

## CHAPTER FIVE

### FACILITY REQUIREMENTS

This section of the Flagler County Airport Master Plan Update identifies airside and landside facility requirements through 2022. Existing and future facility requirements and development standards are identified by comparing the Airport's existing facilities to future facility needs based on forecasts of aviation demand prepared for Flagler County Airport in Chapter Three. Airport facility requirements are presented in the following sections:

- Airport Role and Service Level
- Airside Facility Requirements
- Landside Facility Requirements
- Summary

The Federal Aviation Administration (FAA) provides guidance for planning and design of airport facilities through FAA Advisory Circulars that promote airport safety, economy, efficiency, and longevity. Many of the facility requirements identified for the Airport incorporate FAA planning and design standards published in Advisory Circular (AC) 150/5300-13 (through Change 7), *Airport Design*. Chapter Six of the Master Plan Update examines alternatives for developing Airport facilities based on the facility requirements and development standards identified for Flagler County Airport in the following analysis.

#### 5.1 AIRPORT ROLE AND SERVICE LEVEL

The FAA, through the *National Plan of Integrated Airport Systems (NPIAS)*, establishes the role and service level of each airport included within this national planning document. The role for each airport identifies one of five basic service levels, which describe the type of public aviation service the airport is expected to provide to the community or area it serves. The role and service level also define the funding category setup by Congress to assist in airport development and to compete for federal funds. In past and the most recent NPIAS, Flagler County Airport has been designated as a General Aviation airport.

Additionally, the Florida Department of Transportation (FDOT) publishes the Florida Aviation System Plan (FASP) as an element of the Florida Transportation Plan in order to assess the function of each airport in the State to define the relationships between airports and the services provided to the flying public. The document is also used to help determine distribution of State aviation funds to the seven FDOT districts across the State. The FASP recognizes the contribution that Flagler County Airport makes to the flight training industry, and the great potential for the Airport to meet the increasing demands of businesses using the Airport as they grow with the County. The FASP 2004 update, currently in development, will therefore support development of the flight training and corporate service functions at the Airport.

Airside facilities needed at Flagler County Airport to accommodate the projected level of demand were determined using applicable FAA standards and requirements for various airside components. A key element in defining airport development needs is establishing development guidelines that are directly associated with the size and type of aircraft activity the Airport is expected to serve. By determining the aircraft types expected to use the Airport, it is possible to establish a critical design aircraft that is then used for facility planning and design purposes. The critical, or design, aircraft is defined as the most demanding aircraft that operates at the airport for 500 or more operations annually. Once the critical aircraft has been determined, an Airport Reference Code (ARC) is established based on specific characteristics of aircraft operating at the Airport.

The ARC is a coding system used by the FAA to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at an airport. The ARC has two components that relate to an airport’s design. The first component is the aircraft approach category, which refers to approach speed of the critical aircraft. In the ARC, the aircraft approach category is depicted by a letter as shown in **Table 5-1**.

**TABLE 5-1  
 AIRCRAFT APPROACH CATEGORY CLASSIFICATION**

Approach Category	Approach Speed (Knots)	Typical Aircraft Type
A	Less than 91	Beech Baron 55, Cessna 172
B	91 but less than 121	King Air, Citation II
C	121 but less than 141	Lear 25, Gulfstream III
D	141 but less than 166	Gulfstream II, IV, V
E	166 or greater	Blackbird 71, Tupolev 144

Source: FAA Advisory Circular 150/5300-13, *Airport Design*

The second component is the airplane design group, which refers to the critical aircraft’s wingspan. In the ARC the airplane design group is depicted by a Roman numeral as shown in **Table 5-2**. Generally, aircraft approach speed determines the specifications of runways and runway-related facilities, while airplane wingspan determines the separation criteria for the positioning of taxiways and taxilanes.

**TABLE 5-2  
 AIRPLANE DESIGN GROUP (AIRCRAFT WINGSPAN) CLASSIFICATION**

Airplane Design Group	Wingspan (feet)	Typical Aircraft
I	Less than 49	Cessna 172, Cessna 414, Piper PA-23,
II	49 but less than 79	Falcon 50, Beech King Air E-90, Gulfstream III
III	79 but less than 118	Dash 8, Convair 580, Gulfstream V
IV	118 but less than 171	A-300, B-707, B-757, B-767, L1011, DC-10
V	171 but less than 197	B-747
VI	197 but less than 262	Future

Source: FAA Advisory Circular 150/5300-13, *Airport Design*

As stated previously, to be considered an airport's critical aircraft, the aircraft (or type of aircraft) must perform 500 total operations annually. Currently, the critical aircraft for Flagler County Airport are those with an Airport Reference Code (ARC) of C-II. Aircraft classified under ARC C-II that frequently operate at Flagler County Airport include the Cessna Citation X, the Canadair CL-600 Challenger, the Grumman Gulfstream III, the Falcon 900 and the Raytheon Hawker 800. Several of these aircraft are pictured below.



Cessna 780 Citation X  
Source: Lundgren Aerospace International, [www.airliners.net](http://www.airliners.net)



Grumman Gulfstream III  
Source: Omni Jet Trading Center, Inc., [www.omnijet.com](http://www.omnijet.com)



Falcon 900  
Source: Lundgren Aerospace International, [www.airliners.net](http://www.airliners.net)



Raytheon Hawker 800  
Source: Omni Jet Trading Center, Inc., [www.omnijet.com](http://www.omnijet.com)

The operating aircraft fleet at Flagler County Airport is comprised of single and multi-engine aircraft, however larger multi-engine and jet aircraft are performing operations at the Airport with increasing frequency. For example, aircraft such as the Cessna Citation X, Gates Learjet 35A, and Grumman Gulfstream IV also currently operate at the Airport. There are also two based jets on the Airport. These types of aircraft have higher approach speeds than smaller aircraft, and require particular facilities to allow for their continued safe operation. Both the Gates Learjet 35A and the Gulfstream IV are in Approach Category D, as opposed to C, the Airport's current approach category. Therefore, the Airport's aircraft approach category should be reclassified as Category D to reflect the larger and faster aircraft that are operating and are continued to increase their operations at the Airport on a regular basis (at least 500 annual operations).

The previous Master Plan, prepared in 1997, established that the Airport should be designed to accommodate aircraft included under Airplane Design Group III. Among other specifications, this includes all aircraft with wingspans between 79 and 118 feet. Aircraft in this group include the Gulfstream V and the Global Express. While aircraft such as Gulfstream IV (the aircraft with the largest wingspan operating regularly at the Airport today) are not in this group, increasing population growth and projected demand indicate that larger planes are expected to use the Airport more frequently in the future. Predicated on projected levels of future operations at the Airport by based and transient jet aircraft, design criteria specified under Airplane Design Group III are recommended for Flagler County Airport through the end of the planning period.

Finalizing this analysis, the recommended ARC for the Airport is D-III. Current and future minimum FAA design standards for the primary runway, taxiways, and setbacks will be determined using Approach Category D, Design Group III standards (ARC D-III).

Aircraft in Approach Category D and Design Group III include those shown below:



Grumman Gulfstream V  
Source: Lundgren Aerospace International, [www.airliners.net](http://www.airliners.net)



Bombardier Global Express  
Source: Lundgren Aerospace International, [www.airliners.net](http://www.airliners.net)

It should be noted that it is not necessary for both Runway 11/29 and Runway 6/24 to be improved to comply with an ARC D-III. The identification of one primary runway as the focus for facility improvements should be sufficient for Flagler County Airport to accommodate future demand by aircraft classified in an ARC D-III. Whichever active runway is not selected to receive these improvements should be maintained at standards consistent with an ARC C-II.

## 5.2 AIRSIDE FACILITY REQUIREMENTS

Airside facilities generally include those that support the transition of aircraft from flight to ground or parking/storage areas (landside facilities) to their departure and flight. The planning and design of an airport is based not just on the number of annual operations, but also on its local and regional role in serving aviation demand. Therefore, it is important to note that the recommended improvements are intended to address needs of the broad range of general aviation users in the community.

This section identifies existing and future airside facility requirements, and examines their layout and design in the following sections:

- Runway System
- Taxiway System
- Navigational Aids
- FAA Airfield Safety Areas
- Part 77 Surfaces

Airside facilities needed at Flagler County Airport to accommodate the projected level of demand were determined using applicable FAA standards and requirements for various airside components.

### Runway System

To adequately serve existing and future aviation activity at the Airport, runway system facility requirements for Flagler County Airport are based on the types and numbers of aircraft projected to frequently use the runway system. Components and characteristics of the runway system examined in this facility requirements analysis include the following:

- Runway Length
- Runway Width
- Runway Pavement Strength

All components of the runway system should be designed and constructed in accordance with the standards developed by the FAA. As previously noted, a primary runway should be designed to meet ARC D-III standards. In the future, any improvements to the airfield should incorporate these standards, except in cases where existing conditions make it impossible to provide fully conforming facilities. Design standards may also be exceeded for existing facilities when the airport sponsor plans on funding the development. The following sections discuss the specific runway requirements for the future runway system.

### *Runway Length*

Runway 11/29, the existing primary runway, is currently 4,999 feet in length, while Runway 6/24 is the crosswind runway and measures 5,000 feet in length. At the present time, both Runway 11/29 and Runway 6/24 are designed to ARC C-II standards. While both runways are similar in length and width, at this time Runway 11/29 is the primary runway, and as such provides adequate coverage in most weather conditions. In order to determine the ultimate required length of the future primary runway, several issues must be considered, including the requirements of the critical aircraft that will use the runway and the runway's role at the Airport. Other important factors are the typical stage length of the critical aircraft and the common atmospheric conditions at the Airport. In general, longer stage lengths require aircraft to carry more fuel, which increases the aircraft's weight and runway length required for takeoff. Similarly, warmer air temperatures

(and their corresponding impacts on air density) result in increased runway takeoff length requirements for most aircraft.

FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design* and the FAA’s Airport Design computer program provide guidelines to determine the ultimate runway length required at an airport facility. These guidelines consider airfield conditions including airfield elevation, mean daily maximum temperature, and effective runway gradient. Length determinations also consider critical aircraft data such as takeoff weight, length of haul, payload, and aircraft landing weight. For this analysis, runway length requirements were examined for aircraft in the ARC recommended for Flagler County Airport (ARC D-III). **Table 5-3** presents the recommended FAA design standard lengths for runways using various categories of aircraft at standard useful loads in different weather conditions that result from the FAA’s Airport Design computer program.

**TABLE 5-3  
 RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN**

	Dry Runways	Wet/Slippery Runways
Small airplanes with less than 10 passenger seats 100 percent of these planes	3,650 feet	3,650 feet
Small airplanes with 10 or more passenger seats 100 percent of these planes	4,260 feet	4,260 feet
Large airplanes of 60,000 pounds or less:		
75 percent of these large airplanes at 60 percent useful load	4,760 feet	5,350 feet
75 percent of these large airplanes at 90 percent useful load	6,800 feet	7,000 feet
100 percent of these large airplanes at 60 percent useful load	5,530 feet	5,530 feet
100 percent of these large airplanes at 90 percent useful load	8,420 feet	8,420 feet
Airplanes of more than 60,000 pounds	6,830 feet	6,830 feet

Source: FAA Advisory Circular 150/5325-4A, Airport Design Computer Program, Version AD4.2

Using the FAA computer program to determine the required runway length for the Airport, the daily mean maximum temperature of the hottest month (90 degrees Fahrenheit), the Airport’s elevation (35 feet mean sea level, or MSL), and a stage length of 1,000 nautical miles (NM) were entered for analysis. The stage length of 1,000 NM adequately covers most trips from Flagler County Airport to typical locations throughout the Midwest, Caribbean, or those along the East Coast of the United States.

The FAA Airport Design computer program presents runway length requirements for small and large airplanes. Small airplanes are those with weights of 12,500 pounds or less. Runway length requirements are presented for large airplanes in two categories, large airplanes between 12,500 and 60,000 pounds, and large airplanes greater than 60,000 pounds.

The results of the runway length analysis conducted for Flagler County Airport, as shown in Table 5-3, indicate that the current runway lengths should be sufficient to accommodate

operations by all small airplanes in all conditions. Runway length requirements for large airplanes between 12,500 and 60,000 pounds are calculated based on the percentage of aircraft in that category that can be accommodated as well as the useful load of those aircraft. As shown in Table 5-3, the analysis indicates that a runway length of 5,350 feet is sufficient to accommodate approximately 75 percent of large airplanes (60,000 pounds or less) when operating at 60 percent of their average useful load during wet or slippery conditions. A runway length of approximately 7,000 feet would be required to accommodate 75 percent of these aircraft at Flagler County Airport while operating at 90 percent of their average useful load.

The Airport's current runway lengths are inadequate to accommodate 100 percent of these large aircraft at 60 percent of their average useful load. A runway length of approximately 8,420 feet would be required to accommodate 100 percent of these aircraft at 90 percent of their average useful loads. Unless a specific aircraft is identified that requires a runway approaching this length, 100 percent of the fleet at 90 percent load should not be planned for. Additionally, runway length analysis indicates that a runway length of approximately 6,830 feet would be required at Flagler County Airport to accommodate large aircraft greater than 60,000 pounds, in order for those aircraft to operate fully loaded and fly maximum stage lengths.

Based on the runway analysis conducted with FAA Airport Design software, which considers the designated ARC D-III for Flagler County Airport, the existing lengths of both runways are sufficient to accommodate 100 percent of small airplanes (12,500 pounds or less) including those up to 10 or more passenger seats. The analysis also indicates, however, that the two runways' lengths are only sufficient to accommodate 75 percent of large airplanes (60,000 pounds or less) at 60 percent of their useful load. This indicates that in certain conditions these large aircraft may have to operate at less than optimal payload and fuel load to use Flagler County Airport. As the number of corporate general aviation jets in the national fleet increases, and as the number of operations conducted by large aircraft at Flagler County Airport increases, a runway extension resulting in an ultimate runway length of 7,000 feet may be warranted at the Airport. As shown in Table 5-3, a length of 7,000 feet would be sufficient for 75 percent of large airplanes at 90 percent of their useful load. This extension would allow the Airport to accommodate heavier aircraft such as Grumman Gulfstream V and the Boeing Business Jet in most weather conditions. Currently, the airport nearest Flagler County having a usable runway length greater than 7,000 feet is Daytona Beach International Airport, located approximately 22 nautical miles southeast of Flagler County Airport.

As described, the improvement of one runway to meet ARC D-III standards at a length of 7,000 feet would be sufficient to accommodate larger and heavier aircraft through the end of the planning period. For this reason, the other runway should be maintained in compliance with C-II standards. Currently, both active runways meet all design standards for an ARC C-II classification. At their current lengths, both runways can accommodate 75 percent of larger planes (60,000 pounds or less) at 60 percent of their useful load.

**Table 5-4** compares FAA standards for ARC C-II and D-III runways to illustrate the improvements necessary under the D-III standards.

**TABLE 5-4  
 FAA DESIGN CRITERIA**

<b>Facility Criteria</b>	<b>Existing ARC C-II</b>	<b>Future ARC D-III</b>
Runway Length:	4,999 ft/5,000 ft.	7,000 ft.
Runway Width:	100 ft.	100 ft.
Runway Centerline to:		
Taxiway Centerline	300 ft.	400 ft.
Aircraft Parking Area	400 ft.	500 ft.
Runway Blast Pad:		
Length	150 ft.	200 ft.
Width	120 ft.	140 ft.
Runway Object Free Area (Width)	800 ft.	800 ft.
Length Beyond Runway End	1,000 ft.	1,000 ft.
Runway Obstacle Free Zone (Width)	250 ft.	400 ft.
Length Beyond Runway End	200 ft.	200 ft.
Runway Safety Area (Width)	500 ft.	500 ft.
Length Beyond Runway End	1,000 ft.	1,000 ft.
Taxiway Width	35 ft.	50 ft.
Taxiway Centerline to:		
Parallel Taxiway Centerline	105 ft.	152 ft.
Fixed or Movable Object	57.5 ft.	93 ft.
Taxiway Object Free Area (Width)	131 ft.	186 ft.
Taxiway Safety Area (Width)	79 ft.	118 ft.

Source: FAA Advisory Circular 150/5300-13, *Airport Design*

### *Runway Width*

The required width of any runway is determined by the ARC classification of that runway’s critical aircraft. Based on the current and future operational fleet at Flagler County Airport, the classification of the critical aircraft has been identified as ARC D-III. FAA airport design standards dictate that a runway with this classification should have a width of at least 100 feet. Both active runways at Flagler County Airport are currently 100 feet in width. Therefore, both runways’ widths are adequate to support current and anticipated future aviation activity at Flagler County Airport.

*Runway Pavement Strength*

Runway pavement strength represents the load-bearing capacity of the pavement. In order to ensure safe aircraft operations and minimize pavement damage, it is important that runway pavement strength be sufficient to support the heaviest aircraft expected to use that runway on a regular basis. Runway pavement strength can be expressed by a rating of single-wheel loading, dual-wheel loading, and dual-tandem-wheel loading capabilities. The aircraft gear type and configuration dictates how aircraft weight is distributed to the pavement and determines pavement response to loading. Currently, both Runways 11/29 and 6/24 are rated for dual-wheel loading up to 60,000 pounds. The previous Master Plan stated that the current pavement strength rating should be sufficient to accommodate most aircraft expected to use the runways at their present rating. The Plan went on to recommend that pavement strengths should be improved to accommodate aircraft up to 120,000 pounds at the time when a runway extension project is implemented. In the context of this Master Plan Update, this recommendation remains suitable for Flagler County Airport. To accommodate the demand of the ARC D-III critical aircraft and other large jet aircraft likely to use the Airport more frequently through the planning period, it is recommended that the pavement strength for the primary runway be improved to 120,000 pounds.

While the existing pavement strength is sufficient for most aircraft using the Airport at present, an improved strength rating is desirable to accommodate larger aircraft classified under ARC D-III. **Table 5-5** displays the maximum taxi (or ramp weight) of several typical aircraft categorized in Approach Category D and/or Airport Design Group III. As shown, both the Gulfstream III and IV corporate jet aircraft cannot operate at their maximum allowable weights on the existing runway pavement. For this reason, pavement-strengthening projects are recommended for the Airport to safely accommodate operations by these aircraft.

**TABLE 5-5  
 MAXIMUM WEIGHTS OF TYPICAL AIRCRAFT**

<b>Aircraft Type</b>	<b>Comment</b>	<b>Landing Gear Configuration</b>	<b>Maximum Taxi Weight</b>
Gulfstream III	Current Critical Aircraft	Dual-Wheel	68,700 lbs.
Gulfstream IV (or similar)	Critical Aircraft – Approach Category D	Dual-Wheel	90,900 lbs.
Global Express (or similar)	Critical Aircraft – Design Group III	Dual-Wheel	94,250 lbs.
Boeing Business Jet	New Corporate Aircraft in National Fleet	Dual-Wheel	171,500 lbs.

Source: Airport Inventory

The Boeing Business Jet, a recent introduction into the corporate general aviation aircraft fleet, has a substantially higher maximum weight than the Airport’s critical aircraft and it has a dual-wheel landing gear configuration. With the existing pavement strength of the Airport’s runway facilities, Boeing Business Jets should operate at Flagler County Airport only with significant range reductions and other weight limitations. If operations by Boeing Business Jets or similarly sized aircraft increase at Flagler County Airport, pavement-strengthening projects would be necessary to minimize the impacts on Airport pavements.

## Taxiway System

Taxiways can be categorized into the following three groups: parallel, exit, and hangar/apron access. Currently, both active runways at the Airport are served by parallel taxiways. Runway 11/29 is served by Taxiway A, which offers five exits, and Runway 6/24 is served by Taxiway E, offering four exits. Apron and aircraft storage areas at the Airport are supported by a number of other taxiways (B, C, and D). Taxiways C and D are full-length taxiways that are parallel to the two closed runways.

Similar to runway width design standards, the FAA also prescribes taxiway widths primarily dependent on the wingspan of the Airport's critical aircraft. Taxiway design standards applicable to Flagler County Airport are summarized in **Table 5-6**.

**TABLE 5-6  
TAXIWAY DESIGN STANDARDS**

<b>Taxiway</b>	<b>ARC D-III</b>	<b>Existing</b>
Taxiway A (full-length parallel RWY 11/29)	50 ft.	50 ft.
Taxiway B (partial parallel RWY 11/29)	50 ft.	35 ft.
Taxiway C (full-length parallel closed RWY 15/33)	50 ft.	50 ft.
Taxiway D (full-length parallel closed RWY 2/20)	50 ft.	50 ft.
Taxiway E (full-length parallel RWY 6/24)	50 ft.	50 ft.

Source: FAA Advisory Circular 150/5300-13, *Airport Design*

As shown in Table 5-6, only Taxiway B does not meet the minimum design standard for ARC D-III, having a width of 35 feet. Taxiway B should be widened to meet ARC D-III standards that require taxiways to have a width of 50 feet. Additionally, the current runway centerline to taxiway centerline of Runway 11/29 to Taxiway B is also below standard at 300 feet. Minimum standards required by the critical aircraft and the ARC D-III are 400 feet. To meet minimum separation requirements for ARC D-III facilities, Taxiway B must be relocated 100 feet to the north and widened to 50 feet. This relocation, however, would necessitate the removal of apron space that is currently used for aircraft storage with the exiting runway/taxiway system configuration.

For Taxiways A and E, the full-length parallel taxiways serving Runways 11/29 and 6/24, the current runway centerline to taxiway centerline separation is 525 feet. This is more than adequate to serve critical aircraft in the ARC D-III.

## Navigational Aids

Navigational aids (NAVAIDs) are any visual or electronic devices, airborne or on the ground, that provide point-to-point guidance information or position data to aircraft in flight. Airport NAVAIDs provide guidance to a specific runway end or to an airport. An airport is equipped with precision, non-precision, or visual capabilities in accordance with design standards that are based on safety considerations and airport operational needs. The type, mission, and volume of aeronautical activity used in association with meteorological, airspace, and capacity considerations determine an airport's eligibility and need for various NAVAIDs.

Facility requirements at Flagler County Airport include the following two types of NAVAIDs: instrument approach NAVAIDs and visual NAVAIDs. Both active runways currently have precision approach and runway-end lighting. A circling non-precision VOR is the only available approach at the Airport. This existing NAVAID equipment will not likely accommodate newer and more sophisticated aircraft expected to use the Airport more frequently over the planning period. These aircraft, including the Diamond Star DA-40, the Piper Seminole PA-44, and the Diamond DA-42 Twin Star used by Embry-Riddle Aeronautical University, are equipped with the latest digital avionics equipment for visual and instrument training. Corporate aircraft such as the Gulfstream V and the Global Express (along with others classified in ARC D-III) are similarly equipped with state-of-the-art technology that is not adequately accommodated by visual approach procedures currently in place at Flagler County Airport.

The ability of Flagler County Airport to accommodate increasingly sophisticated aircraft, especially those in the corporate and business segment, would be greatly enhanced with the implementation of one or more precision or non-precision instrument approaches. Therefore, to meet the forecasted growth of operations by more sophisticated aircraft capable of instrument approaches, a precision approach is recommended. A medium intensity approach lighting system with runway alignment indicator lights (MALSR) is recommended for the runway identified for the precision approach. Existing lighting and/or instrumentation and requirements for future NAVAID development at Flagler County Airport are presented in detail in the following sections.

#### *Instrument NAVAIDs*

This category of NAVAIDs provides assistance to aircraft performing instrument approach procedures to an airport. An instrument approach procedure is defined as a series of predetermined maneuvers for guiding an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

The standard type of precision approach available today is the ILS approach. The FAA, however, is currently developing a global navigation satellite system (GNSS) using the U.S. Department of Defense's global positioning satellites (GPS) for precision approaches. The GPS satellite-based navigation system is able to provide instant and precise three-dimensional position information for every phase of a flight. It is anticipated that GPS technology will become the standard for precision approaches in the near future; therefore Flagler County should work toward implementing a precision GPS approach as it is developed and commissioned by the FAA.

While GPS service provides users with a level of accuracy that is appropriate for en route navigation and non-precision approaches, two augmentations have been defined to meet international standards of accuracy, availability, and GPS signal integrity. These augmentations improve the GPS service considerably, each providing a progressively higher degree of accuracy and availability during adverse weather conditions.

The Wide Area Augmentation System (WAAS) provides required accuracy, availability and integrity to support GPS use as a primary means of navigation during all phases of flight through Category I precision approaches. Minimums for Category I approaches enable properly equipped

aircraft to descend as low as 200 feet before having the runway environment in sight. Ground-based equipment is not required to achieve a WAAS support Category I precision approach.

The WAAS became part of the U.S. National Airspace system in July 2003; however a Local Area Augmentation System (LAAS) is currently being tested by the FAA. The LAAS will improve GPS service to provide all-weather approach, landing, and surface navigation capabilities and will exceed the accuracy of the WAAS via a very high frequency radio data link from a ground-based transmitter. The LAAS correction message will be broadcast for a finite local area (approximately a 20-30 mile radius) with a significant improvement in service flexibility and user operating costs.

The LAAS will yield extremely high accuracy, availability and integrity necessary for Category I, II, and III precision approaches. Curved approach paths, those designed to avoid obstacles, restricted or congested airspace, and/or noise sensitive areas will be possible for Category I, II, and III precision approaches, providing multiple precision approach capabilities to runways within the LAAS coverage area. This technology is also expected to assist in the prevention of runway incursions in low visibility conditions.

In addition to the precision approach capabilities of the GPS system, non-precision instrument approaches are also available. The implementation of at least one additional non-precision approach is recommended for Flagler County Airport. While it is possible to establish such an approach to each runway end, a more detailed analysis should be made to determine which end may provide the most advantageous approach minimums, as well as which would be the most feasible considering costs, frequency of use, and surrounding land uses.

The implementation of both precision and non-precision instrument procedures for Flagler County Airport requires the initiation of an application process with the regional FAA Flight Procedures Office. The application process requires the Airport sponsor to establish its eligibility, request approval of the approach, and formulate the instrument approach procedure. A questionnaire identifying the specific facilities and services at the Airport must also be completed.

### *Visual Landing Aids*

Visual landing aids provide aircraft guidance to and alignment with a specific runway end, once the airport is within a pilot's sight. Existing and recommended future visual landing aids at Flagler County Airport include the following:

- Approach Lighting System (ALS) – The Airport does not currently have an ALS. To support the recommended precision approach, a medium intensity approach lighting system with runway alignment indicator lights (MALSR) is recommended. The MALSR will remain adequate throughout the 20-year planning period.
- Runway Lighting – Both active Runways 11/29 and 6/24 are equipped with medium intensity runway lighting (MIRL). A high intensity runway lighting system (HIRL) is recommended for the runway identified for the precision approach.

- Other Runway Lighting and Guidance – Several additional NAVAIDs and visual aids are available at the Airport to assist in locating and landing aircraft at night and in poor weather conditions. These NAVAIDs include a rotating beacon, and lighted wind cone. These are adequate to meet future needs.
- Visual Glide Slope Indicators (VGSI) – Both paved Runways 11/29 and 6/24 are equipped with precision approach path indicators (PAPI – P2L), with two identical lights placed on the left side of the runway ends. These PAPIs will remain adequate throughout the 20-year planning period.

### *Air Traffic Control Tower*

The benefits associated with an air traffic control tower (ATCT) are typically realized in a busy environment where operational efficiency and conflicts associated with dissimilar traffic are critical issues. A typical rule of thumb is for airports approaching 150,000 annual operations to consider the benefits that an ATCT will have on the safe operation of the airfield. Current and projected operations at Flagler County Airport are more than adequate to justify inclusion of the Airport in the FAA's Contract Tower Program.

Construction and equiptage of an ATCT is eligible for funding under the Airport Improvement Program (AIP) if the tower will be used in the FAA Contract Tower Program. This is a cost-sharing program that enables ATCTs to be staffed by FAA-certified controllers. Under the program, the airport sponsor is responsible for establishing and maintaining the ATCT and the FAA agrees to share the cost of staffing (operating) the facility. The FAA share of the cost is dependent upon the results of a benefit/cost analysis. The AIP specifies that such tower development projects compete with other eligible projects for funding based on a priority value.

As described in Chapter One, Flagler County is estimated to be the fifth-fastest growing county in the United States between the time of the 2000 Census and estimates for July 2001. Flagler County Planning Department population and employment projections reflect this trend, indicating continued growth in the County for the foreseeable future. The demand for general aviation services at Flagler County Airport, most notably the level of operations and based aircraft on the Airport, has risen commensurately with the robust socio-economic activity in the County. Corporate interests also continue to surface, including Embry-Riddle Aeronautical University and other businesses such as Cakes Across America and The Ginn Company pursuing the development of operations on the Airport. The combination of recommended ALS and precision approach improvements with the ATCT will allow Flagler County Airport to better serve current and future users throughout the 20-year planning period.

To initiate the development of an ACTC at Flagler County Airport, it is recommended that the Airport commence the process by requesting an FAA Contract Tower (FCT) application package from the appropriate FAA regional point of contact. Upon return of the completed application, the Airport will be placed on an applicant list at the FCT Program Office. The Program Office will then forward the application to the Office of Policy and Plans (APO). Once the APO has calculated the preliminary Benefit/Cost Ratio, the Airport will be notified of the results and the program in which the Airport is eligible to participate, either fully funded or cost-share program.

FAA Airfield Safety Areas

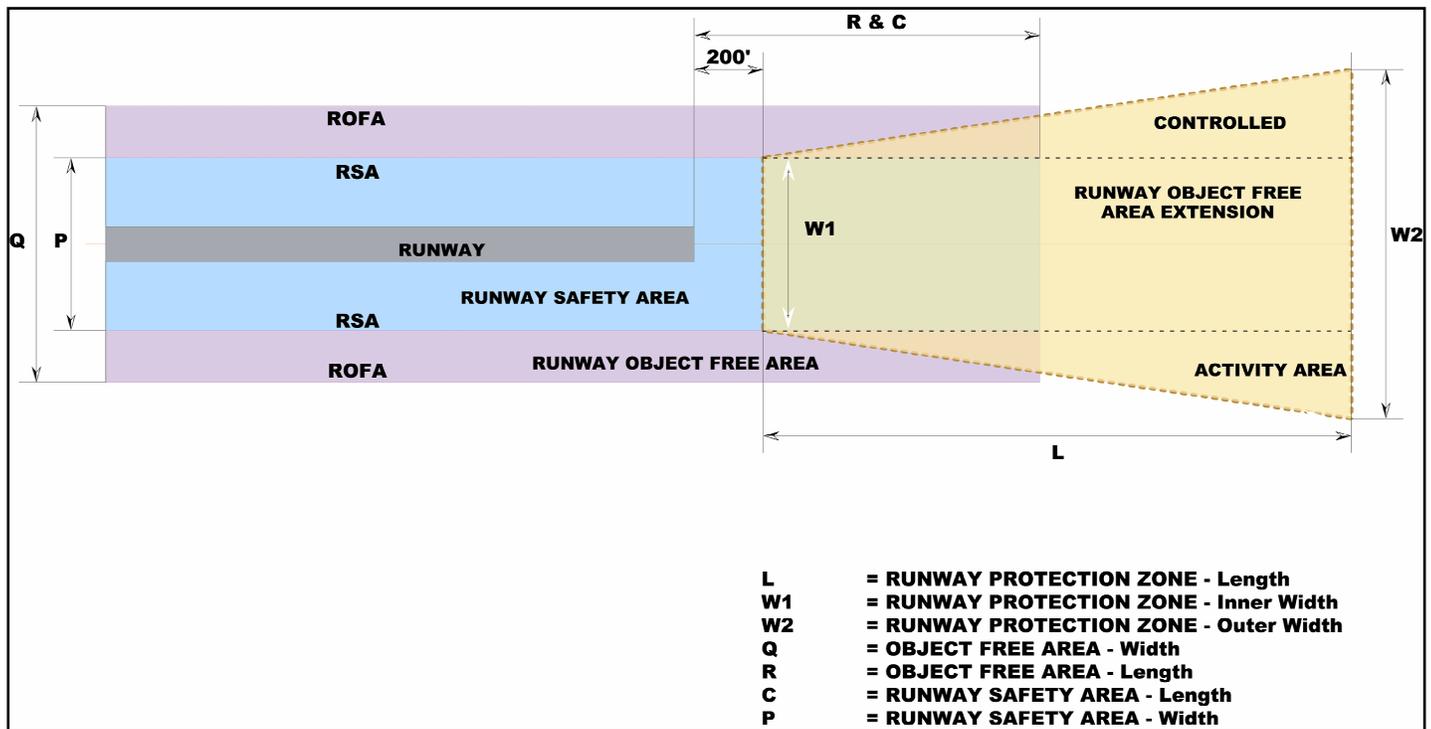
This section presents FAA standards for various airfield safety areas as they relate to Flagler County Airport. FAA safety areas are designated airfield areas with specified dimensions and requirements that promote the safe movement and operation of aircraft at an airport. Many of these safety areas pertain to runways and their immediate surroundings. The following airfield safety areas are examined in this analysis:

- Runway Protection Zone
- Runway Safety Area
- Obstacle Free Zone

*Runway Protection Zone*

The Runway Protection Zone (RPZ), formerly the runway clear zone, is trapezoidal in shape and is centered on the extended runway centerline as shown in **Exhibit 5-1**.

**EXHIBIT 5-1  
 RUNWAY PROTECTION ZONE**



The function of the RPZ is to enhance the protection of people and property on the ground. The RPZ begins 200 feet beyond the end of the runway pavement that is usable for takeoffs and landings. Displacing the landing or takeoff threshold does not change the beginning point of the RPZ. If runway pavement is used for either takeoffs or landings, the start of the RPZ remains at the 200-foot standard. The actual length and width of the RPZ is contingent on the size of the aircraft operating on the runway, as well as the type of approach available. Generally, as the

aircraft size increases and the approach minimums become more precise, the dimensions of the RPZ increase.

**Table 5-7** displays the RPZ dimensions as specified in FAA AC 150/5300-13.

**TABLE 5-7  
 RUNWAY PROTECTION ZONE (RPZ) DIMENSIONS**

Approach Visibility Minimums	Aircraft Expected To Serve	Dimensions			
		Length (feet)	Inner Width (feet)	Outer Width (feet)	RPZ Acres
Visual and not lower than 1-mile	Small Aircraft Exclusively	1,000	250	450	8.035
	Aircraft Approach Categories A & B	1,000	500	700	13.770
	Aircraft Approach Categories C & D	1,700	500	1,010	29.465
Not lower than 3/4-mile	All Aircraft	1,700	1,000	1,510	48.978
Lower than 3/4-mile	All Aircraft	2,500	1,000	1,750	78.914

Source: FAA Advisory Circular 150/5300-13, *Airport Design*

Currently, both Runways 11/29 and 6/24 at Flagler County Airport have non-precision instrument approaches with visibility minimums not lower than 1 mile. As shown in Table 5-7, these approach minimums indicate that Runways 11/29 and 6/24 should have RPZs that measure 1,700 feet in length, with an inner width of 500 feet, and an outer width of 1,010 feet. Based on these dimensions, RPZs at the Airport each encompass an area of approximately 29 acres. Current RPZ measurements at Flagler County Airport meet these FAA minimum standards for aircraft in approach categories C and D.

The establishment of a precision approach would increase the dimensions for RPZs under visibility minimums of less than 1-mile. The implementation of a MALSR, with lower than 3/4-mile visibility minimums, also increases the dimensions of the RPZ. Therefore, the RPZ would be 2,500 feet in length, with an inner width of 1,000 feet and an outer width of 1,750 feet. This represents a total of nearly 79 acres. The RPZ for the opposite end would be 1,700 feet in length,

with an inner width of 1,000 feet and an outer width of 1,510 feet. This would contain an area of approximately 49 acres of land.

The RPZ contains two sub-areas, the runway object free area (OFA) and the controlled activity area. These two sub-areas are described as follows:

- **Runway Object Free Area** - The runway Object Free Area (OFA) is a two-dimensional ground area surrounding the runway that prohibits parked aircraft and objects, except NAVAIDs and objects with locations fixed by function, from locating there. For Runways 11/29 and 6/24 at Flagler County Airport, the OFA should extend 1,000 feet beyond each runway end and have a width of 800 feet. Current OFA measurements at Flagler County Airport meet these FAA minimum standards.
- **Controlled Activity Area** - The controlled activity area is the portion of the RPZ beyond and to the sides of the runway OFA. It is recommended that an airport control, in fee, this area. The controlled activity area should be free of land uses that create glare and smoke. Also, the construction of residences, fuel-handling facilities, churches, schools, and offices is not recommended in the RPZ's controlled activity area. Roads are also typically not recommended in this area.

#### *Runway Safety Area*

The Runway Safety Area (RSA) serves as a safety area if an aircraft overruns the paved runway surface. According to the FAA's definition, the RSA should be cleared and graded and have no potentially hazardous ruts or surface variations. This area should also be drained through grading or by storm sewers. General requirements for grading of the RSA are 0 to -3 degree grade for the first 200 feet from the runway end, with the remaining longitudinal grade ensuring that no part of the RSA penetrate the approach surface or drop below a -5 degree grade.

For Design Standard D-III runways, the RSA is required to be 500 feet wide and extend 1,000 feet beyond the runway end. Currently, the RSAs for Runways 11/29 and 6/24 meet these length and width requirements. However, a visual inspection indicates that there are surface variations and terrain irregularities within the RSA that may need to be eliminated or minimized to ensure complete compliance with RSA requirements at Flagler County Airport. The FAA and FDOT typically require that all RSA standards be met before major runway projects are implemented.

#### *Obstacle Free Zone*

The runway Obstacle Free Zone (OFZ) is a three-dimensional volume of airspace that protects for the transition of aircraft to and from the runway. The OFZ clearing standards prohibit taxiing and parked airplanes and other objects, except frangible NAVAIDs or fixed-function objects, from penetrating this zone. The OFZ consists of a volume of airspace centered on the runway. In addition, some precision instrument runways are required to meet standards regarding inner-approach OFZs and inner-transitional OFZs.

The inner-approach OFZ is a defined volume of airspace centered on the approach area for runways with approach lighting systems. The inner-approach OFZ begins 200 feet from the runway threshold, at the same elevation as the runway threshold, and extends 200 feet beyond the last unit in the approach lighting system. It is the same width as the runway OFZ and rises at a slope of 50:1 away from the runway end.

The inner-transitional OFZ is a defined volume of airspace along the sides of the runway and the inner-approach OFZ. The inner-transitional surface OFZ applies only to precision runways and slopes out from the edges of the runway OFZ at a 3:1 ratio to a height of 150 feet above the Airport elevation.

The OFZs for Runways 11/29 and 6/24 at Flagler County Airport are 400 feet wide and extend 200 feet beyond the runway ends. Existing facilities at Flagler County Airport meet these FAA standards.

### Part 77 Surfaces

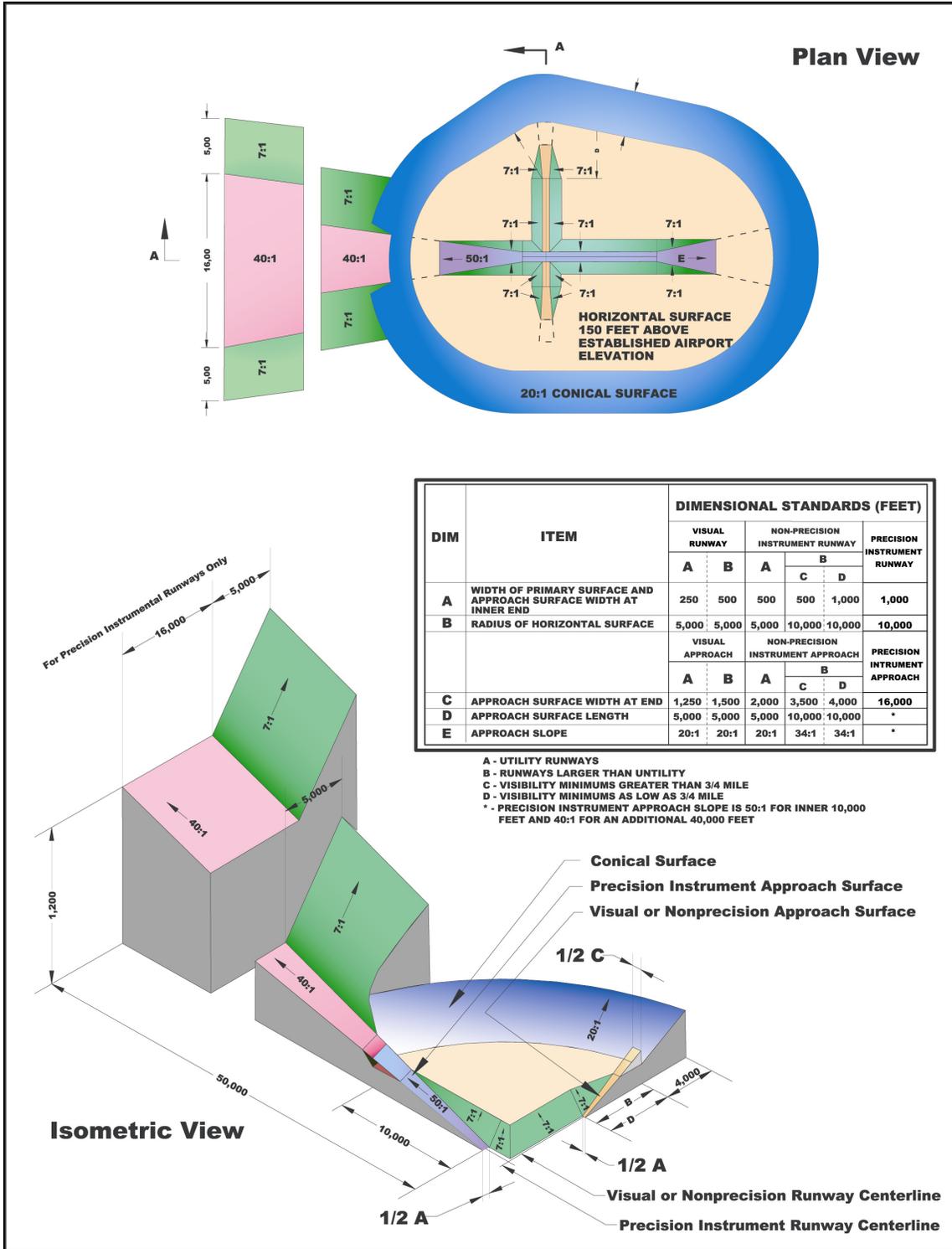
*Federal Aviation Regulation (FAR) Part 77 – Objects Affecting Navigable Airspace* establishes standards for determining which structures pose potential obstructions to air navigation. It does this through defining specific airspace areas around an airport that cannot contain any protruding objects. These airspace areas are referred to as “Imaginary Surfaces.” Objects affected include existing or proposed objects of natural growth; terrain; or permanent or temporary construction, including equipment, which is permanent or temporary in character. The imaginary surfaces outlined in FAR Part 77 include the following:

- Primary Surface
- Transitional Surface
- Horizontal Surface
- Conical Surface
- Approach Surface

Dimensions of FAR Part 77 surfaces, like RPZs, vary depending on the type of runway approach. Currently, Runways 11/29 and 6/24 accommodate only visual approach procedures. **Exhibit 5-2** graphically illustrates the FAR Part 77 “Imaginary Surfaces” in both plan view and profile view representations.

Although the FAA can determine which structures are obstructions to air navigation, the FAA is not authorized to regulate tall structures. Under FAR Part 77, an aeronautical study can be undertaken by FAA to determine whether the structure in question would be a hazard to air navigation. However, there is no specific authorization in any statute that permits the FAA to limit structure heights or determine which structures should be lighted or marked. In fact, in every aeronautical study determination, the FAA acknowledges that state or local authorities have control over the appropriate use of property beneath an airport’s airspace.

**EXHIBIT 5-2  
 FAR PART 77 "IMAGINARY SURFACES"**



The definitions for the FAR Part 77 surfaces are as follows:

#### *Primary Surface*

The primary surface is longitudinally centered on a runway. When the runway has a hard surface, the primary surface extends 200 feet beyond each end of the runway. The width of a primary surface ranges from 250 feet to 1,000 feet, depending on the existing or planned approach and runway type (e.g., visual, non-precision, or precision).

#### *Transitional Surface*

Transitional surfaces extend outward and upward at right angles to the runway centerline, with the runway centerline extended at a slope of seven feet horizontally for each foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to where they intercept the horizontal surface at a height of 150 feet above the runway elevation. Transitional surfaces for those portions of the precision approach surface, which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet horizontally from the edge of the approach surface and at right angles to the runway centerline.

#### *Horizontal Surface*

The horizontal surface is a horizontal plane located 150 feet above the established airport elevation, covering an area from the transitional surface to the conical surface. The perimeter is constructed by swinging arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those areas. For all approaches to runways supporting large aircraft, the radius of each arc used to construct the horizontal surface is 10,000 feet.

#### *Conical Surface*

The conical surface is a surface extending upward and outward from the periphery of the horizontal surface at a slope of one foot for every 20 feet (20:1) for a horizontal distance of 4,000 feet.

#### *Approach Surface*

Longitudinally centered on the extended runway centerline, the approach surface extends outward and upward from the end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach. The approach slope of a runway is 20:1, 34:1, or 50:1, depending on the sophistication of the approach. FAA approach surfaces are 20:1 for visual approaches, 34:1 for non-precision approaches, and 50:1 for precision approaches.

### 5.3 LANDSIDE FACILITY REQUIREMENTS

Landside facilities at Flagler County Airport include all areas, buildings, and amenities that are not considered part of the airfield system that was examined in the previous sections. Landside facility requirements were developed based on existing landside facilities, current and planned utilization of those facilities, projected aviation demand, and the Airport’s developable land envelope. The projected aviation activity indicates that Airport activity could increase to approximately 135 based aircraft and up to 372,600 aircraft operations by the end of the planning period. The Airport’s landside requirements were identified for the following:

- Aircraft Storage
- Terminal/Administration Building
- Automobile Parking
- Maintenance Facilities
- Fuel Storage and Distribution
- Aircraft Rescue and Firefighting
- Airport Safety/Security

#### Aircraft Storage

Storage needs for general aviation aircraft reflect local climatic conditions and the size and sophistication of the Airport’s based aircraft fleet. Typically, the more valuable the aircraft, the more likely it is to be stored in large, more secure facilities. There are two primary types of aircraft storage in use at Flagler County Airport: hangar storage and tie-downs. Facility requirements for each of these aircraft storage types are discussed in the following sections:

- Apron Tie-Down Storage Requirements
- Hangar Storage Requirements

**Table 5-8** illustrates the current based aircraft storage by type at Flagler County Airport.

**TABLE 5-8  
 CURRENT BASED AIRCRAFT STORAGE**

Year	Aircraft Tie-Downs	T-Hangars	Conventional Hangars	Total Aircraft Storage	Total Based Aircraft
2003	42	36	6	84	62
2004E ***	42	36	10	86	78
% of Total Based Aircraft (2004E)	54%	46%	13%	113%	-

\*\*\* The Airport is constructing 10 condo-hangar units which will bring the total number of conventional hangar spaces to 20 and total aircraft storage units to 96.

Source: Airport Inventory

As Table 5-8 indicates, the Airport currently has a surplus of aircraft storage space. While the based aircraft storage characteristics shown will fluctuate through the planning period as a result

of the movement of based aircraft to or from the Airport and the construction of new storage facilities, it is anticipated that current storage ratios will represent future storage preferences at Flagler County Airport. Therefore, current based aircraft storage characteristics at the Airport are used in the following sections to develop estimates of future storage requirements.

#### *Apron Tie-Down Storage Requirements*

Based aircraft not stored in hangar facilities require parking positions on the apron. In addition, transient aircraft flown to the Airport for business and pleasure-related activities, or available maintenance and services, also require short-term parking positions on the apron. Aircraft tie-down storage requirements are calculated by independently examining the needs of both based aircraft and transient aircraft.

There are 42 paved apron tie-down spaces that are used to serve the needs of based and itinerant aircraft at Flagler County Airport. Currently, nine based aircraft are reportedly permanently stored in tie-down spaces and the Airport's 33 remaining tie-down spaces support transient traffic. The Airport stores an average of approximately 21 aircraft in tie-downs per night.

The number of transient operations occurring at an airport impacts storage requirements for transient aircraft. As the number of operations increase, the demand for itinerant apron will also increase. In order to calculate the demand for itinerant apron at Flagler County Airport, the following methodology was used:

- Estimate the number of itinerant operations (2004E: 116,300, 2022: 249,600).
- The number of annual itinerant operations is multiplied by 50 percent (50 percent of the operations equal departures), divided by 12 (12 months per year), and divided again by 31(days in peak month). This number is assumed to be the average daily number of itinerant arrivals.
- This number is increased by 10 percent to account for busy periods.
- It is assumed that 35 percent of the busy day arrivals will be on the apron at any one time.

Following this methodology, the estimated demand in 2004 is for approximately 60 transient apron tie-down spaces during peak periods. By 2022, transient tie-down requirements are estimated at approximately 129 spaces. The same calculation can be used to determine the number of apron tie-down spaces that are needed to accommodate transient aircraft during each of the forecast periods.

In addition to the demand for apron tie-down storage from transient aircraft, it is estimated that a certain percentage of the Airport's based aircraft fleet, primarily smaller single-engine piston aircraft, will be permanently stored in apron tie-down positions. As mentioned previously, nine aircraft are currently stored permanently in tie-down spaces. This accounts for approximately 12 percent of the current based aircraft fleet. To estimate the number of apron tie-down spaces that would be required to accommodate based aircraft through 2022, it is assumed that 12 percent of the based aircraft fleet will be stored on the apron throughout the planning period. Therefore, by 2022 when 135 aircraft are forecasted to be based at the Airport, approximately 16 aircraft will be permanently stored in apron tie-down spaces by 2022.

**Table 5-9** presents the apron tie-down storage requirements for each forecast year in the 20-year planning period.

**TABLE 5-9  
 APRON TIE-DOWN STORAGE REQUIREMENTS**

Year	Based Aircraft	Based Aircraft Tie-Downs	Transient Aircraft Tie-Downs	Total Tie-Downs
2003	62	9	33	42
2004E	78	9	33	42
2007	85	10	72	82
2012	99	11	92	103
2017	116	13	111	124
2022	135	16	129	145

Source(s): Airport Inventory  
 Wilbur Smith Associates

*Hangar Storage Requirements*

Existing hangar storage facilities at Flagler County Airport include the following:

- T-hangars
- Conventional Hangars

General descriptions of these existing hangar storage facilities as well as future requirements of each are presented in the following sections.

T-Hangars

T-hangar buildings at Flagler County Airport are located on the north side of Taxiway A and near Runway 11. The 36 existing T-hangar units are currently used to store 36 based aircraft and there is a waiting list of 53 parties who are interested in T-hangar space. Aircraft stored in T-hangars account for 46 percent of the based fleet in 2004, however a substantial waiting list indicates that there would be an additional 53 based aircraft at the Airport if there were adequate T-hangar units to store them. This would represent that approximately 68 percent of based aircraft would be stored in T-hangars. Due to this considerable waiting list for T-hangar storage, it is assumed that the percentage of the based aircraft fleet stored in T-hangars will increase steadily from this level (68 percent of total based aircraft stored in T-hangars) through the end of the planning period. This methodology produces an estimate indicating that an additional 62 T-hangar units should be constructed by 2022 to accommodate market demand.

### Conventional Hangars

When construction is completed in 2004, there will be 20 conventional or box hangars at Flagler County Airport. This includes 10 condo-hangar units planned for the northwest side of the airfield. At this point, approximately 26 percent of the Airport's total based aircraft will be permanently stored in conventional/box hangars in 2004.

The development of additional conventional hangar facilities at the Airport will be an important consideration over the 20-year planning period of the Master Plan Update. These hangars typically house corporate aircraft in support of flight departments associated with local businesses. Due to the high cost of jet aircraft, owners typically prefer conventional hangars for storage.

Based on the significant increases estimated for T-hangar storage units, it is reasonable to anticipate the percentage of based aircraft stored in conventional hangars to remain relatively stable over the planning period. For this reason, it is estimated that 26 percent of based aircraft in 2022 (36 aircraft) will require conventional hangar storage at that time. This indicates a need for 16 additional conventional units by 2022. This level of conventional hangar storage should be adequate to accommodate the 10 jet aircraft projected to be based at Flagler County Airport by 2022.

### Hangar Storage Summary

As the number of based aircraft at Flagler County Airport increases, so will the need for T-hangar and conventional/box hangar facilities. All facilities should be located to provide adequate access to auto parking in addition to fuel and airside facilities.

**Table 5-10** presents the hangar storage requirements for each forecast year in the 20-year planning period at Flagler County Airport.

**TABLE 5-10  
HANGAR STORAGE REQUIREMENTS**

<b>Year</b>	<b>Based Aircraft</b>	<b>T-Hangars</b>	<b>Conventional Hangars</b>	<b>Total Hangars</b>
2003	62	36	6	42
2004E	78	36	20	56
2007	85	60	24	84
2012	99	70	28	98
2017	116	84	30	114
2022	135	98	36	134

Source(s): Airport Inventory  
Wilbur Smith Associates

Terminal/Administration Building

The primary function of the Flagler County Airport terminal/administration building is to serve as the focal point of pilot and passenger transfer between ground transportation and aircraft. The secondary purpose is to provide office and functional space for Airport management personnel.

The FAA recommends 180 square feet of office space be provided for a manager and one secretary at a small general aviation airport. An average of 40 square feet per individual is routinely used for determining the size of pilot and passenger waiting areas. To calculate the terminal/administration space required for an improved Flagler County Airport, estimated peak hour itinerant operations were estimated using the same calculation presented in Chapter Three for determining total peak hour operations. These estimates were then multiplied by two and one-half. This is the average occupancy of a general aviation aircraft, including the pilot. **Table 5-11** presents a summary of the space recommended for a terminal/administration space to accommodate demand through the 20-year planning period.

**TABLE 5-11  
 TERMINAL/ADMINISTRATION REQUIREMENTS**

Year	Itinerant Operations	Peak Month Average Day	Peak Month Peak Hour	Peak Hour Persons	Minimum Space
2003	116,277	488	59	146	5,900
2004E	116,300	488	59	146	5,900
2007	138,400	580	70	174	7,000
2012	177,600	745	89	223	8,900
2017	214,500	900	108	270	10,800
2022	249,600	1,047	126	314	12,500

Source: Wilbur Smith Associates

All of the primary operational activities at the Airport are currently housed in a 3,200-square foot structure. As shown in Table 5-11, the existing Airport administration building lacks the space required to adequately serve the Airport’s current activity. To accommodate demand through the planning period, an expansion of the existing facility or construction of a new facility of approximately 12,500 square feet is recommended to accommodate the projected peak hour passengers.

Due to the projected growth of the Airport, it is reasonable to anticipate the need for fixed based operator (FBO) services on the Airport during the planning period. The County and Airport staff must decide at what point it becomes economically beneficial to procure an FBO rather than continuing to provide those services with County employees. Additionally, adequate space should be considered to accommodate at least one competing operation in order to maintain compliance with FAA regulations regarding exclusive rights. If an FBO were established on the Airport, any terminal or administration structure they would require would count toward the requirements presented in Table 5-11.

The administrative area of an expanded or new terminal building would house such functions/facilities as the Airport administrative offices, administrative support, the Airport business office, a conference room, and other offices available for rent for aviation-related uses.

The services wing of an expanded or new terminal building would house such functions/facilities as the customer service desk, the line service office, a passenger lobby/waiting room, a pilot’s lounge, sleep rooms with showers, a business center with office supplies, and/or a restaurant overlooking the airfield. In the event that the construction of a new terminal/administration building is preferred over the existing structure, an aircraft maintenance hangar should be considered as part of the new terminal building.

Automobile Parking

Vehicle parking for the Airport is currently located between the administration building and High Jacker’s Restaurant building on the north side of the airfield. Currently, there are 35 general aviation patron parking spaces available for visitors. Mudry Aviation occupies an additional 15 parking spaces.

A general estimate of the total number of automobile parking spaces the Airport requires for general aviation users can be obtained by using the following methodology. At general aviation airports, a rule of thumb is that approximately two parking stalls per operation during the peak hour are required to accommodate pilots and passengers. However, due to the extent to which flight-training operations occur at Flagler County Airport, this ratio should be applied to the projected levels of itinerant operations. This method will provide a more reasonable estimate of auto parking requirements that will be necessary to accommodate transient aircraft operations. This is especially true given that the Airpark Phase A and Flight Training Complex includes 150 auto spaces.

The Airport’s general aviation parking needs, based on a ratio of approximately two parking stalls per itinerant operation during peak hours, are shown in **Table 5-12**.

**TABLE 5-12  
 AUTO PARKING REQUIREMENTS**

	Existing 2004E	Required 2004E	2007	2012	2017	2022
Auto Parking Spaces	50	161	182	220	255	290

Source: Wilbur Smith Associates

Table 5-12 indicates that parking spaces at the Airport are not sufficient to accommodate existing demand. The methodology used indicates that, as the activity at the Airport increases, the Airport’s shortfall in available parking spaces will continue to increase, which will impact the Airport’s ability to adequately serve users, visitors, and businesses. As shown, approximately 290 auto parking spaces are required to accommodate demand through the 20-year planning period. This represents a need for nearly 240 more parking spaces, in addition to the 150 auto spaces that are planned in conjunction with the Airpark Phase A and Flight Training Complex.

### Maintenance Facilities

Flagler County Airport currently has several maintenance hangars that are maintained by existing aviation tenants. Aside from these privately owned maintenance/storage facilities, no other Airport-owned maintenance facilities are currently located at the Airport. Routine mowing and related Airport maintenance is outsourced and/or performed by County maintenance departments. Equipment used in conducting this maintenance is primarily stored at the County Facilities Complex, which is located just a short distance west of the Airport. This eliminates the need for maintenance facilities to be located on the Airport. For this reason no changes to the current maintenance operations and/or maintenance facilities are recommended.

### Fuel Storage and Distribution

The Airport currently maintains two above ground fuel storage tanks on the west end of the terminal area, each with a capacity of 12,000 gallons. Additional fuel capacity is provided with two 1,800-gallon trucks. The Airport has identified the need for additional fuel capacity and has indicated that an additional 700-gallon fuel truck will be purchased in 2004. The avgas fuel pump operated by Flagler County is located on the west end of the airfield near the storage tanks, and a self-fuel avgas pump is also in operation.

Existing fuel storage and distribution facilities are adequate to serve the near-term demand projected for Flagler County Airport. However, in order to accommodate existing Airport tenants and users, planned development and anticipated growth in activity levels, the construction of additional bulk fuel storage facilities and fuel pumps is recommended.

### Aircraft Rescue and Firefighting

Flagler County recently constructed a fire and emergency medical services (EMS) station on the northern end of the Airport property. The Airport Fire/EMS Station has an engine/pumper with 1,000 gallons of water and a 1,250 gallons-per-minute pump. It should be noted that the engine is EMS equipped with Advanced Life Support equipment and has a paramedic as part of the three man crew. The station has a Woods Truck which carries 1,000 gallons of water. There is also two Medical Attack Vehicles (ambulances) assigned to the station, each with a crew of two medical staff per shift. The station operates on a 24/7 basis. A firefighting skidder is assigned to the station for fighting fires in rough terrain environments. There is also a FireFlight Helicopter stationed at the Airport with capabilities in fire suppression, aerial surveillance, and air ambulance transports. There is currently no equipment approved for Airport's Aircraft Rescue and Firefighting (ARFF) (i.e., crash truck, foam or dry chemicals) and firefighters have not been trained to provide such services.

Given the nature of current anticipated activity occurring at the Airport, it is recommended that the County pursue the purchase of ARFF equipment and training for firefighters at this station in the near term. Advanced ARFF facilities and equipment, meeting specific FAA requirements, would only be required at Flagler County Airport if it were to acquire Part 139 certification, allowing it to accommodate scheduled air carrier operations. However, given the anticipated

increasing nature of high-end corporate users, ARFF facilities and equipment would add to the overall safety of the Airport and are recommended.

#### Airport Safety/Security

Flagler County Airport has secured funding from the Florida Department of Transportation for the design and installation of security fencing, gating and operators (card-reading) to provide a safe and secure airfield appropriate for the activity underway at the Airport. This project is scheduled for final design and installation in 2004.

## **5.4 SUMMARY**

The analysis contained in this chapter of the Flagler County Airport Master Plan Update indicates that some landside and airside improvements will be required to meet projected demand levels. The following summarizes specific identified facility requirements:

- Alternative runway development scenarios that address runway/taxiway separation, runway safety area deficiencies, and other concerns will be examined in the alternatives chapter.
- The existing runway length and pavement strength is adequate to meet the needs of the existing critical aircraft identified for the Airport, however improvements will be necessary to accommodate anticipated future critical aircraft. An ultimate length for one runway of approximately 7,000 feet and increased pavement strength to 120,000 pounds dual-wheel loading are recommended for the Airport to accommodate frequent operations by larger general aviation jets.
- In the event that Runway 11/29 is selected for facility improvements to meet FAA design standards for facilities designated as ARC D-III, parallel Taxiway B shall be relocated or removed to provide adequate separation from the centerline of Runway 11/29.
- Clearing and grading of the Airport's RSA may be required to meet FAA design standards.
- Recommended lighting and NAVAID improvement projects for the Airport include a precision approach for Runway 11 and the installation of a MALSR for Runway 11.
- Construction of an additional 62 T-hangar units and 16 additional conventional hangar units is recommended.
- Improvements to the existing terminal/administration building are recommended up to approximately 12,500 square feet of total space.
- It is recommended that automobile parking should be expanded and/or reconfigured over the planning period to provide an ultimate capacity of approximately 440 spaces.
- The development of alternatives for the location of an Airport ATCT facility is recommended.
- An analysis is recommended to determine the costs and benefits associated with the procurement of a private enterprise Fixed Based Operator to provide aircraft services at the Airport.

The implementation of these facility requirements will likely occur in several phases. Likewise, several development alternatives will be considered that will allow Flagler County Airport to accommodate the forecasted levels of demand through implementing the facility improvements recommended in the previous sections in phases. Phasing of these recommendations are presented in **Table 5-13**.

**TABLE 5-13  
 SUMMARY OF FACILITY REQUIREMENTS**

Facility Improvement	Existing	Short Range	Intermediate	Long Range
		2004-2007	2007-2012	2012-2022
Runway System (Length in Feet) <sup>1/</sup>	4,999/5,000	7,000		
Taxiway System				
Taxiway A	-	Extend	-	-
Taxiway B	-	Relocate/Remove	-	-
FAA Airfield Safety Areas (Length in Feet)				
RPZ Length	1,700	2,500	-	-
RPZ Inner Width	1,000	1,000	-	-
RPZ Outer Width	1,510	1,750	-	-
RPZ Acres	29.465	78.914	-	-
NAVAIDS/Lighting				
Precision Instrument Approach	-	✓	-	-
MALSR	-	✓	-	-
Air Traffic Control Tower	-	✓	-	-
Aircraft Storage Space (Total)				
Tie-down Spaces	42	82	103	145
Conventional/Box Hangars	20	24	28	36
T-Hangars	36	60	70	98
Terminal Space (Total Square Feet)	3,200	7,000	8,900	12,500
Auto Parking Spaces (Total)				
Terminal/Administration Parking	-	160	206	289
Airpark Phase A & Flight Training	-	150	-	-
Aircraft Rescue and Firefighting	-	✓	-	-
Airport Safety/Security	✓	-	-	-

<sup>1/</sup> The alternatives analysis examines which runway shall be the primary runway and extended to 7,000 feet.  
 Sources: Airport Inventory  
 Wilbur Smith Associates