand day, December 25, 2016, there were an estimated 8,801 parked vehicles, 1,408 spaces in the garage and 7,393 spaces in the surface lot. A 3.5% annual growth factor was applied to project the parking demand for the Airport for a minimum 5-year and 10-year planning horizon, between years 2016-2028. Projections to determine the estimated year parking demand was expected to exceed the existing parking supply for each parking facility independently was also calculated. Parking demand calculations assume no changes are made to the existing parking supply.

Table 4 in Appendix R summarizes the projected effective parking supply needs (95% of total supply) associated with the estimated absolute peak parking demand onsite and for each parking facility between years 2016 and 2033.

Figure 4-20 summarizes the projected effective parking supply needs (95% of total supply) associated with the estimated absolute peak parking demand onsite and for each parking facility for each PAL. The absolute peak parking demand (12,689 vehicles) is expected to exceed supply (11,194 spaces) by 2026 (PAL 1).



SOURCE: Kimley-Horn, RSW Existing Parking Facility Capacity Evaluation, 2018 (Appendix R)

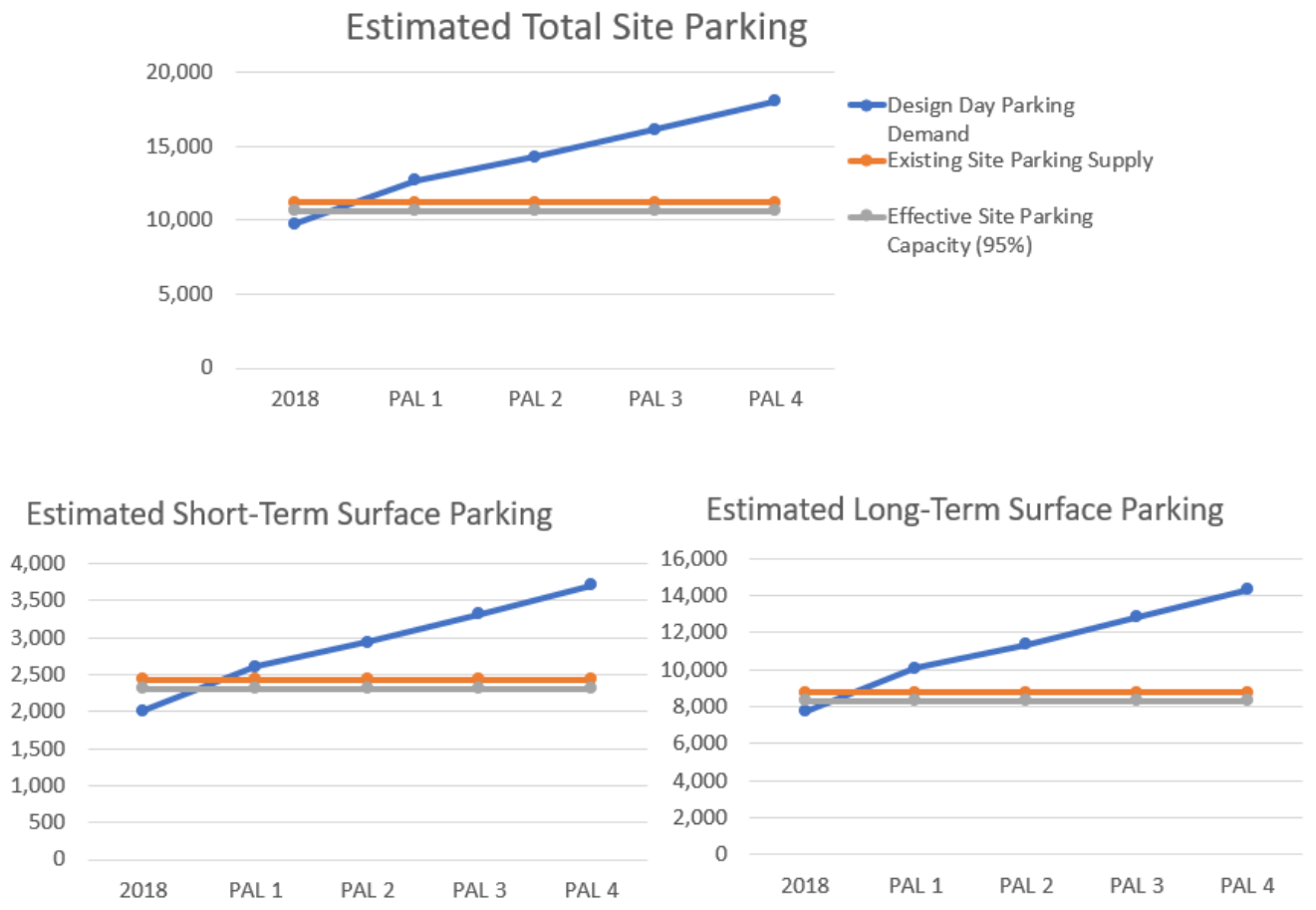
Figure 4-19 Projected Future Design Day Parking Demand (Non-Holiday)

Parking Conclusion

The total public parking supply at the Airport is 11,194 parking spaces. On the absolute peak parking day (December 25), 8,801 (79%) of the spaces were occupied in 2016. At the current rate of growth (3.5%), total parking supply is adequate through PAL 4 during non-holiday peak periods (estimated to be 90% of the year), however the parking demand is projected to exceed the total parking supply by 2026 (PAL 1) on the absolute peak parking day (December 25).

The short-term parking garage has 2,432 parking spaces. On the absolute peak parking day (December 25), 1,408 (58%) of the spaces were occupied in 2016. At the current rate of growth (3.5%), parking supply in the short-term parking garage is adequate through PAL 2 during non-holiday peak periods (estimated to be 90% of the year), however the parking demand is projected to exceed the short-term parking supply by 2026 (PAL 1) on the absolute peak parking day (December 25).

The long-term surface lot has 8,762 spaces. On the absolute peak parking day (December 25), 7,393 (84%) of the spaces were occupied in 2016. At the current rate of growth (3.5%), parking supply in the long-term parking lot is adequate to meet demand through PAL 4 during non-holiday peak periods (estimated to be 90% of the year), however the parking demand is projected to exceed the long-term surface parking lot supply by 2026 (PAL 1) on the absolute peak parking day (December 25).



SOURCE: Kimley-Horn

Figure 4-20 Projected Future Absolute Peak Parking Demand (Holiday)

Garage Ground-Level Curb Front

Data of 72-hour traffic volumes were collected along the proposed curb front starting at 12 a.m. on Thursday, February 1, 2018, through 12 a.m. on Sunday, February 4, 2018. The proposed curb front was divided into three analysis zones with one count location placed within each zone. The analysis zones and traffic count locations are numbered from east to west starting with Zone 1 at the east end of the garage, Zone 2 in the middle, and Zone 4 at the far west end. The results of the traffic count show 12 p.m. as the peak period with an average total vehicle count of 523 vehicles exiting during the peak period. The results show that during the analysis window, the peak hour volume was at 12 p.m. on February 1. Figure 3 in RSW Garage Ground Level Curb Front Assessment, 2018, by Kimley Horn (Appendix S) provides a summary of the traffic volume data collected by zone for Thursday, February 1, 2018.

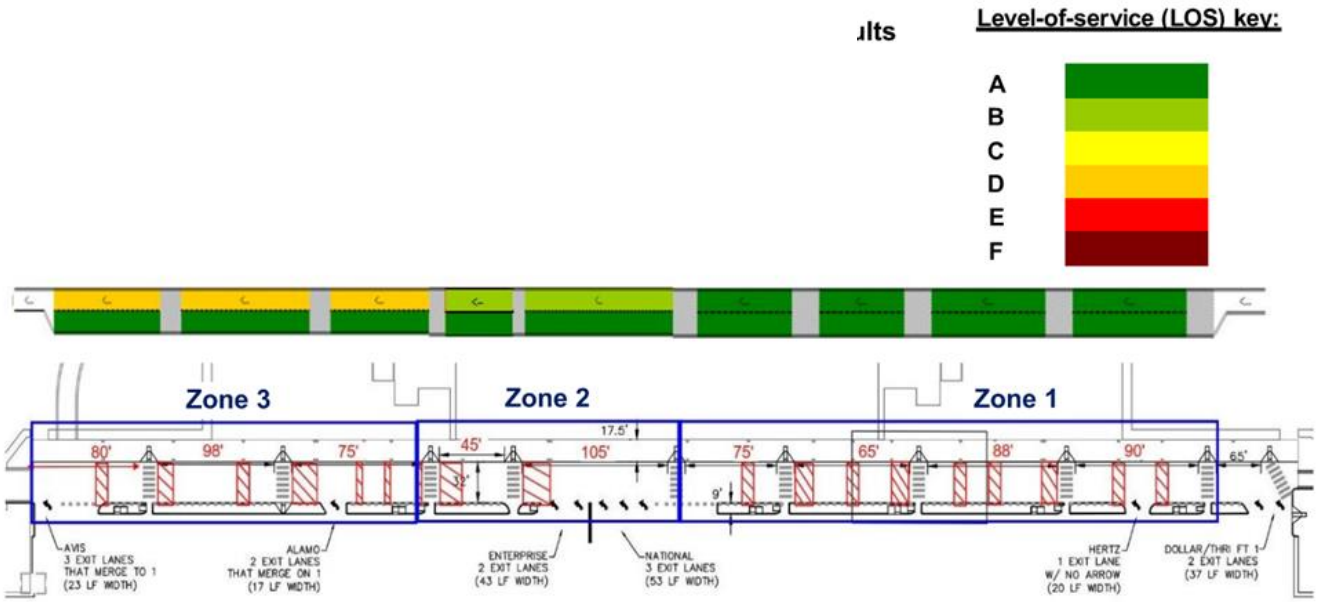
A QATAR analysis was performed using the average peak hour traffic volume and a total of 57 vehicles to represent vehicle-for-hire/TNC activity, the volumes of which are shown in Table 4-44.

Table 4-44 Scenario 1: Vehicle Classification Utilized

Vehicle Classes	Length (feet)	Dwell Time (minutes)	Vehicles per Hour (vph)		
			Zone 1	Zone 2	Zone 3
SCENARIO 1: ZONES 1, 2, AND 3 WITH FOR-HIRE AND TNC					
Rental Vehicle	25	2	118	214	523
For-Hire/TNC	25	1	57	57	57

SOURCE: Kimley-Horn, *RSW Garage Ground Level Curb Front Assessment*, 2018 (Appendix S)

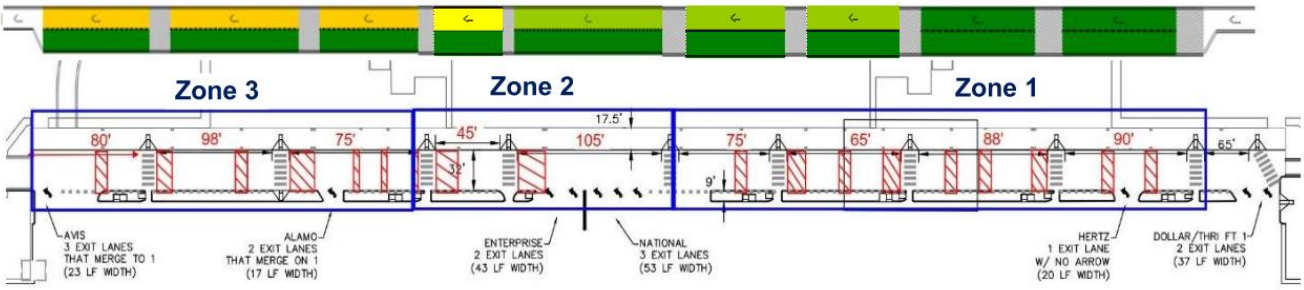
The QATAR analysis projects over half of the proposed curb front operating above LOS C. Due to all vehicles exiting at the west end of the corridor (compounded volume) and the limitations to available curbing length due to columns and existing crosswalk locations, level of service degrades to LOS D within Zone 3. The results of the QATAR model are presented in Figure 4-21.



SOURCE: Kimley-Horn, *RSW Garage Ground Level Curb Front Assessment*, 2018 (Appendix S)

Figure 4-21 Scenario 1 – QATAR Results

A variation of the above analysis was modeled assuming the estimated total number of vehicle-for-hire/TNC vehicle activity during the peak hour was doubled. With the increase in vehicle activity LOS is projected to be impacted within Zones 1 and 2. Zone 3 LOS remains at a projected LOS D. The results of the QATAR model for the modified variation of Scenario 1 are presented in Figure 4-22.



SOURCE: Kimley-Horn, *RSW Garage Ground Level Curb Front Assessment*, 2018 (Appendix S)

Figure 4-22 Scenario 1, Increased TNC Activity – QATAR Results

Rental Car Facilities and Parking

Ready/Return (R/R)

The results of the industry survey indicate a current demand of 1,700 stalls, over the current capacity of 1,200 stalls. On-site observations have indicated that several of the brand families have begun to utilize portions of their QTA stacking space for ready/return operations when the ready/return stall utilization is at capacity. The need for additional stalls has also been confirmed by analysis, shown in Appendix R.

Quick Turn-around Facility (QTA)

The existing QTA facility is operating at or near capacity. The stacking and wash bays are adequate with slight deficiency in fueling positions. This slight deficiency can be mitigated by operating the facility for additional hours during the peaks or sending vehicles to the off-site maintenance facilities for processing.

Customer Service Building (CSB)

The existing customer service building is adequate when based purely on counter length. The impact of the divided counters with two distinct areas and allocated by brand versus brand family creates some inefficiencies. Based on conversations with the employees at the counters, one challenge they identified was the amount of waiting area. During peak transaction times, customers dwelling in the CSB can cause dense pedestrian traffic that causes some customers to wait outside the building.

Maintenance Facilities

The current maintenance facilities are planned to be relocated as part of a near-term project, as the most significant deficiency identified was the amount of available storage space located within the current maintenance facilities themselves. The concept development phase will evaluate sites that will meet the demands of today and reserve space for future expansions to continue to accommodate growth.

Table 4-45 shows the current rental car facility supply and projected demand

Table 4-45 Rental Car Facility Supply and Projected Demand

Rental Car Facility	Existing Supply	Current Demand	Projected (PAL 1)	Projected (PAL 2)	Projected (PAL 3)	Projected (PAL 4)	PAL 4 Surplus/ (Deficiency)
Service Counters	66	53	59	67	75	84	(18)
Office Space	6,800 sf	5,460 sf	6,100 sf	6,880 sf	7,770 sf	8,680 sf	(1,880) sf
Ready/Return Spaces	1,200	1,700	1,890	2,130	2,400	2,690	(1,490)
Fueling Positions	68	73	81	91	103	115	(47)
Wash Bays	17	13	13	15	17	19	(2)
QTA Vehicle Stacking Spaces	1,300	1,395	1,540	1,740	1,960	2,190	(890)
Maintenance Bays	22	32	37	41	47	52	(30)
Remote Idle Vehicle Storage	10,500	5,700	6,440	7,250	8,190	9,150	1,350

SOURCE: Kimley-Horn, *Rental Car & Public Parking Sizing Analysis*, 2019 (Appendix T)

NOTES: Figure 7 (of Appendix T) provides the annual historic rental car transactions per year.
Figure 8 (of Appendix T) provides the annual historic rental car transactions per 1,000 enplanements.

4.8 Utilities

Electric

Electrical power infrastructure is provided by Florida Power and Light (FPL). FAA electrical infrastructure is minimal, mostly around the southerly portion of the runway. In terms of power, FPL will provide whatever additional power is necessary as new services are added to their system.

Fiber

Communications infrastructure is primarily provided by T-Mobile and to a much lesser extent, CenturyLink, entirely located between north of the runway and Daniels Parkway in the aviation support and non-aviation support area known as Skyplex. Fiber optic infrastructure is limited to most of the perimeter of the runway. For future development and expansion areas, additional fiber can be added to the network as new locations come online.

Water

Potable water is provided through the Lee County Utilities system. All five of Lee County Utilities Water Treatment Plants are interconnected and feed the Airport from the south and west. An existing 30-inch water transmission main that crosses Airport property from south to north connects Daniels Parkway to Airport Haul Road. Per the 2020 Lee County Concurrency Report there is sufficient capacity to meet the present demand and foreseeable future demand. North Lee County Water Treatment Plant has a planned expansion to add 5 million gallons of water to the system to account for future buildout of areas including RSW.

It appears the spine water main system is large enough to handle development planned through 2041 in the North Ramp Area and Skyplex. Water main extensions off of the 12-inch, 16-inch, and/or 30-inch lines will need to be looped within each expansion area to maximize the available fire flow.

A second water service line and fire line have been added on the east end of the terminal as part of the 2021-22 terminal expansion project. According to the plumbing designer these two connections on the west and east ends of the terminal will be adequate to serve future expansions for Concourses A and E as well. The existing 8" ductile iron fire line that loops around the existing concourses on the airside will need to be extended to loop around the future concourses.

Sanitary Sewer

Sanitary sewer service is provided by Lee County Utilities using traditional gravity sewer, force main and pump stations at the Airport. There is one Master Lift Station (3307) that takes in all the wastewater south and west of Skyplex Boulevard and discharges due north. Wastewater flow is then directed east along Daniels Parkway within a 24-inch force main which discharges into Gateway Wastewater Treatment Plant (WWTP). The Gateway WWTP has a planned expansion from 3 million to 6 million gallons per day to assist in treating future flows.

As future non-aviation and aviation support development is brought online, gravity sewer, lift stations and force mains will need to be built to connect to the existing wastewater infrastructure.

The existing 10" gravity line that runs along Terminal Access Road in front of the terminal building has adequate capacity to serve the existing facility and the future expansions of Concourses A and E. The existing airport master lift station 3307

(MLS 3307) will likely need to be upgraded prior to the additional 14 gates planned for Concourse E. The downstream force main appears to be sufficiently sized to handle the non-aviation flows and future concourse expansion.

The existing terminal lift station (LS3308) has adequate capacity for existing conditions and appears to have adequate capacity for the addition of Concourse E but will likely need to be upgraded prior to expansion of a future Concourse A.

All wastewater flow will be directed to the Gateway Wastewater Treatment Plant owned by Lee County. This Plant has space to expand, and Lee County will keep up with demands of the County and expand as needed.

Information Technology

As the airport grows and becomes more reliant on its staff and services to deliver operational excellence to guest, airlines and tenants, technology systems will assist with automation and compliance benefits.

Traveling customers experience can be enhanced through development of wayfinding kiosks and virtual queueing to enhance opportunities to explore the terminal amenities. Development of remote and self-bag drop services to relieve passenger loads at ticket hall and counters. Explore assistive listening technologies to discretely assist hearing challenged guests.

Parking customers experience can be improved by automation of fee collection, guidance to open garage spaces and blue light phone system upgrades to improve customer efficiency and operational support.

Tenant services can be developed to support expansion of airline, cargo, and development areas to include extending infrastructure and Information Technology (IT) services to these areas to support development and security of the area.

Several major systems will require maintenance and upgrades during the timeframe. The security systems upgrades will include AACS, CCTV, and PIDS. The development of integration platforms for these systems to manage alarms (PSIM) and credentials (PIAM) is recommended to improve security monitoring and compliance.

Several space needs will also be evaluated including IT staff, storage and AirCom space.

Several infrastructure upgrades are planned to improve sustainability of services including IT server room expansion, perimeter fiber optic cable replacement, redundant service entry points, expanded Wi-Fi and private LTE.

4.9 Non-Aviation/Non-Commercial Development

The new parallel runway, when implemented, will require the relocation of a Florida high-voltage power line (FPL). In order to accommodate the preferred runway configuration, the existing FPL will need to be relocated further to the south and east of its current location.

The proposed route of the relocated FPL will impact two property owners: the Jared F. Holes Trust and Lee County 20/20 Wild Turkey Strand Preserve (WTS).

A successful negotiation of the relocation easement through the Jared Holes Trust parcel was completed by June 2017.

Approximately two-thirds of the new transmission line will be located within the WTS preserve. These lands were acquired by Lee County as part of the Conservation 20/20 program, an environmentally sensitive land acquisition and

stewardship program in Lee County. The LCPA environmental team worked with the Lee County 20/20 program staff to evaluate routes that would minimize the impact of the relocation. An ultimate alignment was proposed and approved by the Conservation Land Acquisition and Stewardship Advisory Committee (CLASAC) at their August 26, 2015, meeting. Further coordination with the Florida Communities Trust (FCT) was required due to funding from the FCT to acquire the WTS lands. Additional information was requested by the FCT and provided by LCPA and the Lee County 20/20 staff to obtain approval for the proposed right-of-way. However, the FCT requested additional coordination and approvals which delayed a potential approval past a June 2017 funding deadline. It was decided that the WTS easement would be re-evaluated and coordinated upon restarting of the new parallel runway planning and design program. More information can be found in the Parallel Runway Close-Out Report, 2017 by AECOM (Appendix H).

The three areas designated for non-aviation support development are Skyplex north of Runway 6-24, approximately 51.6 acres in the Midfield Area, and a 487-acre area in the southeast quadrant of the airport property. Through a comprehensive commercial market analysis and land planning effort initiated in 2022, the LCPA is actively determining how to position Skyplex to accommodate future market-driven demands for commercial, office, hotel, and entertainment development. Through additional studies in the future, LCPA will determine optimal utilization of the Midfield non-aviation support property, which is well positioned to provide commercial, convenience, and hospitality services on-airport. Given its location, the future potential development area in the southeast quadrant will require additional analysis and infrastructure evaluation to determine strategies for access and utilization of that area in the long term.

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Chapter 5 Alternative Development and Evaluation

This chapter outlines the alternatives developed to address the forecasted requirements for RSW to meet increased passenger, cargo, and aviation demand through the planning horizon. The alternatives outlined in this chapter are developed based on the facility requirements identified in the previous chapter as well as recent independent studies and experience gained from similar projects by the Master Plan Update team.

5.1 Recommended Airfield Development

The purpose of the airfield alternatives development and evaluation process is to identify and select a single proposed development alternative to meet the future needs of an airport. Establishing future development plans for the airfield is critical because the airfield configuration is the least flexible infrastructure at the airport since it is highly dictated by terrain, predominant meteorological conditions, aircraft performance requirements, and FAA design standards, guidance, and best practices.

There have been numerous airfield alternatives identified and evaluated for RSW over the past few decades as part of an effort to refine the implementation plan for the new runway. The subsequent sub-sections summarize the airfield development recommendations completed to-date. The following assessments and studies were used to prepare the summary of the recommended airfield alternative:

- Runway Close-out Report by AECOM, August 2017
- Engineer's Report for Runway 6R-24L Site Preparation Package prepared by RS&H, October 28, 2016
- Existing Airfield Geometry Evaluation Study prepared by Kimley-Horn and Associates, January 2018
- Pavement Condition Analysis and Recommendation prepared by Kimley-Horn and Associates, January 2018
- Airside Pavement Rehabilitation Recommendations Report prepared by Kimley-Horn and Associates, August 2015

Proposed Parallel Taxiways to Runway 6-24

Southern Parallel Taxiway to Runway 6-24

With increased airliner traffic in the Terminal area south of Taxiway F, the taxiway system serving the Terminal area will come under strain with an increased potential for head-to-head aircraft conflicts and increased waiting times for arriving aircraft taxiing to gate and for aircraft pushbacks. With the addition of Concourse E in the Terminal area, the western portion of Taxiway F (from the Runway 6 end to Taxiway L) will be under heavy traffic from both arriving and departing traffic. The addition of the first phase of Concourse E includes a portion of the new parallel taxiway between Taxiway G2 on the east and a new to be built taxiway connector west of the Concourse E development. The second phase of the Concourse E buildout would add additional gates which would compound congestion in the area. The buildout of the parallel taxiway to the Runway 6 end should occur between PAL 3 and PAL 4 to alleviate congestion in the area as traffic grows. With the addition of the additional gates on Concourse E, the taxiway should be extended to Taxiway L on the east. The design standards for the new taxiway should meet the critical aircraft design standards of ADG-V and TDG-5.

Northern Parallel Taxiway to Runway 6-24

A northern parallel taxiway to Runway 6-24 is envisioned as part of the North Area Development. This new taxiway would be located north and parallel to Taxiway A. As Taxiway A is sufficient to meet the current needs of the existing tenants on the north side of the airfield, this new parallel taxiway would be triggered by the North Area Development. While operators have not yet been defined, the proposed uses including cargo and maintenance, repair and overhaul activity would require a taxiway that meets ADG-V and TDG-6 aircraft standards.

Proposed New Parallel Runway

Runway 6R-24L and Associated Taxiways

A new runway is needed at RSW by the early 2040s to address the capacity shortfall identified based on the airfield demand/capacity analysis. Original plans for a second parallel runway to existing Runway 6-24 was for a general aviation runway northwest of Runway 6-24. However, as demand for commercial service continued at RSW, development plans evolved to instead provide a second runway to the southeast with capacity for larger commercial service aircraft operations. The second parallel runway configuration was identified, evaluated, and refined in several studies dating back to the 1990s.

The resulting future proposed Runway 6R-24L configuration, previously referred to as Alternative B-1, (as depicted in Figure 4-4, is for a 9,100-foot by 150-foot parallel runway with centerline separation of 5,465 feet from the existing Runway. The future proposed runway dimensions and configuration meet airfield requirements associated with the critical aircraft described in Chapter 4, *Demand Capacity and Facility Requirements*. Runway 6R-24L would connect to the existing airfield via Taxiway K and Taxiway L, which would both be extended to connect to the new taxiway(s) that would be aligned parallel to Runway 6R-24L. The proposed development alternative provides the Airport with an unconstrained runway for Airplane Design Group (ADG) V operations that will meet the forecast demand.

The 5,465-foot separation preserves a 600-foot separation between runway and parallel taxiway which allows for high-speed reverse turn taxiway exits. The separation also gives LCPA the flexibility to construct a full dual parallel taxiway at ADG-V separation standards. Dual parallel taxiways enhance flexibility for aircraft taxiing operations and maneuvering to support efficient airfield operations. The separation provides sufficient space between the Taxiway Object Free Area and the existing Terminal Access Road for a 25-foot perimeter road, 8-foot-wide jet blast fence, and 50- to 60-foot right-of-way for the Terminal Access Road to include roadway signage, landscaping, utilities, drainage, and security fencing.

Both runway ends would be equipped with a Category I (CAT I) precision instrument approach using either Instrument Landing System (ILS) or Global Positioning System (GPS) technology. Both runway ends would be equipped with a Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR).

Previous work to advance the implementation of the New Parallel Runway program includes 100% design plans for clearing, grading, and drainage to support the new airfield pavement infrastructure. This work was completed in 2017. Implementation efforts were subsequently suspended. The operational need for the New Parallel Runway program was delayed due to the reduced aviation demand at RSW associated with the Great Recession and resulting airline consolidation.

The design aircraft for the previously completed work on the Parallel Runway Program is the Boeing 747-400. The aircraft is classified as ADG-V, Taxiway Design Group (TDG) 5, and Aircraft Approach Category D. While the projected Critical Aircraft is projected to maintain TDG-5 characteristics, the parallel taxiway system serving the new Runway could be upgraded to TDG-6 specifications depending on commercial aviation development in the North Area. If cargo and maintenance, repair, and overhaul (MRO) activities grow considerably, there would be justification to improve the taxiways to the higher TDG-6 standard.

To validate its viability, the proposed Runway 6R-24L configuration was prepared and evaluated in previous studies with consideration of the following geometric design standards for the approach and departure:

- Runway Protection Zone (RPZ)
- Part 77 Surfaces
- One-Engine Inoperative (OEI) Obstacle Identification Surfaces (OIS)
- Approach Lighting System Surfaces
- Obstacle Free Zones
- Terminal Instrument Procedures (TERPS) Surfaces, including instrument departure and missed approach obstacle clearance surfaces

Several enabling projects need to be completed before the implementation of the New Parallel Runway program. The most significant enabling project is the relocation of high-voltage electrical transmission lines southeast of the existing airfield. The transmission lines are owned by Florida Power and Light (FPL) power utility company.

FPL Transmission Line Relocation Enabling Project

The existing FPL high-voltage transmission lines were evaluated to identify potential obstructions to air navigation and electromatic interference with NAVAIDs for the Runway 6R-24L alignment. The location of the existing transmission lines was surveyed and uploaded to FAA's Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) system. The FAA determination has since expired since the New Parallel Runway program was delayed so additional coordination with the FAA will be required again prior to proceeding. Since the completion of the previous OE/AAA study, FPL added towers within the aforementioned segment of the corridor; however, FPL worked closely with LCPA to ensure the new obstructions were evaluated and data about these obstructions should be available in the FAA database.

A 5,450-foot segment of transmission line corridor will need to be relocated because it will penetrate the Runway 6R-24L approach/departure surfaces. Several realignment routes were studied as part of previous studies to relocate the transmission line corridor outside the Runway 24L end approach/departure surfaces. The recommended route was

selected because it provided the shortest length required to relocate the power lines. The recommended alignment was approved by FPL in 2011/2012 as depicted in Figure 4-7.

An ILS modeling study was completed in 2008 to identify potential electromagnetic interferences with the proposed localizer array and glideslope equipment. The study concluded that the existing segment of FPL transmission lines that parallel the proposed runway can remain in-place with no measured interference with Category I ILS operations.

Major elements of the transmission lines relocation project include relocation of the transmission towers, construction of new patrol road, and construction of applicable fences/gates. These project components were previously included as a project component in discussions between LCPA and FPL. These costs were previously identified to be borne by LCPA based on previous discussions/negotiations. A non-binding construction cost estimate for relocation of the transmission lines was $5.5 million as provided by FPL in 2023 dollars.

The recommended route for the FPL transmission lines runs through two private properties owned by the Jared F. Holes Trust and Lee County Conservation 20/20 Wild Turkey Strand (WTS) Preserve which requires obtaining easements. Approximately one-third of the new transmission line corridor is located within the Jared F. Holes Trust property, for which an easement was obtained from the Jared F. Holes Trust in June 2017.

The remaining two-thirds of the new transmission line corridor is located within the Wild Turkey Strand preserve. Obtaining an easement for the relocation of the transmission lines through this parcel remains an open item. Approval was obtained from the Conservation Land Acquisition and Stewardship Advisory Committee (CLASAC), the Lee County Board of County Commissioners, and the Lee County Board of Port Commissioners governing bodies in 2015. However, approval was not granted by the Florida Communities Trust (FCT) – the organization that provided the funds used to acquire the WTS preserve. Further coordination with FCT is required when the New Parallel Runway program is restarted to enable the relocation of the FPL transmission lines.

The future proposed Runway 6R-24L location is identified on the current Airport Layout Plan. The New Parallel Runway program underwent environmental review as part of an Environmental Assessment prepared in 1994. The future parallel runway was granted environmental entitlement in March 1994 with a Finding of No Significant Impact (FONSI). The FONSI was revalidated by the FAA in 2007.

Next Steps for New Parallel Runway Implementation

Plans for 100% design for site preparation for New Parallel Runway Program were completed in 2016. They were completed before implementation work was suspended in 2017 and are awaiting FAA-approval when the project implementation is restarted. The site preparation package includes general site clearing, grubbing, stormwater drainage, utility relocation (i.e., irrigation lines and overhead electric distribution lines – not to be confused with previously mentioned high-voltage transmission lines), wetland mitigation, and new perimeter fencing. Construction cost estimate prepared based on preliminary quantities associated with the 100% site preparation design plan was approximately $143 million in 2023 dollars. All funding for site clearing for the parallel runway portion of the program expired in June 2017 and new funding sources will need to be identified when the project is restarted.

Construction of the site preparation package and the conceptual design of Runway 6R-24L and associated taxiways was permitted through South Florida Water Management District (SFWMD) and US Army Corps of Engineers. The permits were issued in 2017 with an original expiration date of 2022 so permit extension(s) will be required until the New Parallel Runway project is restarted. The permits only included site preparation so additional permits or permit modification will be required prior to construction of pavement and electrical.

The FPL Transmission Line Relocation enabling project will be permitted separately through Florida Department of Environmental Protection and the US Army Corp. or Engineers. That permitting effort will need to include the private property owner and Lee County as co-applicants because of the establishment of new easement corridor on the private properties.

Geotechnical investigation was completed for the area within the future boundary of the parallel runway and taxiways to support the site preparation package design effort. The approach included collection of soil borings which is consistent with FAA Advisory Circular recommendations. Additional geotechnical investigation was undertaken to obtain a more comprehensive understanding of the subsurface conditions of the study area given the history of wetlands, unsuitable soils, and subsurface anomalies at other locations on and around the Airport. The team used ground penetrating radar (GPR) and electrical resistance imaging (ERI) to supplement the topographical soil boring investigation. Soil boring and GPR investigation were completed for the full area for the future runway/taxiway complex. The ERI investigations were not completed due to budgetary and deadline constraints. It is recommended that the ERI investigations be conducted when the project is restarted to facilitate a comprehensive understanding of potential subsurface anomalies.

Previous design efforts did not finalize key project elements such as pavement, electrical, or NAVAID design. Conceptual design was completed to support the site preparation design and permitting but follow-on design work is required upon project restart, Similarly, coordination with off-airport entities will need to be restarted to finalize the planning, permitting, and programming to enable the FPL transmission line relocation project upon project restart.

Recommended NAVAID Improvements

While RSW operates in VFR and IFR CAT I conditions a majority of the time, an upgrade of one of the approaches to CAT II would be beneficial to ensure continuity and resiliency of operations. Existing Runway 6-24 can be upgraded to a CAT-II approach with some minor modifications subject to a feasibility analysis. As mentioned earlier the proposed new parallel runway to the south can be operated with a CAT-I ILS without impacting the FPL transmission line. While the installation of a CAT-II ILS is feasible on the south runway, it would require the relocation of a sizeable portion of the FPL line located parallel and south of the proposed runway, beyond what is already recommended to mitigate the approach surfaces on the east side.

Due to the longer length of the existing runway (12,000 feet versus 9,100 feet) than the proposed future runway, the location in proximity to the terminal, cargo and general aviation areas, as well as the need for the new parallel runway to relocate the FPL transmission lines along the length of the runway; it is recommended to implement, pending further study, a CAT-II approach to Runway 6.

The airport rotating beacon (or airport beacon) is currently located in between Taxiways J and H adjacent to the terminal ramp area. With potential development in this area to meet terminal expansion needs, the airport beacon may need to be relocated. The Airport Layout Plan (ALP) identifies a new location in the vicinity of the new air traffic control tower. The selection of this site is conceptual as a site selection study should be undertaken to determine an optimal site that will be compatible with future airport development, tower operations, airspace restrictions etc.

Recommended Airfield Safety Modifications

Modifications to airfield geometry were considered to enhance airfield safety by reducing pilot confusion through infrastructure changes. The recommendations were identified in the Existing Airfield Geometry Evaluation Study prepared by Kimley-Horn and Associates in 2018. The analysis included review of airfield usage, modeling aircraft movements, and review of existing geometry based on FAA AC 150/5300-13A, Change 1. Recommendations were

identified based on input from LCPA and FAA staff. An update analysis by ESA conducted as part of this Master Plan Update reaffirmed those findings based on FAA AC 150/5300-13B with additional recommendations.

Generally, the Study recommended relocation of Taxiway G1 to the west to eliminate the direct taxi access from the passenger terminal apron to Runway 6-24. The reconfiguration would force pilots to make a turn when taxiing from the passenger terminal towards Taxiway F. They Study also recommended the Installation of in-pavement or aboveground runway guard lights all runway-taxiway intersections to reduce the likelihood of incursion. However, installation of runway guard lights was recommended at five specific locations because they were designated as possible areas for runway incursion by the Airport as part of the Existing Airfield Geometry Evaluation Study. Those locations are as follows:

- Taxiway F1 and Runway 6
- Taxiway A4 and Runway 6-24
- Taxiway A5 and Runway 6-24
- Taxiway A7 and Runway 6-24
- Taxiway F9 and Runway 24

The ESA Airfield Geometry Study also recommended removing the following direct runway access from an aircraft parking apron located north of Taxiway A.

- Taxiway A4 between Taxiway A and the Cargo Ramp
- Taxiway A5 between Taxiway A and the General Aviation Ramp
- Taxiways A6 and A7 between Taxiway A and the North Ramp

Recommended Airfield Rehabilitation

The airfield pavement condition was evaluated as part of the Airside Pavement Rehabilitation Recommendations Report prepared by Kimley-Horn and Associates in August 2015. The analysis included visual condition surveys of the airfield pavements, non-destructive testing to evaluate the structural sufficiency of existing pavement, and surface borings. GPR surveys were also used to aid in identifying significant anomalies and depressions of the underlaying subsoils. The analysis included a traffic analysis of the aircraft fleet to determine the pavement remaining life, structural analysis to evaluate the pavements structural integrity, and an electrical assessment to determine if/what electrical improvements should be included in a rehabilitation program.

The pavement rehabilitation recommendations were identified based on guidance provided from a combination of general airport planning criteria, site specific conditions at the Airport, and feedback from LCPA. This section summarizes the pavement rehabilitation recommendations identified as part of that study.

Taxiway A

Analysis associated with the Pavement Condition Study of Taxiway A pavement conditions found blistering observed on the pavement concerning as water could penetrate the surface through cracks in the ruptured blisters. The total pavement thickness is adequate to protect against subgrade failure. The proposed solution is to regularly inspect and monitor the severity of the blistering.

It is recommended that LED taxiway edge and centerline lights be installed the entire length of Taxiway A. Taxiway A edge and centerline circuits are proposed to be split into East and West segments with new cable and isolation transformers. New sign panels and a new parallel duct bank between Taxiway A and Runway 6-24 with crossings for future expansion are recommended to be installed in collaboration with an airfield rehabilitation program.

Taxiways A3/A4

Taxiways A3 and A4 are subject to air cargo carrier loading, which presents more stress on the pavement than usual. Analysis associated with the Pavement Condition Study found blistering observed on the pavement between the cargo apron and Taxiway A concerning as water could penetrate the surface through cracks in the ruptured blisters. To provide extra strength for cargo loads and for long-term performance a 2-inch asphalt concrete (AC) overlay is recommended. A minimum of 0.5-inch mill of the existing asphalt is recommended to remove surface cracking and weathered pavements. Installation of LED taxiway edge lights and sign panels is also recommended. The proposed changes to Taxiways A3 and A4 are shown in **Figure 5-1**.

Taxiway A5

Taxiway A5 is intended for use by smaller, lighter corporate and general aviation aircraft, but is much older than Taxiways A3 and A4. Analysis associated with the Pavement Condition Study for Taxiway A5 (between the FBO apron and Taxiway A) found raveling, longitudinal and block cracking. Concrete surrounding the trench drains is severely cracked and the overall pavement condition appears to have deteriorated to a "poor" condition. The recommended rehabilitation for this area is to mill the existing asphalt surface a minimum of ½" to remove damage and replace with a 2.5-inch asphalt overlay. The overlay would bring the asphalt surface thickness to a minimum of 4 inches and within current recommended pavement design guidelines. Removal and replacement of damaged trench drainage should be included in a rehabilitation program.

Installation of LED taxiway edge lights and sign panels is also recommended. The proposed changes to Taxiway A5 are shown in **Figure 5-2**. An opinion of cost for Taxiways A3, A4, and A5 design and construction in the amount of $119,000 was provided for a portion of the recommended work in 2015.[1]

Taxiways A6/A7/A8

Taxiway sections north of Taxiway A leading to the North Ramp and sections between Taxiway A and Runway 6-24 have not received much traffic since the old terminal was decommissioned and no air carriers operate north of the runway. Analysis associated with the Pavement Condition Study for Taxiways A6, A7, and A8 pavement conditions found to be in generally "satisfactory" condition with some swelling and depression observed. The taxiways are calculated to have more than 10 years of remaining life due to their minimal usage. The recommended rehabilitation improvements include ½" mill and a 1.5-inch hot mix asphalt (HMA) overlay.

It is recommended that in-pavement runway guard lights and LED taxiway edge lights be installed. New cable and isolation transformers should be installed. New sign panels are also recommended to be installed in collaboration with an airfield rehabilitation program. The proposed changes to Taxiways A6, A7, and A8 are shown in **Figure 5-3**. An opinion of cost for design and construction in the amount of $394,000 was provided for a portion of the recommended work in 2015.[2]

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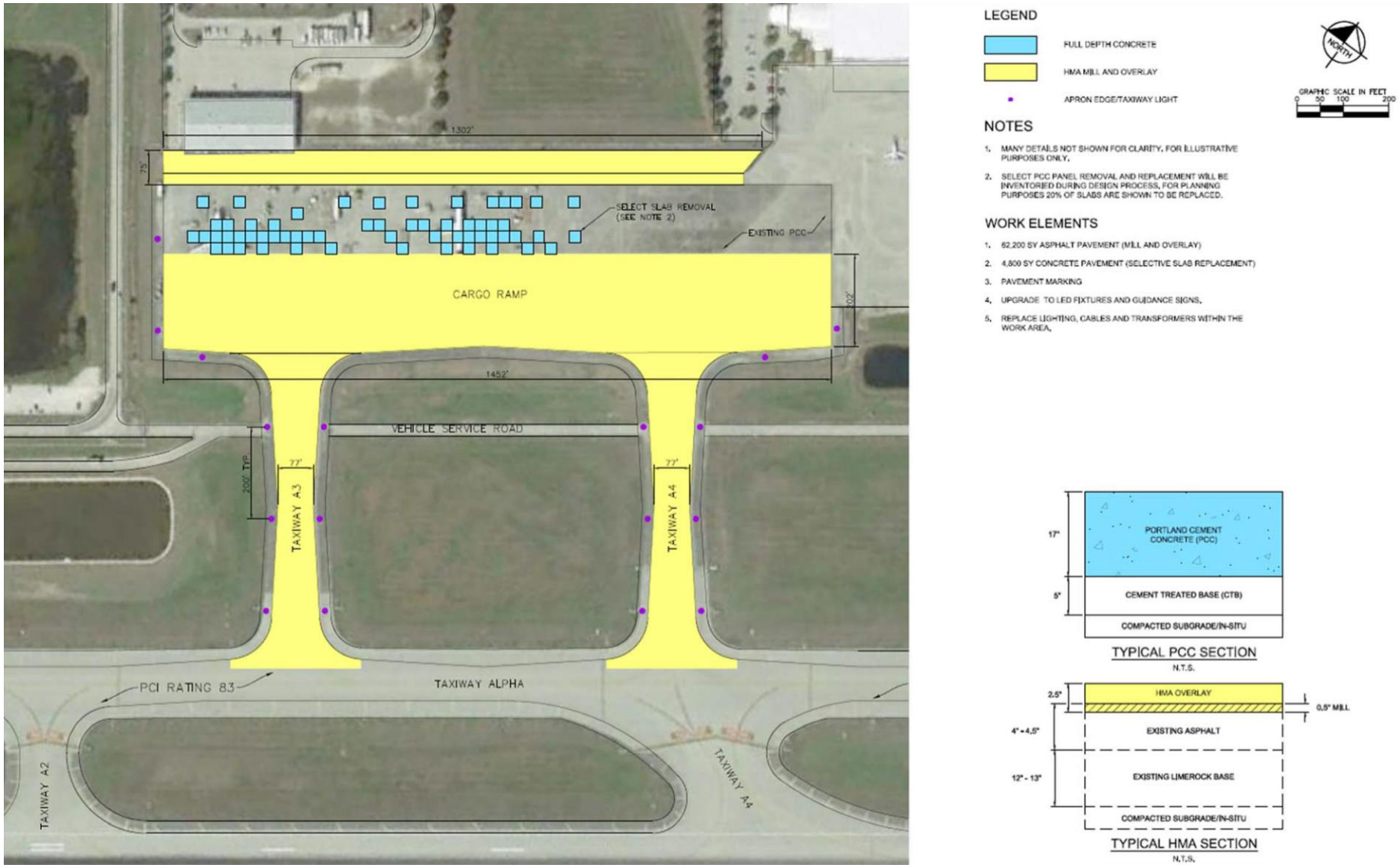
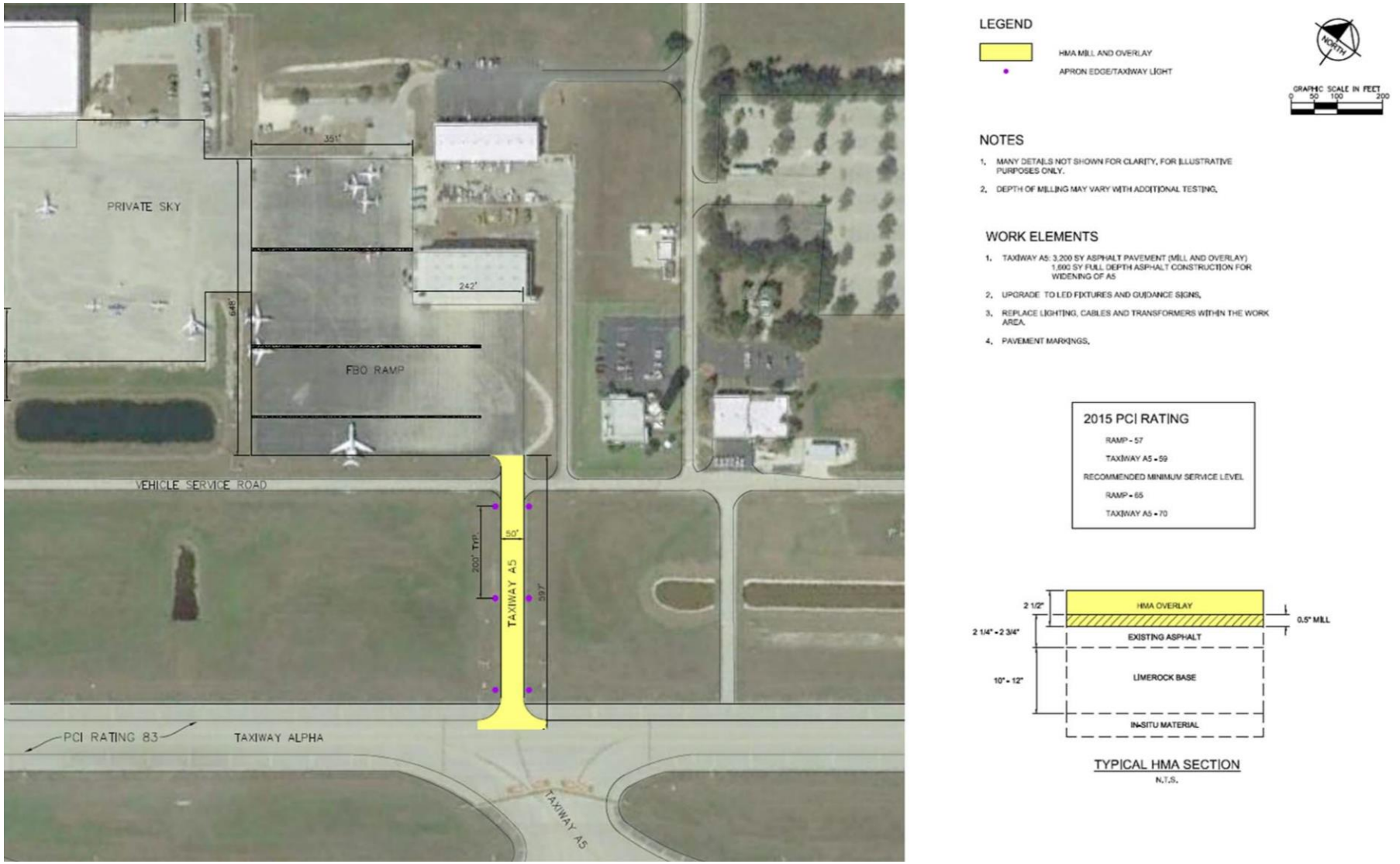
[1] SOURCE: *Airside Pavement Rehabilitation Recommendations Repor*t (August 2015) was developed from visual inspections and available construction history data. Opinion of costs does not include recommendations proposed after 2015.

[2] SOURCE: *Airside Pavement Rehabilitation Recommendations Report* (August 2015) was developed from visual inspections and available construction history data. Opinion of costs does not include recommendations proposed after 2015.



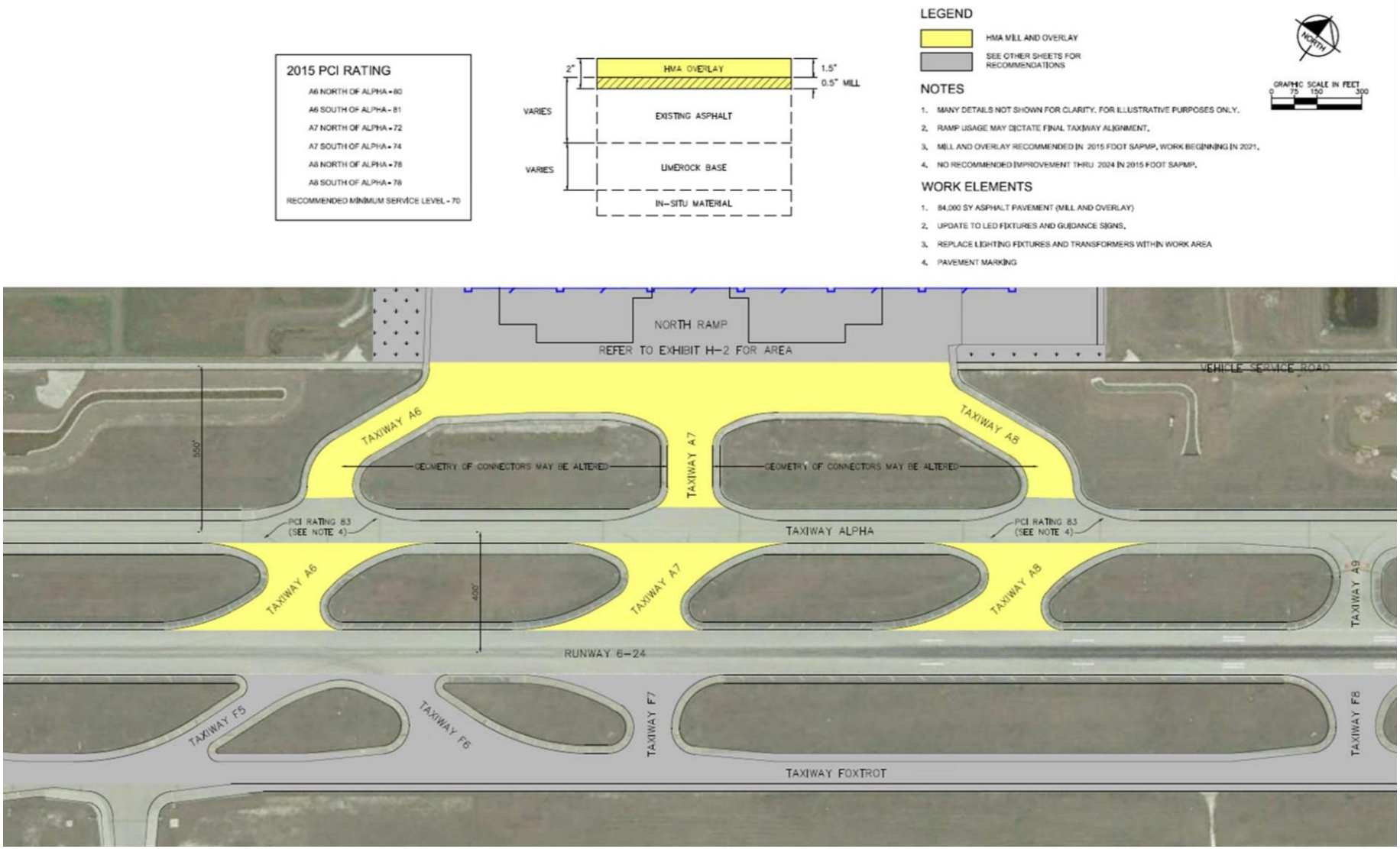
SOURCE: Pavement Condition Analysis and Recommendation, Kimley-Horn and Associates, 2018

Figure 5-1 Rehabilitation Recommendations Taxiways A3 and A4



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-2 Rehabilitation Recommendations Taxiway A5



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-3 Rehabilitation Recommendations Taxiways A6/A7/A8

Other Taxiway A Connectors

Taxiways A1 and A10 are in "good" condition having completed pavement rehabilitation in 2020-2021.

Analysis associated with the Pavement Condition Study for Taxiways A2 and A9 found to have a "Satisfactory" condition rating. Taxiways A2 and A9 pavement are not in consideration for rehabilitation.

Taxiway F

The taxiway is the primary air carrier taxiway to the Airport's only runway, Therefore, Taxiway F experiences more traffic than Taxiway A. Investigation associated with the Pavement Condition Study identified issues with original construction quality and subsurface conditions. The Pavement Condition Study found Taxiway F to have noticeable depressions, pavement weathering, longitudinal and alligator cracking with a weak structural base in its center portion. The blistering observed on the pavement concerning as water could penetrate the surface through cracks in the ruptured blisters. The west end has found have a remaining life of less than five years.

Based on the analysis, the two recommended rehabilitation improvements include a minimum of 2-inch mill of the existing asphalt to remove cracking and weathered pavements and a 9-inch HMA overlay. The second option entails a full depth replacement of approximately 12 inches of AC.

Installation of LED taxiway edge and centerline lights is also recommended for the entire length of Taxiway F. Taxiway F edge and centerline circuits are proposed to be split into East and West segments with new cable and isolation transformers. New sign panels and a new parallel duct banks between Taxiway F and Runway 6-24 with crossings for future expansion are recommended to be installed. The proposed changes to Taxiway F are shown in **Figure 5-4** and **Figure 5-5**. An opinion of cost for design and construction in the amount of $178,000 was provided for a portion of the recommended work in 2015.[3]

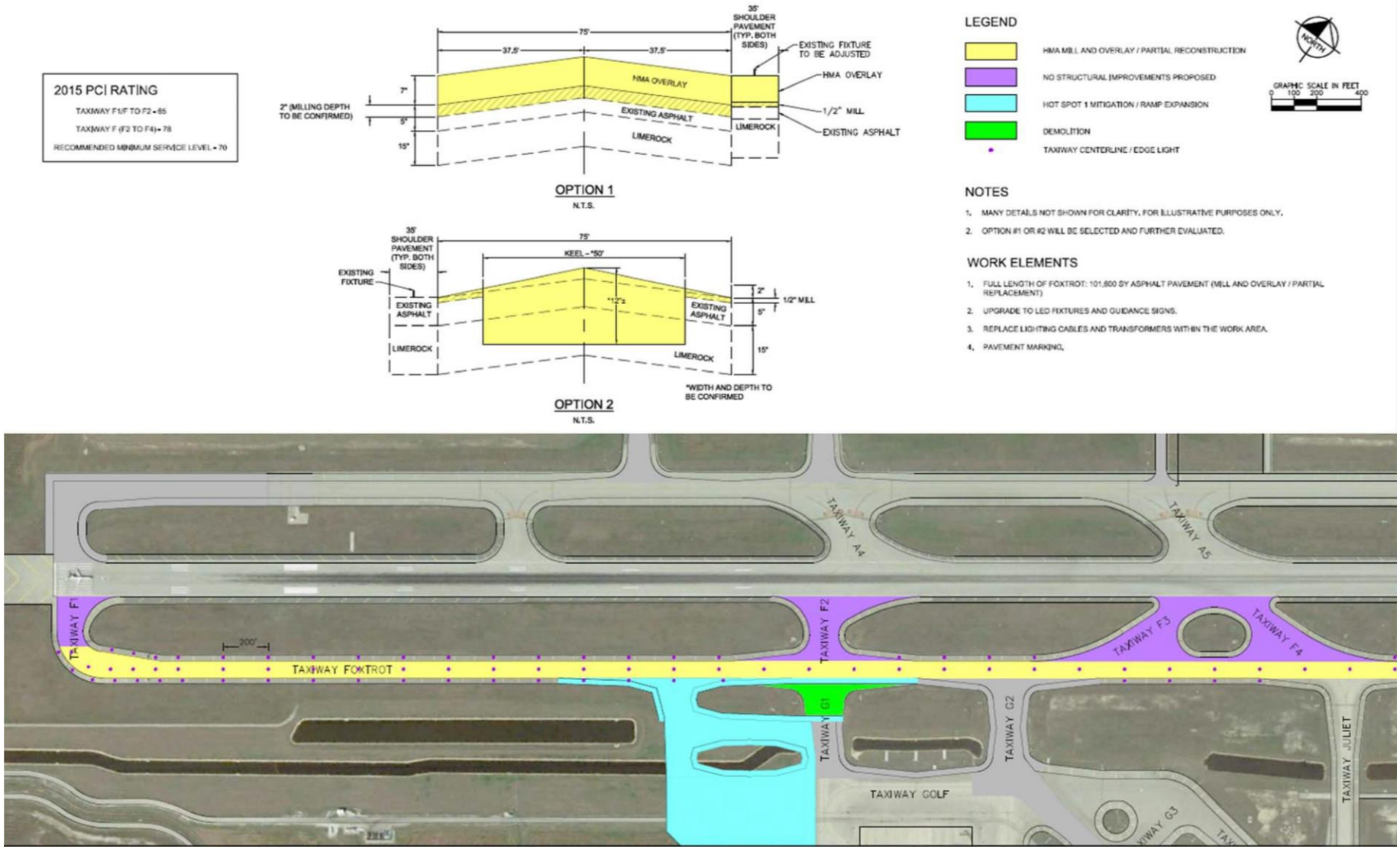
Taxiways F1 through F9

Taxiways F1 through F9 pavement conditions were analyzed as part of the Pavement Condition Study. The analysis found longitudinal cracking with some signs of stress. The general pavement condition rating was "fair" to "satisfactory" which resulted in no structural improvements recommended for the taxiway connectors.

However, it is recommended that in-pavement runway guard lights be installed on Taxiways F1 through F9 with ducts parallel to Runway 6-24. New sign panels are also recommended to be installed. The proposed changes to Taxiways F1 through F9 are shown in Figure 5-4 and Figure 5-5. An opinion of cost for design and construction in the amount of $46,000 was provided for a portion of the recommended work in 2015.[4]

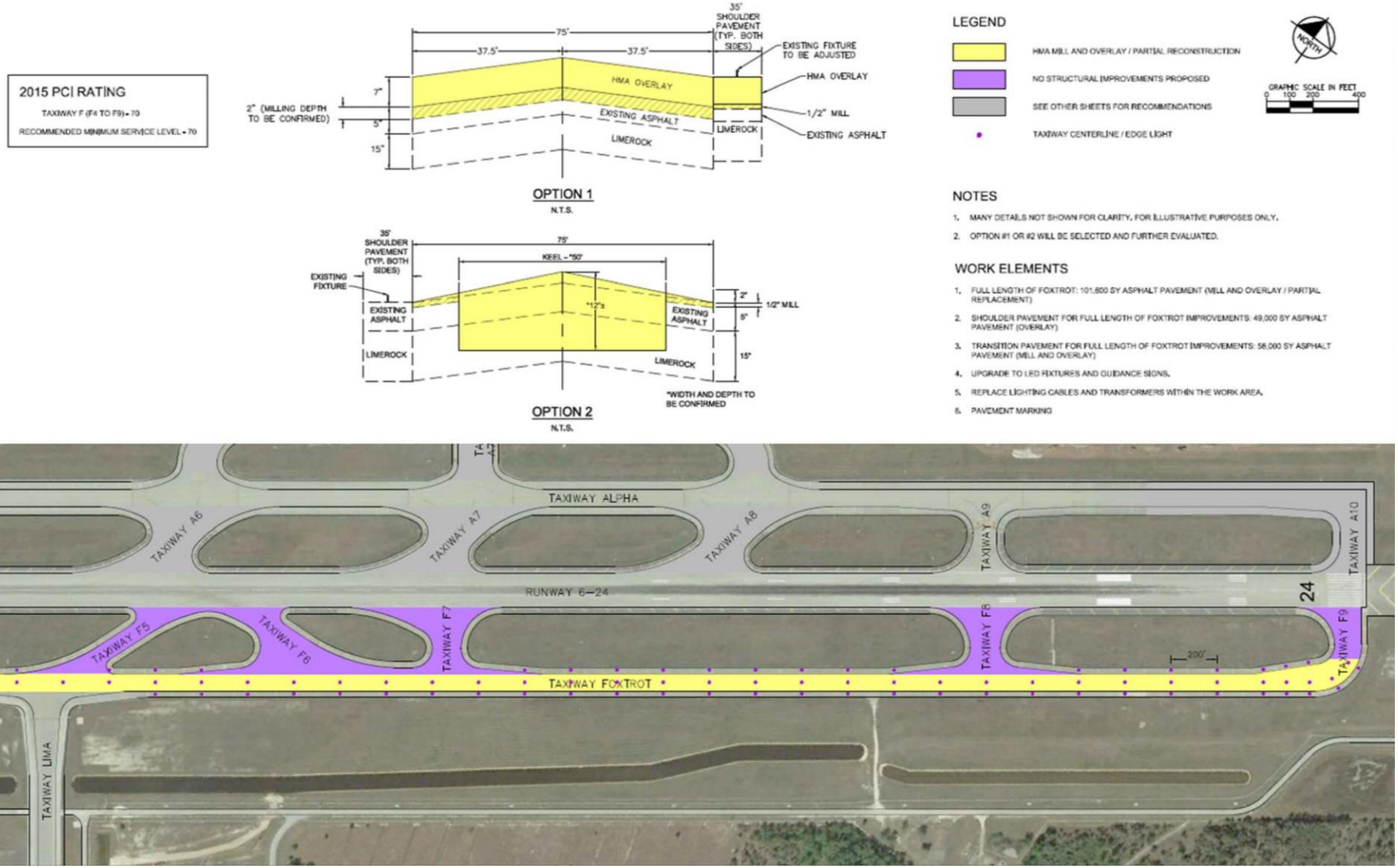
[3] SOURCE: *Airside Pavement Rehabilitation Recommendations Report* (August 2015) was developed from visual inspections and available construction history data. Opinion of costs does not include recommendations proposed after 2015.

[4] SOURCE: *Airside Pavement Rehabilitation Recommendations Report* (August 2015) was developed from visual inspections and available construction history data. Opinion of costs does not include recommendations proposed after 2015.



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-4 Rehabilitation Recommendations Taxiway F West End



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-5 Rehabilitation Recommendations Taxiway F East End

Taxiway G

Taxiway G and its connectors are some of the most used pavements on the Airport as they provide access to Terminal Concourses C and D. Analysis in the Pavement Condition Study of Taxiway G surface found minor cracking. The analysis reflects the taxiway has more than 10 years of remaining life with a condition rating of "fair". The recommended rehabilitation improvements include a 2-inch mill and HMA overlay to remove surface cracking and deterioration.

Installation of LED taxiway and centerline lights in areas that have not been upgraded to LED is recommended. The proposed changes to Taxiway G are shown in **Figure 5-6**.

Taxiways G1/G2

Analysis associated with the Pavement Condition Study of Taxiways G1 and G2 found the taxiways are deteriorating rapidly with Taxiway G2 estimated to have less than 5 years of remaining life. Analysis of Taxiway G1 does indicate more than 10 years of remaining life but the pavement does have depressions from what appears to be related to drainage pipe irregularities.

Each taxiway connector is recommended for substantial rehabilitation with two improvement options. The southern section of Taxiway G1 is recommended for a 4-inch AC overlay or a full depth removal and replacement. During design of a rehabilitation program, a video survey of the drainage pipes should be conducted to determine a resolution for the drainage pipe issue. Airfield hot spot 1 is located at the Taxiway G1 and Taxiway F2 intersection. Taxiway G1 is aligned with Taxiway F2 allowing direct access to Runway 6-24 from the terminal apron which causes increased risk to surface operations. The recommended rehabilitation improvement to mitigate the risk entails removal of the northern portion of Taxiway G1 and installing a new connector to the west of the removed pavement.

The proposed rehabilitation improvements for Taxiway G2 entails a 7-inch AC overlay or a full depth removal and replacement. It is recommended that LED taxiway edge lights and sign panels be installed on each taxiway. The proposed changes to Taxiways G1 and G2 are shown in Figure 5-6. An opinion of cost for pipe inspection and subgrade in the amount of $46,000 was provided in 2015.[5]

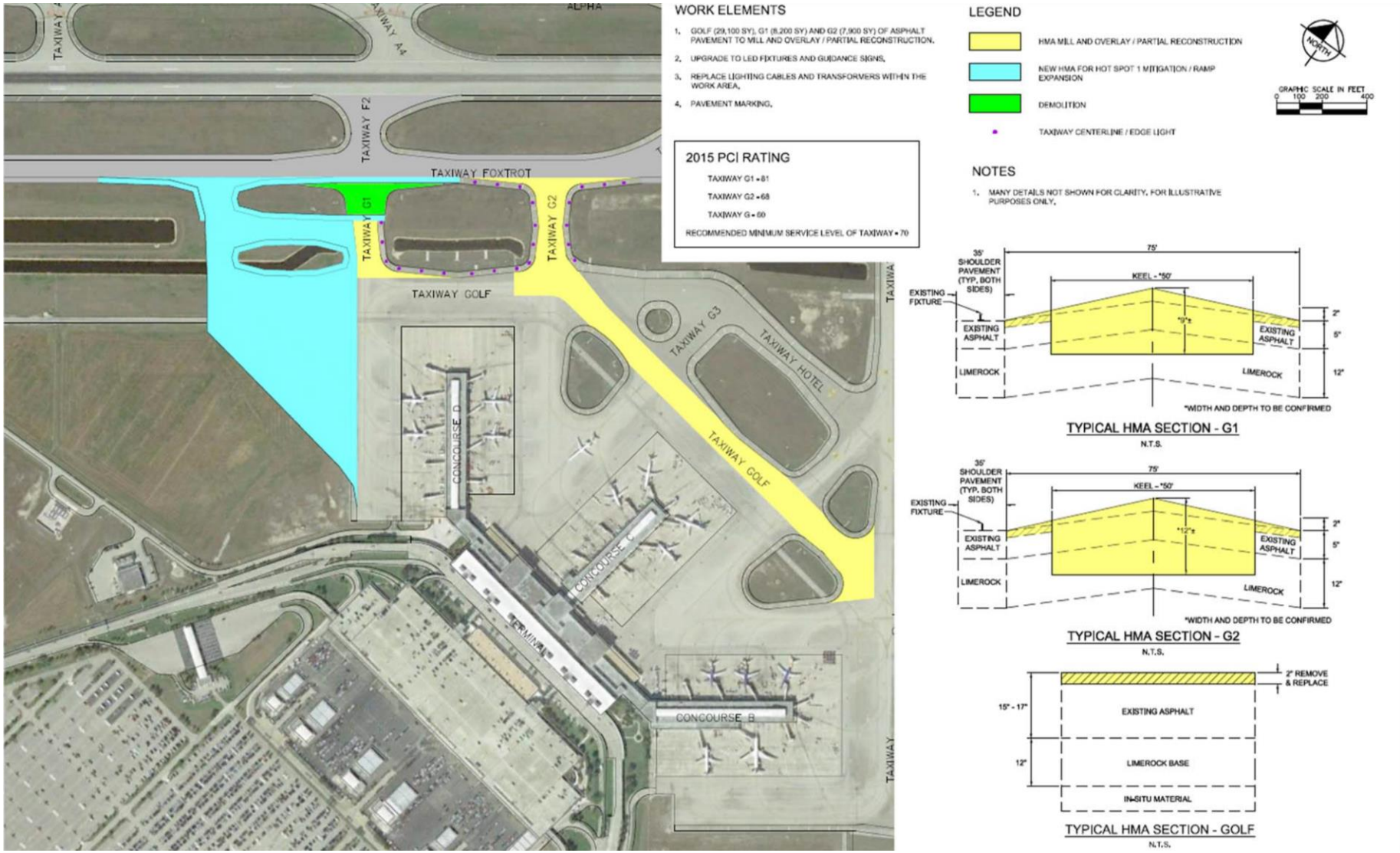
5.2 Support Facilities

North Area Planning

This section provides an overview of the development alternatives that were prepared for the North Area. These alternatives were developed based on the feedback received during the visioning session that took place at the Airport on November 30, 2021, as well as follow-up conversations with LCPA staff.

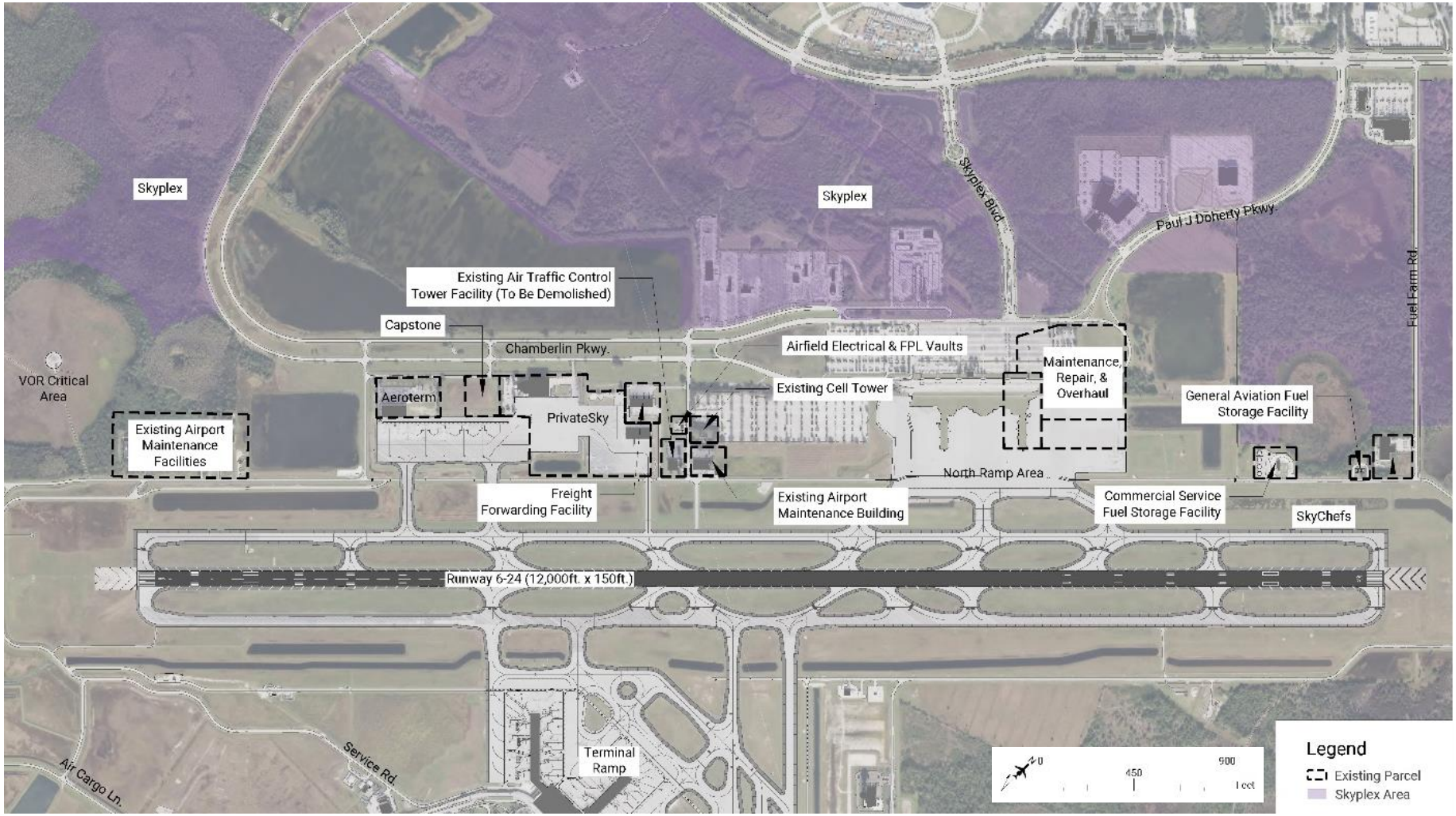
The proposed development alternatives assume the preservation of several existing facilities including the Aeroterm cargo facilities, PrivateSky Aviation general aviation facilities, the airfield and FPL electrical vaults, the cell tower, the Airport maintenance buildings, the freight forwarding facility, and the commercial service and general aviation fuel storage facilities. These facilities are depicted on **Figure 5-7**. The development alternatives also account for the Intrepid Aerospace, Inc. and CapStone Holdings Inc. leaseholds and the future demolition of the former Air Traffic Control Tower facility.

[5] SOURCE: *Airside Pavement Rehabilitation Recommendations Report* (August 2015) was developed from visual inspections and available construction history data. Opinion of costs does not include recommendations proposed after 2015.



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-6 Rehabilitation Recommendations Taxiways G, G1, and G2



SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-7 North Area Existing

Based on the benchmarking analyses that were completed as part of the demand/capacity and facility requirements analyses, the following land use planning targets were established:

- Cargo/logistics area: 70 acres
- GA/FBO area: 50 acres
- MRO area: 40 acres
- E-commerce area: 36 acres

The aforementioned land use targets provided the framework for the development of three land use plan alternatives, illustrated on **Figure 5-8** through **Figure 5-10**. The land use designations included in these figures include:

- Cargo: Includes air cargo buildings, aircraft apron areas, and support facilities including ground support equipment storage areas.
- General Aviation: General Aviation describes those facilities and operational activity by all aviation users other than scheduled commercial flights, military aviation, and cargo operations
- Electronic Commerce: Includes sorting facility, aircraft apron areas, and support facilities to accommodate logistics and freight transport operations associated with electronic commerce.
- Aircraft Maintenance, Repair, and Overhaul Facility: Includes workshops, hangars, and apron areas used for aircraft maintenance, repair, and overhaul
- Commercial Service Fuel Storage Facility: Includes existing facilities and equipment for the handling and storage of Jet-A aviation fuel
- Other Aviation Development: Includes aviation related uses not included in the other land use category such as airline catering and electric vertical takeoff and landing (EVTOL) aircraft facility
- Skyplex: refers to the aviation and non-aviation development area along Daniels Parkway on the north side of the Airport. This area will be discussed in further detail in Section 5.5 of this chapter.

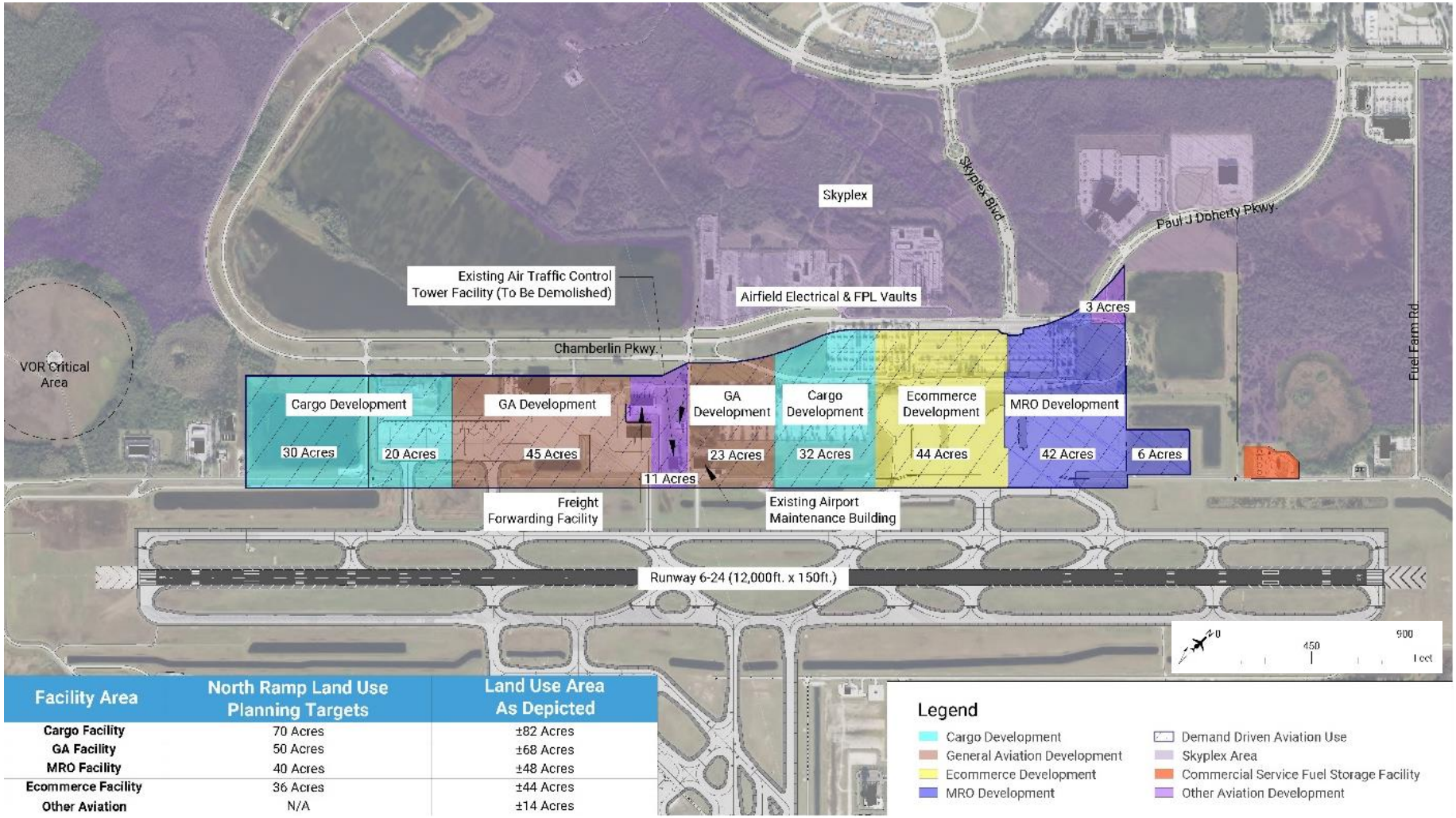
Land Use Plan Alternative 1 assumes the elimination and/or relocation of the stormwater retention/detention basin southwest of the existing cargo facilities to accommodate future cargo development. Future general aviation and cargo development would be accommodated where the existing rental car overflow automobile parking lots are located and the former terminal site would accommodate 44 acres for electronic commerce and 42 acres for MRO development, respectively.

Land Use Plan Alternative 2 is similar to Alternative 1 but assumes the stormwater retention/detention basin north and northwest of the former terminal ramp will be eliminated and/or relocated to accommodate future cargo development. As a result, this alternative provides additional areas for MRO development between the general aviation and ecommerce parcels.

Land Use Plan Alternative 3 assumes that both the stormwater retention/detention basin southwest of the existing cargo facilities and north/northwest of the former terminal ramp would be eliminated and/or relocated to accommodate future cargo development.

The preferred land use plan is illustrated on **Figure 5-11**.

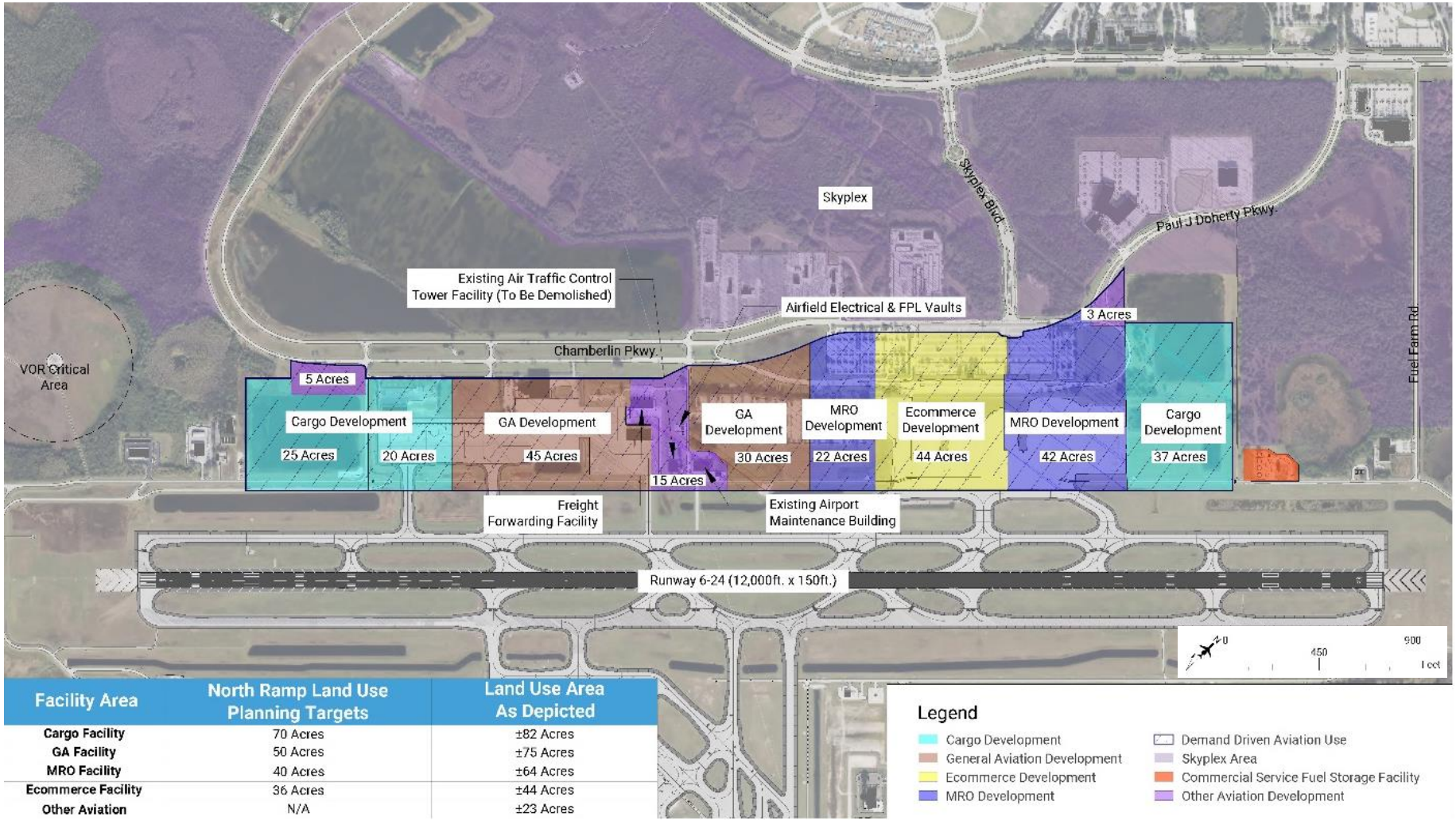
A conceptual development plan for the North Area, which seeks to locate and size various aviation uses based on the preferred land use plan, is included on **Figure 5-12**. Key aviation facilities depicted in the concept plans include buildings and aircraft hangars and apron areas. Supporting ground access and parking systems are also illustrated.



Facility Area	North Ramp Land Use Planning Targets	Land Use Area As Depicted
Cargo Facility	70 Acres	±82 Acres
GA Facility	50 Acres	±68 Acres
MRO Facility	40 Acres	±48 Acres
Ecommerce Facility	36 Acres	±44 Acres
Other Aviation	N/A	±14 Acres

SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

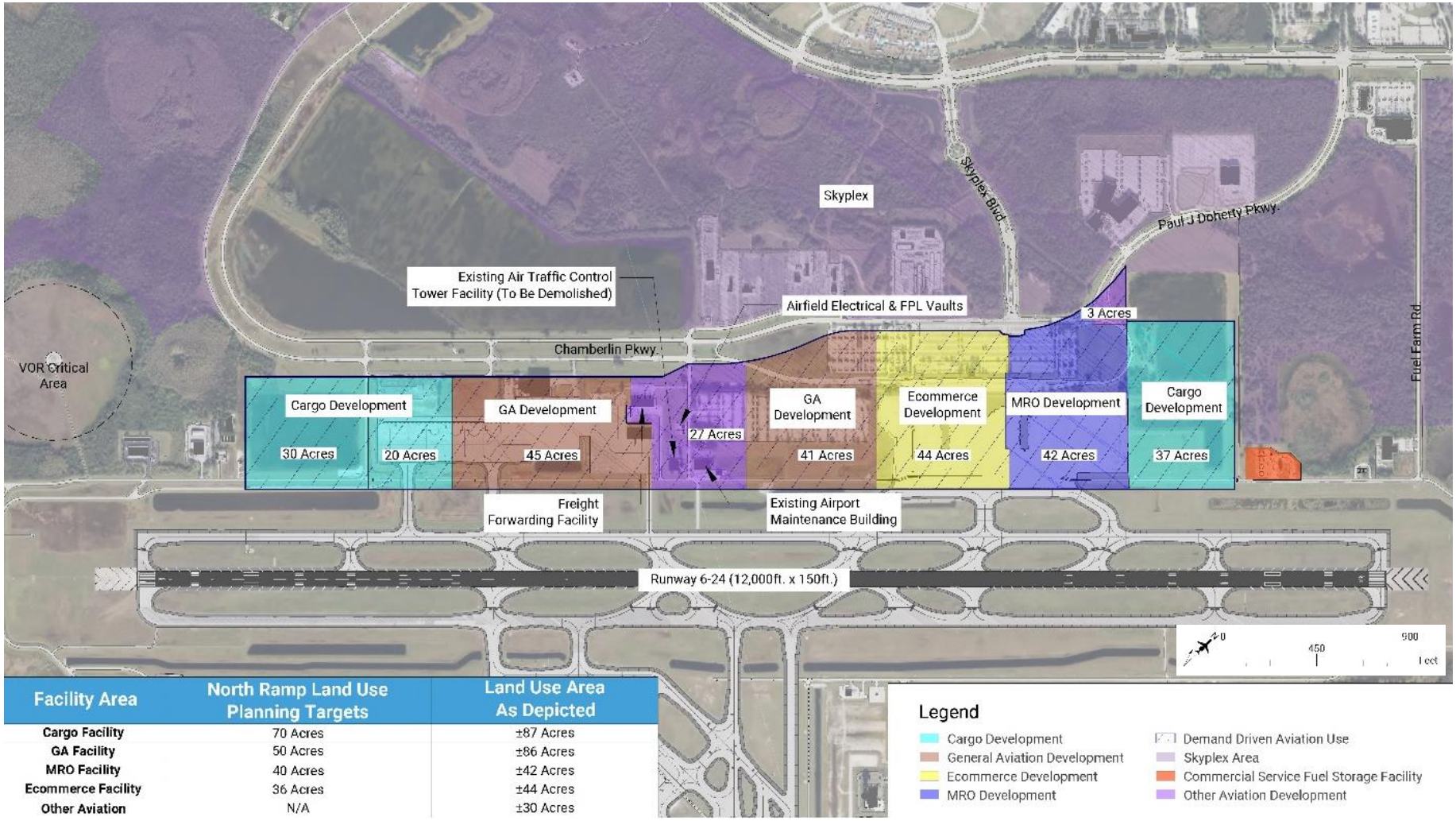
Figure 5-8 Alternative 1



Facility Area	North Ramp Land Use Planning Targets	Land Use Area As Depicted
Cargo Facility	70 Acres	±82 Acres
GA Facility	50 Acres	±75 Acres
MRO Facility	40 Acres	±64 Acres
Ecommerce Facility	36 Acres	±44 Acres
Other Aviation	N/A	±23 Acres

SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

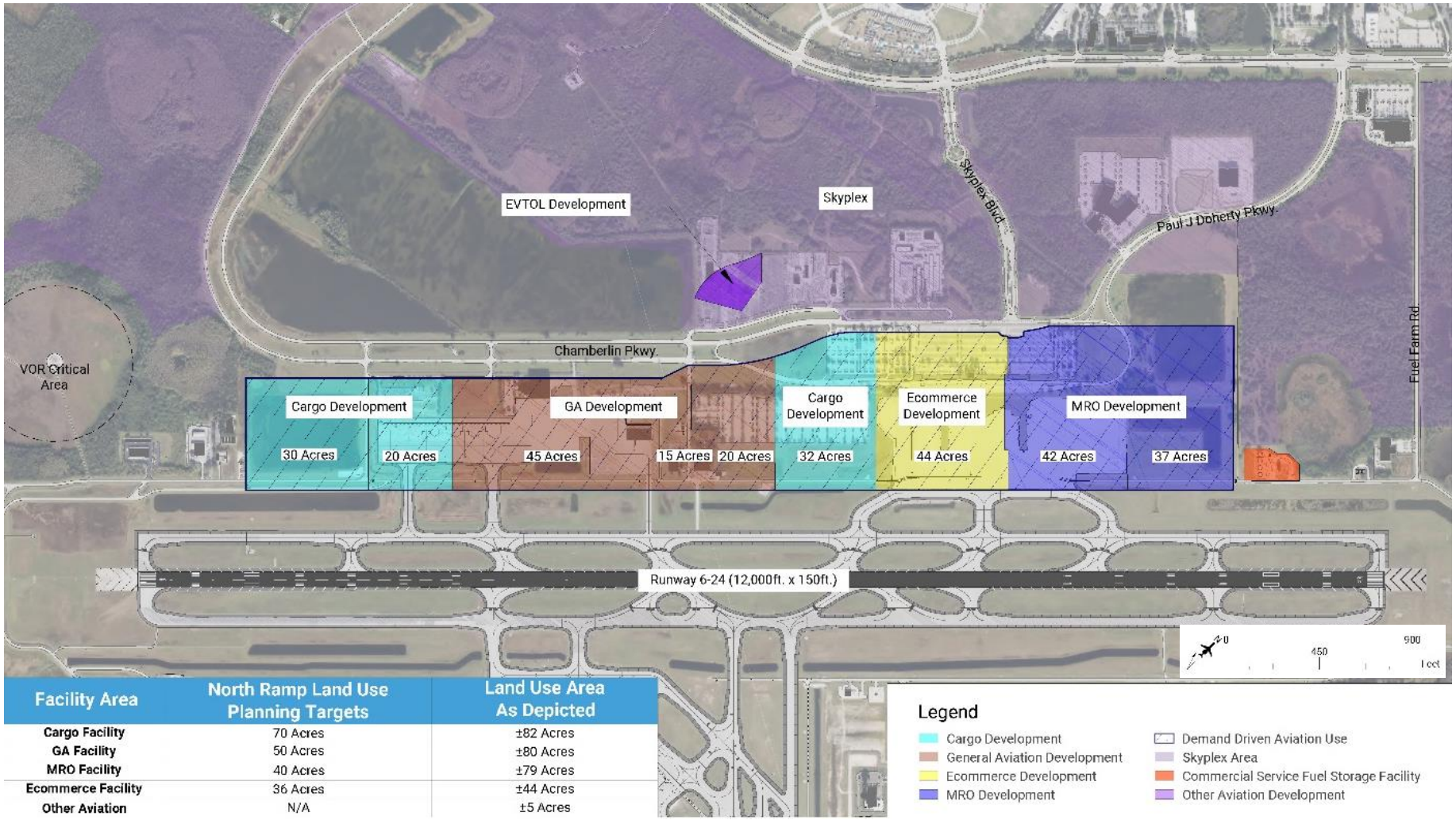
Figure 5-9 Alternative 2



Facility Area	North Ramp Land Use Planning Targets	Land Use Area As Depicted
Cargo Facility	70 Acres	±87 Acres
GA Facility	50 Acres	±86 Acres
MRO Facility	40 Acres	±42 Acres
Ecommerce Facility	36 Acres	±44 Acres
Other Aviation	N/A	±30 Acres

SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-10 Alternative 3



Facility Area	North Ramp Land Use Planning Targets	Land Use Area As Depicted
Cargo Facility	70 Acres	±82 Acres
GA Facility	50 Acres	±80 Acres
MRO Facility	40 Acres	±79 Acres
Ecommerce Facility	36 Acres	±44 Acres
Other Aviation	N/A	±5 Acres

SOURCE: Kimley-Horn and Associates, *Pavement Condition Analysis and Recommendation*, 2018

Figure 5-11 Preferred Alternative

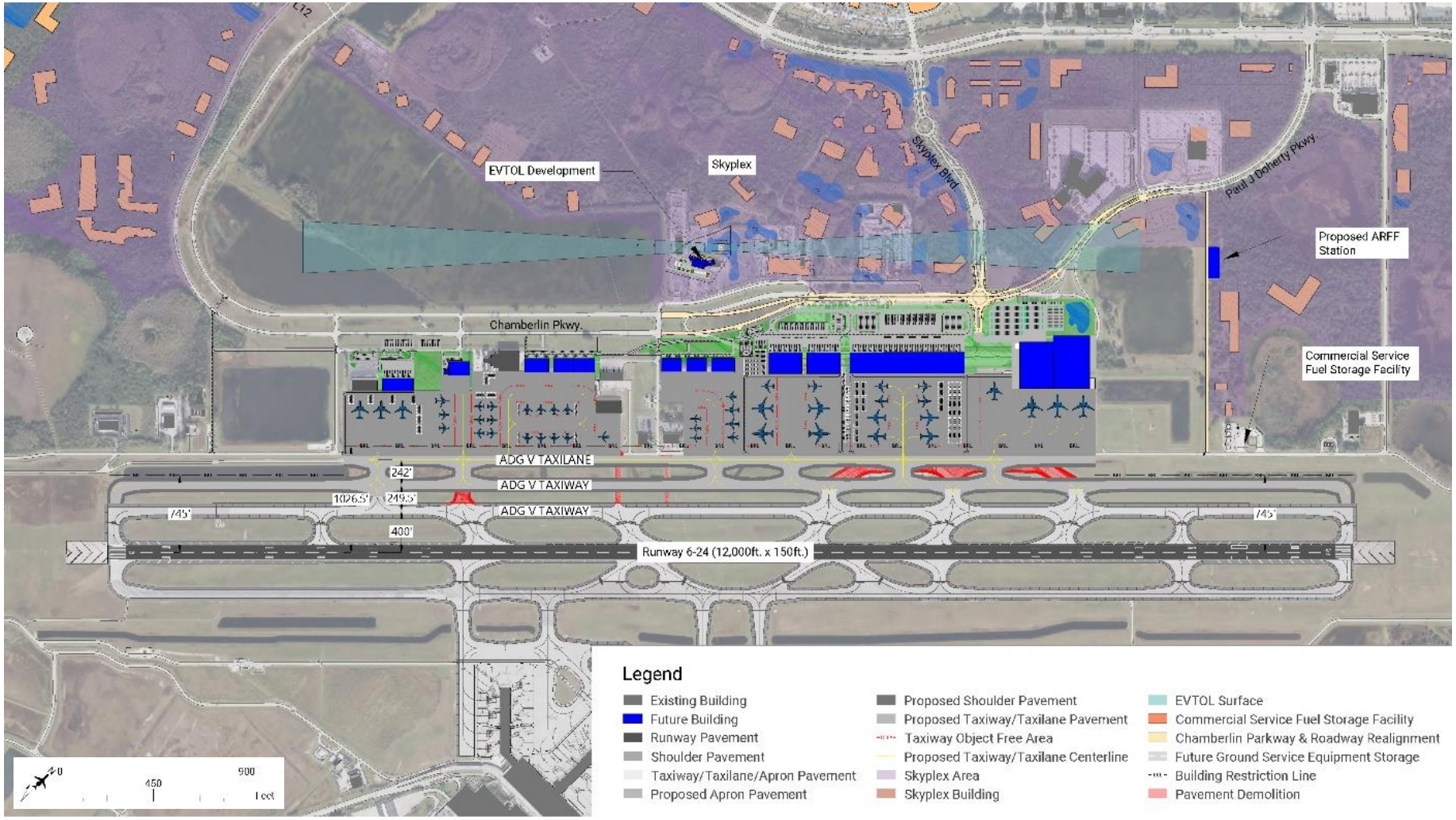
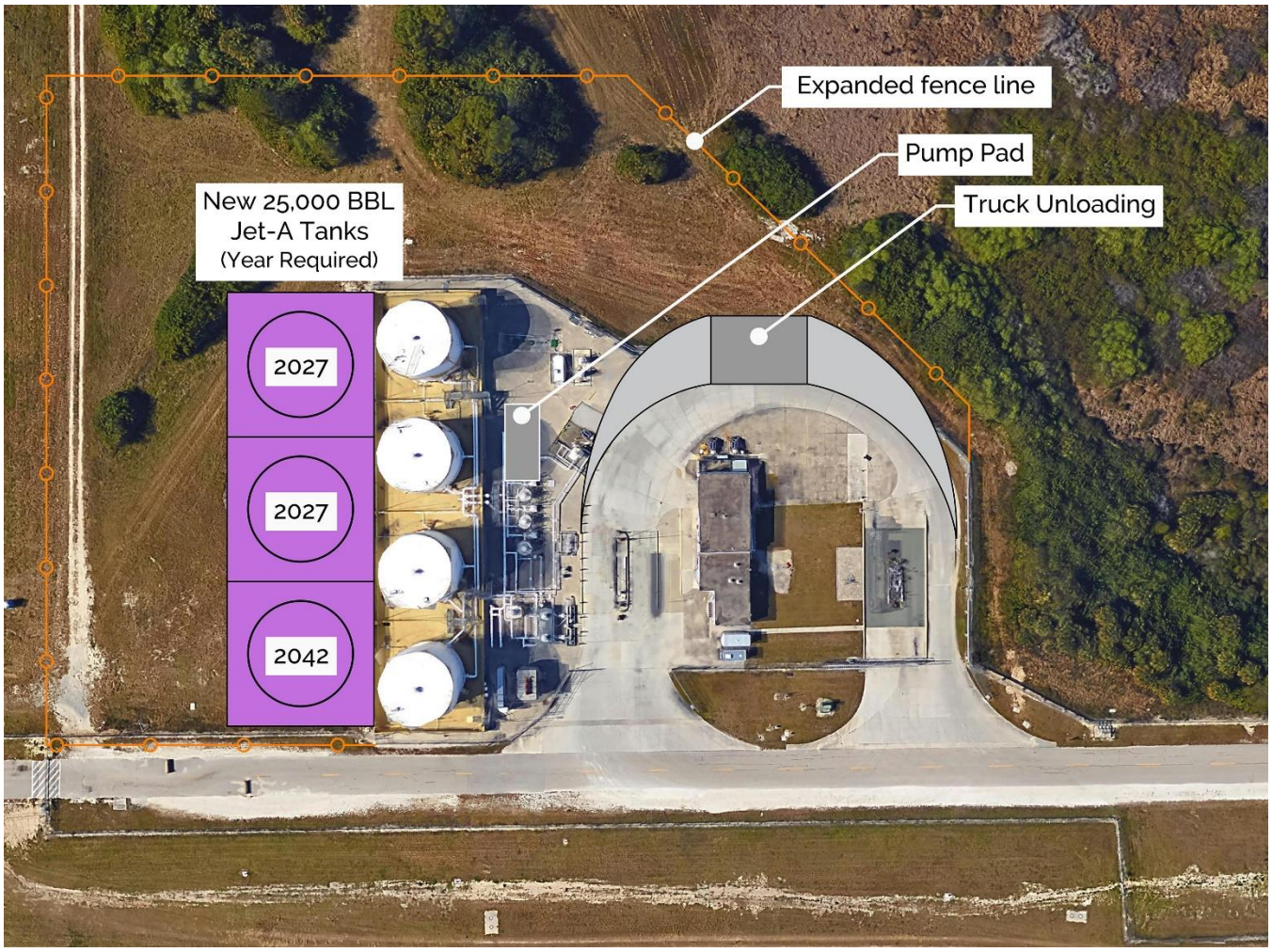


Figure 5-12 Conceptual Development Plan

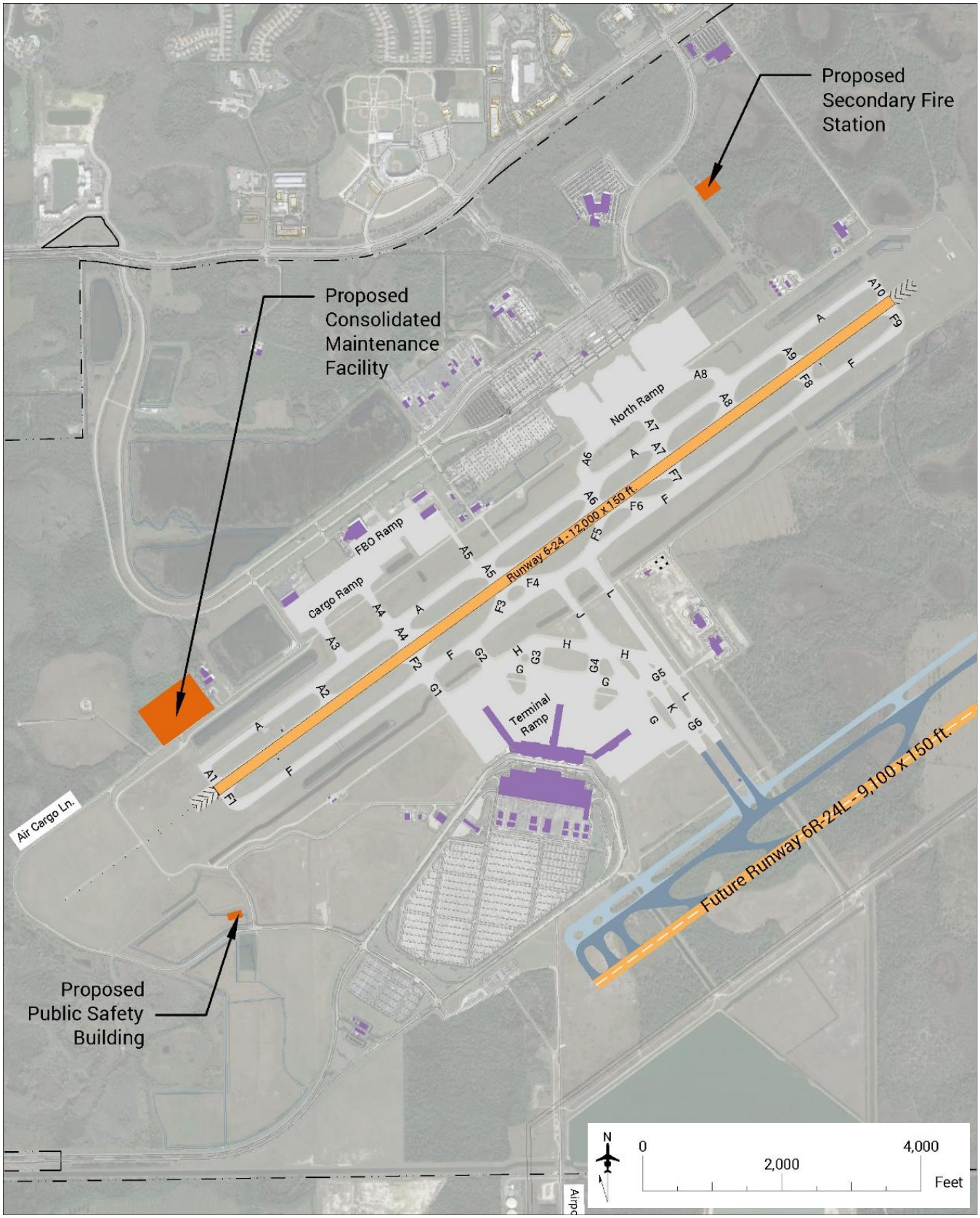
Fuel Farm

Based on the Fuel Farm requirements determined in Chapter 4, *Demand Capacity and Facility Requirements*, an expansion of the existing Fuel Farm facility is the more efficient and economical than locating and building on a new site at the airport. The existing site has ample room to expand and meet the requirements for fuel storage through the planning horizon with room to grow further if needed. The addition of three tanks with a capacity of 25,000 BBL each, two in 2027 and one in 2042, will ensure that fueling needs are met. **Figure 5-13** shows the proposed expansion.



SOURCE: FSM Group, 2022

Figure 5-13 Proposed Fuel Farm Expansion Plan



SOURCE: ESA Analysis

Figure 5-14 Other Support Facilities

Other Support Facilities

The proposed locations for the secondary fire station, public safety building, and consolidated maintenance facility are illustrated in **Figure 5-14**.

Consolidated Maintenance Facility

The consolidated maintenance facility, which would support the majority of the maintenance staff and functions of the department, is proposed to be located between the existing vehicle maintenance and field shop facilities. The proposed facility would include offices, kitchen, breakrooms, locker room facilities, showers, warehouse space, conference rooms, training room, tool room, sign shop, lock shop, systems shop, systems testing lab, carpentry shop, powder coat shop, photometric testing lab, and paint and chemical storage areas. LCPA staff indicated the existing field shop could be repurposed to store equipment. Ultimately, the existing field shop could be demolished to accommodate a facility to shelter large vehicles (e.g., tractors and mowers) and equipment and to provide additional bulk storage capacity for mulch, rocks, pallets, etc. This facility would also accommodate a wash system for large equipment and vehicles.

Public Safety Building

As noted in **Figure 5-15**, nine site locations were identified and evaluated as part of the RSW Public Safety Building Site Selection that was completed in 2021.

Site 3A is identified as the recommended site to accommodate the Public Safety Building because it achieves a primary goal of avoiding impact to future revenue generating nonaeronautical development areas while also providing good public visibility of the building. Site 3A also provides adequate landside (i.e., public) and airside access.

The Public Safety Building will group the majority of LCPA police functions in a consolidated facility that will allow the Police Department to have better team synergies as well as room to grow as security and safety needs increase. The facility will also have the ability to host the AirCom (communications center) and other command and control functions as needed.

Secondary Fire Station

The location for the proposed secondary fire station is illustrated on **Figure 5-16**. A two-lane access roadway to the site will be required to allow for easy access to/from Paul J. Doherty Parkway. The proposed landside access road will extend approximately 500 feet from Paul J. Doherty Parkway. The access roadway to the site will be utilized primarily by employees and passenger cars but will also need to accommodate the equipment fleet mix of the fire station. Ultimately, the access road will be extended to connect to Perimeter Road.

The location of the secondary Fire Station will allow the airport to meet non-ARFF fire service requirements for areas on the northern area of the airport property including on airfield. This fire station can provide support to ARFF units if necessary.

SOURCE: RS&H RSW Public Safety Building Site Selection Memorandum, September 21, 2021

Figure 5-15 Public Safety Building Site Selection Study

SOURCE: LCPA, April 2022

Figure 5-16 Secondary Fire Station Proposed Location

5.3 Passenger Terminal Alternative Analysis

Goals and Evaluation Criteria

The alternatives analysis outlined in this section of the MPU identifies passenger terminal development options to meet planning year 2035 or planning activity level three (PAL 3) requirements as outlined in Chapter 4, *Demand Capacity and Facility Requirements*. As previously mentioned, the Airport provides 27 operational aircraft gates plus one ground boarding position for regional jets and will need an additional 14 aircraft gates to meet forecasted aircraft demand levels. Six potential passenger terminal development scenarios and four subsequent alternatives were evaluated as a part of this alternatives analysis. The capabilities of each existing gate to accommodate international flights, widebody aircraft, and current airline assignments are described in Table 4-10. All gates accommodate narrow-body (ADG-III) aircraft unless otherwise noted.

Alternative Analysis Considerations

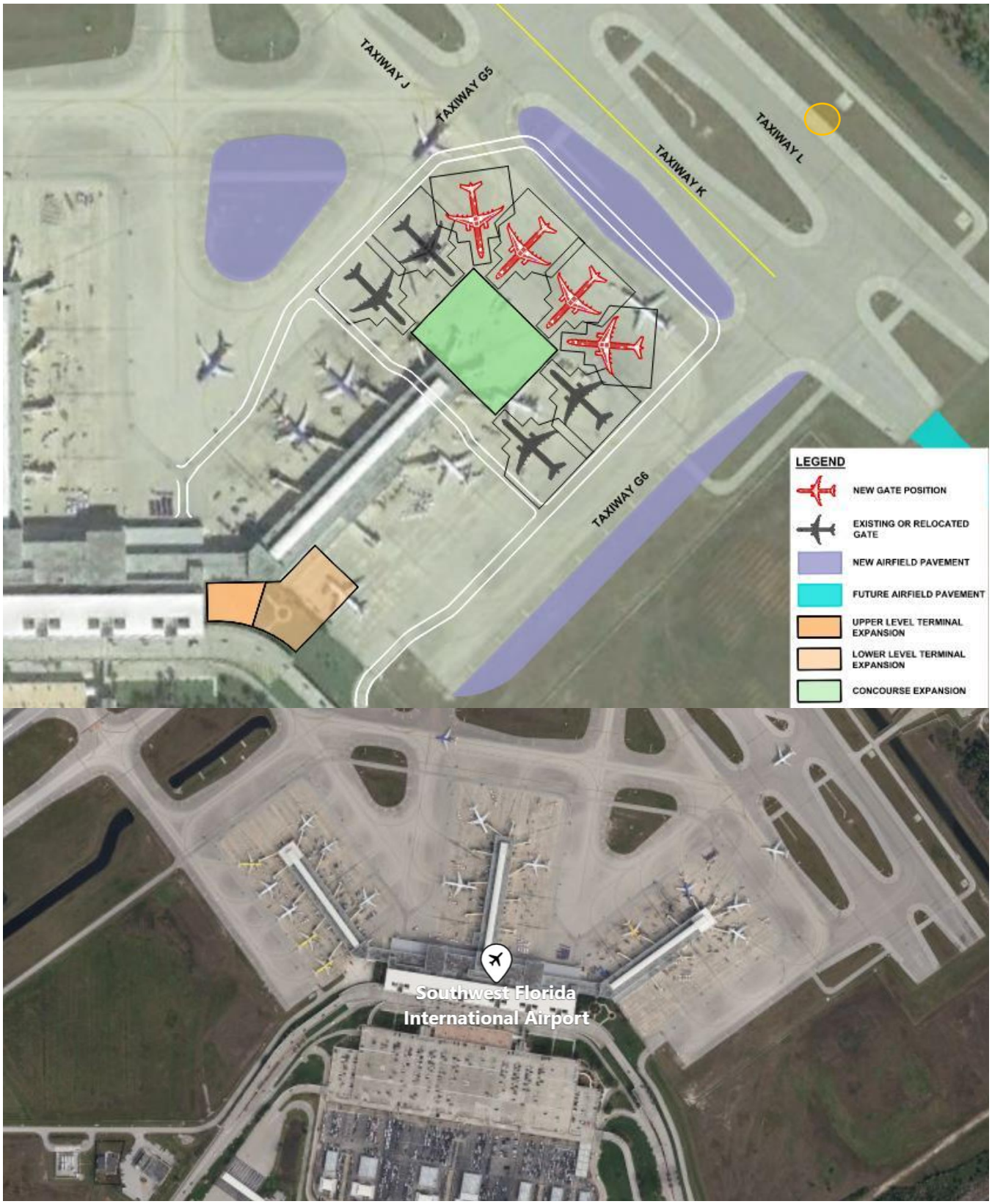
Factors considered to determine the feasibility of each potential passenger terminal development area include:

- Land available for aviation related development
  - Layout of existing passenger terminal infrastructure
  - Future planned aviation related projects
- Restrictions to airspace surfaces
- Number of required parking positions by planning year 2035
- Proximity to exiting aviation facilities and airfield infrastructure
- Construction
  - Impacts to existing facilities
  - Development Cost

Alternative Terminal Development Scenarios

As illustrated in **Figure 5-17** through **Figure 5-22**, six passenger terminal development scenarios at the existing passenger terminal were analyzed as a part of this analysis:

- Scenario 1: Existing Concourse B Extension
- Scenario 2: Existing Concourse C Extension
- Scenario 3: Existing Concourse D Extension
- Scenario 4: Existing Concourse B, C, and D Collective Extension
- Scenario 5: Construction of Future Concourse A
- Scenario 6: Construction of Future Concourse E



SOURCE: Atkins

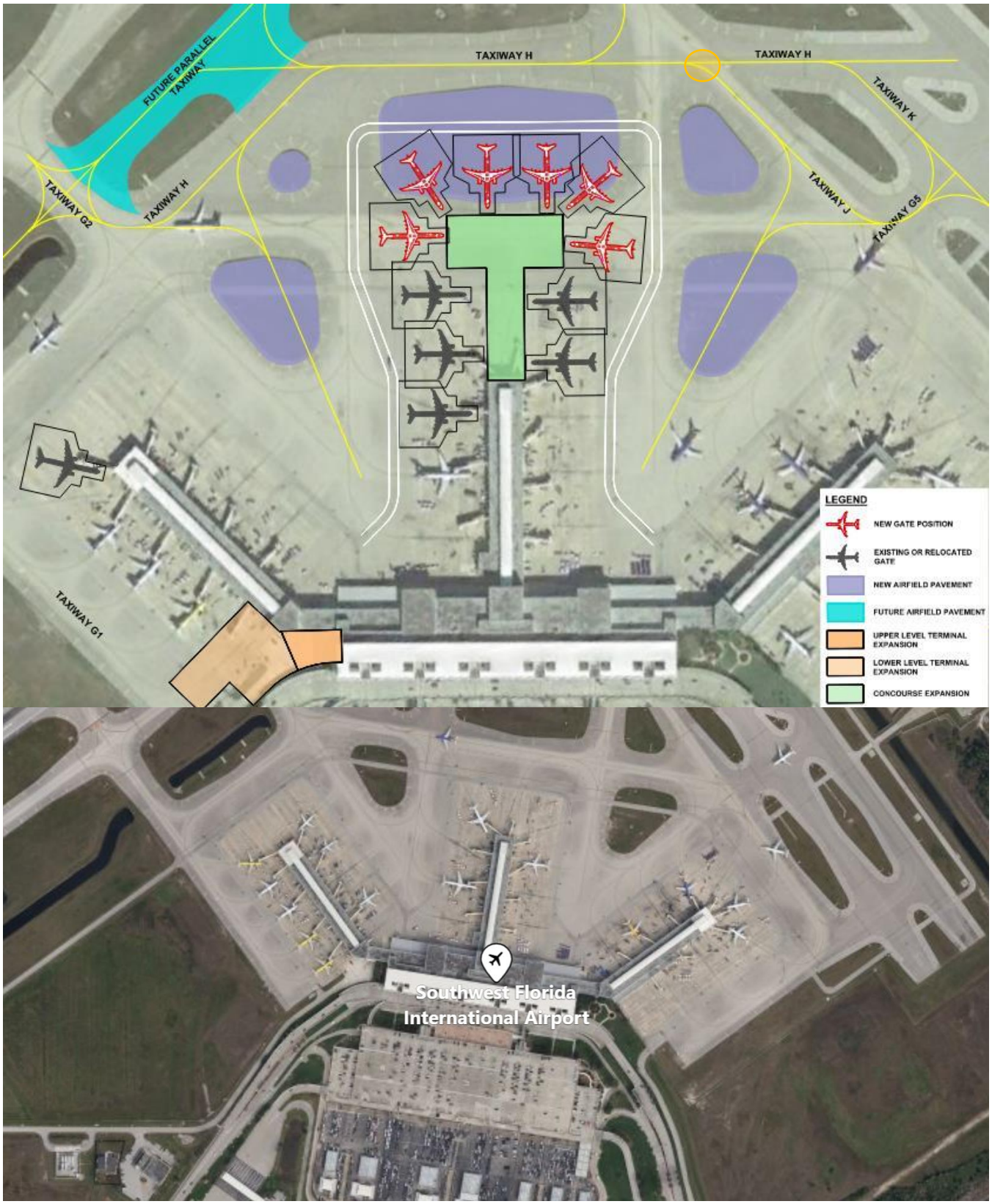
Figure 5-17 Terminal Development Scenario 1: Concourse B Extension

As highlighted in **Figure 5-18**, extending existing Concourse C would require additional main terminal area support space and would require approximately 42,000 square yards of additional apron pavement. Additionally, Taxiway G would become inactive upon extending the existing Concourse C terminal north, requiring future aircraft to push back onto existing Taxiway H. This alternative development area of approximately 76,100 square feet (per level) would assume the relocation of existing aircraft Gate C2 to the end of existing Concourse D. Up to six additional aircraft gates could be provided within this development area, with five of the adjacent existing aircraft gate positions having to be reconfigured. Extending the terminal at the end of Concourse C would require three existing aircraft gates to be temporarily offline during construction and phasing. The land available for future terminal development is restricted in this scenario and eight additional aircraft gates would still be required in this scenario. As a result, this alternative development scenario is not deemed viable.

As highlighted in **Figure 5-19**, extending existing Concourse D would require additional main terminal area support space and would require approximately 26,300 square yards of additional apron pavement. Additionally, Taxiway G would become inactive upon extending the existing Concourse D terminal northeast, requiring future aircraft to push back onto the adjacent future taxiway. This potential development area of approximately 67,100 square feet (per level) would provide enough space to add four additional aircraft gates, with three of the adjacent existing aircraft gate positions having to be reconfigured. Extending the terminal at the end of Concourse D would require two existing aircraft gates to be temporarily offline during construction and phasing. Final development would require existing Gate D2 to remain permanently offline. The land available for future terminal development is restricted in this scenario and ten additional aircraft gates would still be required in this scenario. As a result, this alternative development scenario is not deemed viable.

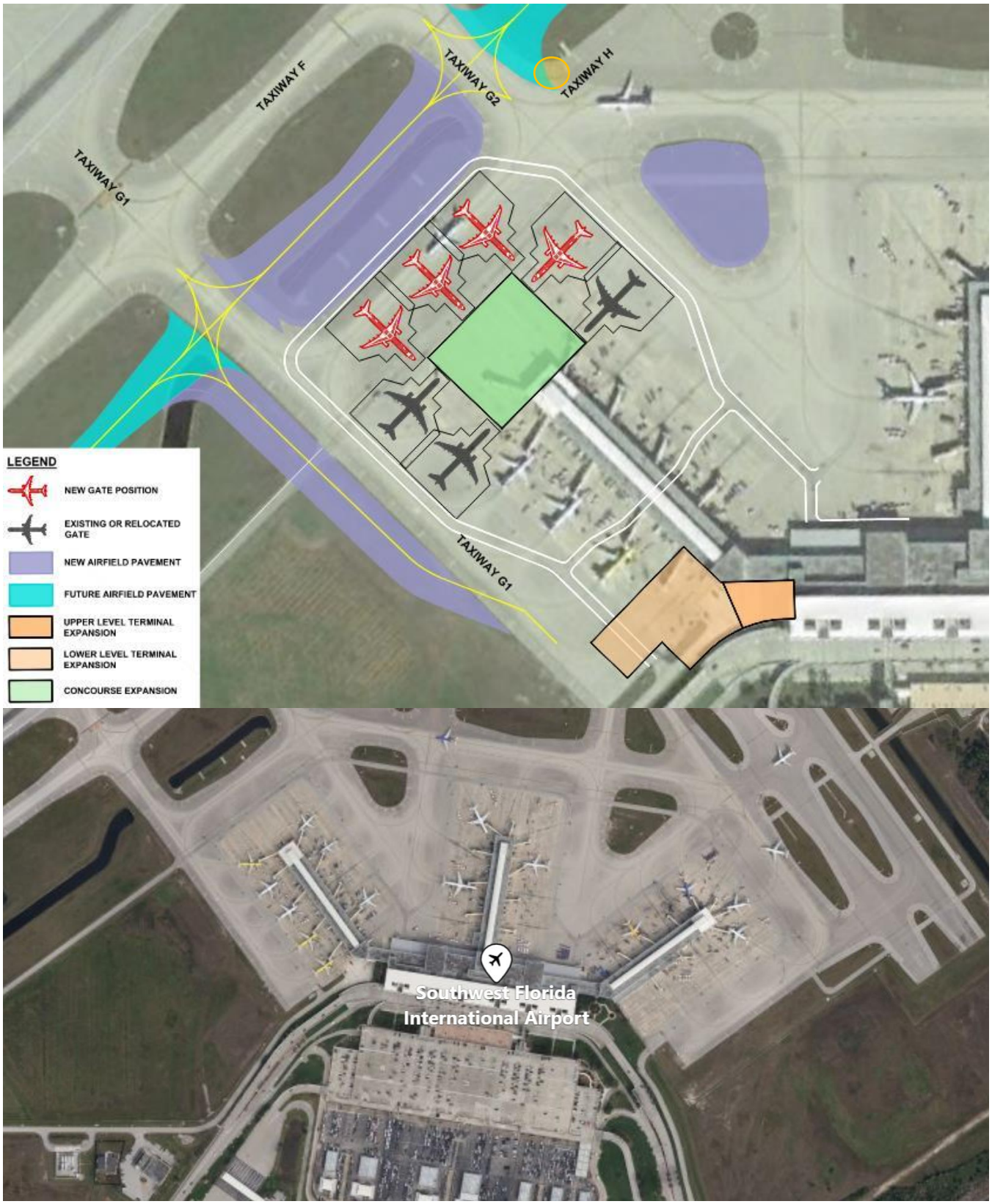
As highlighted in **Figure 5-20**, extending existing Concourses B, C, and D collectively would require additional main terminal area support space and would require approximately 96,800 square yards of additional apron pavement. Additionally, Taxiway G would become inactive upon extending each of the ends of three existing concourses. Aircraft departing from the future Concourse B and C extensions would push back onto existing Taxiways K and H, respectively. Additionally, aircraft departing from the future Concourse D extension would push back onto the adjacent future taxiway. Extending the ends of each of the three existing concourses collectively would provide enough space to add twelve additional aircraft gates, with another twelve of the adjacent existing aircraft gate positions needing to be reconfigured. It is important to note, this scenario would have to be completed in multiple phases at each concourse before fully integrated and operational. Extending the three existing terminals would require nine existing aircraft gates to be temporarily offline during construction and phasing. Final development may have short and/or long-term impacts to the usability of existing international Gate B1 and would also require existing Gate D2 to remain permanently offline. The land available for future terminal development is restricted in this scenario and two additional aircraft gates would still be required in this scenario. As a result, this alternative development scenario is not deemed viable.

As highlighted in **Figure 5-21**, constructing future Concourse A would provide additional terminal area support space and would require approximately 141,000 square yards of additional apron pavement. Minimal modifications to existing Concourse B would be required. Constructing future Concourse A of approximately 99,000 square feet (per level) would provide enough space to add twelve additional aircraft gates and would potentially have short and/or long-term impacts to the usability of existing international Gate B1. All other existing aircraft gates would not be impacted by this scenario. Development of future Concourse A would not impact the existing or future taxiway system. Final development would also require existing Gate D2 to remain permanently offline. It is important to note the aircraft taxiing distance to the existing Runway 6 and 24 ends are approximately 11,000 and 11,800 feet, respectively. These taxiing distances combined are some of the longest of the six scenarios. Additionally, between the three existing concourses and the two future proposed concourses, the location of future Concourse A is the furthest distance from the Chiller Plant and utility buildings/infrastructure, which are located southwest of existing Concourse D. The land available for future terminal development is not restricted in this scenario. As such, the terminal layout and shape could potentially be altered to accommodate two additional aircraft gates. As a result, this alternative development scenario is deemed viable.



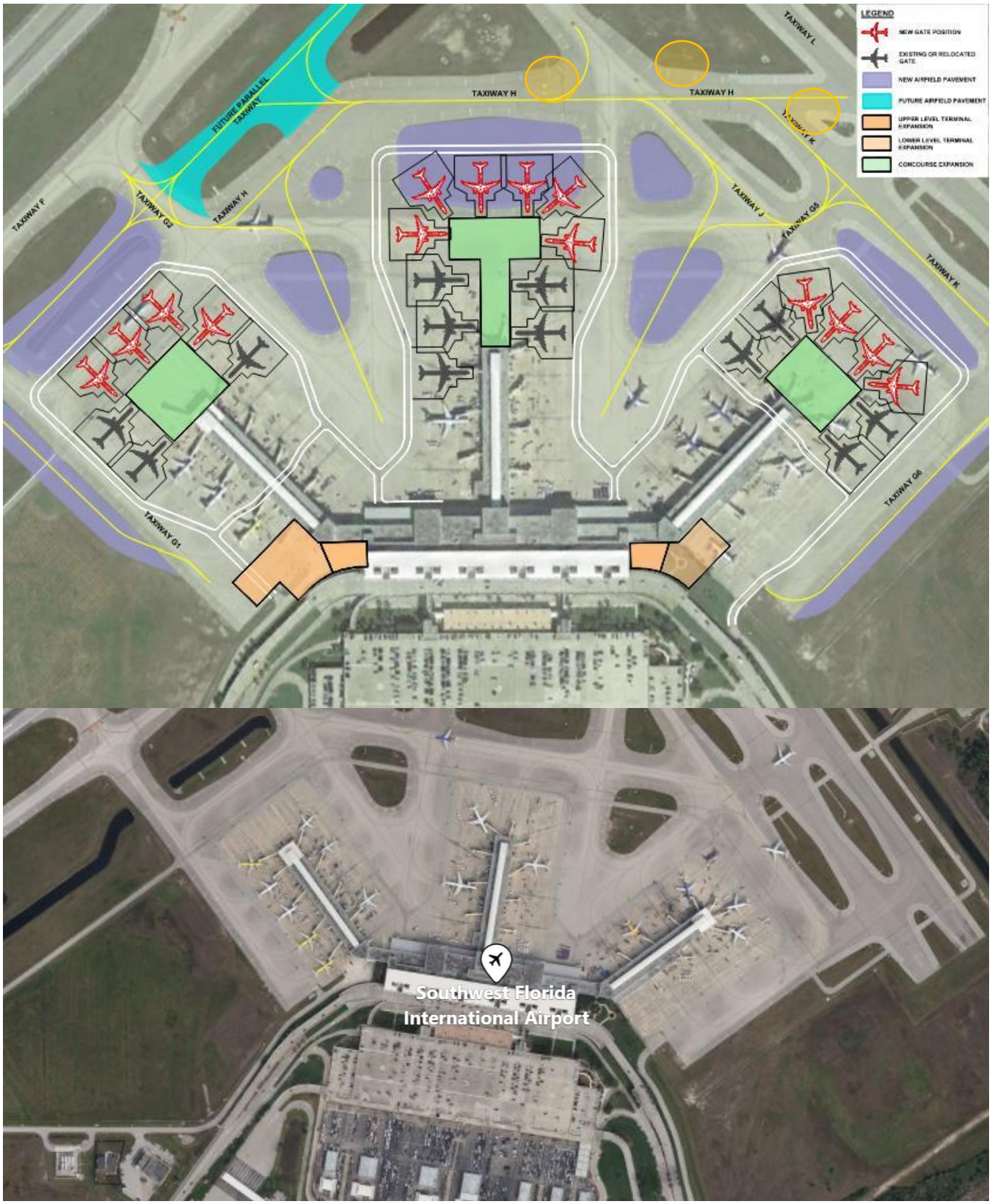
SOURCE: Atkins

Figure 5-18 Terminal Development Scenario 2: Concourse C Extension



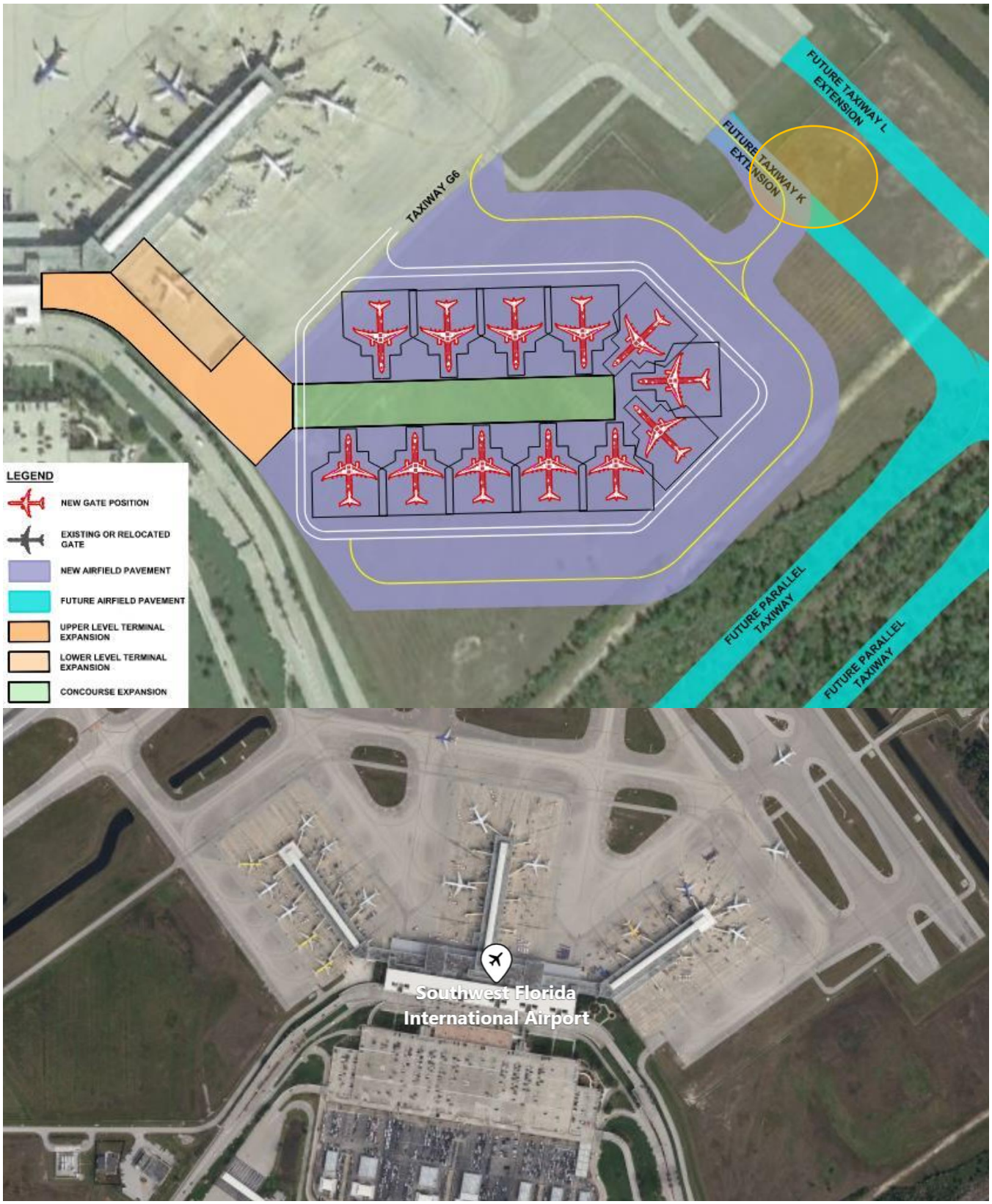
SOURCE: Atkins

Figure 5-19 Terminal Development Scenario 3: Concourse D Extension



SOURCE: Atkins

Figure 5-20 Terminal Development Scenario 4: Concourse B, C, and D Collective Extensions



SOURCE: Atkins

Figure 5-21 Terminal Development Scenario 5: Construction of Concourse A

As highlighted in Figure 5-22, constructing future Concourse E would provide additional terminal area support space and would require approximately 171,000 square yards of additional apron pavement. Minimal modifications to existing Concourse D would be required. Constructing future Concourse E of approximately 99,000 square feet (per level) would provide enough space to add twelve additional aircraft gates and would require existing Gates D2 and D4 to be relocated to the end of existing Concourse D. All other existing aircraft gates would not be impacted by this scenario, including international Gate B1. Development of future Concourse E would not result in any impacts to existing taxiway system other than it would require tie in. The construction of the concourse would require some additional taxiway capacity bult adjacent to existing system. It is important to note the aircraft taxiing distance to the existing Runway 6 and 24 ends are approximately 4,700 and 11,300 feet, respectively. These taxiing distances combined are some of the shortest of the six scenarios. Additionally, between the three existing concourses and the two future proposed concourses, the location of future Concourse A is the shortest distance from the Chiller Plant and utility buildings/infrastructure, which are located southwest of existing Concourse D. The land available for future terminal development is not restricted in this scenario. As such, the terminal layout and shape could potentially be altered to accommodate two additional aircraft gates. As a result, this alternative development scenario is deemed viable.

Evaluation Criteria

Each scenario was evaluated based on impacts to four factors including, building, airside, landside, and then summarized by the overall impacts. Each of these four factors includes various subfactors that have been assigned a specific rating from one being the most negative impact to five being the most positive impacts. Additionally, the level of importance of each subfactor is weighted on a scale with one being the least important and five being the most important. Outlined in Table 5-1 through Table 5-4 are the detailed scoring and evaluation matrices developed to rationalize the selection criteria for each of the development scenarios presented in Figure 5-23 through Figure 5-26.

Evaluation Results

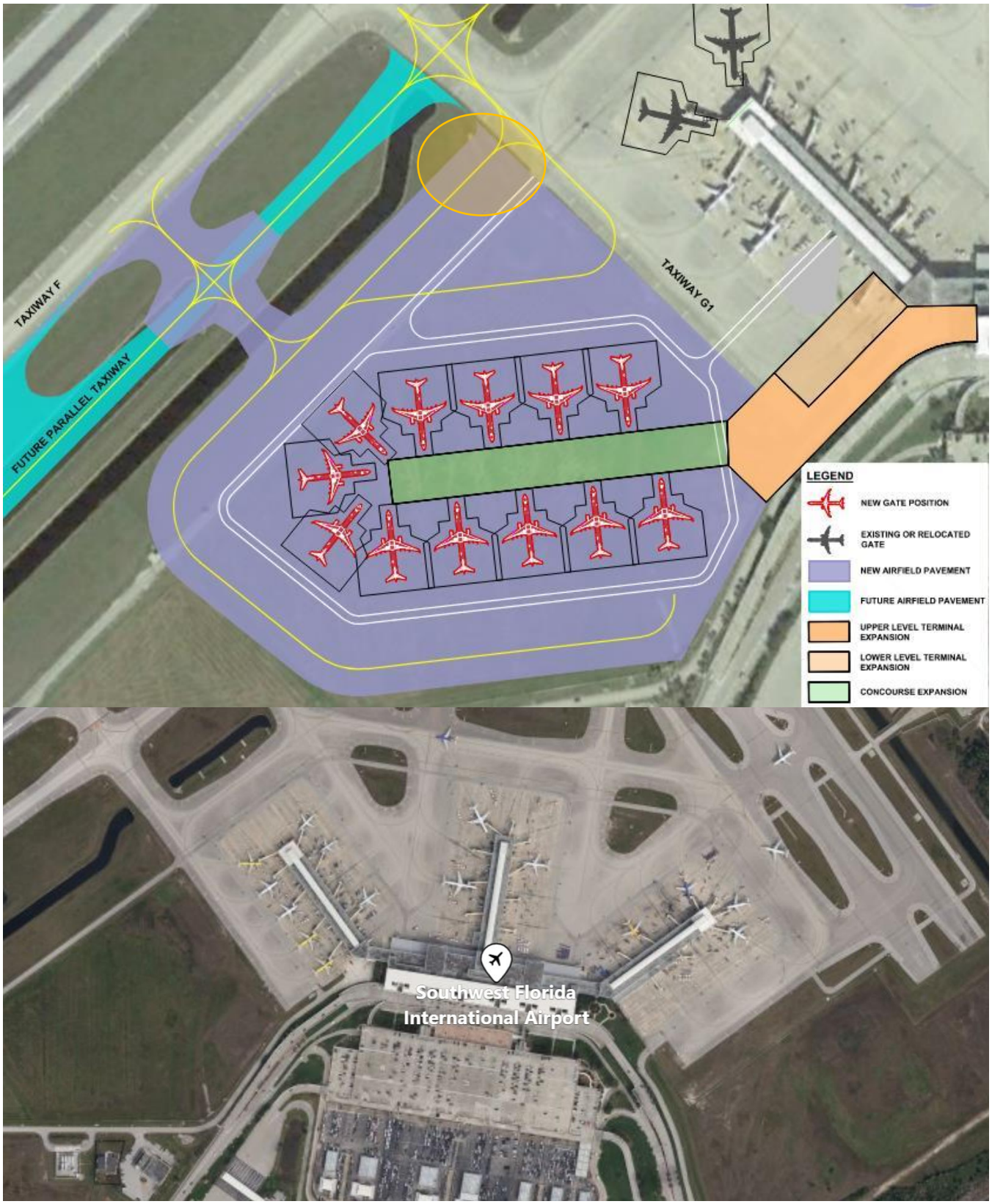
As previously mentioned, future Concourses A and E are determined to be the two only viable options. Future Concourses A and E share many similar characteristics. However, construction of future Concourse E is the overall preferred scenario with a few differentiating factors including:

- Provides a shorter aircraft taxiing distance existing Runway 6/24
- Would be located closer proximity to the Chiller Plant and utility buildings/infrastructure
- Does not impact International Gate B1

In summary, construction of future Concourse E is the final preferred scenario to proceed with developing passenger terminal alternatives as a part of this MPU.

Concourse E Alternative Concept Refinement

The Concourse E passenger terminal alternatives are limited to the area available aviation related development. The project area for the construction of Concourse E is defined by the airfield geometry of the existing apron and taxilanes to the north/northeast, the proposed taxiway to the west/northwest, the vehicular service/exit road and remote loading dock facility to the south.



SOURCE: Atkins

Figure 5-22 Alternative Terminal Development Scenario 6: Construction of Concourse E

Table 5-1 Building Evaluation Matrix

Evaluation Factors	Weighted Multiplier 1 to 5	Ranking 1 to 5	Concourse B Expansion Total Score	Ranking 1 to 5	Concourse C Expansion Total Score	Ranking 1 to 5	Concourse D Expansion Total Score	Ranking 1 to 5	Concourse B + C + D Expansion Total Score	Ranking 1 to 5	New Concourse A Total Score	Ranking 1 to 5	New Concourse E Total Score
Concessions Square Footage	4	3	12	3	12	3	12	3	12	5	20	5	20
Public Space, Seating, Restroom	4	4	16	4	16	4	16	4	16	5	20	5	20
Adequate Security Lanes	3	4	12	4	12	4	12	3	9	5	15	5	15
Adequate Ticketing	2	4	8	4	8	4	8	3	6	5	10	5	10
Outbound Baggage	3	4	12	3	9	4	12	4	12	5	15	5	15
Impacts to Existing Int. Gates	3	2	6	5	15	5	15	2	6	2	6	5	15
Passenger Walking Distance	4	2	8	3	12	2	8	2	8	5	20	5	20
Number of Baggage Claim devices	2	3	6	3	6	3	6	3	6	5	10	5	10
PAX Level of Services Impacts	4	2	8	2	8	2	8	2	8	4	16	5	20
Concessions Square Footage	4	3	12	3	12	3	12	3	12	5	20	5	20
Building Subtotal Score	—		88	—	98	—	97	—	83	—	132	—	145

SOURCE: Atkins

Table 5-2 Airside Evaluation Matrix

Evaluation Factors	Weighted Multiplier 1 to 5	Ranking 1 to 5	Concourse B Expansion Total Score	Ranking 1 to 5	Concourse C Expansion Total Score	Ranking 1 to 5	Concourse D Expansion Total Score	Ranking 1 to 5	Concourse B + C + D Expansion Total Score	Ranking 1 to 5	New Concourse A Total Score	Ranking 1 to 5	New Concourse E Total Score
Net Gain in Gates	4	3	12	3	12	3	12	3	12	5	20	5	20
Airfield Operational Impacts	4	4	16	4	16	4	16	4	16	5	20	5	20
Drainage Impacts	3	4	12	4	12	4	12	3	9	5	15	5	15
Utilities Impacts	2	4	8	4	8	4	8	3	6	5	10	5	10
Proximity to Runway 6-24	3	4	12	3	9	4	12	4	12	5	15	5	15
Additional Pavement Required	3	2	6	5	15	5	15	2	6	2	6	5	15
Construction Phasing Loss of Gates	4	2	8	3	12	2	8	2	8	5	20	5	20
Construction Phasing Apron Impacts to Aircraft Traffic	2	3	6	3	6	3	6	3	6	5	10	5	10
Impacts to Construction Deliveries & Access	4	2	8	2	8	2	8	2	8	4	16	5	20
ATCT Line of Sight Impacts	4	3	12	3	12	3	12	3	12	5	20	5	20
Airside Subtotal Score	—		76	—	71	—	81	—	56	—	129	—	137

SOURCE: Atkins

Table 5-3 Landside Evaluation Matrix

Evaluation Factors	Weighted Multiplier 1 to 5	Ranking 1 to 5	Concourse B Expansion Total Score	Ranking 1 to 5	Concourse C Expansion Total Score	Ranking 1 to 5	Concourse D Expansion Total Score	Ranking 1 to 5	Concourse B + C + D Expansion Total Score	Ranking 1 to 5	New Concourse A Total Score	Ranking 1 to 5	New Concourse E Total Score
Departure Curbside Level of Service	5	1	5	1	5	1	5	4	20	5	25	5	25
Arrival Curbside Level of Service	5	1	5	1	5	1	5	5	25	4	20	4	20
Construction Phasing Landside Traffic Impacts	3	4	12	4	12	4	12	2	6	2	6	2	6
Utilities Impacts	1	5	5	5	5	5	5	1	1	1	1	1	1
Landside Subtotal Score	—		**27**	—	**27**	—	**27**	—	**52**	—	**52**	—	**52**

SOURCE: Atkins

Table 5-4 Overall Scenario Evaluation

Evaluation Factors	Weighted Multiplier 1 to 5	Ranking 1 to 5	Concourse B Expansion Total Score	Ranking 1 to 5	Concourse C Expansion Total Score	Ranking 1 to 5	Concourse D Expansion Total Score	Ranking 1 to 5	Concourse B + C + D Expansion Total Score	Ranking 1 to 5	New Concourse A Total Score	Ranking 1 to 5	New Concourse E Total Score
Permitting & Environmental Factors	1	5	5	5	5	5	5	3	3	1	1	1	1
Ultimate Expansion Capability	5	1	5	1	5	1	5	2	10	4	20	5	25
Proximity to Existing Infrastructure	3	3	9	3	9	3	9	1	3	1	3	5	15
Construction Schedule	2	5	10	5	10	5	10	1	2	3	6	3	6
Costs	5	5	25	5	25	5	25	3	15	5	25	5	25
Overall Subtotal Score	—		**54**	—	**54**	—	**54**	—	**33**	—	**55**	—	**72**
Overall Total Score	—		**245**	—	**250**	—	**259**	—	**224**	—	**368**	—	**406**
Meets PAL 3 Demand	—		NO	—	NO	—	NO	—	NO	—	YES	—	YES

SOURCE: Atkins

Four passenger terminal alternatives were developed and evaluated for the construction of Concourse E:

- **Alternative 1: "Linear A" Option** – as depicted in **Figure 5-23**, similar to the existing Concourses B, C, and D, this option represents a modern layout of the linear terminal concept where the building configuration emphasizes aircraft movement efficiency.
- **Alternative 2: "Knuckle" Option** – as depicted in **Figure 5-24**, slightly different than the "Linear" option, this alternative also emphasizes an efficient linear aircraft layout and provides additional area with an angled concourse extension for possible use as concessions. For the purposes of this analysis, the angled section of the terminal is referred to as the "knuckle." This option maximizes passenger movements, sight lines, and potential concession area.
- **Alternative 3: "Y" Option** – as depicted in **Figure 5-25**, this alternative is configured to reduce the passenger walking distances to the ends of the terminal building. However, the overall building and apron footprint utilizes a larger portion of the airfield.
- **Alternative 4: "Linear B" Option** – as depicted in **Figure 5-26**, similar to the existing Concourses B, C, D, and the "Linear A" option, this alternative represents a more traditional linear terminal concept where the building layout emphasizes aircraft movement efficiency.

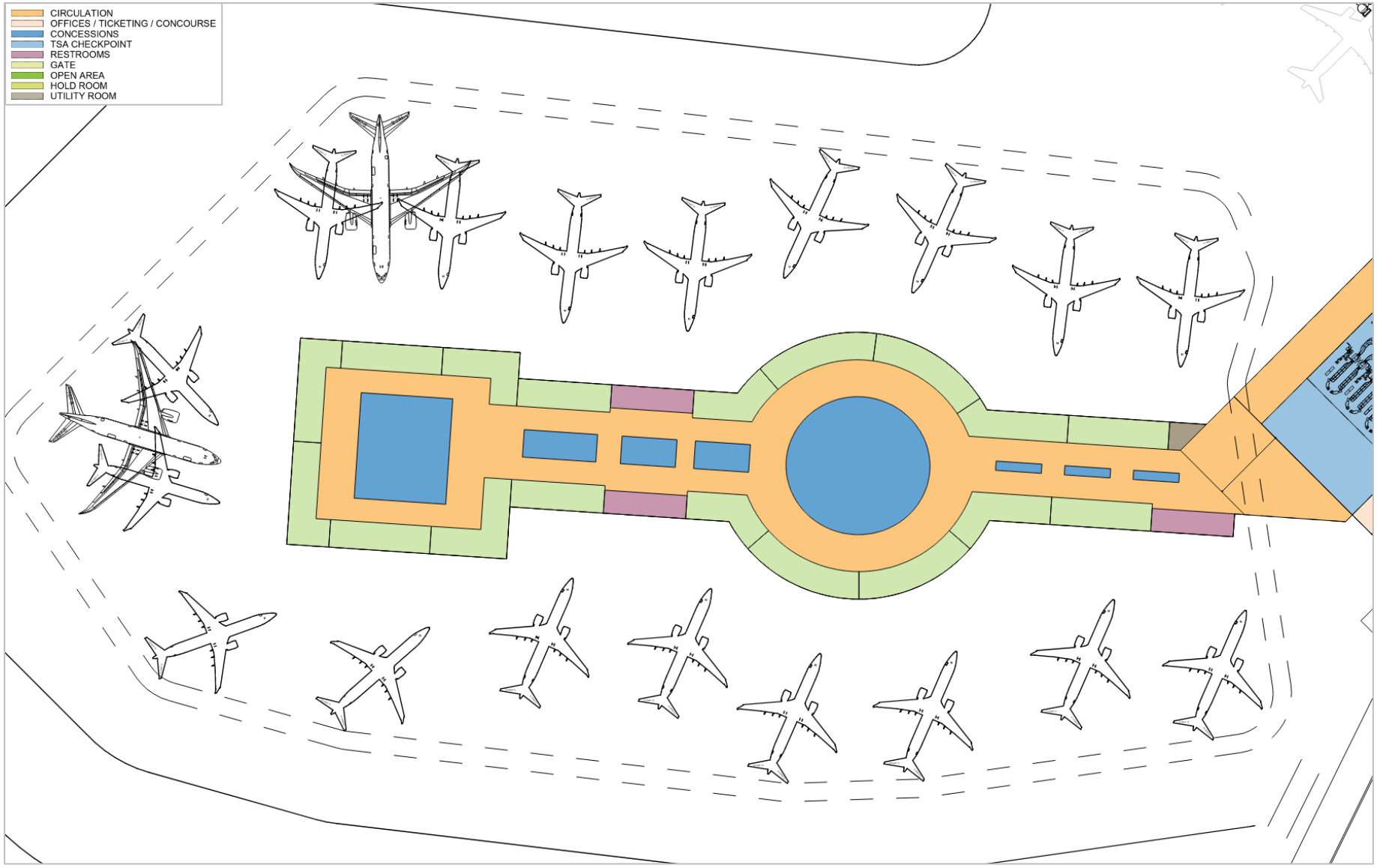
Although 14 gates are required to meet PAL 3 demand requirements, the Concourse E alternatives were developed to account for the ultimate condition through PAL 4, which includes 18 to 19 aircraft gates. As such, the three passenger terminal alternatives include between 18 and 19 gates. For the purposes of this study, it is assumed the four to five additional gates would not be constructed until PAL 4 demand levels have been reached.

As depicted in **Figure 5-23**, Alternative 1 can accommodate up to 18 ADG-III aircraft gates through PAL 4, including two Multiple Apron Ramp System (MARS) gates capable of accommodating up to two ADG-V aircraft. In the ultimate condition, this configuration would require approximately 162,000 square yards of apron pavement. This approximately 196,000-square-foot Concourse E option would provide approximately 3,200 square feet of hold room area per gate. This alternative would allow for approximately 37,000 square feet of concession space.

As depicted in **Figure 5-24**, Alternative 2 can accommodate up to 19 ADG-III aircraft gates through PAL 4, including three MARS gates capable of accommodating up to three ADG-V aircraft. In the ultimate condition, this configuration would require 180,000 square yards of apron pavement. This approximately 183,000-square-foot Concourse E option would provide approximately 3,200 square feet of hold room area per gate. This alternative would also provide an additional 29,000 square feet of concession space.

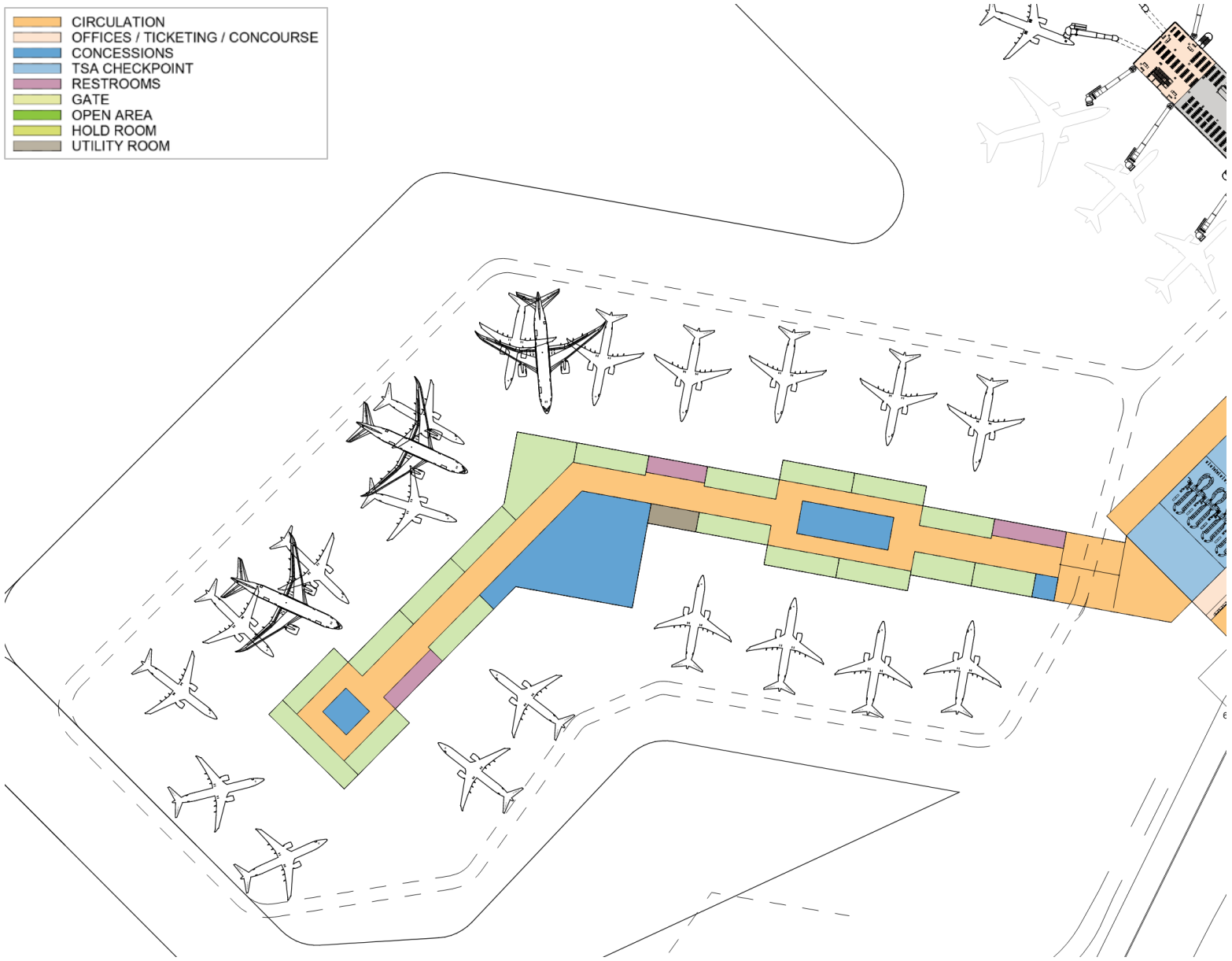
As depicted in **Figure 5-25**, Alternative 3 can accommodate up to 18 ADG-III aircraft gates through PAL 4, including two MARS gates capable of accommodating up to two ADG-V aircraft. In the ultimate condition, this configuration would require approximately 185,095 square yards of apron pavement. This approximately 208,112-square-foot Concourse E option would provide approximately 3,200 square feet of hold room area per gate. This alternative would also provide an additional 37,500 square feet of concession space

As depicted in **Figure 5-26**, Alternative 4 can accommodate up to 19 ADG-III aircraft gates through PAL 4, including two MARS gates capable of accommodating up to two ADG-V aircraft. In the ultimate condition, this configuration would require approximately 231,000 square yards of apron pavement and 57,000 square yards of taxiway pavement. This approximately 120,000-square-foot Concourse E option would provide approximately 3,200 square feet of hold room area per gate. This alternative would also provide an additional 21,000 square feet of concession space.



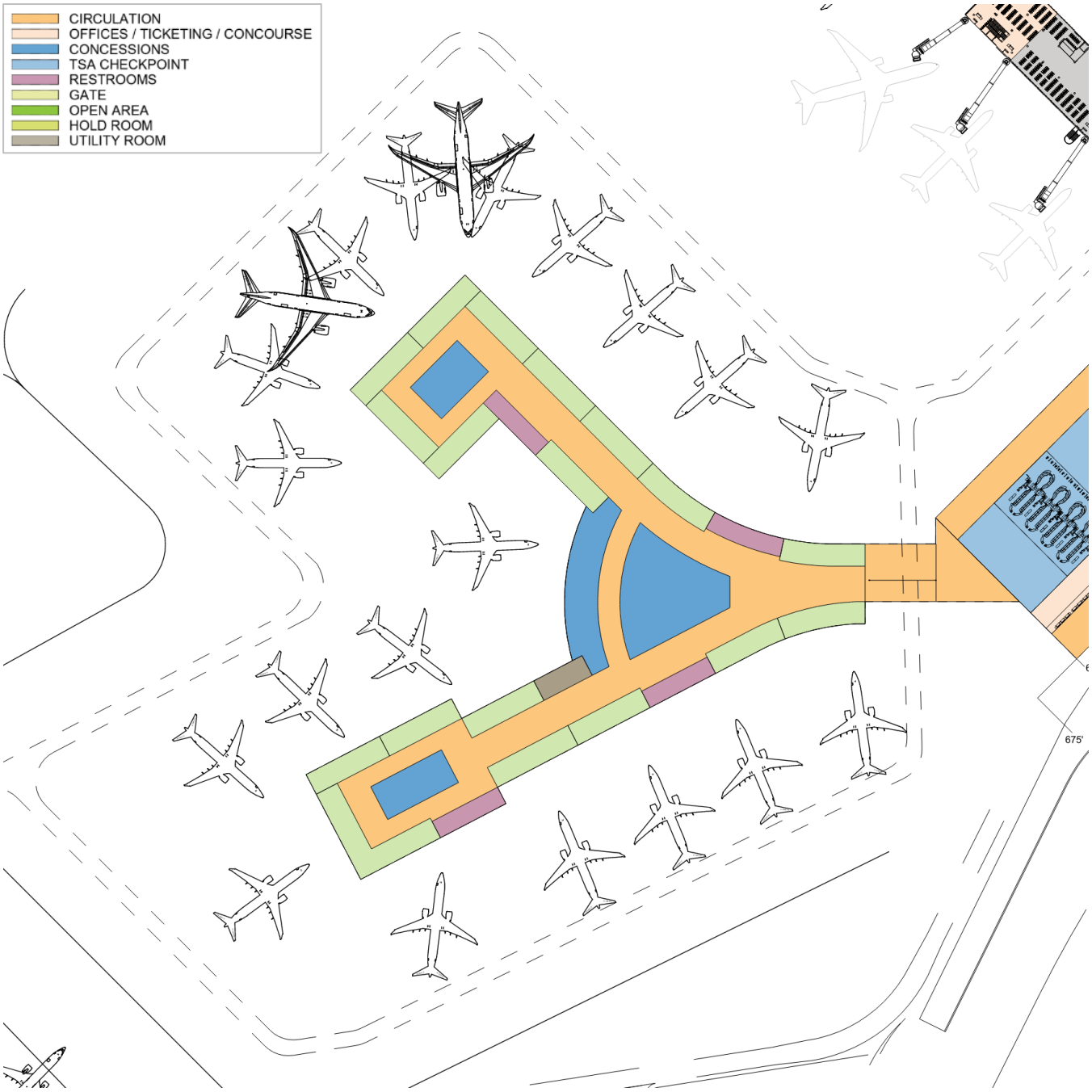
SOURCE: Atkins

Figure 5-23 Alternative 1: Linear Concourse E Alternative



SOURCE: Atkins

Figure 5-24 Alternative 2: Knuckle Concourse E Alternative



SOURCE: Atkins

Figure 5-25 Alternative 3: "Y" Concourse E option

SOURCE: Atkins

Figure 5-26 Alternative 3: "Linear B" Concourse E Option

Passenger Terminal Alternatives Summary

To conclude, implementation cost and the ability for the Airport to recover costs through terminal operations is the determining factor for selecting the preferred passenger terminal alternative. As PAL 3 and PAL 4 demand levels are reached in the future, it is recommended a financial feasibility assessment be made to ultimately determine if implementing the preferred alternative would be practicable.

As previously mentioned, the preferred passenger terminal alternative was determined based primarily on ROM construction costs. While Alternatives 1 through 3 were feasible options, Alternative 4 (Linear B) resulted in the lowest overall construction costs while still meeting PAL 3 and PAL 4 demand level requirements. As illustrated in Figure 5-26, Alternative 4 is the preferred terminal option through PAL 4.

The selected alternative would provide 18 to 19 aircraft gates and approximately 120,000 square feet of concourse space that meet facility requirements. The modern and streamlined architectural layout provide a substantial increase to level of passenger service compared to the three existing concourses while still minimizing costs. As such, Alternative 4 is recommended as the preferred option when demand levels are met to trigger discussions on formal terminal design and construction phasing.

5.4 Landside – Access, Circulation, and Parking

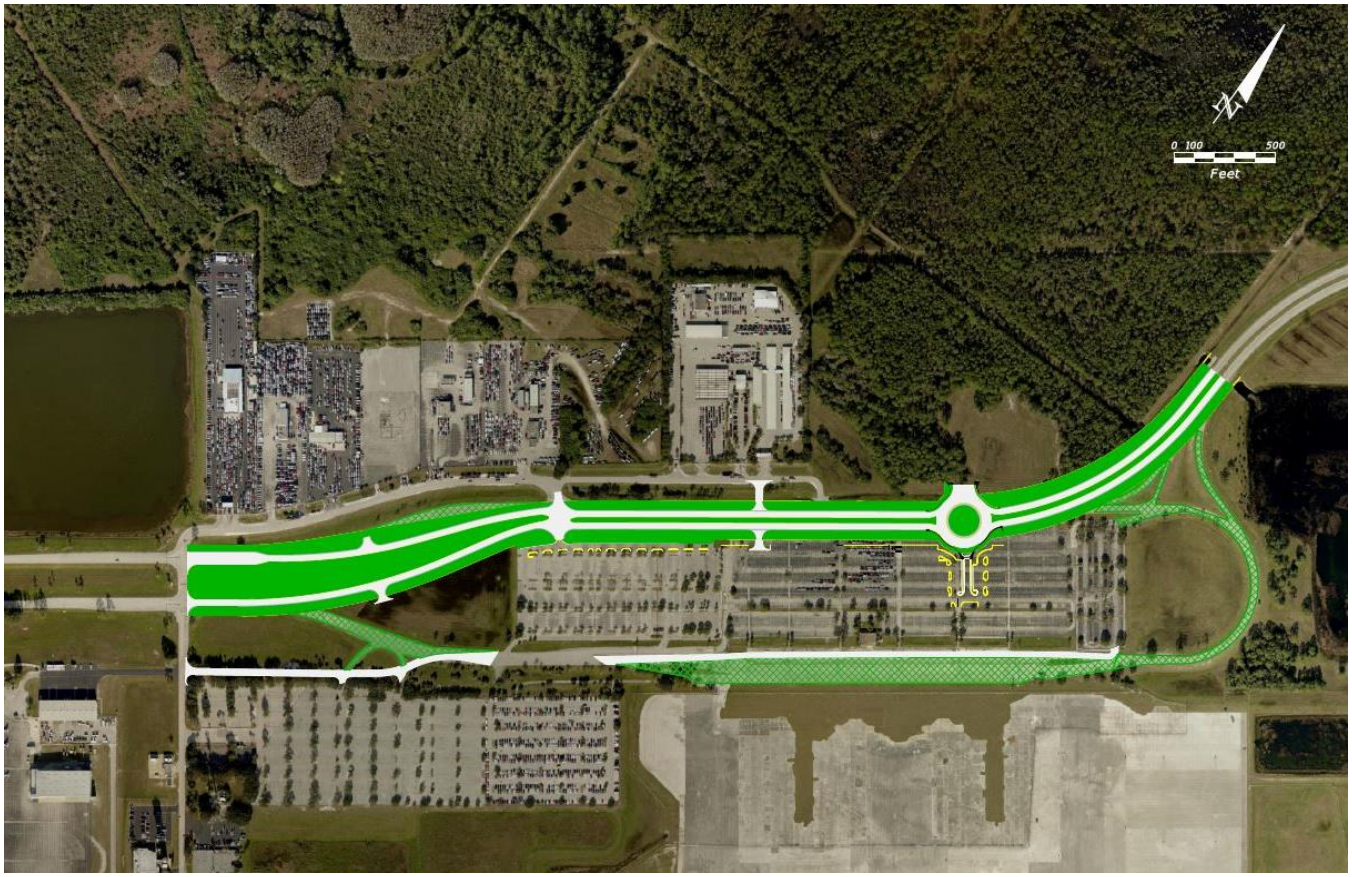
Previous studies have been completed to analyze the demand generated by aviation activity that will be placed on RSW internal roadway network and curbfronts over various horizons (5-year, 10-year, etc.). These studies have been reviewed as part of this Master Plan Update and the recommended alternatives for the roadway network and curbfronts are summarized in the sections that follow. Rough order of magnitude cost estimates that were developed for these recommendations are also included. The recommendations from the previous studies have been validated by the demand-to-capacity assessment and are still recommended.

Chamberlin Parkway

The 2017 *Chamberlin Parkway Alignment Study*. evaluated three alternative realignments for improving the safety and function of Chamberlin Parkway. The Study recommended that the North Alignment be selected for the Chamberlin Parkway realignment due to this scenario providing the greatest long-term benefit to the LCPA. This study determined that the North Alignment affords the greatest flexibility of future development within the Chamberlin Loop Site and proposes minimal immediate impacts to the existing parking facilities while not requiring significant modifications to maintain access to the existing rental car facilities.

The North Alignment begins just east of Private Sky Way and generally follows the existing westbound Chamberlin Parkway lanes. The existing eastbound lanes transition to the north reducing the width of the existing median from 150 feet to 22 feet. The 22-foot median is achieved just west of Regional Lane. The alignment continues east until a reverse crown superelevated curve ties the corridor into the existing Paul J. Doherty Parkway. To minimize anticipated permitting efforts and reduce project costs, the alignment terminates just south of the existing box culvert located on Paul J. Doherty Parkway. **Figure 5-27** illustrates the alignment of this alternative.

Design and bidding for this alternative was completed in 2022, and construction is anticipated to be complete during the PAL 1 period. Components of this project also under consideration are Perimeter Road resurfacing, Chamberlin Road curve rehabilitation, and demolition of portions of the old terminal parking area for redevelopment purposes.



SOURCE: Johnson Engineering, *Chamberlin Parkway Alignment Study*, 2017 (Appendix M)

Figure 5-27 Chamberlin Parkway North Alignment Alternative

Daniels Parkway and Paul J. Doherty

The 2019 *Daniels Parkway and Paul J. Doherty Parkway Assessment* developed by Kimley-Horn presented a traffic assessment which analyzed existing traffic conditions at the intersection of Daniels Parkway/CR 876 at Paul J. Doherty Parkway/Gateway Boulevard and adjacent intersections. Geometric and signal timing improvements were developed to improve delays and vehicle queues at the intersection of the study intersection. Three potential improvements were developed and intended to be constructed sequentially. The improvements consist of the following:

- Option 1:
  - Re-configure the northbound approach to include one left-turn lane, one shared through/left-turn lane, and one shared through/right-turn lane.
  - Add lane line extensions (guidelines) for the northbound left-turn lanes to improve left-turn paths through the intersection.
- Option 2:
  - Re-configure the northbound approach to include two left-turn lanes and one shared through/right-turn lane.
  - Re-configure the southbound approach to include one exclusive left-turn lane, and one through lane, and two right-turn lanes.
  - Modify the existing signal timing to allow for protected northbound left-turns and modify signal heads to account for protected/permitted northbound and southbound phasing.

- Option 3:
  - Re-configure the northbound approach to include two left-turn lanes, one through lane, and one exclusive right-turn lane.
  - Re-configure the southbound approach to include one exclusive left-turn lane, and one through lane, and two right-turn lanes.
  - Modify the existing signal timing to allow for protected northbound left-turns and modify signal heads to account for protected/permitted northbound and southbound phasing.

An intersection capacity analysis determined that Option 1 improvements are expected to reduce delays by up to 11.7 seconds while Option 2 and Option 3 improvements are expected to improve delays at the intersection of Daniels Parkway/CR 876 and Paul J. Doherty Parkway by up to 31.2 seconds. Furthermore, a 95th percentile queue analysis determined that Option 1, Option 2, and Option 3 improvements are expected to improve queues at all approaches at the intersection of Daniels Parkway/CR 876 and Paul J. Doherty Parkway. Note that Option 3 improvements do not improve operations during the A.M. peak hour and result in minimal improvements during the P.M. peak hour when compared to Option 2 improvements.

Terminal Access Road

The 2016 *RSW Terminal Curb Front Roadway Assessment* developed by Kimley-Horn conducted a demand-to-capacity and LOS assessment for the terminal curb front roadways. The objective of the study was to develop improvements and an implementation forecast year in order to mitigate future congestion at the identified points and problem areas. The short-term improvements were developed for implementation immediately or within the next three years. These improvements are non-structural, will not require a long planning phase, and are focused on improving the efficiency and quality of passenger service of the existing curb fronts. The following is the list of short-term improvements for each curb front level.

Lower-Level Short-Term Improvements

Proposed Pavement Markings

- Two 12-foot Inner Curbing Lanes – Hashed
- Two travel lanes
- Remove 'Exit' lane pavement markings from the outer lane

Improve Enforcement

- Improve enforcement with additional staff to create faster turnover and shorter dwell times at curb front

Removal of Pedestrian Crosswalk

- Removal of the pedestrian crosswalk at Exit Door 6.
- This is the last crosswalk before exiting the terminal curb front and is underutilized compared to the other five crosswalks. The removal is necessary to improve flow of traffic exiting the terminal. Additional wayfinding will be necessary to guide pedestrians to remaining crosswalks/access points.

Relocation of Large Vehicles to GTA

- Move large capacity vehicles to limited access GTA; coordination with tour buses, limo companies, private van companies, etc. is needed
- Transponder/permitting policy changes would be necessary

Short-Term Improvements for Both Levels

Implement Dynamic Message Signs (DMS)

- Use of DMS to redistribute traffic by changing airline signage along the curb fronts to balance demand (directs vehicles to curb evenly)
- When peaking is isolated to one curb front only, DMS can be used to communicate available capacity and travel times along strategic positions on the in-bound roadways in order to re-direct passengers to non-peaking level. These DMSs will encourage the use of underutilized levels as drivers are alerted to increased travel times or curb front congestion.

The long-term improvements were developed to be planned and implemented from year 2020 to year 2030, depending on airport growth. The proposed upper-level improvement, illustrated in **Figure 5-28**, is suggested to be combined with the recommended lower-level alternative.

Upper-Level Long-Term Improvements

The Upper-Level long-term improvements will maintain an acceptable level of service for airport users and includes:

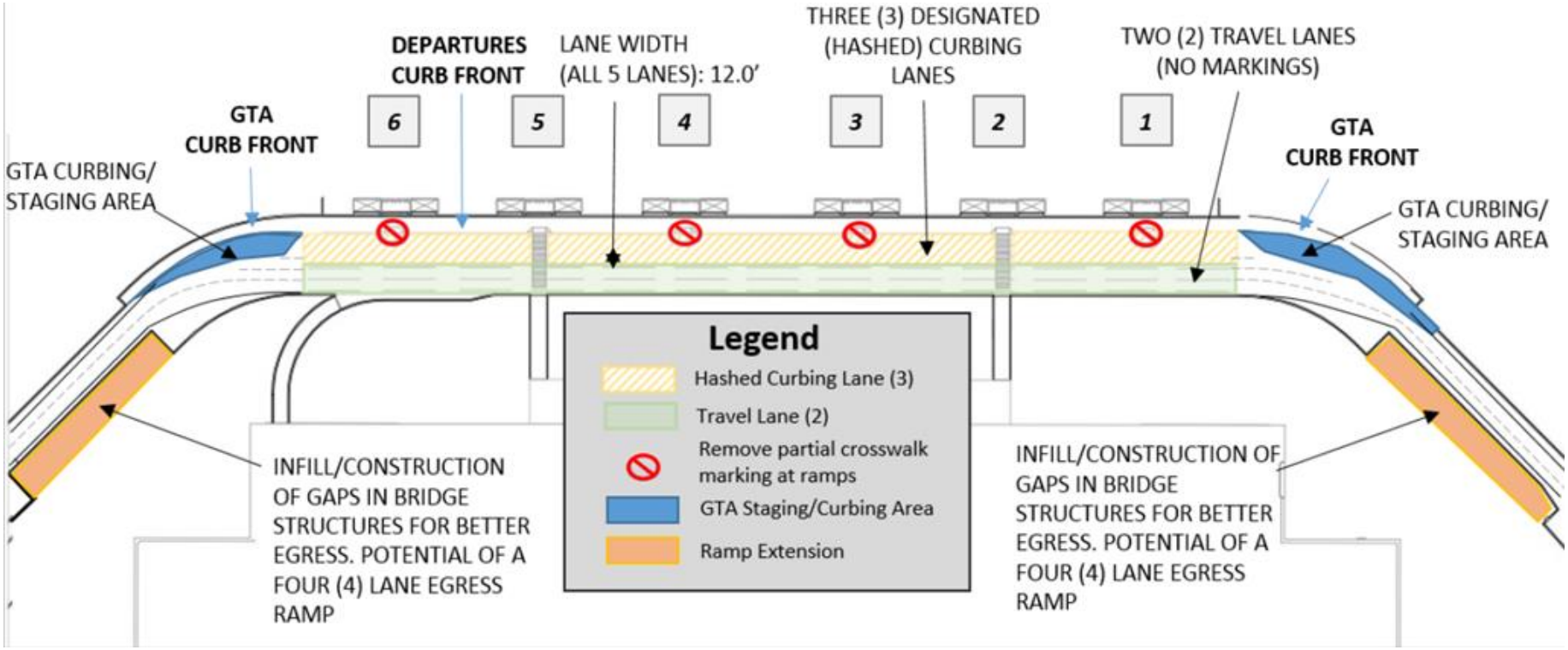
- Create Two GTAs at the Entrance and Exit of the Terminal
  - Use existing 'No Parking' zones at entry and exit locations of terminal to create a drop off location for shuttles and large vehicles
  - Infill/construct the existing gaps in the bridge structures to allow for roadway widening that can accommodate the proposed GTA area along with a total of three additional approach/exit lanes
- Additional Curbing Lane
  - Change in pavement markings only if demand continues to show the need for it at the time
  - Change pavement markings to assign three, 12' curbing lanes (hashed) instead of two
  - Change pavement markings to assign two travel lanes instead of three

The improvements are summarized in Figure 5-28.

Lower-Level Long-Term Improvements

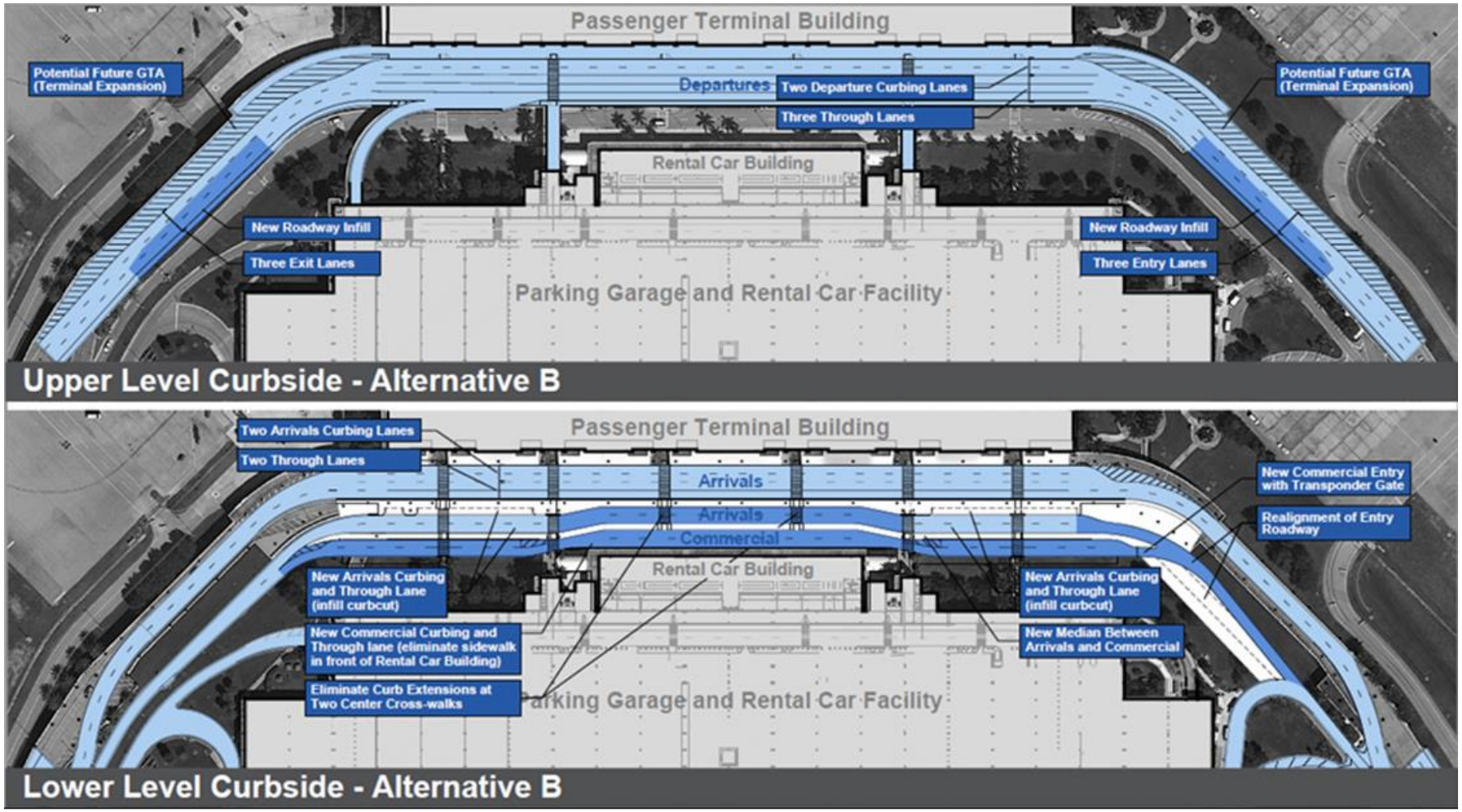
The proposed alternative, Alternative B, proposes changes to the GTA curb front area only; no changes to the existing lower-level curb front are proposed assuming the short-term improvements were implemented. **Figure 5-29** depicts the proposed improvement. The following explains the lane assignments proposed in this alternative from the lane at the GTA closest to the terminal side and is shown in the following exhibit:

- Median – used at GTA for loading/unloading to be converted for private vehicle curbing use
- Private Vehicle Curbing – Existing lane width (one lane)



SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-28 Long-Term Upper-Level Improvements



SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-29 Alternative B Curbside Analysis

- Private Vehicle Travel Lane – Existing lane width (one lane)
- New median for loading/unloading GTA passengers
- GTA Curbing – Existing lane width (one lane)
- GTA Vehicle Travel Lane – Reduction of existing sidewalk between sheltered crosswalks '2' and '5' to allow for addition of GTA travel lane

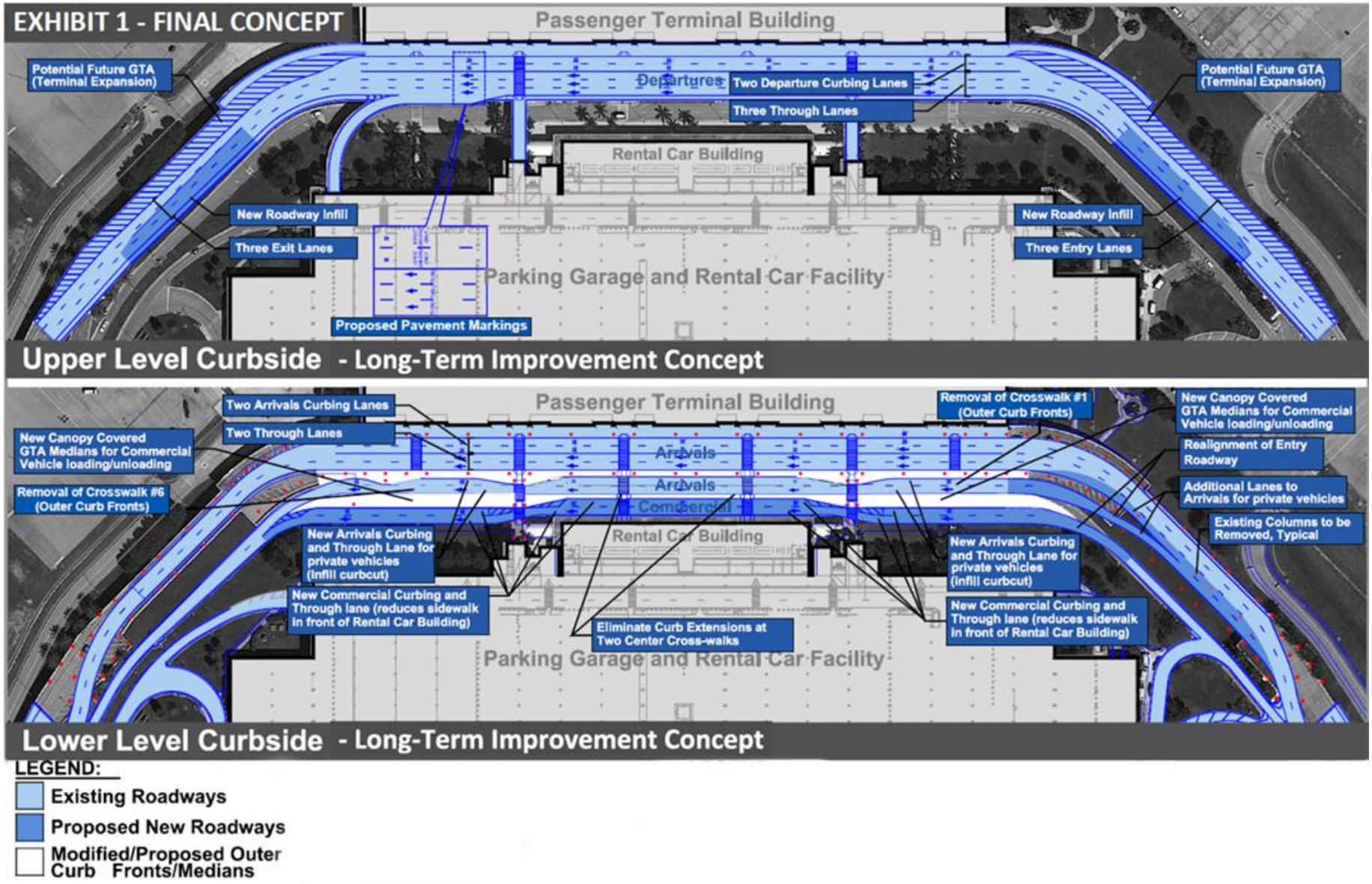
It should be noted that with this alternative the private vehicles would curb on the median that the GTA currently uses for staging/curbing. With the addition of the new median in the middle of the GTA, the commercial vehicles will continue to onload/offload through their right-hand side doors. For this alternative, the entrance gate for permitted vehicles would need to be relocated and additional wayfinding would be required in order to indicate to the private vehicle drivers that additional curbing space is available at the inner lane of the GTA. Follow up on Alternative B was advised by LCPA as an additional evaluation effort so that more detailed measurements, logistics and graphics of Alternative B are provided in Figure 5-29.

Final Long-Term Improvement Concept

In response to the LCPA request for a refined analysis to be performed on the preferred alternative, Kimley-Horn completed the 2017 *RSW Terminal Curb Front Roadway Assessment*. This study presented the structural analysis performed on the upper-level ramps and of a final concept combining Alternative B with Alternative D, concepts from the 2016 *RSW Terminal Curb Front Roadway Assessment*.

As previously mentioned, LCPA selected Alternative B as the preferred long-term improvement concept and requested for additional details to be developed that included the integration of Alternative D, allowing for the expansion of upper and lower levels, along with curbing for private vehicles on an inner and outer curb front. A final improvement concept was developed and is depicted in **Figure 5-30**. The long-term improvement concept includes the following:

- Pavement markings indicating "thru" lanes and "Load/Unload Only" lanes added to all lanes
- A transformation of the existing commercial curb front median into an outer curb front for private vehicles.
  - One travel lane and one curbing lane (three separate curbing bays)
- Construction of the gaps on the entering/exiting upper-level ramps to allow for expansion of lower level and a potential commercial curbing capacity on the upper level. After reconstruction of lower-level travel lanes, private vehicles would have the option to curb at the inner or outer proposed curb front. This requires the existing columns to be relocated after the ramp expansions as seen in Figure 5-30. One additional lane on the upper-level entry/exit
  - Enough space for potential future upper-level commercial curbing area
  - One additional lane on the lower level entering/exiting to the inner curb front
  - One additional lane on the lower level entering exiting to the outer curb front
- Removal of the two bulb out curb extensions from the median in front of crosswalk #3 and #4 to allow for a larger and continuous outer curbing lane for private vehicles.
- Smoother angle cutouts for existing and remaining bulb out curb extensions on outer curbing lane for private vehicles
- Construction of canopy-covered commercial curbing areas consisting of a wide median (20-foot) for passengers and employees to wait for pick-up.



SOURCE: Kimley-Horn, RSW Terminal Curb Front Roadway Assessment, 2016 (Appendix P)

Figure 5-30 Long-Term Improvement Concept

- New outer curb front would include:
  - Maintaining current entry lane
  - One travel lane
  - One curbing lane (three separate curbing bays with designated staging curbing for each individual ground transportation mode)
  - Hatching and delineators proposed to avoid curbing on undesirable areas
  - Taxi booth location with covered access and wide passenger staging
  - Increased capacity for taxi staging
  - Removal of crosswalks #1 and #6 on the outer curb front

Designated Curbing Areas and Details

Details for staging and curbing locations of the multiple commercial vehicle modes are depicted **Figure 5-31** and indicate the curbing space assigned for each mode in different colors. Additional details such as dimensions for the lanes, medians, canopy covered commercial curbs fronts, and taxi booth are depicted in **Figure 5-32** through **Figure 5-34**. As part of the expansion, additional space proposed for passengers to queue while waiting for taxis as shown in **Figure 5-33**. Also, a police/LCPA staging area was also assigned and is depicted on Figure 5-32.

The proposed lower level through lane access road provides a secondary connection to the lower-level arrivals curb front. The proposed lane creates an opportunity for private vehicles picking up passengers on the west end of the terminal to bypass the congestion experienced on the east end of the curb front as demonstrated in **Figure 5-35**.

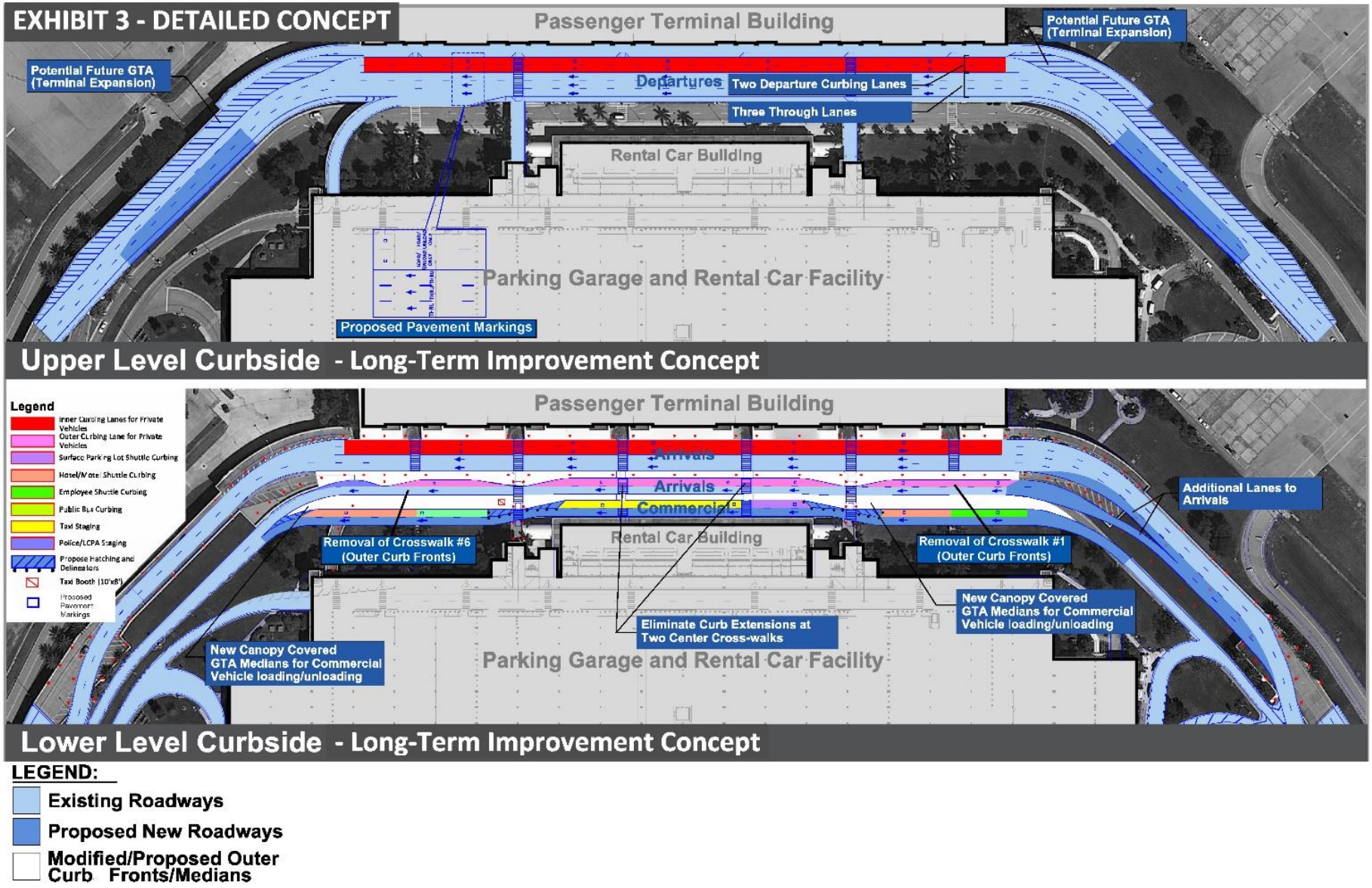
Parking and Rental Cars

Cell Phone Lot

To be able to meet current and future demand, it is recommended that either the existing cell phone lot be expanded or that a new cell phone lot location be explored. Expansion of the lot provides more supply for those wishing to use the lot while retaining the convenient location, next to the gas station. The first expansion alternative is to expand the cell phone lot to the southeast, adding an additional 80 stalls to bring the total amount of cell phone lot stalls to 164. This alternative is illustrated in **Figure 5-36**. A second expansion alternative is to relocate the cell phone lot to the north of the gas station, providing ~150 stalls. This alternative is illustrated in **Figure 5-37**. The third expansion alternative would relocate the cell phone lot to within the footprint of the existing employee parking lot. The cell phone lot would have approximately 160 stalls whereas the employee lot would lose a similar amount and can be seen in **Figure 5-38**. A fourth alternative is to expand the existing cell phone lot to the south. This alternative would increase the number of spaces available to ~280 and can be seen in **Figure 5-39**.

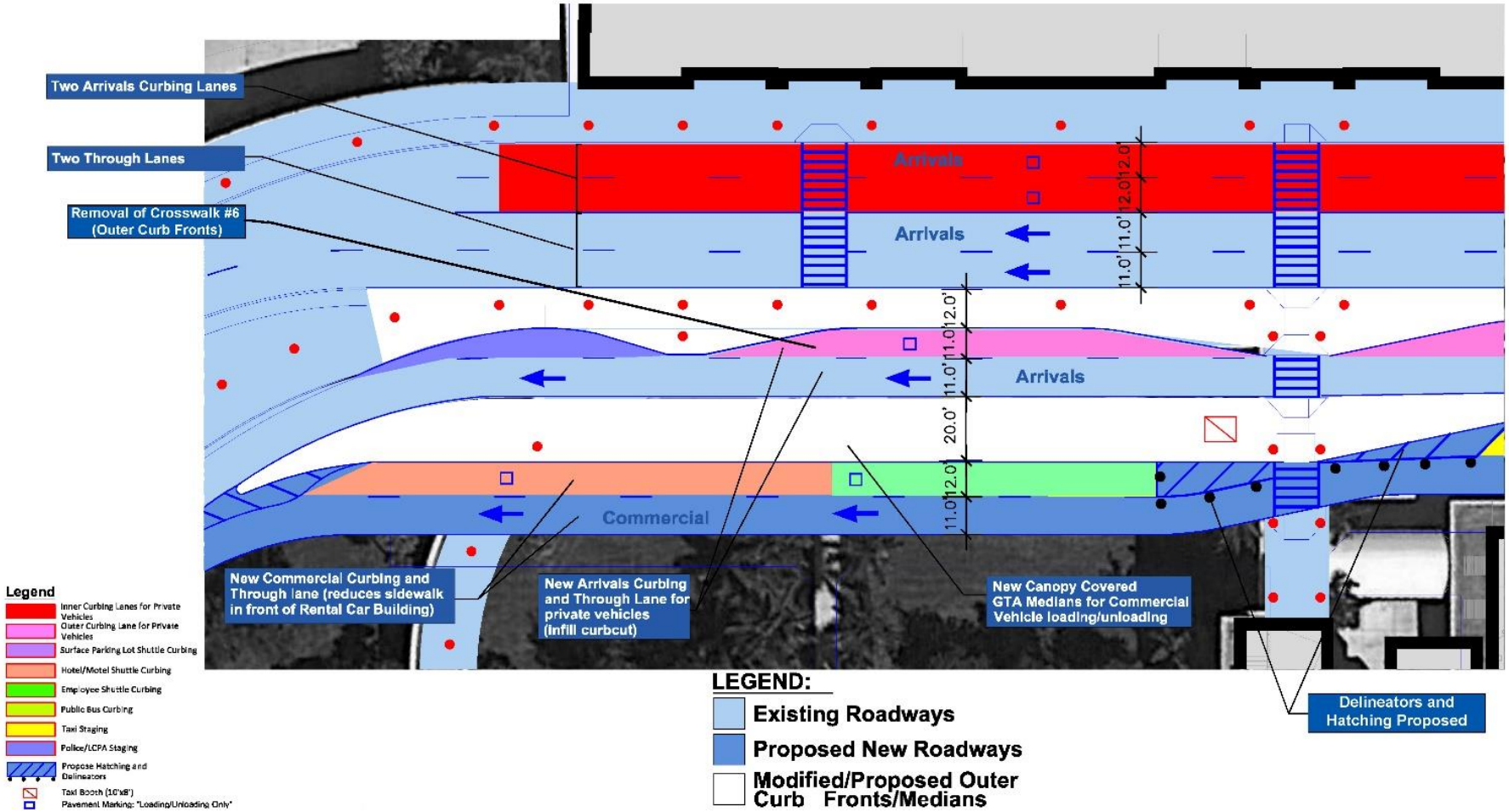
A fifth alternative for the cell phone lot would be to relocate it along Terminal Access Road to the southeast. The existing cell phone lot would remain the same in size and could be dedicated for alternate uses, such as a staging area for Transportation Network Companies (TNCs) such as Uber or Lyft. This alternative is depicted in **Figure 5-40**.

A no-build alternative is to keep existing facilities as they are and to put emphasis on advertising the grace period within the short-term garage. Large and legible signs within the cell phone lot could be utilized to inform cell phone lot users that the short-term garage is a possible place to wait. Currently, customers may leave the short-term garage 20 minutes after they enter and not be charged upon exiting.



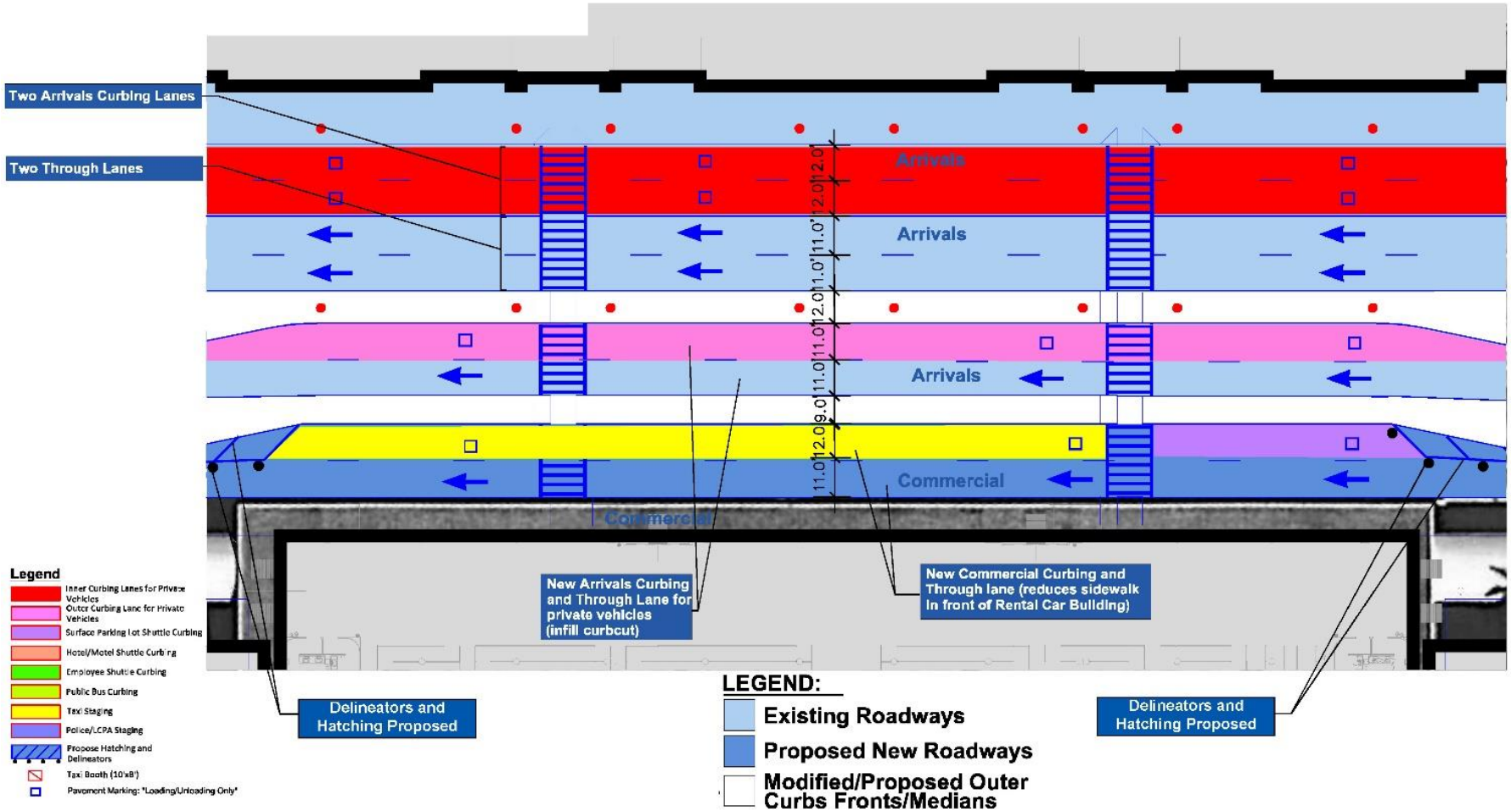
SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-31 Long-Term Improvement Concept Designated Curbing Areas



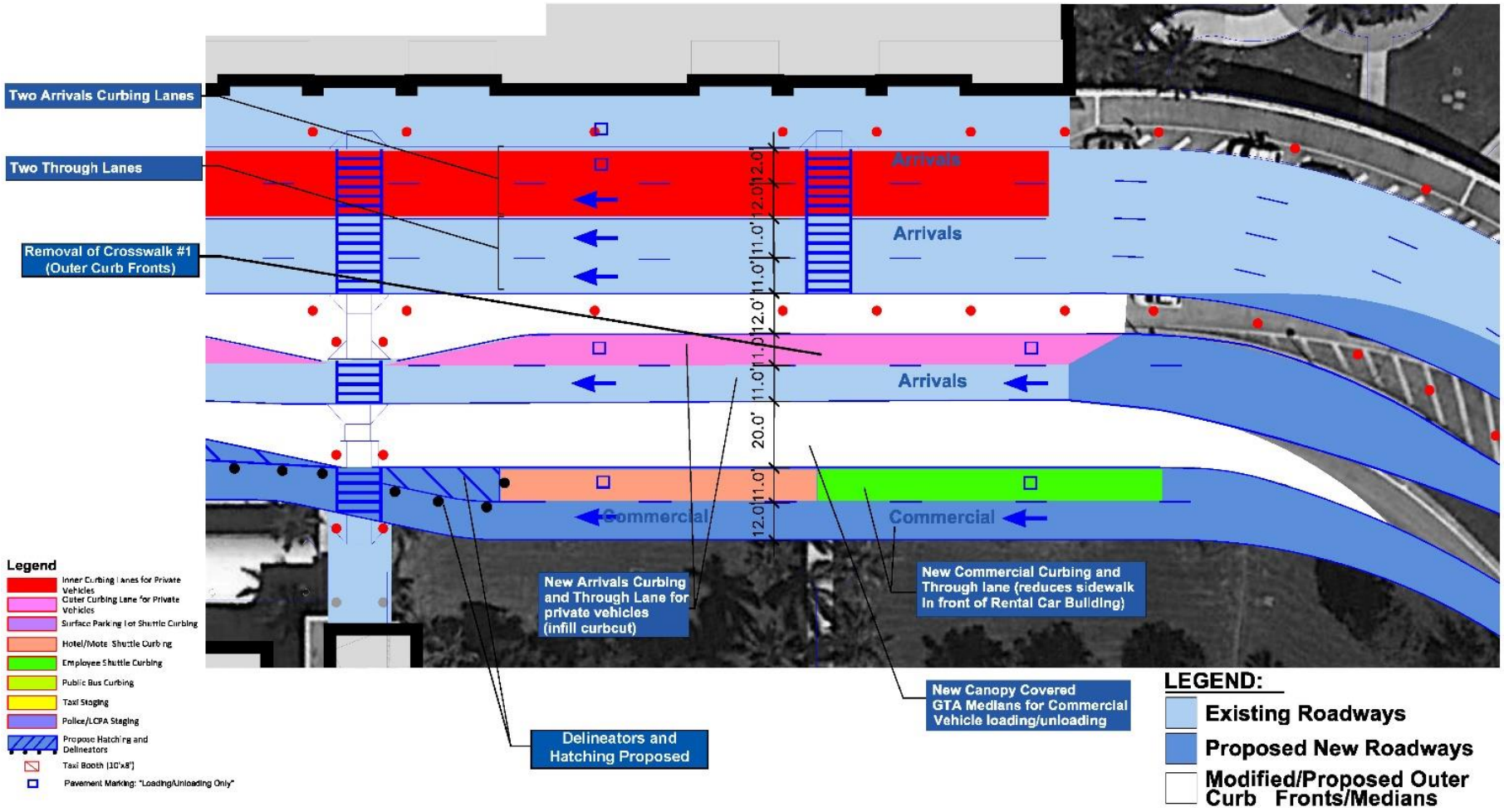
SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-32 West Designated Curbing Areas



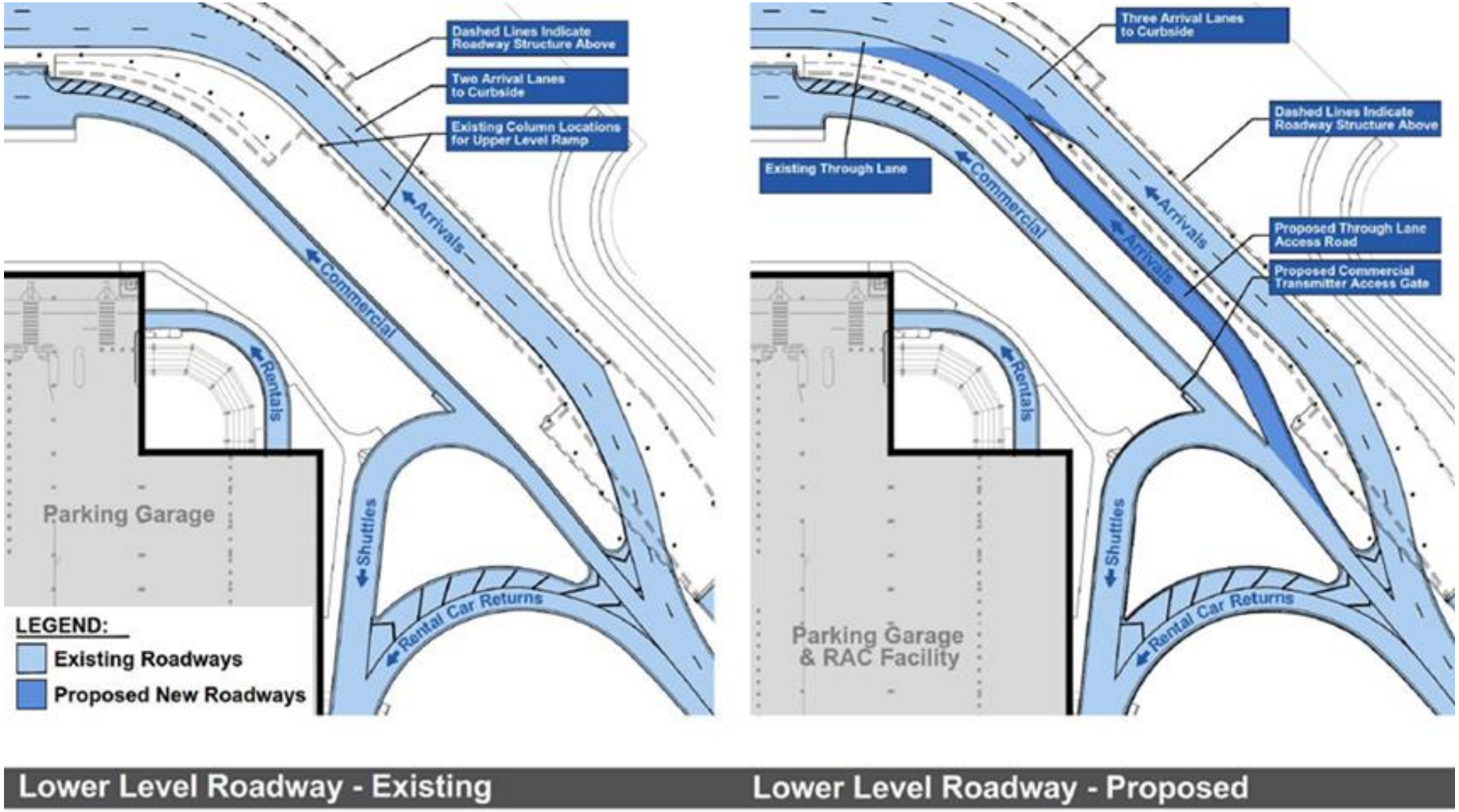
SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-33 Center Designated Curbing Areas



SOURCE: Kimley-Horn, *RSW Terminal Curb Front Roadway Assessment*, 2016 (Appendix P)

Figure 5-34 East Designated Curbing Areas

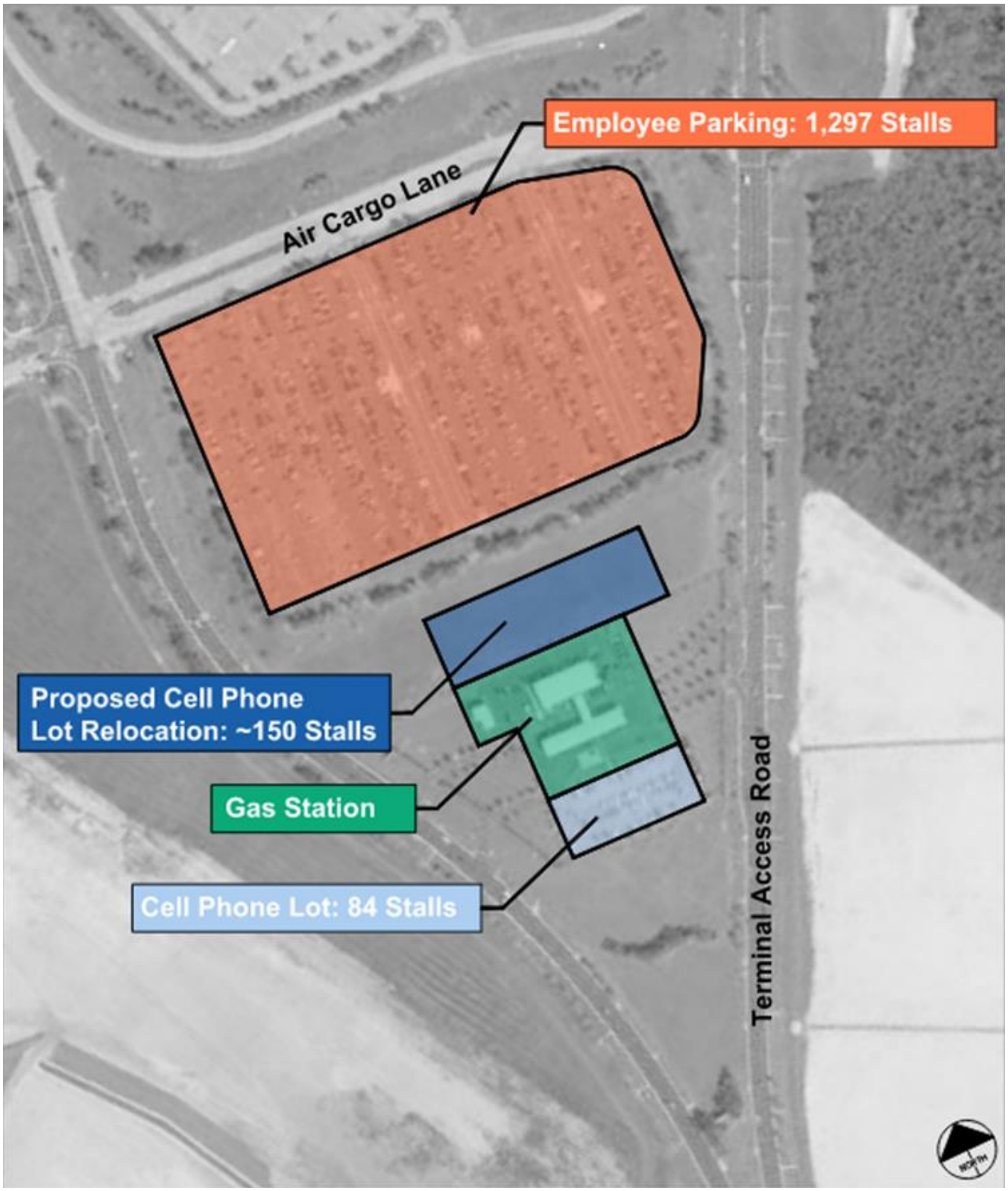


SOURCE: Kimley-Horn, *RSW Arrivals Access Lane Memo*, 2018

Figure 5-35 Proposed Lower-Level Through-Lane Access Road

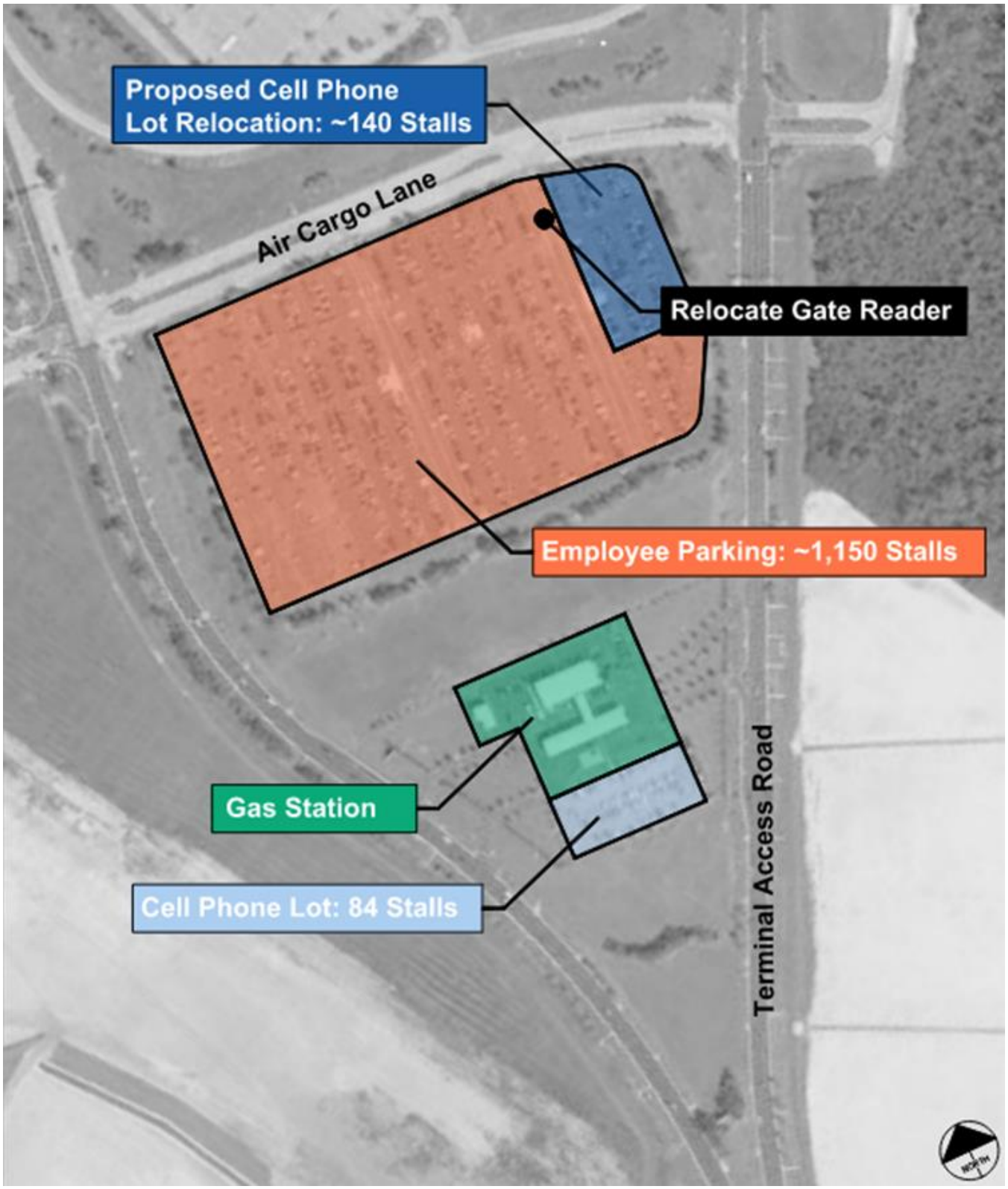
SOURCE: Kimley-Horn

Figure 5-36 Cell Phone Lot Alternative 1



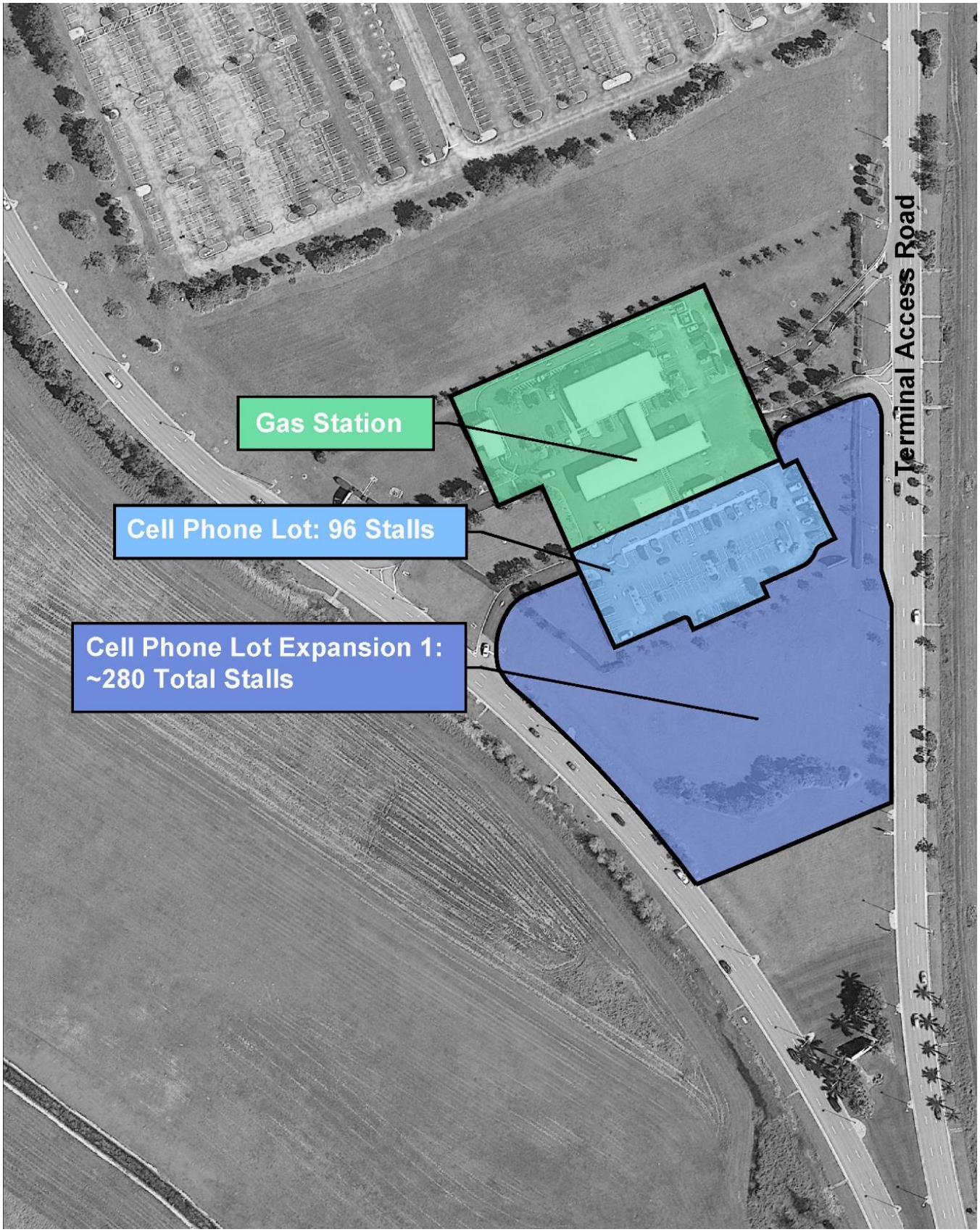
SOURCE: Kimley-Horn

Figure 5-37 Cell Phone Lot Alternative 2



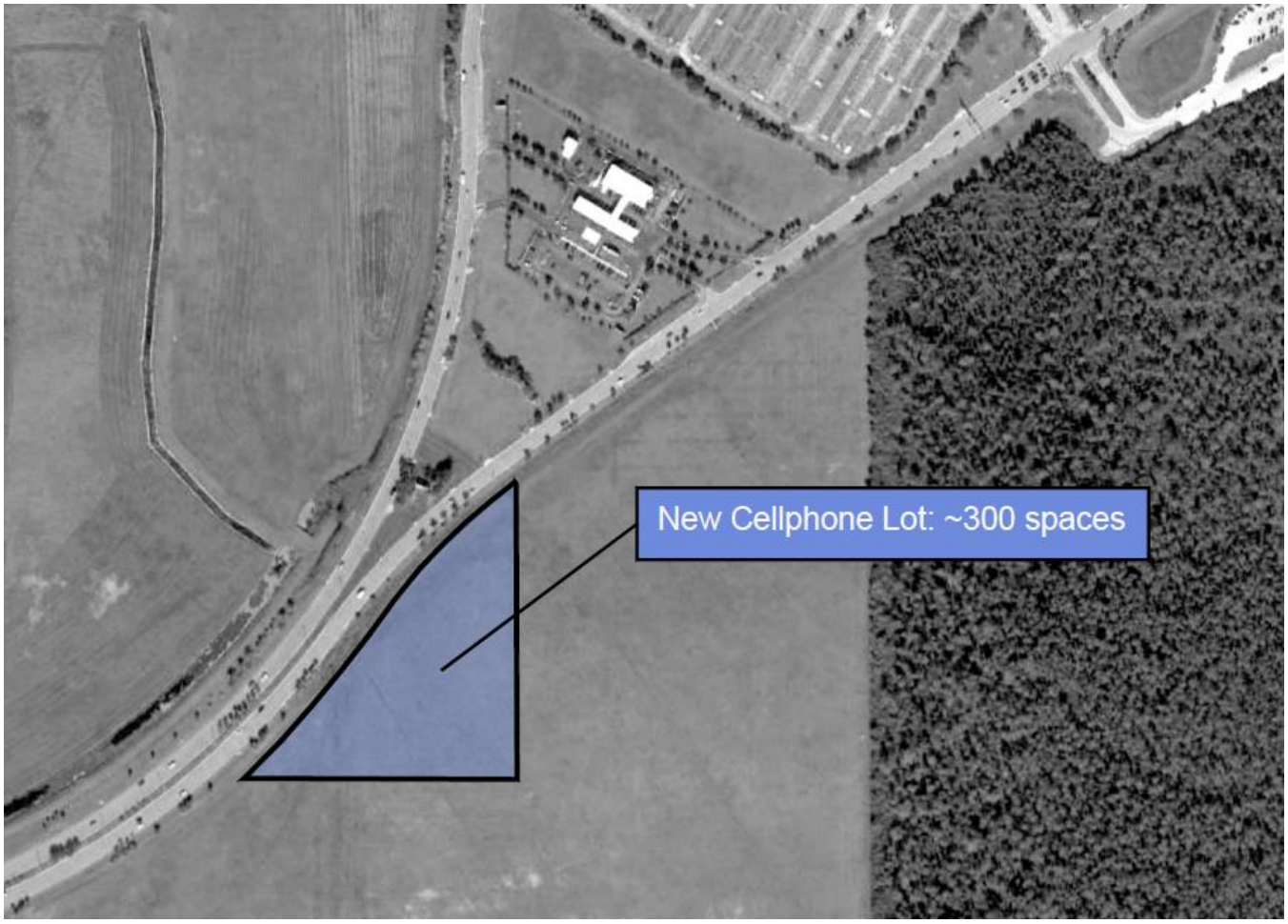
SOURCE: Kimley-Horn

Figure 5-38 Cell Phone Lot Alternative 3



SOURCE: LCPA

Figure 5-39 Cell Phone Lot Alternative 4



SOURCE: LCPA

Figure 5-40 Cell Phone Lot Alternative 5

Construction on this new lot in 2030 would satisfy anticipated demand through PAL 4.

Employee Lot

With strong passenger demand, the need for more airport employees for airlines, concessions, and LCPA staff will require more employee parking capacity. The current employee lot can accommodate 1,297 employee vehicles which will be sufficient to meet PAL 1 requirements. An expansion to the employee lot should be completed at that point or within a year as the excess capacity at PAL 1 will only be 22 spaces. It is anticipated that by PAL 4, there will be a need for an additional 420 spaces to meet employee parking requirements. A summary of demand requirements and proposed capacity improvements are located in Table 5-5.

To best meet the expanded employee parking requirements, a new expansion to the south of the existing lot would add the required 420 spaces and can be seen in Figure 5-41.

Table 5-5 Employee Parking Demand

PAL Level – Year	Demand Capacity	Employee Spaces (March)
Existing – 2022	—	1,297
PAL 1 – 2026	Demand	1,275
	Capacity	+22
2030 420-SPACE NEW EMPLOYEE LOT OPENS		
New Totals		1,717
PAL 2 – 2031	Demand	1,408
	Capacity	+309
PAL 3 – 2036	Demand	1,555
	Capacity	+162
PAL 4 – 2041	Demand	1,717
	Capacity	0

SOURCE: Kimley Horn & Associates

SOURCE: LCPA

Figure 5-41 Employee Parking Lot Expansion

Public Parking, Short-Term and Long-Term

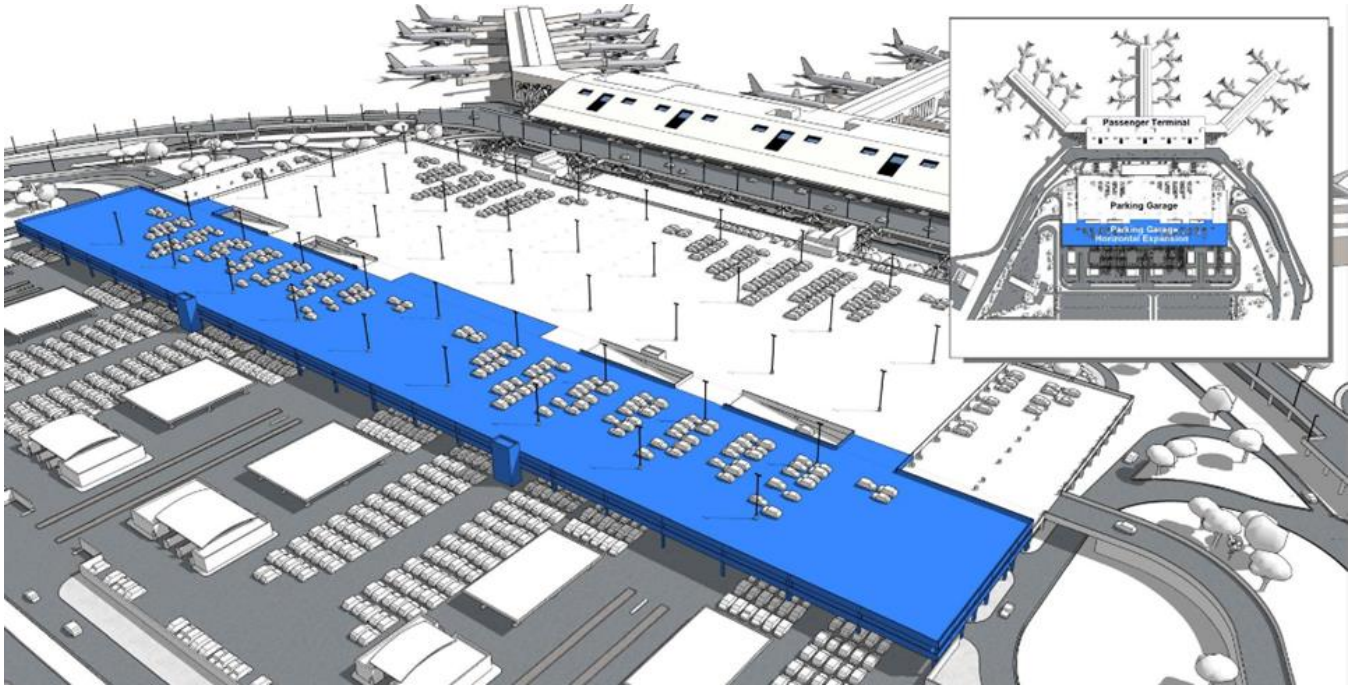
While the current total parking supply of 11,194 spaces is adequate to meet non-holiday demands (90% of the year) through PAL 4, additional surface parking is recommended to satisfy parking demand on the absolute peak day (Christmas). The parking system will need to be expanded in the near term to satisfy parking demand on the absolute peak day. The parking system could be expanded by either providing an additional surface parking facility or by expanding the parking garage vertically or horizontally.

Garage expansion options are proposed in order to increase public parking supply and to accommodate a rental car ready/return expansion. Due to the increased ready/return area, the QTA area will be pushed out into the public parking surface lot and will take up 150 public parking spaces. The three options are as follows:

1. The **first option** expands the two elevated parking garage levels horizontally to accommodate more stalls. Each expanded level can accommodate 575 more stalls each. The horizontal expansion also adds additional covered RAC space. This option results in the lowest net increase in total parking (+546). Stall tabulation for the parking is shown in **Table 5-6**. **Figure 5-42** shows this option.

Table 5-6 Garage Option 1 – Stall Tabulation Parking

Stall Tabulation – Parking	Stalls
Garage Parking	2,432
Garage Expansion	1,150
Surface Parking	8,158
Total	**11,740**



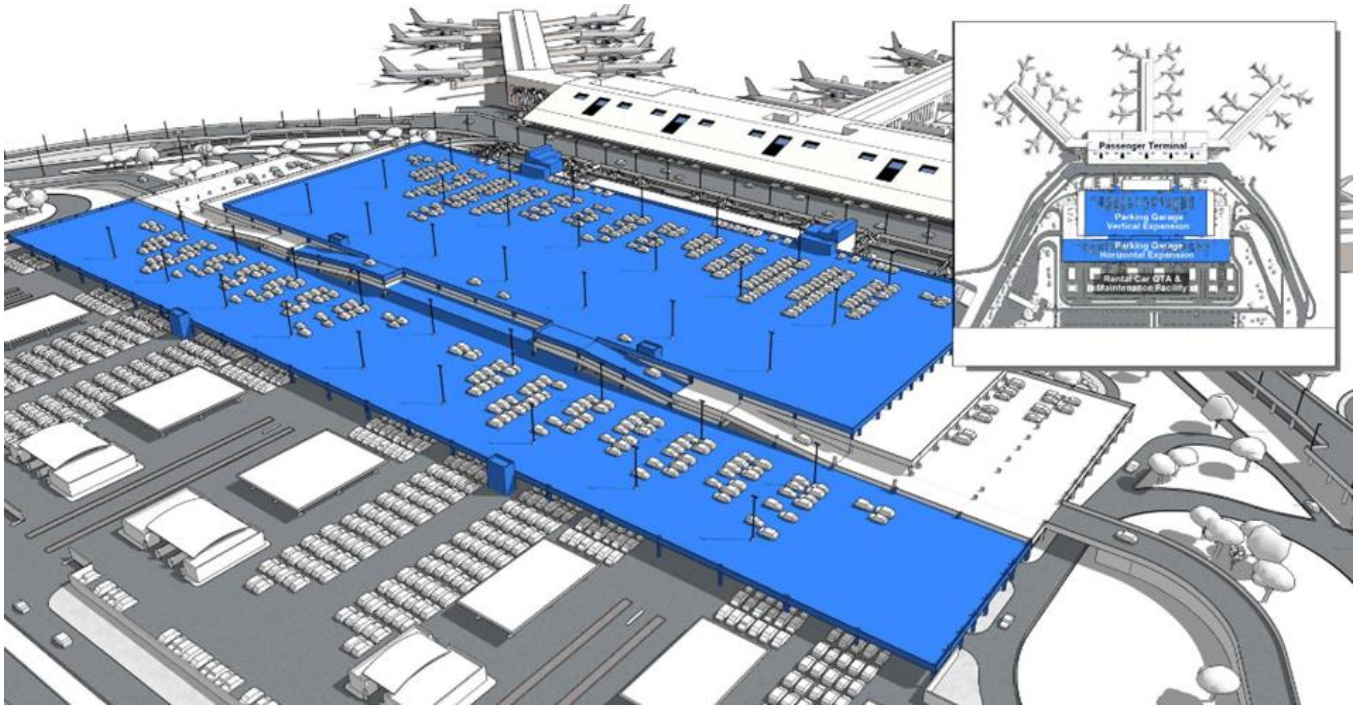
SOURCE: Kimley Horn, Rental Car Facility Sizing Analysis and Expansion Options, August 2019

Figure 5-42 Option A1.1 – View Looking Northwest Horizontal Expansion No Canopy

2. The **second option** expands the parking garage structure vertically by one level to accommodate 1,000 more stalls and expands the second level horizontally to accommodate 575 more stalls. The horizontal expansion also adds additional covered RAC space. This option results in a net increase in total parking (+971). Stall tabulation for the parking is shown in **Table 5-7**. **Figure 5-43** shows this option.

Table 5-7 Garage Option 2 – Stall Tabulation Parking

Stall Tabulation - Parking	Stalls
Garage Parking	2,432
Garage Expansion	1,575
Surface Parking	8,158
Total	**12,165**



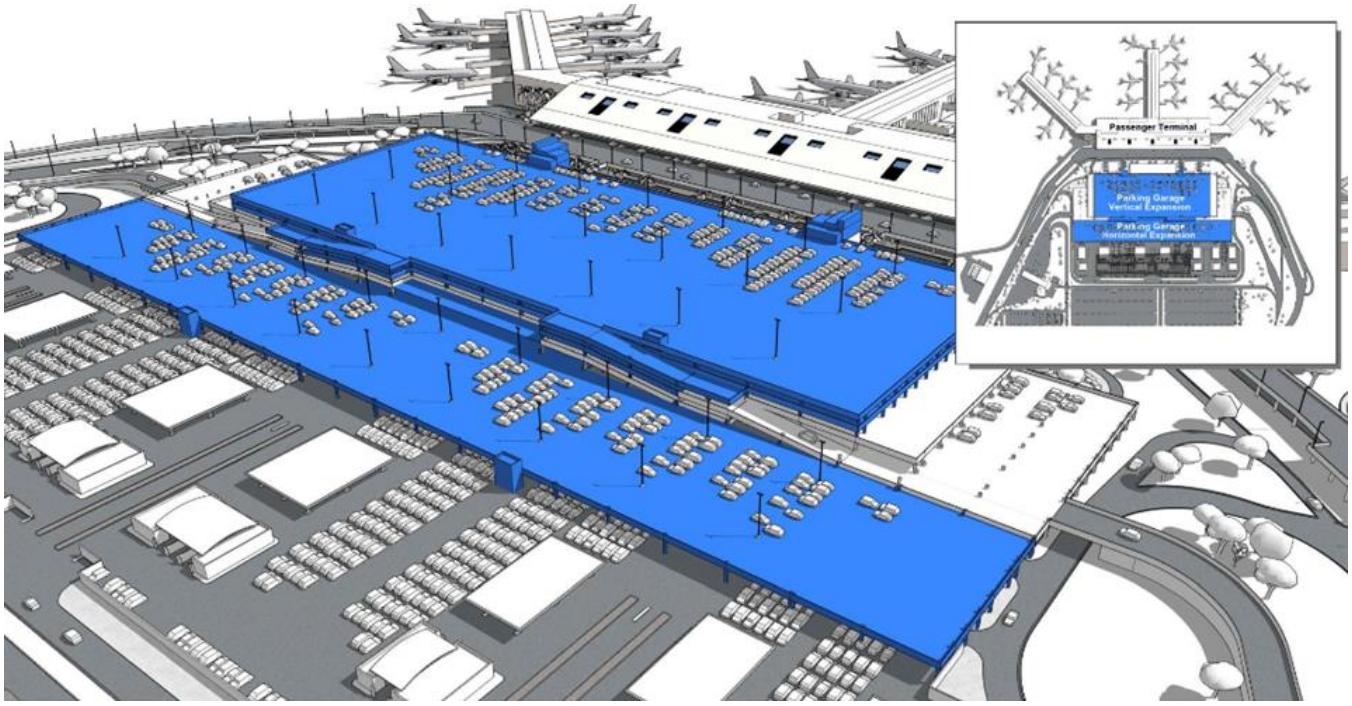
SOURCE Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-43 Option A3.1 – View Looking Northwest Vertical Structure Expansion (One Level) with Horizontal Parking Canopy

3. The **third option** expands the parking garage structure vertically two levels to accommodate 2,000 more stalls and also expands the second level horizontally to accommodate 575 more stalls. The horizontal expansion also adds additional covered RAC space. This option results in the greatest net increase in total parking (+1,971). Stall tabulation for the parking is shown in **Table 5-8**. **Figure 5-44** shows this option.

Table 5-8 Garage Option 3 – Stall Tabulation Parking

Stall Tabulation – Parking	Stalls
Garage Parking	2,432
Garage Expansion	2,575
Surface Parking	8,158
Total	**13,165**



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-44 Option A3.2 – View Looking Northwest Vertical Structure Expansion with Horizontal Parking Canopy

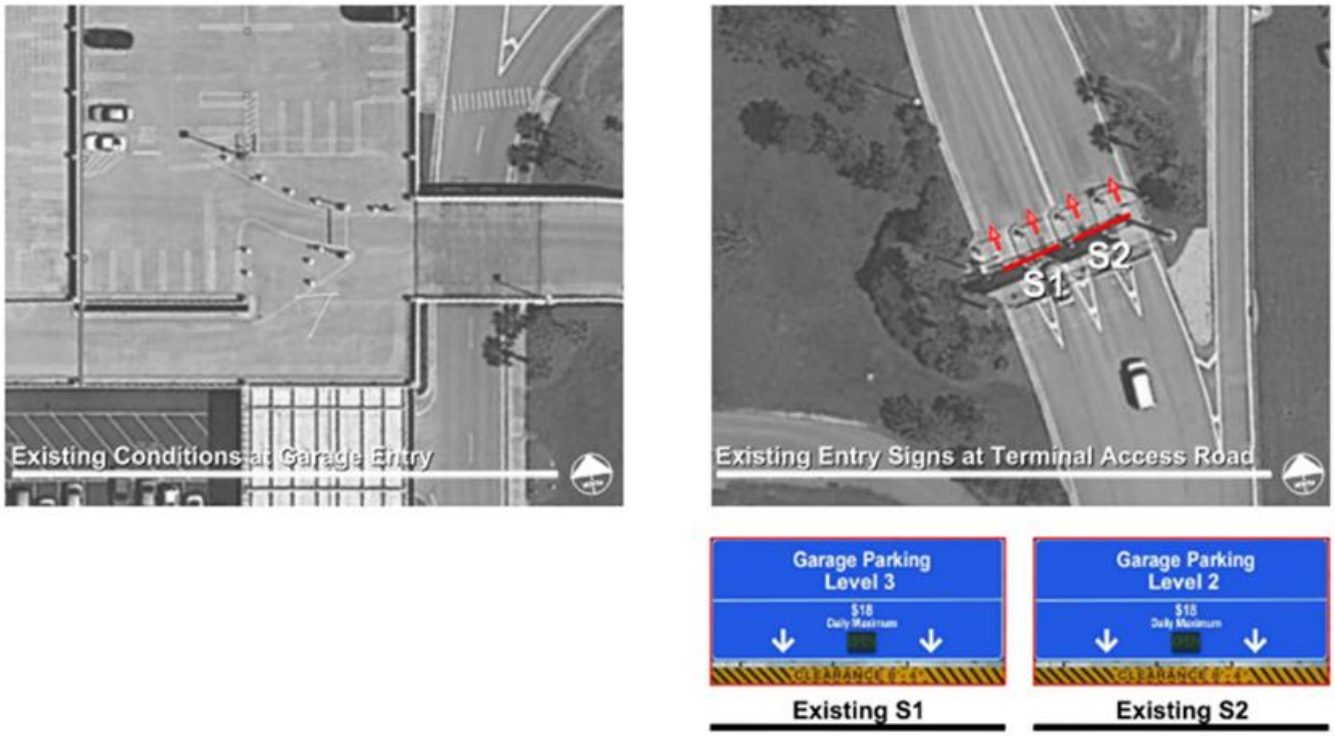
Short-Term Parking Garage

If no parking expansion to the garage occurs, options exist to improve efficiency and customer experience within the short-term parking garage. The following operational management strategies could be utilized:

1. The implementation of a separate pricing product on level three of the short-term garage could also address one of the existing observed operational constraints potentially impacting the customer experience and efficiencies within the short-term garage. The introduction of a second daily pricing products for the third level of the garage could encourage daily/overnight short-term parkers to still park where they prefer but incentivize to in the underutilized, uncovered areas on the third level of the parking garage at a reduced rate. Implementation of a reduced rate in the short-term garage could impact project revenue for both the short-term parking facility and the long-term parking facility.

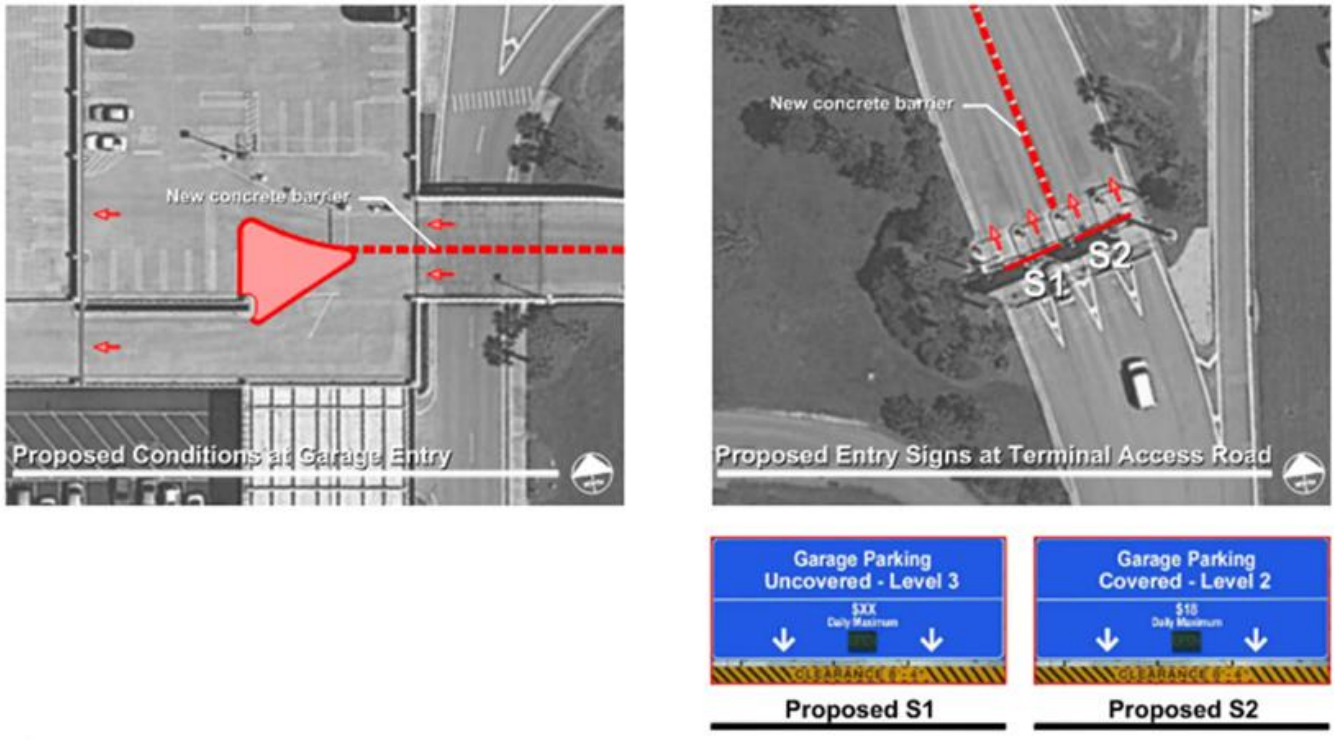
   The existing entry signs for the short-term garage are shown in Figure 5-45 and the proposed entry signs and concrete barrier are shown in Figure 5-46.

2. To improve high-frequency turnover in high demand areas of the garage, it is suggested that the parking spaces closest to the elevators/terminals on the second level be designated to short-term parking only, and overnight parking be prohibited in these spaces. Implementation would restrict daily/overnight parkers to parking in spaces furthest from the elevators on the second level and to the third level only. Enforcement would be required to ticket overnight vehicles parked in designated hourly spaces. Installation of meters could also be added.



SOURCE: Kimley Horn, *RSW Existing Parking Facility Capacity Evaluation*, March 2018

Figure 5-45 Parking Garage Entry – Existing Conditions



SOURCE: Kimley Horn, *RSW Existing Parking Facility Capacity Evaluation*, March 2018

Figure 5-46 Parking Garage Entry – Proposed Conditions

Long-Term Public Parking Lots

In order to address long-term parking needs, two areas have been identified for surface parking lot expansion in the PAL 2 and then the PAL 3 timeframes (**Figure 5-47**). The addition of a long-term surface lot to the west of the existing long-term lot is proposed to open add approximately 3,000 spaces due to open in 2035 or the PAL 2 timeframe allowing peak holiday parking requirements to be met. Likewise, a new long-term lot is proposed to open south of the employee-lot and existing cell phone lot adjacent to Terminal Road. This new lot will add approximately 3,000 spaces in 2035 allowing PAL 3 peak holiday long-term parking requirements to be met.

SOURCE: LCPA

Figure 5-47 Long-Term Surface Parking Alternatives

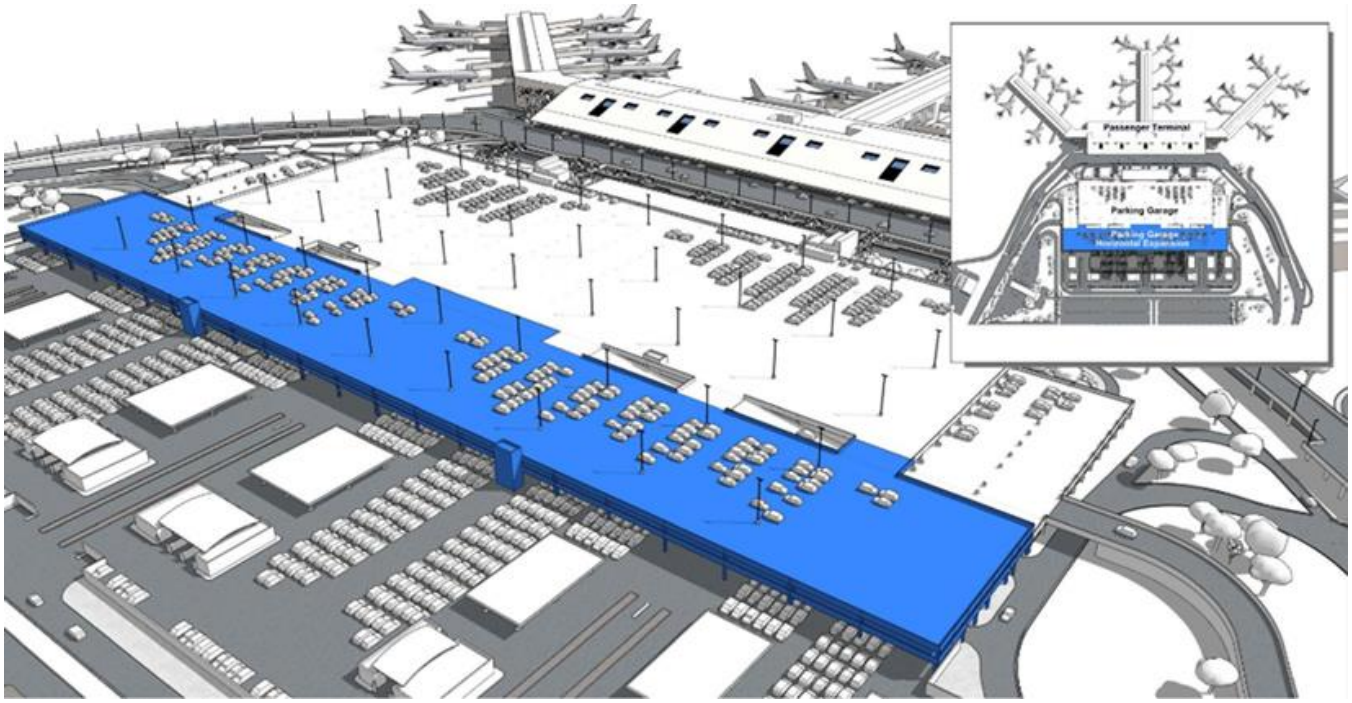
Rental Car Facilities

Option A1.1 – Horizontal Structure Expansion

Option A1.1 expands the two elevated parking garage levels horizontally to accommodate more stalls. Each expanded level can accommodate 575 more stalls each. The horizontal expansion also adds additional covered RAC space. Stall tabulation for the RAC facilities is shown in Table 5-9. Figure 5-48 is a rendering of this option.

Table 5-9 RAC Option A1.1 – Stall Tabulation

	Stalls
Ready Return	1,707
QTA Stacking/Storage	1,980
Remote Storage	3,700
Total	**7,387**



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

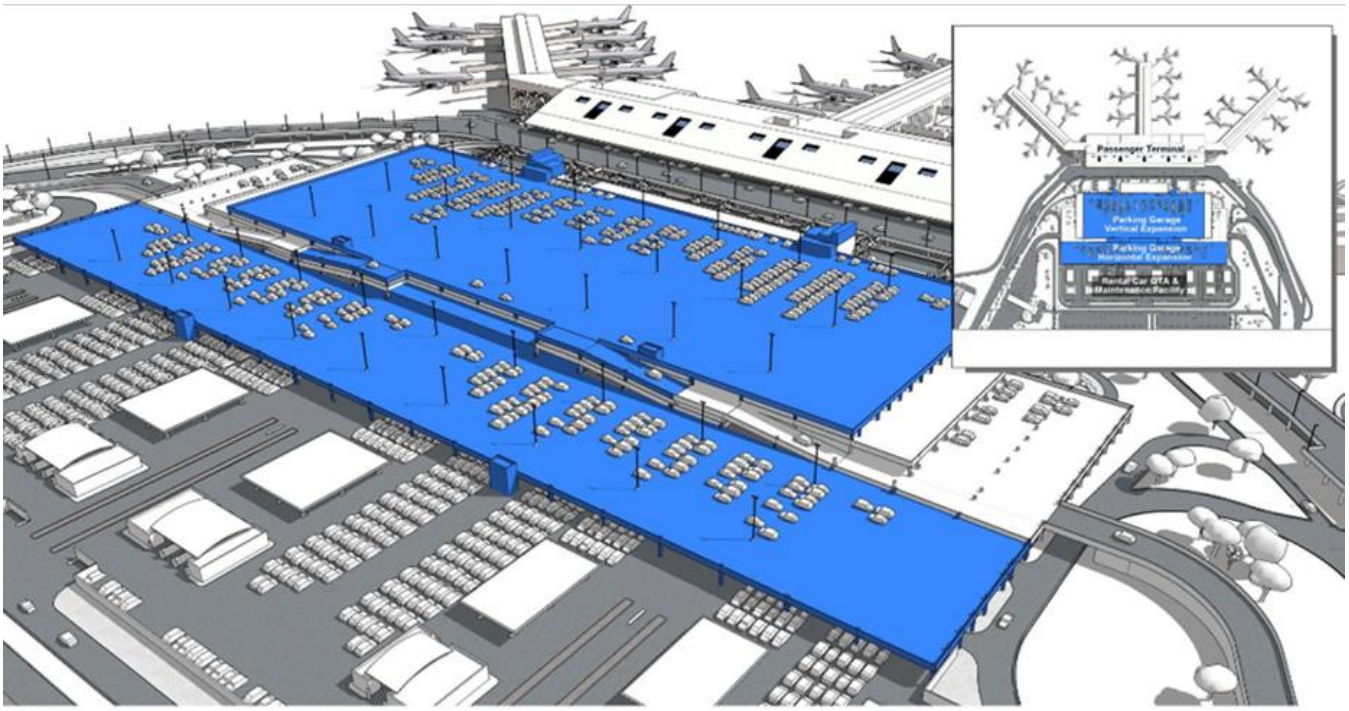
Figure 5-48 Option A1.1 – View Looking Northwest Horizontal Structure Expansion No Canopy

Option A3.1 – Vertical Structure Expansion with Canopy

Option A3.1 expands the parking garage structure vertically one level to accommodate 1,000 more stalls and expands the second level horizontally to accommodate 575 more stalls. The horizontal expansion also adds additional covered RAC space. Stall tabulation for the RAC facilities is shown in **Table 5-10**. **Figure 5-49** is a rendering of this option.

Table 5-10 RAC Option A3.1 – Stall Tabulation

	Stalls
Ready Return	1,707
QTA Stacking/ Storage	1,980
Remote Storage	3,700
Total	**7,387**



SOURCE: Kimley Horn, Rental Car Facility Sizing Analysis and Expansion Options, August 2019

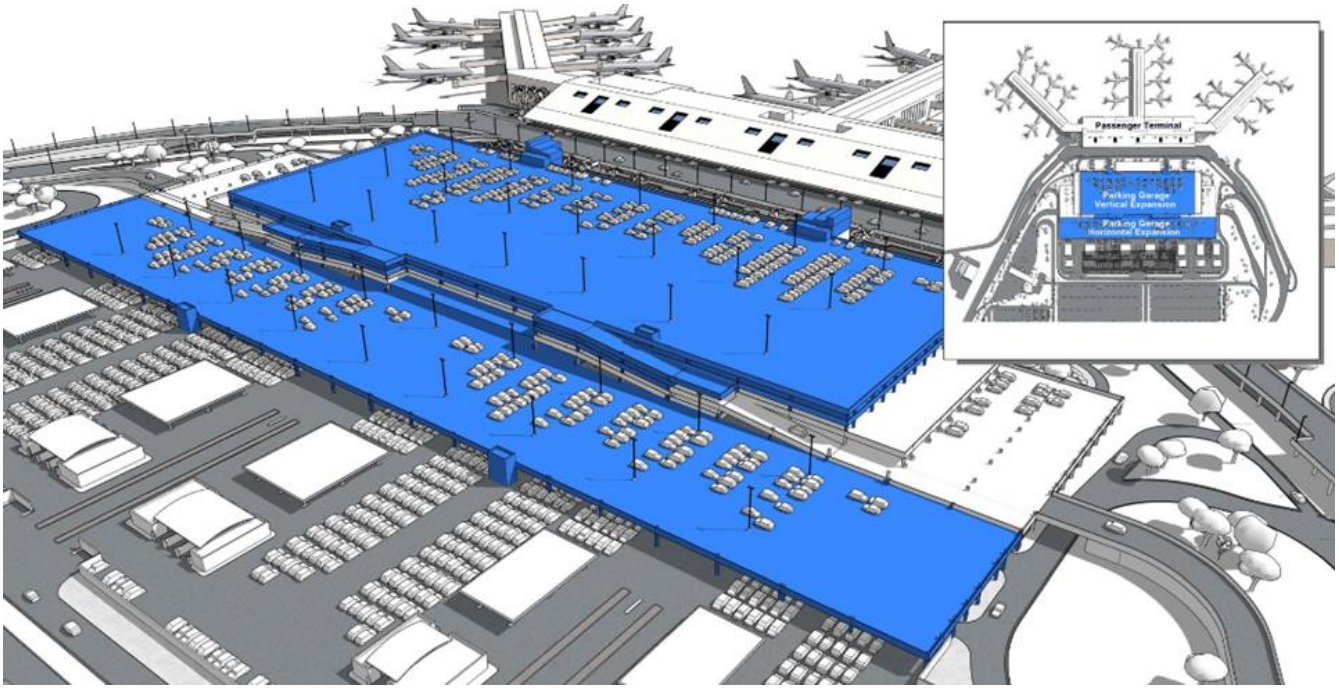
Figure 5-49 Option A3.1 – View Looking Northwest Vertical Structure Expansion (One Level) with Horizontal Parking Canopy

Option A3.2 – Vertical Structure Expansion with Horizontal Parking Canopy

Option A3.1 expands the parking garage structure vertically by two levels to accommodate 2,000 more stalls and expands the second level horizontally to accommodate 575 more stalls. The horizontal expansion also adds additional covered RAC space. Stall tabulation for the RAC facilities is shown in **Table 5-11**. **Figure 5-50** is a rendering of this option.

Table 5-11 RAC Option A3.2 – Stall Tabulation

	Stalls
Ready Return	1,707
QTA Stacking/ Storage	1,980
Remote Storage	3,700
Total	**7,387**



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-50 Option A3.2 – View Looking Northwest Vertical Structure Expansion (Two Levels) with Horizontal Parking Canopy

Customer Service Building

The customer service building currently becomes crowded during peak times. To deal with this issue, two alternatives are proposed. Alternative 1 expands the lobby by 20 feet, thus adding 7,200 square feet to the lobby. This allows for more room to customers. Alternative 2 relocates the restrooms and uses the additional space for more counters, allowing the customers to be serviced quicker. These alternatives are shown below in **Figure 5-51** and **Figure 5-52**, respectively.

Ready/Return Expansion/QTA Reconfiguration

An improvement that can be made to the ready/return facility is to expand its footprint into the QTA area. This will allow the facility to close the gap between the 1,600-stall demand and the 1,200-stall supply.

A parallel improvement that can be made to the QTA facility is to relocate the existing footprint to make room for the ready/return expansion. This relocation will move the footprint into the long-term parking lot, taking 150 public parking spaces. In addition to relocating the QTA facility, it is also recommended that the operations be flipped 180 degrees to optimize the facilities' efficiency. **Figure 5-53** demonstrates the reconfiguration.

Maintenance Facility Options

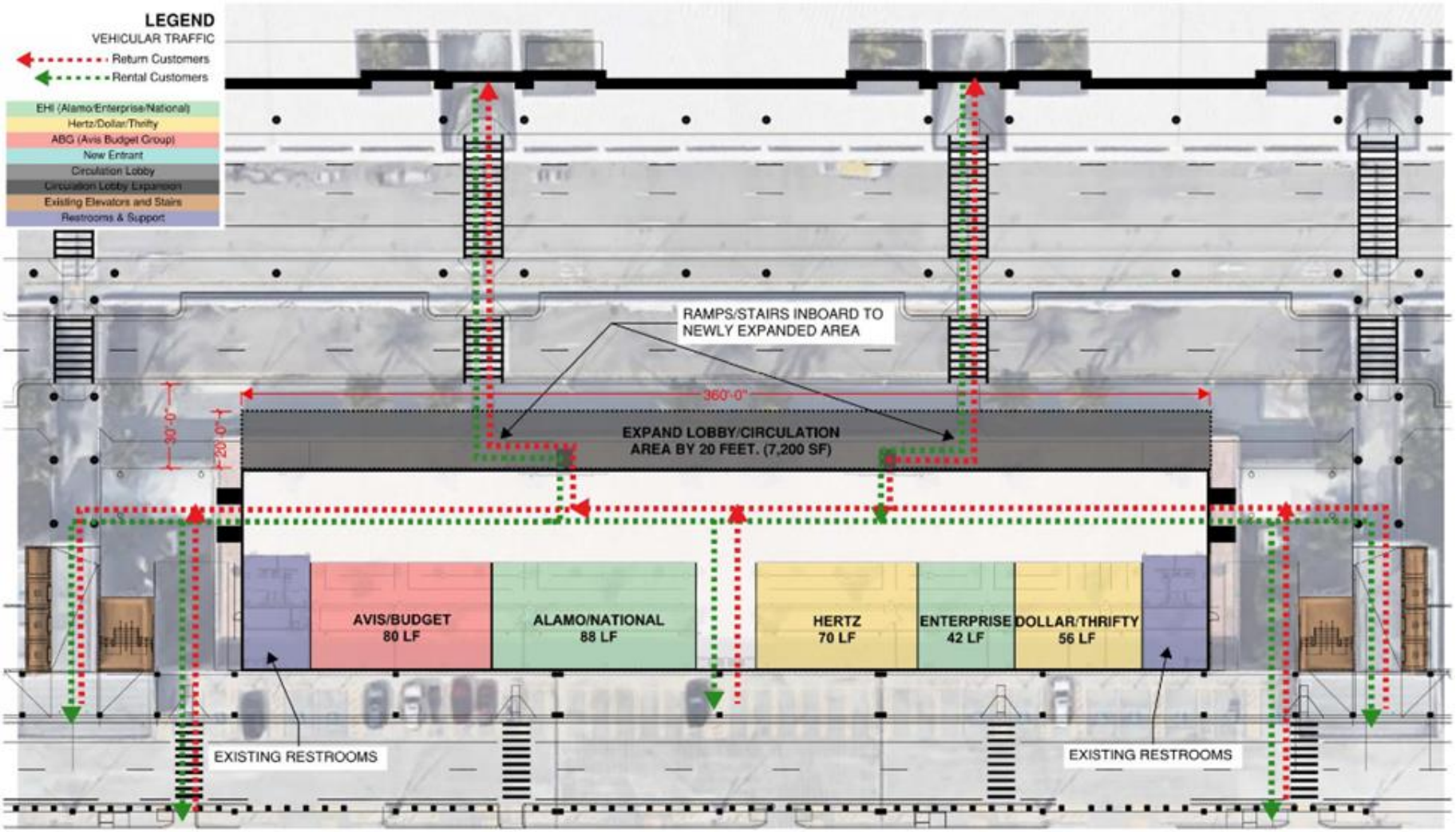
To accommodate the demands of today and to reserve space for future growth, different configuration options of the relocated maintenance facility have been developed. The relocation of which, is shown in **Figure 5-54**. Option 1, shown in **Figure 5-55** is 40 acres and can house up to four rental car agencies with 40 maintenance bays, 20 fueling positions, seven car wash bays, 19,000 square feet of admin space, and +/- 4,800 stalls. Option 2, shown in **Figure 5-56** has similar characteristics except for a slightly less stall capacity at +/- 4,550 stalls.

Option 2 has been identified by the LCPA as the preferred option. It allows for greater airport flexibility for future developments and provides for improved traffic movements. Vehicular ingress/egress of the site occurs off of Air Cargo Lane with this option.

5.5 Non-Aviation Lands and Future Areas

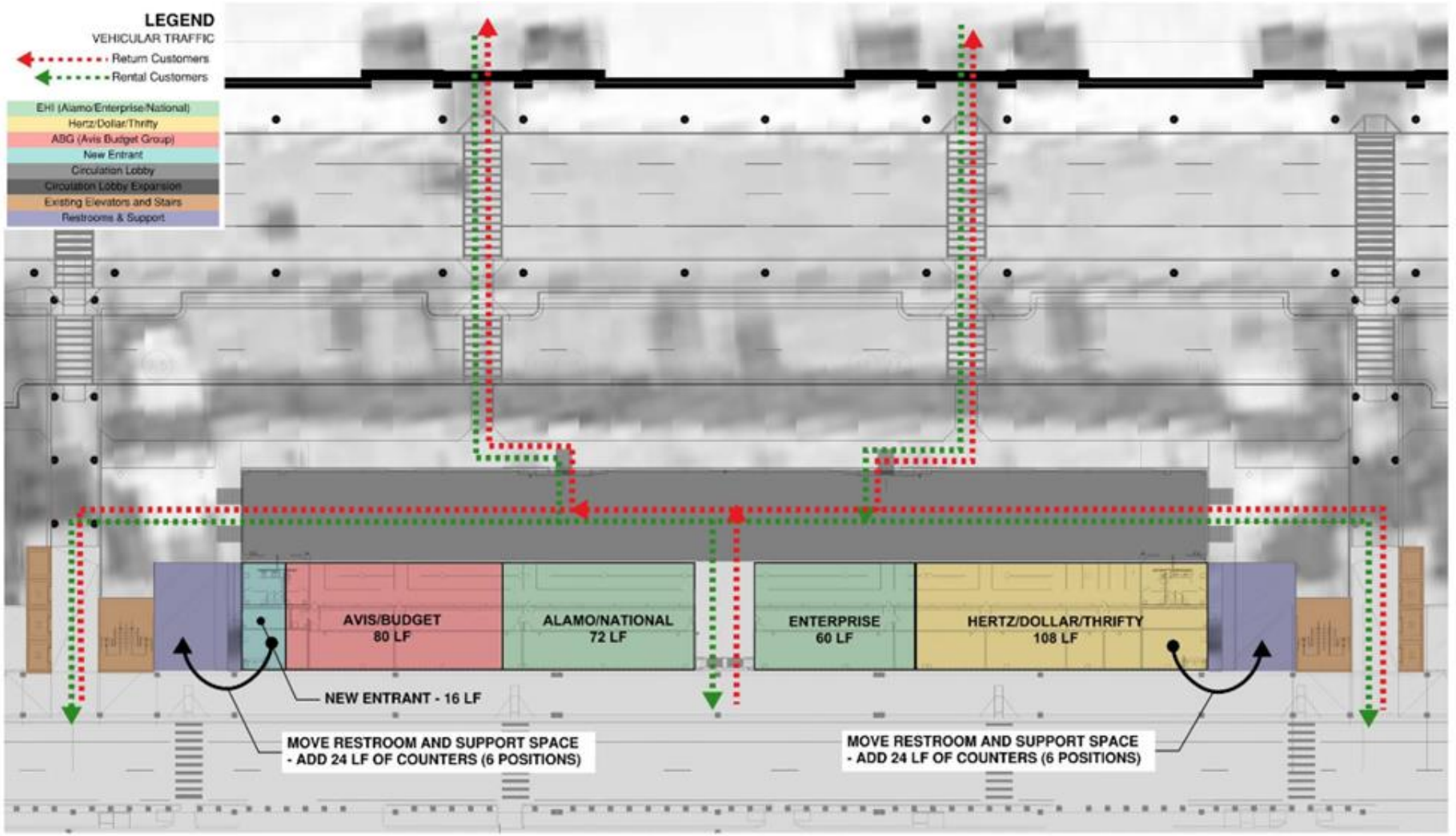
The LCPA has an opportunity to diversify its airport revenues by designating land to meet the area's non-aviation development demand. To the north of Runway 6-24 is an area with opportunity to fulfill these needs, commonly referred to as Skyplex. Two additional areas (in the Midfield and in the southeast quadrant of the airport) have also been identified for this purpose. These areas have significance to operation of the airport because both the Aviation and Non-Aviation use of airport lands provide long-term revenue opportunities that will help offset the costs of RSW airline business partners and the LCPA's dependency on grants.

Skyplex features both Aviation and Non-Aviation related land uses. The Aviation related land uses are located south of Chamberlin Parkway directly adjacent to Runway 6-24 and are described herein as the North Area Plan of Skyplex. The lands of Skyplex planned for Non-Aviation uses will develop over time subject to local comprehensive plan and zoning regulations. The timing (short-term, long-term, or ultimate) of the development of Skyplex is uncertain at this time. The Non-Aviation Skyplex development areas are expected to take decades and will be greatly dependent on market conditions, the economy, surrounding developments, the Southwest Florida real estate market, and a number of other variables. Development could occur by single land leases or by a grouping of development opportunities into a larger lease agreement. Even though the ideal development of the Skyplex area would focus on high-end corporate offices, it may also include a small entertainment/retail area, as well as some industrial/warehouse areas. The timing and specifics of the actual development that is anticipated to occur over the next 30+ years is unknown at this time. Therefore, this area is shown on the Airport Layout Plan as "Non-Aviation Support." Individual developments for the Skyplex area, the Midfield non-aviation designated area, and the future development area in the southeast quadrant of the airport will continue to be analyzed (i.e., compatibility, airport revenues, airspace, environmental, etc.) and addressed if and when development is proposed to occur.



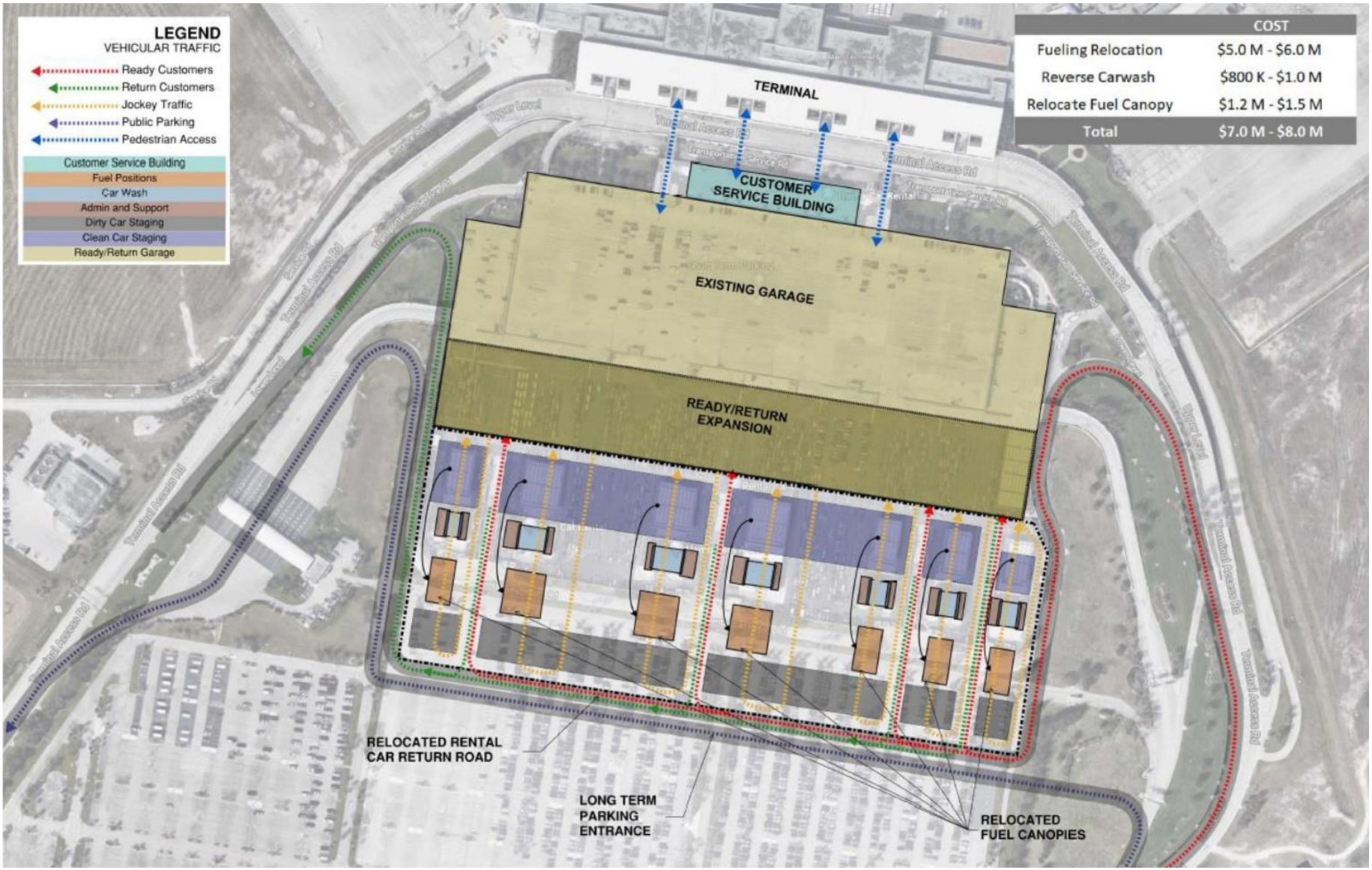
SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-51 CSB Reconfiguration: Expansion Options – Lobby Expansion



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-52 CSB Reconfiguration: Expansion Options – Counter Expansion

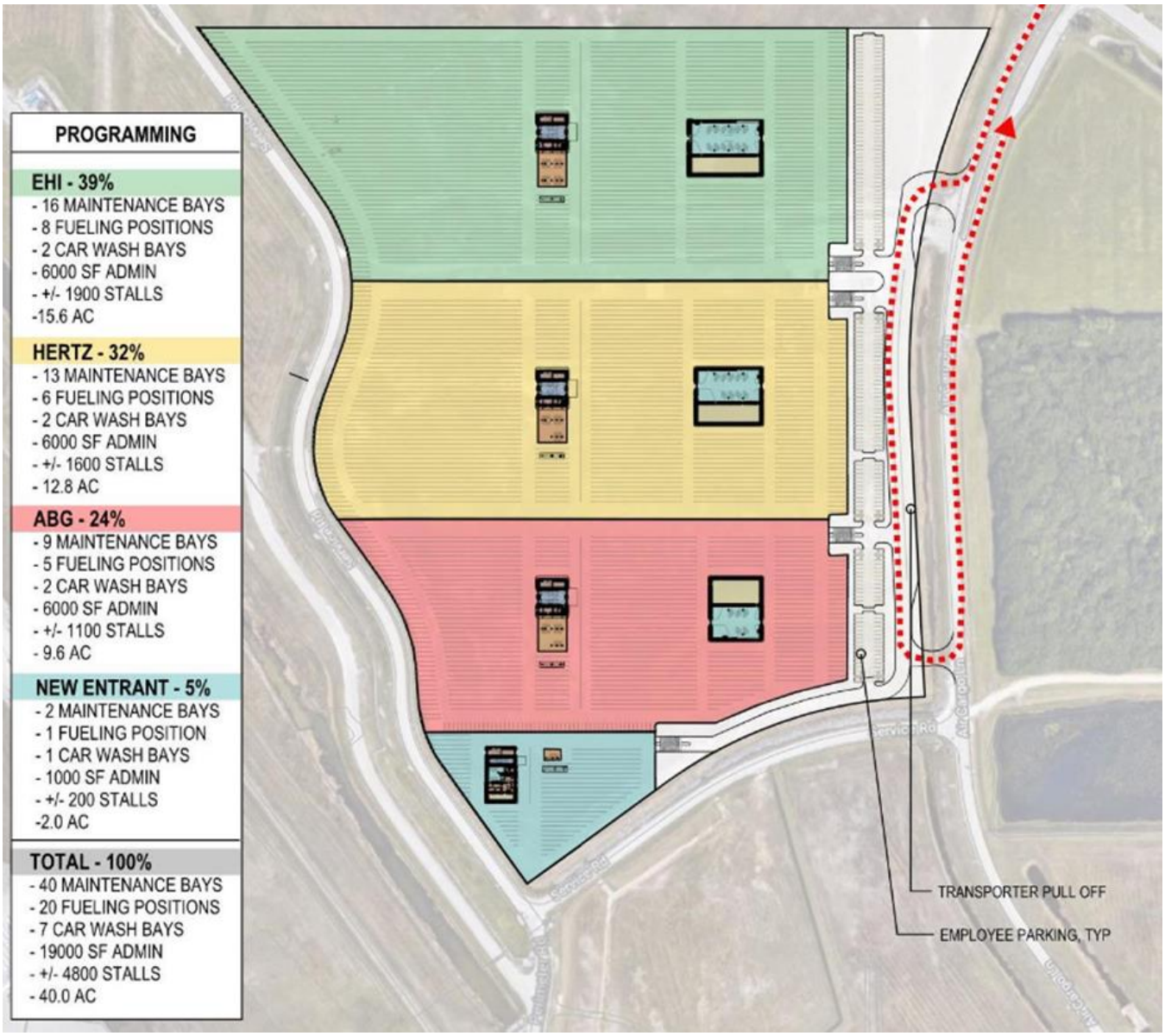


SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-53 QTA Reconfiguration: Relocate Fueling and Stacking

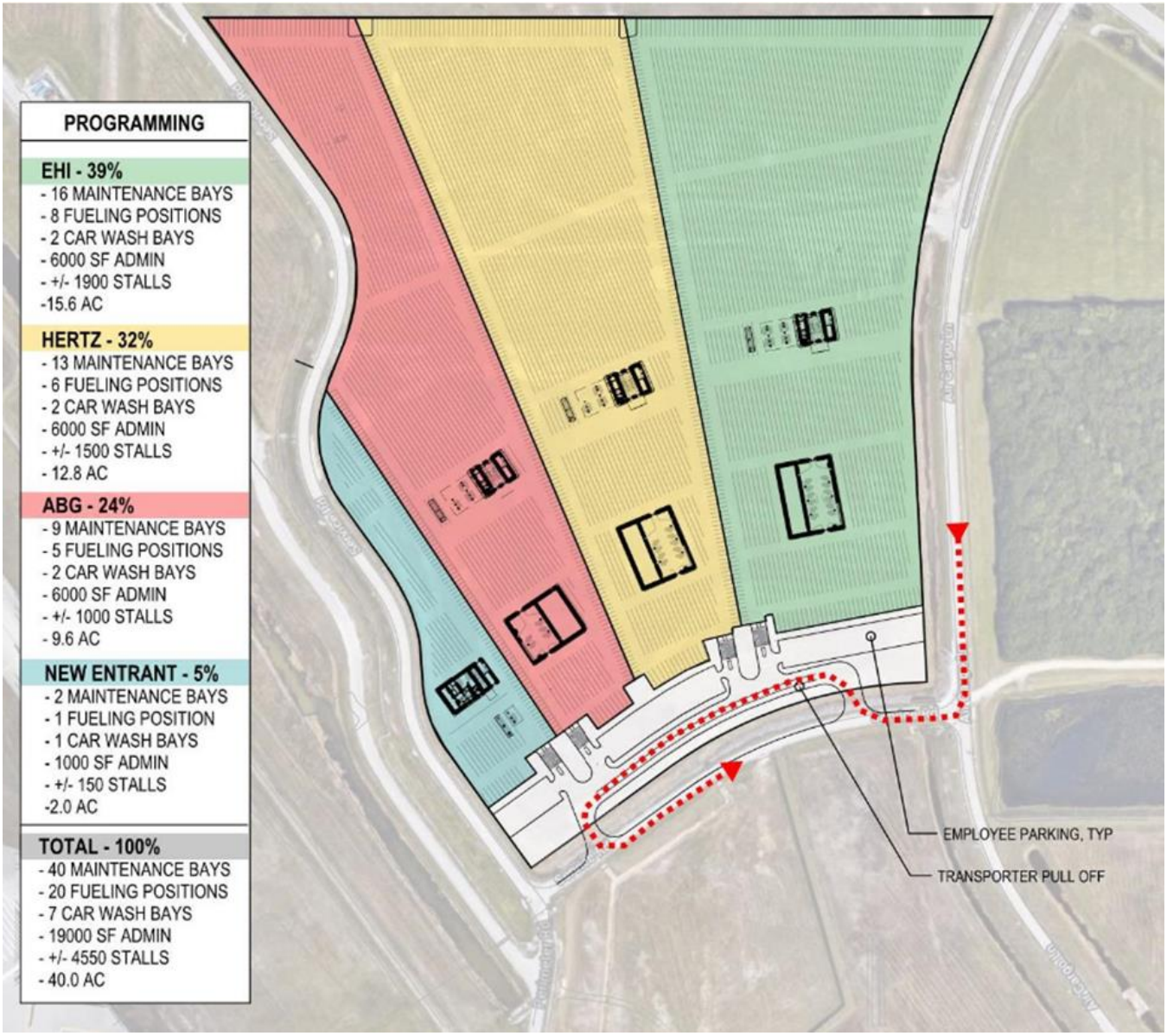
SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-54 Maintenance Facility Relocation Area



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-55 Maintenance Facility Option 1



SOURCE: Kimley Horn, *Rental Car Facility Sizing Analysis and Expansion Options*, August 2019

Figure 5-56 Maintenance Facility Option 2

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Chapter 6 Environmental Overview

RSW has outlined several proposed projects for development as part of this Master Plan Update. This overview of the environmental conditions at RSW helps provide insight into the potential impacts of proposed development projects. The primary focus of this section is to provide an overview of environmental considerations for airport planning purposes.

6.1 Background

Guidance issued by the Federal Aviation Administration (FAA) encourages the review of environmental factors in airport master planning to "help the sponsor thoroughly evaluate airport development alternatives and to provide information that will help expedite subsequent environmental processing." The Florida Department of Transportation (FDOT) 2016 Guidebook for Airport Master Planning, provides similar guidance. As a federally obligated airport, RSW is required to comply with the federal review process, regardless of the funding entity, if a federal action (funding, ALP approval, land release or acquisition, PFC approval, etc.) is required. Certain projects without a federal trigger that are 100 percent funded by FDOT (typically surface transportation projects) may receive approval through the FDOT Project Development and Environment (PD&E) process (state delegated DOT NEPA). However, both agencies clearly note that it is not the intent of a Master Plan to complete the federal and state environmental review processes. Instead, the information should identify and set the stage for understanding what future environmental review or actions may be needed and assist with the screening of potential alternatives.

6.2 Federal Environmental Review

This chapter provides a desktop review of publicly available and known environmental resources considered during the identification and evaluation of development alternatives in this Master Plan Update. The environmental resources discussed in this chapter include many of the categories delineated in FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions; FAA Order 1050.1F, Environmental Impacts: Policies and Procedures; and the President's Council on Environmental Quality (CEQ) Regulations Title 40 Code of Federal Regulations (CFR) § 1500-1508, CEQ Regulations for Implementing the Procedural Provisions of NEPA. However, this overview is not intended to meet the NEPA requirements for any planned development projects. This environmental overview does not constitute NEPA or regulatory level resource review; instead, it provides a compilation of readily available data to provide an environmental basis to identify where additional investigation or studies may be required. The FAA is responsible for ensuring compliance with NEPA with respect to actions at federally-obligated airports.

The processing of Airport Improvement Program (AIP) grant applications and Airport Layout Plan (ALP) approvals are two types of "federal actions" commonly undertaken by the FAA in support of airport development projects which require environmental review under NEPA. While NEPA requires varying levels of interagency coordination, development of environmental documents under NEPA does not exempt airport development projects from compliance with other federal environmental laws (e.g., Endangered Species Act) or state and local environmental regulations.

For those projects that involve a federal action and therefore trigger environmental review under NEPA, the three types of documentation that may be prepared are summarized in Table 6-1. Categorical Exclusions (CatEx) and Environmental Assessments (EA) are usually prepared by the Airport Sponsor and, if the documentation meets FAA requirements, they are accepted by the FAA and become federal documents. Environmental Impact Statements (EIS) are prepared by the FAA.

Table 6-1 Types of FAA NEPA Review Documentation

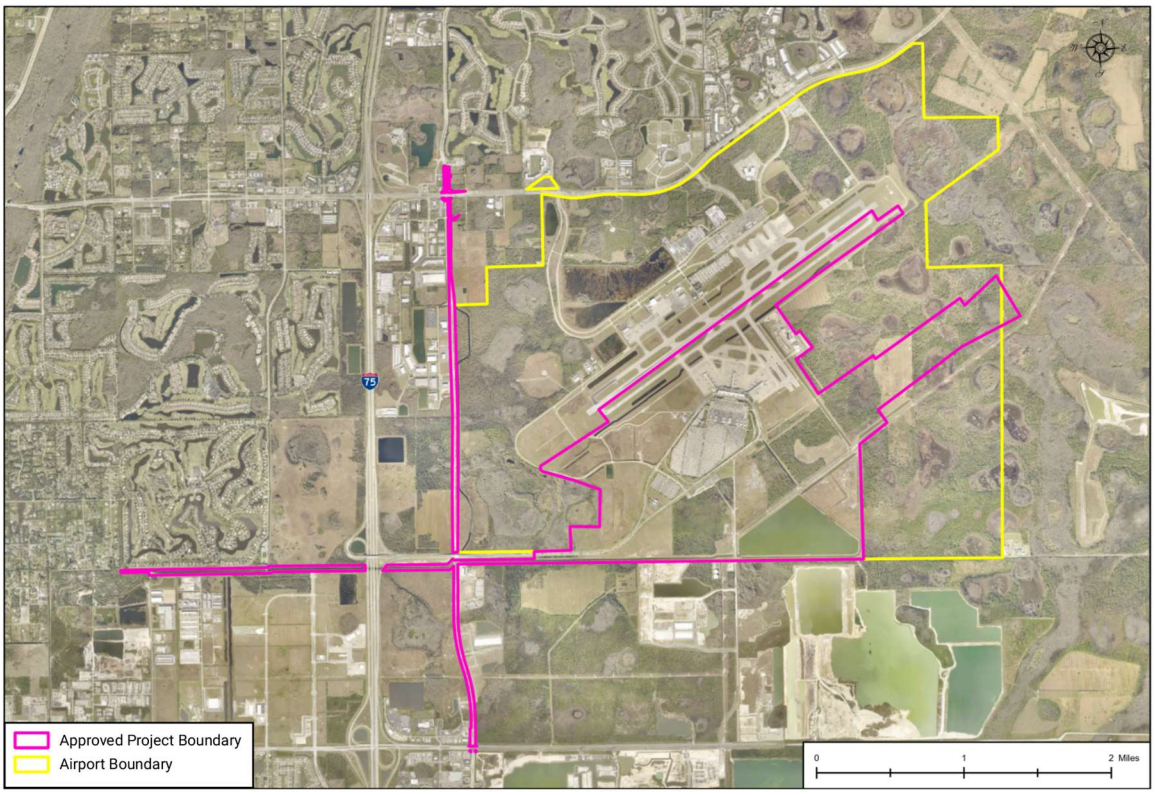
CATEX Categorical Exclusion	The FAA has identified certain actions that may be categorically excluded from a more detailed environmental review. However, extraordinary circumstances, such as wetland impacts, may preclude Categorical Exclusion (CATEX). A CATEX requires a review of impacts and completion of forms provided by the FAA. In some cases, documentation and agency coordination may be necessary to address extraordinary circumstances (see FAA ARP SOP No. 5.00). See FAA Orders 1050.1F and 5050.4B for a more detailed description of categorically excluded actions that may apply to development projects at RSW.
EA Environmental Assessment	An Environmental Assessment (EA) is prepared for proposed actions with expected minor or uncertain environmental impact potential. An EA requires analysis and documentation similar to that of an EIS, but with somewhat less detail and coordination. The FAA will review the EA and decide to either issue a Finding of No Significant Impact (FONSI) or prepare an Environmental Impact Statement (EIS).
EIS Environmental Impact Statement	An EIS is prepared for major federal actions, which are expected or known to significantly affect the quality of the human environment. At this time, no future airport development projects at RSW are expected to require the preparation of an EIS.

Source: ESA Compilation

Prior NEPA Determinations

Parallel Runway and Midfield Development

On March 10, 1994, the Federal Aviation Administration (FAA) issued a Finding of No Significant Impact (FONSI) in compliance with the National Environmental Policy Act (NEPA) for Southwest Florida International Airport (RSW) for a Parallel Runway and Midfield Development. Development (Figure 6-1) included the construction of a 9,100-foot runway with associated midfield development area, navigational aids, terminal access roadways, taxiways, marking, lighting, drainage and flood control systems, additional airport support service facilities (ATCT, ARFF, etc.), and land acquisition necessary for the runway, Midfield Terminal Complex, and related mitigation areas.

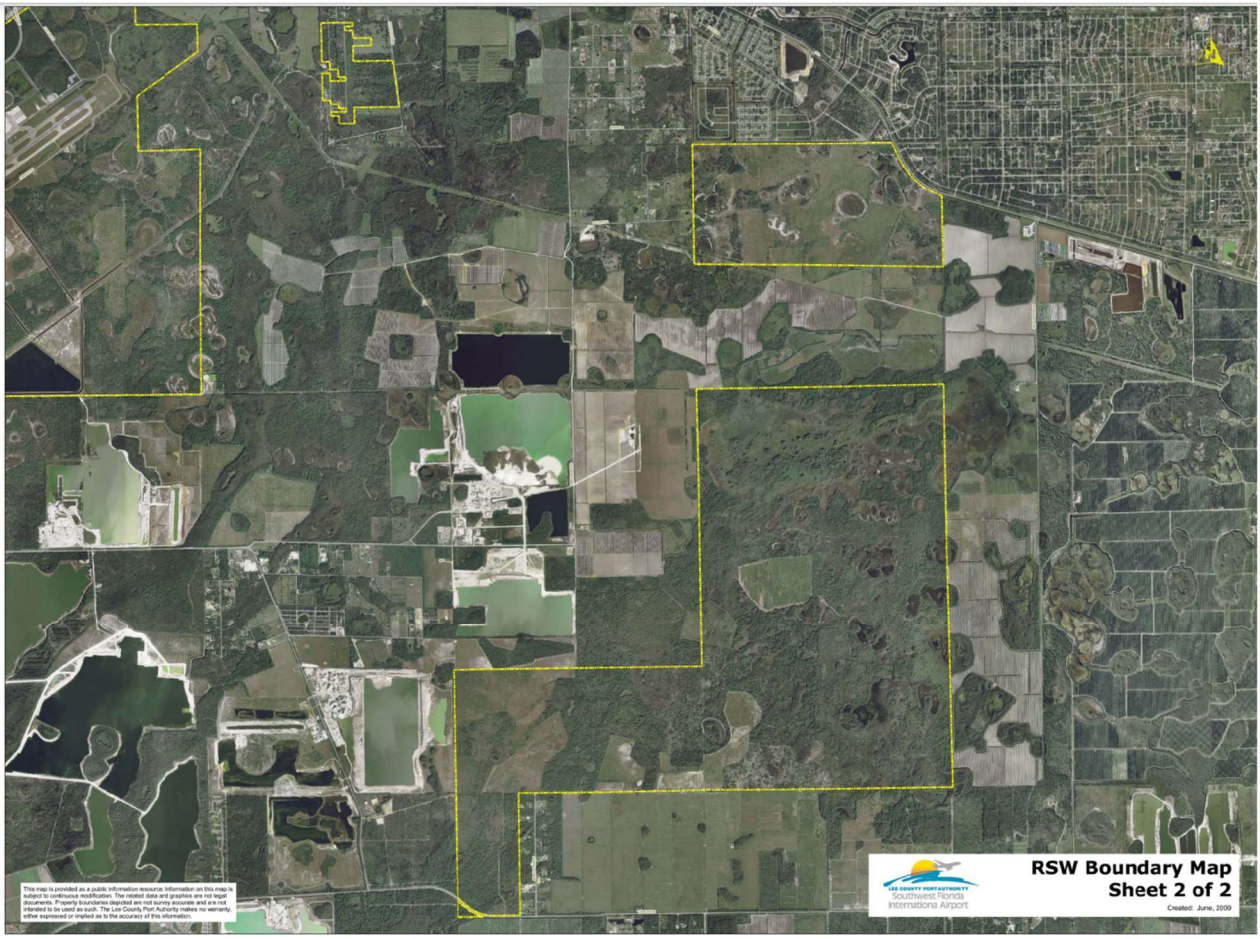


Source: LCPA

Figure 6-1 Approved Runway and Midfield Development Area

RSW property includes two areas dedicated for conservation known as the Southwest (SW) Conservation Area and the Northeast (NE) Conservation Area, both indicated on the ALP. LCPA also purchased 7,000 acres of mitigation lands as outlined in the Environmental Assessment (see Figure 6-2). These mitigation lands are located to the east of RSW and are known as Airport Mitigation Park. Airport Mitigation Park provides, and will continue to provide, an expansive wildlife corridor/habitat as well as wetland mitigation for impacts within the development area depicted in Figure 6-1.

In 2007, a detailed Project analysis was conducted to determine if the 1994 FONSI for the Parallel Runway and Midfield Development Area EA could be revalidated. The analysis concluded that the project effects remained below the threshold of significance for all categories and as a result, a FONSI revalidation request was submitted to the FAA on October 4, 2007. The FONSI revalidation was approved by the FAA on December 20, 2007.



Source: LCPA

Figure 6-2 RSW Boundary Map: Mitigation Park

During the site preparation design phase for the proposed Parallel Runway, several development modifications were evaluated. The recommended modification resulted in an 80-foot shift of the runway to the south after extensive coordination with the FAA. In a letter dated March 6, 2009, the FAA stated that "The FAA concurs that the proposed action to shift and construct Runway 6R/24L 80 feet to the south substantially conforms to plans and project information contained in the 1994 EA subject to the results of the airspace study for the runway at the proposed location. Furthermore, no additional environmental analysis of the proposed project is needed because the data and analysis contained in the 1994 EA remain substantially valid, and all pertinent conditions and requirements of the prior approval have been or will be met in the current action."

Since 1994, the LCPA has been implementing the Project identified in the 1994 EA / 2007 FONSI Revalidation / 2009 Confirmation. The LCPA began implementing the Project in 1994 by acquiring land to accommodate the Midfield Terminal Complex and Parallel Runway facilities and has continued to implement the originally envisioned development by acquiring mitigation lands needed to offset impacts associated with the Midfield Terminal Complex and Parallel Runway, the planning, design and construction of the midfield terminal, drainage and flood control systems, taxiways, navigational aids, terminal access roadways, marking and lighting. The new midfield Aircraft Rescue and Fire Fighting Facility (ARFF) was commissioned in 2013 and the new Air Traffic Control Tower is expected to be commissioned in 2023. The FAA has provided concurrence with Project implementation through FONSI concurrence letters in 2007 and 2009, and through issuance of grant applications for ongoing Project components.

Other Recent NEPA Determinations

While the 1994 EA addressed the development associated with the Parallel Runway and Midfield Development, NEPA compliance has been completed for a number of other projects at the Airport. Table 6-2 identifies the NEPA determinations that have been secured since 2016.

Table 6-2 NEPA FAA Approvals since 2016

Project Name	Type of NEPA Review	Date Submitted to FAA	FAA Approval Date
Sky Walk	EA	5/26/2016	6/3/2016
Skyplex Boulevard	EA	8/23/2016	9/29/2016
Gartner Office Complex	EA	8/10/2017	8/23/2017
Terminal Expansion	CatEx	6/11/2019	10/24/2019
Gartner Phase 1A Parking Lot Expansion	CatEx	7/2/2019	7/3/2019
Gartner Office Complex Phase 2	EA	1/24/2020	2/5/2020
Alta Realty "Contact Center" Office Builiding Development	EA	6/24/2020	7/14/2020
Air Freight Building	CatEx	7/25/2022	11/10/2022
Treeline Assemblage Access to Treeline Avenue	CatEx	12/22/2022	Not in file*

*Awaiting comments/approval from FAA at the time of writing
Source: LCPA, March 2023

6.3 State Environmental Reviews

In addition to compliance with NEPA, all recommended airport development must be consistent with other federal regulatory guidance, Florida Statutes (FS), growth management and concurrency requirements as well as regional and state transportation plans. For projects that require NEPA compliance, state environmental reviews typically initiate with the Florida State Clearinghouse which is administered by the Florida Department of Environmental Protection (FDEP). A primary function of the Florida State Clearinghouse is to serve as the state's single point of contact for the receipt of federal activities that require interagency review, which includes activities subject to consistency review under the Florida Coastal Management Program. Upon completion of their review, the Clearinghouse will typically issue a letter summarizing any potential concerns or inconsistencies regarding the proposed activity. The clearance letter will also include information on obtaining necessary state permits and will inform the applicant if there is a need to submit additional information to a specific state agency for review. In cases where NEPA compliance is not required, direct coordination with the relevant state and federal regulatory agencies may still be required. It is important to note that the State of Florida assumed Section 404 regulatory authority in 2020 and future Section 404 permits will be processed by the FDEP. Information related to the specific agencies and coordination and / or permits required, is discussed in the individual resources categories in this chapter.

6.4 Environmental Overview

A preliminary analysis of environmental conditions throughout the Airport was reviewed relative to the impact categories identified in FAA Order 1050.1F. These impact categories include:

- Air quality

- Biological resources (including fish, wildlife, and plants)
- Climate
- Coastal resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous materials, solid waste, and pollution prevention
- Historical, architectural, archeological, and cultural resources
- Land use
- Natural resources and energy supply
- Noise and compatible land use
- Socioeconomics, environmental justice, and children's environmental health and safety risks
- Visual effects (including light emissions)
- Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers

Air Quality

The federal Clean Air Act, as amended, required the USEPA to set National Ambient Air Quality Standards (NAAQS) for principal pollutants considered harmful to public health and the environment. Those areas where the NAAQS are not met are designated as "nonattainment." A state with a nonattainment area must prepare a State Implementation Plan (SIP) that details the programs and requirements the state will use to meet the NAAQS. Proposed development must then demonstrate that it meets or "conforms" with the SIP.

RSW is located in Lee County, Florida. The United States EPA has designated Lee County as an attainment area for the NAAQS for the following criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), particulate matter (PM) and lead (Pb).

An existing air emissions inventory was conducted for aircraft operations for the year 2021 as well as the planned year of opening of the new south parallel runway (Table 6-3). It is currently planned that the year of opening of the parallel runway will occur in 2043, just after the end of the planning period, and coincide with the airport reaching ASV (approximately 146,000 annual operations).

Table 6-3 Criteria Air Pollutant Emissions

Criteria Air Pollutant Emissions (tons)						
Emissions Source	**CO**	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2021 Existing Year Emissions	432	64	341	38	4	4
2043/100% ASV of Single Runway System	618	92	563	58	7	7

NOTES: CO = carbon monoxide; NOx = oxides of nitrogen; PM2.5 = particulate matter less than or equal to 2.5 microns in diameter; PM10 = particulate matter less than or equal to 10 microns in diameter; SOX = oxides of sulfur; VOC = volatile organic compound

SOURCE: AEDT 3d; Environmental Science Associates, 2022.

Projects constructed throughout the course of the planning period have the potential to generate temporary air emissions. emissions from construction activities and fugitive dust could be reduced or offset by employing some or all the following voluntary measures:

- Curtailing construction activities during periods of high wind conditions
- Reducing exposed erodible surface area through appropriate materials and equipment staging procedures; stabilizing stockpiles of raw materials and other temporarily disturbed areas with water or ground cover
- Stabilizing soils and establishing persistent ground cover as soon as possible after grading and construction activities
- Reducing equipment idling times and onsite vehicle speeds
- Utilizing vapor-recovery systems for fuel-storage facilities
- Using low- or zero-emissions equipment
- Using covered haul trucks during materials transportation

Because the County is currently in attainment for all NAAQS, a general conformity determination is not currently required for future development. Certain projects and tenant activities, such as operating paint booths, will need to comply with applicable regulations and permit requirements.

Biological Resources

The following statutes, regulations, and Executive Orders require consideration in evaluating potential impacts on biological resources: Bald and Golden Eagle Protection Act, Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Executive Order 13112 - Invasive Species, Executive Order 13186- Responsibilities of Federal Agencies to Protect Migratory Birds, Executive Order 13751 - Safeguarding the Nation from the Impacts of Invasive Species, and CEQ Guidance on Incorporating Biodiversity Considerations Into Environmental Impact Analysis Under the National Environmental Policy Act (January 1993). The Magnuson Stevens Fishery Conservation and Management Act and Marine Mammal Protection Act are not applicable since the Airport does not contain any marine resources nor are there any in immediate proximity.

The study area for biological resources considers both areas directly impacted (such as through vegetation and habitat removal within the construction footprint) and those areas indirectly impacted through facility lighting, noise, air emissions, and changes to water quality or quantity caused by construction equipment or facility operations.

The presence and extent of wildlife on RSW property has been extensively studied by professional environmental consultants visiting the airport site and conducting field assessments. A Wildlife Hazard Assessment (WHA) was completed for all of RSW under the guidelines of Federal Aviation Regulations (FAR) Part 139.337(c) and FAA AC 150/5200-36 "Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports." Florida Land Use Forms and Cover Classification System (FLUCCFCS), Level III mapping was conducted for the entire Airport with Level IV mapping where appropriate as part of the last master plan preparation in 2001. This included extensive ground verification and delineation of exotic/nuisance plant species. Surveys for threatened and endangered species have been conducted through 2002 and numerous site surveys have been conducted for the Midfield Terminal Complex as part of re-evaluation studies. Table 6-4 identifies listed species previously observed on site, and Table 6-5 lists potential species based on the habitat.

Table 6-4 Summary of Listed Animal and Plant Species Previously Observed

Birds	Scientific Name	Federal/State Listed
Bald eagle	Haliautus leucocephalus	F
Burrowing owl	Speotyto cunicularia	S
Florida sandhill crane	Grus canadensis	S
Least tern	Sterna antillarum	S
Limpkin	Aramus guarauna	S
Little blue heron	Egretta caerulea	S
Red-cockaded woodpecker[1]	Picoides borealis	F
Reddish egret	Egretta rufescens	S
Roseate spoonbill	Ajaia ajaja	S
Snowy egret	Egretta thula	S
Southern kestrel	Felco sparverius Paulus	S
Tricolored heron	Egretta tricolor	S
White ibis	Eudocimus albus	S
Wood stork	Mycteria americana	S
Mammals	**Scientific Name**	**Federal/State Listed**
Big Cypress fox squirrel	Sciurus niger avicennia	S
Florida black bear	Ursus americanus floridanus	S
Reptiles	**Scientific Name**	**Federal/State Listed**
American alligator	Alligator mississippiensis	F
Plants	**Scientific Name**	**Federal/State Listed**
Common wild pine	Tillandsia fasciculata	S
Leafless black orchid	Stenoffynochos lanceolata	S
Leather fern	Acrostichum spp.	S
Northern needle leaf	Tillandsia balbisiana	S
Pine lily	Lilium catesbaei	S
Pine pink	Bletia purpurea	S
Wild coco	Eulophia alta	S

[1]Abandoned red-cockaded woodpecker cavities observed on-site

SOURCE: 2004 Master Plan Update

Table 6-5 Other Species with Potential to Occur On-site based on Vegetation Communities (FLUCFCS)	
Birds	**Plants**
Arctic peregrine falcon	Beautiful paw-paw
Crested caracara	Curtis Milkweed
Snail kite	Fakahatchee burmannia
	Florida coontie
	Hand adder's tongue fern
	Satin leaf
	Simpson's stopper
	Twisted air plant
Mammals	**Reptiles**
Florida panther	Eastern indigo snake
Everglades mink	Florida pine snake
Sherman's fox squirrel	Gopher Frog
	Gopher Tortoise

SOURCE: 2004 Master Plan Update

No state or federal listed plants were observed during field verifications of the Midfield Terminal Complex or surveys for the Parallel Runway. Field verified vegetation mapping was also prepared as part of the SFWMD and COE permitting efforts for the Midfield Terminal Complex and Parallel Runway. Associated construction/impact permits were based on this site-specific mapping. The majority of remaining land areas on Airport property include forested uplands consisting mostly of pine habitats and old farm fields. Remaining wetlands to be impacted can be generally described as freshwater marsh, wet prairie, hydric pine, pine-cypress, cabbage palm, cypress, shrub wetlands, wetland-cut ditches, and disturbed hydric land with varying degrees of infestation by nuisance and exotic vegetation. The other surface waters consist of upland-cut ditches. Future impacts beyond those already permitted/mitigated will be to primarily low quality, degraded systems that are infested with exotic vegetation and are not contiguous with larger regional wetland systems.

Although it is anticipated that wildlife use within the natural habitats between the existing Runway 6-24 and the future Parallel Runway will continue, secondary impacts to wetlands were assessed due to the scale of the project, the potential for aircraft-wildlife strikes and potential impacts from the increase in noise and lighting. An additional assessment of secondary impacts was made due to estimated potential future tree removal required within the line of sight of two operational areas per FAA clearing criteria. This assessment includes secondary impacts to herbaceous wetlands adjacent to proposed tree removal areas in forested wetlands. In order to provide reasonable assurances that the tree removal areas reflect the post-condition designated in the functional analysis, a qualitative monitoring and planting plan will be implemented.

The WHA that was prepared for RSW included a list of recommendations that were ultimately incorporated into the RSW Wildlife Hazard Management Plan (WHMP). The initial RSW WHMP was approved by the FAA in October 2011. Since that time, LCPA has completed annual reviews and revisions which have been approved by the FAA as part of the airport's annual inspection and Airport Certificate Manual (ACM) approval. The most current, FAA approved WHMP was approved in May 2022. As part of the ongoing data collection and evaluation of the RSW wildlife hazard management program, LCPA conducts continual monitoring following the guidance in FAA Advisory Circular (AC) 150/5200-38 "Protocol for the

Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans" (8/20/18).

LCPA has a long-standing wildlife hazard management program in place to help decrease wildlife use and attractants on the airfield. Potential impacts on biological resources from the operations described above were considered. The extent of potential impact is greatest in the Aircraft Operations Area (AOA), with impacts lessening the further away from the AOA the species is. However, even considering potential impacts in the AOA (including take of species), these activities do not result in:

- The long-term or permanent loss of unlisted plant or wildlife species, (i.e., extirpation of the species from a large project area);
- Significant adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Significant adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.

Potential impacts on biological resources from construction activities including the destruction or alteration of habitat and the disturbance or elimination of individuals or local populations of fish, wildlife, plants, or the introduction of invasive species were also considered. RSW implements wildlife management best management practices (BMPs) on airfield projects to minimize this disturbance.

While biological surveys have been conducted throughout the Airport property, planned development projects will involve the validation of conditions as part of future NEPA and permitting actions.

Climate

The airport operational environment was reviewed in accordance with the Clean Air Act. Executive Order 13514 Federal Leadership in Environmental Energy and Economic Performance; Executive Order 13653, Preparing the United States for the Impacts of Climate Change; and Executive Order 13693, Planning for Federal Sustainability were reviewed but are not applicable because LCPA is not a federal agency.

Increasing concentrations of greenhouse gases (GHGs) in the atmosphere are affecting global climate, and research has shown there is a direct correlation between fuel combustion and GHG emissions. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Scientific measurements indicate Earth's climate is changing, with associated impacts including warmer air temperatures, increased sea level rise, intensified storm activity, and alteration of seasonal precipitation events.

The study area for climate was defined by the extent of the potential project changes (i.e., immediate vicinity of the airport) and full extent of aircraft movements as part of the future potential projects.

Existing and future anticipated aircraft operational greenhouse gas (GHG) emissions were modeled using the FAA's Airport Environmental Design Tool (AEDT) as depicted in Table 6-6. The analysis of climate includes both the potential emission of additional GHGs incrementally contributing to climate change, but also includes an assessment of a given project's resiliency to the potential effects of climate change. Resiliency is defined as "the ability of a system and its

component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions." When compared to many other airports in Florida, RSW is well prepared with respect to the impacts of climate change. The property is over 4 miles east of the coast and the runway is approximately 27 feet Above Mean Sea Level. Sea level rise is not expected to be an issue throughout the planning horizon due to distance from, and height above, the sea. There are current measures in place to adapt to the impacts of climate change (i.e., stronger or more frequent storms) through the RSW airport-wide hurricane plan. Storm preparedness briefing meetings are held when RSW is in a potential storm projection path, construction and operation hurricane BMPs are adhered to, and pre/post storm activities for drainage and debris removal/cleanup are implemented to recover for storms as soon as possible.

Table 6-6 Greenhouse Gas Emissions from Aircraft

Source	Carbon Dioxide (metric tons)
2021 Existing Conditions	90,893
2043/100% ASV of Single Runway System	138,571

SOURCE: AEDT 3d; Environmental Science Associates, 2022.

While aircraft related GHG emissions are projected to increase with the increase in aircraft activity at the Airport, development of the Parallel Runway will reduce aircraft operational delays at RSW as the Airport reaches its Annual Service Volume capacity. Delay reduction will reduce aircraft fuel burn and accordingly, the resulting GHG emissions. Additionally, GHG emission reduction is expected to continue from measures such as changes to more fuel-efficient equipment, use of renewable fuels, and operational changes (e.g., performance-based navigation procedures). GHG emissions associated with the construction of future projects are expected to be limited and temporary and BMP's can be employed to minimize emissions (vehicle idling, etc.).

Coastal Resources

The entire State of Florida, including RSW, is located in a coastal zone. Based on the definitions in the Coastal Barrier Resources Act, RSW is not on or adjacent to a coastal barrier. Based on the definitions in Executive Order 13089 Coral Reef Protection, RSW is not within or adjacent to a U.S. coral reef ecosystem. Future projects will require coordination with the State Clearinghouse to secure a consistency determination with the Florida Coastal Management Program (FCMP) and the Coastal Zone Management Act.

The Airport is almost four miles east of the closest coastal resource, which is the landward-most portion of the tidally influenced segment of Mullock Creek immediately downstream from the weir. Mullock Creek then flows west-southwest for approximately 2.6 miles to Estero Bay, which is a Florida designated aquatic preserve. Estero Bay is connected to the Gulf of Mexico.

Although the Airport is not within or adjacent to a coastal resource, it discharges surface water (stormwater) into a series of canals that eventually reach Mullock Creek. The onsite surface water management system is permitted and designed to meet State of Florida attenuation and water quality standards. Regular maintenance of the system and onsite water quality monitoring ensures that the water leaving the site meets water quality standards.

Previous coordination with the Florida State Clearinghouse has indicated that RSW's development is consistent with the Florida Coastal Management Program.

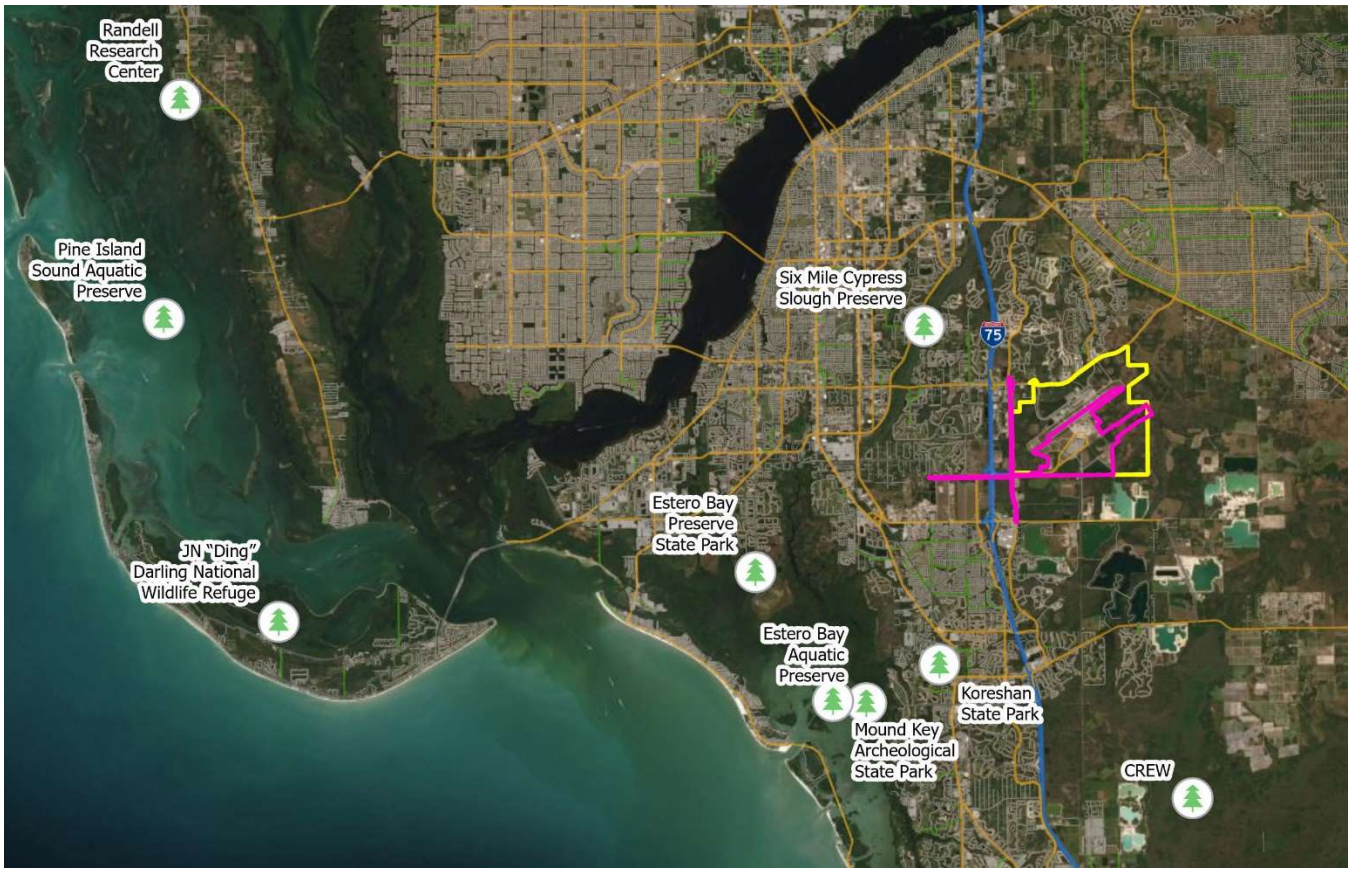
Department of Transportation Act, Section 4(f)

Potential airport development was reviewed based on the Land and Water Conservation Fund Act of 1965; U.S. Department of Transportation (DOT) Act – Section 4(f); Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) – Section 6009; and U.S. Department of Defense Reauthorization. Section 4(f) of the DOT Act pertains to certain resources affected by transportation projects that are funded or approved by the DOT and its administrations and agencies. Per the 1050.1F Desk Reference, Section 4(f) properties include:

- parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public;
- publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and
- historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public..

The study area for Section 4(f) resources considers both areas directly impacted within the construction footprint of a planned development project, as well as those areas indirectly impacted through noise or visual impacts, air emissions or facility operations.

No Section 4(f) lands will be required for use nor would any such lands be adversely impacted though implementation of any planned development projects (Figure 6-3). There are no 4(f) resources located on or in near proximity to the Airport. While activity is projected to increase at the Airport, neither the DNL 65 or 60 contours include any 4(f) resources. Visual effects to 4(f) resources are expected to be consistent with the visual effects today. Finally, the establishment of the Airport Mitigation Park enhances the Corkscrew Regional Ecosystem Watershed (CREW), a significant regional environmental resource.



Source: LCPA

Figure 6-3 Section 4(f) lands in the vicinity of RSW

Farmlands

The regulatory framework for farmlands includes several statutes and guidance documents, including the Farmland Protection Policy Act (FPPA), CEQ Memorandum on the Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act, and state & local regulations. Federal regulation defines prime, unique, and statewide and locally important farmlands (7 CFR § 657.5). Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor and without intolerable soil erosion. Unique farmland is land used for producing high-value food and fiber crops and has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of crops. State-wide and locally important farmland is land that has been designated as "important" by either a state government (state Secretary of Agriculture or higher office), county commissioners, or an equivalent elected body.

The study area for farmlands is the Airport property boundary. However, indirect impacts were also considered so the entire RSW property and adjacent lands were reviewed by searching the Natural Resource Conservation Service (NRCS) inventory of prime farmland and unique farmlands. It was noted that while some on-airport soils are consistent with a prime or unique farmland classification, potential development would not convert agriculture land to non-agricultural use and no future lands are currently planned for acquisition.

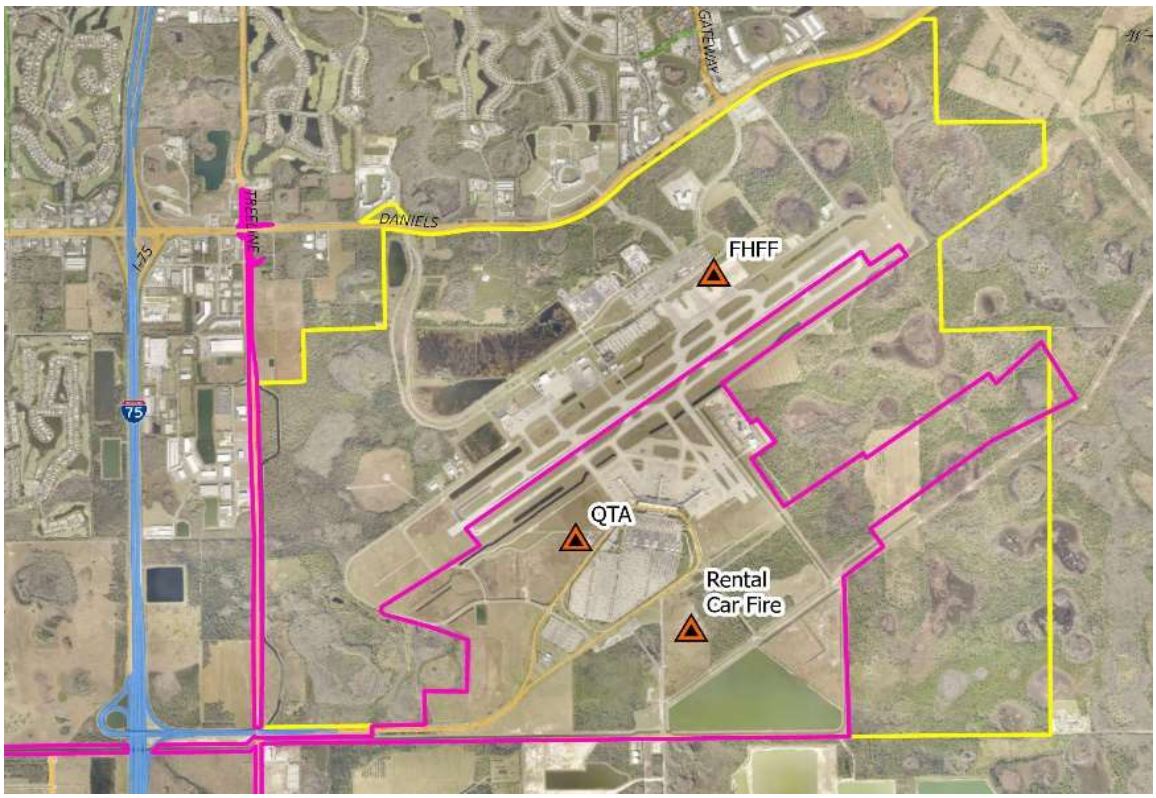
Hazardous Materials, Solid Waste, and Pollution Prevention

Materials are typically defined as being hazardous if they have specific characteristics defined as such or if they appear on a list of hazardous materials prepared by a federal, state, or local regulatory agency. The USEPA classifies a waste as hazardous if it is listed on the USEPAs list of hazardous waste and exhibits one or more of the following properties: ignitability (including oxidizers, compressed gases, and extremely flammable liquids and solids); corrosivity (including strong acids and bases); reactivity (including materials that are explosive or generate toxic fumes when exposed to air or water); or toxicity (including materials listed by the USEPA as capable of inducing systemic damage in humans or animals). Federal, state, and local laws regulate the use, storage, transport, and disposal of hazardous materials. Applicable federal laws include:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) (42 U.S.C. § 9601 et seq)
- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 et seq)
- Superfund Amendments and Reauthorization Act of 1986 (SARA)(Public Law 99-499)
- Emergency Planning and Community Right-to-Know Act (42 U.S.C. § 11001 et seq)
- Toxic Substances Control Act (15 U.S.C. § 2601 et seq.)

The study area for hazardous materials, solid waste, and pollution prevention includes the Airport property boundary and its near proximity in relation to existing contaminated sites. The following information was also considered for known contaminated sites currently undergoing remediation on airport property (Figure 6-4).

- Former Hydrant Fueling Facility
- Rental Car Fire
- Quick Turn Around (QTA) Sump Spill



Source: LCPA

Figure 6-4 RSW known contaminated sites

LCPA maintains Operating Instructions (OI-1000) for hazardous materials management on-site. Persons working at RSW who handle hazardous materials must comply with all applicable local, state and federal regulations, FAA Advisory Circulars, and adopted NFPA codes, and shall maintain the provisions of any agreement with the LCPA for the protection of life and property in developing facilities and operating at RSW. All persons must perform their duties in a manner consistent with applicable safety standards and practices to prevent the release or discharge of a hazardous material into the environment. No person is allowed to cause or permit the discharge of a hazardous material to the soil, ground water, or surface waters at RSW unless the discharge is in compliance with federal, state, and local regulations. No person is allowed to cause or permit the unauthorized discharge of a hazardous material to a septic tank or other type of on-site sewage disposal system. No person is allowed to transport a vehicle knowing or having evidence of a discharge and shall report such knowledge or information to the LCPA immediately, following the procedures set forth in the OI. Inspections of all facilities are conducted by the owner/operator and any agency tasked with code compliance or inspection pursuant to any applicable regulations. In addition, the LCPA conducts regular inspections through the ARFF, Facilities, and Operations Departments.

Spill Prevention Control Countermeasures (SPCC) plans that address the containers, equipment, facilities, and associated infrastructure regulated or required under 40 CFR Part 112 have been implemented and are maintained on applicable RSW facilities/operations. The plans are periodically reviewed and updated as required. All underground and aboveground storage tanks are managed and maintained in accordance with local, state, and federal regulations.

A solid waste system is currently in operation to support the airport and ongoing on-site and surrounding development. Lee County has an integrated solid waste management system consisting of a mix of recycling, waste-to-energy and landfill resources.

Waste and recycling are a large part of LCPA's existing sustainability initiatives. Solid waste is hauled by Lee County Solid Waste and recycling is hauled by Waste Pro. Solid waste data is collected at 19 facilities at RSW.

A Storm Water Pollution Prevention Plan (SWP3) for RSW has been prepared and implemented to maintain LCPA and associated tenants' compliance with the requirements of the FDEP National Pollutant Discharge Elimination System (NPDES) Multi-Sector Generic Permit for Storm Water Discharge Associated with Industrial Activities (MSGP).

LCPA has implemented an MSGP compliance strategy that is focused on achieving consistent implementation of storm water pollution prevention measures airport-wide. In general, LCPA has assumed the role of principal permittee and tenants that perform MSGP-regulated industrial activities in common spaces are enjoined into this compliance program as co-permittees, subordinate to LCPA, unless the LCPA determines that certain common space tenants need to obtain separate coverage and maintain their own SWP3 based on their specific activities/practices.

No wastes are expected to impact environmental resources or the impacts on waste handling and disposal facilities that would likely receive the wastes. Pollution prevention procedures are in place to address potential hazardous materials that could be used during construction and operation of the project. All planned projects will be evaluated for potential to encounter hazardous materials at contaminated sites during construction and operation, and potential to interfere with any ongoing remediation of existing contaminated sites is unlikely.

Historical, Architectural, Archeological, and Cultural Resources

Several laws and regulations require that possible effects on historic, archaeological, and cultural resources be considered during the planning and execution of federal undertakings, including the *National Historic Preservation Act* (NHPA), the *Archaeological Resources Protection Act*, and the *Native Graves Protection and Repatriation Act*.

In accordance with Section 106 of the National Historic Preservation Act, consultation with the State Historic Preservation Officer (SHPO) is required to determine if any archeological and historical resources exist within a planned project area. Additionally, SFWMD-issued Environmental Resource Permits require consultation with the Florida Department of Historical Resources if archeological or historical resources are discovered during construction.

The Airport property includes previously disturbed areas and non-disturbed areas. Future projects outside the footprint of the previously evaluated and/or disturbed areas may require consultation with the SHPO.

Portions of RSW are within Archeological Sensitivity 2 zones, however no historic properties (including archeological sites), traditional cultural properties, Native American sacred sites or other properties afforded consideration have been identified. Land Use

The Airport and Airway Improvement Act of 1982 and the Airport Improvement Program (AIP) is followed for project using AIP grants. Under Section 1502.16(c) of the CEQ Regulations, discussion of environmental impacts associated with proposed development must include consideration of "possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned."

All of Lee County is considered for the affected environment related to land use, with a focus on the Airport Lands and Tradeport future land use categories identified in the Lee County Comprehensive Plan (Lee Plan). The Lee Plan is designed to depict Lee County as it will appear in the year 2045. Goal 1 of the Lee Plan is to maintain and enforce the Lee County Future Land Use Map (Figure 6-5) showing the proposed distribution, location, and extent of future land uses by type, density, and intensity.

The RSW property is designated as Airport Lands in the Lee County Comprehensive Plan and is zoned Airport Operations Planned Development (AOPD). All proposed projects in the county must be in compliance with the Lee Plan before any potential rezoning action could take place. Additionally, all projects must meet the requirements of the Lee County Land Development Code (LDC), including the Airport Compatibility District standards adopted in the Lee County LDC to address height obstructions, airport hazards, wildlife attractants, noise, runway protection zones, light emissions, reflectivity and power interference, aircraft overflights, and the public investment in air transportation facilities in accordance with provisions of F.S. chs. 330 and 333 (as amended), as well as Federal regulations (as amended) including 14 CFR Parts 77, 150 and 151 and FAA Advisory Circulars 150/5300-13A as amended, renumbered or replaced, and 150/5200-33B as amended, renumbered or replaced.

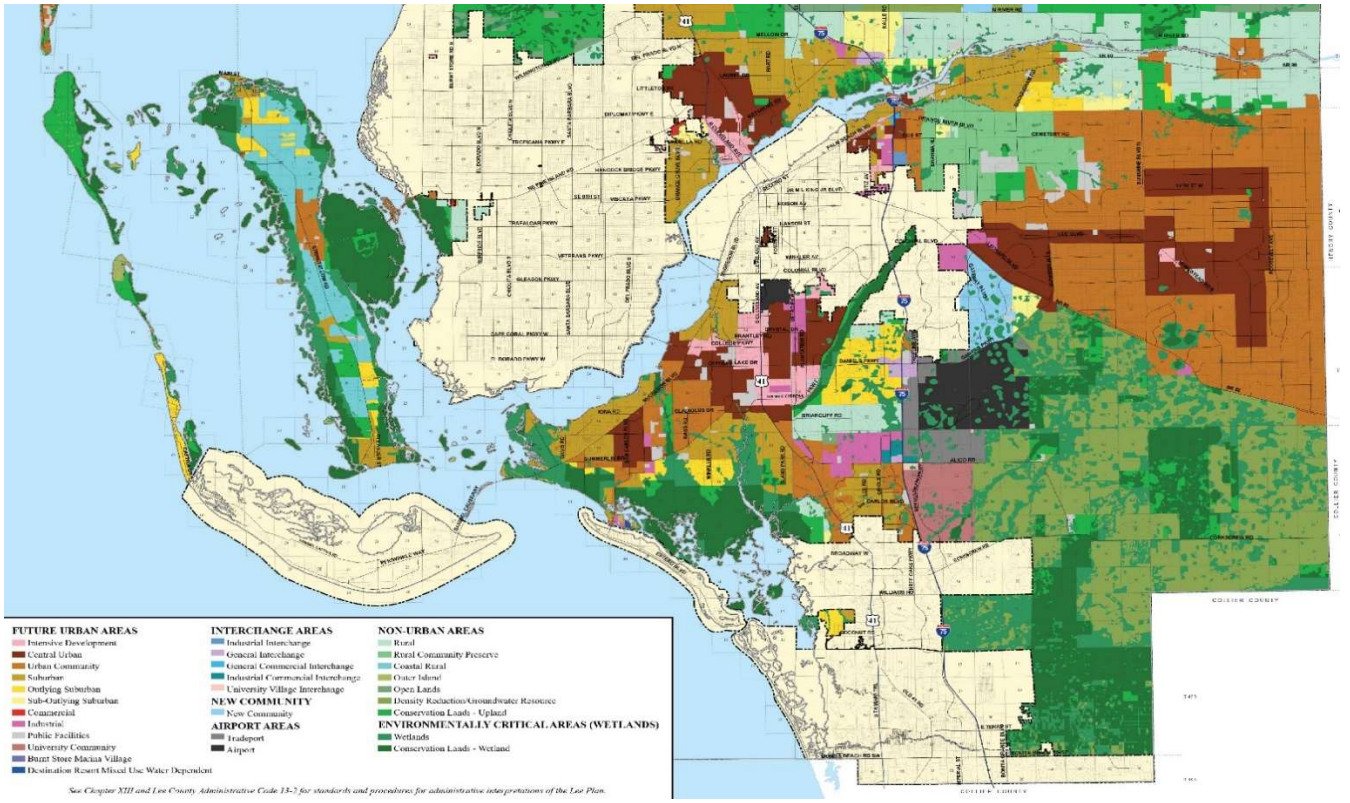


Figure 6-5 Future Land Use Map, Lee Plan

Policy 1.1.12 of the Lee Plan is related to the Airport Lands future land use category that accommodates LCPA airports and its projected growth needed, as economic engines, to meet the region's demands for air travel and for the non-aviation related uses necessary to continue viable airport operations. Allowable land uses and intensities within the Airport Lands future land use category are according to the Airport Master Plan. Development includes aviation related facilities such as hangars, terminals, and runways and non-residential, non-aviation related uses as approved through the AOPD zoning process. In cooperation with local, state, and federal regulatory agencies, the LCPA works to minimize and address any wildlife hazards arising from existing wetlands or water bodies located on properties designated Airport Lands in accordance with FAA directives. Site improvements on properties designated Airport Lands will be designed to minimize attractiveness to wildlife of natural areas and man-made features such as detention/retention ponds, landscaping, and wetlands, which can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape.

Planned development projects identified as part of this Master Plan Update are consistent with the allowable land uses and applicable policies of the local comprehensive plan (Lee Plan).

Natural Resources and Energy Supply

Natural resources refer to the raw materials that would be committed to a proposed project, such as water, asphalt, aggregate, and wood, etc. Energy supply refers to the coal, natural gas, and fuel available to support the construction, operation, and maintenance of an action. The statutes and executive orders governing natural resources and energy supply that were considered include the Energy Independence and Security Act, the Energy Policy Act and Executive Order 13834, Efficient Federal Operations. No federal permits or certifications are required under this impact category. Consultation with state and local entities has verified that no state or local permits are required. Coordination with Lee

County Utilities, Lee County Solid Waste and Florida Power and Light (FPL) occurs as needed based on project requirements and demands.

The amount of water, asphalt, aggregate and wood that is used in relation to a project is based on construction and design criteria, as well as availability. These resources are supplied by local and contracted vendors as needed.

Where possible, sustainability practices are employed to conserve energy and reduce demand for these resources. A sustainability program with goals, objectives and performance metrics is utilized to implement the program. Sustainability practices currently employed include, but are not limited to, a recycling program, low flow toilets, LED lighting upgrades, natural lighting in building design, etc. Additionally, pollution prevention plans are in place to reduce the potential for unintentional impacts to adjacent resources.

Construction and operation of the Airport and the incremental growth from future projects would use consumable natural resources including electricity, gas, water, and sewage treatment. Presently, there exists an adequate supply to service the Airport including its planned growth. Future projects are not anticipated to exceed current supply for any energy or natural resource category and sustainability practices will help mitigate impacts of future growth. However, further review of energy and resource needs of a given project versus availability will be completed as a part of the Lee County development and building permit process.

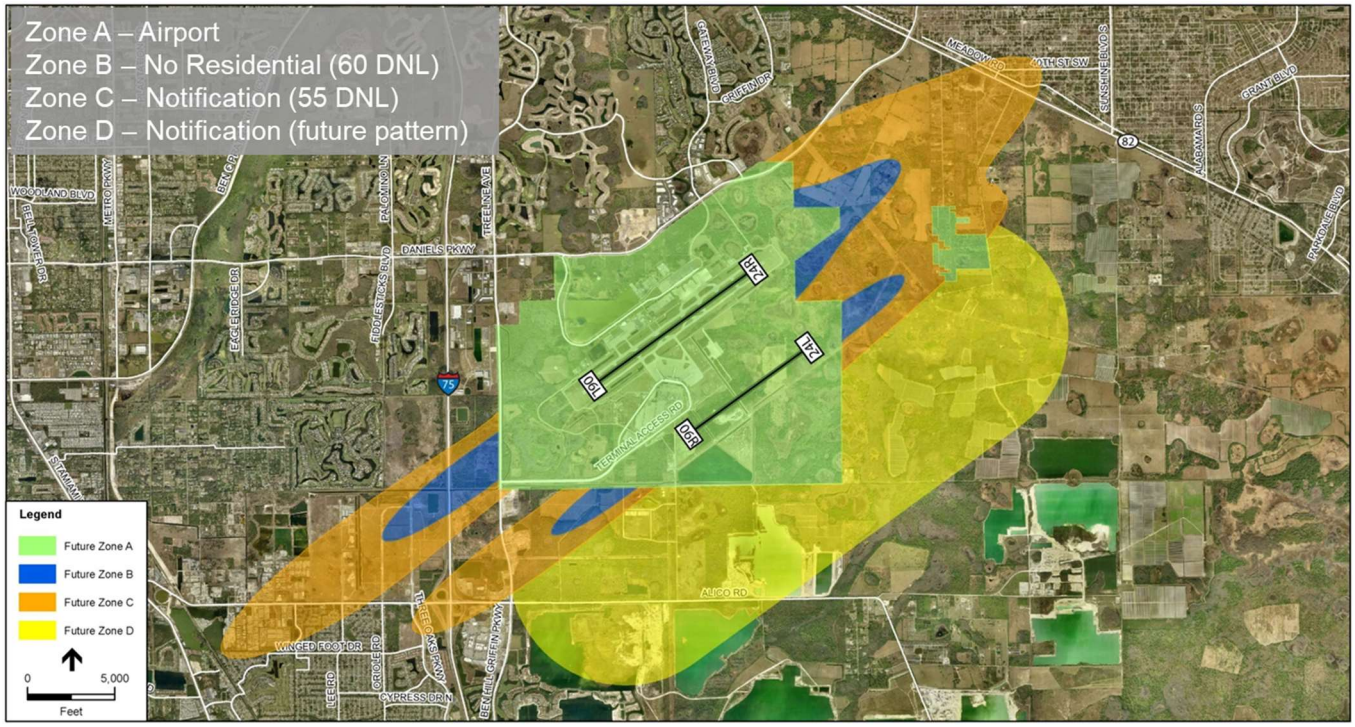
Noise and Noise-Compatible Land Use

The FAA requires preparation of a noise exposure analysis for any project that may result in a change in cumulative noise exposure to noise sensitive areas around an airport. FAA Order 1050.1F defines noise sensitive areas as areas where noise interferes with normal activities associated with its use. Noise sensitive areas may include residential, educational, health, religious structures and sites, parks and recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. Common development actions that may change the cumulative noise environment include changes to runway configuration, aircraft operations and/or movements, aircraft types using the airport, or aircraft tracks and profiles. The FAA established land use compatibility guidelines relative to certain noise levels in Title 14 Code of Federal Regulations (CFR) Part 150, Noise and Land Use Compatibility, Appendix E. Most land uses are compatible with noise levels less than DNL 65 dBA.

FAA Order 1050.1F, FAA Order 5050.4B, and Title 14 CFR Part 150 specify the methods required for evaluation of the airport noise environment. The FAA defines DNL 65 dBA as the threshold of exterior noise compatibility for residential and other noise-sensitive land uses.

Following the 1994 EA approval for the Parallel Runway and Midfield Terminal Complex, a Part 150 noise study update was conducted in 1995 that expanded the resulting Noise Overlay Zones to incorporate areas that would be affected by aircraft activity on the future Parallel Runway. The 1995 Noise Compatibility Program also included additional noise abatement operational measures/procedures. A 2006 14 CFR Part 150 Study Update included further refinements to the noise overlay zone including limiting noise sensitive land uses within the 60 DNL contour and establishing a public notification area within the 55 DNL contour.

In 2011, the LCPA began another update to the Part 150 study for RSW. The study was completed in 2013 (2013 Study) and was used as the basis for further updating the noise overlay zones in proximity to the airport. The updated zones were based on projected aircraft activity for 2030 with the future two runway system as depicted in Figure 6-6. The DNL 65 is wholly contained on airport property.

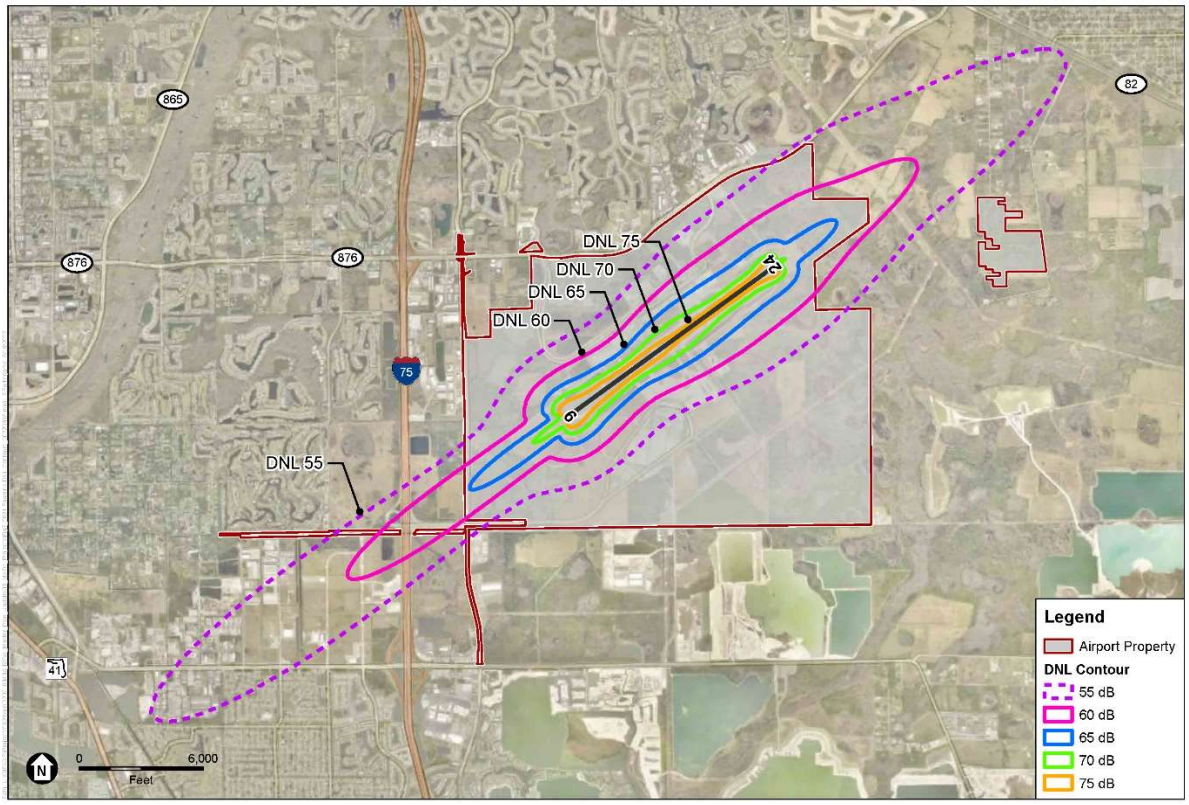


Source: LCPA

Figure 6-6 Existing Airport Overlay Zones

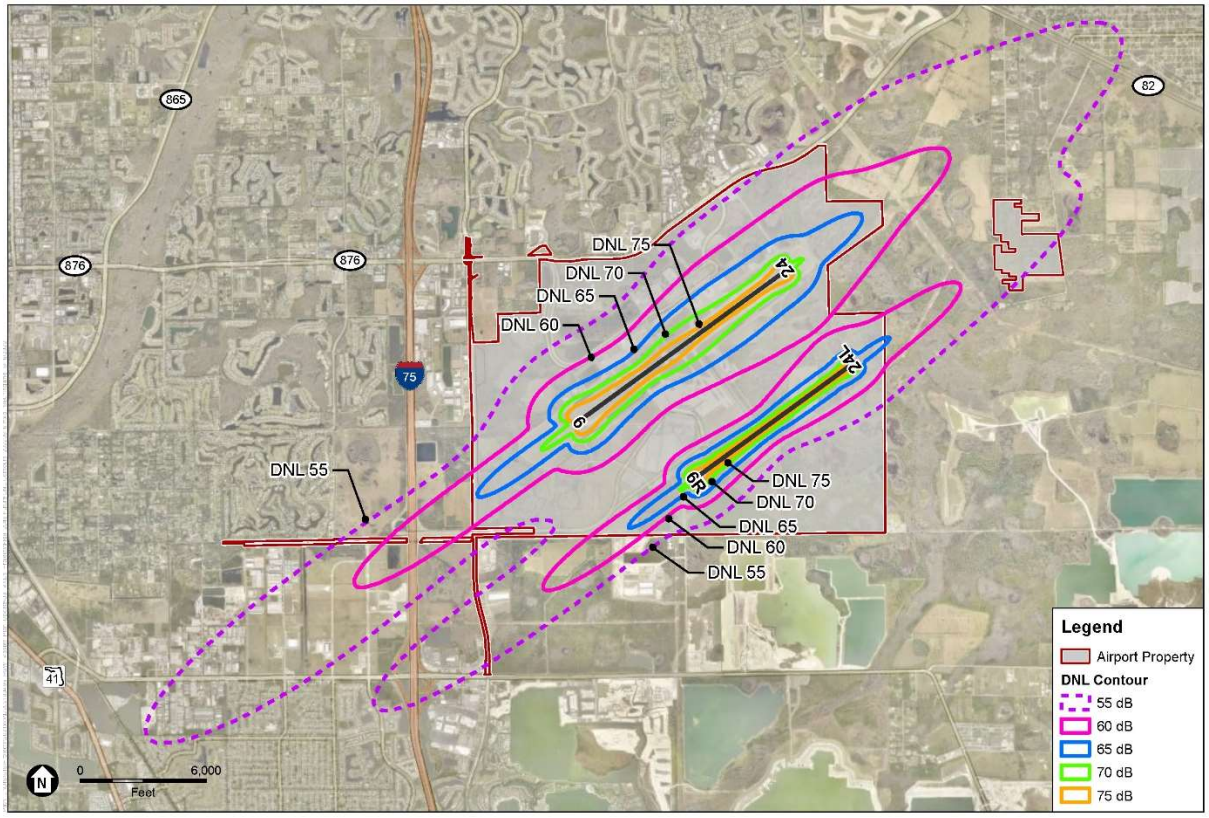
An additional noise modeling analysis was prepared as a part of the RSW Master Plan Update to determine the existing noise exposure conditions and the anticipated conditions when the Parallel Runway comes online. For this analysis, AEDT Version 3d (AEDT 3d) was used to model aircraft noise exposure at RSW for the 2021 Baseline Condition and Year of Opening/100% ASV (theoretical capacity) condition. A detailed existing fleet profile including time of day and stage lengths was also developed from landing fee reports and 2021 historical fleet data obtained from FlightAware™. Projected fleet evolution and estimated future fleet profile (airframe and engine types) was developed for the purposes of this analysis based on the FAA approved forecast and industry trends.

Noise exposure contours depicting the 55, 60, 65, 70, and 75 DNL levels were overlaid on an aerial for the Airport and the immediate vicinity. One set of contours was generated to reflect Baseline 2021 noise exposure (existing runway configuration) (Figure 6-7). A second set of contours was generated that reflects the anticipated Year of Opening/100% ASV Future noise exposure associated with future airfield (Parallel Runway) conditions (Figure 6-8). Projected fleet evolution and estimated future fleet profile (airframe and engine types) were developed for the purposes of this analysis based on the FAA approved forecast and industry trends.



Source: ESA

Figure 6-7 Existing DNL contours (2021)



Source: ESA

Figure 6-8 Future DNL contours (2043)

While beyond the federal thresholds of significance, the DNL 55 and 60 contours are shown because Lee County has adopted the 2030 projected noise exposure contours for these contours for long term land use planning. This requires notification/disclosure within the DNL 55 Contour (Zone C) and restricts future noise sensitive development within the DNL 60 contour (Zone B). The 2043 Future Condition DNL contours depicted on Figure 6-8 incorporate the ultimate planned southern Parallel Runway and reflect use distribution between the two runways.

The FAA approved noise contours have continued to generally decrease with each noise contour analysis, due to the required federal phase-out of Stage 2 aircraft in the early 2000s and the continued transition to quieter Noise Stage 4 and 5 aircraft. There are no people living within the current 65 DNL noise contour since it is located entirely on RSW property, nor are there any forecasted to be in the 65 DNL contour through the year 2043. Additionally, there are no noise sensitive land uses or Section 4(f) properties or historic resources within or in near proximity the 65 DNL contour.

Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic impacts are generally associated with the loss or creation of jobs or significant tax base, depression or stimulation of economic activity, and induction of additional population to relocate to the area. Environmental justice describes whether these or other environmental impacts are born primarily by a low-income or minority group.

Socioeconomics

FAA Order 1050.1F describes socioeconomics as "an umbrella term used to describe aspects of a project that are either social or economic in nature." A socioeconomic analysis evaluates how elements of the human environment such as population, employment, housing, and public services might be affected by proposed actions and alternatives (FAA, 2015). 49 CFR part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, addresses displacement of persons associated with implementing a project.

As commercial aviation grew in Southwest Florida, by the 1970's it became clear that Page Field was too small and constrained to meet regional demand. A site selection process for a new airport was undertaken and an undeveloped area east of I-75 was selected. RSW became the primary commercial airport supporting Southwest Florida upon the opening of the Airport in 1983. Significant state, local and regional planning efforts were and continue be undertaken to ensure that the Airport and its surrounding development was consistent with the long-term needs of the region. In 2022, the Florida Department of Transportation estimated that RSW supports more than 60,000 jobs and has a total economic impact of $8.3 billion.

Planned development at the Airport is not expected to result in disruption to communities or businesses and future land acquisition is not anticipated. Additionally, planned development aligns with the Lee Plan (Lee County Comprehensive Plan) and is expected to generate additional jobs and economic benefit. The relocation of the commercial passenger terminal from the north side of the runway to the midfield location in 2005 and the addition of the I-75 Airport direct connection in 2015 resulted in reduced impact to off-airport roads. It was determined that the existing (2022) roadway capacity is sufficient to meet traffic demands throughout the planning period (2041).More detailed analyses may be required to maintain on-airport operational requirements at intersections, and identify the need for longer turn lanes, adjusted signal timing, additional turning movements, etc. at intersections as development occurs.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994), directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations. DOT Order 5610.2 (1997), Environmental Justice in Minority and Low-Income Populations, implements EO 12898.

The boundary of RSW contains no residential dwellings. The Airport is bound by major roadways and mixed-use commercial, mixed use industrial and vacant lands. Low income and minority populations are not within or directly adjacent to the Airport. However, low income and minority populations exist within Lee County and Southwest Florida. Based on EPA's EJScreen database and the 2016-2020 American Community Survey, total population in Lee County is just under 780,000. Minorities represent approximately 34 percent of the total population and approximately 18 percent of the population is below the poverty line. A review of the adjacent census tracts indicates that all have lower relative percentages of minority and low-income population. As a result, disproportionately high and adverse environmental effects on minority and low-income populations are not anticipated as a result of the ongoing operations and continued development of the Airport property through the planning horizon.

Children's Environmental Health & Safety Risks

The regulatory setting associated with this environmental impact category includes Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.

The affected environment for Children's environmental health and safety risks was analyzed in the context of other environmental impact categories, including air quality, noise, water resources, etc. within Lee County. The Airport is not located immediately adjacent to any schools, daycare facilities, parks, or children's health clinics. Gateway Charter Elementary School and Gateway Charter High School are located approximately one mile to the north of Airport property, while San Carlos Park Elementary and Rayma C. Page Elementary are located approximately three and five miles southwest of the Airport. All are located outside the future DNL 55 dB contour.

The airport is not located adjacent or in near proximity to any schools, daycare facilities, parks, or children's health clinics. Zoning regulations adopted in the Lee County Land Development Code establish protections so that construction of an educational facility is prohibited in the 60 DNL Noise Contour based on the most recent Part 150 Study approved by FAA for RSW. Aviation related educational facilities are exempt from this restriction. Considering the existing conditions and protective measures in place, planned development at RSW is not anticipated to have a disproportionate health or safety risk to children. No significant impacts to children's environmental health and safety risk are anticipated as a result of the planned airport development projects.

Visual Effects

Visual effects address the potential for interference with existing visual resources or the visual character of a site. This resource category also considers the extent to which a project would generate light emissions that create annoyance or interfere with existing activities. Visual resources consist of the natural and manmade physical features that give a particular landscape its aesthetic character and value. Light emissions include any light that emanates from a light source into the surrounding environment, such as lighting associated with airports, parking facilities, roadways, and other business and residential uses. People, wildlife, and land uses that could be affected by light emissions must be considered, including the extent to which they are currently affected by existing light emissions. The current level of light emissions include those typical to airport operations and parking.

The Airport is largely shielded from view by its location. With major divided highways/roadways to its west and north and limited development to the south and east, the light emissions and visual character of the Airport are largely contained on Airport property. The nearest developments include the residential area known as Gateway which is north of Daniels Parkway, Jet Blue Park, and the adjacent industrial development along the Daniels corridor. Airport light emissions are contained entirely on-site. No unique resources with the potential to be affected by light emissions or changes to the visual character of the Airport exist. No historic properties, parks, traditional cultural properties, and light-sensitive wildlife species are located in or immediately adjacent to the Airport. Planned development on Airport property will be consistent with the current visual character of the site. While activity at the Airport is projected to change over time, land use controls limit residential development in near proximity to the Airport. The light emission effects from the planned development are unlikely to create annoyance or interference with normal activities, will not affect the visual character of the area, would not contrast with other visual resources, and will not block/obstruct the views of visual resources. As a result, negative visual effects associated with the future Airport development are not anticipated.

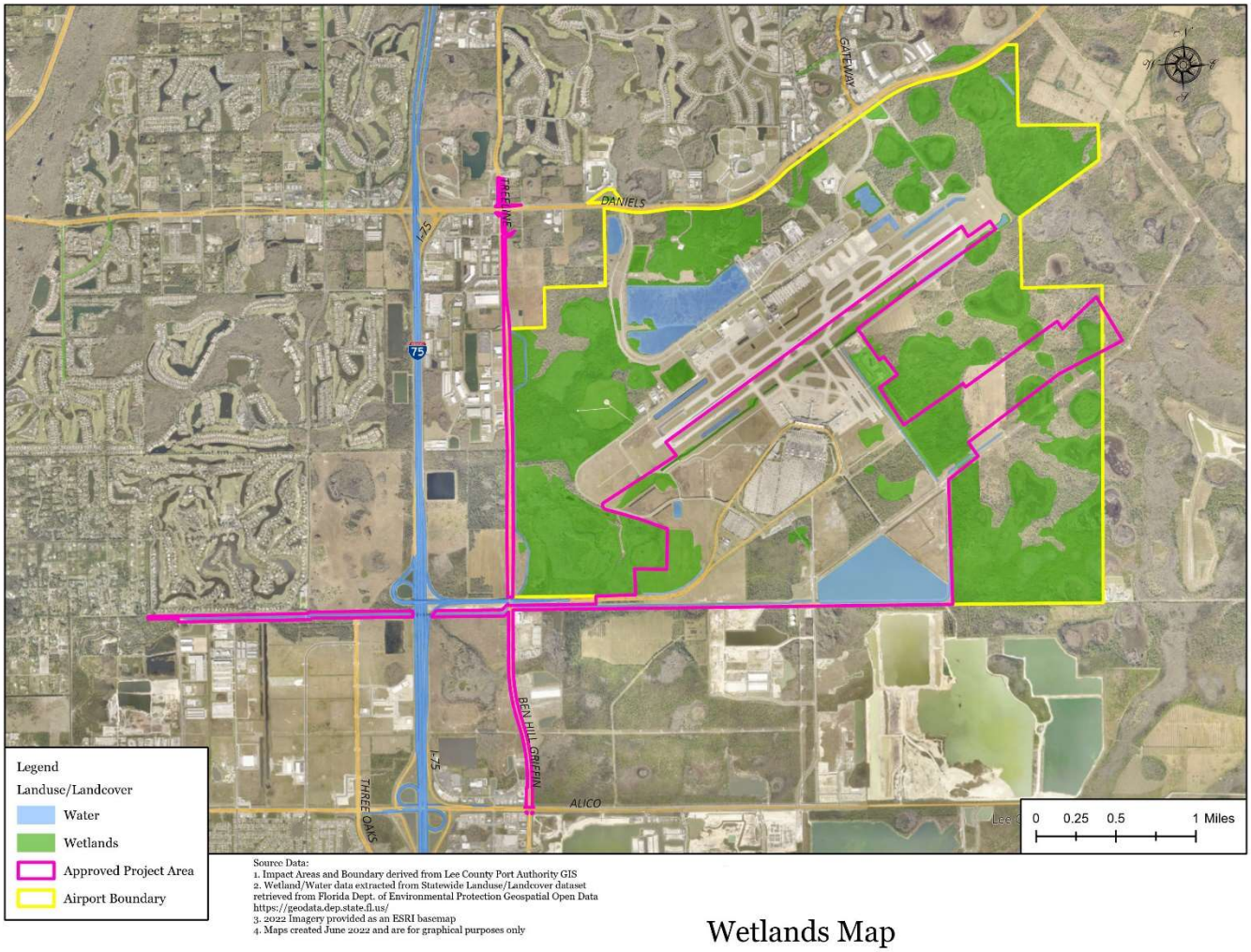
Water Resources

Wetlands

The Statutes and Executive Orders associated with wetlands that were evaluated include the Clean Water Act, Fish & Wildlife Coordination Act, Executive Order 11990, DOT Order 5660.1A and Chapter 373, F.S. These Statutes and Executive Orders require consultation and concurrence with pertinent agencies having wetlands-related interests, permits and other approvals prior to any works in, on or over wetlands.

As indicated in Figure 6-9, the Airport property boundary encompasses many areas where wetlands are present. Much of the area encompassed by the north area plan has been previously developed and contains few wetland areas. However, further environmental review of specific sites will be required as development plans become more defined and refined and future mitigation may be required to address associated impacts.

Early coordination regarding the Parallel Runway and the midfield development area was conducted with the FAA, USFWS, COE, SFWMD and other agencies. Efforts were made to avoid and minimize wetland impacts while still maintaining consistency with FAA requirements regarding wildlife hazard attractants. Additionally, Section 404 permits and Environmental Resource Permits from the SFWMD were obtained prior to any works in, on or over wetlands associated with the Project. Mitigation is in place for wetland impacts, including purchased mitigation bank credits and the 7,000-acre Airport Mitigation Park.



Source: LCPA

Figure 6-9 RSW Wetlands map

For much of the Airport property, wetland impacts have been completed. A detailed mitigation plan was developed and implemented to the satisfaction of the COE (for Section 404) and SFWMD (for State ERP) at the time of the Parallel Runway and Midfield Terminal Complex permitting.

The 7,000-acre Airport Mitigation Park is maintained in accordance with Federal and State permits, and provides wetlands compensation and mitigation for the project area depicted in Figure 6-9. Airport Mitigation Park contains a mosaic of wetlands within the landscape, including flow-ways, strands, cypress swamps and domes, marshes and hydric flatwoods. The Mitigation Park protects the largest freshwater marsh in Lee County, Imperial Marsh, and hydrologically connects with other publicly owned wetland preserves and mitigation areas. These include the Corkscrew Regional Ecosystem Watershed (CREW), Corkscrew Mitigation Bank and Imperial Marsh Preserve. Additionally, Airport Mitigation Park provides a myriad of ecosystem services valuable for wetland functional value, including:

- Flood storage and protection
- Water quality improvement
- Groundwater recharge
- Fish and wildlife habitat (including for listed species)

Significant wetland conservation and compensatory mitigation are in place, and LCPA maintains compliance with the permit requirements for perpetual maintenance of the Airport Mitigation Park.

Floodplains

Floodplains are often discussed in terms of the 100-year flood, or base flood. Several Executive Orders and State and Federal Statutes govern the regulatory setting associated with floodplains. The primary requirements are provided in Executive Order 11988 and DOT Order 5650.2.

The study area includes the Airport property area and downstream discharge areas. The Airport property is currently classified as FEMA floodplain Zone X. Zone X is the area of minimal flood risk outside the 0.2% annual chance (500-year) floodplain.

As discussed in the Surface Water section below, Airport-related stormwater discharge is controlled by gated weirs with permit specific control elevations. This ensures no indirect impacts to downstream Floodplains through discharge of too much or too little water during a typical wet season.

Although the Airport does not impact a floodplain, the 7,000-acre Airport Mitigation Park preserves a portion of a natural flow-way system known as Imperial Marsh and Flint Pen Strand that provides many of the natural and beneficial values of floodplains as identified in DOT Order 5650.2. These benefits include:

- Sustaining aquatic and terrestrial species by providing needed food, cover and water requirements.
- Recharging groundwater and reduce flooding by providing slow water flow and retaining water.
- Maintaining water quality by providing a natural flow of water over rough surfaces, through vegetation so the natural biological and chemical processes can reduce pollutant loads.
- Providing open space with natural beauty inhabited by fish, wildlife and plants.

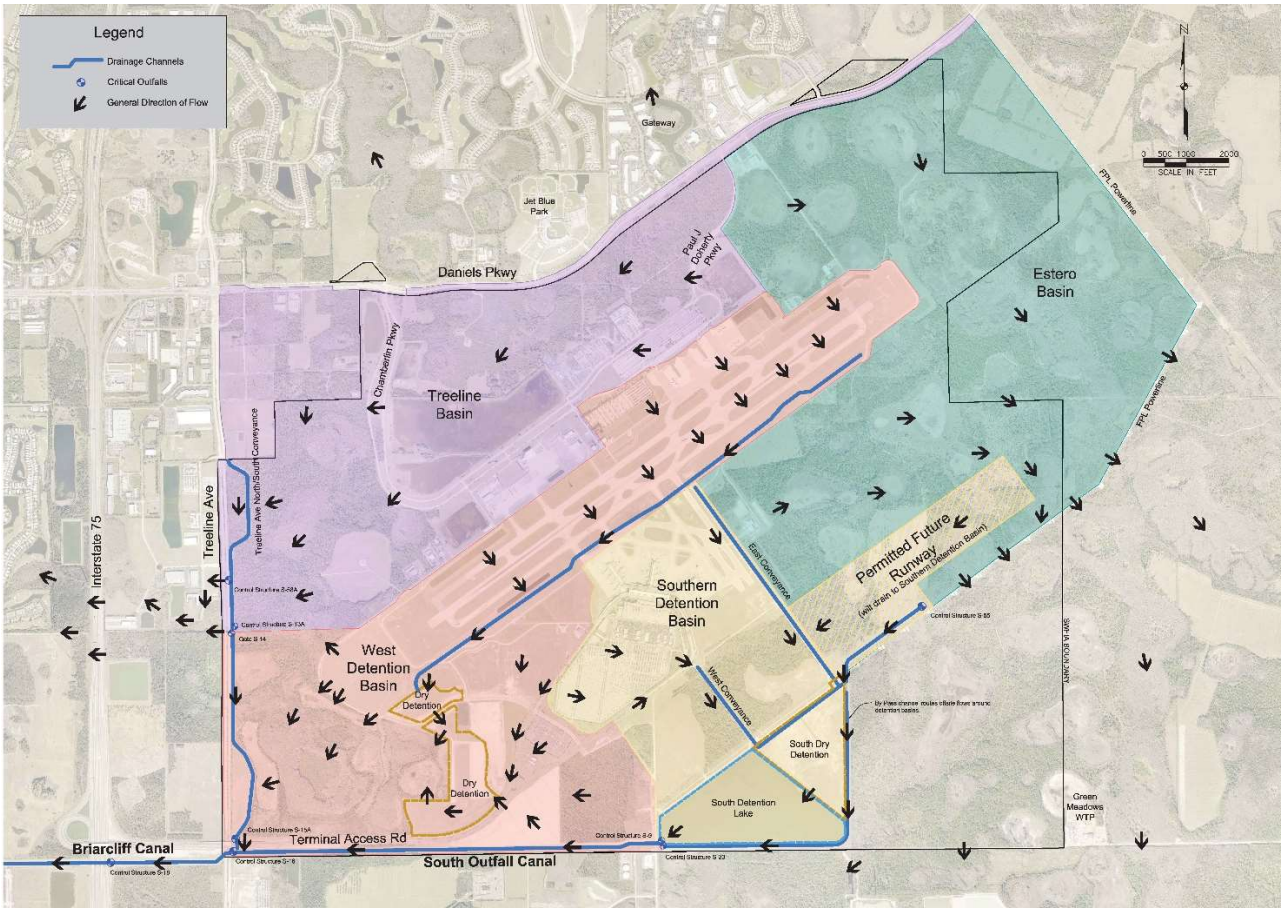
According to FAA Order 1050.1F, floodplain impacts would be significant for any action that would cause notable adverse impacts on natural and beneficial floodplain values. No impacts to floodplains, either directly or indirectly, are expected as a result of the planned development on Airport property.

Surface Waters

The study area includes the Airport property area and associated discharge points (Figure 6-10). Exisiting Runway 6-24 and midfield development area utilizes a permitted master stormwater management system for all surface water. This system includes a series of swales, culverts, detention and retention areas, stormwater ponds, and canals with gated weirs to collect, treat and discharge water offsite as needed. A current SWP3 exists for all of RSW as required by the NPDES MSGP.

Commonly accepted measures to minimize erosion and sedimentation and maintain water quality throughout land clearing and construction activities are available and would be required during construction for future projects as appropriate. Measures outlined in FAA Advisory Circular 150/5370.10H, Standards for Specifying the Construction of Airports, will be implemented to minimize the potential for water quality impacts. Prior to any construction, the contractor will be required to obtain a state NPDES permit for discharges from construction activities and comply with the conditions of the approval.

Regular water quality sampling is conducted to verify the surface water quality prior to discharge from Airport property. Surface water impacts are minimized, avoided, and mitigated through compliance with the SWP3, State, Federal, and local permits.



Source: Johnson Engineering, 2018

Figure 6-10 RSW Onsite Drainage map

Based on the significance threshold for surface waters outlined in FAA Order 1050.1F, the impacts of planned development through the planning horizon is below the threshold of significance for impacts to surface waters. Specifically, as a result of required permitting compliance, the anticipated development will not:

- Exceed water quality standards established by federal, state, local, and tribal regulatory agencies
- Contaminate public drinking water supply such that public health may be adversely affected

Additionally, based on the FAA's list of other factors to consider with regard to impacts to surface waters, the anticipated development will not:

- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization

Groundwater

The Airport requires withdrawal of mid-Hawthorn aquifer groundwater for landscape irrigation. Additionally, occasional temporary dewatering may occur during the course of construction projects for the purpose of installing sub-surface project-related components and appurtenances. All activity associated with groundwater withdrawals and dewatering is conducted in accordance with the conditions of SFWMD-issued permits.

A Density Reduction Groundwater Recharge area (DRGR) has been incorporated into the southeastern portion of Lee County for the purpose of protecting groundwater recharge within the most critical area of the region. The Airport is located immediately west of the DRGR, however the 7,000-acre Mitigation Park is entirely within the DRGR, providing further protection of the groundwater recharge area.

Regarding safe drinking water, Lee County Utilities has established wellfield protection zones for the purpose of protecting drinking water wells within the County. A small portion of the Green Meadows Wellfield Protection Zone exists within the southeastern portion of RSW. The Green Meadows and Corkscrew Wellfield Protection Zones include portions of Airport Mitigation Park. The preservation status of the Mitigation Park ensures protection of groundwater within the wellfield protection zones.

Any activities affecting groundwater are conducted under strict requirements outlined in the consumptive-use and master dewatering permits issued by the state. Groundwater withdrawals remain limited to permitted irrigation and construction activities, and state rules apply regarding drawdown and wetlands. No significant impacts to groundwater are anticipated as a result of planned development through the planning horizon.

Injection or importation of water or substances into groundwater (i.e. deep well injection, aquifer storage & recovery, etc.) is not anticipated on Airport property. Groundwater quality associated with potential spills is addressed through the incorporation of a Spill Prevention, Control and Countermeasure (SPCC) Plan, as required per 40 CFR Part 112.

Based on the FAA's significance threshold for groundwater in Order 1050.1F, the planned development through the master plan horizon is not anticipated to:

- Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies; or
- Contaminate an aquifer used for public water supply such that public health may be adversely affected.

In analyzing other factors to consider, the planned development through the master plan horizon does not:

- Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values.
- Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained, and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

Wild and Scenic Rivers

The Airport is not on, adjacent to, or within the corridor of a Wild and Scenic River or any NRI listed river as defined by the Wild and Scenic Rivers Act. Florida has two rivers designated as Wild and Scenic River System rivers: the Loxahatchee River in southeast Florida and the Wekiva River in central Florida, north of Orlando. No designated Wild and Scenic Rivers exist within Lee County. However, three NRI listed rivers exist in Lee County, including Orange River, Hendry Creek and Estero River. The Project is at least five miles from each of these designated river corridors and does not utilize or discharge into these systems, either directly or indirectly. Further, these rivers are well outside the 60 dB DNL contour and are not affected by noise, light or other activities associated with any other airport development projects.

Summary

Based on continual analysis of panned RSW development project impacts:

- The midfield development area as defined in the FONSI has been and continues to be implemented, with the majority already constructed.
- . All wetland impacts completed and permitted to date have been fully offset.
- Regulatory permits (COE, SFWMD, etc.) and mitigation have been secured which allow for construction of the Parallel Runway and various other projects within the Airport boundary.
- 7,000 acres of off-site mitigation (Airport Mitigation Park) has been purchased and continues to be preserved and restored in compliance with permit conditions.
- Wetland mitigation credits and panther habitat units have been purchased to mitigate for the future Parallel Runway.

As development projects evolve through planning, various levels of environmental documentation and studies may be required before construction can begin. The impact categories with the highest potential for future impacts are likely to be wetlands and biological resources. While wetland and biological resource impacts should be avoided and minimized to the extent possible, future mitigation may be required to address associated impacts.

Chapter 7 Sustainability Initiatives and Airport Recycling, Reuse and Waste Reduction

Per the FAA Modernization and Reform Act of 2012, master plans for airports receiving Airport Improvement Program (AIP) funding for eligible projects must ensure that updated master plans address issues related to solid waste recycling at the Airport.

In accordance with the FAA's Memorandum of Guidance of Airport Recycling, Reuse and Waste Reduction Plans dated September 30, 2014, this chapter summarizes the related efforts underway at RSW as part of the Airport's sustainability planning initiatives. As part of the overall sustainability planning effort, a more focused set of objectives has been established to address certain aspects of recycling, reuse and waste reduction as summarized below.

7.1 Sustainability Plan

The Port Authority began the process of developing a Sustainability Plan (Plan) for RSW in 2019. The framework for the Plan is based on the Florida Department of Transportation (FDOT) Airport Sustainability Guidebook (2017), and the development of the mission statement, goals, objectives, and performance metrics are tailored to meet the conditions and needs of RSW. The Port Authority has a Green Team comprised of employees who engage in the development and continuation of sustainability initiatives.

The Green Team and consultant are developing the Sustainability Plan in four phases. The Phase 1 organizational aspects are complete, and the following sustainability categories for the focus of the RSW Sustainability Plan have been identified:

- Economic Resiliency
- Energy
- Waste and Recycling
- Water Quality and Quantity
- Sustainable Business, Planning, Design, Construction, and Operations
- Community Outreach and Employee Engagement

The Phase 2 baseline assessment is also complete. The facility description and background are contained in the *LCPA Sustainability Plan – RSW Sustainability Baseline Assessment* dated 12/8/2020. Data was collected to establish baseline conditions as of 2020. Goals, Objectives, and Performances Metrics are established to determine success at achieving sustainability goals listed below, based on the performance metrics listed below each goal:

- Goal 1. Protect and enhance water quality and quantity
    - Stormwater runoff rate
    - Levels of nitrogen, phosphorus, and suspended solids
    - Gallons potable water use per passenger
    - Irrigation - gallons per year
- Goal 2. Use energy resources efficiently
    - Total electricity use kilowatt hours (KwH) per passenger
    - Percent energy use intensity (EUI) reduction
    - Total energy saved (KwH)
- Goal 3. Reduce waste to landfill
    - Waste diversion rate (per passenger)
    - Total solid waste (tons/pounds) diverted from landfill
    - Percent of total construction & demolition waste diverted from landfill (tons/cubic yards)
- Goal 4. Incorporate sustainable business, planning, design, construction, and operational practices
    - Percent of vendor, concession, contractors, and tenant contracts that incorporate sustainable requirements
    - Dollar value of projects utilizing sustainable design and construction guidelines
    - Percent of sustainable goods and products purchased. Sustainable products refer to products that contain or are certified by: recycled content, Forest Stewardship Council wood products, bio-based materials, reused materials, GreenScreen v1.2 Benchmark, Cradle to Cradle Certified, REACH Optimization, Product Manufacturer Supply Chain Optimization, Low Emissions of Volatile Organic Compounds.
    - Roadway congestion during peak travel periods
- Goal 5. Enhance the economic resiliency of RSW

- Aeronautical vs. Non-aeronautical revenue (terminal vs. landside)
- Acres of developed land vs total developable land in Skyplex
- Revenue per square foot for food & beverage vs. retail vendors usage space within the terminal

- Goal 6. Continue effective community outreach and employee engagement
  - Number of community events held at and/or sponsored by LCPA
  - Number of employee engagement opportunities and activities
  - Dollars raised for United Way and other charities or non-profits

The Green Team is currently working on different concepts to further RSW's work in achieving the established goals, and development of a formal sustainability plan is under consideration.

7.2 Waste Audit

Lee County Solid Waste Division provides solid waste collection service through franchised hauling contractors. Disposal for RSW's solid waste is accomplished at the Lee County Resource Recovery Facility and the Lee-Hendry Regional Landfill.

Solid waste data is collected at 19 facilities at RSW. Five (5) of these locations are off-site tenants that are not operated by the Authority, and one (1) facility is dedicated for collecting international (regulated) waste, which is hauled off-site and destroyed by Lee County Solid Waste. The available waste data has been analyzed for 13 facilities at RSW that are owned and/or operated by the LCPA as part of the *LCPA Sustainability Plan - RSW Sustainability Baseline Assessment* dated 12/8/2020. Total solid waste at RSW increased 5 percent from FY 2017/2018 (78,433 tons) to FY 2018/2019 (82,671 tons), then a 22 percent decrease was observed from FY 2018/2019 to FY 2019/2020 (64,321 tons).

LCPA's waste and recycling initiatives throughout the RSW property include: implementation of recycling programs, installation of water bottle filling stations throughout the terminal, recycling bins provided in main terminal and LCPA offices and breakrooms, and recycling of IT electronics.

7.3 Review of Recycling Feasibility

The LCPA recycles paper, cardboard, wood, ferrous, nonferrous metals, glass, plastic, construction debris, and electronics. Recycling services are performed and tracked by service provider Waste Pro. Recycling data is comprised of single stream recycling, construction, and metal. Recycling at RSW increased by 60-percent from 2015/2016 to 2019/2020. In FY2021-22, LCPA and its tenants recycled 184.5 tons, an increase of 35 tons more than the prior year. LCPA utilizes *Stream Recycling* to conduct and certify the recycling of electronic equipment. Electronic equipment collected includes computers, printers, and monitors. Those that include hard drives or media are physically destroyed in accordance with the Department of Defense standards.

7.4 Operation and Maintenance (O&M) Requirements

Local regulations require recycling. The Lee County Board of County Commissioners adopted Ordinance 07-25, the Mandatory Business Recycling Program, which LCPA implements and mandates for all LCPA owned/operated buildings, tenants and construction crews.

Port Authority maintenance personnel are responsible for operating and maintaining the airport's recycling program. To promote recycling, notifications are distributed and flyers are provided to LCPA employees and tenants to advise of the requirements and the methods for recycling on airport property.

Containers are provided for in-office recyclables. Staff and tenants are required to deliver recyclables to large recycling dumpsters provided at a corral airside. Six (6) vertical compactors are located at the loading dock, available to all LCPA employees and tenants. A separate dumpster is provided for metals excluding aluminum located at the Chiller Building.

Construction contractors are also required to separate construction debris for recycling.

LCPA will continue to track recycling activity and performance on an annual basis and communicate results to employees, tenants and contractors to ensure compliance with recycling requirements.

7.5 Review of Waste Management Contracts, Potential for Cost Savings & Minimizing Solid Waste Generation

Recycling services are collected and tracked by service provider Waste Pro. LCPA utilizes *Stream Recycling* to conduct recycling of electronic equipment and contracts Diversity Facility Solutions (DFS) for collection.

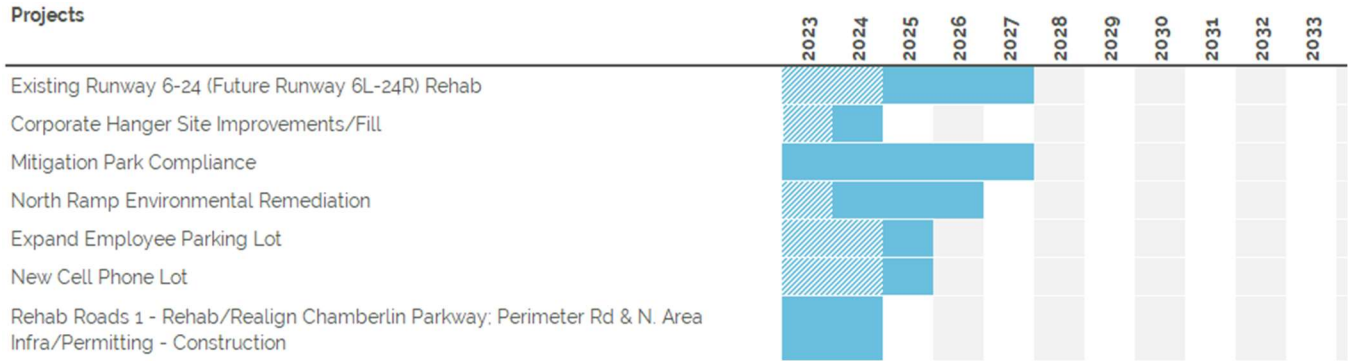
LCPA incorporates sustainability language into contracts and the bidding process as new contracts arise. Evaluation of bids and contracts is also performed to capture opportunities for minimization of solid waste generation and potential for cost savings.

LCPA adopted Purchasing Guidelines in July 2017, including the following recycling, reuse and waste reduction considerations when purchasing products and materials (Lee County Port Authority - Purchasing Guidelines, Section 10, Green Policy Program):

- Reducing materials consumption
- Providing a useful outlet for collected recycled material
- Waste reductions, recycle, and compost
- Increasing the use of renewable products

As part of the program, the LCPA states that it is "committed to reducing any harmful effects on the environment and promoting the understanding of sustainability in its broadest context."

sion/Fill Lakes (Airside Pavement Rehab 3) - Phase 2	Apron construction and relocation/elimination of stormwater retention ponds to support future north area developments	Airfield	2027	1
sion/Fill Lakes (Airside Pavement Rehab 3) - Phase 3	Apron construction and relocation/elimination of stormwater retention ponds to support future north area developments	Airfield	2028	1
smission Line	Relocation of existing FPL high-voltage transmission line to eliminate future airspace penetrations to future Runway 6R-24L approach/departure surfaces	Airfield	2036	2
	Pavement rehabilitation and maintenance for existing apron pavements	Airfield	2027	1
arallel Taxiway to Existing Runway 6 End	Extension of the southern parallel taxiway constructed with Concourse E to the end of Runway 6	Airfield	2037	2
	Pavement rehabilitation and maintenance for Taxiway A and Taxiways A1-A10;			



Chapter 8 Capital Improvement Plan

The Capital Improvement Program (CIP) presented in Table 8-1 describes the timing of proposed Master Plan improvements, estimated rough-order of magnitude (ROM) development costs, and potential funding sources. This CIP is intended to provide general sequencing and implementation guidance for the Lee County Port Authority (LCPA) staff to support decision-making relative to recommended development at the Airport. The information provided in this document can also be used to update and inform the annual Airport Capital Improvement Program (ACIP) shared with the Federal Aviation Administration (FAA) and Florida Department of Transportation (FDOT), and to facilitate discussions with airport stakeholders.

The CIP includes projects that increase or improve the capacity, operational efficiency, and/or processing capabilities of RSW's airfield, terminal, landside facilities, general aviation facilities, cargo facilities, and other airport or airline support areas which are necessary to accommodate future demand levels. These projects have been identified and analyzed at a conceptual level through the master planning process.

To develop a comprehensive CIP, the ongoing maintenance, existing facility rehabilitation needs, and programmed development projects must also be considered. Therefore, the projects identified on LCPA's FY2023-FY2027 Capital Improvement Program, the current CIP available at that time, were incorporated into the sequencing of this CIP included in this Master Plan Update. Table 8-2 presents the development schedule of the CIP in a simplified Gantt Chart format.

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Table 7-1 Captial Improvement Program

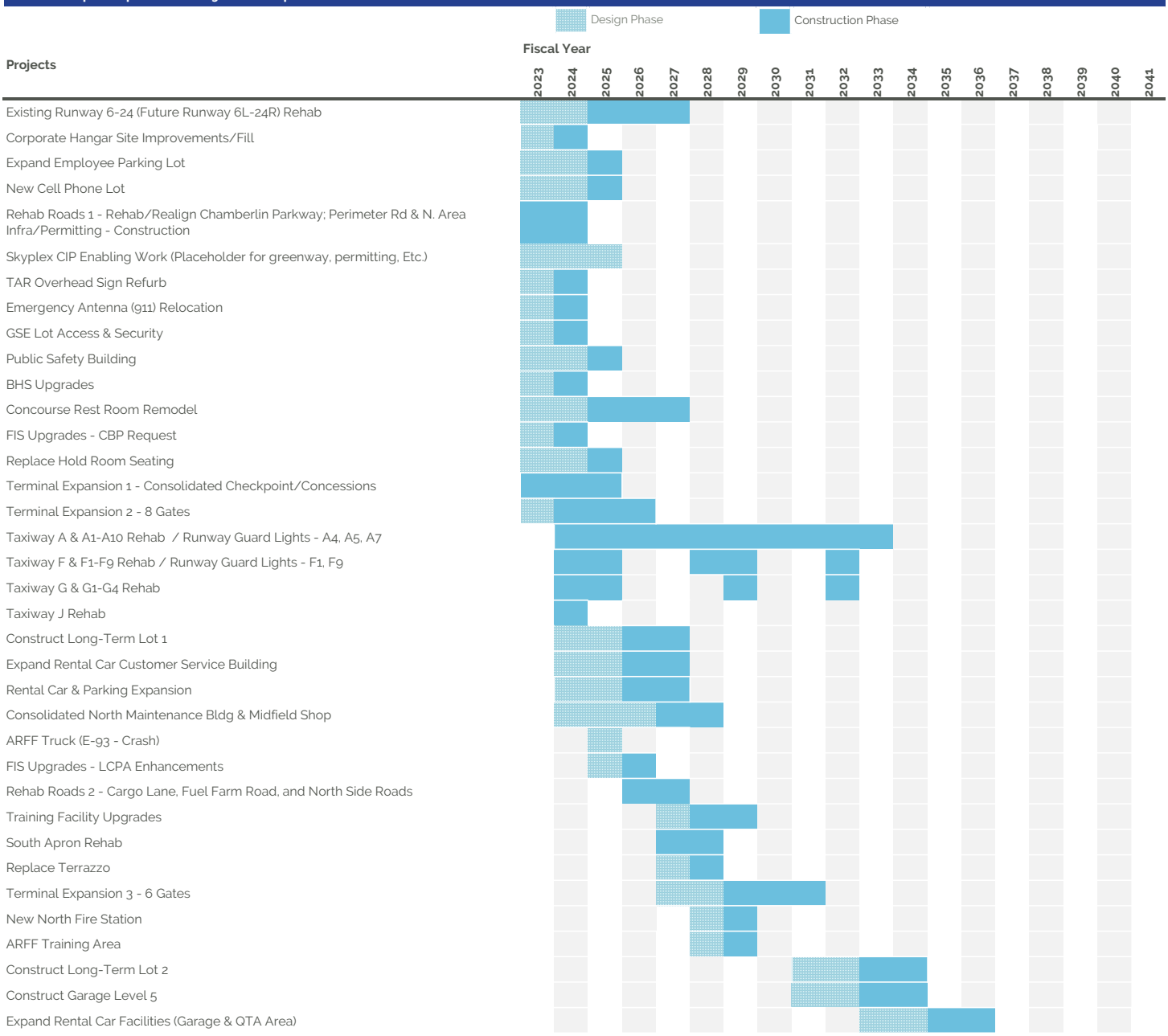
Project Name	Project Description	Cost Center	Design Start Date	Design Phase Duration	Project Construction Start Date	Project Construction Duration	Total Project Costs
Existing Runway 6-24 (Future Runway 6L-24R) Rehab	*Pavement rehabilitation and maintenance for existing runway and hotspot mitigation on Taxiways A and F*	*Airfield*	*2023*	*3*	*2026*	*2*	$ 46,000,000
South Apron Rehab	*Pavement rehabilitation and maintenance for existing apron pavements*	*Airfield*	*2027*	*1*	*2028*	*1*	*$ 17,293,000*
Taxiway A & A1-A10 Rehab / Runway Guard Lights - A4, A5, A7	*Pavement rehabilitation and maintenance for Taxiway A and Taxiways A1-A10; also includes installation of runway guard lights, LED taxiway edge and centerline lights, and new sign panels*	*Airfield*	*ongoing*	*N/A*	*ongoing*	*10*	*$ 21,942,000*
Taxiway F & F1-F9 Rehab / Runway Guard Lights - F1, F9	*Pavement rehabilitation and maintenance for Taxiway F and Taxiways F1-F9; also includes installation of runway guard lights, LED taxiway edge and centerline lights, and new sign panels*	*Airfield*	*ongoing*	*N/A*	*ongoing*	*5*	*$ 16,722,000*
Taxiway G & G1-G4 Rehab	*Pavement rehabilitation and maintenance for Taxiway G and Taxiways G1-G4; also includes installation of LED taxiway edge lights and sign panels, and mitigation of drainage pipe issues*	*Airfield*	*ongoing*	*N/A*	*ongoing*	*4*	*$ 6,071,000*
Taxiway J Rehab	*Pavement rehabilitation and maintenance for Taxiway J*	*Airfield*	*ongoing*	*N/A*	*2024*	*1*	*$ 2,720,000*
Corporate Hanger Site Improvements/Fill	Improvements associated with the corporate hangar development	General	ongoing	1	2024	1	$ 692,498
Training Facility Upgrades	Improvements to training facility	General	2027	1	2028	2	$ 2,365,818
Construct Garage Level 5	*Construction of 5th level on parking garage - est. 1,300 spaces*	*Ground Transportation*	*2031*	*2*	*2033*	*2*	*$ 140,000,000*
Construct Long-Term Lot 1	*Construction of new long-term public parking spaces (+3,000 spaces)*	*Ground Transportation*	*2024*	*2*	*2026*	*2*	*$ 27,000,000*
Construct Long-Term Lot 2	*Construction of additional long-term public parking spaces (+3,000 spaces)*	*Ground Transportation*	*2031*	*2*	*2033*	*2*	*$ 27,000,000*
Expand Employee Parking Lot	Expansion of existing employee parking lot - est. 420 additional spaces	Ground Transportation	2023	2	2025	1	$ 2,200,000
Expand Rental Car Customer Service Building	*Construction and Reconfiguration of Rental Car Customer Service Building*	*Ground Transportation*	*2024*	*2*	*2026*	*2*	*$ 10,000,000*
Expand Rental Car Facilities (Garage & QTA Area)	*Long-Term expansion of rental car facilities - Ready/Return & QTA*	*Ground Transportation*	*2033*	*2*	*2035*	*2*	*$ 18,000,000*
New Cell Phone Lot	Construction of new cell phone lot to meet future demand levels	Ground Transportation	2023	2	2025	1	$ 3,200,000
Rehab Roads 1 - Rehab/Realign Chamberlin Parkway; Perimeter Rd & N. Area Infra/Permitting - Construction	Rehabilitative measures to correct existing pavement distresses in order to maintain the level of service needed for Perimeter Road and Chamberlin Parkway; Realignment of Chamberlin to optimze land usage in north area	Ground Transportation	complete	0	2023	2	$ 20,095,845
Rehab Roads 2 - Cargo Lane, Fuel Farm Road, and North Side Roads	Rehabilitative measures to correct existing pavement distresses in order to maintain the level of service needed	Ground Transportation	complete	0	2026	2	$ 4,057,308
Rental Car & Parking Expansion	Construction of relocated service facilities closer to Terminal Area; Expansion of Ready/Return area and QTA; Construction of Garage Level 4 (Est. 1450 spaces) to account for displaced public spaces	Ground Transportation	2024	2	2026	2	$ 210,498,743
Skyplex CIP Enabling Work (Placeholder for greenway, permitting, Etc.)	Enabling projects associating with the long-term nonaeronautical development of the Skyplex area	Ground Transportation	2023	3	N/A	0	$ 500,000
TAR Overhead Sign Refurb	Refurbishment of the overhead signage on the Terminal Access Road	Ground Transportation	2023	1	2024	1	$ 467,371
ARFF Training Area	*Development of new ARFF training facility*	*Support Facilities*	*2028*	*1*	*2029*	*1*	$ 10,000,000
ARFF Truck (E-93 - Crash)	Procurement for new ARFF truck	Support Facilities	2025	1	N/A	0	$ 1,500,000
Consolidated North Maintenance Bldg & Midfield Shop	Construction of new facility to support the majority of maintenance staff and functions of the department	Support Facilities	2024	3	2027	2	$ 27,060,000
Emergency Antenna (911) Relocation	*Construction cost for relocating antenna*	*Support Facilities*	*2023*	*1*	*2024*	*1*	*$ 2,276,268*
GSE Lot Access & Security	*Improvements to GSE lot access and security*	*Support Facilities*	*2023*	*1*	*2024*	*1*	*$ 215,000*
New North Fire Station	Construction of a 2nd fire station to allow the airport to meet non-ARFF fire service requirements for areas on the northern area of airport property	Support Facilities	2027	1	2028	1	$ 10,000,000
Public Safety Building	*Construction of facility to contain the majority of LCPA police functions and have the ability ot host the communications center and other command and control functions as needed*	*Support Facilities*	*2023*	*2*	*2025*	*1*	$ 15,000,000
BHS Upgrades	Upgrades to Baggage Handling System	Terminal	2023	1	2024	1	$ 3,500,000
Concourse Rest Room Remodel	Remodeling of existing restrooms	Terminal	2023	2	2025	3	$ 7,022,404
FIS Upgrades - CBP Request	Upgrades to FIS Facility	Terminal	2023	1	2024	1	$ 2,067,610
FIS Upgrades - LCPA Enhancements	Upgrades to FIS Facility	Terminal	2025	1	2026	1	$ 3,838,996
Replace Hold Room Seating	*Procurement and Installation of new hold room seating*	*Terminal*	*2023*	*2*	*2025*	*1*	$ 4,200,000
Replace Terrazzo	Procurement and Installation of new Terrazzo flooring	Terminal	2027	1	2028	1	$ 10,500,000
Terminal Expansion 1 - Consolidated Checkpoint/Concessions	Passenger Terminal extension of the north side of the terminal to create a connector between the 3 existing concourses, consolidating the Transportation Security Administration (TSA) security checkpoints, and providing additional public seating and hold room areas	Terminal	complete	2	2023	3	$ 331,586,401
Terminal Expansion 2 - 8 Gates	Passenger Terminal Expansion - Construction of Concourse E Phase 1	Terminal	ongoing	2	2024	3	$ 623,056,455
Terminal Expansion 3 - 6 Gates	Passenger Terminal Expansion - Construction of Concourse E Phase 2	Terminal	2027	2	2029	3	$ 250,000,000
Total							**$ 1,878,648,717**

LEGEND:

Project on Existing CIP

Project on Existing CIP / Master Plan Recommendation

Table 7-2 Captial Improvement Program Development Schedule



Chapter 9 Airport Layout Plan Set Update (ALP) Narrative

9.1 Airport Layout Plan Set Narrative

This narrative briefly describes the information specific to each of the drawing sheets in the traditional Airport Layout Plan (ALP) drawing set developed for Southwest Florida International Airport (RSW or the Airport). These drawings were developed and produced as a set on 36-inch by 48-inch sheets using AutoCAD 2023 and AutoCAD Civil 3D software. To provide vertical and horizontal accuracy for the ALP set, a digitized map, developed by Martinez Geospatial, Inc., was used as a base map for all drawings. The aerial imagery was completed in April 2022. The coordinates, elevations, and aerial photogrammetry are in U.S. survey feet. The horizontal datum is the Florida State Plane Coordinate System, East Zone, North American Datum of 1983/1990 adjustment. The vertical datum is the North American Vertical Datum of 1988. Reduced reproductions of these drawings are included in Appendix W for illustration purposes and are not to scale. A copy of the Federal Aviation Administration (FAA) Standard Operating Procedure 2.00 ALP Review Checklist is included in Appendix X. A full-size set of the drawings will be submitted along with this report to the FAA and the Florida Department of Transportation (FDOT) for review and approval.

The critical design aircraft is defined as the most demanding aircraft that will substantially use the Airport, with "substantially" defined as either 500 or more annual itinerant operations or scheduled service. Also, the critical design aircraft can be either a single aircraft or a composite of the most demanding characteristics of several aircraft.[1] The pMaster Plan Update identified the critical aircraft as an Airplane Design Group (ADG)-V aircraft. Representative ADG-V aircraft would be the Boeing 747.

Runway Design Code

The Runway Design Code (RDC) is a coding system described in FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*, it is the basis for specifying applicable runway design standards. The intent of the RDC is to provide a simple method for compiling the numerous dimensional and performance specifications for aircraft operating at or forecasted to operate at an airport; the specifications are translated into criteria that define the dimensional and design standards for a

[1] Federal Aviation Administration, Advisory Circular 150/5300-17, *Critical Aircraft and Regular Use Determination*, Draft.

given runway. The RDC consists of three parameters: Aircraft Approach Category (AAC), ADG, and approach visibility minimums. RSW has one runway: Runway 6-24. The following describes the RDC for existing and future Runway 6-24:

- Aircraft Approach Category - Based on approach speed, the B747 is the critical aircraft; this aircraft is categorized as AAC D.
- Airplane Design Group - Based on the wingspan, the B747 is the critical aircraft; this aircraft is categorized as ADG-V.
- Visibility Minimums - Runway 6 is equipped with an instrument landing system approach, providing a visibility minimum of 0.5 miles, and Runway 24 utilizes a very high frequency omni-directional range (VOR) approach, providing a visibility minimum of .75 miles.

Combined, these parameters result in an RDC of D/V/1800 for Runway 6 - 24; and an RDC of D/V/1800 for future Runway 6-24. Similarly, the RDC for the Ultimate Runway 6R-24L is D/V/1800. The following further describes the RDC for Ultimate Runway 6R-24L:

- Aircraft Approach Category - Based on approach speed, the B787/ A350 is the critical aircraft; this aircraft is categorized as AAC D.
- Airplane Design Group - Based on the wingspan, the B787/ A350 is the critical aircraft; this aircraft is categorized as ADG-V.
- Visibility Minimums - Runway 6R is equipped with an instrument landing system (ILS) approach, providing a visibility minimum of 0.5 miles, and Runway 24L utilizes an ILS approach, providing a visibility minimum of .50 miles.

Table 9-1 summarizes the RDCs for RSW. The Airport's current Airport Reference Code (ARC) is designated as D-V.

Table 9-1 Southwest Florida International Airport Runway Design Codes

RUNWAY	Aircraft Approach Category	Airplane Design Group	Visibility Minimums	Runway Design Codes
Existing/Future				
6-24	D	ADG V	6 – (0.50 miles)	6 – D/V/1800
	(Boeing 747)	(Boeing 747)	24 – (0.75 miles)	24 – D/V/1800
Ultimate				
6L-24R	Same	Same	6L – (0.50 miles)	6L – D/V/1800
			24R – (0.75 miles)	24R – D/V/1800
6R-24L	D	ADG V	6R – (0.50 miles)	6R – D/V/1800
	(Boeing 787/Airbus A350)	(Boeing 787/Airbus A350)	24L – (0.50 miles)	24L – D/V/1800

NOTES:
ADG – AIRPLANE DESIGN GROUP
VIS – Visual
SOURCE: Federal Aviation Administration, Advisory Circular 150/5300-13B, Airport Design, March 31, 2022.

Runway Reference Codes

The Runway Reference Codes, or the Approach Reference Code (APRC) and the Departure Reference Code (DPRC), describe the current operational capabilities of a runway and adjacent taxiways where no special operating procedures are necessary. The APRC consists of the same three parameters as the RDC (AAC, ADG, and visibility minimums), whereas the DPRC consists of the AAC and ADG only. The APRC and DPRC coding system is described in FAA AC 150/5300-13B, *Airport Design*.[2]

The APRC and DPRC are determined based on the existing runway-to-taxiway separation and visibility minimums. At RSW, the runway centerline separation from the associated full-length parallel taxiway centerline is 400 feet. The runway-to-taxiway separation combined with the visibility minimums results in the following APRCs: D/V/2400 for Runway 6-24; The ultimate APRCs for both runways will remain the same. The DPRCs at RSW are D/V for Runway 6-24. The ultimate DPRCs for both runways would remain the same. Table 9-2 summarizes the APRCs and the DPRCs at RSW.

Table 9-2 Southwest Florida International Airport Approach and Departure Reference Codes

Runway	Existing		Future		Ultimate	
	Approach Reference Code (APRC)	Departure Reference Code (DPRC)	Approach Reference Code (APRC)	Departure Reference Code (DPRC)	Approach Reference Code (APRC)	Departure Reference Code (DPRC)
6 (Ult: 6L)	D/V/2400	D/V	Same	Same	Same	Same
24 (Ult. 24R)	D/V/2400	D/V	Same	Same	Same	Same
6R	N/A	N/A	N/A	N/A	D/V/2400	D/V
24L	N/A	N/A	N/A	N/A	D/V/2400	D/V

NOTE: N/A – Not Applicable
SOURCE: Federal Aviation Administration, Advisory Circular 150/5300-13B, Airport Design, March 31, 2022.
Prepared by: Ricondo & Associates, Inc., March 2023.

Cover Sheet (Sheet 1)

Sheet 1, the Cover Sheet, lists the drawings within the RSW ALP set. Also included are the location and vicinity maps. The location map is a scaled representation of the Airport's location in the State of Florida, and the vicinity map shows the location of the Airport in the Fort Myers area, including major roadways and highways in the Airport vicinity.

Airport Data Sheet (Sheet 2)

Sheet 2, the Airport Data Sheet, contains a set of six data tables, as well as listings of abbreviations and acronyms used throughout the ALP set, and wind rose data.

- Airport Data Table – This table lists existing and ultimate information specific to the Airport, such as Airport elevation, service level, role, reference code, design aircraft, Airport reference points, temperature information, magnetic variation, and available NAVAIDS.
- Runway Data Table – This table is a compiled tabulation of information specific to the existing and ultimate runway profile characteristics, coordinates, dimensions, ADG, available lighting and NAVAIDS, and safety clearance areas, as defined in FAA AC 150/5300-13B, *Airport Design*.

[2] Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

- Taxiway Data Table – This table provides information regarding the existing and ultimate taxiways at the Airport, including taxiway width, shoulder width, taxiway safety area (TSA) and taxiway object-free area (TOFA) dimensions, taxiway edge safety margin, and lighting for each taxiway.
- Wind Rose and Wind Coverage Tables – These tables include the Airport's wind roses (visual flight rules, instrument flight rules, and all-weather). The wind data depicted in these tables were obtained from the National Oceanic and Atmospheric Administration's National Climatic Data Center. Wind data are provided for all weather conditions, visual meteorological conditions (ceiling at or above 1,000 feet and visibility greater than or equal to 3 miles), and instrument meteorological conditions (ceiling below 1,000 feet and/or visibility less than 3 miles). These components provide information on the percentage of time a runway end or a combination of runway ends or runways are available for arrivals. When combined, the coverage is intended to be as near as possible to 100 percent.
- Declared Distances – This table provides the take-off run available (TORA), take-off distance available (TODA), the accelerate stop distance available (ASDA), and the landing distance available (LDA) for the existing and ultimate runways at RSW.
- Abbreviations and Acronyms – A list of abbreviations and acronyms referenced throughout the ALP set and their respective definitions.

Existing Airport Layout Plan (Sheet 3)

The existing ALP is provided as a reference document to identify existing facilities (including airfield pavement, buildings, and other structures). The ALP sheet represents the Airport in its entirety at a scale of 1-inch equals 600 feet. The ALP drawing is a graphic presentation of the actual layout of physical facilities at RSW. Major features of the ALP drawing include runways, taxiways, aprons, NAVAIDS, other existing Airport facilities, and the roadway system. This drawing also includes information from the data sheet for each runway approach, runway end elevations, the orientation of the airspace surfaces for each runway end, and the angle of declination (magnetic north), including the annual rate of change for the magnetic declination. It also includes pertinent clearance and dimensional information associated with the runways and taxiways, such as runway safety areas (RSAs), runway object-free areas (ROFAs), and runway protection zones (RPZs). Other data referenced on the existing ALP sheet includes existing Airport reference point (ARP), ground terrain contours, and other dimensional data recommended by the FAA.

Ultimate Airport Layout Plan (Sheet 4)

The ultimate ALP depicts the proposed Airport development-related projects necessary to meet forecasted demand over the 20-year planning horizon and beyond. The proposed development is consistent with those projects discussed in Chapter 7: Implementation Plan. The ultimate ALP sheet illustrates the Airport in its entirety at a scale of 1-inch equals 600 feet. Major features of the ultimate ALP include runways, taxiways, aprons, NAVAIDs, existing facilities, roadway system, and non-Airport facilities surrounding Airport property. This drawing also includes information from the data sheet for each runway approach, runway end elevations, runway high and low points, true azimuths for each runway, and the angle of declination (magnetic north), including the annual rate of change for the magnetic declination. The ultimate ALP also includes pertinent clearance and dimensional information associated with runways and taxiways, such as RSAs, ROFAs, and RPZs. The ultimate ALP demonstrates the Airport's compliance with standards set forth in FAA AC 150/5300-13B, *Airport Design*.

The proposed airfield and other related development that are presented graphically on the ultimate ALP are consistent with those projects discussed in the Implementation Plan of the Airport Master Plan Update. Primary proposed improvements depicted on the ultimate ALP include the following:

- Construct the southern parallel taxiway to the existing Runway 6-24 (Future 6L-24R)
- Construct the northern parallel taxiway to the existing Runway 6-24 (Future 6L-24R)
- Construct future Runway 6R-24L and associated taxiways
- Install future Runway 6R-24L Medium Intensity Approach Light System with Runway Alignment Indicator Light (MALSR)
- Install future runway 6R-24L Instrument Landing Systems (ILS) – CAT I capability for both runway ends
- Relocate FPL transmission line (including transmission towers, construction of new patrol road, and construction of applicable fences/gates)
- Upgrade existing Runway 6 (Future Runway 6L) Instrument Approach – From CAT I to CAT II
- Improve taxiway intersection and turns to meet TDG-5 standards
- Relocate Airport Rotating Beacon in the vicinity of the new air traffic control tower
- Relocate Taxiway G1 to the west to eliminate the direct taxi access from the passenger terminal apron
- Install Runway Guard lights at five locations
  - Taxiway F1 and Runway 6
  - Taxiway A4 and Runway 6-24
  - Taxiway A5 and Runway 6-24
  - Taxiway A7 and Runway 6-24
  - Taxiway F9 and Runway 24
- Remove direct runway access at three locations:
  - Taxiway A4 between Taxiway A and the Cargo Ramp
  - Taxiway A5 between Taxiway A and the General Aviation Ramp
  - Taxiways A6 and A7 between Taxiway A and the North Ramp
- Incorporate land use per exhibit 5-11
- Expand existing fuel farm
- Construct Public safety building
- Construct a secondary fire station
- Construct Concourses (A,B,C, and E)
- Consolidated Maintenance Facility
- Chamberlin Parkway realignment
- Intersection improvements on Daniels Parkway/CR 876 at Paul J. Doherty Parkway/Gateway Boulevard
- Terminal access road and curbside improvements
- Expand and relocate cell phone lot
- Expand employee parking lot and parking garage
- Expand long-term surface parking lot
- Expand rental car facilities
- Relocate rental car maintenance facilities
- Future potential non-aviation development
  - North of Runway 6-24 (Skyplex)
  - Midfield
  - Southeast quadrant of the airport

Terminal Area Plan Drawing (Sheet 5)

Sheet 5 includes a scaled drawing depicting close-in features of all major aviation-related development in the main terminal area at RSW, as consistent with the ultimate ALP drawing. This drawing depicts detailed reference to buildings, apron/ramp areas, and motor vehicle–related features, including geometric dimensional areas, safety setbacks, NAVAID critical areas, and separation standards. Key areas shown on these drawings include aircraft parking positions, existing and future building footprints, aprons, taxiways and taxilanes, and primary access roadways and fencing. Also included are building data tables that identify the major existing and proposed structures and their associated elevation. Buildings and structures are identified by numerical codes.

Part 77 Airport Airspace Plan Drawings (Sheet 6 and 7)

Sheets 6 and 7 of the ALP drawing set provide the Airport Airspace Drawings, East and West sides, respectively. To enhance the safe operation of aircraft in the airspace around an airport, the FAA has adopted 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. Subpart C of 14 CFR Part 77 establishes imaginary surfaces for determining obstructions to air navigation, which are illustrated on the Airport Airspace Drawings. The Airport Airspace Drawings also illustrate physical features on and around the Airport, including any existing obstructions that penetrate the 14 CFR Part 77 imaginary surfaces. These obstructions are listed numerically on the 14 CFR Part 77 Airport Airspace Drawings, and the obstruction data table included in Sheet 5 provides a description of the obstruction, the obstruction elevation, the affected 14 CFR Part 77 surface, the surface elevation, the amount of penetration, and the proposed manner in which the obstruction will be mitigated. The dimensions of the 14 CFR Part 77 surfaces are based on the NAVAIDs and the types of approaches available to a runway end. Table 9-3 summarizes the primary 14 CFR Part 77 dimensions associated with each runway end at the Airport. The specific imaginary surfaces depicted on these drawings include:

- Primary Surface – Longitudinally centered on each runway, this surface extends 200 feet beyond each end of the runway; it has an elevation equal to that of the runway centerline. The width of the primary surface is that prescribed for the most precise instrument approach procedure, existing or planned, for either end of the runway. The primary surfaces at RSW are 1,000 feet wide for existing Runway 6-24 and Ultimate Runway 6L-24R.
- Approach Surfaces – These surfaces are longitudinally centered along the extended centerline, and they extend outward and upward from each end of the primary surface. The size and slope of the approach surface are based on the type of approach, existing or planned, for that runway end. The inner edge of the approach surface is the same width as the primary surface. However, its overall length, slope, and outermost width may vary; refer to Table 9-3.
- Transitional Surfaces – These surfaces extend outward and upward from the lateral edges of all primary and approach surfaces at a slope of 7:1. The overall width of the transitional surfaces is 5,000 feet, which is measured perpendicularly from the runway centerline.
- Horizontal Surface – This surface is a plane located 150 feet above the established Airport elevation, which calculates out to 179.2 feet. Its perimeter consists of arcs of specific radii connected by lines tangential to the arcs. The arcs are centered on the midpoint of the ends of all primary surfaces.
- Conical Surface – This surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1, for a horizontal distance of 4,000 feet.
-

Table 9-3 14 Code of Federal Regulations Part 77, Existing Primary Imaginary Surfaces by Runway End

	Runway Approach End			
	Existing Runway 6	Existing Runway 24	Ultimate Runway 6L	Ultimate Runway 24R
Approach Type	PIR-PIR	PIR-PIR	PIR-PIR	PIR-PIR
Primary Surface Width (feet)	1,000	1,000	1,000	1,000
Horizontal Surface Radius (feet)	10,000	10,000	10,000	10,000
Approach Surface Width (inner; feet)	1,000	1,000	1,000	1,000
Approach Surface Width (outer; feet)	16,000	16,000	16,000	16,000
Approach Surface Length (feet)	100,001	100,001	100,001	100,001
Approach Slope	50:1/40:1	50:1/40:1	50:1/40:1	50:1/40:1

NOTES: PIR – Precision
SOURCE: Federal Aviation Administration, *Airport/Facility Directory*, March 2023.

Inner Portion of the Approach Surface Drawings and Obstruction Data Tables (Sheets 8 through 11)

The Inner Portion of the Approach Surface Drawings (Sheets 8 through 11) were prepared for each of the existing runway approaches; they consist of scaled drawings of the area immediately beyond the existing and proposed runway ends at RSW, including the RPZ off each runway end. These drawings depict the location of roadways, structures, natural ground elevations, and other manmade or natural features within the limits of each RPZ. The drawings also detail objects that penetrate the existing and proposed approach surfaces. Note that on Sheet 9, only trees that penetrate the 14 CFR Part 77 existing approach surface are labeled in the profile view. These obstructions are listed numerically on the Inner Portion of the Approach Surface Drawings. The obstruction data tables included on these sheets provide a description of the obstruction, the obstruction elevation, the affected 14 CFR Part 77 surface, the surface elevation, the amount of penetration, and the proposed way the obstruction will be mitigated. Obstruction information was obtained from the 2022 aerial photo survey that was completed by Martinez Geospatial, Inc.

Only trees penetrating the Terminal Instrument Procedures (TERPS) and/or Threshold Siting surfaces (TSS) were recommended for trimming and/or removal. Objects fixed by function and/or marked with obstruction lights would remain in place. The obstruction survey identified over 5,000 points of treetops or obstructions within 10 feet of the TERPS and/or TSS surfaces. Due to this large data set, the complete list of obstruction data is not shown in the ALP but will be submitted in electronic format.

Ultimate Land Use Plan (Sheet 12)

Land use planning allows coordinating uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for the orderly development and efficient use of available space. The two primary considerations for airport land use planning are to secure areas essential to the safe and efficient operation of the airport and to determine compatible land uses for property areas that could be utilized most effectively in the airport's surrounding area.

The Ultimate Land Use Plan shows the use of property areas within the existing airport property boundary at RSW. Sheet 12 identifies Ultimate land use designations for airport owned property for Airport Operations Areas and non-aviation use areas. The land uses are depicted on the Sheet 12:

- Existing Aviation/Airport Related Use Area - Land used for aviation activities such as aircraft and vehicle parking, storage and maintenance hangars, Fixed Based Operators (FBOs), aircraft maintenance and fueling facilities, cargo and/or Maintenance, Repair, and Overhaul (MRO) facilities, terminal area and gates, and landside terminal parking.
- Ultimate Aviation/Airport Related Use Area - Proposed land use for aviation activities such as aircraft and vehicle parking, storage and maintenance hangars, FBOs, aircraft maintenance and fueling facilities, cargo and/or MRO facilities, terminal area and gates, and landside terminal parking.
- Ultimate Non-Aviation Related Development Area - Proposed areas used for non-aviation revenue support. These areas are intended for commercial, industrial, and appropriate agricultural development.
- Existing Airport Operations Area - Areas of the airport utilized for the safe and efficient operation of aircraft including airfield facilities such as runways and taxiways and the areas within the limits of the RPZ, ROFA, and Taxiway Object Free area (TOFA).
- Ultimate Airfield Operations - Proposed areas of the airport with the intent to be developed to maintain the safe and efficient operation of aircraft including proposed airfield facilities such as runways and taxiways and the areas within the limits of the RPZ, ROFA, and TOFA.
- Environmental Areas/Compatible Land Use - Controlled area at or near the airport of special architectural, historic, agricultural, and/or wildlife interest.

Property Map Sheets (Sheet 13 and 14)

The Airport Property Map, Sheets 13 and 14, provides an overview of land conveyances associated with the Airport and how they were acquired. The Airport Property Map also illustrates the properties that were released and the avigation easements that have been obtained. These land conveyances aid in creating the approximate Airport property boundary used in the ALP drawing sheets. A table is included that details the following information for each parcel: parcel identification number, acreage, property interest, acquisition date, and federal project number.