Flagler County Board of County Commissioners
General Business / Agenda Item 8.c.

Meeting Date: November 16, 2026
Department Contact: Roy Sieger, Airport Director
Subject: **Consideration of Working Paper No. 2 for the Airport Master Plan Update.**

Overview/Summary:
Steady progress is being made on the Airport Master Plan Update. Working Paper No. 2 has been completed. This paper focuses primarily on the Facility Assessment and Requirements chapter, offering a detailed evaluation of the airport's facility needs across a 20-year planning horizon. It also highlights our analyses using the FAA's two newest planning tools: the Small Aircraft Runway Length Analysis Tool (SARLAT) and the Runway Exit Design Interactive Model (REDIM). Working Paper No. 2 was presented to the Airport Master Plan Working Group members on October 27, 2026.

Strategic Plan:
Focus Area: Economic Vitality,
Goal 2- Develop Competitive Advantages for New and Existing Businesses
Objective EV 2.4: Expand facilities and attract aviation-related businesses to the Flagler Executive Airport.

Funding Information:
N/A

Recommendations:
Staff recommends that the BoCC review Working Paper No. 2 and provide consensus to submit Working Paper No. 2 to the FAA and FDOT for review.

Attachments:
1. FIN MP - Working Paper #2 - 08-17-2026
2. WP#2 Presentation to BOCC 11-16-2026

FLAGLER EXECUTIVE

Airport Master Plan

Working Paper #2

Facility Assessment and Requirements

Prepared for:
Flagler Executive Airport
201 Airport Road
Palm Coast, FL 32164

DRAFT - September 17, 2026



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Working Paper #2

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CHAPTER 4
Facility Assessment and Requirements

CHAPTER 4
Facility Assessment and Requirements

4.1 Introduction

This chapter evaluates and establishes the improvements necessary at Flagler Executive Airport (FIN or the Airport) to maintain a safe and efficient facility while also accommodating the expected demand. The following sections use the appropriate design criteria to identify and define necessary facility requirements over the 20-year planning horizon.

4.2 Airport Capacity

Airport capacity is defined by the Federal Aviation Administration (FAA) as a measure of the maximum number of aircraft operations that an airfield can support with reasonable levels of delay. Estimates of airfield capacity at FIN were developed in accordance with FAA Advisory Circular (AC) 150/5060-5, Change 2, *Airport Capacity and Delay*. Methodologies from this AC were used to calculate the hourly capacity of the runway system and annual service volume (ASV) of the airfield based upon specific airfield, operational, and meteorological characteristics on a typical day.

4.2.1 Airfield Geometry

The airfield configuration is the primary factor in determining the overall airport capacity due to its direct influence on how aircraft can operate. In theory, as the number of runways and taxiways increases, so should the capacity. However, the physical orientation and proximity of the various runway and taxiway surfaces may or may not contribute to the overall airfield capacity. It should be noted that Runway 18W-36W was not included in calculating the capacity of the airfield.

Runway Configuration

Different runway configuration and use diagrams are provided in FAA AC 150/5060-5, Change 2. For FIN's two runways, the use diagrams are selected using the distances between the different runway ends relative to the intersection of the runway centerlines. These diagrams allow the capacity calculations to account for the fact that some simultaneous operations are conducted (simultaneous departures on Runways 11 and 6). Otherwise, due to the orientation of the runways, the airfield is typically limited to a single runway operation.

Exit Taxiways

The capacity of a runway system is greatly influenced by the ability of aircraft to exit the runway as quickly and safely as possible. Once an aircraft has cleared the runway environment, another is able to either land or takeoff. Therefore, the number and location of exit taxiways directly influence runway occupancy time and overall capacity of the airfield system. Capacity is also enhanced if a full-length parallel taxiway system is provided since these taxiways generally have several connector taxiways (increasing the number of runway exits) and eliminate the need to back-taxi on the runway. Both runways have a full-length parallel taxiway with multiple connectors.

The FAA methodology utilizes an exit factor based upon the number of connector taxiways within a certain range. The optimal range for exit taxiways varies for different runway configurations and is primarily based on the aircraft mix index (described in the following section) charts listed in the capacity AC. For the purposes of the capacity calculations, each exit taxiway must also be separated by at least 750 feet. Throughout the planning period, the optimal exit range for FIN is 2,000 to 4,000 feet from each landing threshold on both Runways 11-29 and 6-24. Using these criteria, the number of taxiway exits eligible for inclusion in the capacity calculations are shown in **Table 4.2-1**.

TABLE 4.2-1
ELIGIBLE TAXIWAY EXITS FOR CAPACITY CALCULATIONS

	2,000 to 4,000 Foot Range
Runway 11	2
Runway 29	2
Runway 6	1
Runway 24	1

Source: ESA analysis 2026.

4.2.2 Operational Characteristics

Operational characteristics related to airfield capacity include the aircraft mix index, the percent of aircraft arrivals, and the percent of aircraft touch and go operations. Each of these are described in the following sections based on the FAA methodology.

Aircraft Mix Index

The FAA has four aircraft categories (A through D) for capacity determinations which are based upon the maximum certificated takeoff weight, the number of engines, and the wake turbulence classifications. It should be noted that these capacity classes differ from the Aircraft Approach Categories utilized in other sections of this study. In the simplest terms, larger and heavier aircraft create more wake turbulence and require more entrail spacing to allow this turbulence to subside before another aircraft travels through the same area.

Likewise, as an aircraft's size and weight increases, so does the time typically needed for it to slow to a safe taxiing speed or to achieve the needed speed for takeoff. Therefore, larger aircraft occupy the runway longer than smaller ones. For these reasons, aircraft classifications are used to determine the aircraft mix index which is a critical component for calculating airfield capacity.

The mix index is calculated by adding the percent of Class C aircraft plus three times the percent of Class D aircraft. Class A aircraft include single-engine aircraft that are less than 12,500 pounds. While Class B aircraft include multi-engine aircraft that are less than 12,500 pounds. The percent of Class A and B aircraft is not considered to significantly affect airfield capacity because the wake turbulence generated by these smaller aircraft dissipates rapidly. Thus, the spacing can be reduced between Class A and B aircraft more than for Class C or D aircraft. Class C aircraft include multi-engine aircraft greater than 12,500 pounds, but less than 300,000 pounds with a large wake turbulence classification. Class D are multi-engine aircraft over 300,000 pounds with a heavy wake turbulence classification.

While a significant portion of aircraft operations at FIN currently fall within Classes A and B, a number of Class C operations are also present. Accordingly, the mix index for 2025 is 4. Over the next 20 years, Class C aircraft operations are projected to increase, resulting in a mix index of 8 by the end of the planning period in 2046.

Percent of Aircraft Arrivals

The percent of arrivals is simply the ratio of aircraft arrivals to total operations during a peak or average hour of operations. The FAA methodology considers a 40, 50, or 60 percent arrivals factor to compute airfield capacity. Since aircraft on final approach are given priority over departures, a higher percent of arrivals during peak periods can reduce the hourly capacity due to the longer runway occupancy times for arrivals over departures. However, this is typically only considered when estimating capacity during peaks at airports with predominately commercial airline operations. As there are no commercial operations at FIN, the percent of arrivals is assumed to equal those of departures on a typical day. A 50 percent arrivals factor was applied to all of the capacity calculations.

Percent of Touch and Go Operations

A touch and go operation refers to a training procedure in which the pilot performs a normal landing followed by an immediate takeoff, without stopping or taxiing clear of the runway. While each touch and go operation accounts for two runway operations (one landing and one takeoff), this procedure typically takes less time than two operations by separate aircraft. Therefore, airports with significant touch and go operations will have a greater airfield capacity than a similar airport with less of these training operations.

As noted in the forecast chapter, most local operations are related to flight training which primarily include touch and go maneuvers. This was confirmed with the airport traffic

control tower (ATCT) management during discussions on FIN's operational activity. Based on the 2025 Virtower data, 24 percent of all operations are touch and goes. Local operations, which accounted for 73 percent of the activity in 2025 are projected to increase slightly over the 20-year planning horizon. Therefore, the touch and go factor for calculating hourly capacity will be in the 21 to 30 range of the FAA methodology.

4.2.3 Meteorological Conditions

Different meteorological conditions influence the utilization of an airfield's runways. Variations in the weather resulting in limited cloud ceilings and reduced visibility typically lower airfield capacity, while changes in wind direction and velocity will dictate runway usage.

Ceiling and Visibility

As weather conditions deteriorate, pilots must rely on instruments to define their position both vertically and horizontally. Capacity is lowered during such conditions because aircraft are spaced further apart when they cannot see each other. For capacity calculations, FAA AC 150/5060-5, Change 2 defines three general weather categories, based upon the height of the clouds above ground level (AGL) and visibility:

Visual Flight Rules (VFR) - Cloud ceiling is greater than 1,000 feet (AGL) and visibility is at least three statute miles.

Instrument Flight Rules (IFR) - Cloud ceiling is at least 500 AGL but less than 1,000 feet AGL and/or visibility is less than three statute miles but more than one statute mile.

Poor Visibility and Ceiling (PVC) - Cloud ceiling is less than 500 feet AGL and/or visibility is less than one statute mile.

The ten years of wind, cloud ceiling, and visibility data obtained for the wind rose analysis from the FAA's online Windrose File Generator site was also utilized for the capacity analysis. For FIN, the data showed that VFR conditions occurred approximately 93.3 percent of the time, IFR conditions 6.7 percent of the time, and PVC conditions much less than one percent of the time.

Runway Utilization

The wind analysis in the forecast chapter documents that both Runway 11-29 and Runway 6-24 share equivalent all weather coverage. However, wind coverage is not the only factor that determines operational flow, especially at an airport with an ATCT. In addition to wind conditions, the type of aircraft and type of operation are also important.

The individual runway end utilization shown in **Table 4.2-2** were derived from the historic wind conditions, discussions with ATCT management, and 2025 Virtower data obtained for the study.

TABLE 4.2-2
RUNWAY END UTILIZATION

	Annual Average
Runway 11	28%
Runway 29	15%
Runway 6	33%
Runway 24	24%

Source: ESA analysis, 2026.

4.2.4 Airfield Capacity Calculations

The preceding airfield geometry, operational characteristics, and meteorological conditions were first utilized to calculate hourly capacity. These results were then applied to determine the ASV to evaluate the ability of the airfield to accommodate the projected demand.

Hourly Capacity of the Runway System

The hourly capacity for FIN was calculated by analyzing the appropriate runway-use diagrams and figures for both VFR and IFR conditions. Using these, the aircraft mix index and percent of aircraft arrivals were applied to calculate the hourly capacity base. Next, a touch and go factor was determined using the percent of touch and go operations with the aircraft mix index. Finally, the taxiway exit factor was determined by the aircraft mix index, percent of aircraft arrivals, and number of eligible exit taxiways. A weighted hourly capacity was then calculated (**Table 4.2-3**) based on the percentage that VFR and IFR conditions have historically been observed for each different operational flow. It should be noted that all the calculations are based on the existing airfield configuration.

TABLE 4.2-3
HOURLY CAPACITIES OF THE RUNWAY SYSTEM

	Average VFR Hourly Capacity	Average IFR Hourly Capacity	Weighted Hourly Capacity
Base Year			
2025	109	61	106
Forecast			
2031	108	59	104
2036	106	58	103
2046	104	57	101

Source: ESA analysis 2026.

Annual Service Volume

ASV is the overall measure of runway capacity at an airport. It represents the number of total operations that an airfield can support annually. In other words, ASV is the theoretical limit of operations that the airport can safely accommodate without unreasonable levels of delay occurring on a regular basis. To calculate ASV, first the ratio of annual demand to average daily demand, during the peak month, is calculated. Next, the ratio of average daily demand to average peak hour demand during the same time is determined. These values are then multiplied together with the corresponding weighted hourly capacity to compute ASV. The calculated ASV is included in **Table 4.2-4** and compared to the annual operations from the approved forecasts.

TABLE 4.2-4
AIRFIELD CAPACITY ANALYSIS – EXISTING AIRFIELD

	Annual Operations	Annual Service Volume (ASV)	Capacity Level
Base Year			
2025	180,927	199,100	91%
Forecast			
2031	199,000	196,100	101%
2036	215,400	192,900	112%
2046	252,200	190,000	133%

Source: ESA analysis 2026.

A demand that exceeds ASV can result in delays on the airfield. However, no matter how substantial an airport's capacity may appear, it should be realized that delays can occur

even before an airport reaches its stated capacity. In fact, according to FAA Order 5090.5, *Formulation of the NPIAS and ACIP*, capacity enhancing projects need sufficient lead times so that the improvements can be properly planned, environmentally reviewed, designed, and constructed before the resulting delays become critical. For most types of airfield capacity enhancing project, the FAA recommends planning for such improvements when activity levels reach 60 percent of the annual capacity so that improvements can be developed before the 80 percent threshold is reached. For additional exit taxiways, the activity level trigger is 50 percent of the annual capacity in order to implement improvements before 70 percent occurs.

As shown in **Table 4.2-4**, the airfield is already operating at approximately 90 percent of its practical capacity, approaching the upper limit for efficient operational performance. At this level of utilization, the airfield begins to experience constrained conditions in which minor fluctuations in demand, weather, or operational sequencing can result in disproportionate increases in delay and reduced system reliability. Forecast activity levels indicate that demand will continue to grow throughout the planning period, resulting in sustained operations at or above acceptable capacity thresholds.

Given these conditions, the capacity analysis indicates that the existing runway system will become increasingly constrained during the planning period and is projected to exceed its practical capacity during the short-term forecast horizon. At the levels anticipated, the airport can be expected to experience increasing delays, reduced operational flexibility, diminished efficiency during peak periods, and a limited ability to accommodate additional growth.

Consistent with FAA planning guidance, airfields operating above approximately 85 to 90 percent of their practical capacity are considered to be experiencing congestion that may warrant capacity improvements. Based on this analysis, the existing runway system is not expected to adequately accommodate future operational demand without increasing levels of delay and reduced flexibility in airfield operations. Accordingly, the development of additional airfield capacity, including the potential construction of a new runway, should be considered to maintain acceptable levels of service and support long-term aviation activity.

Input obtained from ATCT personnel further corroborates the findings of the capacity analysis. On a daily basis, controllers implement traffic management measures that limit the number of aircraft entering the Class D airspace due to runway constraints. Training activities such as touch and go operations and practice instrument approaches are frequently restricted or deferred to prioritize full stop landing aircraft and departure traffic. These operational limitations provide qualitative evidence of capacity constraints currently affecting the airfield and demonstrate that the system is already operating at or near its practical limits during peak demand conditions.

As such, airport capacity calculations were re-analyzed with a new parallel runway offset between 700 and 2,499 feet from the existing Runway 11-29 and with the same

operational considerations and assumptions. The results in **Table 4.2-5** indicate that with a new parallel runway, airfield capacity could be improved significantly.

TABLE 4.2-5
AIRFIELD CAPACITY ANALYSIS - NEW PARALLEL RUNWAY

	Annual Operations	Annual Service Volume (ASV)	Capacity Level
Base Year			
2025	180,927	386,100	47%
Forecast			
2031	199,000	374,200	53%
2036	215,400	364,800	59%
2046	252,200	345,900	73%

Source: ESA analysis 2026.

The implementation of a parallel runway would fundamentally transform the airport's long-term capacity outlook. Annual service volume would nearly double, eliminating the projected capacity deficiency identified under the existing configuration. In fact, the capacity could be slightly higher given a new parallel runway could also be combined with maximizing the exit factor for landings on all of the runways. The benefits of a parallel runway extend beyond the increase in annual service volume. As a high-activity flight training airport, FIN is particularly sensitive to airfield congestion because training operations involve repeated takeoffs, landings, touch and goes, and pattern work that can create runway occupancy conflicts and limit throughput. A parallel runway would allow aircraft operations to be distributed more efficiently across the airfield, reducing conflicts between arrivals and departures, improving traffic flow during peak training periods, and enhancing operational flexibility for both local and transient users. The additional runway would also provide greater opportunities to segregate slower training aircraft from faster turbine and business aviation traffic, improving overall efficiency and reducing delays for all airport users.

The capacity enhancement also supports the airport's evolving role within the regional aviation system. Runway 11-29 was recently extended to 5,500 feet to better accommodate turbine-powered aircraft and midsize business jets while continuing to serve a substantial flight training population. As operations continue to increase, maintaining a single-runway configuration would likely constrain the airport's ability to accommodate both training activity and business aviation growth. In contrast, a parallel runway would provide the operational flexibility necessary to support these diverse user groups while maintaining acceptable levels of service throughout the planning period.

From a long-range planning perspective, the proposed parallel runway would not simply address a future capacity shortfall; it would establish a sustainable airfield configuration capable of accommodating forecast demand well beyond the 2046 planning horizon. The analysis demonstrates that a parallel runway represents the most effective long-term solution for preserving operational efficiency, enhancing safety, supporting continued flight training activity, and ensuring that the airport can accommodate future growth without capacity-related restrictions.

The airport is also obligated to address existing and forecast capacity constraints to fulfill its responsibilities under FAA Grant Assurances 19 (Operation and Maintenance) and 22 (Economic Nondiscrimination), which require the sponsor to provide safe, adequate facilities and reasonable access for all aeronautical users. The airport currently experiences recurring congestion that requires the ATCT to delay or restrict aircraft operations because demand exceeds available runway capacity. These limitations affect all users but have a particularly significant impact on the airport's extensive flight training activity, which depends on reliable access to the airfield and surrounding airspace. As congestion increases, delays and operational restrictions reduce the airport's ability to efficiently accommodate existing and projected demand. The proposed new runway is needed to relieve these capacity constraints, improve operational efficiency and safety, reduce delays, and ensure continued access for corporate, general aviation, and flight training operators. By addressing documented capacity deficiencies, the project supports the airport's federal obligations and advances FAA objectives to maintain safe, efficient, and equitable access within the National Airspace System.

Therefore, runway length requirements for a new parallel runway will be modeled in Section 4.3 and the alternatives will evaluate placement options on the airfield.

4.2.5 Runway and Taxiway Flow Analysis

In addition to the FAA airfield capacity calculations, evaluations of the different airfield arrival and departure flows were made to help identify any inefficient areas on the airfield. This evaluation focused on the following conditions:

- Runway 11-29 Movements – Southeast and Northwest Flows
- Runway 6-24 Movements - Northeast and Southwest Flows

Assessing the different flows individually provides the simplest way to observe how aircraft movements typically occur on the current taxiway system. Through meetings with ATCT management, the most common taxi routes utilized to access or exit the runway environment were documented. Detailing how the airfield is operated ultimately helps identify where future improvements should be considered, especially given the taxiway design guidance in FAA AC 150/5300-13B, Change 1, *Airport Design* was established well after the last master plan that was completed in 2015.

Runway 11 Movements – Southeast Flow

Typical aircraft arrival and departure movements for Runway 11 in a southeast flow are illustrated on **Figure 4.2-1**. Taxiway F provides access to the approach end of Runway 11. The figure also depicts the FAA's optimal taxiway exit range described as part of the capacity calculations. The primary observations include:

Arrivals

1. Taxiway D is occasionally used by small general aviation aircraft as the exit is located just 1,500 feet from the landing threshold. Less than 12 percent of aircraft can utilize this location.

2. Most general aviation exit the runway onto Taxiway E which is approximately mid-point the runway with occasional exit at the Runway 6-24 intersection.

3. Larger jet aircraft exit at the end of the runway on Taxiway G. Based on ATCT, occasionally larger jet aircraft also exit at the Runway 6-24 intersection.

Departures

4. Most general aviation aircraft use Taxiway A to Taxiway F and hold short as required. Alternatively the Runway 11 end can be accessed via Taxiways B or G to Taxiway F.

5. Larger jet aircraft use Taxiways A1, G, and F for departures on Runway 11.

Runway 29 Movements – Northwest Flow

Typical aircraft arrival and departure movements for Runway 29 in a northwest flow are illustrated on **Figure 4.2-2**. The figure also depicts the FAA's optimal taxiway exit range described previously. The primary observations include:

Arrivals

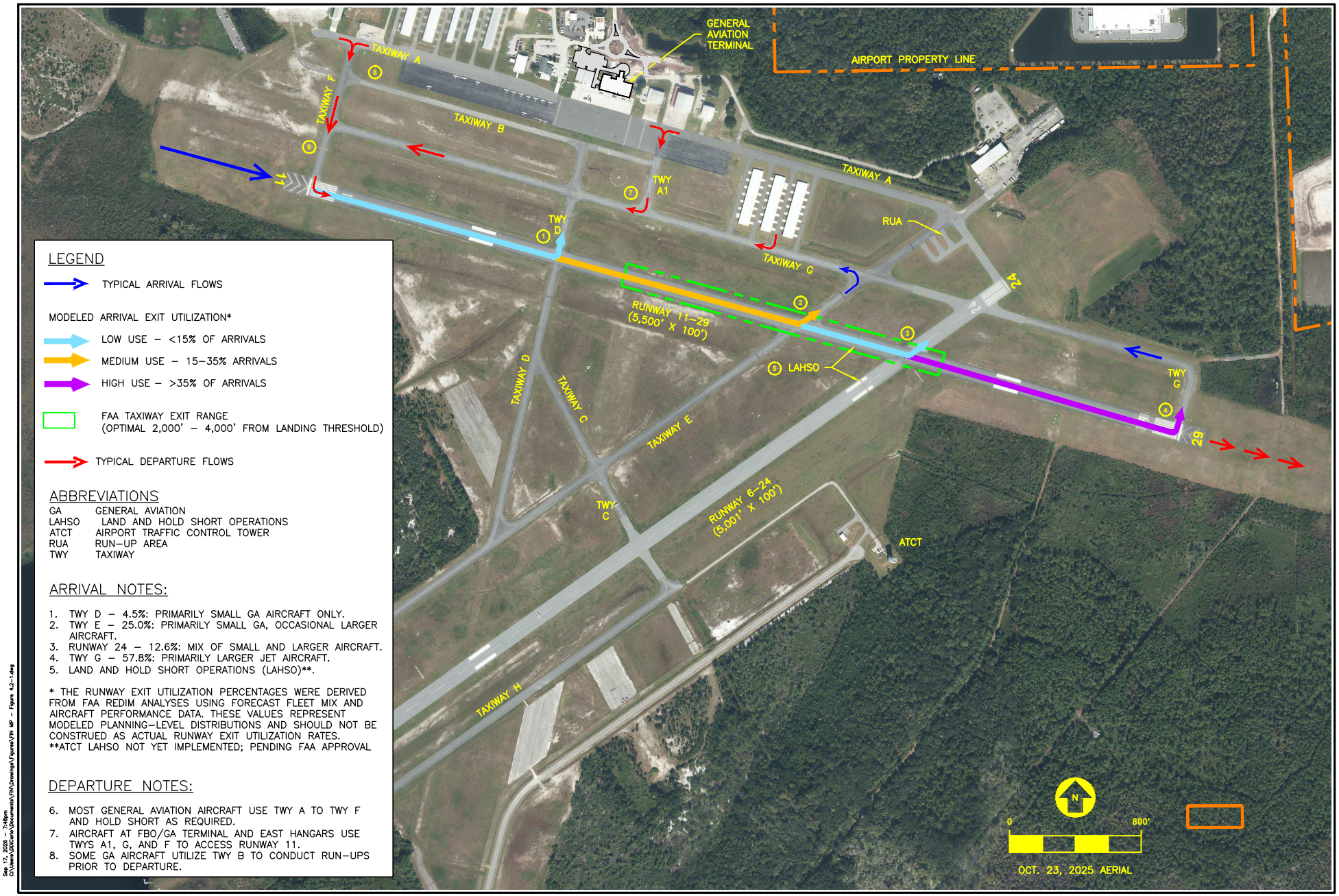
1. Taxiway E is located 2,400 feet from the landing threshold; therefore, only about 10 percent of small general aviation aircraft can use this exit.

2. Taxiway D is used by most general aviation aircraft and occasional use by the larger jet aircraft.

3. Aircraft requiring additional distance exit at the end of the runway onto Taxiway F.

Departures

4. Taxiway G is used by all aircraft for departures on Runway 29.



LEGEND

- TYPICAL ARRIVAL FLOWS

MODELED ARRIVAL EXIT UTILIZATION*

- LOW USE – <15% OF ARRIVALS
- MEDIUM USE – 15–35% ARRIVALS
- HIGH USE – >35% OF ARRIVALS
- FAA TAXIWAY EXIT RANGE (OPTIMAL 2,000' – 4,000' FROM LANDING THRESHOLD)
- TYPICAL DEPARTURE FLOWS

ABBREVIATIONS

GA	GENERAL AVIATION
LAHSO	LAND AND HOLD SHORT OPERATIONS
ATCT	AIRPORT TRAFFIC CONTROL TOWER
RUA	RUN–UP AREA
TWY	TAXIWAY

ARRIVAL NOTES:

1. TWY D – 4.5%: PRIMARILY SMALL GA AIRCRAFT ONLY.
2. TWY E – 25.0%: PRIMARILY SMALL GA, OCCASIONAL LARGER AIRCRAFT.
3. RUNWAY 24 – 12.6%: MIX OF SMALL AND LARGER AIRCRAFT.
4. TWY G – 57.8%: PRIMARILY LARGER JET AIRCRAFT.
5. LAND AND HOLD SHORT OPERATIONS (LAHSO)**.

* THE RUNWAY EXIT UTILIZATION PERCENTAGES WERE DERIVED FROM FAA REDIM ANALYSES USING FORECAST FLEET MIX AND AIRCRAFT PERFORMANCE DATA. THESE VALUES REPRESENT MODELED PLANNING–LEVEL DISTRIBUTIONS AND SHOULD NOT BE CONSTRUED AS ACTUAL RUNWAY EXIT UTILIZATION RATES.
**ATCT LAHSO NOT YET IMPLEMENTED; PENDING FAA APPROVAL

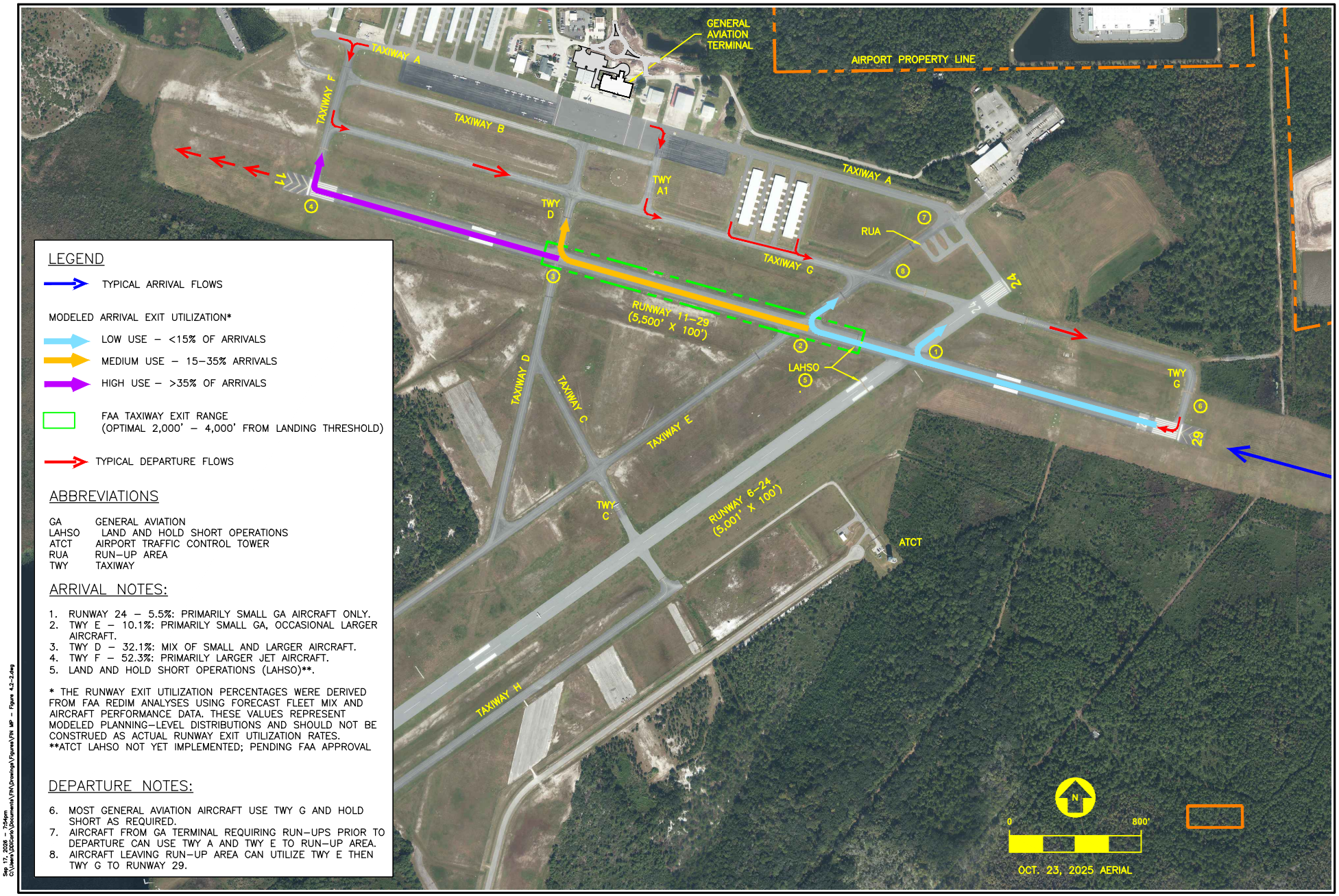
DEPARTURE NOTES:

6. MOST GENERAL AVIATION AIRCRAFT USE TWY A TO TWY F AND HOLD SHORT AS REQUIRED.
7. AIRCRAFT AT FBO/GA TERMINAL AND EAST HANGARS USE TWYS A1, G, AND F TO ACCESS RUNWAY 11.
8. SOME GA AIRCRAFT UTILIZE TWY B TO CONDUCT RUN–UPS PRIOR TO DEPARTURE.

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Source: ESA, 2026.

FIGURE 4.2-1
RUNWAY 11 MOVEMENTS - SOUTHEAST FLOW



LEGEND

- TYPICAL ARRIVAL FLOWS

MODELED ARRIVAL EXIT UTILIZATION*

- LOW USE – <15% OF ARRIVALS
- MEDIUM USE – 15–35% ARRIVALS
- HIGH USE – >35% OF ARRIVALS
- FAA TAXIWAY EXIT RANGE (OPTIMAL 2,000' – 4,000' FROM LANDING THRESHOLD)
- TYPICAL DEPARTURE FLOWS

ABBREVIATIONS

GA	GENERAL AVIATION
LAHSO	LAND AND HOLD SHORT OPERATIONS
ATCT	AIRPORT TRAFFIC CONTROL TOWER
RUA	RUN–UP AREA
TWY	TAXIWAY

ARRIVAL NOTES:

1. RUNWAY 24 – 5.5%: PRIMARILY SMALL GA AIRCRAFT ONLY.
2. TWY E – 10.1%: PRIMARILY SMALL GA, OCCASIONAL LARGER AIRCRAFT.
3. TWY D – 32.1%: MIX OF SMALL AND LARGER AIRCRAFT.
4. TWY F – 52.3%: PRIMARILY LARGER JET AIRCRAFT.
5. LAND AND HOLD SHORT OPERATIONS (LAHSO)**.

* THE RUNWAY EXIT UTILIZATION PERCENTAGES WERE DERIVED FROM FAA REDIM ANALYSES USING FORECAST FLEET MIX AND AIRCRAFT PERFORMANCE DATA. THESE VALUES REPRESENT MODELED PLANNING–LEVEL DISTRIBUTIONS AND SHOULD NOT BE CONSTRUED AS ACTUAL RUNWAY EXIT UTILIZATION RATES.
**ATCT LAHSO NOT YET IMPLEMENTED; PENDING FAA APPROVAL

DEPARTURE NOTES:

6. MOST GENERAL AVIATION AIRCRAFT USE TWY G AND HOLD SHORT AS REQUIRED.
7. AIRCRAFT FROM GA TERMINAL REQUIRING RUN–UPS PRIOR TO DEPARTURE CAN USE TWY A AND TWY E TO RUN–UP AREA.
8. AIRCRAFT LEAVING RUN–UP AREA CAN UTILIZE TWY E THEN TWY G TO RUNWAY 29.

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Source: ESA, 2026.

Flagler Executive Airport Master Plan

FIGURE 4.2-2
RUNWAY 29 MOVEMENTS - NORTHWEST FLOW

Runway 6 Movements – Northeast Flow

Typical aircraft arrival and departure movements for Runway 6 in a northeast flow are illustrated on **Figure 4.2-3**. Taxiway E provides access to both ends on the north side of Runway 6-24. The figure also depicts the FAA's optimal taxiway exit range described as part of the capacity calculations. The primary observations include:

Arrivals

1. Taxiway C is used predominantly by small general aviation aircraft as this exit is only 2,200 feet from the threshold.

2. Aircraft that require longer landing distance typically exit at Runway 11-29, Taxiway G or at the end of the runway onto Taxiway A.

Departures

3. Taxiway E is a full parallel taxiway that connects to the Runway 6 threshold. Accessing Taxiway E from the General Aviation Terminal area requires using Taxiway D.

Runway 24 Movements – Southwest Flow

Typical aircraft arrival and departure movements for Runway 24 in a southwest flow are illustrated on **Figure 4.2-4**. The figure also depicts the FAA's optimal taxiway exit range described previously. The primary observations include:

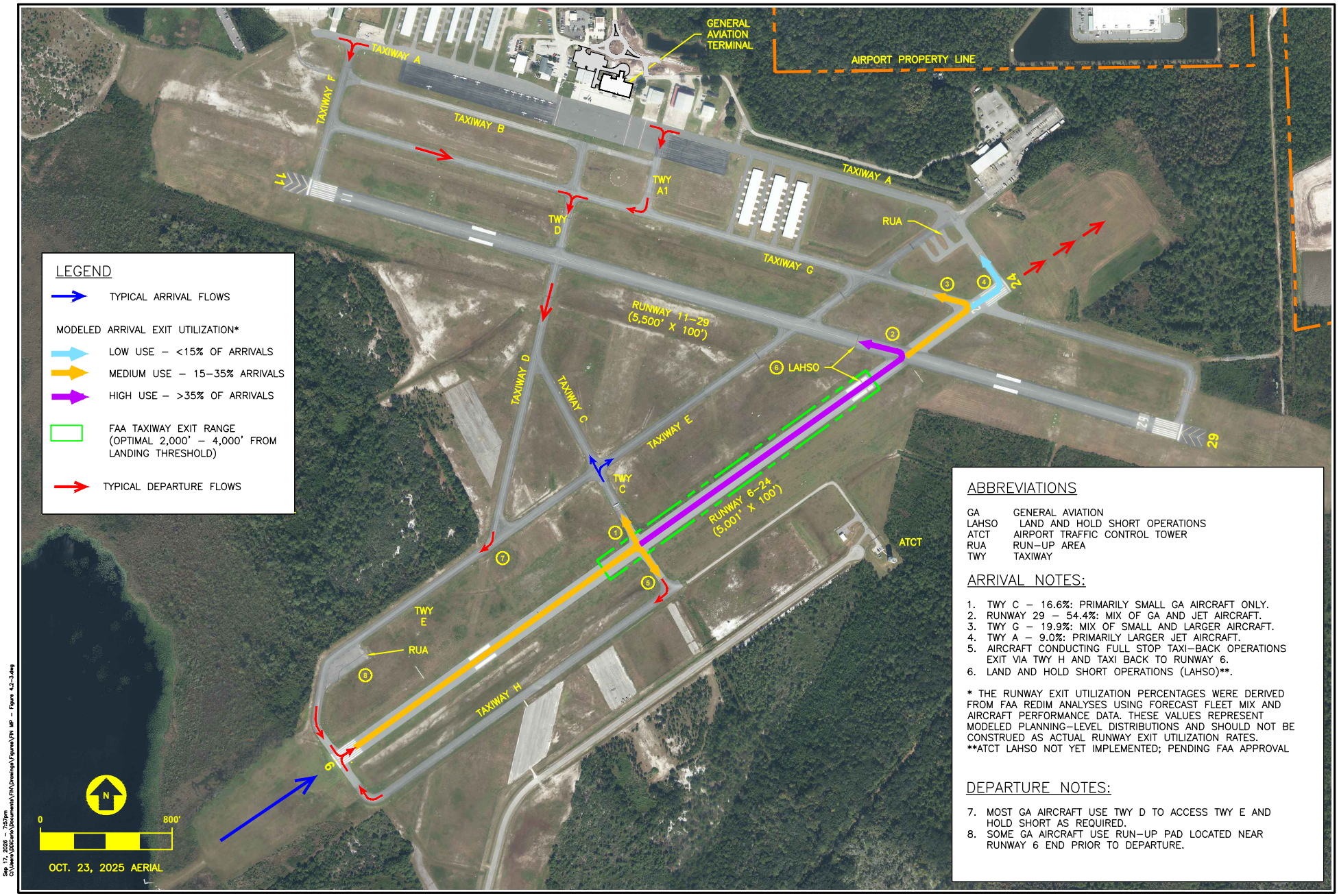
Arrivals

1. Taxiway C is used predominantly by small general aviation aircraft.

2. Jet aircraft predominantly exit at the end of the runway onto Taxiway E.

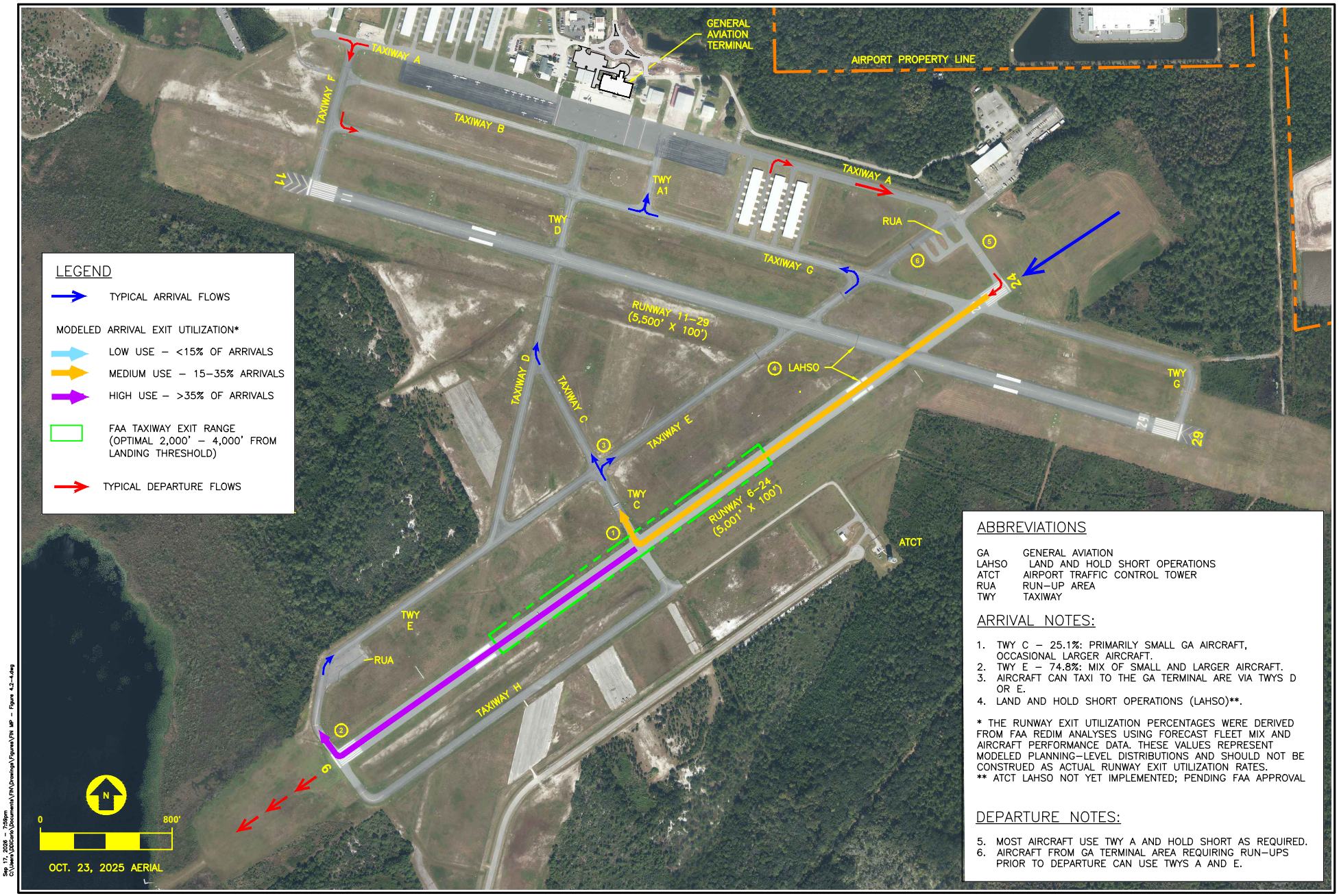
Departures

3. Taxiway A connects the General Aviation Terminal area to Runway 24.



Source: ESA, 2026.

FIGURE 4.2-3
RUNWAY 6 MOVEMENTS - NORTHEAST FLOW



Source: ESA, 2026.

Flagler Executive Airport Master Plan

FIGURE 4.2-4

RUNWAY 24 MOVEMENTS - SOUTHWEST FLOW

4.3 Runway Requirements

As the primary airfield component, a runway must have the proper length, width, and strength to safely accommodate the existing and future critical aircraft. In addition to the physical characteristics of a runway, there are a number of other safety related design standards that must be met, including the Runway Safety Area, Runway Object Free Area, Runway Protection Zones, and Obstacle Free Zones. Each of these, as well as other runway requirements, are described in this section. A separate description of the requirements for Runway 18W-36W is included at the end of this section.

Per FAA Order 5100.38D, *Airport Improvement Program Handbook*, runways are categorized into four groupings:

> **Primary Runway -** is typically designated as the main landing and takeoff surface oriented to achieve greater than 95 percent wind coverage for the design aircraft. It is typically the longest and most equipped runway for instrument approach capability. Runway 11-29 is the primary runway at FIN.
>
> **Crosswind Runway -** is a runway that is not parallel to the primary runway and is needed because the primary runway alone has less than 95 percent wind coverage.
>
> **Secondary Runway -** applies when there is more than one runway at the airport and that runway does not meet crosswind criteria because the primary runway is operating at 60 percent or more of its annual capacity or when the FAA has made a specific determination that the runway is required for operation of the airfield.
>
> **Additional Runway -** designation occurs when there is more than one runway at the airport and that runway does not meet the requirements of being designated a crosswind runway or as a secondary runway.

Recent revisions to AC 150/5300-13B Change 1 clarified that the 95 percent wind coverage requirement must be evaluated under all-weather conditions. Earlier guidance allowed wind coverage analyses to be based on IFR, VFR, or all-weather conditions independently. For example, the 2015 Master Plan determined that Runway 11-29 provided 88 percent coverage under IFR (10.5-knot crosswind component) and 91 percent under VFR, which supported the designation of Runway 6-24 as the crosswind runway by the FAA. Under the updated AC, however, IFR coverage alone is no longer sufficient to justify crosswind runway designation; instead, wind coverage must be evaluated using all-weather conditions exclusively.

In 2020, the FAA began assigning runway classifications to all federally obligated airports to implement Airport Improvement Program (AIP) handbook provisions. As a result, airports that historically received AIP funding for runways functioning as crosswind runways (but whose primary runways already met or exceeded the 95 percent wind coverage requirement) were reclassified as not meeting the FAA's true crosswind runway

definition. These airports consequently lost eligibility for AIP funding for those runways, requiring sponsors to fully fund any improvements. Runway 6-24 is currently designated as a crosswind runway by the FAA and remains eligible for federal funding. However, as noted in the forecast chapter, Runway 11-29 provides 97 percent all-weather wind coverage, which may prompt a reclassification of Runway 6-24.

The FAA Reauthorization Act of 2024 revised the treatment of previously funded crosswind runways by formally recognizing a new category known as legacy crosswind runways. This change acknowledged that many airports had historically received federal funding for secondary or crosswind functioning runways under prior FAA standards, even if those runways were not required to satisfy the 95 percent wind coverage requirement. Under the revised approach, these legacy crosswind runways retain eligibility for certain federal funding considerations based on their historical role and prior investment, rather than being penalized by newer classification criteria. The policy shift restored regulatory consistency, protected past federal investments, and relieved airport sponsors from automatically bearing the full financial responsibility for maintaining runways that were previously deemed federally justified.

Under current guidance outlined in FAA Reauthorization Program Guidance Letter (R-PGL) 25-01, legacy crosswind runways are limited to a maximum Runway Design Code (RDC) of A-I/B-I. For a rehabilitation project, the ADO may fund to current dimensions, or lesser right-sized dimensions, as permitted by the AIP Handbook. It should be noted that the airport sponsor may use local funding to exceed standards and develop the runway to a higher RDC or longer runway length. Forthcoming policy changes may further restrict eligibility. Current updates under consideration for the AIP Handbook indicate that legacy crosswind runway projects could be capped at RDC A-I/B-I (small aircraft), further limiting federal participation for facilities serving larger aircraft.

Operational data highlights the limitations of relying on a legacy crosswind designation for Runway 6-24. Virtower data from 2025 indicates more than 600 annual operations by B-II aircraft, exceeding both current and proposed legacy crosswind runway design thresholds. This level of utilization demonstrates that Runway 6-24 serves a broader operational function than a traditional crosswind runway and plays an important role in accommodating airport activity. Maintaining a legacy crosswind designation would limit eligibility for certain federal investments needed to support this level of demand, potentially constraining the airport's ability to address capacity and operational needs at a time when congestion and flight training activity continue to increase.

Accordingly, subsequent sections of this study assume Runway 6-24 will retain the eligibility for federal funding and the potential of being reclassified as either a legacy crosswind or secondary runway. Reclassification would better align the runway's designation with its operational role as a capacity-relief asset, support more efficient distribution of aircraft operations across the airfield, reduce reliance on the primary runway, and strengthen the Airport's ability to accommodate future demand. This dual-

scenario approach ensures development alternatives remain flexible, fiscally responsible, and aligned with evolving FAA policy while supporting the safe accommodation of current and future Group II operations.

4.3.1 Runway Length Analysis

FAA AC 150/5325-4B, Runway Length Requirements for Airport Design, provides the current standards and methods for computing recommended runway lengths. Use of this AC is required when a runway extension project is intended to request or receive federal funding. Depending on the critical aircraft's maximum takeoff weight (MTOW), the AC provides different methods for calculating runway length. They are based on the MTOW ranges of 12,500 pounds or less (small aircraft); over 12,500 pounds, but less than 60,000 pounds; and 60,000 pounds or more. It should be noted that depending on the aircraft manufacturer, MTOW may also be referred to as the maximum certificated takeoff weight, maximum allowable takeoff weight, or maximum design takeoff weight.

While the procedures and design rationale vary depending on the weight category, each still require some basic airfield data. This data is used in adjusting how an aircraft's takeoff and landing performance might be influenced by the characteristics at a specific airport. For FIN these include the established airfield elevation of 33 feet above mean sea level (AMSL) and the mean daily maximum temperature of the hottest month, which is 89°F.

Runway length requirements were calculated for both runways using the existing and future critical aircraft approved by the FAA as part of the aviation activity forecasts. Each aircraft will be modeled using charts from the AC with the exception of the Gulfstream 450 as that aircraft has a maximum takeoff weight greater than 60,000 pounds and requires the use of the performance manual from the aircraft manufacturer.

4.3.2 Length Required for Small Aircraft

Small aircraft are defined as those that have a MTOW of 12,500 pounds or less. The small aircraft group includes almost all single- and multi-engine (piston and turboprop) aircraft. The charts in FAA AC 150/5325-4B for determining the length required for small aircraft (such as the single-engine Cessna 172) were not utilized for the existing runways at FIN since operations data demonstrated historical use of aircraft greater than 12,500 pounds on both runways. As described in a later section these charts were utilized to compare with results from the FAA's newer small aircraft methodology for calculating the length of a future parallel runway.

Requirements for Large Aircraft up to 60,000 Pounds

Using approved aircraft flight manuals, FAA AC 150/5325-4B provides performance curves to determine the runway length required for large aircraft weighing between 12,500 and 60,000 pounds. In addition to the airfield elevation and mean daily maximum temperature, information on the useful load factors, effective runway gradient, and typical weather conditions are required.

Useful load is defined as the difference between an aircraft's maximum takeoff weight (MTOW) and its empty weight, representing the combined weight of passengers, cargo, and fuel. The useful load factor therefore indicates the proportion of this capacity utilized during a given operation. FAA runway design charts provide options for either a 60 percent or 90 percent useful load factor, with higher percentages corresponding to heavier aircraft and increased runway length requirements.

To determine the appropriate factor for FIN operations, average stage length data was compared to aircraft range. Typical trip distances are approximately 350 nautical miles (nm) for the Dassault Falcon 900, 450 nm for the Bombardier Challenger 300, and 500 nm for the Gulfstream G450. Thess trips are substantially lower than their maximum ranges which are 3,600 nm, 3,100 nm, and 4,400 nm respectively. Because trips departing FIN are generally 500 miles or less, this indicates that aircraft operate well below their maximum range capability. As the stage lengths are 500 miles or less for the Falcon, Challenger, and Gulfstream aircraft operating out of FIN, these trips are considered short-haul trips; meaning, the aircraft would likely not operate at maximum takeoff weight. As such, 60 percent useful load charts were applied for determining runway length requirements.

The FAA performance curves for jet aircraft weighing 12,500 to 60,000 pounds are also split into the categories of 75 and 100 percent of the fleet. FAA AC 150/5325-4B provides lists of the general aviation jet aircraft that represent 75 percent of the fleet flying in the U.S. This list combined with a second list represents 100 percent of the general aviation jet fleet in this weight range. The FAA's 100 percent of the fleet table includes the larger Beechcraft Hawker, Bombardier Challenger, Bombardier Learjet, Cessna Citation, and some larger Dassault Falcon series business jets. It should be noted that certain Falcon and Challenger aircraft are also specified in the 75 percent fleet charts. As the Falcon 900 and Challenger 300 are specifically listed in the 75 percent chart, this will be used for determining runway length.

Applying local conditions to these performance curves yields an initial runway length requirement of 4,650 feet based on no wind, a dry runway surface, and zero effective runway gradient for a 60 percent useful load. Adjustments are then made for either takeoff or landing operations, but not for both, as the increases are not cumulative. Takeoff adjustments are based on the maximum difference in centerline elevation of the runway being considered while landing adjustments are only made for runways serving jet aircraft operations. For takeoffs, since the initial lengths are adjusted for a specific runway's effective gradient, the centerline elevation difference for the most critical runway was applied as both runways accommodate the critical aircraft in this weight range.

At 3 feet, Runway 6-24 has the greater difference in centerline elevation between the high and low points of the runway. Per FAA methodology, runway length is increased at a rate of 10 feet for every foot of elevation differences between the high and low points of the centerline. As such, the adjusted runway length is 4,680 feet. For landings conducted by

turbojet-powered aircraft performance values also are increased by 15 percent or up to 5,500 feet for wet and slippery runways. Applying this formula results in 5,348 feet.

Specific Lengths for Aircraft Greater than 60,000 Pounds

FAA Advisory Circular (AC) 150/5325-4B specifies that Airport Planning Manuals (APMs) provided by aircraft manufacturers should be used to determine takeoff and landing distances for large aircraft weighing more than 60,000 pounds. The future critical aircraft for Runway 11-29 is the Gulfstream G450 which has a maximum takeoff weight (MTOW) of 74,600 pounds and is therefore not included in the FAA's runway length charts. As such, manufacturer performance data were used to calculate required takeoff distances either at maximum certificated takeoff weight, or, for a typical short-haul operation at a reduced weight. APM data was also used to determine landing distances based on wet runway conditions and the aircraft's maximum landing weight (MLW).

In accordance with AC 150/5325-4B, the typical stage length (or trip distance) of the critical aircraft must be considered when assessing takeoff performance for federally funded projects. For this analysis, an average trip length of 525 nm was utilized for Gulfstream G450 aircraft. A representative takeoff weight of 58,000 pounds was selected as this reflects a realistic weight profile for the G450 to perform a short-haul trip from FIN.

Using the APM chart of 58,000 pounds at 33 feet MSL, 89°F, and 20 degrees of flaps results in a runway length of 4,700 feet. Per FAA methodology, runway length is increased at a rate of 10 feet for every foot of elevation differences between the high and low points of the runway centerline. Since the elevation change for Runway 11-29 is 2 feet, the final runway length for takeoff is 4,720 feet.

For the Gulfstream G450, AC 150/5325-4B requires the use of APM data at maximum landing weight. At 66,000 pounds, 33 feet MSL, zero wind, and a dry runway (no spoilers), the unfactored landing distance is 3,200 feet. Applying the FAA-required wet runway correction increases the landing distance to approximately 6,133 feet. However, FAA guidance caps landing distance at 5,500 feet. As this value exceeds the aircraft's takeoff requirement, 5,500 feet governs as the final runway length requirement for the Gulfstream G450.

New Parallel Runway

As a new parallel runway is needed to address the capacity shortfall driven by the extensive amount of flight training activity conducted by single-engine aircraft. In 2022, the Airport Cooperative Research Program (ACRP) released the Small Aircraft Runway Length Analysis Tool (SARLAT), which was funded by the FAA, to help augment challenges with FAA AC 150/5325-4B regarding updated performance data and aircraft that are not reflected in the charts.

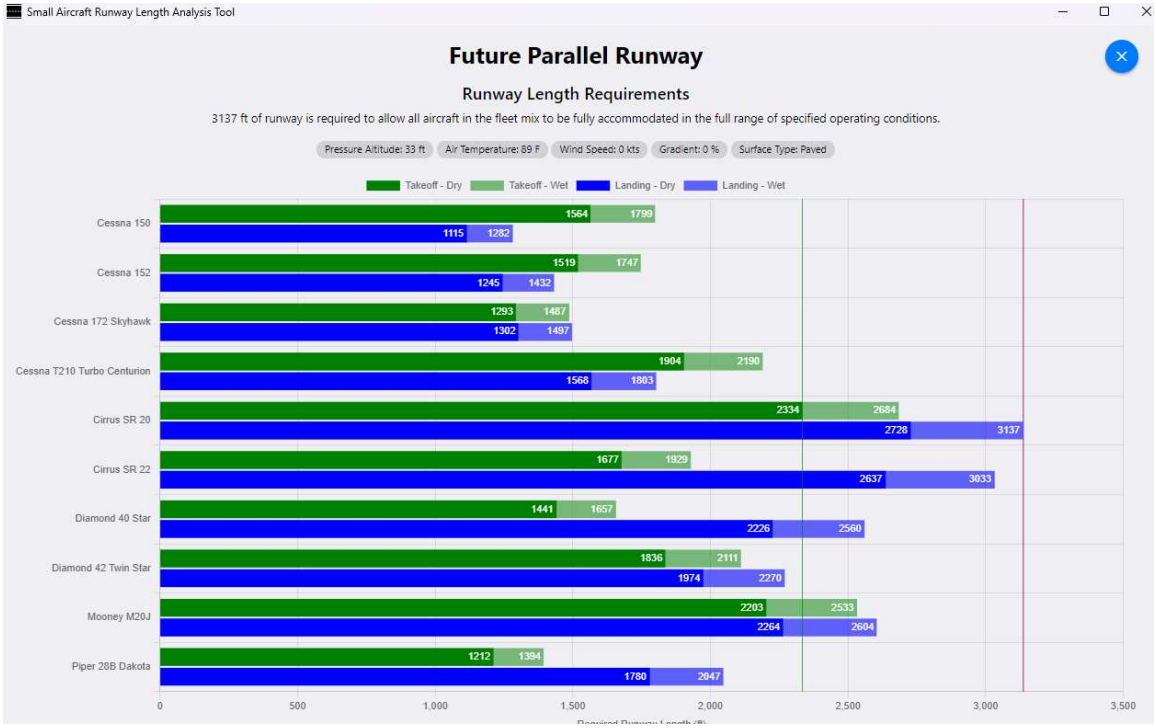
The SARLAT tool allows users to select from 42 different aircraft type (28 piston engine, 2 light sport aircraft, 9 turboprop, 5 twin engine turbofan with maximum takeoff weights

less than 20,000 pounds), payload analysis and parameters for air taxi operations; all of which offer an enhanced method for runway length design.

Using the Runway Design Mode in SARLAT, aircraft performance was selected from a representative mix of single-engine aircraft with documented operational history at FIN. Among the evaluated aircraft, the Mooney M20, Cirrus SR20 and Cessna 210 demonstrated the most demanding runway length as identified by **Figure 4.3-1.**

The runway length analysis was conducted using a mean daily maximum temperature of 89°F, an airport elevation of 33 feet MSL, zero wind conditions, a zero-percent runway gradient, and a useful load equal to 75 percent of the aircraft's maximum useful load. A zero-percent runway gradient was assumed because any proposed runway would be designed and constructed in accordance with current FAA design standards, which seek to minimize longitudinal slope and associated performance impacts.

FIGURE 4.3-1
FUTURE PARALLEL RUNWAY LENGTH ANALYSIS



Source: SARLAT and ESA Analysis 2026.

A 75-percent useful load factor was selected to reflect typical operating conditions for flight training aircraft. These aircraft rarely conduct training missions at maximum gross weight with full fuel, passenger, and cargo loads. Instead, a typical training flight often consists of three occupants; the flight instructor, student pilot, and an additional student observer. Under these conditions, fuel loads are commonly reduced to ensure compliance with aircraft weight and balance limitations, as training aircraft are particularly sensitive to

changes in loading. As a result, the use of a 75-percent useful load factor represents a realistic and operationally representative assumption for SARLAT runway length calculations.

SARLAT analysis specifies a recommended runway length of 2,334 feet for a new parallel runway based on dry takeoff performance criteria for the Cirrus SR-20. Although the analysis produced a required takeoff runway length of 2,684 feet under wet conditions, dry conditions prevail for the majority of the year, and the additional 350 feet of runway length would not materially affect aircraft departure capability. Furthermore, runway length requirements are typically based on dry takeoff performance rather than wet takeoff conditions.

For landing operations, however, SARLAT indicates that the Cirrus SR-20 requires 3,137 feet of runway under wet conditions, which is a standard consideration in aircraft landing performance analyses. Because the wet landing requirement is more restrictive than the dry takeoff requirement, the 3,137 foot runway length will govern for the final required length and be carried forward into the alternatives analysis. This runway length will provide an acceptable length for all training aircraft queried in the model. Additionally, for comparison purposes, the runway length charts published in the FAA runway length AC indicate a requirement of approximately 3,100 feet for small aircraft (fewer than 10 passenger seats) at a 95 percent load factor at 89°F, providing independent validation of the SARLAT-derived runway length estimate.

Based on the existing airfield configuration, siting of the new runway will also need to account for its proximity to the existing ATCT structure and Fin Way, which currently ends at the ATCT. Preliminary discussions with ATCT personnel indicated that any planned parallel runway should provide greater separation standards from the runway to the ATCT to ensure an adequate safety buffer exists given the extensive training environment that takes place. The alternatives will evaluate the ideal location of a new runway based on the spacing requirements and existing airfield infrastructure.

Recommended Runway Lengths

The current length of Runway 11-29 is 5,500 feet. As shown in the analysis above, no additional length is required on Runway 11-29 during the course of the planning period as the future critical aircraft (Gulfstream G450) only requires 5,500 feet.

Runway 6-24 currently measures 5,001 feet in length. Extending the runway to 5,400 feet (rounded up from the calculated 5,348 feet) is recommended to fully support the general aviation business jets that regularly utilize this facility. The existing and future critical aircraft are both represented on the same FAA runway length curves, thereby eliminating the need for separate runway length determinations and avoiding the requirement for the future critical aircraft to independently demonstrate regular use.

The new parallel runway would be constructed to a length of 3,200 feet (rounded up from the calculated 3,137 feet). The following sections identify other characteristics of the

future parallel runway that also need to be considered to evaluate its configuration on the airfield.

TABLE 4.3-1
EXISTING AND FUTURE RUNWAY LENGTH REQUIREMENTS

Runway	Critical Aircraft	Required Runway Length	Current Runway Length	Additional Length Required
11-29 (existing)	B-II (Dassault Falcon 900)	5,500’	5,500’	None
11-29 (future)	D-II (Gulfstream G450)	5,500’	5,500’	None
6-24 (existing)	B-II (Dassault Falcon 900)	5,400’	5,001’	399’
6-24 (future)	C-II (Bombardier Challenger 300)	5,400’	5,001’	399’
Future Parallel	A-I Small Aircraft (Cirrus SR20)	3,200’	n/a	3,200’

Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design, FAA Small Aircraft Runway Length Analysis Tool (SARLAT), and ESA analysis, 2026.

4.3.3 Runway Width Requirements

Runway width requirements are based on the runway design standards of the most critical aircraft defined in the forecast chapter. The minimum requirements for each runway are listed in **Table 4.3-2** along with the corresponding runway shoulder width and blast pad dimensions. For the shoulders and blast pads, only runways with an Airplane Design Group (ADG) of IV and higher require paving; otherwise, they can be stabilized.

Runway 11-29 provides the 100 foot pavement width and paved blast pads (measuring 120 feet wide by 150 feet long) at both runway ends required to accommodate the future critical aircraft. Beyond the edges of the runway the soil is stabilized to provide the required 10 foot shoulders.

Runway 6-24 currently provides a 100 foot pavement width, which is adequate for both the existing and future critical aircraft. Beyond the pavement edges, the adjacent soil has been stabilized to provide the required 10 foot shoulders. Off each end of Runway 6-24 the soil has been graded and turf maintained to provide a stabilized blast pad.

For the future parallel runway a width of 60 feet is required for the A-I small aircraft intended to use it under visual conditions. The future parallel runway will require a minimum separation distance of 700 feet from one of the other runways in order to conduct simultaneous independent takeoffs and landings under visual conditions. If the future parallel runway will ultimately support instrument flight operations, additional runway separation criteria must be considered.

TABLE 4.3-2
MINIMUM RUNWAY WIDTH, SHOULDER, AND BLAST PAD REQUIREMENTS

Runway	Runway Design Code	Pavement Width	Shoulder Width	Blast Pad Width	Blast Pad Length
11-29 (Existing)	B-II-5000	75’	10’	95’	150’
11-29 (Future)	D-II-5000	100’	10’	120’	150’
6-24 (Existing)	B-II-4000	75’	10’	95’	150’
6-24 (Future)	C-II-4000	100’	10’	120’	150’
Future Parallel	A-I-VIS[1]	60’	10’	80’	60’

Notes: 1. VIS indicates visibility minimums limited to visual conditions only.

Source: FAA AC 150/5300-13B, Change 1, Airport Design.

4.3.4 Runway Pavement Strength and Condition

Pavement strength requirements for each runway at an airport are predicated upon the most demanding aircraft’s weight and how that weight is distributed through the landing gear. The Pavement Condition Index (PCI) documented in the 2024 Florida Department of Transportation (FDOT) pavement evaluation report provides an indication of the degree of maintenance, repair, rehabilitation, or reconstruction required to ensure airfield pavements are maintained properly.

In 2024 Runway 11-29 had a weighted PCI of 90 (good) as the pavement was constructed in 2017 when the primary runway was shifted to the south 400 feet and extended from its original length of 5,000 feet to 5,500 feet. The last major rehabilitation to Runway 6-24 was in 2021 and the pavement was documented as having an area weighted PCI of 94 (good) in the 2024 pavement report.

In the AIP Handbook, the FAA defines the minimum useful life of pavement rehabilitations as 10 years and 20 years for reconstructed or new pavement surfaces. However, since pavement conditions depend on the use and the environment, projects to rehabilitate airfield pavements are routinely conducted every 15 to 20 years after the previous major rehabilitation, strengthening, or new construction. These projects, which repair damage to the runway pavement resulting from normal wear, need to be conducted even at airports with regular pavement maintenance programs, including crack sealing and surface seal coats.

Typically, pavements are eligible for rehabilitation when the PCI reaches 70 (fair) and reconstruction when the PCI is 55 (poor). The 2024 pavement report forecast PCI ratings out to 2029. For Runway 11-29 the pavement is expected to be at 81 (satisfactory) and

for Runway 6-24 at 85 (satisfactory). Projects to rehabilitate both runways should be programmed before the end of the 20-year planning horizon to avoid their pavement surfaces from getting to a condition where reconstruction would be required.

The pavement for the future parallel runway should be designed to support the forecast single-engine aircraft fleet identified in SARLAT. As the project progresses into final design, pavement strength requirements will be determined using the FAA's Aircraft Classification Rating-Pavement Classification Rating (ACR-PCR) methodology. The analysis will be performed using FAARFIELD 2.1, the FAA's standard software for airport pavement design, evaluation, and pavement strength reporting, consistent with the procedures outlined in AC 150/5320-6G, *Airport Pavement Design and Evaluation* and AC 150/5335-5D, *Standardized Method of Reporting Airport Pavement Strength - PCR*.

4.3.5 Runway Safety Criteria

The safety surfaces required to protect aircraft operations and the public include the Runway Safety Area, Runway Object Free Area, Runway Protection Zones, and Obstacle Free Zones. The FAA definitions for these surfaces as well as their dimensions at FIN are included below.

Runway Safety Area (RSA) - A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or veer off the runway. The RSA needs to be: (1) cleared and graded with no potentially hazardous ruts, humps, depressions, or other surface variations; (2) drained by grading or storm sewers to prevent water accumulation; (3) capable, under dry conditions of supporting the occasional passage of aircraft without causing structural damage to the aircraft; and (4) free of objects, except for those that need to be located in the safety area because of their function. It should be noted that the FAA does not allow modifications to any RSA standards and that the area must be owned and controlled by the airport.

Runway Object Free Area (ROFA) - The ROFA is centered on the runway centerline. Standards for the ROFA require clearing the area of all ground objects protruding above the RSA edge elevation. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the ROFA. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the ROFA. This includes parked airplanes and agricultural operations. As with the RSA, the ROFA must be owned and controlled by the airport.

Runway Protection Zone (RPZ) – The RPZ is trapezoidal shaped area typically beginning 200 feet from the usable pavement end of a runway. The primary function of this area is to preserve and enhance the protection of people and property on the ground. Even though there is no vertical component, airports are required to maintain control of each runway’s RPZ. Such control includes keeping the area clear of

incompatible objects and activities. While not required, this control is much easier to achieve and maintain through the acquisition of sufficient property interests in the RPZs.

Runway Obstacle Free Zone (ROFZ) - The ROFZ is a three-dimensional volume of airspace centered on the runway that supports the transition of ground to airborne operations (or vice versa). The ROFZ clearing standards prohibit taxiing, parked airplanes, and other objects, except frangible navigational aids or fixed-function objects (such as signage), from penetrating this zone. Precision instrument runways also require an Inner-transitional OFZ and Precision OFZ. If there is an approach lighting system, then an Inner-approach OFZ is also required.

Dimensions for the required RSA, ROFA, RPZ, and ROFZ shown in **Table 4.3-3** are related to the existing and future Aircraft Approach Category (AAC), ADG, and visibility minimums included in the forecast chapter.

TABLE 4.3-3
EXISTING AND FUTURE RUNWAY SAFETY CRITERIA

Runway	Runway Safety Area	Runway Object Free Area	Runway Protection Zone	Runway Obstacle Free Zone
11-29 (Existing)	150’ wide 300’ prior 300’ beyond	500’ wide 300’ prior 300’ beyond	500’ x 700’ x 1,000’	400’ wide 200’ beyond
11-29 (Future)	500’ wide 600’ prior 1,000’ beyond	800’ wide 600’ prior 1,000’ beyond	500’ x 1,010’ x 1,700’	400’ wide 200’ beyond
6-24 (Existing)	150’ wide 300’ prior 300’ beyond	500’ wide 300’ prior 300’ beyond	1,000’ x 1,510’ x 1,700’ (Runway 6) 500’ x 700’ x 1,000’ (Runway 24)	400’ wide 200’ beyond
6-24 (Future)	500’ wide 600’ prior 1,000’ beyond	800’ wide 600’ prior 1,000’ beyond	1,000’ x 1,510’ x 1,700’ (Runway 6) 500’ x 1,010’ x 1,700’ (Runway 24)	400’ wide 200’ beyond
Future Parallel	120’ Wide 240’ prior 240’ beyond	250’ wide 240’ prior 240’ beyond	250’ x 450’ x 1,000’	250’ wide 200’ beyond

Source: FAA AC 150/5300-13B, Change 1, Airport Design.

Runway Safety and Object Free Areas

Both runways have compliant RSAs and ROFAs. Based on an analysis of existing RSA terrain profiles for each runway, there are no grading violations, undulations, depressions, or hazardous ruts. However, at the approach end of Runway 6, the outermost edge of the RSA is subject to soil erosion and will need to be monitored to maintain the proper grade.

For the future Runway 11-29 RSA and ROFA, a few trees will require removal in the southwest corner of the surface at the approach end to Runway 11, in order to accommodate the increased dimensions for D-II aircraft. Similarly some trees on both sides of the future ROFA at the Runway 6 approach end will need to be cleared and some in the northernmost corner of the future RSA and ROFA at the approach end to Runway 24. Finally, the grade prior to the Runway 6 threshold will likely need to be improved when the larger RSA dimensions are required for the future C-II critical aircraft.

When evaluating the potential option of extending Runway 6-24 from 5,001 to 5,400 feet, the alternatives chapter will also assess the ability to provide the required RSA and ROFA surfaces. For the proposed parallel runway, the alternatives will evaluate the most suitable location in conjunction with the area needed for the required RSA and ROFA surfaces.

Runway Protection Zones

In 2022, the FAA updated RPZ guidance via FAA AC 150-5190-4B, *Airport Land Use Compatibility Planning*. Key elements from the AC that pertain to this effort include:

- Actively consider and evaluate available options anytime there is an Airport Layout Plan (ALP) update or master plan update, and to be vigilant for any other opportunities that may arise from time to time (especially to purchase land) to eliminate or minimize existing incompatibilities. The FAA expects airport sponsors to document their efforts to demonstrate they are complying with relevant FAA Grant Assurances.

- Projects such as runway extensions or new runways, that would result in moving the RPZ into an area that has incompatible land uses, the FAA expects the sponsor to have or secure sufficient control of the RPZ, ideally through fee simple ownership, including any off-airport property within the RPZ.

As such, the RPZs for each runway end have been evaluated to identify any existing or future incompatible uses. The Airport retains control over the existing and future RPZs off all four ends of the existing runways as the limits for each are all within the Airport's property. Additionally, there are no incompatible land uses within the limits of the current or future RPZs.

It should be noted that the existing and future RPZs prior to the Runway 6 threshold do overlap a portion of Runway 18W-36W. To support seaplane operations, a small dock and ramp are located along the shoreline of Gore Lake, both of which are sited outside the existing RPZ and future RSA/ROFA limits, but would be encompassed by the future RPZ. As these facilities are considered aeronautical in nature, no alternatives analysis is required per FAA AC 150-5190-4B, *Airport Land Use Compatibility Planning*.

Regardless of whether Runway 6-24 is extended, the future RPZ prior to the Runway 24 threshold would have two small areas that would extend beyond the current airport property line. These areas do not currently have any incompatible land uses and in lieu of acquiring additional property, an alternative would be to obtain avigation easements to

control future uses. This will be evaluated as part of the alternatives analysis as will the future RPZ requirements associated with establishing a future parallel runway.

Runway Obstacle Free Zones

Both runways have compliant ROFZs, per the dimensions included in **Table 4.3-3**, for both the existing and future conditions. As there are no precision approaches planned to any runway end, no Inner-approach, Inner-transitional, or Precision OFZ surfaces are required. The alternatives will ensure that the required ROFZ standards for a future parallel runway are met.

4.3.6 Line-of-Sight Requirements

As part of the design and safety criteria, there are also two critical line-of-sight requirements that must be considered. The first is the Runway Visibility Zone (RVZ) which protects the proper line-of-sight between both existing and future runway configurations. A clear RVZ allows aircraft operating on the airfield to verify the location and movements of other aircraft and vehicles on the ground that could create a conflict. This zone must be kept clear of any fixed or movable objects, including parked aircraft, when the ATCT is closed. While the existing RVZ has no obstructions, any changes in the runway configuration or new facilities proposed will need to be considered to ensure no future impacts are created. The alternatives analysis will evaluate RVZ requirements for the future Runway 6-24 extension and new parallel runway. The RVZ does not include Runway 18W-36W.

The other line-of-sight requirement is related to the ATCT and the ability for the controllers to have an unobstructed view of all existing and future aircraft movement areas. In addition to other setbacks and imaginary surfaces, the ATCT line-of-sight is a critical element when considering the location and height of future airport facilities, as well as the location of future aircraft movement areas. There are no published line-of-sight restrictions in the Airport Master Record, Chart Supplement, or Letters to Airmen. Based on ATCT personnel feedback, there are currently no line-of-sight limitations or concerns to any of the runways or taxiways. However, it was conveyed that future development along Taxiway H could potentially result in line-of-sight restrictions for portions of Taxiway H near the Runway 6 threshold. As such, the alternatives will evaluate the development potential in this area.

4.3.7 Runway 18W-36W Requirements

As noted previously, the current length and width established Runway 18W-36W is based on the size of Gore Lake. FAA AC 150/5300-13B references AC 150/5395-1B, *Seaplane Bases* for designing facilities serving seaplane operations. At 3,001 feet long, it is capable of supporting the operations of the critical aircraft in the A-I small aircraft category. The current 500 foot width exceeds the AC's recommendation for a width of at least 200 feet.

In order to determine future requirements, it is important to understand how Runway 18W-36W is utilized. As noted in the inventory, due to line-of-sight issues, the air traffic

controllers at FIN do not have the ability to issue instructions to any aircraft operating to or from Gore Lake. It was also noted during interviews that Runway 18W-36W is used very infrequently. The following remark is included in the current aeronautical publications:

> RWY 18W/36W SEAPLANE LNDG AREA GORE LAKE 3196 FT BY 1633 FT UNMRKD; 40 FT TREES WATER EDGE ALL QUADRANTS; ALL APCHS HDG 180 DEG OR 360 DEG PAST TREES.

The dimensions included in the current remarks are different from those established for Runway 18W-36W in the same publications. It is also not certain when or where the information about the tree heights around Gore Lake came from. Finally, because the limits of Runway 18W-36W are not marked with buoys; protective aeronautical surfaces, such as an approach surface or RPZ cannot be defined. If the water runway at FIN was marked with buoys, both a 20:1 visual approach surface and RPZs off each end need to be established. The 20:1 surface is addressed in another section of this chapter while the RPZs would have an inner width of 250 feet, an outer width of 450 feet, and 1,000 feet long.

The alternatives analysis will evaluate the difference between the operational flexibility provided with what the FAA calls an unmarked water lane versus a more formal marked water lane or water runway.

4.4 Taxiway System Requirements

Taxiway systems include parallel taxiways, entrance/exit taxiways, connector taxiways, apron taxilanes, hangar taxilanes, bypass taxiways, and run-up areas. The Airport's critical aircraft were utilized to establish the minimum taxiway system requirements. Since the last master plan was conducted, the FAA has issued newer guidance on taxiways, primarily with respect to fillet design and layouts to enhance the safety of aircraft movements. The primary design criteria for the taxiways at FIN are provided in **Table 4.4-1**. Some of the taxiway standards are based on the Taxiway Design Group (TDG) while others still remain a function of the critical aircraft's ADG.

The taxiway widths and associated standards presented are based on current FAA design criteria and reflect the ADG and TDG of the critical aircraft. Under existing conditions for both Runways 11-29 and 6-24, the Falcon 900 landing gear geometry places it within TDG 2A standards. The future critical aircraft for Runway 11-29 is the Gulfstream G450 which also falls within TDG 2A. As indicated by **Table 4.4-1**, runway offset for the future condition of both runways increases to 300 feet due to the RDC change from B-II to C/D-II.

The future critical aircraft for Runway 6-24 is the Challenger 300 which is TDG 1B, only requiring 25 feet due to a shorter cockpit-to-main gear distance and narrower main gear width. However, it should be noted that the designation of a critical aircraft may reflect a representative aircraft within a broader family of regularly operating aircraft possessing similar operational characteristics consistent with FAA AC 150/5000-17, *Critical Aircraft*

and Regular Use Determination. Within this family, aircraft can exhibit meaningful variations in landing gear geometry that directly influence TDG classification and associated taxiway design requirements.

TABLE 4.4-1
MINIMUM TAXIWAY SYSTEM REQUIREMENTS

Taxiways Serving	Airplane Design Group (ADG)	Taxiway Design Group (TDG)	Width	Taxiway Safety Area (TSA)	Taxiway Object Free Area (TOFA)	Offset to Runway
11-29 and 6-24 (Existing)	II	2A	35’	79’	124’	240’
11-29 and 6-24 (Future)	II	2A	35’	79’	124’	300’
Future Parallel	I	1A	25’	49’	89’	225’

Source: FAA AC 150/5300-13B, Change 1, Airport Design.

Because other ADG II aircraft within the Gulfstream and Dassault family currently operate on the taxiway system serving both Runways 11-29 and 6-24 which have more demanding landing gear configurations requiring a TDG 2A, it is appropriate to retain TDG 2A for the design of all taxiways and taxilanes. Designing for TDG 2A ensures the taxiway system accommodates the full range of aircraft within the applicable fleet mix, consistent with the FAA’s similar characteristics provision, rather than being governed solely by the dimensional requirements of a single representative aircraft.

All of the taxiways provide the proper widths, safety areas, and object free areas for the existing and future critical aircraft. Parallel Taxiways G and E also provide the proper offset to the centerline of the runway they serve for both existing and future conditions. A number of taxiways were updated and reconfigured as part of the Runway 11-29 shift and extension in 2017. At that time, most of the taxiways and fillets were constructed to TDG 3 standards following the approved critical aircraft at that time. Since the 2015 master plan nearly every taxiway has been rehabilitated. These pavements are included in the 2024 FDOT pavement evaluation report, which documents most areas as either good or satisfactory. Specific information is provided in the following sections for those portions of the taxiway system needing rehabilitation or other improvements.

Taxiway B

Taxiway B is used as a supplementary route for aircraft entering and exiting the ramp area. This taxiway is also used occasionally as a run-up area for piston aircraft departing on Runway 11. Taxiway B is closed to fixed wing aircraft between Taxiways A1 and D as this area has a painted H where helicopter parking occurs.

In 2024 the PCI for Taxiway B was 62 (fair) and is projected in the 2024 pavement report to be 57 (fair) by 2029, but just above the PCI of 55 (poor), when the pavement would be eligible for reconstruction. As such, a project to rehabilitate Taxiway B needs to be considered in the short-term planning horizon to coincide with the future development plans along its alignment.

Taxiway C

Small training aircraft landing in either direction on Runway 6-24 sometimes use Taxiway C as an exit while jet aircraft exit further down the runway. Training aircraft landing on Runway 6 can also exit Taxiway C on the southeast side of the runway to connect with partial parallel Taxiway H. This allows the aircraft to do full stop landings and then taxi back to the Runway 6 threshold for departure.

The pavement where Taxiway C connects to the southeast side of Runway 6-24 is currently in satisfactory condition, but is projected to decrease to a PCI of 76 by 2029. Therefore, the rehabilitation of this portion of the taxiway should be planned in the intermediate planning horizon.

Taxiway D

Similar to Taxiway C, the pavement where Taxiway D connects to the northwest side of Runway 6-24 is currently in satisfactory condition, but is projected to decrease to a PCI of 76 by 2029. Therefore, the rehabilitation of this portion of the taxiway should be planned in the intermediate planning horizon.

Taxiway E

While the area weighted condition of Taxiway E received a PCI of 86 (good), the northeast end and southwest half of the taxiway are only considered satisfactory and projected to range between a PCI of 73 and 76 (satisfactory) by 2029. As such, a project to rehabilitate these portions or potentially the entire taxiway, should be planned in the intermediate planning horizon.

The existing Taxiway E holding position marking at the Runway 6 end is not aligned at the current 90-degree standard, which limits pilots' ability to see aircraft departing Runway 24. This configuration is due to the wetland areas to the immediate northwest of the taxiway. The alternatives will evaluate re-aligning this section of the taxiway to permit aircraft to hold short perpendicular to the runway.

On the north side of the airfield, Taxiway E extends across Taxiway A into a portion of the Airport property that was previously occupied by a flight school. The portion of Taxiway E north of Taxiway A was rated a PCI of 63 (fair) in the 2024 pavement report. A project to rehabilitate or potentially reconstruct this end of Taxiway E should be considered in the short-term planning horizon.

Taxiway H

The pavement condition for Taxiway H is currently in the upper range of the satisfactory rating, but is projected to decrease to a PCI of 76 by 2029. Therefore, the rehabilitation of this portion of the taxiway should be planned in the intermediate planning horizon. An extension of Taxiway H to the northeast should also be considered to support future development along the flightline to the south of Runway 6-24.

Taxilanes

Several taxilanes exist on the airfield that serve T-hangars situated on both the north and south side of Taxiway A. The current minimum ADG I separation standards between the taxilane centerline and fixed objects is 39.5 feet to provide a 79 foot Taxilane Object Free Area (TLOFA). None of the T-hangar taxilanes on the airfield meet this dimensional requirement; however, those on the north side of Taxiway A were designed and constructed before that standard changed in 2012 (previously 75 feet was the minimum allowed). Conversely, the three T-hangars located south of Taxiway A were completed in 2024, yet still do not provide a 79 foot TLOFA between the buildings or the minimum 39.5 feet from the centerline of the taxilanes serving only one side of a T-hangar. As such a modification to standards should be pursued for this non-standard condition. Future T-hangars that are constructed adjacent to these hangars will be modeled using the current ADG I separation standards.

Of the six taxilanes serving the T-hangars on the north side of Taxiway A, the four on the east side serving T-hangar Buildings A, B, C, and D are in a deteriorated state. The 2024 pavement report rated these taxilanes with PCIs ranging from 41 (poor) to 57 (fair). A project to rehabilitate these taxilanes was underway at the time this study was being conducted.

New Taxiways and Taxilanes

Depending on the recommended development plan, there will be a need for improvements to the existing taxiway system, which will likely include extending portions of the existing taxiways and taxilanes to provide airfield access to new facilities. Additional requirements are included in the following sections.

Future Parallel Runway Access

As indicated by the capacity analysis, an additional runway will be required within the planning horizon. Implementation of this runway will necessitate reconfiguration of portions of the existing taxiway network to accommodate the ultimate airfield layout, as determined through the alternatives analysis. As shown in **Table 4.4-1**, at a minimum, the taxiways supporting the proposed parallel runway should be designed to accommodate ADG I and TDG 1A taxiway design standards; however, depending on the configuration of the parallel runway, its taxiway system may need to support the movement of the critical aircraft for Runways 11-29 and 6-24. The alternatives analysis will determine parallel

taxiway options and the optimal number and locations of taxiway exits using the FAA software described in the following section.

Taxiway Exits

The annual service volume analysis indicates that the airfield was operating at 91 percent of its capacity in 2025 and, without improvements, is projected to reach 133 percent of capacity by the end of the 20-year planning period. In addition to a future parallel runway, enhancements to the taxiway exit system should be considered to improve the short-term runway throughput and overall airfield efficiency. The runway exit factor is maximized when at least two taxiways are available within the optimal exit range, which is 2,000 to 4,000 feet from each landing threshold. While the runway system provides multiple exit opportunities, the number of exits located within the FAA's optimal 2,000 to 4,000 foot range varies by runway end. For Runway 6-24 the location and even number of exits may vary depending on the future configuration and length of the runway.

In addition to exit modelling outlined in FAA AC 150/5060-5, Change 2, *Airport Capacity and Delay*, the FAA released a software based application in 2022 called the Runway Exit Design Interactive Model (REDIM) which assists with the planning and design of runway exit locations based on runway occupancy time. REDIM can be used to evaluate existing and proposed exit configurations, quantify potential reductions in runway occupancy times, and identify opportunities to improve runway capacity and operational efficiency by optimizing exit placement for the airport's aircraft fleet mix.

REDIM utilizes data collected from recorded landing events at major U.S. airports resulting in highly accurate modeling for exit locations. Runway occupancy time is defined as the time interval from when an aircraft crosses the runway threshold until the aircraft wingtip has cleared the runway edge imaginary line. Estimations of runway occupancy time encompasses five landing phases: 1) time to touchdown, 2) one free roll time between touchdown and the initiation of braking, 3) braking time, 4) a second free roll time between the end of the braking phase and the start of the turnoff maneuver, and 5) the turnoff time. Generally, lower runway occupancy time values enable a runway to accommodate a higher number of operations increasing overall capacity. Runway occupancy time is influenced by the number, type, and placement of runway exits. REDIM can be used to model whether the removal or reconfiguration of specific exits would negatively affect runway performance.

After applying a representative fleet mix, the REDIM analysis yielded a runway occupancy time for all surface conditions (wet and dry), calculated the percent usage for each taxiway exit, and refined the planning level assessment of runway exit needs. A summary of the findings follows while more detailed information on the REDIM analysis is included in **Appendix B**.

Overall the REDIM analysis indicates that Runways 11 and 24 exhibit the strongest need for additional runway exits to support current and future airfield capacity demands. As shown in **Appendix B**, Runway 24 demonstrates the highest average modeled runway

occupancy time and the greatest dependence on a runway-end exit, with approximately 74.8 percent of modeled arrivals utilizing Taxiway E. Modeling of a proposed intermediate exit reduces average runway occupancy time from 55.7 seconds to 49.9 seconds and substantially redistributes arrivals away from Taxiway E. Similarly, Runway 11 exhibits a strong concentration of modeled arrivals at Taxiway A, particularly among business jets, and would benefit from an additional intermediate exit that reduces runway occupancy time and improves runway availability.

Runway 29 also demonstrated a measurable operational benefit from an additional exit, particularly for business jet arrivals; however, its lower overall runway utilization reduces the airport-wide benefit relative to Runways 24 and 11. Conversely, Runway 6 exhibits relatively low runway occupancy time, distributed use among several exit opportunities, and limited reliance on the runway-end exit. Accordingly, Runway 6 does not demonstrate a near-term operational need for an additional exit.

Given that the airport is currently operating around 91 percent of its annual service volume and annual operations continue to increase, the recommended strategy is to prioritize new exits on Runway 24 and then Runway 11 as near-term capacity enhancements, while preserving a Runway 29 exit as a future complementary improvement to support operational flexibility and continued growth. The alternatives analysis will further evaluate the operational benefits, feasibility, and preferred placement of additional taxiway exits.

Run-up Areas and Bypass Capability

Run-up areas are intended to serve the small general aviation piston fleet that need to perform engine checks before each departure. The FAA recommends providing run-up areas or holding bays when a runway's operations reach a level of 30 operations per hour. The activity forecasts showed that overall, the airfield supported approximately 98 operations during the peak hour of the average day in 2025. This level is expected to increase to 134 operations per hour by the end of the planning period.

As noted in the inventory, two run-up areas are currently provided at each end of Taxiway E to accommodate the airport's piston engine fleet. The run-up area at the Runway 6 end of Taxiway E is a more traditional apron configuration where aircraft can pull off the taxiway and position in any direction. The lack of entry and exit lines in the apron could result in aircraft being within ADG II TOFA for Taxiway E as there is a wide expanse of pavement between the taxiway edge markings and the TOFA line marked on the pavement. The run-up area near the approach end to Runway 24 is configured with three separate taxilane bays with designated hold lines providing ADG II separation from aircraft on Taxiway E. This run-up area can also be utilized when aircraft are departing on Runway 11. Although there is no designated run-up area adjacent to Runway 29, aircraft conduct run-ups on Taxiway B without impacting access to Runway 29 since aircraft primarily use parallel Taxiway G.

While these run-up areas adequately serve existing operations, both will be affected by the anticipated upgrade in critical aircraft from B-II to C/D-II due to the increased ROFA

width requirement from 500 feet to 800 feet. Accordingly, the run-up areas would need to be either relocated outside the protected area or reconfigured to maintain compliance while continuing to support aircraft operations. The alternatives chapter will evaluate run-up configurations and locations including options for the future parallel runway which will be used primarily by training aircraft.

4.5 Instrument Procedures

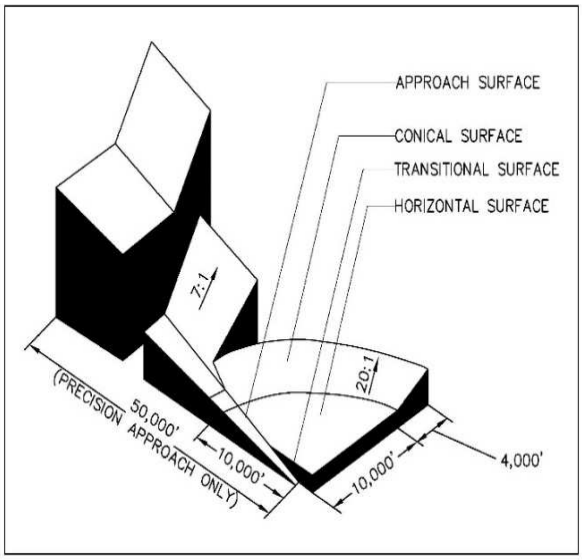
Instrument approaches enable pilots to safely descend into the airport environment for landing during times of inclement weather and/or reduced visibility. As noted in the inventory, there are three categories for instrument approaches: precision approaches, approach procedures with vertical guidance, and non-precision approaches. Currently only Runway 6 has a GPS procedure with vertical guidance also known as a Localizer Performance with Vertical Guidance (LPV) while Runway 11, 29, and 24 only have non-vertically guided GPS approaches.

The forecast chapter documented that over the past 10 years, an average of 3.9 percent of the activity at FIN was conducted as an instrument operation under an instrument flight plan. However, over the past 5 years, the average has increased to approximately 5 percent and will likely continue to increase based on the level of training activity conducted. The forecast chapter also noted that the percentage of operations under an instrument flight plan is different from the actual percentage of the year that the Airport experiences IFR conditions. As noted in the airport capacity section, over the ten years of data analyzed, the airfield was under actual instrument meteorological conditions 6.7 percent of the time. Discussions with ATCT and airport management revealed that there are virtually no instances where an aircraft had to divert due to the instrument procedures available at FIN. For these reasons and the fact that lower instrument approach procedures have much larger areas to protect and may require additional airfield equipment, no improvements to the current procedures are recommended.

4.5.1 14 CFR Part 77 Imaginary Surfaces

The airspace around airports is protected by the imaginary surfaces defined in 14 Code of Federal Regulations (CFR) Part 77. When combined, the five different imaginary surfaces of this federal regulation protect airspace and the ability for aircraft to safely fly into and out of an airport. These surfaces must be incorporated into the local planning and land use ordinances to control the height of objects in the vicinity of the airport. As such, the future surfaces are the most critical in order to protect the viability of the airfield's visual and instrument approach capabilities. **Figure 4.5-1** provides a general illustration of the five different imaginary surfaces, while the descriptions and specific dimensions as they apply to FIN are described in the following sections.

FIGURE 4.5-1: 14 CFR PART 77 IMAGINARY SURFACES



Primary Surface

The Primary Surface is a rectangular area symmetrically located about each runway centerline and extending a distance of 200 feet beyond each paved runway end. The width of the Primary Surface is based on the type of approach a particular runway has, while the elevation follows, and is the same as that of the runway centerline, along all points. Since the existing approach procedures all have visibility minimums greater than ¾ mile and no improvements are planned, the existing and future Primary Surface is 500 feet wide for both Runways 11-29 and 6-24.

For the future parallel runway, only visual approaches are planned to each end. The future parallel runway would be designated under 14 CFR Part 77 as a utility runway since it will only serve small aircraft (12,500 pounds or less). As such, the existing and future Primary Surface would be 250 feet.

For Runway 18W-36W, 14 CFR Part 77 surfaces only apply if the designated area for the landing and takeoff of seaplanes is outlined by visual markers such as buoys. If the corners of the water runway are marked in the future, 14 CFR Part 77 would require a minimum 250 foot wide Primary Surface since Runway 18W-36W only has visual approaches and is limited to aircraft under 12,500 pounds. If the width of the landing and takeoff area is marked as greater than 250 feet, then the Primary Surface would correspond with the increased width. As for the length of the Primary Surface, it would be the same as the marked water runway lengths since there is no prepared hard surface.

Horizontal Surface

The Horizontal Surface is a level oval-shaped area situated 150 feet above the established airport elevation, extending 5,000 or 10,000 feet outward from the Primary Surface, depending on the runway category and approach procedures available. For both Runways 11-29 and 6-24 the Horizontal Surfaces require a radius of 10,000 feet, now and in the future. The future parallel runway and Runway 18W-36W (if the limits are marked) would require Horizontal Surfaces with a radius of 5,000 feet.

Conical Surface

The Conical Surface extends outward for a distance of 4,000 feet beginning at the outer edge of the Horizontal Surface, and sloping upward at a ratio of 20:1. This surface is the same for both existing runways, the future parallel runway, and water runway (if the limits are marked), regardless of the types of approaches available.

Approach Surface

The Approach Surfaces begin at the end of the Primary Surface (200 feet beyond the paved runway end) and slope upward at a ratio determined by the runway category and type of instrument approach available to the specific runway end. The inner width and elevation of the Approach Surface conforms to that of the Primary Surface while the outer width and overall length is also governed by the runway category and instrument approach procedure available.

For Runways 11-29 and 6-24, the existing and future Approach Surfaces extend out 10,000 feet at a slope of 34:1 to an outer width of 3,500 feet. For the future parallel runway and Runway 18W-36W (if the limits are marked) the Approach Surfaces extend out 5,000 feet at a slope of 20:1 to an outer width of 1,250 feet.

Transitional Surface

The Transitional Surface is a sloping area beginning at the edges of the Primary and Approach Surfaces and sloping upward and outward at a 7:1 slope.

4.5.2 Approach Protection Surfaces

The criteria for establishing runway thresholds are defined in FAA AC 150/5300-13B, Change 1. These airport design surfaces, which are categorized by a number, are utilized to ensure that the required approach surface is clear of obstacles. It should be noted that these approach surfaces are different from those defined in 14 CFR Part 77 and were previously referred to as threshold siting surfaces.

Each end of Runways 11-29 and 6-24 have a Surface 4 designation where the approach end of runways support IFR circling procedures and procedures only providing lateral guidance. As the existing and future minimums are greater than 3/4 mile visibility, the 20:1

slope surface begins 200 feet prior to the landing threshold, has an inner width of 400 feet, an outer width of 3,400 feet, and extends out 10,000 feet. For the future parallel runway and Runway 18W-36W (if the limits are marked) each end would have a Surface 2 designation for visual approaches and serving aircraft with an approach speed of 50 knots or more. The 20:1 slope surface begins at the landing threshold with an inner width of 250 feet which initially extends out 2,250 feet to an outer width of 700 feet. The surface then extends an additional 2,750 feet at the same outer width.

Runway thresholds should be located such that there are no penetrations to the required approach protection surface for both the existing and future conditions. The ability to provide the proper criteria to each runway threshold is addressed in the alternatives chapter.

4.5.3 Departure Surfaces

If any single runway end at an airport has a published instrument approach procedure, the FAA applies an instrument Departure Surface (Surface 7) off all active runway ends at the airport, to include a parallel runway in the future. Section 1 of the Departure Surface begins at the departure end of the runway, at the same elevation, with an inner width equal to the runway width. It then splays out from the corners of the usable runway at 15 degree angles, and extends out to 12,152 feet (2 nm) at a 40:1 slope to end 304 feet above the runway end elevation. From the edge of the usable runway, Section 2 rises upward to 150 feet above the runway end elevation at a point 500 feet on either side of the runway centerline. Section 2 also rises upward along the extended runway centerline at the same 40:1 slope until reaching 304 feet above the runway end elevation. Upon reaching 304 feet, the surface levels out until the end of Section 1.

Both sections of the Departure Surface should be clear of all obstacles. If it is not possible, penetrations to the surface must be evaluated through the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) process. If obstacles cannot be removed, non-standard climb gradients are published (as part of the departure procedure) which are higher than the standard 200 feet per minute that is used to clear the 40:1 surface. An airport sponsor can also request that a specific runway end be designated as Not Authorized (NA) for instrument departures, in which case the 40:1 Departure Surface would not apply. The ability to provide the current Departure Surface criteria off each runway end is evaluated as part of the new ALP drawing set.

IFR departures are permitted off all runway ends with the exception of Waterway 18W-36W as specified in the takeoff minimums published by the FAA. No non-standard climb gradients are published for any runways but there are two departure procedures established for both Runways 24 and 29 where aircraft are required to climb out on a specific heading to a certain altitude before initiating a turn to ensure adequate obstacle clearance. As such, the alternatives will evaluate any obstacles that need to be removed for the 40:1 departure surface.

4.6 Airfield Environment

A number of facilities are necessary to support the operations of the airfield environment. Airfield lighting is required for airports intended to be utilized for nighttime operations as well as for operations during less than visual meteorological conditions. These along with pavement markings, signage, and other navigational aids are addressed in the following sections.

4.6.1 Airfield Lighting

The light emitting diode (LED) medium intensity runway lights (MIRLs) on both Runway 11-29 and Runway 6-24 are considered to be in good condition; however, they will likely need to be replaced towards the end of the 20-year planning period. MIRLs are recommended for the future parallel runway as the Airport regularly supports night training operations and it is not recommended to have an unlit surface at an airfield where all the other surfaces are lit.

Most of the taxiways are equipped with LED medium intensity taxiway lights (MITLs) which are in good condition, but will also need to be replaced by the end of the 20-year planning horizon. Only Taxiway B still has incandescent MITLs which should be replaced with LED fixtures when the taxiway is rehabilitated in the short-term planning period.

4.6.2 Airfield Signage

Most of the currently illuminated airfield signage consist of LED fixtures and are in good condition. The panels, as well as the units themselves, will need to be replaced over the course of the planning period, particularly those that are not currently LED. Additionally, lighted airfield signage will be required for any new taxiway in order to maintain the efficient and safe movement of aircraft to and from the runway environment. Typically, these are placed on the left side of the taxiway but can be located on the right when necessary to meet clearance requirements or when it is impractical on the left side.

Neither runway has runway distance remaining signs. Runway distance remaining signs provide pilots with clear and continuous awareness of the runway length available during takeoff and landing operations. For training operations, these signs can enhance pilot situational awareness and reinforce runway management practices during repetitive flight training activities, including touch and go operations, short- and soft-field procedures, and go-arounds. They also benefit turbine and business jet operators who require greater awareness of runway length due to their higher approach and takeoff speeds. The signs can also be particularly valuable during night operations, adverse weather conditions, and for transient pilots who may be less familiar with the airport. For these reasons, runway distance remaining signs will be included as part of the final recommended development plan.

4.6.3 Pavement Markings

Runway pavement and displaced threshold markings are painted white, while taxilane pavement markings are painted yellow. FAA guidelines state that all taxiways should have centerline markings and runway holding position markings whenever they intersect with a runway. Many surface markings on light-colored pavements require glass reflector beads and need to be outlined in black paint without beads to enhance their conspicuity. This is true for all Portland Cement Concrete (PCC) surfaces and older asphalt pavements. In as little as two years, many asphalt surfaces (new or treated) can become 'light-colored pavements.' This is especially true in Florida; therefore, glass beads and black outlines need to be included as part of all future pavement markings at FIN.

Runways

Runway pavements are marked with painted lines and numbers to aid in the identification of the runways from the air and to provide information to the pilot during the approach phase of flight. The FAA classifies three marking schemes depending on the type of runway:

Visual – minimum requirement for landing designator markings and centerline stripe.

Non-precision – minimum requirement for landing designator markings, centerline stripe, and threshold markings.

Precision - minimum requirement for landing designator markings, centerline stripe, threshold markings, aiming point markings, touchdown zone markings, and edge markings.

Non-precision runway markings are also used on runways with approaches providing vertical guidance and visibility minimums no lower than ¾ mile. Depending on aircraft activity and pavement characteristics, additional markings may be required. As discussed in the existing conditions assessment, both runways currently have markings appropriate for the aircraft they serve and the instrument approaches they support. Landing designators and a centerline stripe are the minimum markings required on the future parallel runway with only visual approaches.

Runway pavement markings typically last for ten years; however, there are a number of variables that could significantly shorten that period, especially given the rain and sun in Florida. Therefore, at least two remarking projects will be required for the runways during the course of the planning period.

It should be noted that hold lines also extend across Runway 11 and Runway 6 prior to the runway intersection. These markings and their associated signage were added as part of the Runway 11-29 relocation and extension project to facilitate establishing Land and Hold Short Operations (LAHSO). LAHSO operations allow air traffic control to authorize an aircraft to land and stop before reaching a designated intersection, runway, or taxiway, thereby increasing airport capacity and operational efficiency. Participation is at the pilot's

discretion and may only be conducted when runway length, weather, and other operational conditions meet FAA requirements.

LAHSO infrastructure requirements include hold short lines and position signs which are installed on both sides of the runway. For night operations, a six bar in-pavement unidirectional pulsing white lights need to be installed across the runway at the hold-short point. Based on discussions with ATCT personnel, LAHSO night operations will not be implemented. As the marking and signs are already installed, the only requirements left to complete LAHSO (once approved) will include updating the chart supplement with the landing distances available from the Runway 11 and Runway 6 thresholds to the hold short points so pilots can determine stopping distance required before accepting a LAHSO clearance.

Taxiways and Taxilanes

All of the taxiways have holding position markings to identify the point where aircraft and vehicles must stop and obtain clearance before entering or crossing a runway. They help protect the runway environment by ensuring adequate separation from aircraft operating on the runway. Placement of the holding position lines for the existing B-II critical aircraft and approach procedures requires a minimum of 200 feet offset from the runway centerline. All of the holding position markings at FIN are currently offset 250 feet, including the LAHSO markings. This spacing meets the future critical aircraft design and approach procedure standards, which require 250 feet for both runways. For any taxiways which would only serve the future parallel runway, the holding position markings need at least a 125 foot offset.

The taxiways markings at FIN also include enhanced taxiway centerline markings, prior to the holding position markers. The enhanced taxiway centerline marking provides supplemental visual cues to alert pilots of an upcoming runway holding position marking in order to minimize the potential for runway incursions. Although these markings are only required for 14 CFR Part 139 airports, incorporating these at a general aviation airport provide a safety enhancement given the extensive flight training that occurs at the airport.

For consistency, this is applied to all taxiways and therefore needs to be included as part of any future taxiways connecting directly to the existing runways or future parallel runway. Any new taxiways or taxilanes should also have the appropriate centerline and holding position markings required by the FAA. And as with the runway pavements, periodic taxiway and taxilane remarking will be required at least twice during the course of the planning period due to normal weathering and wear from regular usage.

4.6.4 Takeoff and Landing Aids

Over the course of the planning period some of the takeoff and landing aids will require repair or replacement, as well as a few new ones. The following sections describe these systems.

Runway End Identifier Lights

The current runway end identifier lights (REILs) installed on all four existing runway ends are in good condition but will likely to be replaced in the second half of the 20-year planning horizon. REILs are also recommended for each end of the future parallel runway to facilitate recognition of the runway within the overall airfield environment during night and marginal weather conditions.

Visual Glide Slope Indicators

While the precision approach path indicator (PAPI) systems to each of the four existing runway ends are considered to be in good condition, it is likely they will need to be replaced before the end of the 20-year planning period. The PAPI angles for each runway end are also currently published at 3.0 degrees, which is the desired angle to provide. PAPIs are also recommended to be installed at each end of the future parallel runway since it will primarily support training operations.

Wind Indicators

Depending on its final location and configuration, at least one supplemental wind cone should be installed for the aircraft using the future parallel runway.

Compass Calibration Pad

A compass calibration pad is a designated paved area used for the calibration and verification of aircraft magnetic compasses. The facility allows aircraft to be aligned with known reference headings so that compass indications can be compared against established magnetic bearings. Since magnetic compasses reference magnetic north rather than true north, and because onboard equipment can introduce additional deviation errors, periodic calibration is required to ensure compass accuracy. Compass calibration pads support aircraft maintenance and safe navigation by enabling the identification and correction of compass errors and the development of accurate compass correction data.

Currently, the airport does not have a dedicated compass calibration pad, requiring aircraft operators to use alternate areas on the airfield for compass calibration and verification. Given the airport's significant flight training activity, growing based aircraft population, and active maintenance operations, a dedicated compass calibration pad should be considered during the planning period. The facility would enable aircraft to be aligned on known magnetic headings in an area free from magnetic interference, improving the accuracy and efficiency of compass calibration procedures.

A compass calibration pad needs to be located in an area free from magnetic interference and outside protected airport operational areas. FAA guidance recommends that the center of the pad be located at least 600 feet from large parking lots, busy roadways, railroad tracks, and high-voltage electrical transmission lines; 300 feet from buildings, aircraft, fuel lines, and utilities containing ferrous materials; and 150 feet from airfield

lighting, signage, drainage structures, and other metallic airport infrastructure. The pad should also be located outside all navigational aid critical areas, runway and taxiway safety areas, object free areas, and obstacle free zones. In addition, a magnetic survey should confirm that magnetic variation remains consistent within a 250-foot radius of the pad and that deviations do not exceed 0.5 degrees within the calibration area, ensuring accurate and repeatable compass calibration results. The alternatives will evaluate the most practical location for a compass calibration pad.

4.7 General Aviation Facilities

The following sections address facilities necessary to continue to support the general aviation operations at FIN. A number of interviews were conducted at the onset of the study to help identify future needs.

4.7.1 General Aviation Terminal

A new General Aviation Terminal was constructed during the development of this master plan. The building provides a total of 15,500 square feet (SF) of space to support passenger and pilot activity, fixed base operator (FBO) operations, airport administration space, meeting rooms, and space for aviation related businesses.

The number of passengers and pilots during the peak hour of the average day is utilized to evaluate the amount of terminal space required. The following methodology and assumptions were developed based on industry trends, site visits, and meetings with airport management. A summary of the key variables and resulting terminal space requirements are included in **Table 4.7-1**.

- The number of general aviation operations conducted during the peak hour of the average day during the peak month was calculated. This accounts for arriving, departing, local, and itinerant users.

- The number of peak hour operations were then adjusted to eliminate local operations using the local versus itinerant splits from the forecast chapter for each planning period. It is assumed that general aviation terminal facilities are primarily used by itinerant operators. The calculations also exclude training aircraft conducting touch and go operations as it is assumed these aircraft would not be using the FBO or terminal facilities.

- The adjusted peak hour operations (arriving or departing) were estimated to average three individuals for each aircraft in 2025. The assumption is that for the different sized aircraft, typically only the two pilots and one passenger (or one pilot and two passengers) utilize general aviation terminal facilities. For the larger aircraft, this assumption is reasonable given in many instances passengers are directly picked up and dropped off at the aircraft, by passing the terminal facilities. By the end of the planning period, this estimate was increased to five individuals per aircraft.

- An area of 100 SF was applied to each peak hour pilot/passenger to assess the minimum space required.

TABLE 4.7-1
GENERAL AVIATION TERMINAL SPACE REQUIREMENTS

	2025	2031	2036	2046
Peak Hour General Aviation Operations	98	106	115	134
Itinerant Peak Hour General Aviation Operations	20	24	28	39
Average Individuals Per General Aviation Aircraft	3	4	4	5
Minimum Space Required	6,000 SF	8,400 SF	11,200 SF	19,500 SF
Existing General Aviation Terminal Space	15,500 SF	15,500 SF	15,500 SF	15,500 SF
Surplus (+) / Deficit (-)	+9,500 SF	+7,100 SF	+4,300 SF	-4,000 SF

SF = Square Feet

Source: ESA analysis 2026.

As shown in the evaluation, the new General Aviation Terminal is expected to adequately accommodate projected demand through 2036. However, if itinerant operations increase as forecasted, additional space may be warranted towards the end of the 20-year planning horizon. The alternatives analysis will evaluate potential long-term terminal improvements.

4.7.2 Aircraft Storage Hangars

Because hangars provide protection from weather and security, they are one of the most desirable means for aircraft storage at any airport. Most of the hangar space at FIN is used for based aircraft, with occasional use by itinerant aircraft during maintenance or extended visits. In 2025 approximately 94 percent of the based aircraft at FIN were stored in the various T-hangars and clearspan hangars on the north side of the airfield.

T-hangars are fully enclosed buildings which have individual t-shaped stalls, each capable of storing one aircraft (typically a single-engine or a light multi-engine aircraft) in a nested, back to back configuration. Approximately 64 percent of the based aircraft at FIN were stored in T-hangars in 2025. Depending on the size, clearspan hangars are capable of holding one to multiple different aircraft and commonly have an attached office, shop, and/or storage space. The smaller clearspan hangars are sometimes referred to as private hangars while those which provide individual stalls or units are referred to as box or condo hangars. Regardless, clearspan hangars can accommodate multiple aircraft types while also serving to provide maintenance or other aviation related services. For the purposes of this analysis, clearspan hangars represent any hangar, other than T-hangars, expected to be used by based aircraft.

Given the harsh sun and rain in Florida, most aircraft owners prefer hangar space when available. As such, it is expected that at least 90 percent of the based aircraft will be stored in hangars over the planning period; presuming new hangars will be constructed. This assumption is supported by the current occupancy rate, active hangar wait list, the frequent requests the Airport receives for hangar space, and the fact there is very little hangar space available at other airports in the region. When these assumptions are considered, a minimum of 29 additional T-hangar units and a mix of both small and large clearspan hangars to accommodate at least 27 additional based aircraft will be required.

While some of the clearspan hangar space would be used for smaller aircraft, most will accommodate the larger multi-engine and jet aircraft, as well as rotorcraft. The existing and future based aircraft storage expected are summarized in **Table 4.7-2**. It should be noted that the figures include those aircraft currently leasing hangar space at FIN, which is greater than the numbers included in the FAA's National Based Aircraft Inventory Program; the difference being the FAA does not count the numerous seasonal aircraft that lease hangar space year round at FIN.

TABLE 4.7-2
EXISTING AND FUTURE BASED AIRCRAFT STORAGE FACILITIES

	T-HANGARS	CLEARSPAN HANGARS	AIRCRAFT PARKING APRON	TOTAL BASED AIRCRAFT
2025	98	37	9	144
2046	127	64	21	212
Additional Aircraft Expected to Use	**29**	**27**	**12**	-

Note: Includes seasonal aircraft leasing space at FIN, but not in the National Based Aircraft Inventory Program.

Source: ESA analysis 2026.

4.7.3 Aircraft Parking Aprons

The three main aircraft parking aprons located along the Taxiway A flightline provide a combined 23,425 square yards (SY) of paved area for both based and itinerant aircraft. Combined these areas were reported in the 2024 FDOT pavement report with PCIs ranging from 85 (satisfactory) to 100 (good). The pavement report also projected these areas to have PCIs ranging from 75 (satisfactory) to 87 (good) by 2029. As such, these areas will need to be rehabilitated in the second half of the 20-year planning horizon.

For planning purposes, the based and itinerant aircraft parking area requirements are calculated separately since they can have slightly different characteristics. Aprons for small aircraft are typically designed for ADG I size aircraft with tie-down capability. Large aircraft apron space includes the area necessary to park ADG II multi-engine and jet aircraft, as well as rotorcraft and the occasional larger ADG III aircraft. The methods used

to estimate the minimum apron space required for based and itinerant aircraft parking are provided in the following sections.

Based Aircraft Parking Area

Approximately 6 percent of the based aircraft were parked on aprons in 2025 consisting primarily of single-engine aircraft. Minimum areas of 330 to 630 square yards (SY) for the small to larger aircraft were applied to the mix of based aircraft currently parked on an apron. Then, following accepted planning criteria, this value was increased ten percent. The result is a minimum apron space of 2,000 SY for based aircraft in 2025.

As stated in the previous section, it is assumed that 90 percent of the based aircraft demand will be met through the use of hangar facilities by the end of the planning period. It was also presumed that the remaining based aircraft stored outside will continue to predominantly be single-engine aircraft. Therefore, using the same methodology described above, approximately 5,800 SY of apron space will be required for based aircraft by 2046.

Itinerant Aircraft Parking Area

Itinerant apron space is intended for relatively short-term parking, usually less than 24 hours. For planning purposes, a preferred approach is to calculate the total number of peak day itinerant general aviation aircraft that can be expected on the apron during the average day. This was performed by using the peak activity projections, local versus itinerant splits, and operational fleet mix figures from the approved aviation activity forecasts.

Based on typical space and maneuvering requirements, a minimum area of 400 SY was applied per itinerant single-engine aircraft; 760 SY for itinerant multi-engine and rotorcraft; and 1,860 SY for itinerant jets. Overall, this methodology is considered conservative, given that the space allocation per aircraft only includes a minimal area for the associated apron movement areas. When calculated, this results in 17,400 SY of itinerant apron space needed in 2025 and 35,900 SY by 2046.

Aircraft Parking Apron Requirements

Table 4.7-3 summarizes the aircraft parking apron requirements and then compares them to the apron space available in 2025 for both based and itinerant aircraft. As noted previously, this does not include the various aprons in front of the clearspan hangars, rather only the space of the three main aprons located along the Taxiway A flightline.

Although existing facilities provide a modest apron surplus of approximately 4,025 SY under current conditions, forecast growth in transient and based aircraft activity is expected to consume this available capacity, resulting in the need for additional apron space over the 20-year planning period. Any planned apron expansion should be closely coordinated with future rehabilitation efforts. Combining these projects into a single

construction phase can reduce overall costs, minimize operational disruptions, and avoid the need to reconstruct or modify newly rehabilitated pavement.

TABLE 4.7-3
AIRCRAFT PARKING APRON REQUIREMENTS

	2025	2046
Recommended Area for Based Aircraft (subtotal)	2,000 SY	5,800 SY
Minimum Area Required for Itinerant Aircraft (subtotal)	17,400 SY	35,900 SY
Combined Apron Space Requirements		
Area Required for Based and Itinerant Aircraft	19,400 SY	41,700 SY
Available General Aviation Terminal Apron Space	23,425 SY	23,425 SY
Surplus (+) / Deficit (-)	4,025 SY	-18,275 SY

SY = Square Yards

Source: ESA analysis 2026.

4.8 Heliport and Vertiport Facilities

The following sections address both existing and future facilities related to the operation of rotorcraft and the advanced air mobility (AAM) aircraft currently under development, specifically the electric vertical takeoff and landing (eVTOL) aircraft. While eVTOLs can operate to and from airport runways, operators have expressed a desire for dedicated vertiport facilities at airports.

4.8.1 Existing Facilities

Currently there is a private heliport established on the apron in front of the 4,200 SF clearspan hangar located just east of the T-hangar buildings on the north side of Taxiway A. This facility was not included in the airfield inventory, because as noted in the FAA publications, it is not available except by Flagler County emergency services. This heliport has not been used for a number of years and the markings associated with its takeoff and landing area surfaces have faded. It is recommended that the Airport or Flagler County emergency services request that the FAA and FDOT decommission this heliport so that it can be removed from their systems and the aeronautical publications.

Additionally, there is a small painted “H” located on Taxiway B, between Taxiways A1 and D, which is used for rotorcraft parking since this section of the taxiway is typically closed to fixed-wing aircraft movements. However, it should be noted that this is not an established heliport as it is not registered with FAA or FDOT, nor should it be in the future since it lies within 100 feet of the edge of the segmented circle collocated with the primary wind cone.

4.8.2 Future Facilities

A designated public heliport should be established on the airfield so rotorcraft operators can safely operate to and from a dedicated takeoff and landing area before hover taxiing to a parking area. FAA AC 150/5390-2D, *Heliport Design* provides the requirements for heliports and for FIN the Airbus AS350B was the largest helicopter conducting the 905 operations recorded in 2025. With a controlling dimension of 42.5 feet, the Airbus AS350B would not be as critical with respect to the dimensions of a dedicated heliport/vertiport takeoff and landing area for the eVTOL aircraft currently under development.

FAA Engineering Brief (EB) 105A, *Vertiport Design, Supplemental Guidance to FAA AC 150/5390-2D, Heliport Design* was released on December 27, 2024. This document provides the current standards and guidance for the development of vertiports to support eVTOL operations. Since various eVTOL aircraft continue to work toward certification, the FAA utilized the design and performance characteristics of three aircraft in development for a Reference Aircraft to create the vertiport requirements in EB 105A. The controlling dimension of the Reference Aircraft is 50 feet.

Takeoff and Landing Area Requirements

EB 105A identifies vertiports as a type of heliport, serving aircraft with three or more propulsive units (whereas the FAA's heliport criteria are based on single, tandem, or dual rotor aircraft). As such, the Reference Aircraft in EB 105A has been applied to determine the requirements for establishing a heliport/vertiport at the Airport, which include the following:

Touchdown and Lift-off Area (TLOF) = 50 feet (1 times the rotor diameter of the critical eVTOL aircraft). In this case the EB 105A Reference Aircraft has an overall controlling dimension of 50 feet, which is utilized as the rotor diameter until a specific critical eVTOL aircraft is identified. The entire TLOF should be load bearing and paved for the design aircraft. Portland Cement Concrete (PCC) is recommended for ground level facilities as asphalt surfaces are less desirable given, they may rut under the skids or wheels of a parked eVTOL. The TLOF can be square, circular, or even rectangular; however, a square is considered the preferred with respect to the visual acuity it provides for judging aircraft closure rates, altitude, attitudes, and approach angles.

Final Approach and Takeoff Area (FATO) = 100 feet (2 times rotor diameter of the critical eVTOL aircraft). The area between the TLOF and FATO should be capable of supporting the static loads of the design eVTOL aircraft. At this time the Reference Aircraft in EB 105A is limited to a maximum takeoff weight (MTOW) of 12,500 pounds or less. Regardless, if the FATO is load bearing, the portion abutting the TLOF should be continuous with the TLOF, and the adjoining edges should be at the same elevation. If it is unpaved, the FATO should be prepared to prevent loose stones and any other flying debris caused by rotor or propeller downwash and outwash.

Safety Area = 125 feet (2.5 times the controlling dimension of the critical eVTOL aircraft). The Safety Area needs to be clear of all objects except any frangible objects that must be located within due to their function. The Safety Area does not need to be load bearing and in fact, can extend over water (such as a drainage area). If at ground level, the Safety Area should be prepared to prevent loose stones and any other flying debris caused by rotor or propellor downwash and outwash.

Downwash/Outwash Caution Area (DCA) - Defined as any area around the vertiport, its taxiways and/or taxilanes, and parking positions that would be subject to wind velocities greater than or equal to 34.5 miles per hour (mph). The DCA is an operational boundary that during eVTOL operations protects people from the hazards of wind velocities equal to or greater than 34.5 mph. The size of the DCA will vary depending on the size and/or configuration of the operating eVTOL aircraft. As such, the largest eVTOL using a facility should be considered when establishing DCA limits. Additionally, the features and elements required within the DCA should be developed such that they will not be damaged by downwash and outwash or create other hazards such as flying debris.

VFR Approach/Departure and Transitional Surfaces - At least one VFR Approach/Departure Surface must be established to the vertiport. The surface starts at the edge of the FATO and slopes out and upward at an 8:1 ratio for a distance of 4,000 feet horizontal. At the outer limit, the surface is at a height of 500 feet above the established elevation of the TLOF and has a width of 500 feet.

Transitional surfaces also extend out from the edges of the FATO for a distance of 250 feet to each side of the FATO from the approach/departure surface centerline. The side transitional surfaces slope out and upward at a 2:1 ratio and are not applied to the FATO edge opposite of the approach/departure path.

Protection Zone - While not specified in EB 105A, it is fully anticipated that the next version or the eventual FAA AC including vertiport standards will also include a protection zone. The current guidance for protection zones in FAA AC 150/5390-2D, *Heliport Design* includes one for each established approach/departure surface. The surface starts at the FATO and extends out 280 feet beneath the 8:1 approach/departure surface. The size and shape of the protection zone matches the approach/departure surface but has no set elevation.

Offsets from Runway Centerlines - For on-airport facilities, EB 105A has established minimum distances from the vertiport centerline to runway centerline for simultaneous, same direction VFR operations. For both runways at FIN this offset is 500 feet.

Marking, Lighting, and Visual Aids - The public vertiport should have a white “H” marking in the center of the TLOF, oriented in the direction of the preferred approach/departure path. The standard height of the “H” is 10 feet and the width 6 feet, 8 inches. A one 1 foot wide bar should be placed 2 feet below the “H” when it is necessary to distinguish a preferred approach/departure path. The letters “VTL” should also be placed above and to the left of the “H” at a preferred height of 5 feet. Additional markings may be added to the

TLOF area to indicate size or weight limitations. The TLOF itself is marked with a solid white line around its perimeter, while a dashed white line outlines the FATO. Other optional markings may be included such as a yellow circle around the “H” marking (to designate a touchdown/positioning area) or flight path alignment markings.

At least one orange wind cone should be located within 500 feet horizontal of the TLOF. More than one wind cone may be required if a single location cannot be seen by pilots when either on the TLOF or within 500 feet of the TLOF when on the approach path.

For night operations the perimeter of the TLOF and FATO perimeters need to include elevated or flush mounted (preferred) green omnidirectional lights. The number and location of the lights depend on the shape of the TLOF and FATO surfaces as well as the type of lighting used. The wind cone should also be lighted internally or externally, while other optional lighting includes approach lighting and floodlighting to assist in the visual identification of the vertiport.

Supporting Infrastructure

There are a number of additional facilities required to support the operation of eVTOL aircraft at a vertiport. It should be noted that the number and size of these facilities will vary depending on the ultimate tempo of operations expected. Therefore, the ability to expand the initial facilities should be considered when siting a vertiport and its associated facilities.

Taxiways/Taxilanes – Much like a runway, designated taxiways and/or taxilanes are needed at a vertiport for the ground movement of eVTOLs between the takeoff and landing area(s) and the aircraft parking areas. As noted previously, the downwash and outwash will occur wherever an eVTOL is operating, including if taxiing in or out of a parking area.

eVTOL Parking Areas – In order to accommodate more than one operation at a time, an eVTOL parking area is needed; otherwise, the aircraft will have to occupy the takeoff and landing area while loading, unloading, or charging. The number of parking areas required will depend on the tempo of operations expected during peak activity periods. Considerations also need to be given to accommodate hovering or air taxiing into and out of the position, especially as it relates to the downwash and outwash created and its potential impacts on adjacent elements such as ground support equipment, ground vehicle movement areas, and passenger walkways.

Charging Systems - Even though there are other emerging energy technologies such as hybrid or hydrogen powered aircraft for AAM, the need for adequate electrical charging systems and capacity is both an essential and critical element of AAM capability. Currently there is no single charging standard for eVTOL aircraft, but most original equipment manufacturers intend to use the combined charging standard, the same charging standard widely used for electric vehicles today, and the standard endorsed by the General Aviation Manufacturers Association. The current chargers in production today can provide power

up to 350 kilowatts (kW); however, if two 350 kW chargers are used concurrently, it will require 700 kW of power or over a megawatt for three.

These charging capabilities will increase as battery and charging technologies evolve. According to the National Renewable Energy Laboratory, aircraft electrification could include 820 kilowatt-hour (kWh) batteries, which would require megawatt level charging to recharge in less than 30 minutes. As such, the megawatt charging system is in development and will allow for faster charging speeds but require more power. In addition, other methods to recharge an eVTOL may also be employed at a vertiport such as mobile charging systems or even changing out the eVTOL batteries during ground service operations. Therefore, additional space may be required to support the charging infrastructure ultimately utilized for the vertiport, which at a minimum is assumed to include a dedicated charging station for each eVTOL parking position.

Due to the high energy demand and turnaround times desired for eVTOL aircraft charging, it is critical to engage the local electric utility provider as early as possible. At a minimum, they would need to know the preliminary plans for where the chargers would be installed, the number of chargers, and the load that would be created. The local provider would then be able to assist in evaluating the options for locating any future chargers at Airport. Once an accurate plan is in place, the local provider would then be able to develop the additional infrastructure necessary. Another option is to consider on-site power generation and/or storage to ease demand, especially during peak periods.

Fire Protection – Another very critical consideration for any vertiport facility is the ability to provide the appropriate fire safety systems. The current eVTOLs under development use lithium-ion batteries, which like electric vehicles present unique challenges for firefighting when compared to traditional fuels. For this reason Flagler County Fire and Rescue needs to be included in any discussions about vertiport locations and the issues associated with fighting lithium-ion battery fires. Issues to consider include the toxic gases released during lithium-ion battery fires; the need to retain the water or foam used to fight the fire; the difficulty in cooling the higher temperatures of the fire due to thermal release from the battery; and the current tactics employed for lithium-ion fires. National Fire Protection Association (NFPA) 418: *Standard for Heliports* was revised in 2024 to include considerations for vertiports and should be referenced.

There are a number of other supporting facilities that need to be considered when developing a vertiport, which are difficult to estimate when the tempo of operations or potential passenger/cargo activity is not known. For example, there may be the need for a passenger terminal or warehousing facility and the associated automobile parking and landside access. Additionally other equipment or services may be required for weather reporting, communications, and data requirements, the latter of which would be critical in the future as the AAM industry looks towards more autonomous aircraft operations. The alternatives chapter will evaluate the most suitable location to consider establishing a heliport/vertiport facility.

4.9 Seaplane Facilities

As documented, the current seaplane facilities are limited to a small dock and ramp located on the eastern shore of Gore Lake. There is no airside or landside connection with these facilities and both are currently in a state of disrepair due to damage from Hurricane Milton. While short-term repairs to these facilities are expected, longer term plans need to look at other options. Previously it was noted that the current facilities would be encompassed by the future RPZ off the approach end of Runway 6. Current FAA criteria does not allow new public facilities to be constructed within a RPZ. Therefore, the alternatives chapter will explore options to relocate and improve the current seaplane facilities, to include the potential of providing a link to the other airfield facilities.

4.10 Support and Service Facilities

Key facilities to support the airport activity were described in the existing conditions chapter. Any improvements needed for these over the course of the 20-year planning horizon are identified in the following sections.

4.10.1 Airfield Electrical Vault

For the current runway and taxiway system, the existing airfield electrical vault is considered to be of adequate size and in relatively good condition, including the equipment to control the lighting and airfield systems. Constructed in 2022, the current vault has significant expansion capability which would easily accommodate any new equipment required, specifically as it relates to the future parallel runway electrical systems.

4.10.2 Maintenance Facilities

As noted in the inventory, all of the Airport's maintenance equipment is currently stored in three T-hangar end units and a small metal shed. A new maintenance building is needed in the short-term planning horizon. The size of the facility will depend on the ultimate needs to accommodate the existing and expected maintenance equipment, as well as to provide space for service bays, offices, work benches, storage, and restrooms. The alternatives chapter will evaluate different locations to site a facility that could provide at least 5,000 SF of building space as well as additional covered and outdoor storage areas.

4.10.3 Aviation Fuel Supply

The current aviation fuel supply is via two 12,000 gallon tanks (one 100LL Avgas and one Jet A), as well as the self-serve 100LL Avgas facility are scheduled to be replaced. During the development of this master plan, a project to design a new fuel storage and self-serve area was underway with construction expected simultaneous with the completion of this study. The new fuel storage and self-serve area will be located at the west ends of Taxiways A and B and adjacent to Taxiway F. Two new 20,000 gallon Jet A and one

10,000 gallon 100LL above ground tanks will be installed with a self-serve facility for the 100LL.

4.11 Land Acquisition

Whenever possible, the option to acquire additional property for aviation related development and to ensure future land use compatibility must be considered. Even though there are options to develop the current property, the potential for non-compatible development around the Airport will always exist. In short, as development pressure builds in the areas surrounding the airfield, the ability for airport management to acquire any additional land diminishes. For these reasons, consideration must be given to the identification of a future property envelope that the Airport should secure to address demand and development needs beyond the master planning horizon.

As a new parallel runway is needed for capacity, land acquisition may be required which will be evaluated in the alternatives.

4.12 Summary of Facility Requirements

Table 4.12-1 provides a general summary of the facility requirements that were determined necessary to satisfy the approved aviation demand forecasts. Essentially, this table includes the minimum improvements required over the 20-year planning period. Some additional facilities will also be planned and included as part of the final ALP drawing set and Capital Improvement Program to maximize the flexibility of the Airport and the ability to respond to future opportunities. The order in which these improvements are listed does not have any relation to the priority or phasing of such projects.

TABLE 4.12-1
20-YEAR FACILITY REQUIREMENTS

Category	Proposed Improvements
Runways	Construct parallel runway for capacity
	Extend Runway 6-24 to 5,400 feet
	Rehabilitate Runways 11-29 and 6-24
Taxiways	Rehabilitate Taxiway B
	Rehabilitate intersections of Taxiways C and D with Runway 6-24
	Re-align Taxiway E with Runway 6
	Rehabilitate Taxiway E north of Taxiway A
	Extend Taxiway H
	Rehabilitate T-hangar taxilanes
	Construct additional exit taxiways for Runways 24 and 11-29
	Reconfigure run-up areas for Runway 6-24
	Construct taxiway system with run-up areas for new parallel runway
	Construct taxiway or taxilane access to new facilities
Airfield	Replace MIRLs on Runway 11-29 and 6-24
	Install LED MITLs on Taxiway B
	Replace MITLs on all taxiways
	Replace incandescent airfield signage with LED fixtures
	Install distance remaining signs for Runways 11-29 and 6-24
	Periodic remarking of all airfield pavements
	Replacement of REILs and PAPIs on Runways 11-29 and 6-24
	Install PAPIs, REILs, and supplemental wind cone(s) on new parallel runway
	Construct compass calibration pad
Airport Facilities	Additional General Aviation Terminal space (4,000 SF)
	T-hangar facilities (29 additional units)
	Clearspan hangars (to accommodate 27 additional aircraft)
	Additional aircraft parking apron space (minimum 18,275 SY)
	Rehabilitate aircraft parking aprons
	Establish a heliport/vertiport and supporting facilities
	Improve facilities for seaplane operations
	Construct an airport maintenance facility

Source: ESA, 2026.

APPENDIX A

Correspondence and Outreach

AIRPORT MASTER PLAN UPDATE WORKING GROUP AGENDA

THURSDAY | OCTOBER 2, 2025 | 3:00 PM

TOURISM DEVELOPMENT CONFERENCE ROOM | 120 AIRPORT ROAD, SUITE 3 | PALM COAST, FL 32164

1. **Call to Order**

2. **Pledge to the Flag & Moment of Silence**

3. **Consent Agenda**
   a. Meeting Minutes – None

4. **Presentations & Updates**
   a. Flagler Executive Airport Overview | Roy Sieger, Airport Director
   b. Airport Master Plan Key Elements and Process | Doug DiCarlo, Project Manager
   c. Airport Master Plan Update Working Group Roles & Responsibilities | Roy Sieger, Airport Director

5. **General Business**
   a. Election of Chairperson and Vice-Chairperson
      i. Chairperson
      ii. Vice-Chairperson
   b. Discussion of Meeting Schedule and Time
   c. Discussion of Other Requirements for Future Business
      i. Public Notice of Meetings
      ii. Meeting Minutes

6. **Community Outreach:** Thirty-minute time period allocated at the end of the meeting for public comment. Each speaker will be allowed up to three minutes to address the Working Group on items not on the agenda.

7. **Working Group Member Comments**

8. **Adjournment**

Please take note that individual Commissioners of the Board of County Commissioners may attend this meeting. The Commissioners who attend, will not take any action, or take any vote at this meeting.

This is not an official meeting of the Board of County Commissioners of Flagler County. This notice is being provided to meet the spirit of the Sunshine Law to inform the public that commissioners may be present at these discussions. In accordance with the Americans with Disabilities Act, persons needing assistance to participate in this meeting should contact the number listed above at least 48 hours prior to the meeting.

Flagler Executive Airport
Airport Master Plan Update Working Group Kick-off Meeting

October 2, 2025

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Roy Sieger	Airport Director	(386) 313-4220	rsieger@flaglercounty.gov
Doug DiCarlo	MP Team	(813) 207-7215	ddicarlo@esassoc.com

AIRPORT MASTER PLAN UPDATE WORKING GROUP AGENDA

TUESDAY | DECEMBER 16, 2025 | 3:00 PM

TOURISM DEVELOPMENT CONFERENCE ROOM | 120 AIRPORT ROAD, SUITE 3 | PALM COAST, FL 32164

1. **Call to Order**

2. **Pledge to the Flag & Moment of Silence**

3. **Consent Agenda:** Request the Board accept the following:
    a. Meeting Minutes
        i. October 2, 2025, Regular Meeting

4. **Presentations & Updates**
    a. Sunshine Law | Sean S. Moylan, Deputy County Attorney
    b. Airport Project Updates | Roy Sieger, Airport Director

5. **General Business**
    a. Discussion of Meeting Schedule and Time

6. **Community Outreach:** Thirty-minute time period allocated at the end of the meeting for public comment. Each speaker will be allowed up to three minutes to address the Working Group on items not on the agenda.

7. **Working Group Member Comments**

8. **Adjournment**

Please take note that individual Commissioners of the Board of County Commissioners may attend this meeting. The Commissioners who attend, will not take any action, or take any vote at this meeting.

This is not an official meeting of the Board of County Commissioners of Flagler County. This notice is being provided to meet the spirit of the Sunshine Law to inform the public that commissioners may be present at these discussions. In accordance with the Americans with Disabilities Act, persons needing assistance to participate in this meeting should contact the number listed above at least 48 hours prior to the meeting.

FLAGLER EXECUTIVE AIRPORT
FIN

Flagler Executive Airport
Airport Master Plan Update Working Group Kick-off Meeting

December 16, 2025

Name	Representing	Phone Number	E-Mail Address
William LYON	AIRPORT MSTR PLAN WORK GROUP	386-283-2803	blyon@PCREFLA.COM
Don Turlington	" "	386-283-4604	dturlington48@gmail.com
Charles Rowsell	" "	510-303-0640	LKRAMB12020@HOTMAIL.COM
Richard Klumpp	" "	703-559-2814	rich@theklumpfamily.net
Les Aben	N/A	386-264-8318	lesaben@sbcglobal.net
Sean Moylan	County Atty	386-313-4056	smoylan@flaglercounty.gov
Ralph S Bruner	Teens in Flight	386-804-3236	ralph.bruner@teensinflight.org
Dave Faust	citizen	386-586-8397	[redacted]davefaust46@gmail
Colleen Conklin	~~EDC~~ Work Group	386-569-9323	walshcoc@erau.edu
Kim M. Carney	BOCC	386-846-5493	Kcarney@flaglercounty.gov
Anna Jones	Citizen	702 882-5914	Annaj9365@gmail.com
Bruce BARKER	Airport Planning Bd	617 480 7433	Bruce.BARKER@ITMGTGRP.com
Ray Ricchi	AMPWG	214.704.8609	rricchi@rayricchi.com

AIRPORT MASTER PLAN UPDATE WORKING GROUP AGENDA

TUESDAY | APRIL 7, 2026 | 3:00 PM

TOURISM DEVELOPMENT CONFERENCE ROOM | 120 AIRPORT ROAD, SUITE 3 | PALM COAST, FL 32164

1. **Call to Order**

2. **Pledge to the Flag & Moment of Silence**

3. **Consent Agenda:** Request the Board accept the following:
    a. Meeting Minutes
        i. December 16, 2025, Regular Meeting

4. **Presentations & Updates**
    a. Airport Master Plan Working Paper No. 1 | Doug DiCarlo, Project Manager
    b. Airport Project Updates | Roy Sieger, Airport Director

5. **General Business**
    a. None

6. **Community Outreach:** Thirty-minute time period allocated at the end of the meeting for public comment. Each speaker will be allowed up to three minutes to address the Working Group on items not on the agenda.

7. **Working Group Member Comments**

8. **Adjournment**

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Flagler Executive Airport
Airport Master Plan Update Working Group Meeting

April 7, 2026

Name	Representing	Phone Number	E-Mail Address
Douglas DiCarlo	ESA Airports	(727) 208-7326	ddicarlo@esassoc.com
Dave Faust	Self		davefaust76@gmail.com
Bruce Parker	Self	617 480 7433	BRUCE.PARKER@ITMGTGRP.com
Colleen Conklin	Self	386-569-9323	Conklin4Kids@gmail.com
Bill Lyon	Self	386-283-2803	blyon@pcrefla.com
Don Turlington	Self	386-283-4604	dturlington48@gmail.com
Ray Ricchi	Self	214-704-8609	rricchi@rayricchi.com
CD Rowsell	Self	5103030640	LHRAMBI2020@HOTMAIL.COM
Ray Sieger	Flagler Exec Airport	386.931.0064	rsieger@flaglercounty.gov

U.S. Department
of Transportation
**Federal Aviation
Administration**

ORLANDO AIRPORTS DISTRICT OFFICE
8427 SouthPark Circle, Suite 524
Orlando, Florida 32819
Phone: (407) 487-7220 Fax: (407) 487-7135

July 15, 2026

Mr. Roy Sieger
Airport Director
Flagler Executive Airport
201 Airport Road
Palm Coast, FL 32164

RE: Flagler Executive Airport (FIN)
Aviation Activity Forecast Approval

The Federal Aviation Administration (FAA) has reviewed the aviation forecast for FIN dated May 8, 2026 (attached). The FAA approves these forecasts for airport planning purposes and its use in advanced planning efforts only. Our approval is based on the forecasts being supported by reasonable planning assumptions and current data as well as being developed using acceptable forecasting methodologies.

The existing critical aircraft for the primary Runway 11/29 is determined to be RDC B-II. (Falcon 900) The future critical aircraft for Runway 11/29 is expected to be RDC D-II. (Gulfstream G-450) The existing critical aircraft for the crosswind Runway 6/24 is determined to be RDC B-II. (Falcon 900) The future critical aircraft is expected to be RDC C-II. (Bombardier Challenger 300)

The approval of the forecast does not automatically constitute a commitment on the part of the United States to participate in any development recommended in advanced planning efforts, a Master Plan Update or shown on the Airport Layout Plan. Justification for future projects will be made based on activity levels at the time the project is requested for development, in accordance with criteria in FAA Orders 5090.5 and 5100.38. Documentation of actual activity levels meeting planning activity levels will be necessary to justify AIP funding for eligible projects. Further, the approved forecast may be subject to additional analyses if the fundamental rationale of the forecast or the critical aircraft changes materially.

If you have any questions, please feel free to contact me at (407) 487-7234.

Sincerely,

Jenny Iglesias-Hamann, ACE
Community Planner

Attachment

APPENDIX B

Runway Exit Design Interactive Model (REDIM) Analysis

APPENDIX B
Runway Exit Design Interactive Model (REDIM) Analysis

B.1 REDIM Inputs

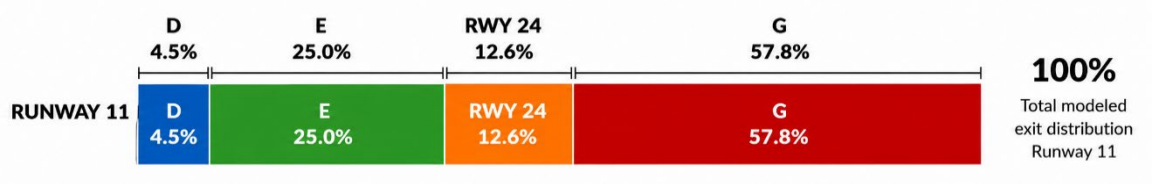
Both runways were analyzed in REDIM using Virtower operations data from 2025. The fleet utilized for Runways 11-29 and 6-24 included a representative mix of general aviation aircraft, small turboprop, and jet aircraft from the REDIM model library.

The software allows airport-specific inputs such as temperature, airport elevation, location and geometry of existing taxiway exits, and aircraft fleet mix. The model analyzes exit placement based on the point at which an aircraft begins the turn onto the exit taxiway, requiring exits to be assessed separately for each runway direction because locations are not always equidistant from the runway thresholds.

B.1.1 Runway 11 Arrivals

When arriving on Runway 11, numerous exit locations are available on the north side of the runway for access to the Taxiway A flightline using both 90 degree and 45 degree connections (Taxiways D, E, Runway 24, and Taxiway G). Two additional exit locations on the south side of Runway 11-29 serve as connectors and access to the Runway 6 threshold. The runway exit assignment analysis in **Figure B-1** indicated that 57.8 percent of arriving aircraft are projected to exit at Taxiway G, compared to 25.0 percent at Taxiway E, 12.6 percent at the Runway 24 turnoff, and 4.5 percent at Taxiway D.

Figure B-1 Runway 11 REDIM Results: Tiered Runway Exit Utilization



Source: ESA Analysis 2026.

Runway 11 exhibits an average runway occupancy time of 54.2 seconds and has relatively long and variable runway occupancy times due to differences in aircraft performance and runway exit utilization per **Table B-1**. REDIM analysis identified that aircraft exiting at Taxiway G experience the longest occupancy times, ranging from approximately 51 to 92 seconds depending on aircraft type.

Table B-1 Runway 11 Runway Occupancy Time

CONDITIONS	EXITS	EXISTING	FUTURE
ALL	RIGHT		
	LEFT	54.2	50.5
WET	RIGHT		
	LEFT	58.7	55.2
DRY	RIGHT		
	LEFT	53.7	50

The REDIM analysis indicates that, based on the representative fleet mix and aircraft performance characteristics, the largest share of modeled Runway 11 arrivals continue to Taxiway G at the runway end. This modeled exit distribution contributes to higher runway occupancy times for aircraft requiring the additional rollout distance. While many piston-engine aircraft, including the Cessna 172, are modeled to vacate the runway at Taxiway E or, in some cases, Taxiway D, approximately 86 percent of the modeled jet fleet, when weighted by the aircraft mix used in REDIM, continues to the end of the runway and exits on Taxiway G..

When modeling a proposed 90 degree exit in REDIM between the Runway 24 turnoff and Taxiway G, the exit assignment analysis indicates that more than half of Falcon 900 arrivals and a significant portion of Gulfstream IV and Citation Sovereign 680 arrivals would shift from Taxiway G to the proposed exit per **Table B-2**. As a result, Taxiway G usage would decrease from 87.8 percent to 34.8 percent for the Falcon 900, 94.8 percent to 43.5 percent for the Gulfstream IV, and 60.5 percent to 14.9 percent for the Citation Sovereign 680. This shift would reduce runway occupancy times by approximately 5 to 6 seconds per arrival for these aircraft types.

Table B-2 Runway 11 Exit Usage Utilization by Business Jet Type

Aircraft Type	Existing TWY G	Proposed New Exit 1	Proposed TWY G
Citation Sovereign 680	60.5%	45.7%	14.9%
Falcon 900	87.8%	53.0%	34.8%
Gulfstream IV	94.8%	51.3%	43.5%

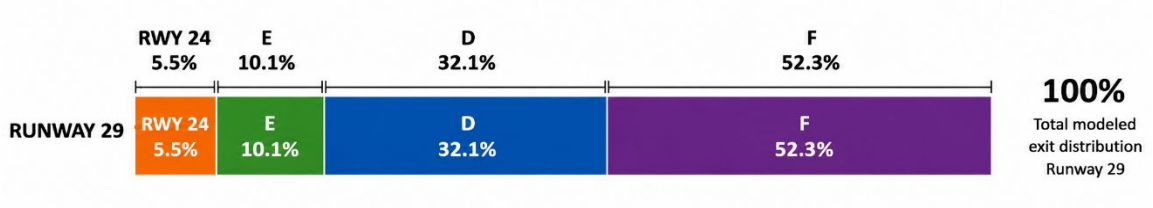
Although the per aircraft time savings are modest, turbine aircraft comprise more than half of the airport's fleet mix and account for most arrivals currently using Taxiway G. By providing an additional exit opportunity before the runway end, the proposed exit would reduce runway occupancy times, decrease reliance on Taxiway G, improve runway throughput and operational efficiency, and help accommodate future traffic growth while mitigating potential capacity constraints.

B.1.2 Runway 29 Arrivals

When arriving on Runway 29, aircraft primarily use Taxiways E, D, and F on the north side of the runway. Per **Figure B-2**, the runway exit assignment analysis indicates that 52.3 percent of arrivals exit at Taxiway F (which is at the end of the runway), followed by

Taxiway D (32.1 percent), Taxiway E (10.1 percent), and the Runway 24 turnoff (5.5 percent).

Figure B-2 Runway 29 REDIM Results: Tiered Runway Exit Utilization



Source: ESA Analysis 2026.

The REDIM analysis indicates that smaller piston aircraft are more likely to utilize Taxiway D as an earlier runway exit based on their landing performance characteristics. Under the representative fleet mix and modeled conditions, Taxiway D accounts for 46.7 percent of Cessna 172 arrivals, 62.6 percent of Diamond DA42 arrivals, and 45.3 percent of Piper PA-28 arrivals. These results demonstrate that Taxiway D provides a viable earlier exit opportunity for a substantial portion of the modeled piston fleet, while aircraft requiring additional rollout distance continue to downstream exits.

As identified by **Table B-3**, Runway 29 arrivals exhibit an average runway occupancy time of 53.7 seconds. Based on the modeled aircraft mix, business jet arrivals show strong reliance on Taxiway F, the runway-end exit, and experience runway occupancy times ranging from approximately 53 to 57 seconds. As a result, turbine aircraft have the greatest influence on Runway 29 occupancy and arrival throughput.

Table B-3 Runway 29 Runway Occupancy Time

CONDITIONS	EXITS	EXISTING	FUTURE
ALL	RIGHT	53.7	50.6
	LEFT		
WET	RIGHT	58.5	55.6
	LEFT		
DRY	RIGHT	53.2	50.1
	LEFT		

When modeling a proposed 90-degree exit in REDIM between Taxiway D and Taxiway F, the exit assignment analysis indicates that approximately 46 percent of Falcon 900 arrivals, 46 percent of Gulfstream IV arrivals, and 35 percent of Citation Sovereign 680 arrivals would shift from Taxiway F to the proposed exit per **Table B-4**. As a result, Taxiway F usage would decrease from 80.5 percent to 35.0 percent for the Falcon 900, 89.6 percent to 44.0 percent for the Gulfstream IV, and 50.1 percent to 14.8 percent for the Citation Sovereign 680. This shift would reduce runway occupancy times by approximately 6 to 10 seconds per arrival for these aircraft types and substantially reduce reliance on the runway-end exit.

Table B-4 Runway 29 Exit Utilization by Business Jet Type

Aircraft Type	Existing TWY D	Existing TWY F	Proposed TWY D	Proposed New Exit 1	Proposed TWY F
Citation Sovereign 680	49.6%	50.1%	49.6%	35.3%	14.8%
Falcon 900	19.5%	80.5%	19.4%	45.6%	35.0%
Gulfstream IV	10.4%	89.6%	10.4%	45.5%	44.0%

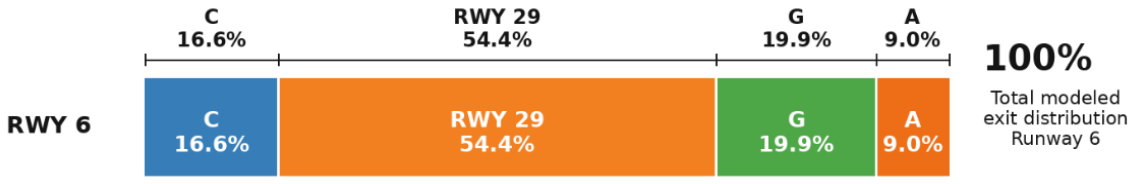
While the proposed Runway 11 exit would likely provide a greater overall airport benefit due to the higher volume of operations using Runway 11, the proposed Runway 29 exit would provide a greater benefit on a per-operation basis. Under existing conditions, the modeled business jet fleet shows a strong concentration of arrivals using Taxiway F, the runway-end exit, resulting in longer runway occupancy times for the aircraft types that dominate the airport's turbine fleet. The proposed exit would capture a substantial portion of these arrivals before they reach Taxiway F, reducing reliance on the runway-end exit and improving runway availability.

Conversely, the proposed Runway 11 exit would benefit a larger number of total operations by reducing occupancy times across a broader range of aircraft. As a result, the Runway 11 and Runway 29 exit alternatives should be viewed as complementary capacity improvements that enhance airfield efficiency under different wind conditions and runway-use scenarios.

B.1.3 Runway 6 Arrivals

When arriving on Runway 6, numerous exit locations are available on the northwest side of the runway for access to the Taxiway A flightline using Taxiway C, Runway 29, Taxiway G, and Taxiway A. Per **Figure B-3**, modeled exit utilization is distributed among Taxiway C (16.6 percent), the Runway 29 intersection (54.4 percent), Taxiway G (19.9 percent), and Taxiway A (9.0 percent).

Figure B-3 Runway 6 REDIM Results: Tiered Runway Exit Utilization



Source: ESA Analysis 2026.

The REDIM analysis indicates per **Table B-5** an average runway occupancy time of 49.9 seconds.

Table B-5 Runway 6 Runway Occupancy Time

CONDITIONS	EXITS	EXISTING	FUTURE
ALL	RIGHT		
	LEFT	49.9	N/A
WET	RIGHT		
	LEFT	53.9	N/A
DRY	RIGHT		
	LEFT	49.5	N/A

The presence of Taxiway A at the end of Runway 6 provides an additional exit opportunity for aircraft requiring longer landing rolls; however, modeled use of the runway-end exit is relatively limited at approximately 9 percent. Approximately 91 percent of arrivals are modeled to vacate the runway before reaching Taxiway A, including 16.6 percent at Taxiway C, 54.4 percent at the Runway 29 intersection, and 19.9 percent at Taxiway G. This distribution indicates that the existing exit system provides a well-spaced series of runway-clearance opportunities for the modeled fleet and limits reliance on the runway-end exit.

Small piston aircraft such as Cessna 172s and Piper PA-28s, which represent the largest group of training aircraft conducting operations at FIN, exhibit the highest use of Taxiway C (43.4 percent) and the lowest use of Taxiway A (2.0 percent), reflecting their lower landing speeds and shorter landing distances.

The business jet fleet consisting of the Citation Sovereign 680, Challenger 300, Falcon 900, and, to a lesser extent, the Pilatus PC-12 turboprop exhibits different runway exit behavior than the piston aircraft. While most arrivals continue to exit at Runway 29, these aircraft show a greater tendency to utilize downstream exits such as Taxiway G and, less frequently, Taxiway A per **Table B-6**. This pattern is consistent with the higher approach speeds, landing weights, and landing roll distances associated with these aircraft types and contributes to longer runway occupancy times.

Table B-6 Runway 6 Exit Utilization by Business Jet Type

Aircraft Type	RWY 29	Taxiway G	Taxiway A
Citation Sovereign 680	71.8%	20.5%	7.3%
Challenger 300	62.2%	27.4%	10.4%
Falcon 900	42.9%	37.2%	19.9%

The Citation Sovereign 680 is the most likely of the three business jet types to exit at Runway 29, with nearly 72 percent of arrivals using that exit. However, over one quarter of the operations continue beyond Runway 29, illustrating that a significant portion of arrivals require additional rollout distance. The Citation Sovereign 680 appears capable of consistently utilizing Runway 29 while retaining

flexibility to use Taxiway G or A when landing weight, touchdown location, or braking conditions warrant.

The Challenger 300's exit profile indicates that Runway 29 is often achievable, but Taxiway G serves as an important operational exit. The aircraft regularly requires additional rollout distance compared with lighter jet categories. More than one third of arrivals continue beyond Runway 29 and more than 10 percent require Taxiway A at the runway end.

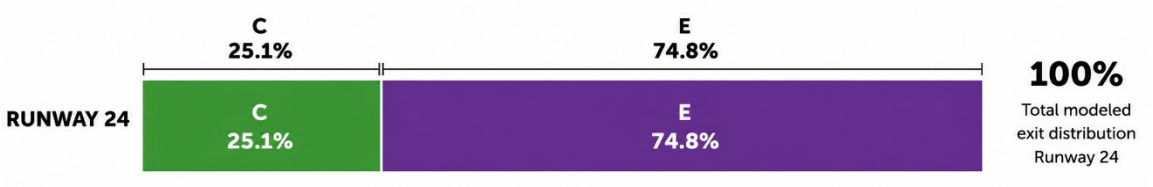
Among all aircraft modeled, the Falcon 900 demonstrates the highest use of the runway length and the greatest dependence on Taxiway A approximately 20 percent of the time. This behavior is consistent with a larger cabin-class jet operating at higher landing weights and approach speeds.

Given the relatively low average runway occupancy time of approximately 50 seconds and the balanced distribution of exit utilization, the existing exit configuration appears to be operating efficiently. Accordingly, the development of an additional runway exit is not supported by current operational demand and would likely be more appropriately considered as part of a long-term capacity enhancement strategy rather than a near-term operational requirement.

B.1.4 Runway 24 Arrivals

Unlike Runway 6, where arrivals are distributed among several exits, Runway 24 arrivals are modeled to almost exclusively utilize either Taxiway C or Taxiway E, which is located at the end of the runway per **Figure B-4**.

Figure B-4 Runway 24 REDIM Results: Tiered Runway Exit Utilization



Source: ESA Analysis 2026.

Approximately 74.8 percent of modeled arrivals utilize Taxiway E, while 25.1 percent utilize Taxiway C, with negligible use of other exits, as they are too close to the landing threshold. This distribution indicates that the majority of arriving aircraft require or prefer a rollout distance extending to the runway end before exiting. Aircraft-specific REDIM results indicate that use of Taxiway E results in approximately 29 seconds of additional runway occupancy time, on average, compared with Taxiway C.

As shown in **Table B-7**, the overall average runway occupancy time is 55.7 seconds, increasing to 59.2 seconds under wet conditions and measuring 55.3 seconds under dry conditions.

Table B-7 Runway 24 Runway Occupancy Time

CONDITIONS	EXITS	EXISTING	FUTURE
ALL	RIGHT	55.7	49.9
	LEFT		
WET	RIGHT	59.2	53.9
	LEFT		
DRY	RIGHT	55.3	49.4
	LEFT		

Business jets exhibit particularly strong reliance on the runway-end exit. REDIM indicates that 95.1 percent of Citation Sovereign 680, 99.2 percent of Challenger 300, and 99.9 percent of Falcon 900 arrivals utilize Taxiway E. These results indicate that the existing Taxiway C exit provides limited operational benefit to the modeled business jet fleet, with nearly all of these aircraft continuing to the runway-end exit.

Several piston aircraft categories make greater use of Taxiway C given the landing performance and can regularly exit before reaching Taxiway E. However, per **Table B-8** there is a significant percentage that continue to Taxiway E, suggesting that the runway geometry naturally channels a large proportion of traffic toward the runway-end exit.

Table B-8 Runway 24 Exit Utilization by General Aviation Aircraft

Aircraft Type	Taxiway C	Taxiway E
Diamond DA42	37.4%	62.6%
Mooney M20C	42.1%	57.9%
Piper PA-28	66.0%	34.0%
Piper PA-34	37.2%	62.8%
Piper PA-44	30.2%	69.8%
Pilatus PC-12	31.4%	68.6%
Cirrus SR22	37.6%	62.4%

REDIM analysis modeled a proposed exit between Taxiway C and E to determine if runway occupancy time and exit usage could be improved for both aircraft groupings. Results indicate that the runway occupancy time decreases from 55.7 seconds to 49.9 seconds and reliance on Taxiway E decreases dramatically from 74.8 percent to 29.3 percent. Per **Table B-9**, nearly half of all arrivals can utilize the new exit.

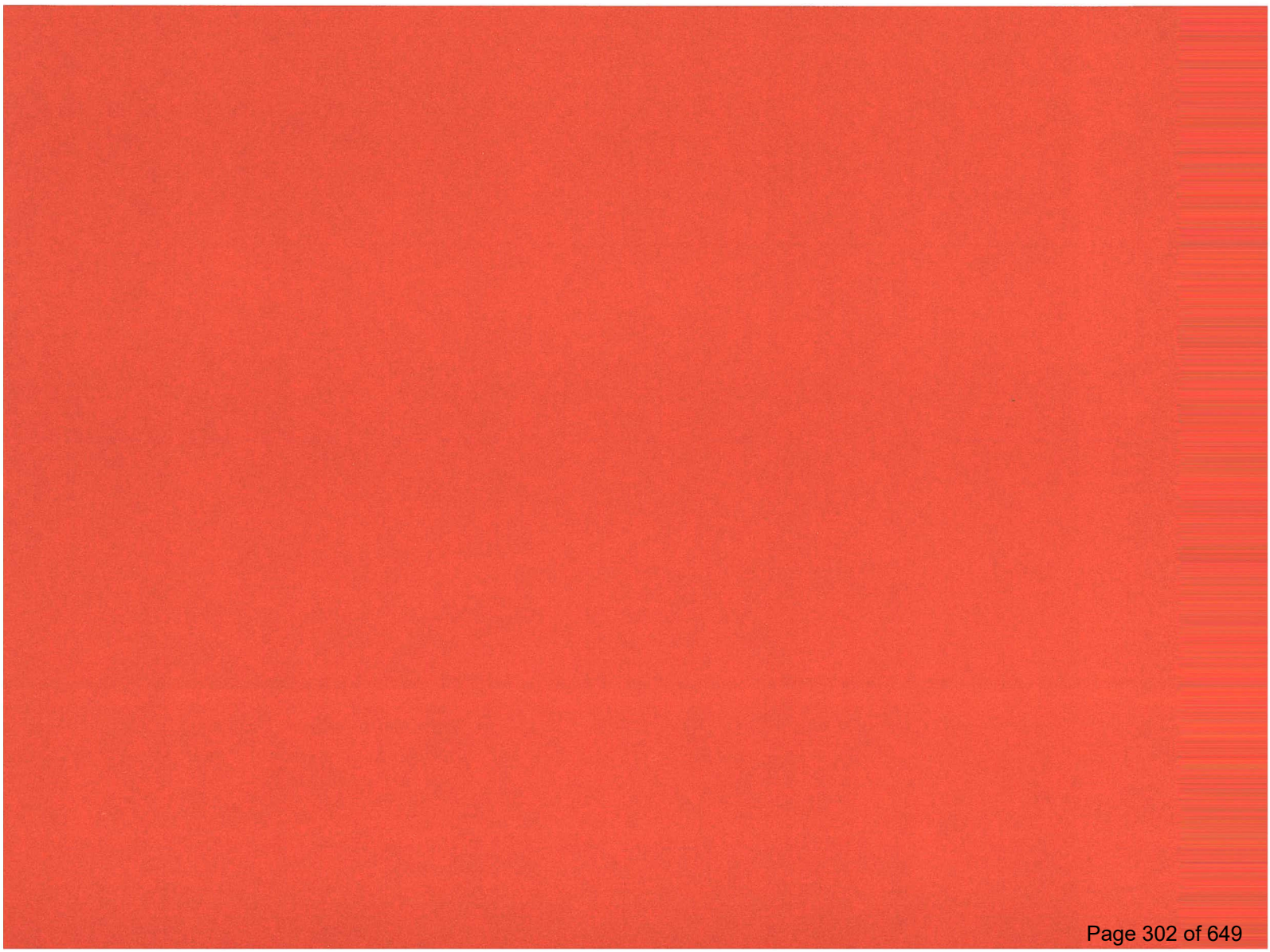
The greatest benefits are realized by the Citation Sovereign 680 and Challenger 300 fleets, which shift a majority of operations from Taxiway E to the new exit. Even the Falcon

900, the aircraft most dependent on runway-end exits, utilizes the new exit on approximately 42 percent of arrivals.

Table B-9 Runway 24 New Exit Utilization All Fleet

Aircraft Type	Existing Taxiway C	Existing Taxiway E	Proposed Taxiway C	Proposed New Exit 1	Proposed Taxiway E
Citation Sovereign 680	4.9%	95.1%	4.8%	66.8%	28.4%
Challenger 300	0.8%	99.2%	0.8%	60.7%	38.6%
Falcon 900	0.1%	99.9%	0.1%	41.9%	58.0%
Diamond DA42	37.4%	62.6%	37.7%	51.6%	10.6%
Mooney M20C	42.1%	57.9%	41.9%	47.6%	10.5%
Piper PA-28	66.0%	34.0%	65.6%	29.0%	5.3%
Piper PA-34	37.2%	62.8%	37.3%	50.4%	12.3%
Piper PA-44	30.2%	69.8%	30.4%	53.8%	15.8%
Pilatus PC-12	31.4%	68.6%	31.3%	55.9%	12.8%
Cirrus SR22	37.6%	62.4%	36.3%	50.6%	13.1%

The new exit modeled significantly redistributes traffic away from Taxiway E, reduces average runway occupancy times, decreases occupancy variability, and provides a meaningful capacity enhancement for both business jet and general aviation aircraft. Based on these results, a proposed exit on Runway 24 appears operationally justified and would likely provide measurable efficiency benefits both in current operations and under future traffic growth scenarios.



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FLAGLER EXECUTIVE AIRPORT

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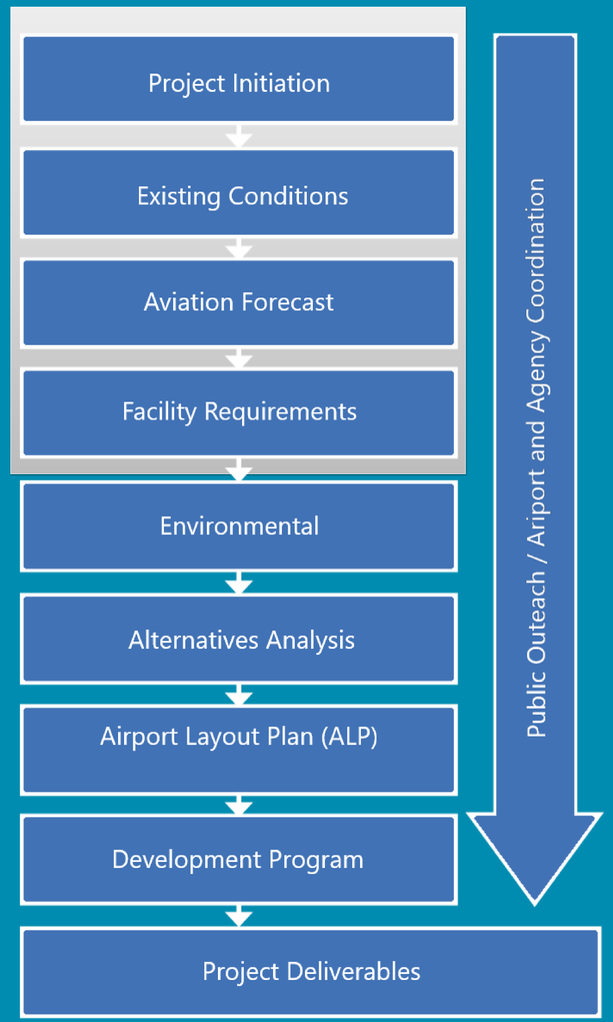
Airport Master Plan Working Paper No.2



Board of County Commissioners Presentation

November 16, 2026

Airport Master Planning Process



Project Initiation

- Stakeholder and Public Outreach
- Airport Mapping and AGIS

Existing Conditions

- Facilities, Operational, and Environmental Data
- Conduct Tenant and Customer Interviews

Aviation Forecast

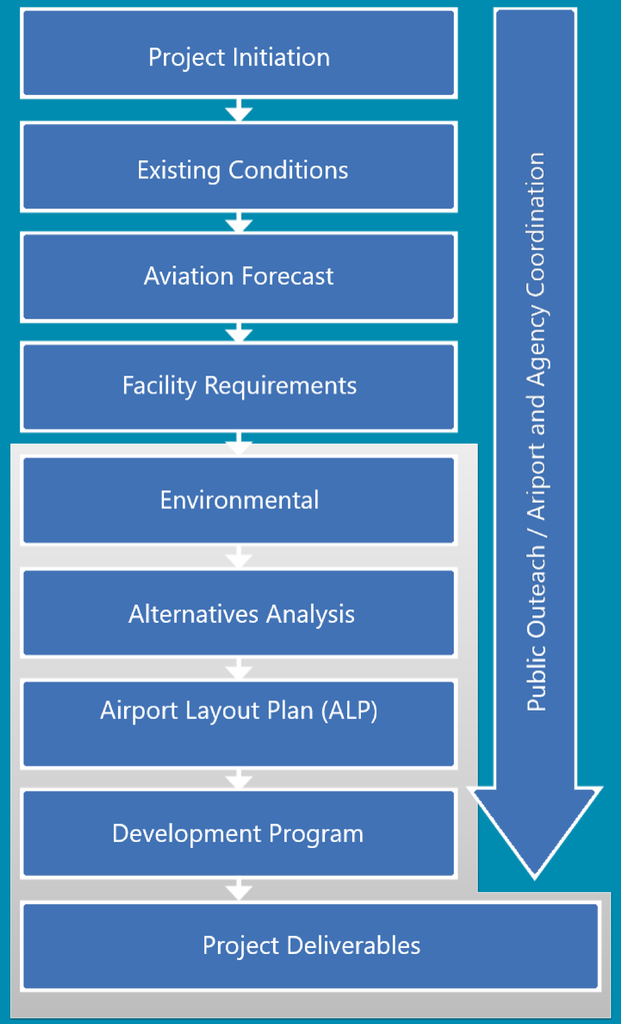
- Operations, Fleet Mix, and Based Aircraft
- **FAA and FDOT Approval**

Facility Requirements

- Capacity Assessment and Design Standards
- Airside, Facility, and Landside Needs

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FIN

Airport Master Planning Process (cont.)



Environmental

- Natural Resources and Noise Modeling
- Recycling, Reuse, and Waste Reduction Plan

Alternatives Analysis

- Develop Concepts and Evaluate Options
- Recommended Alternatives

Airport Layout Plan (ALP)

- ALP Drawing Set and Exhibit “A” Property Map
- **FAA and FDOT Approval**

Development Program

- Financial Assessment and Costs Estimating
- Capital Improvement Program

Key Deliverables

- AGIS Database
- 20-Year Aviation Forecasts
- Capital Improvement Program
- Master Plan Document
- ALP Drawing Set

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FIN

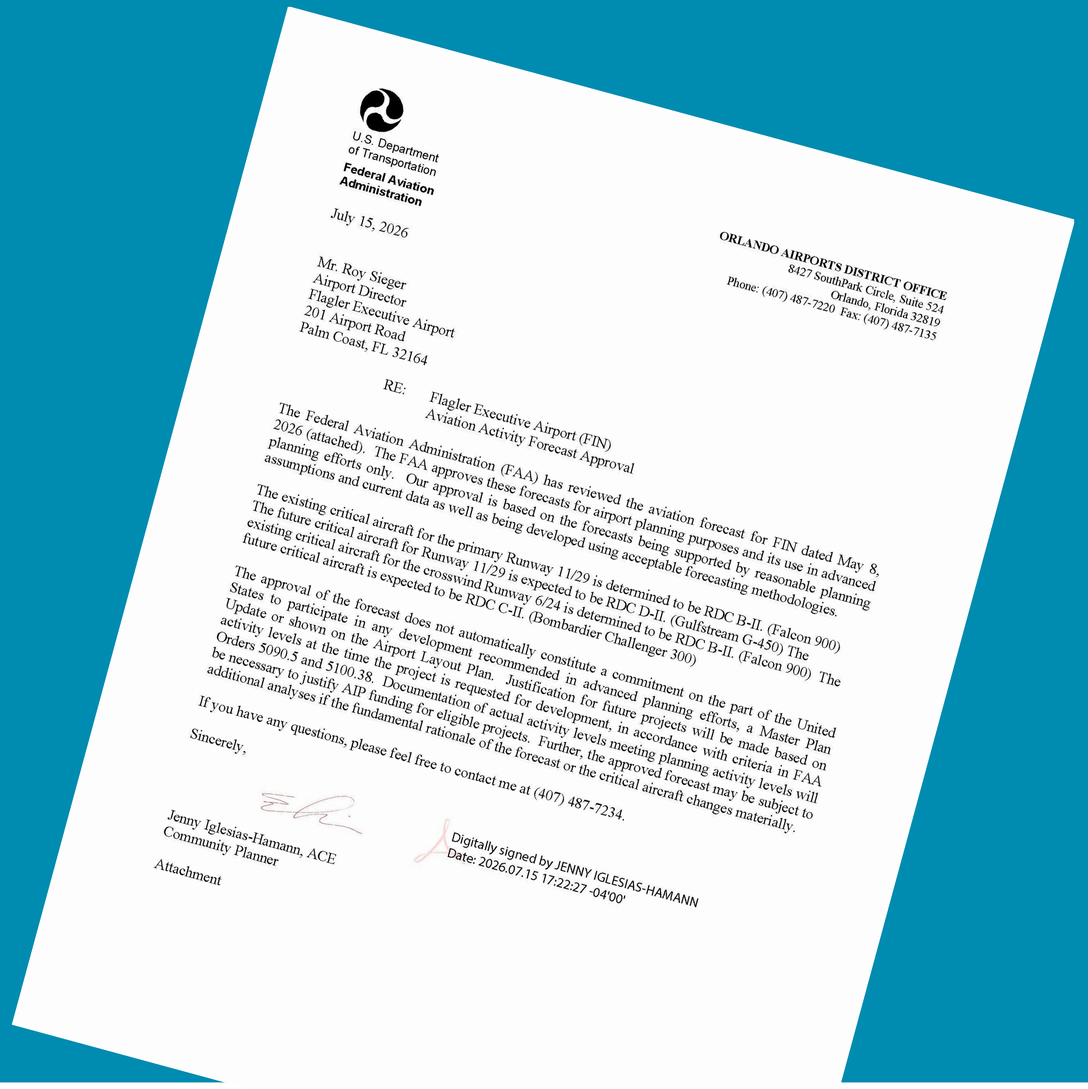
Approved Aviation Activity Forecasts

Annual Operations

2025	**180,927**
2031	199,000
2036	215,400
2046	252,500

Based Aircraft

2025	**91**
2031	99
2036	116
2046	159



U.S. Department of Transportation
Federal Aviation Administration

July 15, 2026

ORLANDO AIRPORTS DISTRICT OFFICE
8427 SouthPark Circle, Suite 524
Orlando, Florida 32819
Phone: (407) 487-7220 Fax: (407) 487-7135

Mr. Roy Sieger
Airport Director
Flagler Executive Airport
201 Airport Road
Palm Coast, FL 32164

RE: Flagler Executive Airport (FIN)
Aviation Activity Forecast Approval

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The approval of the forecast does not automatically constitute a commitment on the part of the United States to participate in any development recommended in advanced planning efforts, a Master Plan Update or shown on the Airport Layout Plan. Justification for future projects will be made based on activity levels at the time the project is requested for development, in accordance with criteria in FAA Orders 5090.5 and 5100.38. Documentation of actual activity levels meeting planning activity levels will be necessary to justify AIP funding for eligible projects. Further, the approved forecast may be subject to additional analyses if the fundamental rationale of the forecast or the critical aircraft changes materially.

If you have any questions, please feel free to contact me at (407) 487-7234.

Sincerely,

Digitally signed by JENNY IGLESIAS-HAMANN
Date: 2026.07.15 17:22:27 -04'00'

Jenny Iglesias-Hamann, ACE
Community Planner

Attachment

Where Service Soars
FLAGLER EXECUTIVE AIRPORT
FIN

Runway 11-29 Critical Aircraft

Existing

Dassault Falcon 900

- Wingspan 63.4’
- Length 66.3’
- Tail Height 24.8’
- MTOW 46,500 pounds
- Reference Code B-II-5000



Future

Gulfstream G450

- Wingspan 77.8’
- Length 89.3’
- Tail Height 25.2’
- MTOW 73,900 pounds
- Reference Code D-II-5000



Where Service Soars
FLAGLER EXECUTIVE AIRPORT
FIN

Runway 6-24 Critical Aircraft

Existing

Dassault Falcon 900

- Wingspan 63.4’
- Length 66.3’
- Tail Height 24.8’
- MTOW 46,500 pounds
- Reference Code B-II-4000



Future

Bombardier Challenger 300

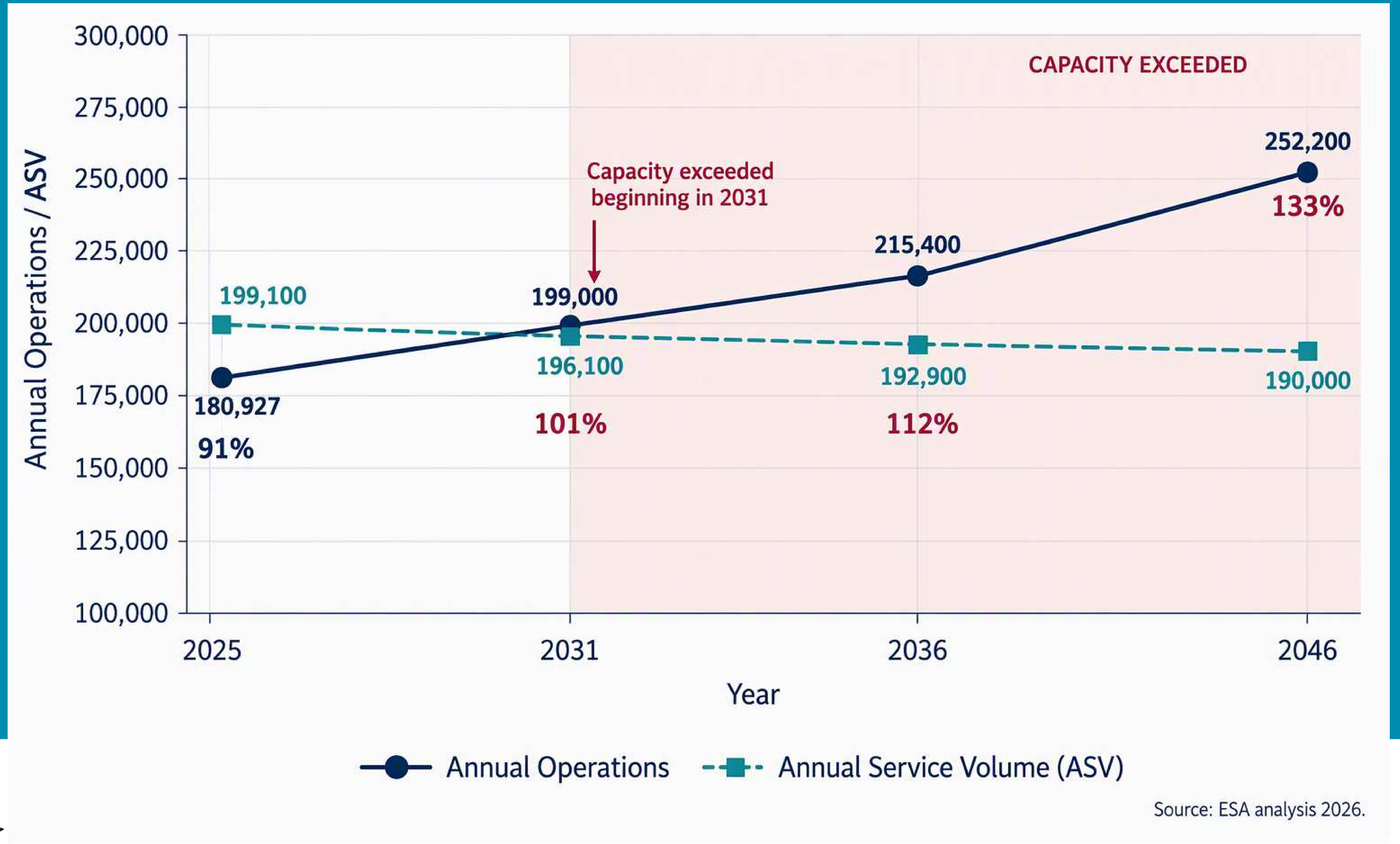
- Wingspan 63.8’
- Length 68.8’
- Tail Height 20’
- MTOW 38,850 pounds
- Reference Code C-II-4000



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FACILITY ASSESSMENT AND REQUIREMENTS

Airfield Capacity Analysis – Existing Airfield



Source: ESA analysis 2026.

Annual Airfield Capacity Does Not Tell the Whole Story

ASV is an annualized planning measure. Peak-period constraints can occur before an airport reaches 100% of ASV.

ANNUAL CAPACITY

91% of ASV Today

180,927 annual operations
199,100 existing ASV
60% FAA planning threshold

PEAK-PERIOD CONDITIONS

Demand can exceed available capacity during busy periods

Operational indicators to document:

- Pattern entry restrictions
- Sequencing or holding
- Departure delays
- Training activity constrained
- Tower imposed flow control

Capacity planning should respond to both annual demand and observed peak-period operating conditions.

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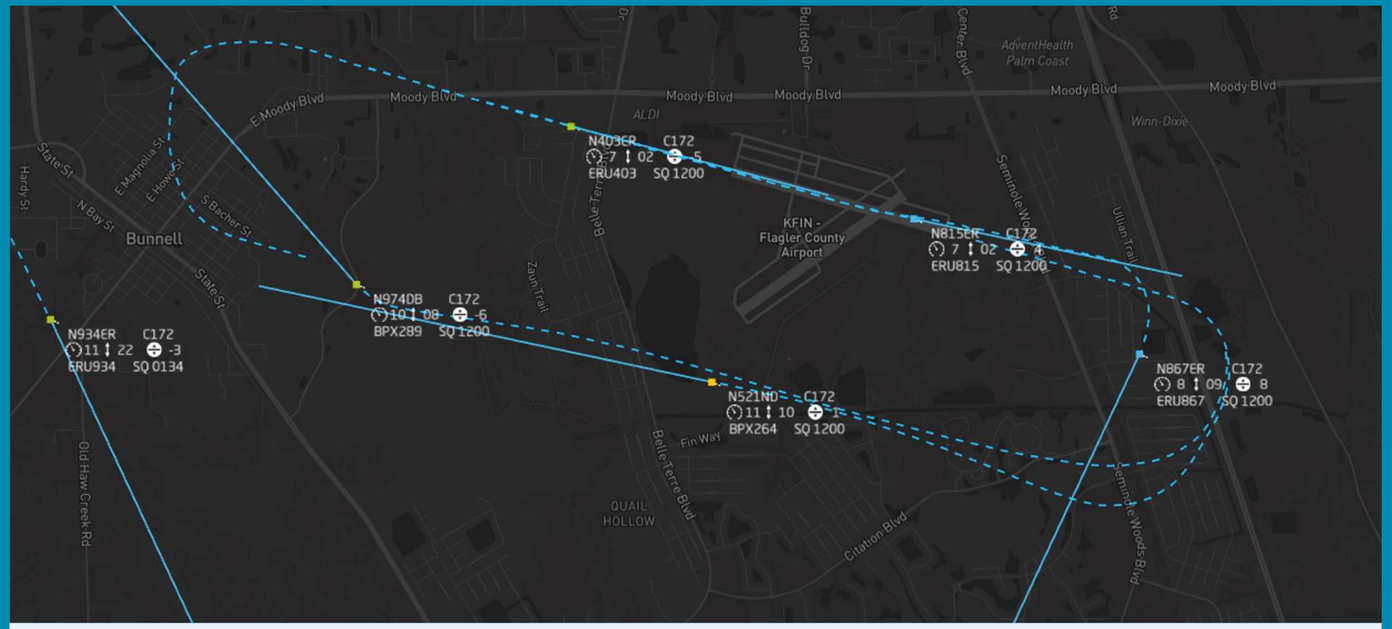
Capacity Constraints Occurring Today

ATCT OPERATIONAL EXPERIENCE



ATCT reports routinely limiting or turning away additional traffic during busy periods.

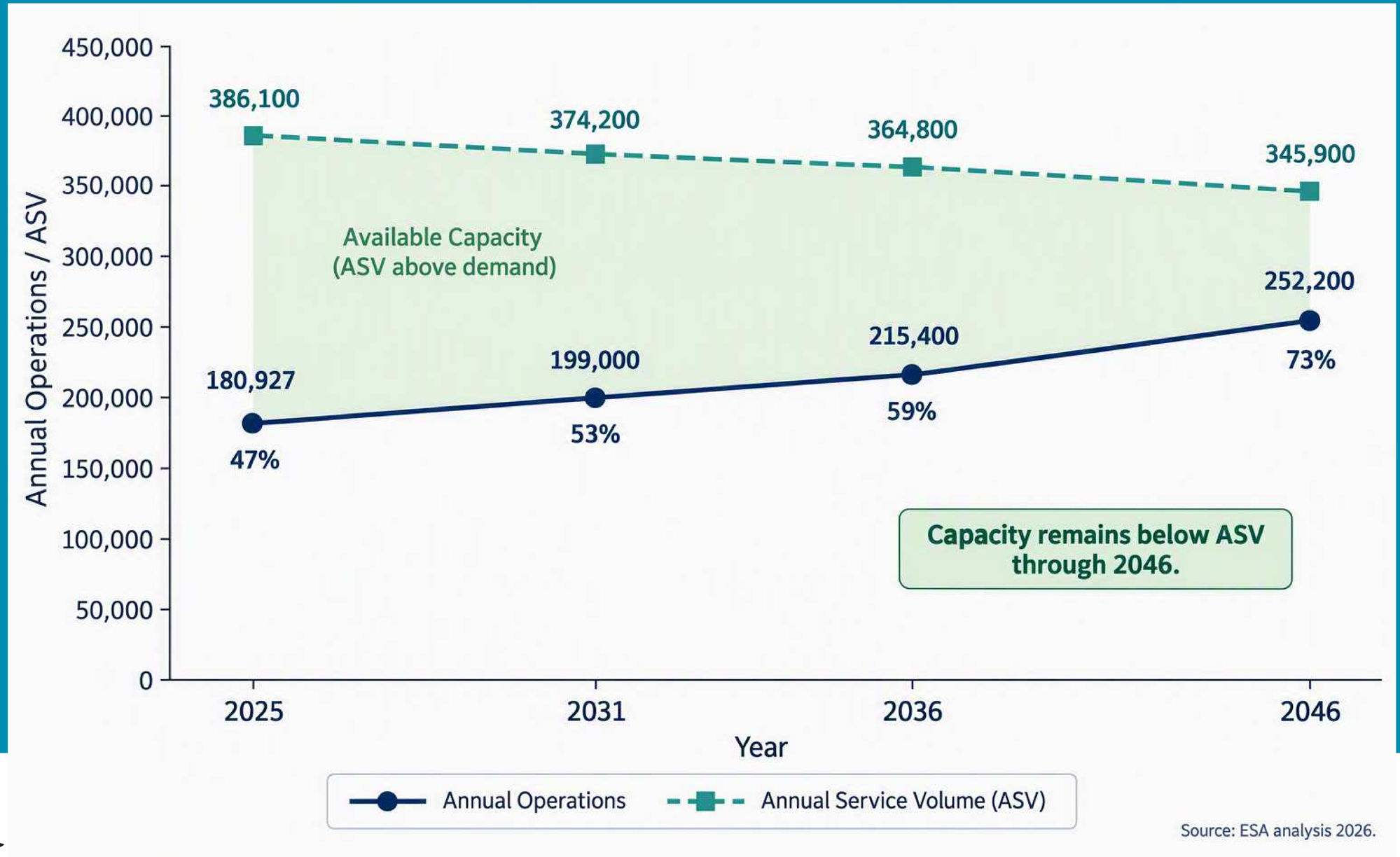
OBSERVED PEAK TRAFFIC ACTIVITY



VirTower illustrates the concentration of simultaneous aircraft activity that can occur around FIN during busy periods.

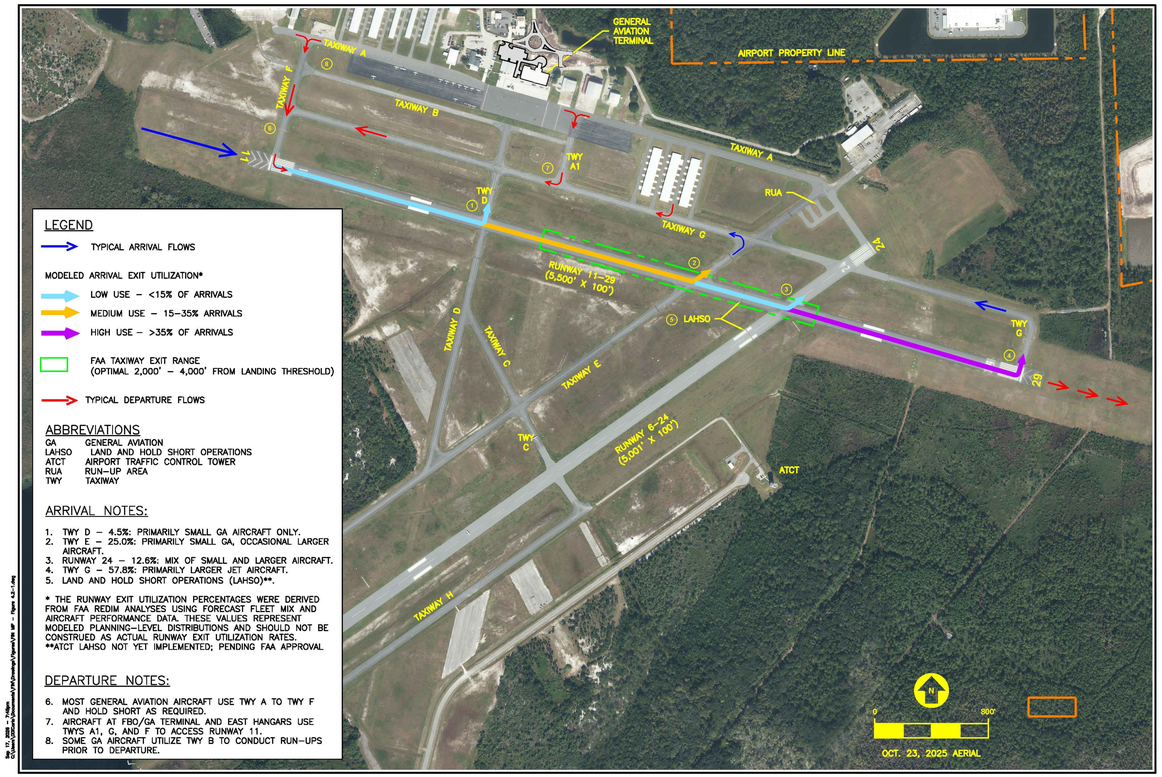
Reaffirms that FIN's capacity constraints are being experienced today.

Airfield Capacity Analysis – Parallel Runway



Source: ESA analysis 2026.

Analysis of Runway and Taxiway Movements

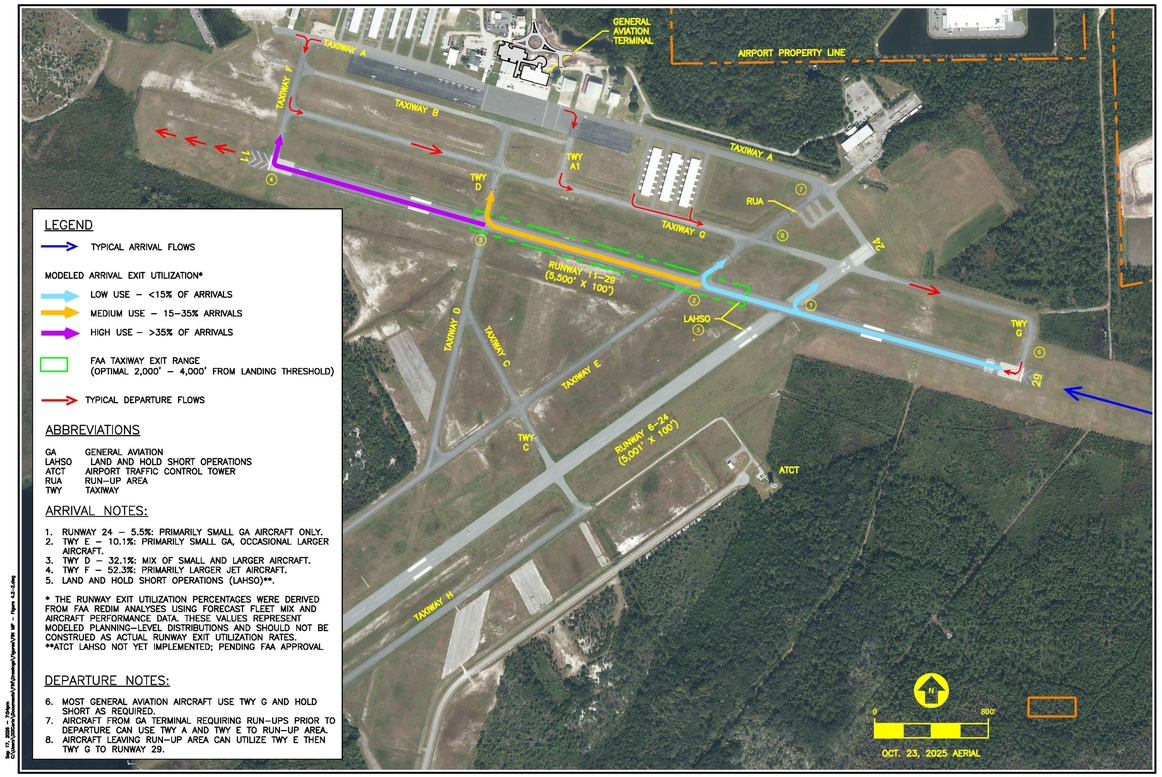


Source: ESA, 2026.

Flagler Executive Airport Master Plan

FIGURE 4.2-1

RUNWAY 11 MOVEMENTS - SOUTHEAST FLOW



Source: ESA, 2026.

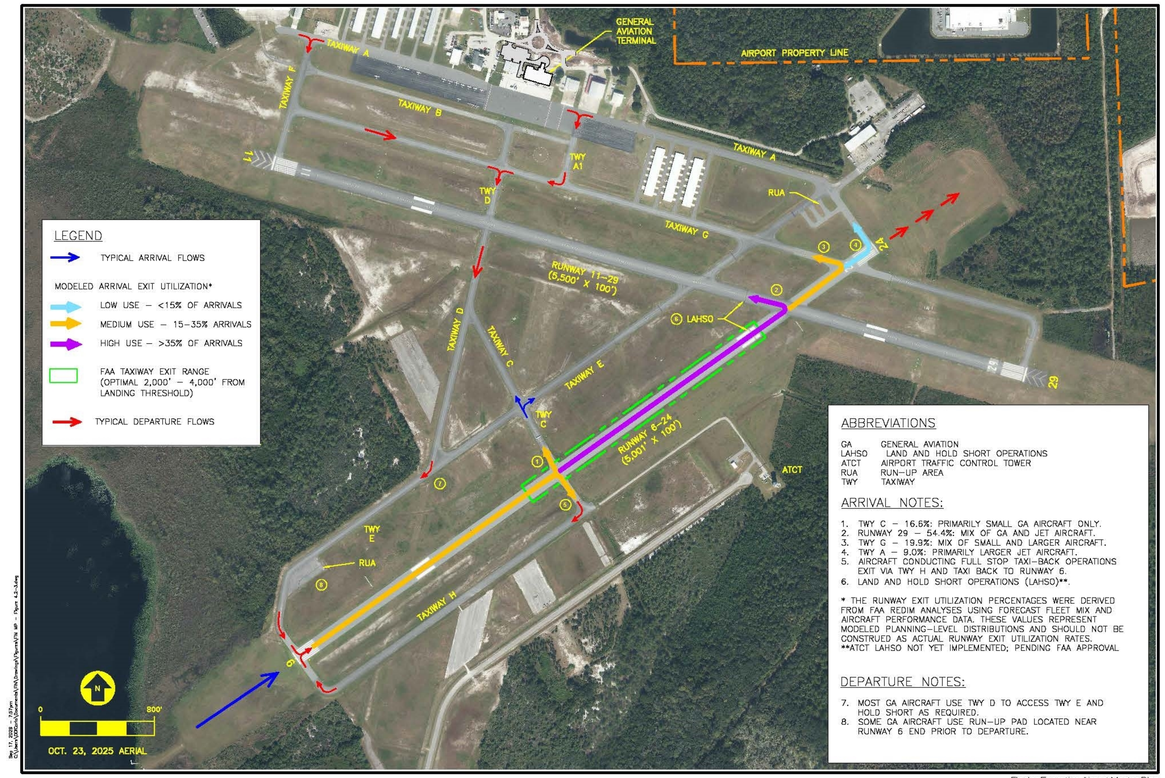
Flagler Executive Airport Master Plan

FIGURE 4.2-2

RUNWAY 29 MOVEMENTS - NORTHWEST FLOW

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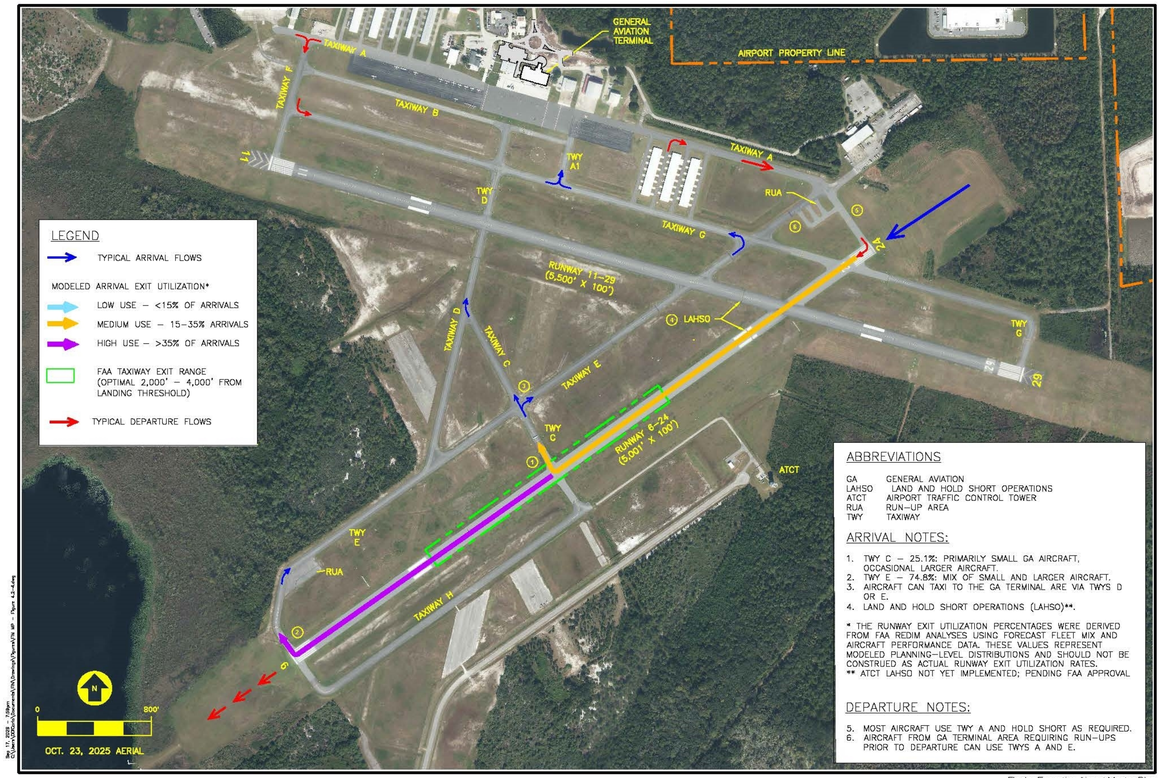
Analysis of Runway and Taxiway Movements



Source: ESA, 2026.

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FIGURE 4.2-3
RUNWAY 6 MOVEMENTS - NORTHEAST FLOW



Source: ESA, 2026.

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FIGURE 4.2-4
RUNWAY 24 MOVEMENTS - SOUTHWEST FLOW

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Runway Exit Design Interactive Model (REDIM)

1 EXISTING OPERATIONS



Aircraft landing performance varies by fleet type.

Different rollout distances lead to different exit use and runway occupancy times.

2 REDIM ANALYSIS

FIN-SPECIFIC INPUTS

2025 VirTower operations
Aircraft fleet mix
Airport conditions
Existing runway / exit geometry

Models where aircraft are likely to clear the runway and tests alternative exit locations.

3 FACILITY PLANNING

REDIM HELPS IDENTIFY WHERE AN EXIT COULD:

- ✓ **Allow aircraft to clear sooner**
- ✓ **Reduce runway occupancy**
- ✓ **Improve runway availability**
- ✓ **Support future traffic growth**

KEY TAKEAWAY:

REDIM helps determine whether an additional runway exit is operationally justified and where it would provide the greatest benefit.

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Capacity Response: Two Improvements Working Together

TODAY **91%** **of existing ASV**

1

ADD RUNWAY CAPACITY

New Parallel Runway



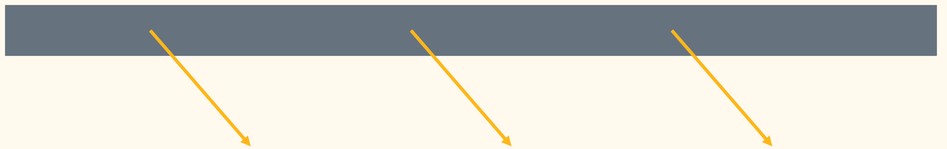
Creates additional operating capacity and provides another runway option during peak demand.

~386,100 ASV

2

IMPROVE RUNWAY FLOW

Optimized Exit Locations



Better-positioned runway exit opportunities

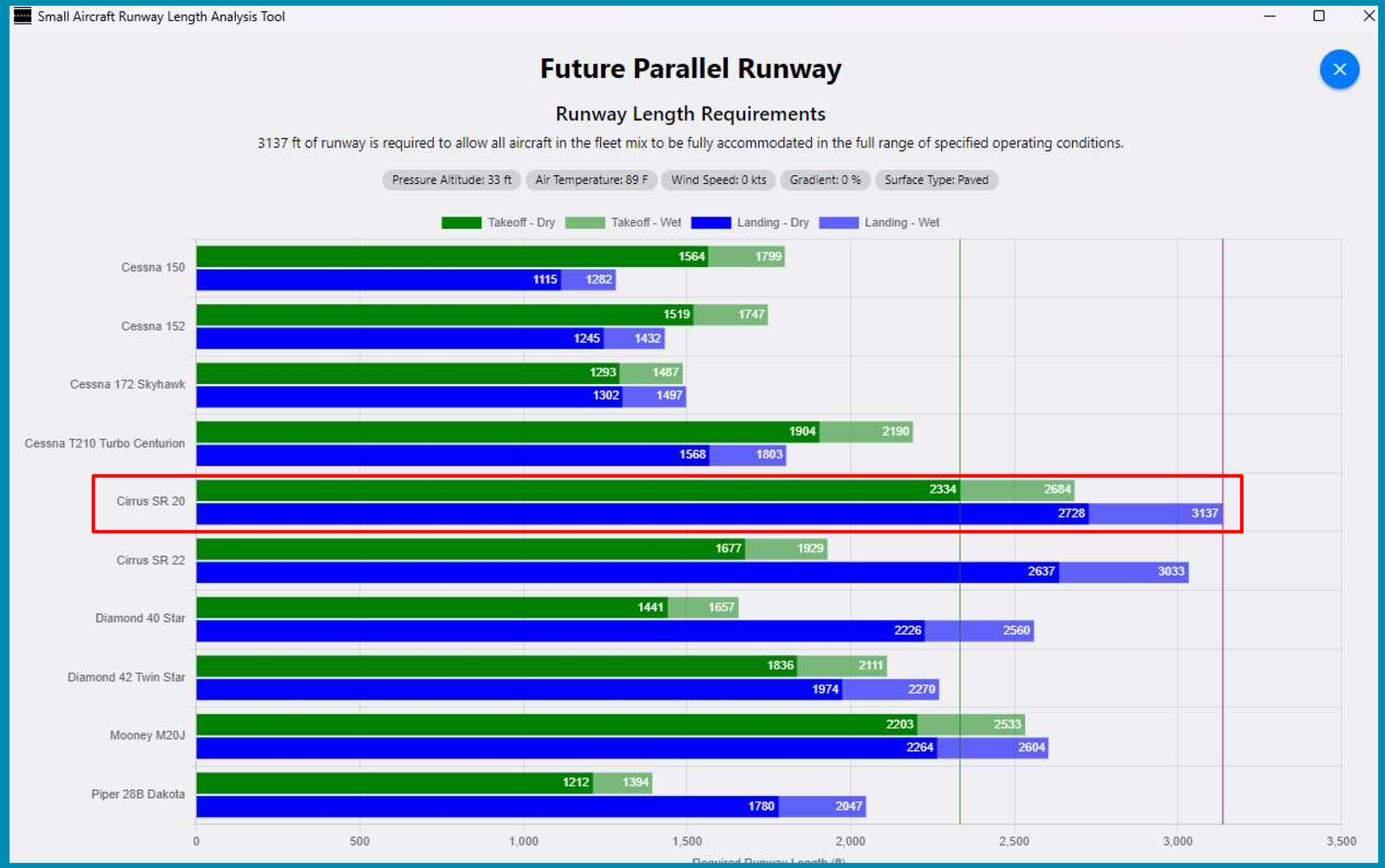
Helps aircraft clear the runway efficiently, reducing runway occupancy and supporting sequencing.

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Small Aircraft Runway Length Analysis Tool (SARLAT)

- Modeled Aircraft – Single Engine
  - Represent ~89% of 2025 Ops
  - < 12,500 LBS
  - < 50 KTS Stall Speed
  - SR-20 Most Demanding

- Parallel Runway
  - Smallest Design Standards A/B-I Small
  - Length = 3,200 FT
  - Width = 60 FT
  - Only Visual Approaches



Recommended 20-Year Facility Requirements

Airfield

- New Parallel Runway
- Construct Additional Exit Taxiways
- Extend Runway 6-24
- Distance Remaining Signs
- Periodic Pavement Maintenance
- Periodic Remarking

Facilities

- T-Hangar Facilities
- Clearspan Hangars
- Aircraft Parking Apron Space
- Establish a Heliport / Vertiport
- Facilities for Seaplane Operations
- Airport Maintenance Facilities

Note: Order of improvements does not have any relation to the priority or phasing of proposed projects.

Project Schedule

AIRPORT MASTER PLAN
Flagler Executive Airport

	MONTH																			
	2026												2027							
TASK NAME	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1 - Project Initiation	COMPLETE																			
2 - Existing Conditions																				
3 - Aviation Forecasts			FAA APPROVED JULY 15, 2026																	
4 - Facility Assessment and Requirements																				
5 - Environmental Analyses																				
6 - Alternatives for Airport Development																				
7 - Airport Layout Plan Drawing Set																				
8 - Recommended Development Program																				
9 - Stakeholder Coordination and Public Outreach																				
9.1 - Flagler County Coordination				2							3						4			
9.2 - Airport Master Plan Working Group				2						3				4			5			
9.3 - Agency Coordination					2			3			4				5			6		
9.4 - Public Outreach (includes Project Website development)													POH #1			POH #2				
9.5 - BOCC Workshops																				
10 - Project Deliverables					WP #1					WP #2				WP #3				WP #4	DRAFT	FINAL
11 - Project Administration	ONOING FOR DURATION OF PROJECT																			

September 17, 2026

LEGEND

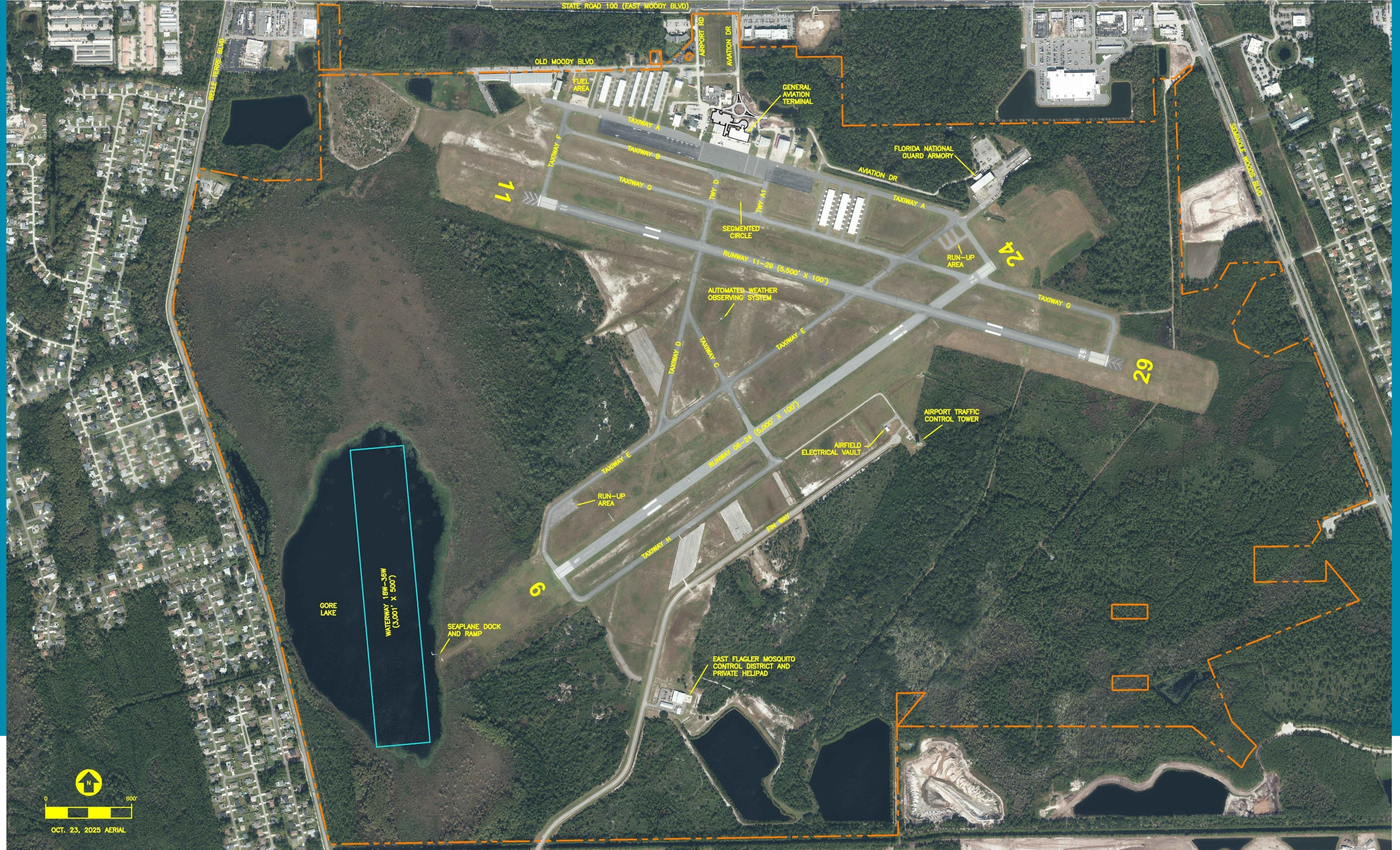
BOCC	Board of County Commissioners
POH	Public Open House
WP	Working Paper

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Questions?

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STATE ROAD 100 (EAST MOODY BLVD)
BELLE TERRE BLVD
OLD MOODY BLVD
AIRPORT RD
AVIATION DR
FUEL AREA
GENERAL AVIATION TERMINAL
TAXIWAY A
TAXIWAY F
TAXIWAY B
TAXIWAY G
TWY D
TWY A1
11
SEGMENTED CIRCLE
FLORIDA NATIONAL GUARD ARMORY
AVIATION DR
TAXIWAY A
SEMINOLE WOODS BLVD
24
RUN-UP AREA
RUNWAY 11-29 (5,500' X 100')
AUTOMATED WEATHER OBSERVING SYSTEM
TAXIWAY G
TAXIWAY E
TAXIWAY D
TAXIWAY C
29
AIRPORT TRAFFIC CONTROL TOWER
AIRFIELD ELECTRICAL VAULT
RUNWAY 06-24 (5,500' X 100')
TAXIWAY E
RUN-UP AREA
TWY A4
TAXIWAY H
6
GORE LAKE
WATERWAY 18W-36W (5,001' X 500')
SEAPLANE DOCK AND RAMP
EAST FLAGLER MOSQUITO CONTROL DISTRICT AND PRIVATE HELIPAD
N
0
800'
OCT. 23, 2025 AERIAL