Tampa International Airport

Hillsborough County Aviation Authority
Tampa International, Peter O. Knight,
Plant City and Tampa Executive Airports

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2015 Master Plan Update for

Peter O. Knight Airport

Final Technical Report

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March 2018

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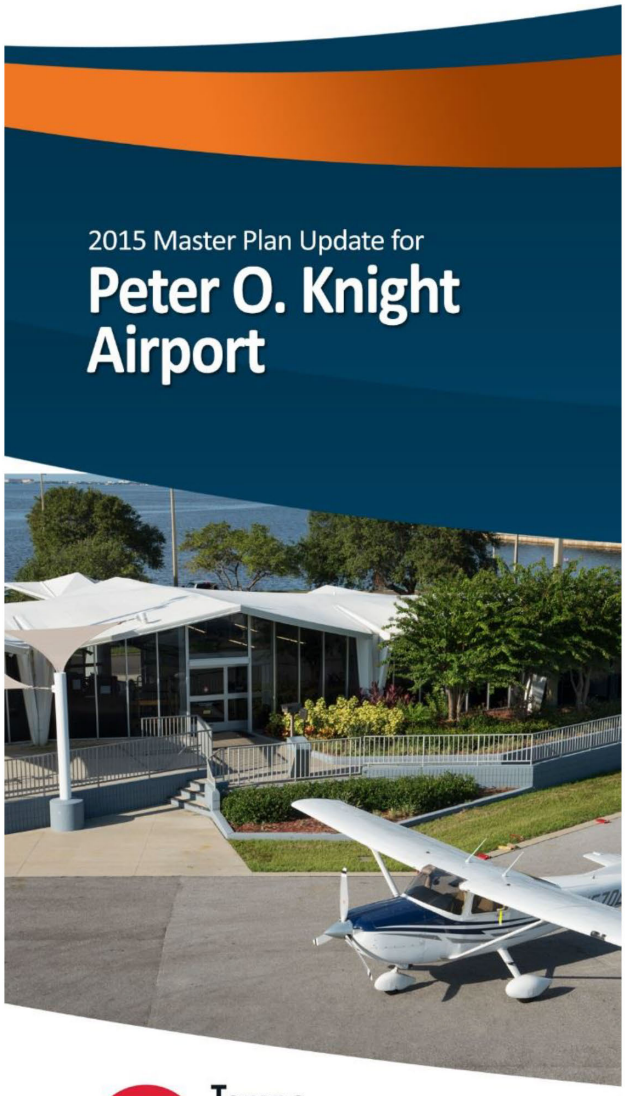

Tampa International Airport

Hillsborough County Aviation Authority

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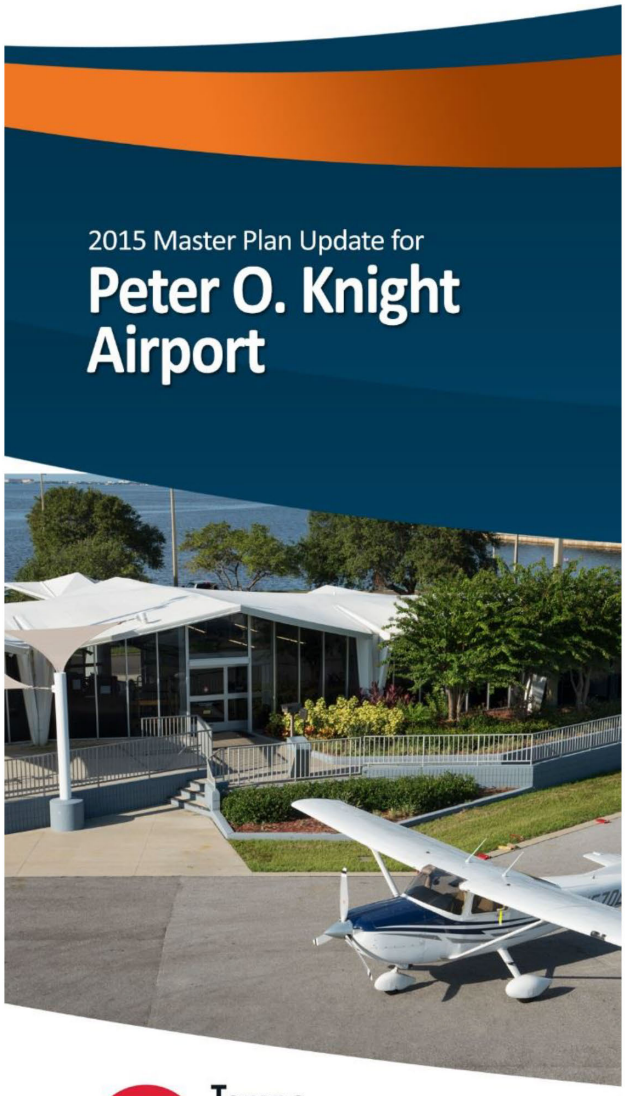


1.0 Introduction

1.1 Overview

In January of 2014, the Hillsborough County Aviation Authority (HCAA) contracted with Michael International, Inc. to develop a Master Plan Update for the Peter O. Knight Airport (TPF). The need for the update was essentially twofold. The primary reason was that the Federal Aviation Administration (FAA) requires airports receiving development grants to conduct periodic updates of their future development plans. Secondly, many changes had occurred in both the aviation industry as well as within the nation's economy since the previous Master Plan Update was completed in 2003. Therefore, it was necessary to reassess the 20-year development plans for the Peter O. Knight Airport.

Although the development of a Master Plan Update and associated Airport Layout Plan (ALP) Drawing Set serves many objectives, one of the most significant purposes it serves is to allow the airport to meet federal assurances for grant funding eligibility. In 1982, the federal government adopted the Airport and Airway Improvement Act, which allowed federal funds to be distributed through a grant program to airports throughout the country. The federal grants did not require repayment provided that certain rules were followed and adhered to (i.e., assurances). Over the years, the grant legislation has been revised, renamed, and expanded to presently include 39 separate assurances that must be met in order for an airport to be considered "compliant." The current grant program, referred to as the Airport Improvement Program (AIP), provides grant funding to cover a significant portion of the costs required to address airport safety, capacity, security, or environmental concerns. Grant Assurance Number 29 states that the airport sponsor will develop and maintain an ALP which denotes the airport's boundaries along with all existing and proposed development within. The ALP and any revision or modification thereof must be reviewed and approved via signature by an authorized representative of the United States Secretary of Transportation.

1.2 Public Involvement

The airport does not exist in a static environment, but rather within the context of a larger community. As such, any future developments identified by this study considered potential impacts to the community. Multiple opportunities were made available for community and governmental representatives to participate in this study. This involvement was facilitated through the formulation of a Master Plan Committee consisting of key stakeholders representing the FAA, Florida Department of Transportation, local planning organizations, the airport's fixed base operator, and representatives from HCAA and the master plan team. In addition, tenants and stakeholders were surveyed and interviewed to solicit key information in support of the planning process.

Over the course of the project, the master plan was supported by a robust public involvement program consisting two rounds of public open house meetings and a series of special presentations to the Metropolitan Planning Organization (MPO) and other local community organizations. Progress of the study was also presented and discussed in an open forum at HCAA briefings. Throughout the project, the local community was provided multiple opportunities to track the status of the plan and comment on project deliverables via the HCAA website.

1.3 Project Scope and Level of Effort

As part of this Master Plan Update, the HCAA wanted to focus on providing development recommendations that would help the airport become more financially self-sustainable while at the same time promoting airfield safety and satisfying aviation demand. Consequently, a parallel support effort concentrated on conducting a Strategic Business Plan to study the land development potential and opportunities for potential income generation. For that reason, the inventory and forecasting efforts were condensed to only focus on specific elements rather than an exhaustive discussion of multiple airport characteristics and activity variables. Additional efforts were allocated towards evaluating short-term and long-term facility needs, developing alternatives to fulfill the identified needs, and creating a financing plan that illustrates revenue-generating opportunities and also how the HCAA may fund the recommendations of this Master Plan Update.

1.4 Peter O. Knight Airport Key Issues

This Master Plan Update provides a comprehensive review of the airport's needs over the next 20 years including issues related to the timing of proposed developments, cost estimates, and financing and management options to provide a clear action plan for the HCAA. Prior to the start of the Master Plan Update, the HCAA identified the following key issues that should be addressed during this planning effort:

- Identify revenue-generating opportunities and/or provide development recommendations that may encourage revenue-generating opportunities in the future.
- Identify market demand in the context of a regional airport system.
- Review airport land parcels to identify the highest and best use of each in regards to its future development potential.
- Assess the operational efficiency, effectiveness and safety of the airport.
- Evaluate the airport facility layout for conformance with FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, as well as other applicable guidance.
- Review vertical obstacles located in the vicinity of TPF in comparison to the airport's airspace requirements.
- Assess the needs of current tenants and requirement improvements that will be necessary to attract new tenants and/or to expand existing tenant facilities.
- Assist the airport in supporting aviation demand within the HCAA's system of airports.
- Identify areas of environmental concern and provide mitigation options for future development.
- Evaluate long-term development options for general aviation and airport support facilities.

- Evaluate the airport's existing and ultimate runway length requirements to identify improvements necessary to meet demand and/or to entice additional traffic to the airport.

1.5 Process

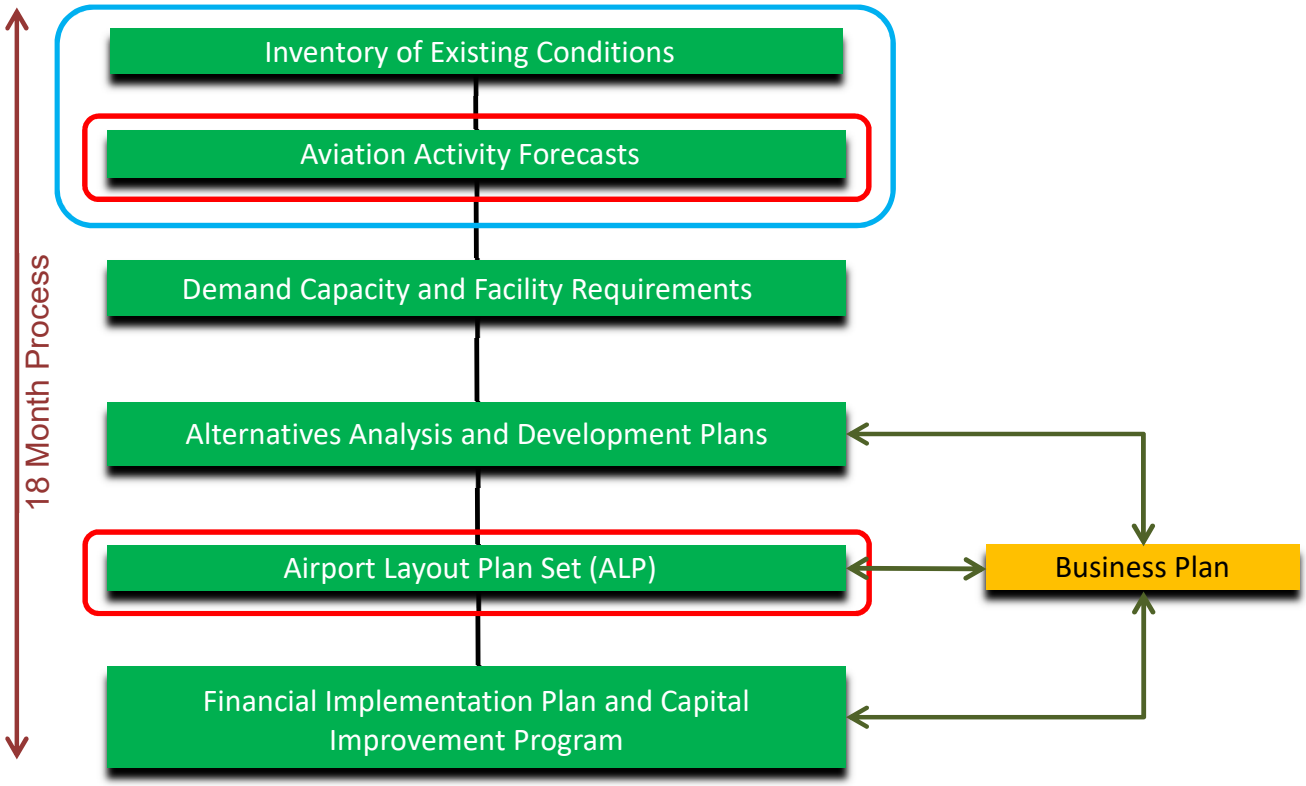
This Master Plan Update provides a systematic outline of the development actions that will be necessary to maintain and further develop TPF's airside and landside facilities. This process provides the officials responsible for the scheduling, budgeting, and ultimate funding of airport improvement projects with advanced notice of the future airport needs. By phasing the airport improvements, the development can be conducted in an orderly and timely fashion.

In order to accomplish the HCAA's long-term development goals for TPF, this Master Plan Update was prepared in accordance with FAA and the Florida Department of Transportation (FDOT) requirements. All portions of this document are based on the criteria set forth in the FAA AC 150/5070-6B, *Airport Master Plans*, and FAA AC 150/5300-13A, *Airport Design*. The following study tasks were performed for this effort:

- Conducted an inventory of the existing documents related to the airport, the physical airport facilities, the demographics of the airport service area, and the airport environment.
- Evaluated and compared the airfield capacity to the expected aviation activity.
- Determined the airport facilities improvements that will be necessary to meet the forecast demand.
- Developed and evaluated alternative methods to meet the facility requirements of the airfield.
- Developed a concise ALP Drawing Set that reflects proposed 20-year improvements.
- Compiled a schedule of the proposed improvements to include the cost estimates, phasing, and financial feasibility of each.

The individual report chapters provide detailed explanations of the tasks described above. It should be noted that each step in the master plan process is built upon information and decisions made during previous steps. Taken as a whole, they address the key issues identified in this chapter and describe how the study objectives were met.

Figure 1-1
Master Planning Process



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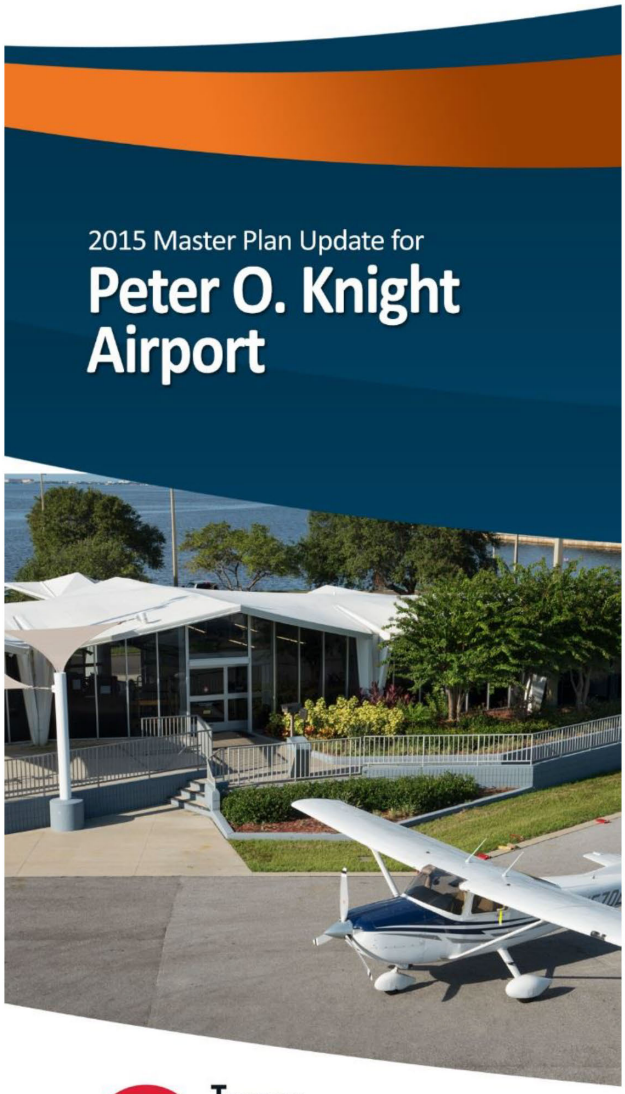
Chapter 2.0 Inventory of Existing Conditions



Tampa International Airport

Hillsborough County Aviation Authority

2.0 Inventory of Existing Conditions

2.1 Introduction

The master planning process requires the gathering of information related to the airport's existing airside and landside facilities. This information is important since it serves as the baseline for future evaluation steps throughout the remainder of the master planning process. For this reason, information related to the Peter O. Knight Airport (TPF) and its surrounding areas was collected, evaluated, and documented within this chapter. The data collected in this phase provides an inventory of the following:

- Existing physical facilities: runways, taxiways, aircraft parking aprons, navigational aids, airport terminal, and facility areas for general aviation, corporate, and aviation support activities.
- Locale and climate information related to TPF.
- Airspace environment and land use controls within the vicinity of the airport.
- The airport's overall role in central Florida: development history, location, and access relationship to other transportation modes.

2.2 Airport History, Land Holdings, and Role

In an effort to combat the Great Depression in the United States, Franklin D. Roosevelt created the Works Progress Administration (WPA) which funded various public works projects for state and local governments including bridges, schools, roads, and other transportation projects throughout the U.S. In recognition of the need for a public use airport, the City of Tampa made plans to utilize WPA funds to construct a new airport in the Tampa area. A site was identified in south Tampa within the Davis Islands development area. The construction of the airport included substantial dredging to create additional land needed for the new runways and also to fill one of the original canals that ran through the western edge of the airport site. Once completed, the overall construction costs amounted to $426,264.

Peter O. Knight was a prominent lawyer, businessman, and an influential member of the Tampa City Council who earned his law degree by the age of 18 and was elected mayor of Ft. Myers before his 21st birthday. Knight convinced financiers to invest in property on Davis Islands and was also instrumental in arranging the property transfer and development of the land that would later become the airport site. Due to his contributions to the Tampa area and role in the development of the airport, it was appropriately named the Peter O. Knight Airport.

Since it was originally constructed, the airport has experienced multiple airside and landside configuration changes including the demolition and reconstruction of multiple T-hangars located in the midfield and the addition of a parallel taxiway along the western side of Runway 18-36. In 1999, the Hillsborough County Aviation Authority (HCAA) purchased the airport from the City of Tampa for approximately $4.2 million. Over the past 15 years, the HCAA has continued to maintain and improve the airport by adding several additional facilities including a new administration building located west of the main terminal, a new fuel farm, a helicopter parking area, additional aircraft parking apron, and recently the addition of two large enclosed hangars that

are located on the easternmost portion of the airfield located near the Seddon Channel. Presently, the airport acts as a reliever to the Tampa International Airport (TPA) and serves as a base for more than 110 aircraft owners and operators. The airport property comprises approximately 143 acres on the southern tip of the Davis Islands and its proximity to downtown Tampa makes it convenient and accessible to facilities such as Tampa General Hospital, the Amalie Arena, Tampa Convention Center, Channelside Bay Plaza, and the Port of Tampa.

FAA-designated Aeronautical Role

As part of the FAA's development and classification of public use airports within the Nation Plan of Integrated Airports (NPIAS), the National Asset Study (ASSET 1) classifies and further defines the activity and levels of service offered by three types of nearly 3,000 airports, heliports, and seaplane bases. The study aligns the general aviation airports into four categories---National, Regional, Local, and Basic to better capture their diverse functions and the economic contributions general aviation airports make to their communities and the Nation.

TPF is currently classified as one of 467 NPIAS listed general aviation airports having a "Regional" Role that supports regional economies by connecting communities to statewide and interstate markets. This type of ASSET-classified airport is typically characterized as having high levels of activity with some jets and multiengine propeller aircraft. The airport, on average, accommodate approximately 90 based aircraft, including 3 jets.

2.3 Location / Locale

As shown in **Figure 2-1**, the Peter O. Knight Airport is located approximately 2.5 south of downtown Tampa and approximately 3.5 miles south of the Interstate 4 / Interstate 275 interchange. Situated at the southern end of the Davis Islands, the airport is surrounded by residential areas, recreational trails, dog parks and the Davis Island Yacht Club. The Port of Tampa is also located nearby to the east across the Seddon Channel. The nearest public use airport in the vicinity of TPF is TPA which is located approximately 5.7 nautical miles to the northwest. MacDill AFB is located 6 nautical miles to the southwest. **Table 2-1** provides a brief comparison of the public airports located within a 20 nautical mile radius along with their respective facilities and associated distances from TPF.

Figure 2-1
Locale

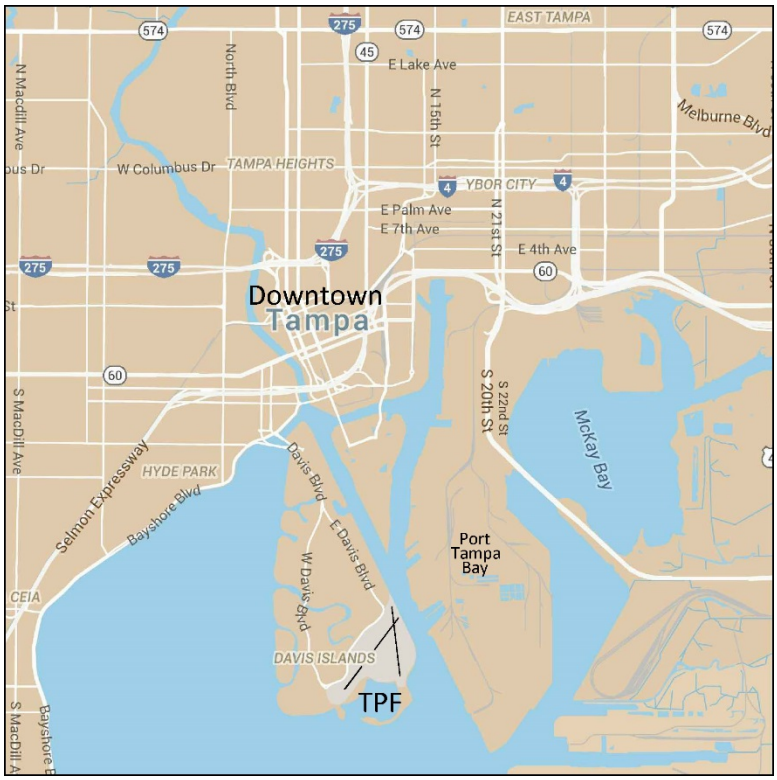


Table 2-1 Public Airports In The Region			
Airport	NM from TPF	Runways	Published Instrument Approach Procedures
Tampa International (TPA)	5.7 NW	1L-19R (11,002' x 150') 1R-19L (8,300' x 150') 10-28 (6,999' x 150')	ILS, RNAV, LOC
Tampa Executive (VDF)	8.1 NE	5-23 (5,000' x 100') 18-36 (3,219 x 75')	ILS, LOC, RNAV
St. Petersburg-Clearwater International (PIE)	12.6 W	18L-36R (9,730' x 150') 4-22 (5,903' x 150') 9-27 (4,712' x 150')	ILS, LOC, RNAV, VOR, DME
Albert Whitted (SPG)	13.0 SW	7-25 (3,677' x 75') 18-36 (2,864 x 150')	RNAV, VOR
Plant City (PCM)	16.0 E	10-28 (3,948' x 75')	RNAV, VOR
Tampa North Aero Park (X39)	18.8 N	14-32 (3,541 x 50')	None
Source: FAA Airport/Facility Directory, effective August 20, 2015.			

2.4 Climate

Due to its location within the west central region of Florida and close proximity to the warm waters of the Gulf of Mexico, temperatures within the Tampa area typically include hot and humid summers and relatively mild winters. The average low in the summer months (June, July, August, and September) varies between 75 and 76 degrees Fahrenheit; whereas, the average high during the same months is relatively steady around 90 degrees Fahrenheit. During the winter months (December, January, and February), the average high temperature varies between 70 and 73 degrees Fahrenheit; whereas, the average low temperature during the same months varies between 52 and 55 degrees Fahrenheit. In regards to precipitation, the wettest months of the year are June, July, August, and September with an average precipitation which varies between six and eight inches per month. The precipitation amounts during the remaining eight months of the year typically average between 1.5 and three inches of rain per month.[1]

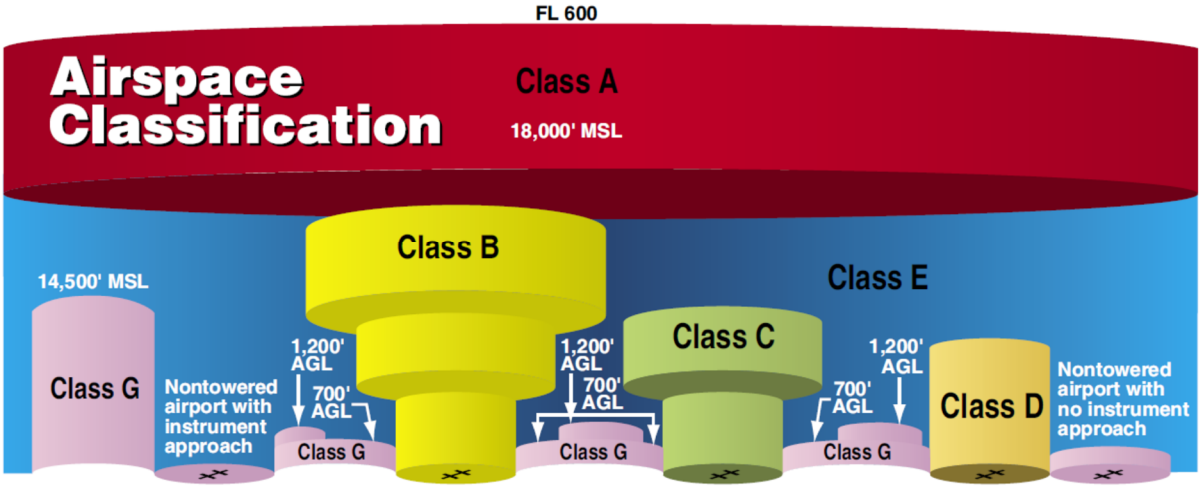
2.5 Airspace Environment

Because TPF is located within 30 nautical miles of TPA, it is located within TPA's Mode C Veil, which requires all aircraft operating at TPF be equipped with a two-way radio and a Mode C transponder. TPF is also located beneath TPA's Class 'B' airspace where all aircraft operating between 1,200 feet Above Mean Sea Level (AMSL) and 10,000 feet AMSL must obtain clearance from Tampa Approach/Departure. Furthermore, TPF itself is located within Class 'E' airspace where aircraft that are operating under Instrument Flight Rule (IFR) conditions must obtain clearance from Tampa Approach/ Departure when operating between 700 feet Above Ground Level (AGL) and 18,000 feet AMSL. Lastly, due southwest of TPF is the Class 'D' airspace associated with MacDill Air Force Base (MCF). MacDill's controlled airspace extends from the surface to 2,600 feet AMSL. Civilian aircraft flying at attitudes less than 2,600 feet AMSL are not ordinarily authorized to fly within MCF's Class 'D.' All other Visual Flight Rule (VFR)

[1] www.weather.com, accessed April 1, 2014.

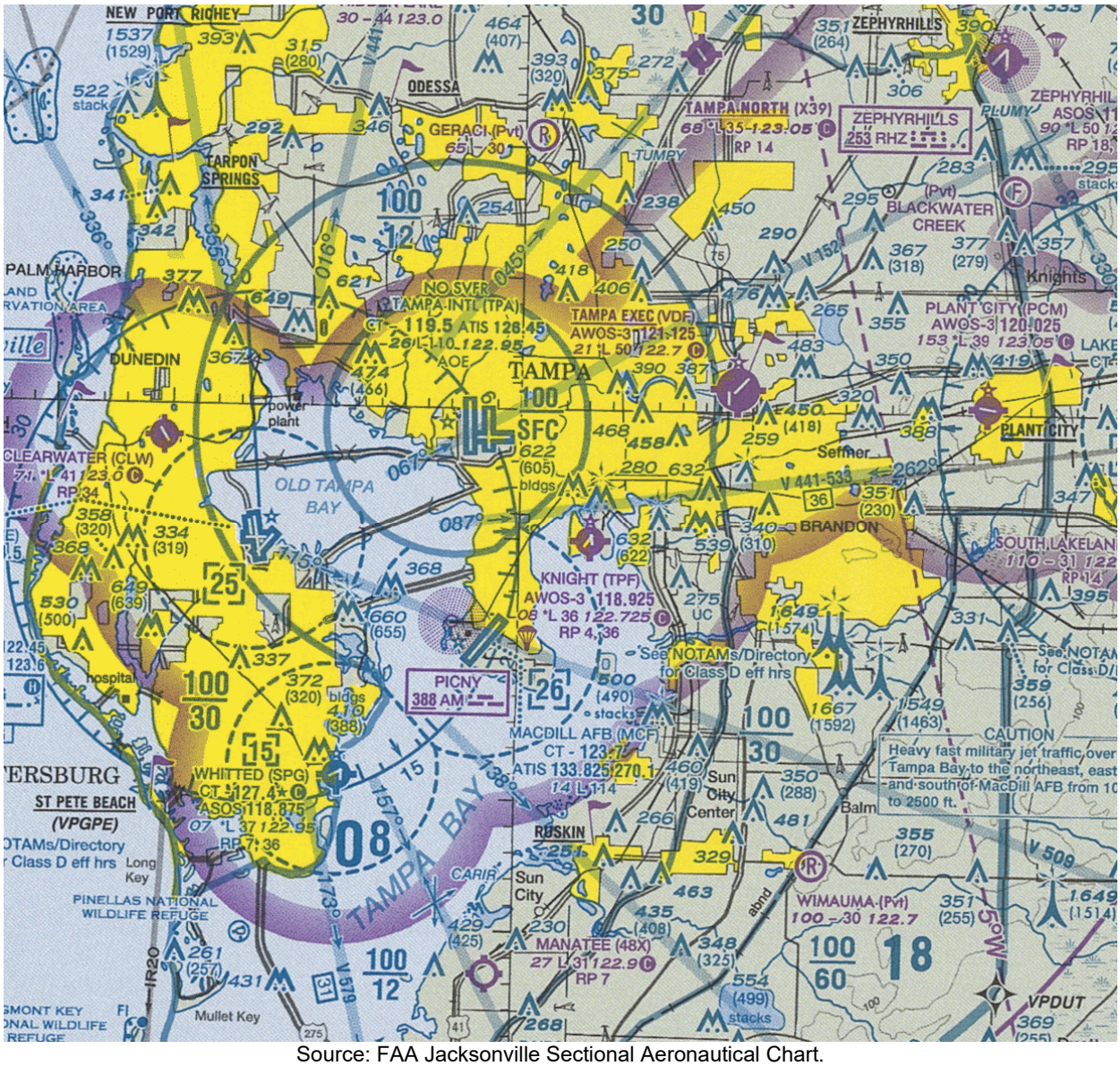
activity that is not subject to the clearance requirements typically communicate (self-announce) by using the Common Traffic Advisory Frequency (CTAF) (frequency 122.725 MHz) once in the vicinity of the airport or traffic pattern. **Figure 2-2** graphically depicts a comparison of the airspace classes by type; whereas, the aeronautical chart for TPF and the surrounding areas is shown in **Figure 2-3**.

Figure 2-2
Airspace Classes



Source: FAA 2013 Pilot's Handbook of Aeronautical Knowledge.

Figure 2-3
Aeronautical Chart



Source: FAA Jacksonville Sectional Aeronautical Chart.

2.6 Airport Zoning and Land Use Controls

On April 1, 2010, the HCAA adopted Resolution No. 2010-54, Airport Zoning Regulations for Tampa International, Peter O. Knight, Plant City, and Tampa Executive Airports. The zoning regulations were established to promote aviation safety, to limit the height of structures located within the vicinity and approaches of airports, to discourage land uses that are incompatible with existing and planned airport operations, and to establish administrative procedures for the uniform review of land development proposals. The zoning regulations were based upon guidance provided in Florida Statute 333, Federal Aviation Regulations (FAR) Part 77, and FAR Part 150 regulations which address land use compatibility, height of objects in the vicinity of airports, and noise compatibility planning in relation to airport operations. As part of this Master Plan Update,

the HCAA's recently updated Airport Zoning Regulations were considered during the creation and evaluation of development alternatives and the selection of recommended developments that are illustrated on the Airport Layout Plan (ALP) for TPF.

In addition, HCAA has an interlocal agreement with the City of Tampa for land use and zoning. The City of Tampa Code of Ordinances (Section 27-171) also defines permitted uses, special requirements, and minimum building requirements for the area surrounding TPF that is zoned as an Airport Compatibility District (M-AP). The purpose of the M-AP zoning district is to control the height of structures in order to minimize the population surrounding the airport and to eliminate hazards to aircraft while in flight.

2.7 Airport Access and Parking

Although there are multiple interstates, state roads, county roads, and other methods to access the Tampa area as well as the vicinity of TPF, because of its location on Davis Islands, there is only one main route to the airport as shown in Figure 2-1. After crossing the bridge onto Davis Islands that leads to Davis Boulevard, the road eventually splits into East Davis Boulevard and West Davis Boulevard. Both of those roads lead to the same roundabout at Severn Avenue, which is the entrance road for the airport which leads to the terminal and hangar facilities. It is noted that Davis Islands is a largely residential community and automobile access to and from TPF requires travelling along roads that contain residential developments. The route along West Davis Boulevard mainly consists of single-family residences while the route along East Davis Boulevard contains a mix of single and multi-family residences as well as commercial development. Most of the automobile parking at TPF is located in the vicinity of the terminal and administration buildings; however, some aircraft owners also park inside their hangars while using their aircraft.

Although airport access is less than ideal because travelers must navigate through a local residential area in order to gain access to the airport property, any methods to improve access would not be deemed cost feasible or realistic. For this reason, no further evaluations of TPF's access requirements were conducted as a component of this study.

2.8 Airside Facilities

The inventory of airside facilities includes those facilities required to support the movement and operation of aircraft. Airside facilities include the airport's runway, taxiways, taxilanes, aprons, airfield lighting, navigational aids, pavement markings, and signage. The existing airfield facilities at TPF are discussed in the following sections and are illustrated in **Figure 2-3**.

Airfield Characteristics

The airfield at TPF consists of two runways with parallel taxiways. Runway 4-22 has a northeast-southwest orientation and is 3,583 feet long and 100 feet wide. There is a 175 foot long displaced threshold on Runway 4 and a 177 foot long displaced threshold on Runway 22. Both ends of the runway have non-precision markings and Medium Intensity Runway Lights (MIRLs) are provided along the edges of the runway. Parallel Taxiway A is 40 feet wide and runs along the east side of Runway 4-22 for the entire runway length. Runway 18-36 has a north-south orientation and is 2,687 feet long and 75 feet wide. There is a 203 foot long displaced threshold on the Runway 18

end and a 201 foot long displaced threshold on the Runway 36 end. Both ends of Runway 18-36 have non-precision markings and MIRLs are provided along the edges of the runway. Parallel Taxiway F is 35 feet wide and runs along the west side of Runway 18-36 for the entire runway length. Partial parallel Taxiway G is 35 feet wide and runs along the east side of Runway 18-36. There are several additional taxiways at TPF that provide access between the runways and the various landside areas. Medium Intensity Taxiway Lighting (MITLs) are provided along the edges of the taxiways. Signage is provided throughout the airfield that identifies the location of the runways, taxiways, and other airside facilities at the airport.

Apron Facilities

There is one large transient apron area and multiple tie-down areas available for transient and based aircraft parking at TPF. The transient apron area is located just north of and adjacent to the airport's terminal building and includes approximately 34,500 square feet of usable space for visitor aircraft parking. For based and longer-term transient aircraft parking, there are five designated tie-down areas available, all of which are located in the midfield between Runway ends 4 and 36. In total, these five areas provide parking for up to 63 fixed-wing aircraft. The northernmost apron parking area contains 13 parking spaces and includes additional wingtip separation to provide parking for larger twin-engine aircraft. In addition, a rotorcraft parking area is located north of the fuel storage facilities which provides space for the parking of three large rotorcraft.

Airfield Pavement

It is important to establish the condition of TPF's existing airfield pavements in order to determine the phasing of future maintenance and development needs. Most of the airfield pavement at TPF are currently in satisfactory to good condition; however, Runway 4-22, a large portion of Taxiway A, and many of the taxilanes that lead to the enclosed hangar facilities are in fair condition. The only pavement section identified which is currently in poor condition at TPF is a taxiway connector near the Runway 22 end. **Figure 2-5** illustrates the various conditions of the pavement facilities at TPF as indicated in FDOT's Statewide Airfield Pavement Management Program Report for District 7, dated June 2015.

Navigational Aids and Instrument Approaches

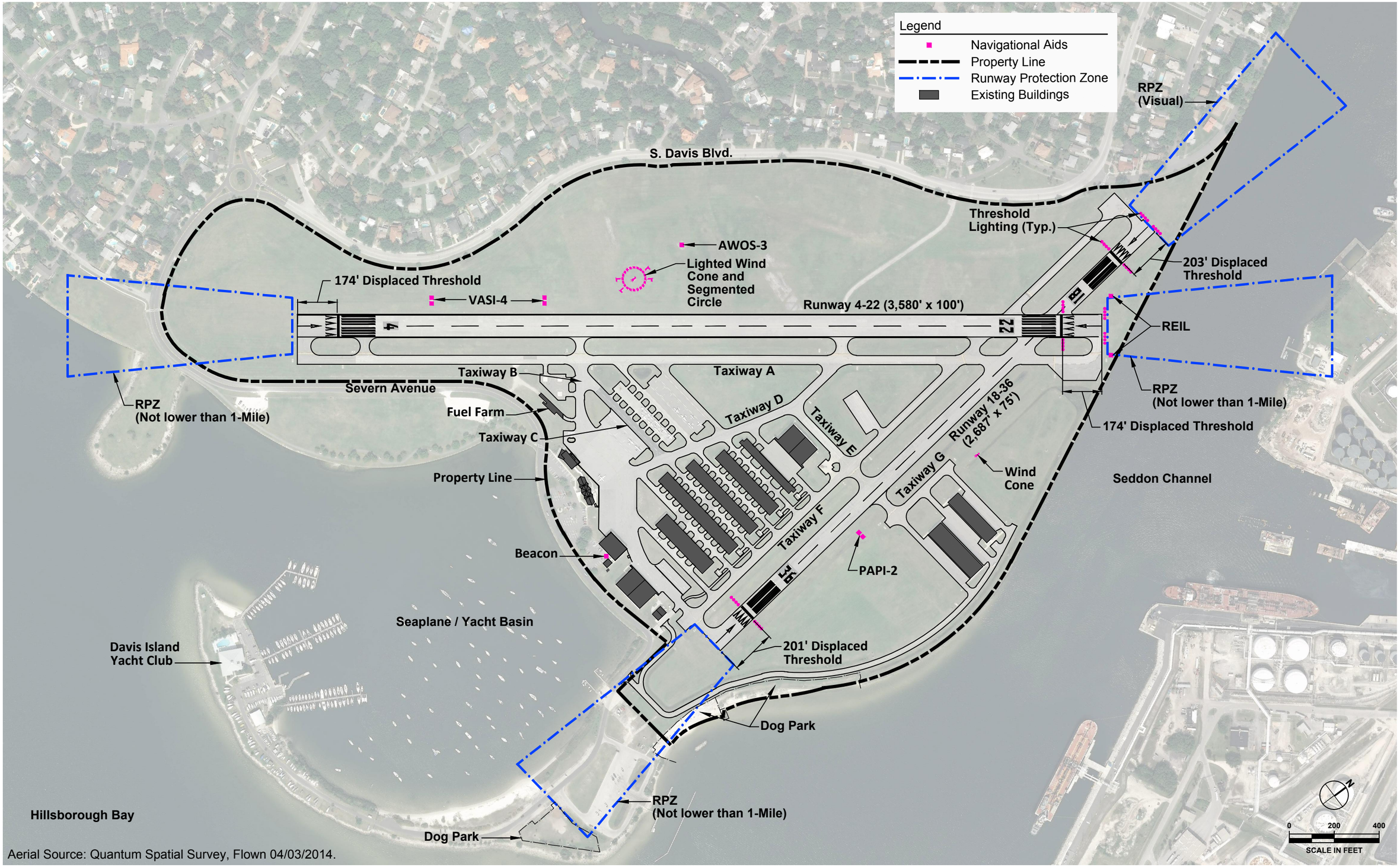
An airport's navigational aids and instrument approach facilities collectively allow pilots to navigate to the runway ends during poor visibility conditions. **Table 2-2** illustrates the various navigational aids that are available at TPF. **Table 2-3** identifies the instrument approach procedures that are currently published to the runway ends along with the lowest vertical and horizontal visibility minimums that are available for each runway end.

Table 2-2 TPF Navigational Aids		
Runway	**Navigational Aids**	**Runway Markings**
4	4-Light Visual Approach Slope Indicator (VASI-4L)	Non-Precision
22	GPS, Runway End Identifier Lights (REILs)	Non-Precision
18	N/A	Non-Precision
36	GPS, 2-Light Precision Approach Path Indictor (PAPI-2L)	Non-Precision
Airport	Beacon, Lighted Wind Cone and Segmented Circle	N/A
Sources: FAA Airport/Facility Directory, effective February 6, 2014, and FAA Terminal Procedures Publication, effective March 6, 2014.		

Table 2-3 TPF Instrument Approach Procedures			
Runway	**Runway Dimensions**	**Lowest Approach Minimums (Vertical / Horizontal)**	**Published Approaches**
4	3,583’ x 100’	No Published Procedures	N/A
22	3,583’ x 100’	LNAV (580’ AMSL / 1 Mile)	GPS (LNAV, Circling)
18	2,687’ x 75’	No Published Procedures	N/A
36	2,687’ x 75’	LP (440’ AMSL / 1 Mile)	GPS (LP, LNAV, Circling)
Sources: FAA Airport/Facility Directory and FAA Terminal Procedures Publication, effective August 20, 2015.			

Weather Facilities

The airport is equipped with an on-site Automated Weather Observation System (AWOS-3) that is located on the north side of Runway 4-22 between the runway and South Davis Boulevard. The AWOS-3 includes a suite of sensors that measure, collect, and broadcast weather data to help pilots and flight dispatchers prepare and monitor weather during all phases of flight including en-route, departures, and landings. The AWOS-3 reports several variables such as wind speed, wind gusts, wind direction, temperature, dew point, altimeter setting, density altitude, cloud height, sky conditions, and present weather. The AWOS-3 broadcasts at TPF are transmitted on frequency 118.925 MHz and can be received by aircraft operating at altitudes up to 10,000 feet AGL and as far away as 25 nautical miles. A lighted wind cone and segmented circle is also provided near the AWOS-3 to allow pilots to see the surface wind conditions while in-flight or on the ground.



Aerial Source: Quantum Spatial Survey, Flown 04/03/2014.

Figure 2-4 Existing Airside Facilities

Y:\Planning\HCAA\GA MPs Project - 2-6-2014\TPF\Drawings\(TPF)_Fig_2-5_Pavement Conditions Map.dwg March 14 2018-13:24

Michael Baker INTERNATIONAL

Figure 2-5 Pavement Conditions Map

Source: Florida Department of Transportation - Aviation and Spaceports Office, 2015.

2.9 Landside and Support Facilities

The inventory of landside and support facilities includes all facilities located within the airport boundaries that are not required for aircraft movement or air navigation. Some examples of these facilities include but are not limited to hangar structures, fuel storage and fueling facilities, and terminal/Fixed Base Operator (FBO) facilities. **Figure 2-6** presents a graphic illustrating the various landside facilities at TPF and **Table 2-4** contains a photo of each facility along with the size, capacity, and use of each.

Fixed Base Operator (FBO)

Atlas Aviation is the airport's only FBO at TPF and they provide services that include aircraft sales, aircraft rental, flight training, 100LL and Jet-A fuel sales, tie-downs, aircraft detailing, and airframe and powerplant services. Atlas operates out of the airport's main terminal building which is located on the southern portion of airport property, adjacent to the transient terminal apron. The terminal building was originally constructed back in 1969 but over the years has been renovated, improved, and well maintained by the HCAA. The terminal building contains approximately 4,000 square feet of office/administrative space and includes a number of amenities including restrooms, flight planning and weather facilities, and a large conference room. Atlas performs their aircraft maintenance activities within a nearby large maintenance hangar (4800) which has a capacity of approximately 7,500 square feet. Building 2800 is located adjacent to the main terminal building and contains approximately 2,500 square feet. This building houses the airport's electrical vault as well as a large conference room in a space that was previously occupied by a restaurant. A portion of Atlas's flight school resides within this building along with multiple aviation operators that lease office space.

General Aviation (GA) Hangar Facilities

The general aviation hangar facilities at TPF are basically split into two distinct development areas on the airport property. The midfield area is located between Runways 4 and 36 and the east development area is centered on the east side of Runway 18-36. There are a number of different types of hangar facilities for the storage and maintenance of aircraft at TPF. **Figure 2-6** illustrates the location of the hangar facilities at TPF and **Table 2-5** describes the size and condition of each hangar.

Enclosed Hangar – These facilities include multiple T-hangar units that are enclosed on three sides by walls and contain a door at the front of each hangar for aircraft ingress and egress. There are presently five enclosed hangars at TPF that provide housing for approximately 59 small and mid-sized general aviation aircraft. Three are located within the midfield development area and two are located in the east development area (Buildings 3800, 4400, 4600, 6600, and 6800).

Enclosed Open Pushback Hangar – These hangars are essentially T-hangar units which have some enclosed hangar facilities and other facilities which are open on one side and therefore do not have hangar doors for added security. There is presently only one of these hangar facilities at TPF that provides housing for 16 aircraft (Building 4000), and it is located in the midfield development area.

Figure 2-6 Existing Landside Facilities

Shade Hangar – The shade hangars are simply a roof structure that provides shade from the sun and limited protection from weather elements. At TPF, there is one shade hangar located in the midfield development area that provides housing for 19 aircraft (Building 4200).

Maintenance Hangar – As their name implies, maintenance hangars are larger hangars that are intended to be used for aircraft maintenance. There is only one maintenance hangar at TPF that is occupied by the FBO (Atlas Aviation). The hangar provides housing for approximately 4 small aircraft (Building 4800).

Bulk Hangar Facilities – These large facilities are sometimes called community hangars and they are typically utilized to store multiple aircraft that may be owned by one or multiple owners. There are presently two bulk hangar facilities at TPF, both of which are located on opposite sides of the midfield development area (north and south sides). These hangars provide housing for up to 16 small aircraft (Buildings 3400 and 5400).

Fuel Storage Facilities

The fuel storage facilities at TPF are located on the westernmost portion of the terminal apron adjacent to the helicopter parking areas. The fuel farm was constructed in 2004 and is comprised of two underground 12,000 gallon fuel storage tanks, one for the storage of 100LL and the other for the storage of Jet-A fuel. The FBO utilizes these tanks to refill their two fuel trucks which consist of a 3,000 gallon Jet-A truck and a 1,200 gallon 100LL truck. In the recent past, the fuel pumping equipment has required maintenance to resolve multiple issues but the system presently functions properly.

Table 2-4
TPF Existing Landside Facilities

Facility #	Description	Size / Capacity	Notes	Image
2000	AWOS	N/A	Constructed in 2005/2006	
2400	Helicopter Parking	N/A	Constructed in 2007	
2600	Fuel Farm	N/A	12,000 Gallon Underground Tanks 100LL and Jet-A Fuels Constructed in 2004	
2800	Administratio n Building	3,391 SF	Former Restaurant, Current Flight School and Aviation Business Offices (Constructed Between 1999-2002)	
3000	Terminal Building	4,494 SF	Constructed Prior to 1969	

Table 2-4 TPF Existing Landside Facilities				
Facility #	**Description**	**Size / Capacity**	**Notes**	**Image**
3200	Lift Station	N/A	N/A	
3400	Bulk Hangar	16,262 SF	Constructed Between 1982-1995	
3600	Aircraft Wash Rack	N/A	Constructed Between 1982-1995	
3800	Enclosed Hangar	11,164 SF	Constructed Between 1982-1995	
4000	Enclosed / Open Pushback Hangar	19,824 SF	Constructed Between 1982-1995	
4200	Shade Hangar	21,832 SF	Constructed Between 1982-1995	
4400	Enclosed Hangar	25,536 SF	Constructed Between 1982-1995	
4600	Enclosed Hangar	21,371 SF	Constructed Between 1982-1995	
4800	FBO Maintenance Hangar	7,670 SF	Constructed Prior to 1969	
5000	Rotating Beacon	N/A	Replaced in August 2015	
5200	Maintenance Storage Unit	764 SF	Constructed Prior to 1969	
5400	Bulk Hangar	16,219 SF	Constructed Between 1969-1982	

Table 2-4 TPF Existing Landside Facilities				
Facility #	Description	Size / Capacity	Notes	Image
5600	Operations & Maintenance Shop	1,922 SF	Constructed Between 1982-1994	
6600	Enclosed Hangar	16,670 SF	Constructed in 2009	
6800	Enclosed Hangar	17,988 SF	Constructed in 2011	
8000	Tie Down	N/A	42 Tie-Down Spots for Small Aircraft	
Sources: Airport Records and Michael Baker International, Inc., 2014.				

2.10 Environmental Overview

As a component of the inventory effort, an environmental overview was conducted to identify environmental considerations that could affect future airport development at TPF. This overview was based on a review of available resource materials and databases, which included:

- Federal Emergency Management Agency (FEMA) digital 100-year floodplain mapping
- Southwest Florida Water Management District (SWFWMD) Florida Land Use, Cover, and Forms Classification System (FLUCCS) data
- Florida Natural Areas Inventory (FNAI) tracking list of protected species for Hillsborough County
- National Register of Historic Places (NRHP) database
- United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey, Farmland Classification and Hydric Rating by Map Unit- Hillsborough County, Florida
- United States Environmental Protection Agency (USEPA) NEPAssist database
- United States Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPAC) Protected Species data
- USFWS National Wetlands Inventory (NWI)

The environmental information was collected based upon the guidelines set forth in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, FAA Order 5050.4B, *National Environmental Policy Act* (NEPA) Implementing Instructions for airport Actions, and FAA's Environmental Desk Reference for airport Actions, which includes 23 categories of potential areas of impact that must be addressed in compliance with NEPA.

For the purpose of this overview, only the environmental categories that were deemed applicable to TPF were addressed, with the goal of identifying features that could affect proposed development projects identified as a product of this Master Plan Update study. Based on review of available resource materials, the following environmental considerations were identified:

Hazardous Material Sites

The USEPA NEPAssist database[2] was utilized to obtain information regarding potential waste and hazardous material sites. No sites in the vicinity of the airport that are listed on federal or state solid and hazardous waste databases were identified. Two underground storage tanks for aviation fuel are located west of Taxiway B. Additional aboveground storage tanks that store automotive and diesel fuels were also noted on the airfield.

Historic, Architectural, Archaeological, and Cultural Resources

There are no NRHP-eligible or listed sites on, or in the vicinity of, airport property. Archaeological resources were not evaluated because this data is protected to preserve the integrity of the sites and was not accessible through standard internet searches.

Water Quality

Airport property is located within the Lower Hillsborough River-Delaney Creek Frontal sub-watershed (United States Geological Survey [USGS] Hydrologic Unit Code [HUC] 0310020603) of the Tampa Bay Watershed, which is one of 29 major drainage basins in Florida. The airport is bordered on three sides by open water, including Seddon Channel to the north and Hillsborough Bay to the south and west.

As part of the Clean Water Act, states are required to record the condition of surface waters in accordance with Section 303(d) documentation. The Florida 303(d) documentation identifies water bodies that are considered impaired because they do not meet state water quality standards regarding pollutant levels. Hillsborough Bay Upper (FL-1558E) is listed impaired on the 2010 Florida Section 303(d) list due to high levels of nutrients. A TMDL has been completed for Total Nitrogen in an effort to control point source and non-point source nutrients. The TMDLs calculate the maximum amount of a pollutant allowed to enter a waterbody, also known as the loading capacity, so that the waterbody will attain the water quality standards for that particular pollutant.[3]

Airport development projects are required to acquire a SWFWMD Environmental Resource Permit which includes stormwater runoff treatment water quality protection, and stormwater pollution prevention best management practices. National Pollutant Discharge Elimination System (NPDES) Construction Permits are required prior to construction of development projects. NPDES Construction Permits mandate sediment and erosion control measures prior to, during and after construction is completed.

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[2] USEPA, NEPAssist, http://nepassisttool.epa.gov/nepassist/nepamap.aspx?action=searchloc&wherestr=Plant%20City%20Airport%2C%20Tampa%2C%20Florida (March 13, 2014).

[3] USEPA, "Overview of Impaired Waters and Total Maximum Daily Loads Program," February 25, 2010, http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/intro.cfm (September 7, 2010).

Wetlands and Other Jurisdictional Waters of the United States

In Florida, land use and vegetative cover are frequently described using FLUCCS. This classification scheme was originally developed by the FDOT, but has been adopted by Florida's Water Management Districts for mapping land cover types within their respective jurisdictions.[4] As discussed above, the airport is bordered on three sides by open water, which is classified as Bays and Estuaries by the FLUCCS data. No wetlands are identified within the airport property boundary, based on the FLUCCS data depicted on **Figure 2-7** or on NWI mapping.

Section 303(c)/4(f) – Section 4(f) of the Department of Transportation Act of 1966 (currently codified as Section 303[c]) provides protection to publicly owned parks, recreation areas, wildlife and waterfowl refuges, and historic sites. Under Section 4(f), properties must not be used unless no prudent and feasible alternative exists, and efforts to minimize impacts to the property are completed. The Davis Islands Seaplane Basin Park, which is owned by the City of Tampa, would be considered a Section 4(f) property and consists of two parcels, one located south of Runway 18-36 and within the Runway Protection Zone (RPZ), and the other located along the northwest shoreline of the seaplane basin. No NRHP eligible or listed sites that would qualify for protection under Section 4(f) are located on or adjacent to TPF.

Floodplains

The 100-year floodplain boundary delineates a flood elevation that has a one percent chance of being equaled or exceeded any given year. Executive Order (EO) 11988, Floodplains, and the United States Department of Transportation Order 5650.2, Floodplain Management and Protection, require that all airport development actions must avoid floodplain impacts wherever there is a practicable alternative. In addition, the design must also minimize the adverse impacts to the floodplain's natural and beneficial values and minimize the likelihood of flood-related risk to human life, health, and welfare.

Based on review of the current FEMA Federal Insurance Rate Maps, the entire airport property is located within the 100-year floodplain associated with Hillsborough Bay (refer to Figure 2-6). The vast majority of the floodplain that is located on airport property is classified as Zone AE, which is defined as areas inside of the 100-year floodplain for which prior hydraulic studies have been completed and base flood elevations (BFEs) are available. The Zone AE floodplains on airport property have a defined BFE of 10.0 feet. A narrow portion of the Zone VE floodplain extends onto the southeastern portion of airport property. Zone VE is defined as areas along coasts that include additional hazards associated with velocity wave action.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA, 16 U.S.C. §§1451-1466) is administered by the United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). After a state develops its coastal zone management plan and NOAA approves the plan, CZMA provisions allow for the transfer of coastal zone management authority to the state. The Florida Coastal Management Program (FCMP) received approval from NOAA in 1981, and the

[4] FDOT, Florida Land Use, Cover and Forms Classification System, January 1999.

FDEP became the lead agency for implementation of the FCMP through its Office of Intergovernmental Programs (OIP).

One of the primary requirements of the CZMA is Federal consistency review. Federal consistency review is required for federal agency activities that affect coastal resources, for projects involving federal assistance (grants, loans, subsidies, insurance, etc.) to state or local governments and for federal licensing and permitting actions. The Florida State Clearinghouse within OIP coordinates federal consistency review by the nine state agencies and five water management districts that comment during the review process. TPF is located within Florida's regulated coastal zone.

Threatened and Endangered Species

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the Bald and Golden Eagle Protection Act of 1940, and the Florida Endangered and Threatened Species Act, habitats at TPF were evaluated with respect to suitability for federal- and state-protected species. A list of federally protected species known to occur or with potential to occur in Hillsborough County, dated May 1, 2013, was acquired from the USFWS.[5] A list of state-protected species was accessed from the Florida Natural Areas Inventory (FNAI) species database for Hillsborough County, last updated in December 2013.[6] Due to lack of suitable habitats, several of the species on the USFWS list for Hillsborough County and the FNAI Tracking List for Hillsborough County would not be anticipated to occur in the immediate vicinity of the airport. The remaining species which could potentially occur in the immediate vicinity due to the presence of suitable habitats are depicted in **Table 2-5.**

No suitable habitats for any of the federal- or state-listed plant species from the USFWS and FNAI lists for Hillsborough County occur at TPF. However, three additional species, the Black Mangrove (*Avicennia germinans*), Red Mangrove (*Rhyzophora mangle*), and White Mangrove (*Laguncularia racemosa*) do have potential to grow along the shoreline of the airport. Those species are not listed as threatened or endangered by either the USFWS or the Florida Department of Agriculture and Consumer Services, but impacts to these three species are regulated at the county level by the Environmental Protection Commission of Hillsborough County.

[5] USFWS, "Federally Listed Species in Hillsborough County, Florida," http://www.fws.gov/northflorida/CountyList/Hillsbor.htm, May 1, 2013 (March 24, 2014).
[6] FNAI, "FNAI Tracking List, Hillsborough County," http://www.fnai.org/bioticssearch.cfm, December 2013 (March 24, 2014).

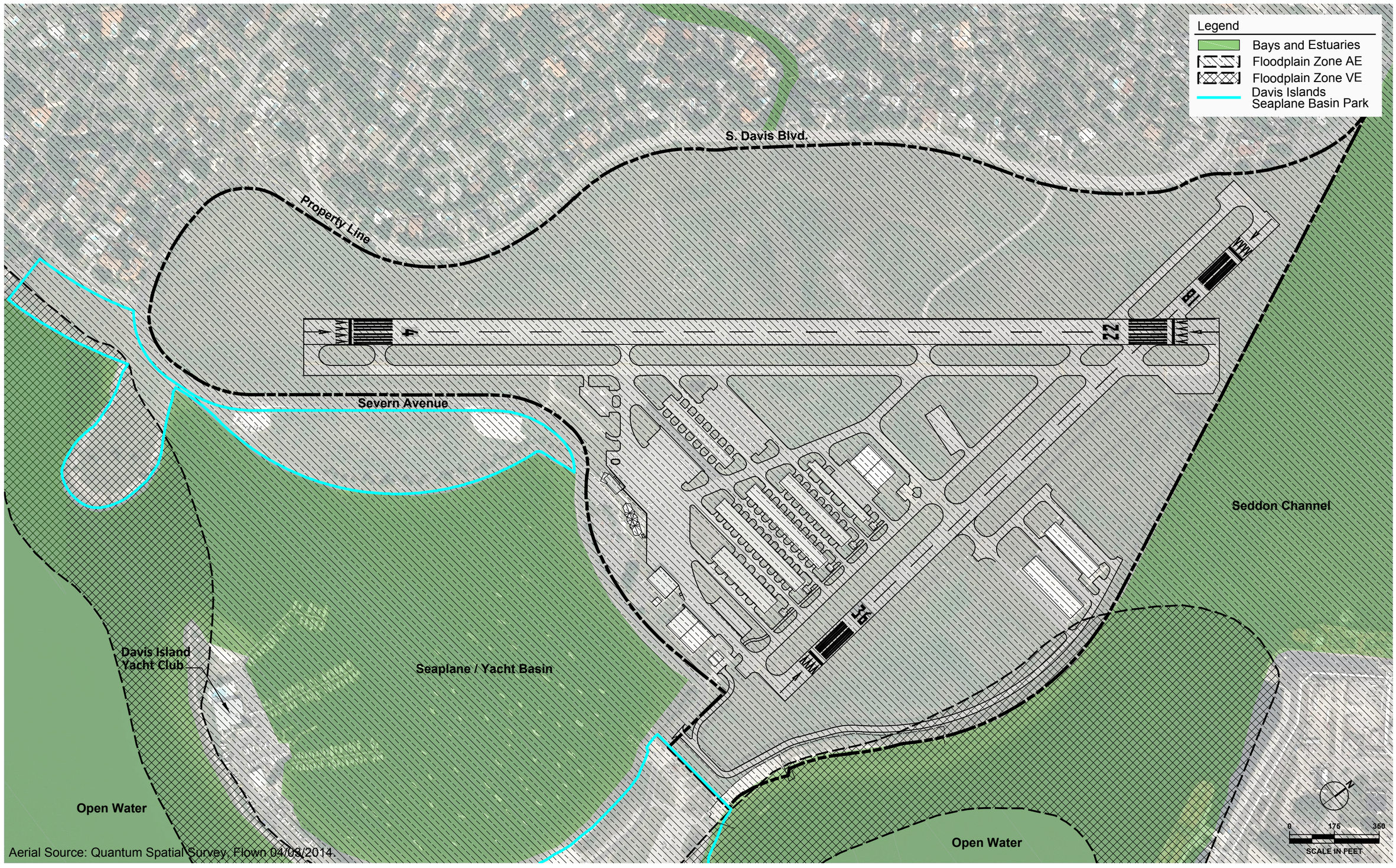


Figure 2-7 Natural Features Inventory

Source: FEMA Floodplain Data, 2008. SWFWMD FLUCCS Data, 2011.

Table 2-5 Potential Federal and State Protected Species in Vicinity of the Airport			
Scientific Name	**Common Name**	**Federal Status**	**State Status**
Caretta caretta	Loggerhead Sea Turtle	Endangered / Threatened	Threatened
Chelonia mydas	Green Sea Turtle	Endangered	Endangered
Dermochelys coriacea	Leatherback Sea Turtle	Endangered	Endangered
Gopherus polyphemus	Gopher Tortoise	C	Threatened
Lepidochelys kempii	Kemp's Ridley Sea Turtle	Endangered	Endangered
Charadrius melodus	Piping Plover	Threatened	Threatened
Charadrius nivosus	Snowy Plover	Not Listed	Threatened
Falco sparverius paulus	Southeastern American Kestrel	Not Listed	Threatened
Grus canadensis pratensis	Florida Sandhill Crane	Not Listed	Threatened
Mycteria americana	Wood Stork	Endangered	Endangered
Sternula antillarum	Least Tern	Not Listed	Threatened
Trichechus manatus	Manatee	Endangered	Endangered
Sources: USFWS, Federally Listed Species in Hillsborough County, Florida, last updated May 1, 2013, and FNAI species database for Hillsborough County, last updated in December 2013. Acronyms: C = Candidate for federal listing as Endangered or Threatened			

NEPA and permitting requirements associated with the preferred airport development alternative may be found in Section 6 of this report.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended, establishes regional fishery management councils to work with National Oceanic Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries), to identify and protect Essential Fish Habitat (EFH) when developing regional fishery management plans.[7] NOAA Fisheries and these regional fishery management councils are required to "minimize, to the extent practicable, adverse effects to EFH caused by fishing activities."[8] In addition, federal agencies are required to consult with NOAA Fisheries to determine if adverse effects would result to EFH from their projects.[9]

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."[10] Many species use marine, estuarine, and/or freshwater throughout their lives, as well as utilizing different strata within these waters. Thus, EFH not only includes the

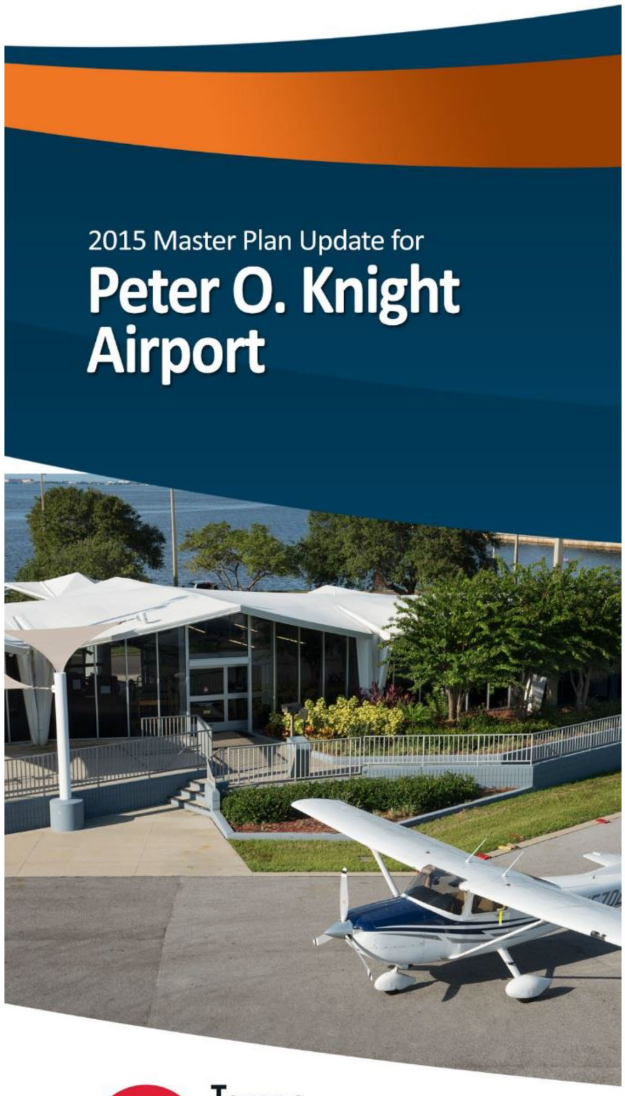
[7] NOAA Fisheries, Office of Habitat Conservation, Habitat Protection Division, "EFH Statute & Regulations," http://www.nmfs.noaa.gov/habitat/habitatprotection/efh/stat_reg_index.htm (March 25, 2014).
[8] NOAA Fisheries, "Essential Fish Habitat Fact Sheet," http://www.nmfs.noaa.gov/habitat/habitatprotection/pdf/efh/factsheets/EFH_factsheet.pdf (March 25, 2014).
[9] Ibid.
[10] Ibid.

water column, but the underlying bottom surface of a body of water.[11] EFH also includes deep ocean waters, coastal waters, and inland waters used by marine and diadromous species, and includes those habitats that support different life stages of the managed species.[12]

Based on data from the NOAA Fisheries EFH Mapper,[13] the waters of Hillsborough Bay and Seddon Channel provide EFH for several marine species groups, including red drum, reef fish, shrimp, and coastal migratory pelagics (mackerel and cobia).

[11] NOAA Fisheries, Office of Habitat Conservation, Habitat Protection Division, "What is essential fish habitat?" http://www.nmfs.noaa.gov/habitat/habitatprotection/efh/index_a.htm (March 25, 2014).
[12] Ibid.
[13] NOAA Fisheries, Office of Habitat Conservation, Habitat Protection Division, EFH View Tool, http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html (March 25, 2014).

Chapter 3.0
Aviation Activity Forecasts



Tampa International Airport

Hillsborough County Aviation Authority

3.0 Aviation Activity Forecasts

3.1 Introduction

The purpose of the aviation activity forecast is to provide reasonable and acceptable estimates of projected aircraft operational and aircraft basing level demand that would be accommodated at the airport for a foreseeable future (20-year) period. Such forecasts also typically include, but are not limited to: annual aircraft operational and basing levels and derivative forecasts of instrument activity and peaking levels.

Aviation activity forecasts directly support airport facility planning and to identify the need, type and timing of the development of airport facility improvements. Aviation activity forecasting also attempts to further identify anticipated changes in the mix (e.g., type and size) of the aircraft that are anticipated to operate and base at the airport throughout the Airport Master Plan's 20-year (2014-2033) forecast period.

The Peter O. Knight Airport is located on the southeast end of the Davis Islands approximately three statute miles south of the central downtown business district. The airport is bounded by Seddon Channel to the northeast, Hillsborough Bay to the south and southwest, and residential land uses to the west. The airport is designated within the FAA's National Plan National Plan of Integrated Airport Systems (NPIAS) as a "Reliever" Airport having the primary function of relieving congestion at Tampa International Airport by attracting and accommodating a significant portion of the light-general aviation activity away from the airport.

While the airport is located near downtown Tampa, available land areas on and around the airport that would typically be required to develop needed airfield and related facilities to support sustained business-related general aviation activity may be limited. The proximity of adjacent noise-sensitive residential land uses to the west may also most likely serve to further limit, and in some cases, preclude the sustained use of larger general aviation turbo-prop and fan-jet aircraft at this airport. Further, while the airport has the requisite airfield facilities and capabilities to fully accommodate the majority of the small- and light-general aviation recreational fleet, the airport's ability to fully accommodate a wider range of larger general aviation turbo-props and jets may be limited primarily because of available runway take-off lengths and the absence of an operating Airport Traffic Control Tower (ATCT). Accordingly, the Airport's role and level of service within the Hillsborough County Aviation Authority's (HCAA) System of Airports is anticipated to be limited to primarily accommodating and serving existing and anticipated increased future levels of demand of smaller-sized general aviation aircraft throughout the 20-year forecast period.

3.2 Forecast Development Assumptions

The development of the aviation activity forecasts for each of the three HCAA general aviation airports were predicated upon the following overlying and guiding assumptions:

- HCAA's system of general aviation airports will remain in place and will evolve as demand dictates throughout the 20-year Master Planning Forecast Period (2014-2033).

- HCAA will continue to develop and improve the availability of needed aviation facilities to maintain the desired level of services, and to fully accommodate existing and latent general aviation demand at each airport.
- HCAA desires to maintain the highest and best use of each airport to support and enhance the entire system of general aviation airports to: 1) provide opportunities for continued airport facility development, 2) increase levels of services offered to the flying public, 3) accommodate increased demand for aircraft activity and aircraft basing needs, and 4) preserve the capability and flexibility to accommodate and facilitate on-airport economic and revenue generation activities.

3.3 Previously Published Forecasts and Available Information

Forecasts of aviation activity provide the necessary information and data that is used for the assessment of the need and timing of airport development projects. For the purpose of identifying previously published aviation activity forecasts that may be suitable for the development of a forecast of aviation activity specific to this update of the Peter O. Knight (TPF) Master Plan, the following documents were reviewed:

- The Federal Aviation Administration's (FAA) Terminal Area Forecast (TAF),
- The FAA Aerospace Forecast (2014 – 2034),
- The Florida Department of Transportation's (FDOT) Florida Aviation System Plan (FASP) Forecast,
- FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS*),
- HCAA Based Aircraft Inventory 2008 through 2013,
- FAA's Traffic Flow Management System Instrument Activity Counts (TFMSC),
- Flightwise.com Aircraft Flight Tracking Data,
- HCAA's Airscene.com (Exelis) Noise Monitoring Data, and
- HCAA-Coordinated Telephone Interviews of Airport Tenants.

Following the review and use of one or more previously published aviation activity forecasts for TPF, and through the use of airport-specific FAA-TAF and FDOT-FASP-generated Compound Annual Growth Rates (CAGR) and Operations Per Based Aircraft (OPBA) forecasting methodologies, a derived Master Plan-specific forecast of based aircraft and aircraft operations was developed. Derivative forecasts of peak activity levels and instrument operations were compared to the derived aviation activity forecast developed for the Master Plan Update and the FAA TAF as required for FAA acceptance and review purposes.

Review of FAA Aerospace Forecast

The FAA Aerospace Forecast Fiscal Year 2014-2034 was reviewed for possible use in the development of a forecast of aviation activity for the Master Plan Update. The FAA Aerospace Forecast contains projections of future United States (U.S.) aviation demand at the national level. This publication provides a 21-year outlook and is updated each year in March. It is the official FAA view of the immediate future for aviation within the United States. The FAA Aerospace

Forecast examines future trends expected in the aerospace industry. The publication includes aggregate level forecasts of the fleet, hours flown, and pilots for general aviation and considers the economics of the aviation industry in general, as well as trends expected to affect the commercial and general aviation community. The FAA Aerospace Forecast was reviewed to ascertain the general health and prosperity of the general aviation industry as a whole and to provide a sense of future aviation activity growth that may occur at TPF throughout the 20-year Master Plan Update planning period.

Highlights of the FAA Aerospace Forecast that were considered germane to TPF are as follows:

- The active domestic (U.S.) general aviation fleet is projected by the FAA Aerospace Forecast[14] to increase at an average annual rate of 0.5 percent over the 21-year forecast period. This forecast of future general growth of general aviation aircraft fleet nationwide is considered to be virtually flat.
- The number of active piston-powered aircraft (including rotorcraft) is projected to decrease at an average annual rate of 0.3 percent. This includes declines in both single and multi-engine fixed wing aircraft, but with the smaller category of piston-powered rotorcraft growing at 1.7 percent a year. Single-engine fixed-wing piston aircraft are projected to decline at a rate of 0.4 percent, while multi-engine fixed wing piston aircraft are projected to decline by 0.5 percent a year.
- In 2005, a new category of aircraft (previously not included in the FAA's aircraft registry counts) was created: "light sport" aircraft. At the end of 2012, a total of 2,001 active aircraft were estimated to be in this category. The forecast assumes a 4.1 percent annual growth of the fleet by 2034.
- The number of general aviation hours flown nationwide is projected to increase by 1.4 percent yearly over the forecast period. The FAA projects above average growth in hours will occur after 2023 with increases in the fixed wing turbine aircraft fleet, as well as increasing utilization of both single and multi-engine piston aircraft as the aging of this fleet starts to slow down. In the medium term, much of the increase in hours flown reflects strong growth in the rotorcraft and turbine jet fleets.
- Hours flown by turbine aircraft (including rotorcraft) are forecast to increase 3.2 percent yearly over the forecast period, compared with a decline of 0.4 percent for piston-powered aircraft. Jet aircraft are forecasted to account for most of the increase, with hours flown increasing at an average annual rate of 4.2 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with a measured recovery in utilization rates from recession induced record lows. Rotorcraft hours, which were less impacted by the economic downturn when compared to other categories and rebounded earlier, are projected to grow by 2.8 percent yearly, with turbine rotorcraft growing at an average annual rate of 3.1 percent. Sales reports show that most replacements were not for pistons, which suggests that the new purchases were possibly to replace other turbine helicopter at the lower end of the market, or the newly introduced light turbine model was a product fulfilling a previously unmet need at the light end of the market. Overall, the market growth was robust in both segments of the industry. Lastly, the light sport aircraft category, which not includes only the special light sport, is

[14] FAA Aerospace Forecast fiscal years (FY) 2014-2034 Tables 28 and 29.

expected to see an increase in hours flown of 5.1 percent a year; this is primarily driven by growth in the fleet.

Based upon the FAA Aerospace Forecast regarding the manufacture and utilization of general aviation aircraft within the U.S., it can be readily assumed that the year-over-year growth of general aviation activity and aircraft basing levels at TPF will continue, albeit at a relatively low annualized rate of growth. The airport will most likely experience continued growth in aviation activity based primarily on the number of and annualized growth rate of locally-based aircraft and their associated activity levels.

Review of FAA Terminal Area Forecast

The FAA's Terminal Area Forecast (TAF) was reviewed as part of the development of a forecast of aviation activity for the TPF Master Plan Update. The TAF is a detailed FAA forecast planning database that the FAA Office of Aviation Policy and Plans (APO) produces each year covering airports in the National Plan of Integrated Airport Systems (NPIAS). The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. The TAF contains both historical and forecast data. The TAF forecasts are made at the individual airport level and are based in part on the national FAA Aviation Forecast. The TAF assumes an unconstrained demand for aviation services (i.e., an airport's forecast is developed independent of the ability of the airport and/or the air traffic control system to supply the capacity required to meet the demand). The FAA TAF forecast of aviation activity published for TPF is presented in **Table 3-1.**

Table 3-1
FAA TAF Aircraft Operations and Based Aircraft

Historical Activity										
	Itinerant					Local			TOTAL	Based Aircraft
Year	Air Carrier	Air Taxi/ Commuter	General Aviation	Military	Total	Civil	Military	Total		
2000	0	500	29,500	0	30,000	36,000	0	36,000	66,000	100
2001	0	371	28,039	0	28,410	20,185	0	20,185	48,595	104
2002	0	374	28,328	0	28,702	20,393	0	20,393	49,095	102
2003	0	378	28,618	0	28,996	20,602	0	20,602	49,598	103
2004	0	381	28,906	0	29,287	20,809	0	20,809	50,096	102
2005	0	385	29,195	0	29,580	21,018	0	21,018	50,598	102
2006	0	388	29,465	0	29,853	21,213	0	21,213	51,066	102
2007	0	392	29,737	0	30,129	21,409	0	21,409	51,538	102
2008	0	500	29,500	0	30,000	36,000	0	36,000	66,000	109
2009	0	500	29,500	0	30,000	36,000	0	36,000	66,000	99
2010	0	500	29,500	0	30,000	36,000	0	36,000	66,000	122
2011	0	500	29,500	0	30,000	36,000	0	36,000	66,000	107
2012	0	500	29,500	0	30,000	36,000	0	36,000	66,000	107
Projected Activity										
Year	Itinerant					Local			TOTAL	Based Aircraft
	Air Carrier	Air Taxi/ Commuter	General Aviation	Military	Total	Civil	Military	Total		
2013	0	505	29,771	0	30,276	36,335	0	36,335	66,611	109
2018	0	528	31,167	0	31,695	38,054	0	38,054	69,749	122
2020	0	538	31,744	0	32,282	38,767	0	38,767	71,049	126
2023	0	552	32,632	0	33,184	39,860	0	39,860	73,044	135
2025	0	562	33,239	0	33,801	40,605	0	40,605	74,406	143
2028	0	577	34,172	0	34,749	41,744	0	41,744	76,493	155
2030	0	587	34,809	0	35,396	42,519	0	42,519	77,915	164
2033	0	602	35,787	0	36,389	43,708	0	43,708	80,097	179
2035	0	612	36,454	0	37,066	44,520	0	44,520	81,586	191
2040	0	637	38,180	0	38,817	46,616	0	46,616	85,433	223
Compound Annual Growth Rate										
Period	Air Carrier	Air Taxi/ Commuter	General Aviation	Military	Total	Civil	Military	Total	TOTAL	Based Aircraft
2013-2018	--	0.89	0.92	--	0.92	0.93	--	0.93	0.92	1.35
2018-2023	--	0.89	0.92	--	0.92	0.93	--	0.93	0.93	1.35
2023-2028	--	0.89	0.93	--	0.93	0.93	--	0.93	0.93	2.80
2028-2033	--	0.85	0.93	--	0.93	0.92	--	0.92	0.93	2.92
2013-2040	--	0.86	0.93	--	0.93	0.93	--	0.93	0.93	2.69

Source: FAA TAF Peter O. Knight Airport, February 2014.
Note: Listed historical operations represent estimates and do not reflect actual based aircraft and aircraft operations.

Between 2000 and 2012, the number of reported based aircraft increased from 100 to 107, however, the number of estimated aircraft operations remained unchanged at 66,000 for the same time period. These published historical levels of aviation activity and number of locally-based aircraft were not recorded or considered to be verifiable because the airport is non-towered. The TAF indicates that TPF had 109 based aircraft and 66,611 aircraft operations in 2013. The TAF forecast projections of based aircraft increases this number from 109 to 223 over the next 27 years representing a CAGR of 2.69 percent. For the same period, the number of annual aircraft operations at the airport is expected to increase from 66,611 to 85,433 representing a CAGR of 0.93 percent. Because there are no formal records of past aircraft activity levels for the airport, for the purposes of this Master Plan Update, that the stated number of 66,611 annual aircraft operations, albeit non-verifiable, was considered to be reasonable and acceptable for use as one of several data sources from which the forecast of future aircraft activity at TPF through the 20-year planning period could be developed.

Review of FDOT FASP Forecast

In cooperation with the FAA and Florida's public airports as part of the Continuing Florida Aviation System Planning Process (CFASPP), the Florida Department of Transportation's Aviation Office (FDOT) developed the Florida Aviation System Plan (FASP) that incorporates the traditional planning elements that are typically included in most state aviation system plans. The FASP 2031 forecast includes an analysis of the intermodal aspects of the state transportation system and a strategic planning element which identifies strategic goals, approaches, measurements, and recommendations to achieve these goals. Each year, as part of the CFASPP, the FDOT Aviation Office updates the forecasts of based aircraft and operational activity levels for each Florida public-use airport or airpark. **Table 3-2** summarizes the FDOT FASP listing of historical levels of based aircraft and aircraft operations data through 2011, and lists projections for based aircraft and annual aircraft operations at TPF through the year 2033.

Table 3-2 FDOT FASP General Aviation Forecast (2012-2033)		
Year	Based Aircraft	Aircraft Operations
Historical Activity		
2000	110	66,000
2001	102	66,000
2002	119	48,595
2003	120	48,595
2004	114	48,595
2005	113	50,598
2006	113	50,598
2007	131	50,598
2008	114	50,598
2009	119	66,000
2010	122	53,800
2011	122	53,800
Projected Activity		
Year	Based Aircraft	Aircraft Operations
2012	123	54,204
2013	124	54,610
2018	130	56,689
2023	137	58,847
2028	143	61,087
2033[1]	150	63,413
Period	Compound Annual Growth Rates	
2013-2018	0.94%	0.75%
2019-2023	0.94%	0.75%
2024-2028	0.94%	0.75%
2029-2033[1]	0.94%	0.75%

Sources: URS, 2014.
FDOT FASP, 2012-2031.
Note: Period 2031-2033 assumes FASP extrapolated CAGR.

Between 2000 and 2012, the number of reported based aircraft increased from 110 to 123; the number of estimated aircraft operations decreased from 66,000 to 54,204. These published historical levels of aviation activity and number of locally-based aircraft were not recorded or considered to be verifiable because the airport is non-towered. FASP records indicate that the Peter O. Knight Airport would have 124 based aircraft and 54,610 aircraft operations in 2013. The FASP forecast projections of based aircraft increases this number from 124 to 150 over the next 20 years representing a CAGR of 0.94 percent. For the same period, the number of annual aircraft operations at the airpark is expected to increase from 54,610 to 63,413 representing a CAGR of 0.75 percent. Because there are no formal records of past aircraft activity levels for the airport, for the purposes of this Master Plan Update, that the stated number of 54,610 annual aircraft operations, albeit non-verifiable, was considered to be reasonable and acceptable for use as one of several data sources from which the forecast of future aircraft activity at TPF through the 20-year planning period could be developed.

3.4 Based Aircraft and Aircraft Operations Forecasts

The number of aircraft based at an airport is typically used to determine the level of existing and future forecasted levels of aviation activity and to determine the number and size of facilities needed to accommodate the based aircraft tie-down and covered storage needs of aircraft owners.

The forecast of based aircraft for the 20-year planning period was developed using information provided by the HCAA that included the total number and relative mix of aircraft type that were based at the airport in 2013.

Based Aircraft Levels Using TAF CAGR

Using the 2013 HCAA-inventoried number and mix of based aircraft at TPF and applying the period-to-period (2013-2033) based aircraft growth rates as projected in the TAF forecast (2.51 percent annually), a "normalized" based aircraft forecast for TPF was developed. By using this forecasting methodology, the number of based aircraft at TPF is projected to increase from 110 to 181 through the 20-year planning period and is presented in **Table 3-3**.

Table 3-3
Normalization of Based Aircraft Forecast – TAF

Year	TAF	Normalized
2013	109	110[1]
2018	122	125
2023	135	141
2028	155	160
2033	179	181
CAGR	**2.51%**	**2.51%**

Sources: URS, 2014.
FAA TAF Peter O. Knight Airport, February 2014.
[1] Actual HCAA Based Aircraft Counts for TPF, November 2013.
Note: Listed based aircraft values rounded for each forecast period using stated CAGR value.

Based Aircraft Levels Using FASP CAGR

Using the 2013 number and mix of based aircraft at TPF and applying the period-to-period (2013-2033) based aircraft growth rates as projected in the FASP forecast (0.94 percent annually), a "normalized" based aircraft forecast for TPF was developed. By using this forecasting methodology, the number of based aircraft at TPF is projected to increase from 110 to 133 through the 20-year planning period and is presented in **Table 3-4**.

Table 3-4 Normalization of Based Aircraft Forecast – FASP		
Year	FASP	Normalized[2]
2013	124	110[1]
2018	130	115
2023	137	121
2028	143	127
2033	150	133
CAGR	**0.94 %[2]**	**0.94 %**

Sources: URS, 2014.
FDOT FASP, 2012-2031.
[1] Actual HCAA Based Aircraft Counts for TPF, November 2013.
[2] FASP 2012-2031 CAGR, Period 2031-2033 assumes extrapolated FASP CAGR of 0.94 percent.
Note: Listed based aircraft values rounded for each forecast period using stated CAGR value.

Averaging of Based Aircraft Levels

Using the 2013 number and mix of based aircraft at TPF and applying the period-to-period based aircraft growth rates as projected in the TAF (2.51 percent annually) and the FASP forecast (0.94 percent annually), average based aircraft forecasts for TPF were developed. **Table 3-5** summarizes these forecasts and averages the normalized TAF and FASP forecasts. The normalized average (1.79% annually) was found to be reasonable and was subsequently adopted for future planning purposes.

Table 3-5 Averaging of Based Aircraft Forecast			
Year	TAF Normalized	FASP Normalized[2]	Normalized Average
2013	110[1]	110[1]	110[1]
2018	125	115	120
2023	141	121	131
2028	160	127	144
2033	181	133	157
CAGR	**2.51%**	**0.94%**	**1.79%**

Source: URS, 2014.
[1] Actual HCAA Based Aircraft Counts for TPF, November 2013.
[2] FASP 2012-2031 CAGR, Period 2031-2033 assumes extrapolated FASP CAGR of 0.94 percent.
Note: Listed based aircraft values rounded for each forecast period using stated CAGR value.

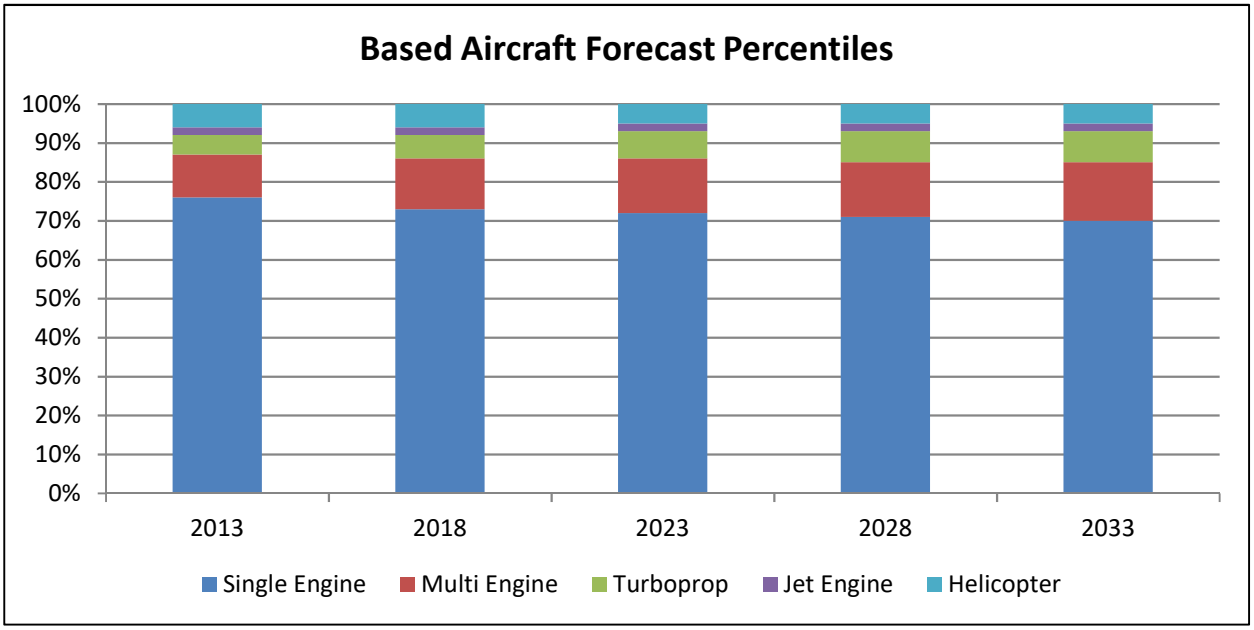
3.5 Adoption of Based Aircraft Forecast

As listed in **Table 3-6** and illustrated in the graph below, the relative mix of aircraft types that will be based and operating at the airport is anticipated to change throughout the forecast period. This will be primarily influenced by the anticipated increase in the availability of aircraft storage and maintenance facilities and the associated level of services offered at the airport.

Table 3-6
Based Aircraft Forecast Percentiles

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	76%	11%	5%	2%	6%	100%
2018	73%	13%	6%	2%	6%	100%
2023	72%	14%	7%	2%	5%	100%
2028	71%	14%	8%	2%	5%	100%
2033	70%	15%	8%	2%	5%	100%

Source: URS, 2014.



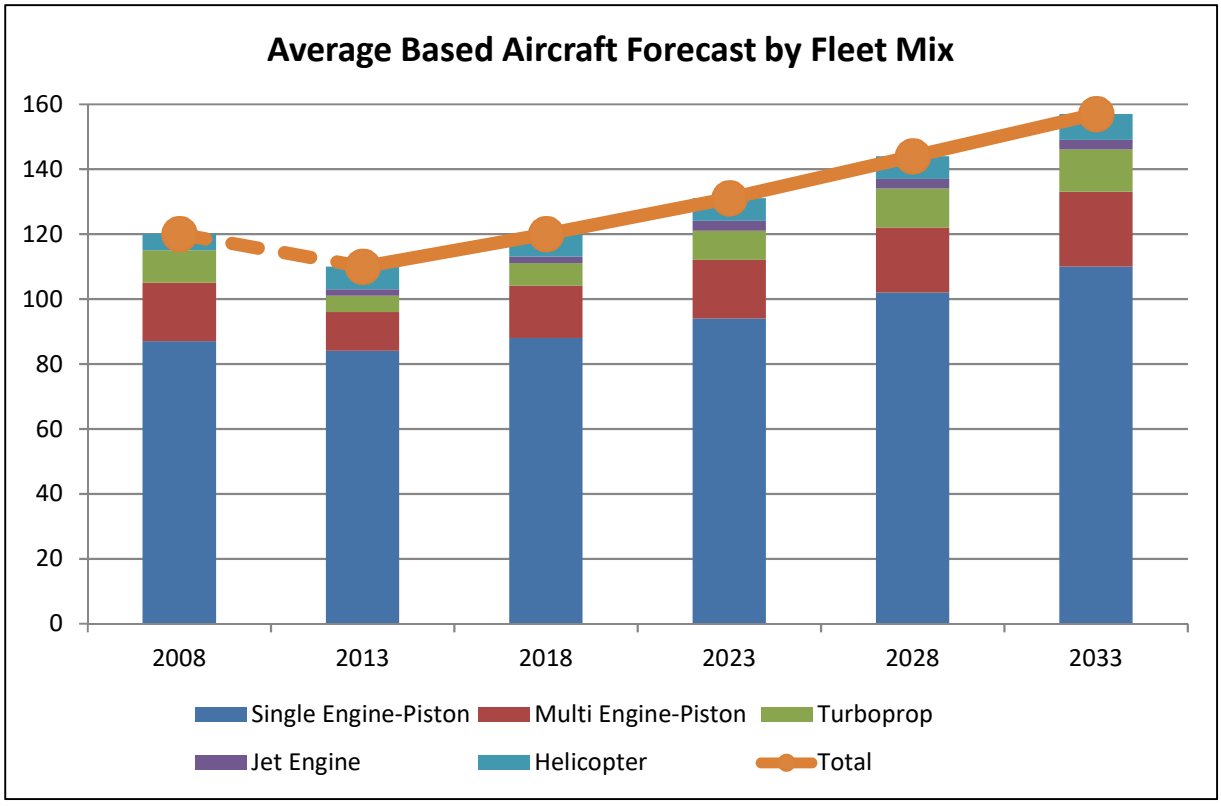
Source: URS, 2014.

Table 3-7 and the associated graph show the based aircraft forecast by aircraft type for TPF using the average normalized based aircraft forecast, which was adopted for future planning purposes.

Table 3-7
Average Based Aircraft Forecast by Fleet Mix[2]

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2008	*87*	*18*	*10*	*0*	*5*	*120*[1]
2013	84	12	5	2	7	110[1]
2018	88	16	7	2	7	120
2023	94	18	9	3	7	131
2028	102	20	12	3	7	144
2033	110	23	13	3	8	157
Year	**CAGR**	**CAGR**	**CAGR**	**CAGR**	**CAGR**	**CAGR**
2013-2018	0.93%	5.92%	6.96%	0.00%	0.00%	1.79%
2019-2023	1.33%	2.38%	5.15%	8.45%	0.00%	1.79%
2024-2028	1.65%	2.13%	5.92%	0.00%	0.00%	1.79%
2029-2033	1.52%	2.83%	1.61%	0.00%	2.71%	1.79%

Source: URS, 2014.
[1] Number and type of based aircraft at the airport in 2008 and 2013 were provided by the Peter O. Knight Airport.
Note: Distribution of aircraft type based on forecast assumptions listed in **Table 3-6.**



Source: URS, 2014.

3.6 Forecast of Aircraft Operations Using OPBA Forecasting Methodologies

While this forecast of general aviation activity included the review of similar forecasts published for TPF as part of the TAF and FASP, two additional "bottom-up" aviation activity forecasts for TPF were developed for this Airport Master Plan update using the Operations Per Based Aircraft (OPBA) metric. The OPBA metric offers an alternative, yet comparative, method to assess historical and potential future levels of aircraft operations at an individual airport. The OPBA metric, however, provides an overly simplistic high-level comparative measure of aircraft operation activity levels that is driven solely by the number of based aircraft at an airport and ignores the relative split between the number of operations generated by those based aircraft and operations generated by visiting (i.e. itinerant) aircraft. The use of the OPBA metric also ignores operations generated by intensified levels of training activities by locally-based or itinerant aircraft that typically include recursive Touch-and-Go pattern-based training activities. Various industry-published recommendations regarding the use of and formulation of OPBA factors vary ranging from 250 to 750 depending upon the airport's level of service, size, and training activity.

Recognizing that the airfield capabilities, number and availability of aircraft storage facilities, and the inherent level of services offered at each of the three HCAA general aviation airports vary, airport-specific an (5-year) average OPBA factors were developed for each airport.

Development of Forecast-Specific Historical OPBA Factors

Using the 2013 HCAA inventory of based aircraft for TPF, the TAF- and FASP-normalized forecasts of based aircraft based upon respective CAGRs, year- and forecast-specific OPBA values were derived using the historical inventoried based aircraft levels and the reported TAF and FASP operations levels for the five-year period 2008 through 2012. The respective 5-year average OPBA values and OPBA-generated forecasts of aircraft operations are listed in **Table 3-8.**

Table 3-8
Average (5-Year) OPBA TAF & FASP Normalized

TAF					FASP			
Year	Operations	Based Aircraft	OPBA		Year	Operations	Based Aircraft	OPBA
2008	66,000	126	524		2008	50,598	126	402
2009	66,000	119	555		2009	66,000	119	555
2010	66,000	119	555		2010	53,800	119	452
2011	66,000	112	589		2011	53,800	112	480
2012	66,000	119	555		2012	54,204	119	455
Average (5-Year) OPBA			556		Average (5-Year) OPBA			469

Sources: URS, 2014.
FAA TAF Peter O. Knight Airport, February 2014.
FASP 2012-2031 Based Aircraft Forecast, Peter O. Knight Airport.
HCAA Based Aircraft Count for TPF, November 2013.

Using the HCAA 2013 based aircraft inventory, the respective TAF- and FASP-based average annual rates of projected based aircraft level growth at TPF (**Table 3-5**), and the TAF- and FASP-derived OPBA factors, forecasts of future aircraft operational levels were derived and are listed in **Tables 3-9 and 3-10.**

Table 3-9 Operations Forecast 5-Year Historical TAF OPBA – TPF			
Year	Based Aircraft	OPBA	Operations
2013	110	556	61,160
2018	120	556	66,720
2023	131	556	72,836
2028	144	556	80,064
2033	157	556	87,292
CAGR	**1.79%**	**–**	**1.79%**

Sources: URS, 2014.
HCAA Based Aircraft Counts for TPF, November 2013.
FAA TAF Peter O. Knight Airport, February 2014.
5-Year Historical TAF OPBA-TPF.

Table 3-10 Operations Forecast 5-Year Historical FASP OPBA – TPF			
Year	Based Aircraft	OPBA	Operations
2013	110	469	51,590
2018	120	469	56,280
2023	131	469	61,439
2028	144	469	67,536
2033	157	469	73,633
CAGR	**1.79%**	**–**	**1.79%**

Source: URS, 2014.
HCAA Based Aircraft Counts for TPF, November 2013.
FASP 2012-2031 Based Aircraft Forecast, Peter O. Knight Airport.
5-Year Historical FASP OPBA-TPF.

There has been no record keeping of past itinerant Part 135 Air Taxi/Commuter, Military or Air Cargo operational activity at TPF. Inspection of the FAA TAF forecast for TPF reveals an assumed static historical level 500 annual Air Taxi operations.

Considering the airport's relative proximity to the Tampa downtown central business district and anticipated increases in the level of services offered by the FBO, additional operations were added to the respective OPBA-generated operations forecasts for comparison purposes as listed in **Table 3-11.**

For the purpose of this update of the forecast of aviation activity at TPF, and to provide a commonality between all but the FASP operational forecast, similar to the TAF forecast, projections of future Air Taxi operations were included within the respective 5-Year OPBA-TAF OPBA-FASP operational forecasts. The annual number Air Taxi operations at TPF were assumed to be 820 operations in 2013 and were further assumed to remain static throughout the forecast period.

Based upon the FAA TAF, no historical or projected future military operations have been documented or forecasted for TPF. For the purpose of this update of the forecast of aviation activity at TPF, a static level of 30 annual military operations were projected to occur throughout the

forecast period. No Air Cargo operations were projected to occur at TPF throughout the forecast period.

Table 3-11
Normalized Average (5-Year) OPBA
with Additional CFR Part 135 and Military Itinerant

TAF					FASP			
Year	OPBA Operations	Additional CFR Part 135 and Military Itinerant Operations	Total Operations		Year	OPBA Operations	Additional CFR Part 135 and Military Itinerant Operations	Total Operations
2013	61,160	850	62,010		2013	51,590	850	52,440
2018	66,720	850	67,570		2018	56,280	850	57,130
2023	72,836	850	73,686		2023	61,439	850	62,289
2028	80,064	850	80,914		2028	67,536	850	68,386
2033	87,292	850	88,142		2033	73,633	850	74,483
CAGR			1.77%		CAGR			1.77%

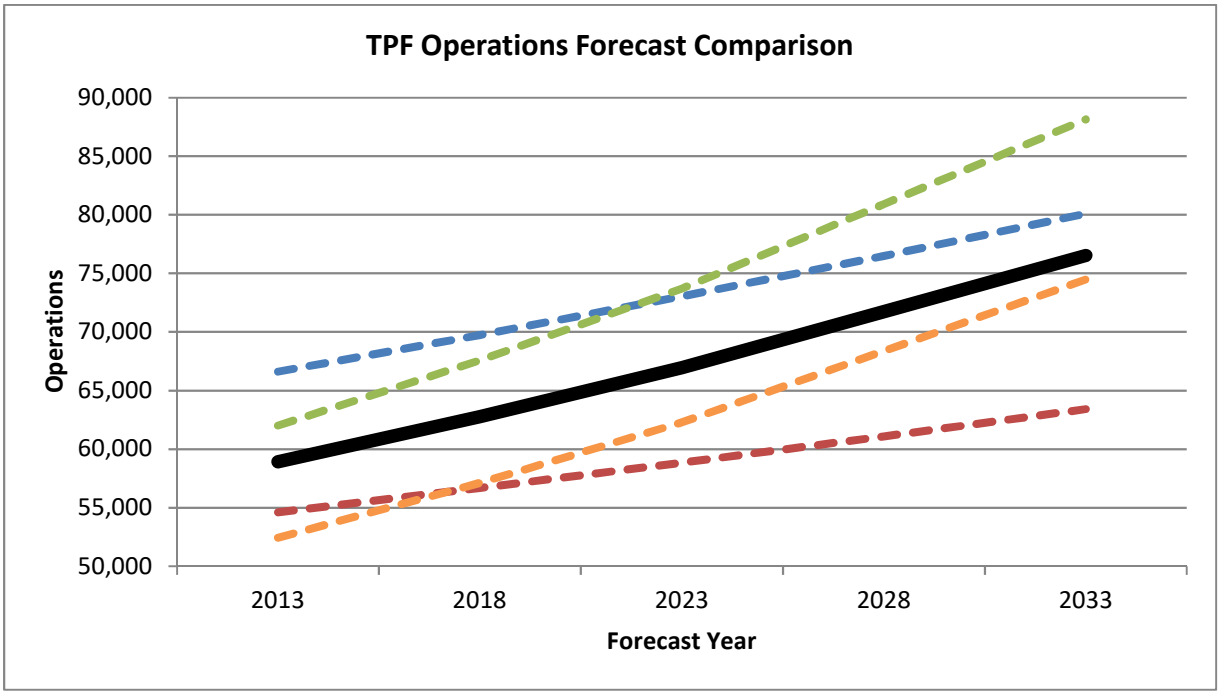
Source: URS, 2014.

Table 3-12 provides a comparison of the operations forecasts between the FAA TAF, FDOT FASP, TAF- and FASP-OPBA normalized forecasts, and an average of the four forecasts.

Table 3-12
TPF
Operations Forecast Comparison

Forecast	CAGR	2013	2018	2023	2028	2033
TAF	0.93 %	66,611	69,749	73,044	76,493	80,097
FASP	0.75 %	54,610	56,689	58,847	61,087	63,413
5-Year OPBA Normalized-TAF	1.77%	62,010	67,570	73,686	80,914	88,142
5-Year OPBA Normalized-FASP	1.77%	52,440	57,130	62,289	68,386	74,483
Average of all Forecasts	1.32%	58,918	62,785	66,967	71,720	76,534

Source: Compiled by URS, 2014.



Source: URS, 2014.

After careful review and consideration of the four separate operations forecasts and an average of all forecasts, HCAA selected and retained the average of all forecasts for submittal to the FAA for review and approval for HCAA's incorporation and use within this update of the TPF Airport Master Plan.

3.7 Derivative Forecast of Aircraft Operations by Fleet Mix

The derivative percentile forecasts of aircraft operations by fleet mix are shown in **Tables 3-13** and **3-14** and will be used within subsequent elements of this Master Plan Update for the identification of future airport facility development needs.

Table 3-13
Aircraft Operations Forecast Percentiles

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	92.04%	5.00%	0.84%	0.13%	2.00%	100.00%
2018	91.72%	4.98%	1.00%	0.15%	2.15%	100.00%
2023	91.36%	4.96%	1.18%	0.17%	2.32%	100.00%
2028	90.97%	4.94%	1.40%	0.20%	2.49%	100.00%
2033	90.51%	4.92%	1.67%	0.23%	2.67%	100.00%

Source: URS, 2014.

Table 3-14
Aircraft Operations Forecast By Fleet Mix

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	54,226	2,946	492	76	1,178	58,918
2018	57,586	3,129	625	93	1,352	62,785
2023	61,182	3,324	793	115	1,553	66,967
2028	65,245	3,545	1,007	141	1,783	71,720
2033	69,272	3,763	1,279	173	2,046	76,534
AAGR 2013-2018	1.21%	1.21%	4.89%	4.20%	2.80%	1.28%
AAGR 2019-2023	1.19%	1.19%	4.89%	4.20%	2.80%	1.27%
AAGR 2024-2028	1.31%	1.31%	4.89%	4.20%	2.80%	1.40%
AAGR 2029-2033	1.20%	1.20%	4.89%	4.20%	2.80%	1.31%
AAGR 2013-2033	1.23%	1.23%	4.89%	4.20%	2.80%	1.32%

Source: URS, 2014.

3.8 Aircraft Operations Split

Table 3-15 shows the split between itinerant and local operations. The determination of itinerant to local aircraft is based on 2014 airport operations statistics provided by AirNav, LLC.

Table 3-15
Aircraft Operations Forecast Split

Year	Itinerant 45%	Local 55%	Total Operations
2013	26,513	32,405	58,918
2018	28,253	34,532	62,785
2023	30,135	36,832	66,967
2028	32,274	39,446	71,720
2033	34,440	42,094	76,534

Sources: AirNav, LLC, Peter O. Knight Airport May 29, 2014.
URS, 2014.

3.9 Instrument Approach Procedure Operations

Each of the three HCAA general aviation airports have published instrument procedures and associated instrument-related aircraft operations. An instrument operation represents a single take-off or landing. The Peter O. Knight Airport has three published Standard Terminal Arrivals (STARs) procedures and two Non-precision Instrument Approach Procedures (IAPs) serving Runway 22 [RNAV (GPS)] and Runway 36 [RNAV (GPS)].

Although 2013 base year instrument operations at TPF were available for use through the FAA's TFMSC system, the historical instrument operations at TPF, as reported through Flightwise.com an aviation industry commercial subscription service, were utilized. A total of 3,011 instrument operations were found for TPF that represented 5.11 percent of all operations. This percentile of instrument operations was assumed to be reasonable for the development of the derivative forecast of instrument operations at TPF through the 20-year forecast period. The relative share of instrument operations generated by aircraft type, however, was assumed to change over time and is reflected in **Table 3-16**. The number of projected instrument operations by aircraft type is listed in **Table 3-17**.

Table 3-16
Based Aircraft Forecast Percentiles

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	75%	16%	5%	2%	2%	100%
2018	75%	16%	5%	2%	2%	100%
2023	75%	15%	6%	2%	2%	100%
2028	73%	15%	7%	3%	2%	100%
2033	72%	14%	8%	4%	2%	100%

Source: URS, 2014.

Table 3-17 Aircraft Instrument Operations By Fleet Mix						
Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	2,258	482	151	60	60	3,011
2018	2,405	513	160	64	64	3,208
2023	2,567	513	206	68	68	3,422
2028	2,675	550	257	110	73	3,665
2033	2,816	548	313	156	78	3,911
Year	CAGR	CAGR	CAGR	CAGR	CAGR	CAGR
2013-2018	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%
2019-2023	1.30%	0.00%	5.06%	1.30%	1.30%	1.30%
2024-2028	0.83%	1.38%	4.56%	9.94%	1.38%	1.38%
2029-2033	1.03%	-0.08%	4.05%	7.31%	1.31%	1.31%
Source: URS, 2014.						

3.10 Operational Peaking Characteristics

Aviation activity forecasts were derived for facility planning purposes that include derivative forecasts of peak month operations, average day peak month operations, and average hour average day peak month operations.

The peak month was estimated to represent 15 percent of annual aircraft operations. The average day peak month operations were derived by dividing the estimated peak month operations by 30.42 (365/52=30.42). At non-towered airports, the average day peak hour can be difficult to measure, but it is estimated that peak hour activity can equate to as much as 20 percent of the average day peak month operations. Peak activity projections for TPF are presented in **Table 3-18**.

Table 3-18 Aircraft Operations Peaking Characteristics Forecast				
Year	Annual	Peak Month	Average Day Peak Month	Average Day Peak Hour
2013	58,918	8,838	291	58
2018	62,785	9,418	310	62
2023	66,967	10,045	330	66
2028	71,720	10,758	354	71
2033	76,534	11,480	377	75
Source: URS, 2014.				

3.11 Forecast Summary and Comparison to FAA TAF

FAA forecast development guidance includes the requirement to develop a comparison between the derived Master Plan Update forecasts and the FAA TAF forecasts as published for TPF. **Table 3-19** summarizes the aviation activity forecast. The comparison of the derived forecast of aviation activity at TPF to the FAA TAF forecast is presented in **Table 3-20**.

The projected future annual operational levels will not deviate from the FAA TAF annual level of aircraft operations by more than 10 percent in the five-year forecast period, or by 15 percent in the ten-year forecast period. For all classes or airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet these criteria. Although there is a low variance between the FAA TAF of 0.93 percent CAGR and the selected forecast of 1.32 percent CAGR, the FAA TAF does not provide a true forecast for TPF. Aircraft operations growth at Peter O. Knight Airport is projected to increase at a steady rate annually. This growth accounts for based aircraft and fleet mix changes at TPF and is considered reasonable for planning purposes.

The forecasts presented in Table 3-19 were approved by the FAA on September 25, 2014.

Table 3-19
Summary of Aviation Activity Forecast

Forecast Levels and Growth Rates

	Forecast Level of Aviation Activity						Average Annual Compound Growth Rates				
Passenger Enplanements	**2013**	**2014**	**2018**	**2023**	**2028**	**2033**	**2013 to 2014**	**2013 to 2018**	**2013 to 2023**	**2013 to 2028**	**2013 to 2033**
Air Carrier	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Commuter	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Enplanements	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Operations											
Itinerant											
Air Carrier/Commuter (Part 121)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Air Taxi (Part 135)	820	820	820	820	820	820	0.00%	0.00%	0.00%	0.00%	0.00%
Total Commercial Operations	820	820	820	820	820	820	0.00%	0.00%	0.00%	0.00%	0.00%
General Aviation	25,663	26,002	27,403	29,285	31,424	33,590	1.32%	1.32%	1.33%	1.36%	1.35%
Military	30	30	30	30	30	30	0.00%	0.00%	0.00%	0.00%	0.00%
Local											
General Aviation	32,405	32,820	34,532	36,832	39,446	42,094	1.28%	1.28%	1.29%	1.32%	1.32%
Military	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Operations	58,918	59,672	62,785	66,967	71,720	76,534	1.28%	1.28%	1.29%	1.32%	1.32%
Instrument Operations	3,011	3,050	3,208	3,422	3,665	3,911	1.30%	1.28%	1.29%	1.32%	1.32%
Peak Day Operations	291	295	310	330	354	377	1.37%	1.27%	1.27%	1.32%	1.30%
Cargo/Mail (Enplaned+Deplaned Tons)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Single-Engine (Non-jet)	84	85	88	94	102	110	1.19%	0.93%	1.13%	1.30%	1.36%
Multi-Engine (Non-jet)	12	13	16	18	20	23	8.33%	5.92%	4.14%	3.46%	3.31%
Turboprop	5	5	7	9	12	13	0.00%	6.96%	6.05%	6.01%	4.89%
Rotorcraft	7	7	7	7	7	8	0.00%	0.00%	0.00%	0.00%	0.00%
Jets	2	2	2	3	3	3	0.00%	0.00%	4.14%	2.74%	2.05%
Total Based Aircraft	110	112	120	131	144	157	1.82%	1.76%	1.76%	1.81%	1.79%

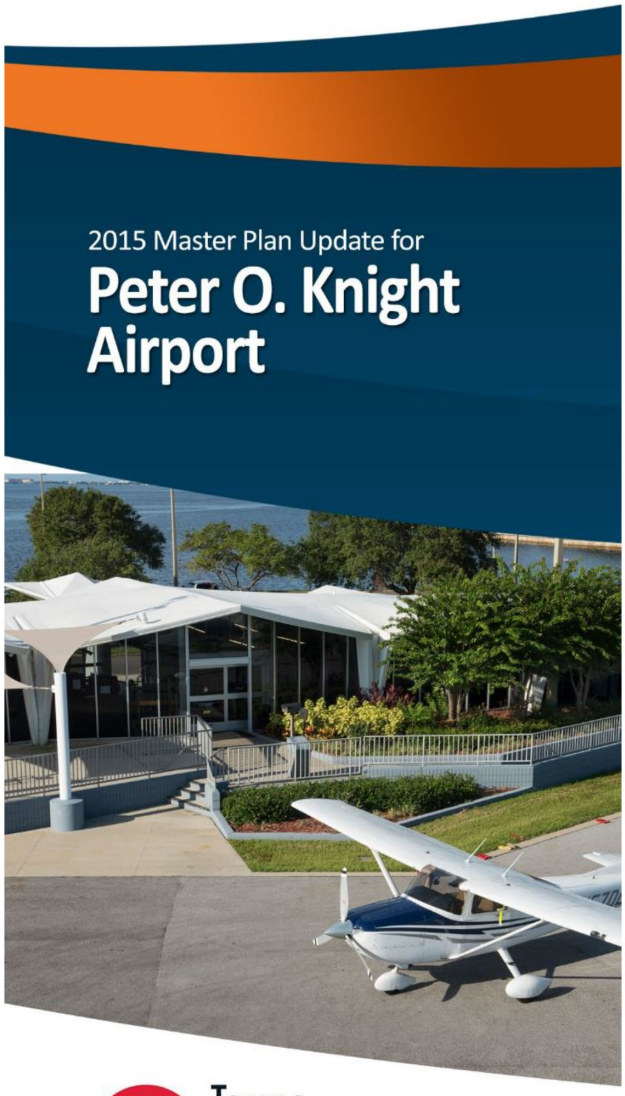
Operational Factors

Average Aircraft Size (Seats)	**2013**	**2014**	**2018**	**2023**	**2028**	**2033**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
Average Enplaning Load Factor	**2013**	**2014**	**2018**	**2023**	**2028**	**2033**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
GA Operations Per Based Aircraft	528	525	516	505	492	482

Source: URS, 2014.

Table 3-20 Comparison of Derived and FAA TAF Forecast			
Year	Selected Forecast	FAA TAF	Selected Forecast vs. FAA TAF (%)
Passenger Enplanements			
2013	0	0	0.0%
2018	0	0	0.0%
2023	0	0	0.0%
2028	0	0	0.0%
Commercial Operations			
2013	0	0	0.0%
2018	0	0	0.0%
2023	0	0	0.0%
2028	0	0	0.0%
Total Operations			
2013	58,918	66,611	-11.55%
2018	62,785	69,749	-9.98%
2023	66,967	73,044	-8.32%
2028	71,720	76,493	-6.24%
2033	76,534	80,097	-4.45%
Source: URS, 2014.			

Chapter 4.0 Capacity Assessment and Identification of Facility Needs



Tampa International Airport

Hillsborough County Aviation Authority

4.0 Airport Capacity Assessment and Identification of Facility Needs

4.1 Introduction

The purpose of the airport capacity assessment and identification of facility needs is to evaluate the two runway airfield system and supporting landside facilities to accommodate existing and future projected aviation activity at Peter O. Knight Airport (TPF).

The airport capacity assessment serves to identify annual service volume and hourly capacity, as well as aircraft operational delay for future airport operations planning. Airfield design standards will also be reviewed to identify current design standards and future needs. Facility requirements for current and future aviation demand will also be evaluated.

4.2 Quantification of Airfield Capacity

Approach and Methodology

Airfield capacity analysis provides a numerical metric measure of the airfield's ability to accommodate the safe and efficient movement of aircraft activities. The capacity of the airfield is primarily affected by several factors that include the physical layout of the airfield, local prevailing meteorological conditions, aircraft fleet mix, runway utilization rates, percent of aircraft arrivals to each runway, relative level of aircraft touch-and-go activity on one or more of an airport's runways, and the location of exit taxiways relative to the approach end of the runway. An airport's airfield capacity is expressed in terms of Annual Service Volume (ASV) and represents a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year without induced aircraft operational delay.

Annual Service Volume and Hourly Capacity

The ability of the airport's runway system to accommodate existing and future levels of operational demand was determined by the use of published FAA guidelines as detailed in FAA AC 150/5060-5, *Airport Capacity and Delay.* The aircraft fleet mix for TPF during 2013 was determined using based aircraft information provided by HCAA and Flightwise.com data from January to December 2013. Based on the data, it is estimated that Class A and Class B aircraft comprise 100 percent of aircraft operations.

The FAA's handbook methodology uses the term "Mix Index" to describe an airport's fleet mix. The FAA defines the Mix Index as the percentage of Class C operations plus three times the percentage of Class D operations. By applying this calculation to the fleet mix percentages for the Airport, a Mix Index of 0 percent is obtained per the following equation:

Class C Operations (0.00%) + (3 * Class D Operations (0.00%)) = Mix Index (0.00%)

The Annual Service Volume (ASV) is a reasonable estimate of an airport's annual capacity. ASV takes into consideration differences in runway use, aircraft mix, weather conditions, and other factors that would be encountered over a year. For TPF, the ASV is 230,000 operations per year. TPF has an hourly capacity of 98 VFR operations per hour and 59 IFR operations per hour.

Aircraft Operational Delay

Aircraft operational delay is the difference in time between a constrained and an unconstrained aircraft operation. As the level of aircraft operations increase as a relative proportion of the calculated ASV value, aircraft operational delay increases at an increasing rate. The level of aircraft operations at TPF for the year 2013 represented approximately 26 percent of the calculated ASV, (58,918/230,000) thus indicating virtually no associated aircraft operational delay. At the end of the 20-year forecasting period (2033), this relative percentage increases to approximately 33 percent, (76,534 /230,000) continuing to reflect little or no associated aircraft operational delay.

Findings

The aircraft operations forecast for TPF indicates that projected aircraft operations (76,534 operations annually in 2033) through the 20-year planning period are not expected to exceed the ASV (230,000 operations annually). The capacity of the airfield system will not be exceeded and will be able to fully satisfy existing and projected future aircraft operational demand for the forecast period without induced adverse effects to aircraft operations and associated aircraft operational delay.

4.3 Runway Orientation and Wind Coverage

Required Wind Coverage

A key meteorological factor is wind direction and speed. Ideally, runways should be aligned with the prevailing wind to reduce the effects of crosswinds on landing aircraft, especially for small aircraft. A tailwind is not a favorable condition for take-off and landing. A wind analysis is to insure that the runway is properly oriented to suit both Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC).

Crosswind Components

The crosswind component of wind direction and velocity is the resultant vector which acts at a right angle to the runway. When a runway orientation provides less than 95 percent wind coverage for the aircraft which are forecast to use the airport on a regular basis, a crosswind runway may be required. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding the allowable value, per RDC. For a RDC of B-I, the allowable crosswind component is 10.5 knots. **Table 4-1** shows the allowable crosswind component per RDC.

Table 4-1
Allowable Crosswind Component per RDC

RDC	Allowable Crosswind Component
A-I and B-I	10.5 knots

Source: Advisory Circular 150/5300-13A, Change 1, Airport *Design,* Table 3-1.

Wind Coverage Analysis

Ten years of historical wind data was analyzed to determine the wind coverage at TPF. The all-weather wind coverage of Runways 4-22 and 18-36 are 98.05 percent using a 10.5 knot crosswind component. This exceeds the FAA's recommended 95 percent wind coverage for the future design aircraft and the most critically affected aircraft at TPF. **Table 4-2** shows the wind coverage

crosswind components for TPF. The All-Weather, VMC, and IMC conditions are show in **Figures 4-1** through **4-3**.

Table 4-2
Runway Wind Coverage Percentiles

Meteorological Condition	Runway	Wind Coverage Crosswind Component 10.5 knots
All-Weather	4-22	95.78 %
	18-36	96.11 %
	Combined	98.05 %
Visual Meteorological Conditions (VMC)	4-22	95.93 %
	18-36	96.25 %
	Combined	98.11 %
Instrument Meteorological Conditions (IMC)	4-22	92.87 %
	18-36	94.03 %
	Combined	96.67 %
Instrument Meteorological Conditions (IMC) - Lowest Minimus	4-22	92.14 %
	18-36	95.49 %
	Combined	96.72 %

Sources: Tampa International Airport USAF 722110 – Period: 2004 to 2013 FAA Airports GIS Program, Airport Design Tools, Standard Wind Analysis.

Findings

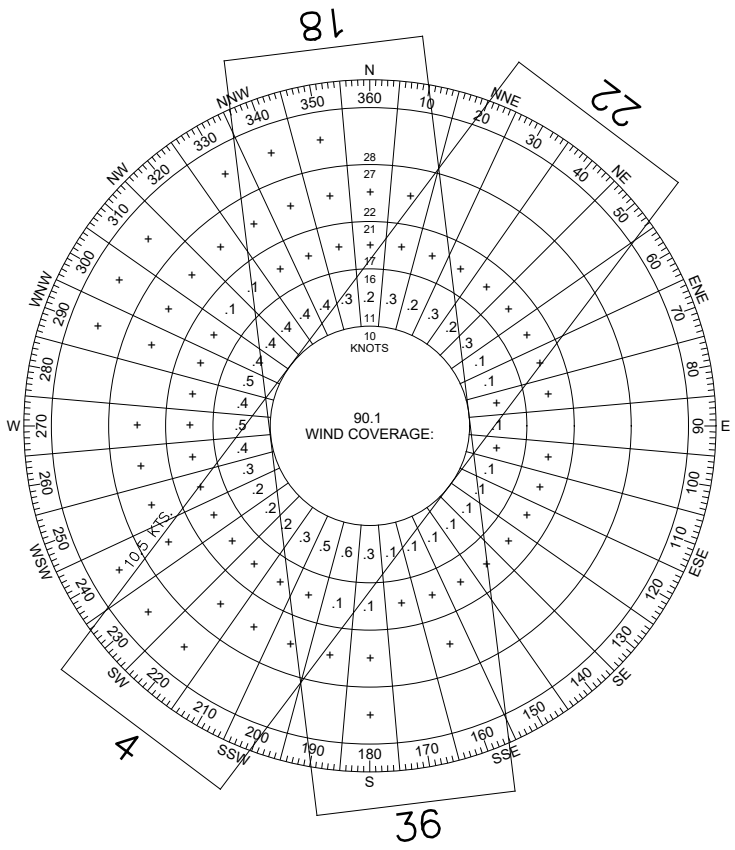
The existing runway system at TPF exceeds FAA guidelines for wind coverage, which requires at least 95 percent wind coverage. Additional runways are not required for the purpose of wind coverage.

4.4 Airfield Design Standards

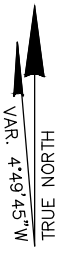
The following sections describe the fundamental airfield design standards for safe, efficient, and economic aircraft operations. Airfield design standards are determined by a careful analysis of the aircraft characteristics for which the airfield will be designed.

Aircraft Approach Category

The Aircraft Approach Category (AAC) as specified in 14 CFR Part 97 § 97.3, *Symbols and Terms Used in Procedures*, represents a grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF}, V_{SO}, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry. The AAC definitions are shown in **Table 4-3**. TPF has an AAC of B for Runways 4-22 and 18-36, representing an approach speed of 91 knots or more, but less than 121 knots.



METEOROLOGICAL CONDITION	RUNWAY	RUNWAY WIND COVERAGE BY PERCENT	
		10.5 KNOTS (12 MPH)	OBSERVATIONS
ALL - WEATHER	4/22	95.78	113,413
ALL - WEATHER	18/36	96.11	
ALL - WEATHER	COMBINED	98.05	

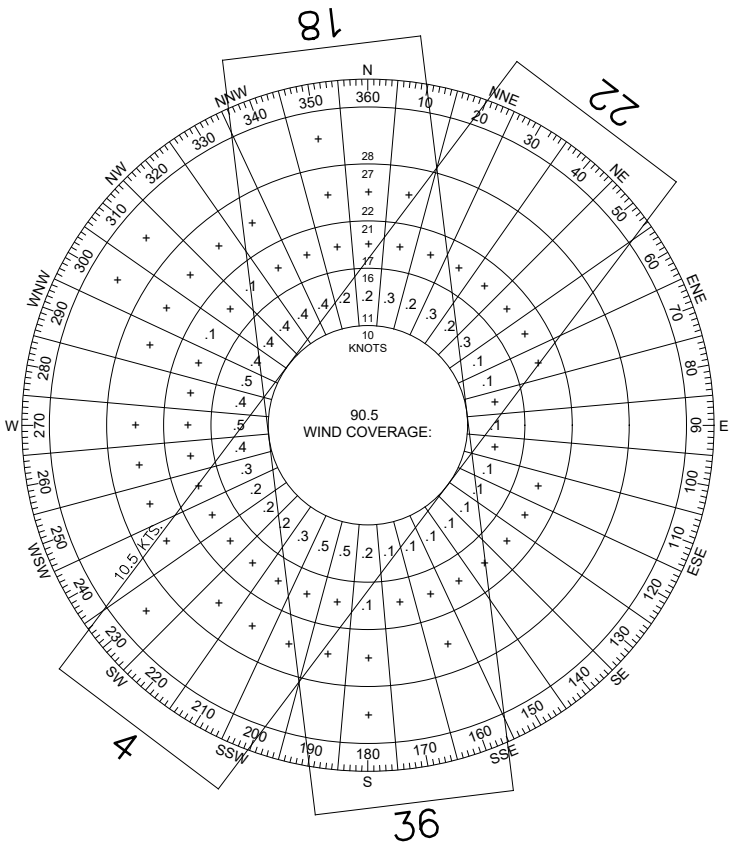


WIND ROSE DEPICTED RELATIVE TO TRUE NORTH (NAD 83)
RUNWAY 4 ORIENTATION: 36°57'00" (TRUE)
RUNWAY 22 ORIENTATION: 216°56'59.99" (TRUE)
RUNWAY 18 ORIENTATION: 172°59'24" (TRUE)
RUNWAY 36 ORIENTATION: 352°58'48" (TRUE)
MAGNETIC DECLINATION: 4°49'45"W

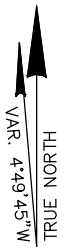
NOTES:

1. THIS GRAPHICAL CHART PLOTS, FOR THE DATA PERIOD LISTED, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED WHILE THE RECTANGULAR BOXES REPRESENT THE MAXIMUM ACCEPTABLE CROSSWIND COMPONENTS OF 10.5 KNOTS FOR BOTH RUNWAYS BASED ON ARC B–II AIRCRAFT DESIGN AND CROSSWIND LIMITATIONS. THE AIRFIELD COVERAGE CAPABILITY (ALL RUNWAYS) IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLE.
2. RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 4°49'45"W DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

SOURCES:
U.S DEPARTMENT OF COMMERCE; NATIONAL CLIMATIC DATA CENTER (NCDC) ASHEVILLE, NORTH CAROLINA,
SURFACE OBSERVATION DATA OBTAINED FOR WEATHER STATION: TAMPA INTERNATIONAL AIRPORT
STATION NO.: 722110
RECORD PERIOD: 2004–2013
SURFACE OBSERVATION DATA COMPILED BY URS, 2014.



METEOROLOGICAL CONDITION	RUNWAY	RUNWAY WIND COVERAGE BY PERCENT	
		10.5 KNOTS (12 MPH)	OBSERVATIONS
VMC	4/22	95.93	97,347
VMC	18/36	96.25	
VMC	COMBINED	98.11	



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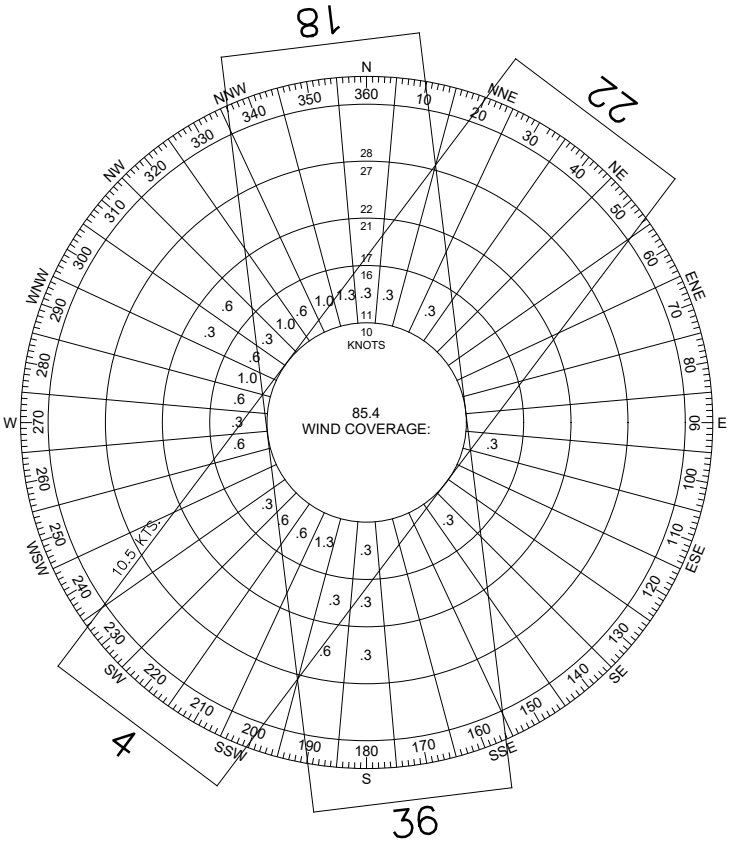
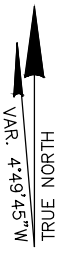
2. RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 4°49'45"W DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

SOURCES:
U.S DEPARTMENT OF COMMERCE; NATIONAL CLIMATIC DATA CENTER (NCDC) ASHEVILLE, NORTH CAROLINA, SURFACE OBSERVATION DATA OBTAINED FOR WEATHER STATION: TAMPA INTERNATIONAL AIRPORT
STATION NO.: 722110
RECORD PERIOD: 2004–2013
SURFACE OBSERVATION DATA COMPILED BY URS, 2014.



METEOROLOGICAL CONDITION	RUNWAY	RUNWAY WIND COVERAGE BY PERCENT	
		10.5 KNOTS (12 MPH)	OBSERVATIONS
IMC (LOWEST MIN.)	4/22	92.14	315
IMC (LOWEST MIN.)	18/36	95.49	
IMC (LOWEST MIN.)	COMBINED	96.72	



WIND ROSE DEPICTED RELATIVE TO TRUE NORTH (NAD 83)
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2. RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 4°49'45"W DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

SOURCES:
U.S DEPARTMENT OF COMMERCE; NATIONAL CLIMATIC DATA CENTER (NCDC) ASHEVILLE, NORTH CAROLINA, SURFACE OBSERVATION DATA OBTAINED FOR WEATHER STATION: TAMPA INTERNATIONAL AIRPORT
STATION NO.: 722110
RECORD PERIOD: 2004-2013
SURFACE OBSERVATION DATA COMPILED BY URS, 2014.

Table 4-3 Aircraft Approach Category	
Aircraft Approach Category	Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more, but less than 121 knots
C	Approach speed 121 knots or more, but less than 141 knots
D	Approach speed 141 knots or more, but less than 166 knots
E	Approach speed 166 knots or more
Source: AC 150/5300-13A Change 1, *Airport Design, Paragraph 105.*	

Airplane Design Group

The Airplane Design Group is classification of aircraft based on wingspan and tail height as shown in **Table 4-4**. When the aircraft wingspan and tail height fall in different groups, the higher group is used. TPF has an ADG of I for both Runways 4-22 and 18-36 representing a tail height of less than 20 feet and a wingspan of less than 49 feet.

Table 4-4 Airplane Design Group		
Group	Tail Height (Feet)	Wingspan (Feet)
I	Less than 20	Less than 49
II	20 to less than 30	49 to less than 79
III	30 to less than 45	79 to less than 118
IV	45 to less than 60	118 to less than 171
V	60 to less than 66	171 to less than 214
VI	66 to less than 80	214 to less than 262
Source: AC 150/5300-13A Change 1, *Airport Design, Paragraph 105.*		

Design Aircraft

Airfield geometric designs that are based on only existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. On the other hand, airfield designs that are based on large aircraft never likely to operate at the airport are not economical.

According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS),* §3-4, airport dimensional standards (such as runway length and width, separation standards, surface gradients, etc.) should be selected which are appropriate for the *"critical"* or *"design"* aircraft that will make *substantial use* of the airport in the planning period. Based upon the NPIAS definition, substantial use means either 500 or more annual itinerant operations, or scheduled commercial service.

The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The "design" or "critical" aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code (ARC) for airport design criteria (such as dimensional standards and appropriate pavement strength) and is contained within FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*. A runway may be designed with a number of different design aircraft. For example, a very large aircraft may be the design aircraft when it comes to runway length specifications, while a very small aircraft may be the design aircraft when designing

for runway orientation, while yet another may be used to design the pavement specifications of the runway. For the purposes of airspace protection, the aircraft with the greatest "approach speed" is used. Although the NPIAS Field Formulation guidance prescribes the use of a "design" or critical aircraft for consideration of future airport development, it was recognized that although currently classified as having an ARC of B-I, there are occasional aircraft operations that are generated by aircraft having greater operational and physical characteristics, (i.e, faster approach speeds and wider wingspans).

A review of FAA-published aircraft operational data for the year 2013 representing aircraft operational activity conducted to and from the airport under Instrument Flight Rules, does not indicate 500 or more itinerate operations by larger and more demanding aircraft. For this reason, and to safely and efficiently accommodate aircraft operations at the airport by larger aircraft, the previously selected design aircraft as identified in the 2003 Airport Master Plan update was retained for planning purpose as part of this update of the Airport Master Plan. The design aircraft for TPF are the Beechcraft Baron 58 and the Cessna Skylane 182, which both classify as B-I (small) aircraft.

Instrument Approach Capabilities

Instrument flight visibility minimums are expressed in feet of Runway Visual Range (RVR) as shown in **Table 4-5**. For TPF, the approach speed is not lower than 1 mile and the RVR is 5,000 feet. The instrument flight visibility is not expected to change through the 20-year planning period.

Table 4-5
Instrument Flight Visibility Category (Statute Mile)

RVR (Feet)	Visibility (statute miles)
5,000	**Not lower than 1 mile**
4,000	Lower than 1 mile but not lower than ¾ mile
2,400	Lower than ¾ mile but not lower than ½ mile
1,600	Lower than ½ mile but not lower than ¼ mile
1,200	Lower than ¼ mile

Source: AC 150/5300-13A Change 1, *Airport Design, Paragraph 105.*

Required Protection of Navigable Airspace

Federal Regulation 49 CFR Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This part provides criteria for whether or not a proposed object should be submitted to the FAA for evaluation; whether or not that object would be classified as an obstruction to air navigation; and if so, whether it should be studied further in order to assess hazard status. This part in itself does not contain the criteria for determining whether or not an obstruction will be considered a hazard to air navigation.

Civil airport imaginary surfaces defined and prescribed by this part are established with relation to the each airport and to each runway at that airport. The size and slope of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of an Approach Surface that is applied to a particular runway end are determined by the most precise (i.e. having the lowest published cloud

base and horizontal visibility) approach procedure minimums that exist, or are planned for that runway end. The slopes of the Approach Surface that extend outward and upward from the end of the Primary Surface are expressed in terms of rise over run ratios (e.g., 20:1, 34:1 or 50:1).

Civil airport imaginary surfaces that are applicable to this airport include:

- Primary Surface – A flat surface that is longitudinally-aligned with each runway centerline that extends to a length of 200 feet beyond end of the runway at the same elevations as the end of the runway.
- Approach Surface – A sloping surface that is longitudinally-aligned with each runway centerline that extends outward and upward at varying ratios (depending on type of approach) beyond from the end of the Primary Surface.
- Transitional Surface – A sloping surface that extends outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the Primary Surface and from the sides of the Approach Surface. Transitional Surfaces for those portions of the precision Approach Surface which project through and beyond the limits of the Conical Surface extend to a distance of 5,000 feet measured horizontally from the edge of the Approach Surface and at right angles to the runway centerline.
- Horizontal Surface – A flat surface that represents a horizontal plane established 150 feet above the highest runway elevation. The perimeter of the Horizontal Surface is constructed by swinging arcs of specified radii from the center of each end of the Primary Surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.
- Conical Surface – A sloping surface that extends outward and upward from the periphery of the Horizontal Surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

Each published instrument approach procedure established for each runway end has published minima describing the lowest cloud base height expressed in feet Above Mean Sea Level (MSL) and Above Ground Level (AGL), and horizontal visibility distances expressed in statute miles or Runway Visual Range (RVR) reporting values expressed in feet.

The following describes each runway end having one or more published instrument procedures, the associated cloud base height and visibility distance minimums and Approach Surface slope:

Two of the four runways at TPF are served by Non-precision Instrument approach procedures that are described as follows:

- Runway 4 has no published instrument approach procedures and is thus considered a Visual Runway. The Part 77 approach slope for this runway is 20:1.

- Runway 22 is served by a RNAV (GPS) Non-precision Instrument approach procedure having straight-in cloud base and horizontal visibility minimums of 580 feet and 1 statute mile. The Part 77 approach slope for this published instrument approach procedure is 20:1.

- Runway 18 has no published instrument approach procedures and is thus considered a Visual Runway. The Part 77 approach slope for this runway is 20:1.

- Runway 36 is served by a RNAV (GPS) Non-precision Instrument approach procedure having straight-in cloud base and horizontal visibility minimums of 440 feet and 1 statute mile. The Part 77 approach slope for this published instrument approach procedure is 20:1.

The FAA periodically reviews Instrument Approach Procedures established for each runway. Obstacles discovered and/or reported within Approach, Departure, Horizontal or Conical surfaces may result in the FAA establishing increased (i.e., "higher") cloud base and/or visibility minima for one or more published instrument approach procedures, loss of approaches and/or loss of night operations. Development on and off an airport may potentially create adverse effects to the protection of navigable airspace at and around airports. Such adverse effects, may affect current and future airport operations when it creates obstacles to the safe and efficient use of the airspace surrounding the airport. Approach and Departure surfaces should remain clear of obstacles, including aircraft, in order to prevent operational restrictions that might affect aircraft operating weights and visibility minimums.

The Civil Airport Imaginary surfaces established for this airport by CFR Part 77 were found to be appropriate and sufficient. At such time that any runway is lengthened, shortened, or upgraded to provide increased published instrument approach capabilities, these Civil Airport Imaginary surfaces should be reviewed and modeled as required.

The HCAA's protection of navigable airspace above and surrounding each of its three general aviation airports has been developed, constructed and publicly published to fully comply with Title 14 of the Code of Federal Regulations (14 CFR) Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace and Florida Statutes 14-60.009, Airspace Protection.

Runway Design Code

The RDC is a code signifying the design standards to which the runway is to be built. It is comprised of the AAC, ADG, and the runway visibility minimums. TPF has a RDC of B-I-5000 for Runway 4-22 and a RDC of B-I-5000 for Runway 18-36.

Although FAA criteria are based upon the three described parameters, aircraft weight should also be considered when assessing the adequacy of pavement strength and length of haul should be considering when considering runway length requirements.

Airport Reference Code

The ARC is a coded system composed of the AAC and ADG. The ARC relates airport design criteria to the operational and physical characteristics of the aircraft that will operate at the airport. TPF has an existing ARC of B-I. Existing and future aircraft operations are considered based on FAA- approved aviation demand forecasts and the airport's existing and future role within the air transportation system. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport.

4.5 Runway Design Standards

Runway design standard guidance is provided by FAA Advisory Circular 150/5300-13A, *Airport Design* and FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design.*

Width

Runway width requirement factors include approach minimums, AAC, and ADG for the runway's design aircraft. With an RDC of B-I-5000, the runway width standard at TPF for Runway 4-22 and 18-36 is 60 feet. TPF currently has runway widths of 75 feet for Runway 18-36 and 100 feet for Runway 4-22, meeting runway width standards.

Length

Based on the review of the total number of aircraft operational activity by larger (i.e., more demanding) general aviation aircraft at the airport during the calendar year 2013, it was determined that the existing runway available take-off lengths at TPF are sufficient.

At such time that the need for increased runway take-off lengths required to support 500 or more annual aircraft operations by one or more aircraft having similar operational characteristics is evident, it is highly recommended that HCAA and FAA initiate a Runway Improvement Justification Study to assess and document such demand. If, as part of these study actions there is a demonstrated need for increased runway take-off length, such findings should be used to formulate HCAA-sponsored planning actions and follow-on FAA funding and National Environmental Protection Act (NEPA) environmental programs that would be required to undertake such runway improvement actions.

Shoulders

Runway shoulders provide resistance to blast erosion and accommodate the passage of maintenance and emergency equipment and the occasional passage of an aircraft veering from the runway. A stabilized surface, such as turf, normally reduces the possibility of soil erosion and engine ingestion of foreign objects. Soil not suitable for turf establishment requires a stabilized or low cost paved surface. Paved shoulders are required for runways accommodating ADG IV and higher aircraft, and are recommended for runways accommodating ADG-III aircraft.

Turf, aggregate-turf, soil cement, lime or bituminous stabilized soil are recommended adjacent to runways accommodating ADG I aircraft. TPF does not currently have runway shoulders. The recommended width is 10 feet.

Blast Pad

Paved runway blast pads provide blast erosion protection beyond runway ends during jet aircraft operations. Blast pads at runway ends should extend across the full width of the runway plus the shoulders. For a RDC of B-I-5000 (Runway 36, and Runway 4-22), the standard blast pad width is 80 feet and the length is 60 feet. For a RDC of B-I-Visual (Runway 18 end), the standard blast pad width is 80 feet and the length is 100 feet. TPF does not currently have runway blast pads.

Safety Area

The Runway Safety Area (RSA) is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The current RSA requirements, for a RDC of B-I-Visual and B-I-5000 (Runways 18-36 and 4-22) are 240 feet beyond the departure end of the runway, 240 feet prior to the threshold, and a width of 120 feet.

The extended portion of the RSA beyond the departure (northeast) end of Runway 4 extends approximately 140 feet beyond the land platform into Seddon Channel. The non-standard RSA condition mandates the use of declared distance criteria to provide the minimum 240-foot length.

Object Free Area

The Object Free Area (OFA) is an area centered on the ground on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. The standard for a RDC of B-I-Visual and B-I-5000 is 240 feet beyond the runway end, 240 feet prior to the threshold, and 250 feet in width.

The extended portion of the OFA beyond the south end of Runway 18-36 extends approximately 59 feet into a public roadway. Similarly, the extended portion of the OFA beyond the north end of Runway 18-36 extends approximately 42 feet into a public roadway. The non-standard OFA condition mandates the use of declared distance criteria to provide the minimum 240-foot length.

Obstacle Free Zone

The Obstacle Free Zone (OFZ) is the three-dimensional airspace along the runway and extended runway centerline that is required to be clear of obstacles for protection of aircraft landing or taking off from the runway and for missed approaches. For a RDC of B-I-5000 and B-I-Visual the design standards are 200 feet in length and 250 feet in width. TPF currently satisfies OFZ requirements.

Runway Protection Zone

The Runway Protection Zone (RPZ) is a predefined ground-level area of land trapezoidal in shape and centered about the extended runway centerline. By designed, shape, size and function, the RPZ serves to enhance the safety and protection of people and property on the ground.

The central portion and controlled activity area are the two components of the RPZ:

1. Central Portion of the RPZ. The central portion of the RPZ extends from the beginning to the end of the RPZ, centered on the runway centerline. Its width is equal to the width of the runway OFA.

2. Controlled Activity Area. The controlled activity area is the remaining area of the RPZ on either side of the central portion of the RPZ.

Typically, RPZs are established 200 feet prior to the threshold, or 200 feet beyond the departure end of the runway. When an RPZ begins at a location other than 200 feet beyond the end of

runway (e.g., through the required application and use of declared distances), two (overlapping) RPZs (overlapping) are required and are designated as either an "Arrival" RPZ, or a "Departure" RPZ.

The size and shape (i.e., dimensions) of an Approach RPZ for a particular runway end are a function of the aircraft approach category and approach visibility minimums associated with the approach runway end. The Approach RPZ typically extends outward along the extended runway centerline approach path from a point 200 feet from the runway threshold, for a pre-determined distance.

The dimensions of the Departure RPZ are a function of the aircraft approach category and departure procedures associated with the runway. The Departure RPZ typically begins 200 feet beyond the departure end of the runway end outward along the extended runway centerline departure path or, if the Takeoff Run Available (TORA) and the runway end are not the same, 200 feet beyond the far end of the TORA. The departure RPZ dimensional standards are equal to, or less than the approach RPZ dimensional standards.

The following land uses are permissible within the confines of a RPZ without further evaluation:

1. Farming that meets airport design standards.
2. Irrigation channels that meet the requirements of AC 150/5200-33 and FAA/USDA manual, Wildlife Hazard Management at Airports.
3. Airport service roads, as long as they are not public roads and are directly controlled by the airport operator.
4. Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable.
5. Unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ.

Where practical, airport owners should own the property within the dimensional limits of the RPZ. It is desirable to clear the entire RPZ of all above-ground objects. Where this is impractical, airport owners, as a minimum, should maintain the RPZ clear of all facilities supporting incompatible activities. Although the FAA recognizes that in certain situations the airport owner may not fully control land within the RPZ, the FAA expects airport owner to take all possible measures to protect against and remove or mitigate incompatible land uses.

On September 27, 2012, to clarify the FAA's policy on land uses within the RPZ, the FAA's Office of Airports' (ARP) issued a Memorandum titled*: Interim Guidance on Land Uses Within a Runway Protection Zone.* The memorandum presented interim policy guidance on compatible land uses within RPZs and addressed recurrent questions about what constitutes a compatible land use and how to airport owners should evaluate proposed land uses that would reside in an RPZ. This interim policy only addressed the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location.

Table 1 of the Memorandum listed the following land uses of critical concern:

- Buildings and structures (Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.),
- Recreational land use (Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.),
- Transportation facilities. Examples include, but are not limited to:
    - Rail facilities -light or heavy, passenger or freight
    - Public roads/highways
    - Vehicular parking facilities
- Fuel storage facilities (above and below ground),
- Hazardous material storage (above and below ground),
- Wastewater treatment facilities, and
- Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations.

Instructional guidance contained in the Memorandum further stated: *when any of the land uses described in Table I would enter the limits of the RPZ as the result of:*

1. An airfield project (e.g., runway extension, runway shift),
2. A change in the critical design aircraft that increases the RPZ dimensions,
3. A new or revised instrument approach procedure that increases the RPZ dimensions, or
4. A local development proposal in the RPZ (either new or reconfigured);

coordination with the FAA's Planning and Environmental Division / Airport Planning and Programming Division (APP-400) is required.

Runways 18-36 and 4-22 each have full-length parallel taxiway systems having a runway-to-taxiway centerline separation of 150 feet. Each of these runways are classified as a "Utility" runways that fully meet Airport Reference Code (ARC) A/B-I "Small Aircraft" airport design standards to accommodate aircraft having maximum certificated takeoff weights of 12,500 pounds or less.

Runway 18

Runway 18 does not have a published instrument approach procedure and is therefore classified as a "Visual" Runway.

The dimensions of the applicable Approach and Departure RPZs for a "Utility" runway having only visual approach visibility minimums are identical with each having an inner width of 250 feet, an outer width of 450 feet and a length of 1,000 feet.

Runway 36

Runway 36 is served by a published non-precision RNAV (GPS) instrument approach procedure having visibility minimums not lower than one statute mile.

The dimensions of the applicable Approach and Departure RPZs for a "Utility" runway a having these published instrument approach visibility minimums are identical with each having an inner width of 250 feet, an outer width of 450 feet and a length of 1,000 feet.

Runway 4

Runway 4 does not have a published instrument approach procedure and is therefore classified as a "Visual" Runway.

The dimensions of the applicable Approach and Departure RPZs for a "Utility" runway having only visual approach visibility minimums are identical with each having an inner width of 250 feet, an outer width of 450 feet and a length of 1,000 feet.

Runway 22

Runway 22 is served by a published non-precision RNAV (GPS) instrument approach procedure having visibility minimums not lower than one statute mile.

The dimensions of the applicable Approach and Departure RPZs for a "Utility" runway having these published instrument approach visibility minimums are identical with each having an inner width of 250 feet, an outer width of 450 feet and a length of 1,000 feet.

TERPS Approach Obstacle Clearance Surfaces

The FAA's Terminal Instrument Procedures (TERPS) final approach Obstacle Clearance Surfaces (OCS) are applicable to precision instrument approach capabilities (i.e., ILS) and non-precision approach capabilities offering vertical guidance using Localizer Performance with Vertical guidance (LPV) capabilities.

None of the four runways at TPF are served by Non-precision Instrument Approach Procedures offering LPV vertical descent procedures.

TERPS Departure Surfaces

When a runway has an established and published instrument approach procedure, the TERPS Instrument Departure Surfaces apply. The prescribed Instrument Departure Surface begins at the departure end of the runway and extends outward and upward along the extended runway centerline with a slope of 1 unit vertically for every 40 units horizontally (40:1). When the 40:1 Instrument Departure Surface is penetrated by natural or man-made objects, the FAA may require modification of the instrument departure procedures that may potentially require the application of non-standard (increased) climb rates, and/or non-standard (increased) published instrument departure minimums.

No instrument departures are allowed from the departure end of Runways 4 or 36 because of environmentally-related issues.

Runway 18 is used for instrument departure activity, but, close-in obstacle penetrations of the 40:1 Instrument Departure Surface, requires a minimum aircraft climb gradient of 260 feet per nautical mile until reaching an altitude of 300 feet above sea level.

Runway 22 is used for instrument departure activity and has no noted penetrations of the 40:1 Instrument Departure Surface.

The existing TERPS Departure surfaces established for Runways 18 and 22 were found to be appropriate and sufficient. At such time that any runway is lengthened or shortened these surfaces should be reviewed and modeled by HCAA as required.

It is highly recommended that HCAA identify and remove any future natural (trees or vegetation) other or any other man-made object that may penetrate the established and overlying 40:1 Instrument Departure Surfaces to protect and enhance the instrument departure capabilities for those runways.

Runway Centerline to Parallel Taxiway Centerline Separation

Runway centerline to parallel taxiway centerline separation standards for a RDC of B-I-5000 and B-I-Visual is 150 feet. TPF currently meets the design standards for Runway 4-22 and 18-36.

Runway Pavement Strength

Runway 4-22 and Runway 18-36 have a pavement strength to accommodate aircraft with a single-wheel load rating of 20,000 pounds or less. The runway is constructed of asphalt and is in fair to good condition as recorded in the FAA 5010, Airport Master Records and Reports for TPF. Based upon the Florida Department of Transportation – Aviation and Spaceports Office, 2015 Pavement Conditions Report, TPF has runway, taxiway and areas that range from fair to good condition. As identified in TPF's Inventory of Existing Conditions, **Figure 2-4**, Runway 4-22 is in fair condition but is in need of rehabilitation. As part of the evaluation of existing conditions cracking and ponding of the runway pavement was observed. Additionally, there is a taxiway connector that is in poor condition and needs improvement.

Threshold Siting Surface

For any given runway, the threshold is the demarcation line that defines the beginning of useable pavement for an aircraft to land. Typically, the threshold is located at the end of the physical pavement of the runway, thereby allowing an approaching aircraft to land with the maximum amount of pavement provided. When required, a threshold can be "*displaced*" at a specified distance from the approach end of the runway. The displaced threshold defines a new location along the runway where an approaching aircraft may begin their touchdown on the runway. Often, the purpose of the displaced threshold is to allow an approaching aircraft ample clearance over obstacles in the approach area (i.e., those obstacles that would exceed the Threshold Siting Surfaces as defined in FAA Advisory Circular 150/5300-13A Change 1, Table 3-2*, Approach/Departure Standards.)*

Displacement of the threshold shortens the useable runway length for landing, while not adversely (i.e., shortening) affecting the length of the runway available for departing aircraft. As a basic

airport design requirement, threshold siting surfaces must be kept clear of obstacles either by removing or lowering the obstacles or displacing the threshold.

The dimensions of the Threshold Siting surfaces, which depend on the runway type, approach type, and other factors, include the following:

- Whether or not the runway is authorized for a visual, non-precision, precision approaches,
- Night-time operations and the approach visibility minimums.
- Whether or not there are published instrument departure procedures on the runway.
- Whether or not the runway is used by scheduled air carriers (those operating under FAR Part 121), and
- The approach category of the runway's design aircraft.

In many cases the requirements for maintaining airspace clear of objects depend, in part, on the type of aircraft that typically use a runway. Airport runway design standards are based, in fact, on what is known as the runway's "*critical"* or "*design*" aircraft.

When a penetration to a Threshold Siting Surface occurs, one or more of the following actions may be required by the airport owner to protect the runway Approach Surface:

- Removal or lowering of the object to preclude penetration of applicable threshold siting surface;
- Displacement of the threshold to preclude object penetration of applicable threshold siting surface, with a resulting shorter landing distance;
- Modification of the approach Glide Path Angle and/or Threshold Crossing Height, or a combination of both;
- Increase of published instrument approach procedure visibility minimums; or
- Prohibition of night-time operations unless the object is lighted or an approved Visual Glide Slope Indicator (VGSI) is in use.

The existing Threshold Siting surfaces established for each runway end were found to be appropriate and sufficient. At such time that any runway is lengthened or shortened, or a threshold is relocated or displaced on an existing runway, these siting surfaces should be reviewed and modeled by HCAA as required.

HCAA should continue to monitor and review all proposals for the erection of temporary or permanent objects in proximity to the airport as filed by proponents via the FAA's 7460-1 and OE/AAA notification process. Further, HCAA should maintain its current pro-active role within this review process with the goal of reducing or eliminating any potential penetrations to the various approach and departure surfaces to preserve the safe and efficient use of the airport.

Runway Design Standard Compliance Needs Summary

Summarized in **Table 4-6** and **Table 4-7** are the runway design standards for TPF. Runway and taxiway shoulders of turf, aggregate-turf, soil cement, lime or bituminous stabilized soil are

recommended adjacent to runways accommodating ADG-I aircraft. Runway blast pads are recommended, TPF does not currently have runway blast pads.

Table 4-6 Runway Design Standard Matrix – TPF – Runway 18 Runway Design Code (RDC): B-I-Visual			
Item	**Standard**	**Existing**	**Satisfies Requirements**
Runway Design			
Runway Length	See Section 4.5.2	2,687 ft	☑
Runway Width	60 ft	75 ft	☑
Shoulder Width	10 ft	0	☒
Blast Pad Width	80 ft	0	☒
Blast Pad Length	100 ft	0	☒
Crosswind Component	10.5 knots	13 knots	☑
Runway Protection			
Runway Safety Area (RSA)			
Length beyond departure end	240 ft	240 ft	☑
Length prior to threshold	240 ft	240 ft	☑
Width	120 ft	120 ft	☑
Runway Object Free Area (ROFA)			
Length beyond runway end	240 ft	240 ft	☑
Length prior to threshold	240 ft	240 ft	☑
Width	250 ft	250 ft	☑
Runway Obstacle Free Zone (ROFZ)			
Length	200 ft[1]	200 ft	☑
Width	250 ft[1]	250 ft	☑
Precision Obstacle Free Zone (POFZ)			
Length	N/A	N/A	N/A
Width	N/A	N/A	N/A
Approach Runway Protection Zone (RPZ)			
Length	1,000 ft	1,000 ft	☑
Inner Width	250 ft	250 ft	☑
Outer Width	450 ft	450 ft	☑
Area (Acres)	8.035	8.035	☑
Departure Runway Protection Zone (RPZ)			
Length	1,000 ft	1,000 ft	☑
Inner Width	250 ft	250 ft	☑
Outer Width	450 ft	450 ft	☑
Area (Acres)	8.035	8.035	☑
Runway Separation			
Runway centerline to:			
Parallel runway centerline	N/A	N/A	N/A
Holding Position	125 ft	150 ft	☑
Parallel Taxiway / Taxilane centerline	150 ft	150 ft	☑
Aircraft parking area	125 ft	150 ft	☑

Sources: FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*.
FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*.
Note 1: Refer to Advisory Circular 150/5300-13A paragraph 308 for design standards. ROFZ width changes based on aircraft approach speed.
Note 2: Standards displayed are based on small aircraft criteria (B-1-small).
Note 3: N/A= Not Applicable

Table 4-7 Runway Design Standard Matrix – TPF – Runway 4, 22, 36 Runway Design Code (RDC): B-I-5000			
Item	**Standard**	**Existing**	**Satisfies Requirements**
Runway Design			
Runway Length	See Section 4.5.2	Varies	☑
Runway Width	60 ft	75 ft	☑
Shoulder Width	10 ft	0	☒
Blast Pad Width	80 ft	0	☒
Blast Pad Length	60 ft	0	☒
Crosswind Component	10.5 knots	13 knots	☑
Runway Protection			
Runway Safety Area (RSA)			
Length beyond departure end	240 ft	240 ft	☑
Length prior to threshold	240 ft	240 ft	☑
Width	120 ft	120 ft	☑
Runway Object Free Area (ROFA)			
Length beyond runway end	240 ft	240 ft	☑
Length prior to threshold	240 ft	240 ft	☑
Width	250 ft	250 ft	☑
Runway Obstacle Free Zone (ROFZ)			
Length	200 ft[1]	200 ft	☑
Width	250 ft[1]	250 ft	☑
Precision Obstacle Free Zone (POFZ)			
Length	N/A	N/A	N/A
Width	N/A	N/A	N/A
Approach Runway Protection Zone (RPZ)			
Length	1,000 ft	1,000 ft	☑
Inner Width	250 ft	250 ft	☑
Outer Width	450 ft	450 ft	☑
Area (Acres)	8.035	8.035	☑
Departure Runway Protection Zone (RPZ)			
Length	1,000 ft	1,000 ft	☑
Inner Width	250 ft	250 ft	☑
Outer Width	450 ft	450 ft	☑
Area (Acres)	8.035	8.035	☑
Runway Separation			
Runway centerline to:			
Parallel runway centerline	N/A	N/A	N/A
Holding Position	125 ft	150 ft	☑
Parallel Taxiway / Taxilane centerline	150 ft	150 ft	☑
Aircraft parking area	125 ft	150 ft	☑

Sources: FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*.
FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*.
Note 1: Refer to Advisory Circular 150/5300-13A paragraph 308 for design standards. ROFZ width changes based on aircraft approach speed.
Note 2: Standards displayed are based on small aircraft criteria (B-1-small).
Note 3: N/A= Not Applicable

4.6 Declared Distance Criteria

As defined in §322 of Advisory Circular 150/5300-13A, Change 1, *Airport Design,* declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distances performance requirements for turbine powered aircraft where it is impracticable to meet the airport design standards or mitigate the environmental impacts by other means, and the use of declared distances is practical. When applicable and prudent, declared distance criteria is applied and published for each runway end where it is impracticable to meet the standard design criteria established for the Runway Safety Area (RSA), the Runway Object Free Area (ROFA), the Runway Protection Zone (RPZ), or where required to fully satisfy minimum vertical clearances over traverseways as prescribed for CFR Part 77 Approach Surfaces and/or TERPS Departure Surfaces. One or more of the any or all of the following declared distances may apply to a particular runway by direction of travel (i.e., arrival or departure).

1. Takeoff Run Available (TORA) – the runway length declared available and suitable for the ground run of an aircraft taking off;
2. Takeoff Distance Available (TODA) – the TORA length plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of TODA may need to be reduced because of obstacles in the departure area;
3. Accelerate-Stop Distance Available (ASDA) – the runway length plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff; and
4. Landing Distance Available (LDA) – the runway length declared available and suitable for landing an aircraft.

By treating these distances independently, application of declared distances is a design methodology that results in declaring and reporting the TORA, TODA, ASDA, and LDA for each operational direction. When applicable, declared distances limit or increase runway use.

Runway 18-36 has a surveyed and published length of 2,687 feet. The threshold for Runway 18 is displaced 203 feet to provide the required CFR Part 77 Approach Surface 15-foot vertical clearances over Seddon Channel a public and navigable waterway. The threshold for Runway 36 is displaced 201 feet to provide the required CFR Part 77 Approach Surface 15-foot vertical clearance over Severn Avenue CFR Part 77 Approach Surface 10-foot vertical clearance over an internal non-public airport road that runs north and south along Seddon Channel. Because the land area located beyond the north end of the runway does not fully accommodate the required 240-foot portion of the Runway Safety Area located beyond the end of the runway, the Runway 36 ASDA and LDA lengths are each reduced.

Runway 4-22 has a surveyed and published length of 3,583 feet. The threshold for Runway 4 is displaced 174 feet to provide the required CFR Part 77 Approach Surface 15-foot vertical clearances over Severn Avenue and Martinique Avenue and the threshold for Runway 22 is also displaced 174 feet to provide the required CFR Part 77 Approach Surface vertical clearances over Seddon Channel, thus reducing the LDA for each runway. Because the land area located beyond the northeast end of the runway does not fully accommodate the required 240-foot portion of the Runway Safety Area located beyond the end of the runway, the ASDA and LDA lengths for Runway 4 are each reduced. To provide the required TERPS 15-foot vertical Departure Surface

clearance over Martinique Avenue and potential 40-foot tall masts of moored sailboats along Martinique Avenue, the TORA and TODA lengths for Runway 22 are reduced. **Table 4-8** contains the existing declared distances for TPF. The applicable declared distances for Runway 4-22 and Runway 18-36 are shown in **Figures 4-4** and **4-5** respectively.

Table 4-8
Existing Declared Distances - TPF

Runway	TORA (ft)	TODA (ft)	ASDA (ft)	LDA (ft)
4	3,406	3,406	3,406	3,231
22	3,408	3,408	3,408	3,406
18	2,687	2,687	2,574	2,371
36	2,487	2,487	2,512	2,311

Source: HCAA, August 2015.

40:1 DEPARTURE SURFACE APPLIED

NO APPLICABLE 40:1 DEPARTURE SURFACE

NOTES:

1. RSA/ROFA LENGTHS AND WIDTHS BASED ON AAC A/B AND ADG I (SMALL UTILITY) CRITERIA WITH RUNWAYS 4 AND 22 HAVING VISIBILITY MINIMUMS NOT LOWER THAN 1 MILE.

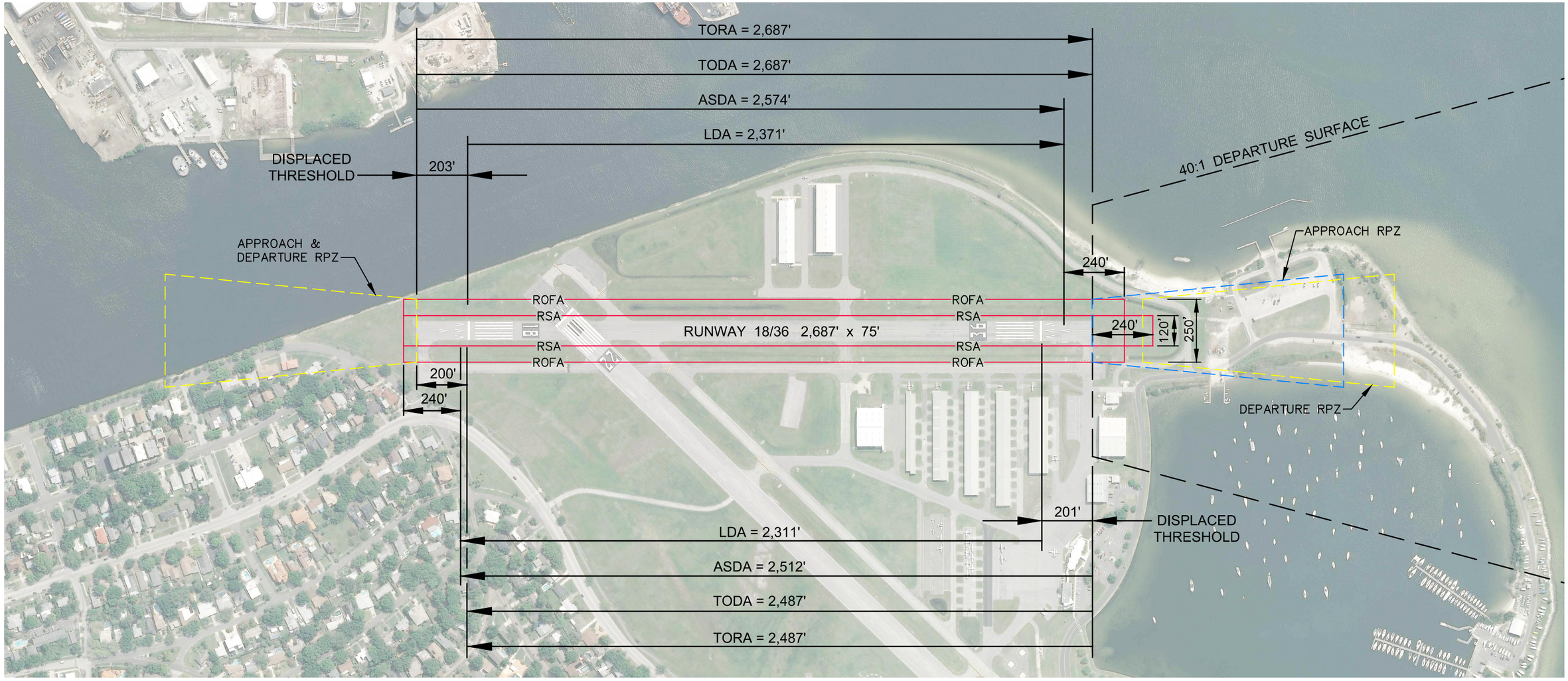
N

0 200 400

SCALE IN FEET

Michael Baker INTERNATIONAL

Figure 4-4 Runway 4/22 Declared Distances



NO APPLICABLE 40:1 DEPARTURE SURFACE

40:1 DEPARTURE SURFACE APPLIED

NOTES:

1. RSA/ROFA LENGTHS AND WIDTHS BASED ON AAC A/B AND ADG I (SMALL UTILITY) CRITERIA, WITH RUNWAY 18 HAVING VISUAL VISIBILITY MINIMUMS AND RUNWAY 36 HAVING VISUAL VISIBILITY MINIMUMS NOT LOWER THAN 1 MILE.
2. RUNWAY 36 LDA AND ASDA LENGTHS BASED ON PROVIDING 240' OF ROFA LENGTH BEYOND DEPARTURE END OF RUNWAY.
3. LENGTH OF TORA/TODA AND START OF INSTRUMENT DEPARTURE SURFACE FOR RUNWAY 18 ESTABLISHED BY HCAA.

N

0 200 400

SCALE IN FEET

Michael Baker INTERNATIONAL

Figure 4-5 Runway 18/36 Declared Distances

4.7 Taxiway/Taxilane Design Standards

Runway design standard guidance is provided by FAA Advisory Circular 150/5300-13A Change 1, *Airport Design.* TPF's taxiway design standards are based on Taxiway Design Group (TDG) 1A, the TDG for TPF's design aircraft.

Width

Taxiway pavement requirements are based on Taxiway Design Group (TDG), which in turn is based on the dimensions of the airplane's undercarriage, which includes the Main Gear Width (MGW) and Cockpit to Main Gear (CMG). For a TDG 1A taxiway, the design standard for width is 25 feet. TPF has a current taxiway width of 40 feet for Taxiway A which is a full parallel taxiway for Runway 4-22. TPF has a current taxiway width of 35 feet for Taxiway F which is a full parallel taxiway for Runway 18-36. Both runways satisfy design standards at this time.

Shoulders

Unprotected soils adjacent to taxiways are susceptible to erosion, which can result in engine ingestion problems for jet engines that overhang the edge of the taxiway pavement. A dense, well-rooted turf cover can prevent erosion and support the occasional passage of aircraft, maintenance equipment, or emergency equipment under dry conditions. Turf, aggregate-turf, soil cement, lime or bituminous stabilized soil are recommended adjacent to paved surfaces accommodating ADG-I aircraft. For TPF, the recommended shoulder width is 10 feet.

Safety Area

The Taxiway Safety Area (TSA) is centered on the taxilane centerline. To provide room for rescue and fire-fighting operations, the TSA width equals the maximum wingspan of the ADG. For TPF, the TSA is 49 feet for ADG-I.

Object Free Area

The Taxiway Object Free Area (TOFA) is centered on the taxiway centerline. The TOFA clearing standards prohibit service vehicle roads, parked aircraft, and other objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. For TPF, the TOFA is 89 feet for ADG-I.

Taxiway Design Group

The TDG is a classification of airplanes based on outer to outer Main Gear Width (MGW) which is the distance from the outer edge to outer edge of the widest set of main gear tires, and the Cockpit to Main Gear distance (CMG) which the distance from the pilot's eye to the main gear turn center.

Unlike the Aircraft Approach Category and the Airplane Design Group, the Taxiway Design Groups do not fit in a simple table format. TDG standards can be found in Advisory Circular 150/5300-13A, Change 1, *Airport Design.* TPF has a TDG of 1A.

Edge Margin

The Taxiway Edge Safety Margin (TESM) is the distance between the outer edge of the landing gear of an airplane with its nose gear on the taxiway centerline and the edge of the taxiway pavement. The TESM for TDG 1A is 5 feet.

Wingtip Clearance

Wingtip clearance for TDG 1A is 20 feet for taxiways and 15 feet for taxilanes. TPF currently satisfies these requirements.

Centerline to Fixed or Moveable Object

TDG 1A taxiway centerline to fixed or moveable object separation is 39.5 feet. TPF currently satisfies these requirements.

Taxiway Centerline to Parallel Taxiway Centerline Separation

Taxiway centerline to parallel taxilane centerline separation is 70 feet for ADG I design standards. TPF currently satisfies requirements for ADG I.

Holding Bays and Aircraft Run-Up Areas

The purpose of a holding bay is to provide space for one aircraft to pass another in order to reach the runway end. This reduces airfield delays which can result when an aircraft is conducting engine run-ups or pre-flight checks.

The airport has no designated or marked aircraft run-up areas within which pilots can safely conduct pre-flight engine run-ups and systems testing. It is recommended that one or more areas be identified and developed for such activities.

Aircraft Run-up Areas can be located within designated portions of apron areas, but should not be in proximity of buildings, adjacent roadways, pedestrian sidewalks and parked aircraft. Aircraft run-up Areas can also be located within taxiway by-pass holding bays that are typically located adjacent to taxiways serving the approach end of a runway. When by-pass holding bays are used to conduct engine run-ups and testing, their size and configuration should accommodate the engine run-up activities of the largest propeller-driven aircraft that operate at the airport while remaining clear of the taxi movements of other aircraft, Safety Areas and Obstacle Free Zones.

The airport currently has three paved areas of different sizes and shapes that may be suitable for conducting aircraft engine run-ups. One is located northeast of the approach end of Runway 22 connecting to Taxiway Alpha, one is northwest of the approach end of Runway 18 connecting to Taxiway Foxtrot and one is west of the approach end of Runway 36 connecting to Taxiway Foxtrot.

When by-pass holding bays are used to conduct engine run-ups and preflight systems testing, the design and configuration of each holding bay should accommodate the engine run-up activities of the largest propeller-driven aircraft that operate at the airport while remaining clear of the taxi movements of other aircraft, Safety Areas and Obstacle Free Zones (OFZ). The suitability of these

existing paved areas as well as other areas on the airport will be examined within the identification of development alternatives.

Taxiway Design Standard Compliance Needs Summary

TPF meets TDG 1A taxiway design standards, based on the design aircraft at the airport. The full-length parallel taxiway system provides adequate capacity and efficient flow of aircraft operations. Turf, aggregate-turf, soil cement, lime or bituminous stabilized soil are recommended adjacent to paved surfaces accommodating ADG-I aircraft. For TPF, the recommended taxiway shoulder width is 10 feet.

4.8 Airfield Facility Requirements

Lighting

The airfield lighting at TPF consists of Medium Intensity Runway Lights (MIRLs) located along the edge of Runway 4-22 and 18-36. The Runway 22 end has Runway End Identifier Lights (REILs). Runway 4 has a 4-box Visual Approach Slope Indicator (VASI) on the left side of the runway. Runway 18 has touchdown zone lights. Runway 36 has a 2-box Precision Approach Path Indicator (PAPI) on the right side of the runway. There are no anticipated changes to the airfield lighting system and current airfield lighting is sufficient, however, it is recommended that a supplemental back-up airfield lighting generator with automatic transfer switching system be installed to provide backup power when the utility-supplied electrical power is interrupted.

Marking and Signage

Advisory Circular 150/5324-1K, *Standards for Airport Markings,* contains standards for markings used on airport runways, taxiways, and aprons. Runways 4-22 and 18-36 are properly marked for non-precision instrument approach capabilities. Taxiways and apron areas at TPF are properly marked and in good condition. No issues with airfield signage were identified. Future changes to RDC and TDG at TPF will require reevaluation of runway, taxiway, and apron area markings for compliance.

Based Aircraft Space Requirements

Although the airport is currently designed to fully accommodate aircraft having ARC B-I dimensional characteristics, larger more demanding makes and models of aircraft (i.e., having wider wingspans and longer lengths) occasionally operate and base their aircraft at the airport. Accordingly, hangar and apron tie-down/parking space needs for based aircraft must be identified to accommodate the parking and sheltering needs of these aircraft throughout the 20-year planning period.

Based upon discussions with the Fixed Base Operator (FBO), there is a current and anticipated future need for additional aircraft storage space for single-aircraft (i.e., grouped T-hangar or single unit), or for multiple-aircraft (i.e., bulk storage).

Projections of future based aircraft hangar storage and apron tie-down needs were developed using the FAA-approved aviation activity forecast for this Master Plan Update and the 2013 Base Year distribution of aircraft storage at the airport by aircraft type as reported by the FBO. As shown in

Table 4-9 and for space planning purposes only, the distribution of based aircraft was assumed to remain constant throughout the 20-year planning period.

Table 4-9
TPF Based Aircraft Distribution

	T-Hangars/ Shade Hangars	Conventional Box Hangar	Large Common Use Hangar	Apron	TOTAL
Single-Engine	62	0	4	18	84
Multi-Engine	9	0	2	1	12
Turboprop	4	0	1	0	5
Jet	0	0	2	0	2
Helicopter	4	0	3	0	7
TOTAL	**79**	**0**	**12**	**19**	**110**

	T-Hangars/ Shade Hangars	Conventional Box Hangar	Large Common Use Hangar	Apron	TOTAL
Single-Engine	74%	0%	5%	21%	100%
Multi-Engine	72%	0%	14%	14%	100%
Turboprop	83%	0%	17%	0%	100%
Jet	0%	0%	100%	0%	100%
Helicopter	57%	0%	43%	0%	100%

Source: Atlas Aviation, September 2014.
Compiled by URS, 2014.

The identification of needed based aircraft hangar space, or the location, layout and spacing for apron tie-downs vary for each airport by type of aircraft depending upon make and model of aircraft that are known to currently operate at the airport, or that are anticipated to operate at the airport (i.e., single-engine, multi-engine, turbo-prop, jet and rotorcraft).

When determining based aircraft hangar and apron tie-down space requirements, the aircraft size (i.e., wingspan and length), as well as, the two-dimensional envelope within which the aircraft will be operated, stored, or tied down must also be considered.

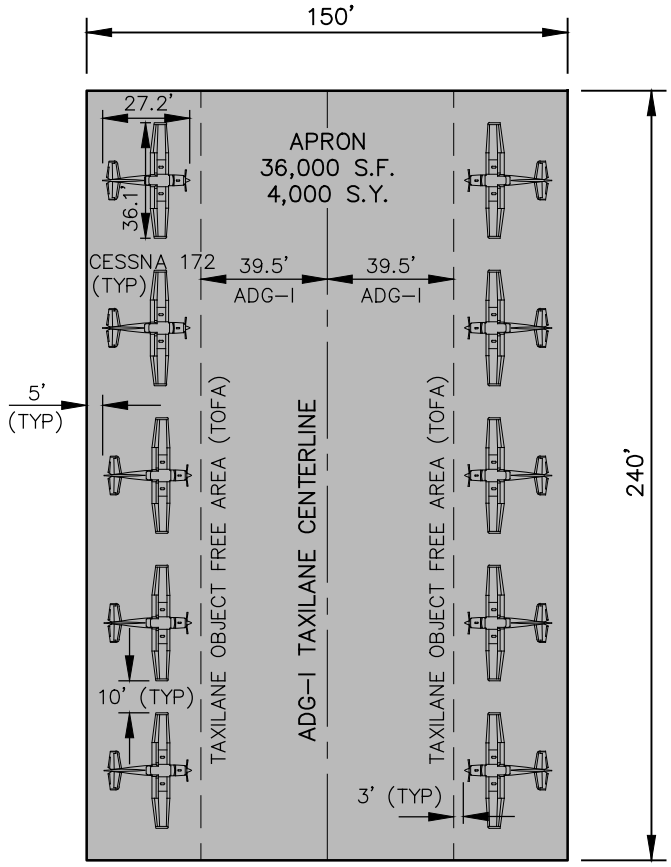
For example, bulk hangar operators typically utilize best-practice methods in the towing, placement and separation of aircraft. When determining apron tie-down space requirements, the aircraft wingspan, length and safety-related separation must be considered, as well as the Object Free Area dimensional setbacks from each taxilane centerline to provide power-in/power-out taxi movement capabilities to and from each tie-down position.

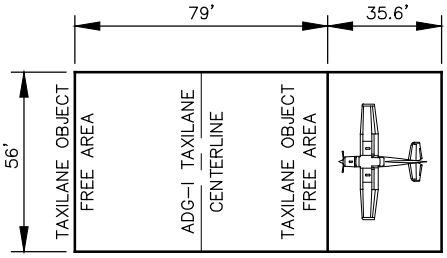
Utilizing published aircraft dimensional data, guidance prescribed in FAA AC 150/5300-13A, Change 1, *Airport Design*, Appendix 5, the based aircraft hangar and tie-down space needs were identified and documented as listed in **Table 4-10** and shown in **Figures 4-6 through 4-9**.

Table 4-10 Based Aircraft Space Requirements			
Space Requirements	**Representative Aircraft**	**Apron Tie-Down (Square Yards)**	**Bulk Hangar (Square Feet)**
ADG-I Single-Engine	Cessna 172	713	2,024
ADG-I Multi-Engine	Beech 100	972	3,248
ADG-II Cabin-Class Jet	Citation X	1,890	6,612
ADG-I Helicopter	Eurocopter 135	713	2,436
Source: URS, 2014.			

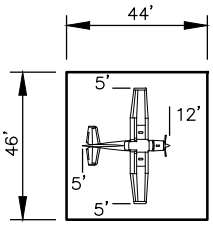
Utilizing the 2013 distribution of based aircraft by type as shown in **Table 4-11**, the aircraft-specific dimensional storage and tie-down requirements listed in **Table 4-12** and the forecast of based aircraft in **Table 4-13,** hangar and apron tie-down space requirements for based aircraft were determined for each forecast year by aircraft type and are listed in **Table 4-14**.

Table 4-11 TPF Forecast of Based Aircraft					
Type	**2013**	**2018**	**2023**	**2028**	**2033**
Single-Engine (Non-Jet)	84	88	94	102	110
Multi-Engine (Non-Jet)	12	16	18	20	23
Turboprop	5	7	9	12	13
Rotorcraft	7	7	7	7	8
Jets	2	2	3	3	3
Total Based Aircraft	**110**	**120**	**131**	**144**	**157**
Source: URS, 2014. Table 3-19.					





CESSNA 172
APRON TIE-DOWN AREA REQUIREMENT
6,418 SF
713 SY



CESSNA 172
HANGAR STORAGE AREA REQUIREMENT
2,024 SF

0 30 60
SCALE IN FEET

SOURCE : URS, 2014

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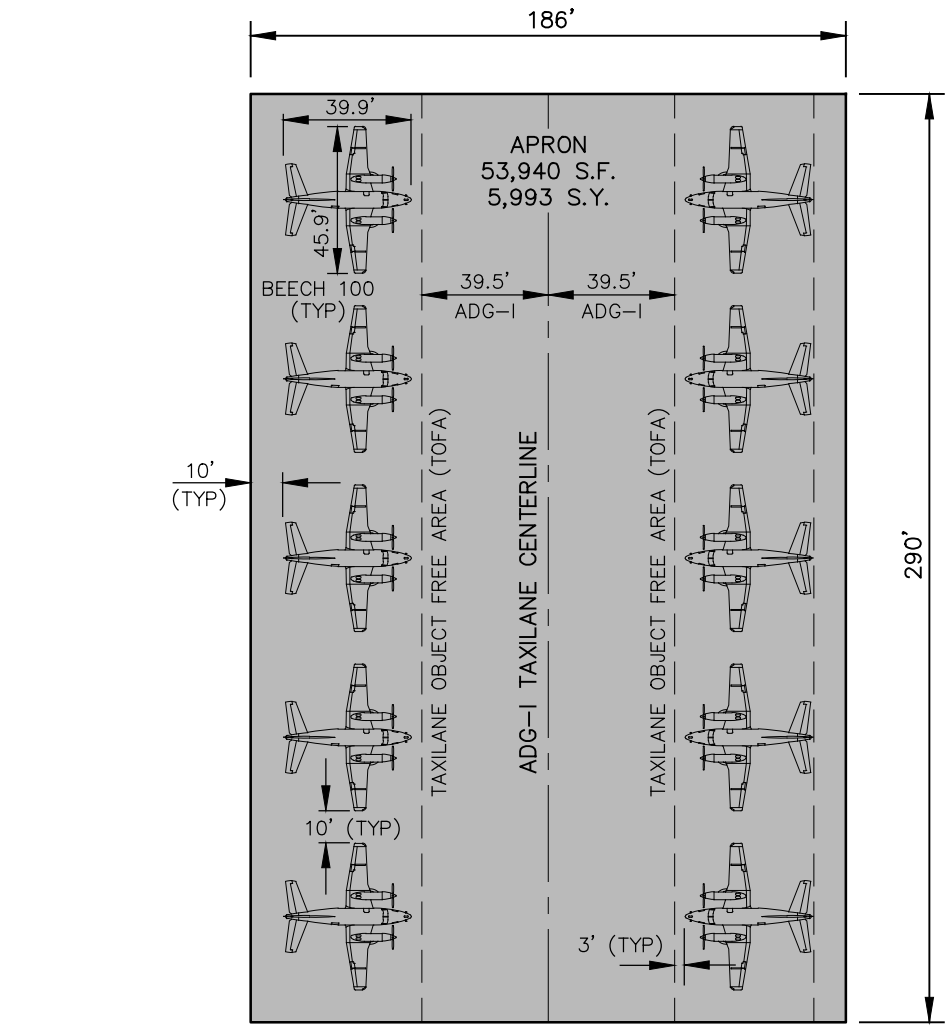
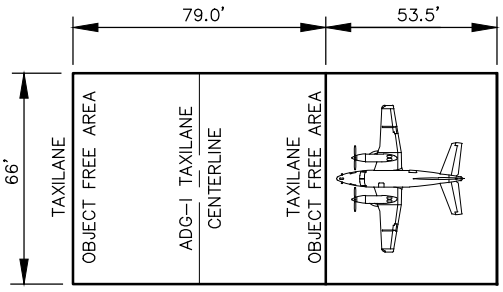
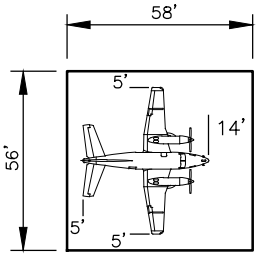
Figure 4-6 ADG-I Aircraft Space Requirements





BEECH 100
APRON TIE-DOWN AREA REQUIREMENT
8,745 SF
972 SY



BEECH 100
HANGAR STORAGE AREA REQUIREMENT
3,248 SF

0 30 60
SCALE IN FEET

SOURCE : URS, 2014

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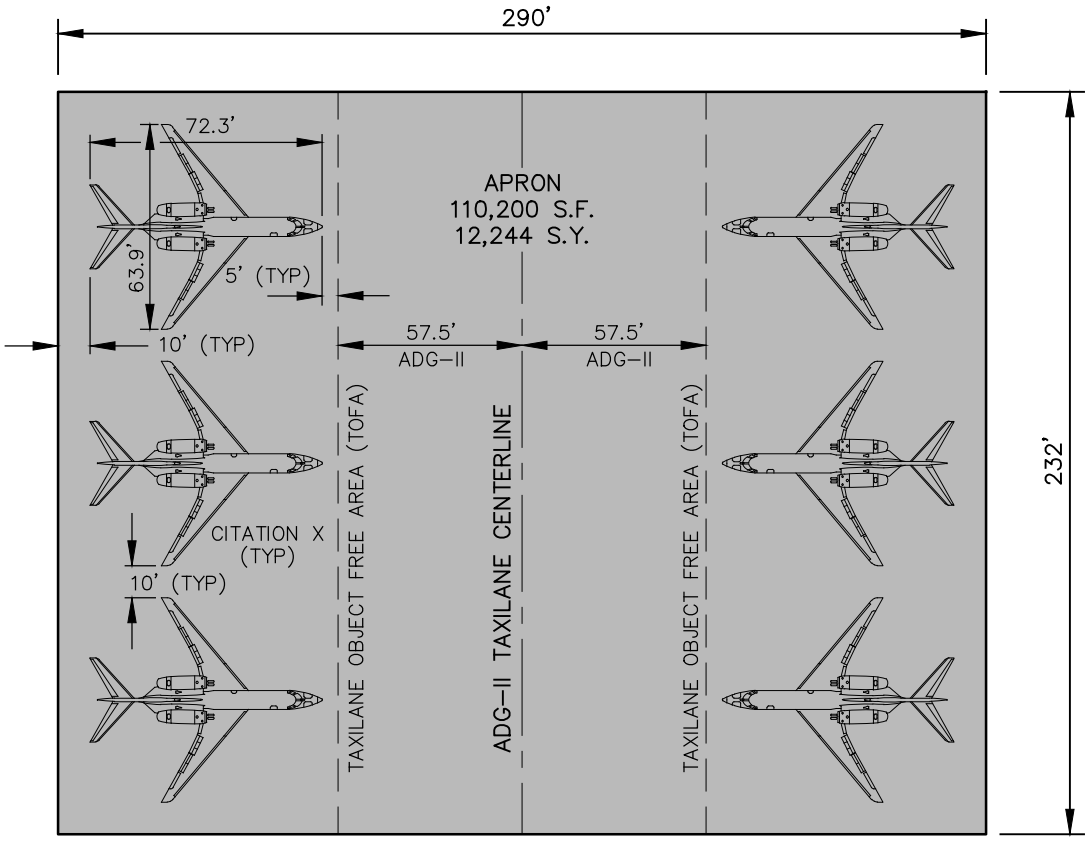
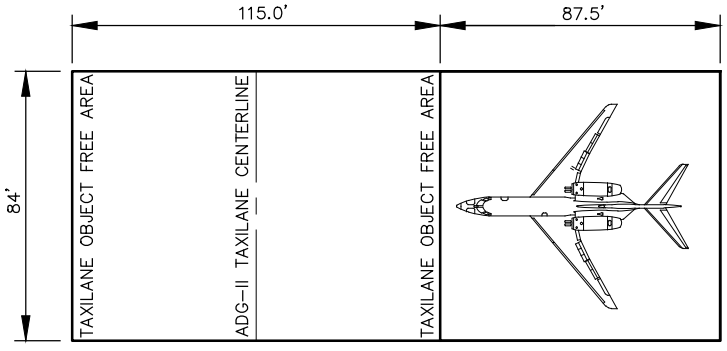
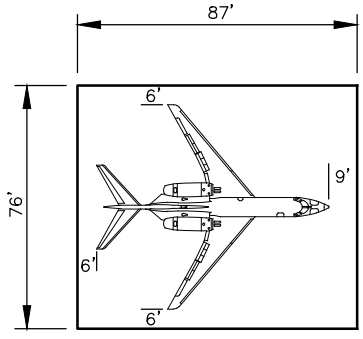
Figure 4-7 ADG-I Aircraft Space Requirements





CITATION X
APRON TIE-DOWN AREA REQUIREMENT
17,010 SF
1,890 SY

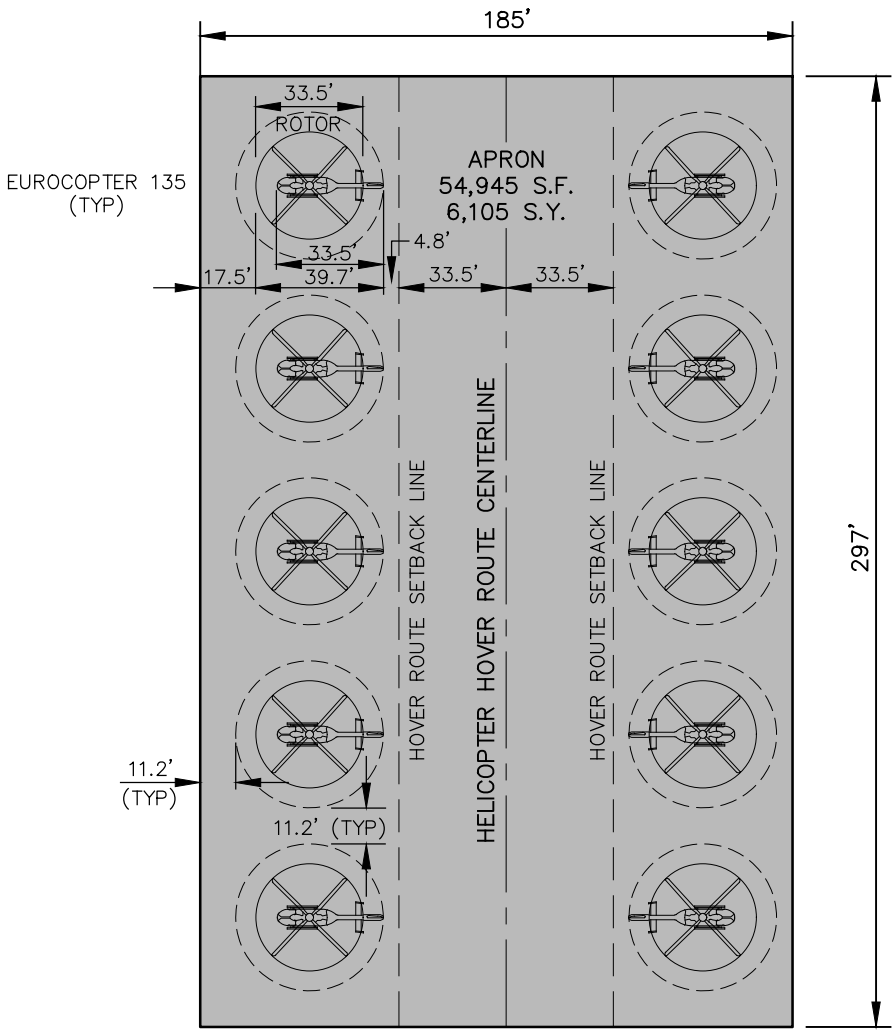


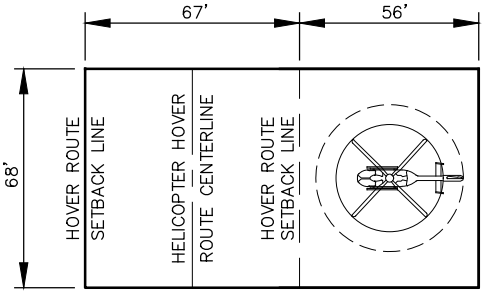
CITATION X
HANGAR STORAGE AREA REQUIREMENT
6,612 SF

0 30 60
SCALE IN FEET

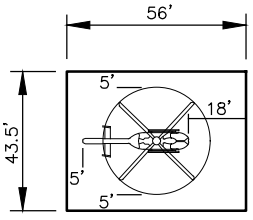
SOURCE : URS, 2014

Figure 4-8 ADG-II Aircraft Space Requirements





EUROCOPTER 135
33.5' ROTOR DIAMETER
APRON TIE-DOWN AREA REQUIREMENT
6,418 SF
713 SY



EUROCOPTER 135
33.5' ROTOR DIAMETER
HANGAR STORAGE AREA REQUIREMENT
2,436 SF

0 30 60
SCALE IN FEET

SOURCE : URS, 2014

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Figure 4-9 Helicopter Space Requirements

Table 4-12 TPF Based Aircraft Storage Analysis										
	2013		2018		2023		2028		2033	
Apron Tie-Downs	**Spaces**	**SY**	**Spaces**	**SY**	**Spaces**	**SY**	**Spaces**	**SY**	**Spaces**	**SY**
Existing	63	44,919	63	44,919	63	44,919	63	44,919	63	44,919
Needed	19	14,065	20	14,778	23	17,176	24	17,889	26	19,315
Surplus/(Deficit)	**44**	**30,854**	**43**	**30,141**	**40**	**27,743**	**39**	**27,030**	**37**	**25,604**
Bulk Hangar Space	**SF**		**SF**		**SF**		**SF**		**SF**	
Existing	32,481		32,481		32,481		32,481		32,481	
Needed	28,928		38,072		49,956		53,204		55,228	
Surplus/(Deficit)	**3,553**		**(5,591)**		**(17,475)**		**(20,723)**		**(22,747)**	
Single Unit Hangars	**Units**		**Units**		**Units**		**Units**		**Units**	
Existing	94		94		94		94		94	
Needed	79		88		94		104		114	
Surplus/(Deficit)	**15**		**6**		**0**		**(10)**		**(20)**	
Source: URS, 2014.										

The projection of future required hangar space was based solely upon the 2013 distribution of based aircraft by type of storage available. This assumption, however, may be found to be unrealistic in that the existing distribution of based aircraft is typically predicated upon aircraft owner preference to utilize covered hangar space based on size and frequency of use.

Based on the evidence of latent demand for additional single-unit hangar space at the airport, it was assumed that regardless of the existing distribution of based aircraft, the availability and aircraft owner preference for single-unit aircraft storage will most likely dictate the development and timing for single-unit or grouped T-hangar development. It is further assumed that hangar facilities will mostly likely be constructed as demand dictates, and that based upon available funding opportunities, HCAA will continue to develop grouped single-unit T-hangars or a variety of hangar styles currently in use at the airport. For long-range planning purposes, it was assumed that development of larger bulk-style hangars will be needed to support FBO or other commercial aircraft maintenance activities that are anticipated to occur throughout the 20-year planning period.

Itinerant Aircraft Space Requirements

Itinerant aprons provide for the movement and parking of visiting aircraft (i.e., transient aircraft") that choose to operate at the airport. Itinerant apron space determinations are typically based upon calculated current and projected future Peak Month Average Day (PMAD) aircraft activity levels, relative percentage mix of local and transient operations, and aircraft type and size. Utilizing industry accepted FAA planning guidance[15] the following procedural planning steps were used to identify required itinerant aircraft apron space:

Step 1. Determine Peak Month Average Day Operations (PMAD) aircraft operations for 2013 Base year and all forecast planning years as listed in Forecast Chapter **Table 3-13**.

Step 2. Increase PMAD aircraft operations by 10 percent.

[15] FAA Advisory Circular 150/5300-13 Changes 1-18, *Airport Design*, Appendix 5, page 117

Step 3. Determine relative percentage mix of local and itinerant aircraft operations as listed in Forecast Chapter **Table 3-15** (45 percent of the total aircraft operations were determined as itinerant, based on data provided by AirNav for TPF.)

Step 4. Derive total itinerant operations by multiplying value derived in Step 2 by the itinerant percentage value.

Step 5. Multiply value derived in Step 5 by 50 percent (itinerant arrivals).

Step 6. Assume that 50 percent of all itinerant arrival operations require apron space.

Step 7. Increase value derived in Step 7 by 10 percent.

Table 4-13 shows the itinerant apron area needs assessment for the 20-year planning period following this methodology.

Table 4-13
TPF Itinerant Apron Area Needs Assessment

Step		2013	2018	2023	2028	2033
1	Peak Month Average Day Operations	291	310	330	354	377
2	Increase by 10%	320	341	363	389	415
3	Percent Itinerant Traffic (Assumed to Remain Constant)	45%	45%	45%	45%	45%
4	Total Itinerant Operations	144	153	163	175	187
5	One-Half of Itinerant Operations (Landings)	72	77	82	88	93
6	Assumed 50% Need Transient Apron Space	36	38	41	44	47
7	Increase This Area by 10%	40	42	45	48	51
	Total Itinerant Aircraft Requiring Apron	**40**	**42**	**45**	**48**	**51**

Source: Advisory Circular 150/5300-13 Changes 1-18, *Airport Design,* Appendix 5, page 117.
AirNav, LLC, Peter O. Knight Airport May 29, 2014.

Table 4-14 provides the aircraft operations forecast percentiles by fleet mix and is based on information provided by the FBO, Atlas Aviation, for the base year (2013) and anticipated fleet mix changes at TPF through the 20-year planning period. **Table 4-15** utilizes the methodology provided in **Table 4-13** and distributes the itinerant aircraft operations by type for the 20-year planning period. When mathematically distributing assignment of aircraft by type, whole numbers of aircraft were utilized for conservative planning purposes.

Table 4-14
TPF Aircraft Operations Forecast Percentiles

Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	75%	10%	5%	5%	5%	100%
2018	74%	10%	6%	5%	5%	100%
2023	73%	9%	8%	6%	4%	100%
2028	72%	8%	9%	7%	4%	100%
2033	70%	8%	10%	8%	4%	100%

Sources: URS, 2014.
Atlas Aviation, 2013.

Table 4-15[1] Itinerant Aircraft Apron Needs by Aircraft Type						
Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total
2013	30	4	2	2	2	40
2018	32	5	3	3	3	46
2023	33	5	4	3	2	47
2028	35	4	5	4	2	50
2033	36	5	6	5	3	55
Source: URS, 2014. [1] Assignment to whole number values.						

Table 4-16 shows the spacing requirements in square yards for the aircraft fleet mix. The basis for this spacing was determined by analyzing ADG B-I and B-II aircraft that are known to currently operate, or are anticipated to operate at TPF as shown in **Figures 4-5** to **4-8**.

Table 4-16 Fleet Mix Spacing Requirements by Aircraft Type					
	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter
Space Needs (Square Yards)	713	972	972	1,890	713
Source: URS, 2014.					

Using the itinerant aircraft fleet mix by type and the respective spacing requirements by aircraft type, it is anticipated that additional itinerant apron area is needed today and through the 20-year planning period. The existing itinerant apron area is currently 3,833 square yards. **Table 4-17** shows the aircraft-specific and total itinerant apron area needs.

Table 4-17 Itinerant Apron Area Needs by Fleet Mix (Square Yards)								
Year	Single Engine	Multi Engine	Turboprop	Jet Engine	Helicopter	Total	Existing	Surplus/ (Deficit)
2013	21,390	3,888	1,944	3,780	1,426	32,428	3,833	**(28,595)**
2018	22,816	4,860	2,916	5,670	2,139	38,401	3,833	**(34,568)**
2023	23,529	4,860	3,888	5,670	1,426	39,373	3,833	**(35,540)**
2028	24,955	3,888	4,860	7,560	1,426	42,689	3,833	**(38,856)**
2033	25,668	4,860	5,832	9,450	2,139	47,949	3,833	**(44,116)**
Source: URS, 2014.								

NAVAIDS

Navigational Aids are used for airport approaches and allow pilots to navigate to the airport and runway ends. Runway 4 has a Non-Directional Beacon (NDB) and a 4-Light Visual Approach Slope Indicator (VASI-4L) for non-precision approaches. Runway 22 has a GPS and REILs for non-precision approaches. Runway 36 has GPS and a 2-Light Precision Approach Path Indicator (PAPI-2L) for non-precision approaches. The airport has an NDB, a beacon, a lighted wind cone, and a segmented circle. Navigational aids are in good condition but should be monitored throughout the planning period for maintenance issues or if replacement is deemed necessary.

Windsock/Segmented Circle

TPF airport management maintains a lighted windsock and segmented circle located next to Runway 4-22. The windsock and segmented circle are in fair condition and are anticipated to adequately serve the airport through the foreseeable future with routine maintenance and upkeep.

Security Fencing

Security fencing at TPF is adequate and well maintained. Fencing should be monitored throughout the planning period.

4.9 Airport Support Facilities

This section addresses the General Aviation (GA) facility requirements based on current and projected levels of local and itinerant traffic.

General Aviation Terminal

The GA terminal at TPF is 4,494 square feet in size and includes a waiting area and pilot lounge, management and operations, public restrooms and concessions. Public and employee parking spaces are located in front of the terminal building.

The following planning assumptions were used to assess functional passenger terminal space based upon Peak Hour passenger movements:

- Peak Day Operations = Peak Month / 30.42 days (365/52)
- Peak Hour Operations = 10% of Peak Day
- Average of 2.5 passengers per general aviation operation
- Total Peak Hour Passengers = Peak Hour Operations X 2.5 Passengers
- Peak Hour Passengers require a total of 50 square feet (sf) of space
    - Common waiting area – 15 sf
    - FBO retail area - 3 sf
    - Public Convenience – 2 sf
    - Concessions – 5 sf
    - Circulation – 25 sf

As shown in **Table 4-18**, based upon these planning assumptions and the forecast of Peak Hour passenger movements at TPF, the existing general aviation / FBO terminal facility will provide the required terminal space into the latter half of the 20-year forecast period.

If operational demand and associated Peak Hour passenger movements increase at year-over-year rates greater than projected in the aviation activity forecast, the terminal space needs should be re-evaluated at that time.

Table 4-18 TPF Terminal Area Requirements								
Year	Peak Day Operations (Peak Month/30.42)	Peak Hour Operations (10% of Peak Day)	Passengers Per Operation	Total Peak Hour Passengers	Space Needs Per Passenger[1] (SF)	Total Space Needs (SF)	Existing Space (SF)	Surplus/ (Deficit) (SF)
2018	310	31	2.5	78	50	3,875	4,494	619
2023	330	33	2.5	83	50	4,125	4,494	369
2028	354	35	2.5	89	50	4,425	4,494	69
2033	377	38	2.5	94	50	4,713	4,494	(219)

Source: URS, 2014.
Note:
[1] General Planning Area Needs (SF): Common Waiting Area: 15, FBO Retail: 3, Public Convenience: 2, Concessions: 5, Circulation: 25.

Fueling Facilities

Using TPF 2013 Base Forecast Year, the assessment of aircraft fuel storage capacity was based upon the following methodology:

Step 1. Compilation of total annual aircraft operational activity by type (i.e., Piston versus Jet/Rotorcraft).

Step 2. Compilation of the total annual fuel flowage by type (i.e., 100-Low Lead (AVGAS) and jet-A).

Step 3. Derivation of the relative operational split between piston and jet/rotorcraft aircraft operations as previously listed in the Forecast of Aviation Activity (See Table 3-13, *Aircraft Operations Forecast Percentiles*).

Step 4: Derivation of the fuel flow (by type) per aircraft operation (by type). These respective ratios were held constant for all future forecast periods.

Step 5: Derivation of Average Daily Fuel Flowage (by type).

Step 6: Derivation of 14 Day Fuel Flowage (by type).

Step 7: Assessed of AVGAS and Jet-A 14-day storage needs considering existing storage capacity (by fuel type).

The following planning assumptions were used to assess the existing aircraft fuel storage capacity and capabilities of the existing aircraft fuel storage facilities:

- Existing aviation fuel storage capacities are fixed and adequate.
- Purchase of aviation fuels (by type) is not constrained by price and/or delivery time.

- Aviation fuel (by type) is purchased as demand dictates to provide a minimum 14-day supply level.

Based upon discussions with the sole FBO, the existing aircraft fuel storage facilities are adequate and sufficient. It is recognized, however, that although excess fuel storage capacity exists today, the need for additional storage capacity may be desired to maintain a 14-day supply as aircraft activity levels increase throughout the 20-year planning period.

The assessment of aircraft fuel storage need is listed in **Table 4-19**.

Table 4-19
TPF Fuel Storage Requirements
(14-Day Supply in Gallons)

2018	AVGAS	JET-A
Existing Capacity	14,000	12,000
Required Capacity for 14-Day Supply	4,738	3,025
Surplus/(Deficit)	9,262	8,975
2023	**AVGAS**	**JET-A**
Existing Capacity	14,000	12,000
Required Capacity for 14-Day Supply	5,053	3,226
Surplus/(Deficit)	9,847	8,774
2028	**AVGAS**	**JET-A**
Existing Capacity	14,000	12,000
Required Capacity for 14-Day Supply	5,412	3,800
Surplus/(Deficit)	8,588	8,200
2033	**AVGAS**	**JET-A**
Existing Capacity	14,000	12,000
Required Capacity for 14-Day Supply	5,775	4,424
Surplus/(Deficit)	8,225	7,576

Source: URS, 2014.

Airport Maintenance

The FBO performs aircraft maintenance activities within a 7,670 square foot hangar built before 1969 and an operations and maintenance shop that is 1,922 square feet and that was constructed between 1982 and 1994. There is also a 764 foot maintenance storage unit constructed before 1969. Recommendations for the future development of airport maintenance should be further evaluated as part of the Strategic Business Plan and addressed during the alternatives analysis component of this study.

Ground Access

Severn Avenue is the entrance road for TPF and can be accessed by East Davis Boulevard or West Davis Boulevard. Access to Davis Island is gained from utilizing Davis Boulevard and involves driving through residential single- and multi-family communities. Methods to improve access to TPF, to avoid residential areas, are not cost feasible or realistic and will not be evaluated at this time. A pedestrian/bike trail is located along the northeast boundary of the airport and ends near

the airport parking lot. Future plans to extend the trail to the city dog park should be considered as part of the alternatives analysis.

Ground access to this airport is considered good and provides adequate Level of Service (LOS) at this time.

Based on the current aeronautical role and associated trip generation associated with current airport activity, the need to modify or enhance the LOS for Severn Avenue is not anticipated at this time.

Automobile Parking

Automobile parking at TPF is adequate for current operational needs. Parking for 120 automobiles is currently provided at the terminal building. If new airport hangar and/or other support facilities are constructed, more parking will be required to meet anticipated increased demand.

4.10 Airport Security

The Transportation Security Administration (TSA) has developed guidance, in cooperation with the General Aviation (GA) community, to provide GA airport owners, operations, and users with guidelines and recommendations that address aviation security concepts, technology, and enhancements. These guidelines and recommendations are found within Information Publication A-001, *Security Guidelines for General Aviation Airports,* published in May 2004.

The TSA uses an airport characteristics measuring tool that includes airport location, runways, and based aircraft to assess the most appropriate security enhancements for the Airport. Each airport is assigned a certain point value that is calculated considering the airport's location, number and types of based aircraft, runway length and surface characteristics, and number and types of aircraft operations. The airport's value is the compared to the TSA's recommended security features to evaluate whether additional security features may be appropriate. A point value of 34 was calculated for TPF, which means that all security features shown in the "25-44 Point Range" are recommended. **Table 4-20** lists TSA recommended security features and TPF's compliance with these features.

Table 4-20
Analysis of TSA Recommended Security Features

TSA Recommended Security Feature	Point Range/Applicable Security Feature				TPF Status
	>45	25-44	15-24	0-14	
Fencing					☑
Hangars					☑
Closed Circuit Television (CCTV)					☒
Intrusion Detection System					☒
Access Controls		☑			☑
Lighting System		☑			☑
Personnel ID System		☑			☑
Vehicle ID System		☑			☑
Challenge Procedures		☑			☑
Law Enforcement Support		☑			☑
Security Committee		☑			☑
Pilot Sign-In/Out Procedures		☑			☑
Signs		☑			☑
Documented Security Procedures		☑			☑
Positive Passenger/Cargo ID		☑			☑
All Aircraft Secured		☑			☑
Community Watch Program		☑			☑
Contact List		☑			☑

Source: TSA Security Guidelines for General Aviation Airports, May 2004.

Although TPF currently satisfies the security features suggested by TSA, it is recommended that the airport's older existing code-entry access control system be upgraded to a more secure proximity card system in the future. Since a higher level of administrative oversight is typically associated with such systems, HCAA will also need to evaluate its ability to administer the proximity system at that time. Currently, TPF has a CCTV system that is connected to HCAA's centralized operations center. In the future, it is recommended that HCAA periodically evaluate the need to accommodate expanded coverage and additional access points.

In recent years, HCAA has taken steps to improve protective lighting at the airport by adding additional lighting and converting existing lights to a light-emitting diode (LED) system. In the future, it is recommended that the security lighting system be connected to an emergency power source, when available. Also, LED lighting should be incorporated with planned hangar and apron expansion at TPF in the future.

4.11 Summary of Facility Needs

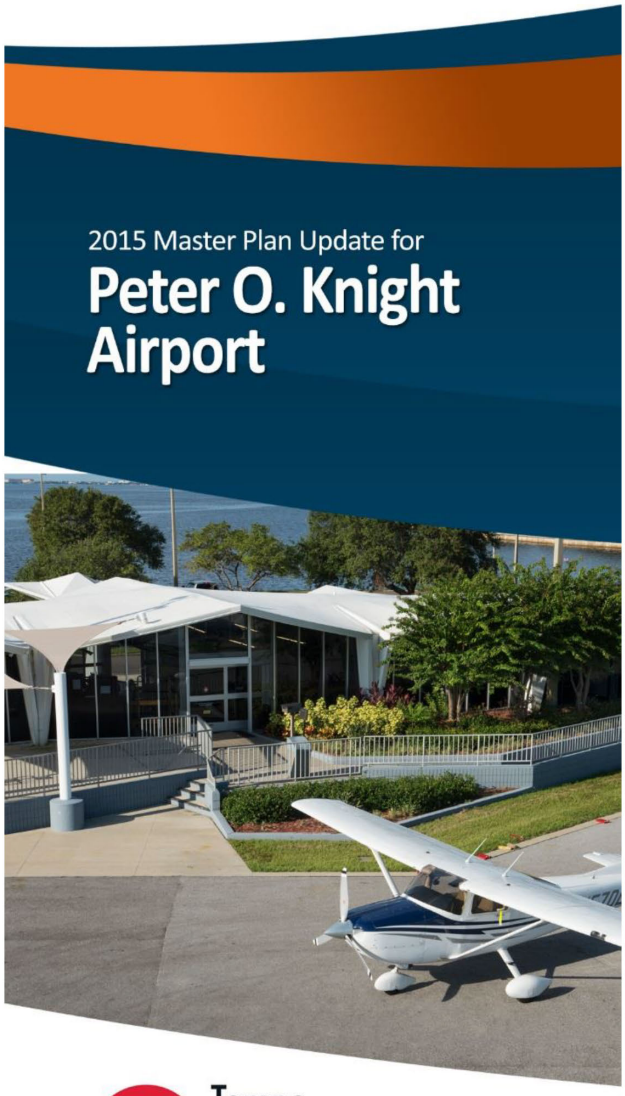
Table 4-21 identifies and summaries TPF's facility requirements. The following table presents recommendations to satisfy these facility requirements.

Table 4-21
Summary of Facility Requirements

Category	Requirements
Airfield Capacity and Configuration	No Improvements Recommended
Design Aircraft and Airport Reference Code (ARC)	Beechcraft Baron 58 and Cessna Skylane 182 – ARC I
Runway Strength	No Improvements Recommended
Instrument Approaches	No Improvements Recommended
Runway Design Standards	Runway Shoulders Recommended Runway Blast Pads
Taxiway Design Standards	Extension of Taxiway G as hangars are constructed Taxiway Shoulders Recommended Pavement Improvements to Taxiway Connector
Airfield Lighting	No Improvements Recommended
Airfield Markings	No Improvements Recommended
Airfield Signage	No Improvements Recommended
Navigational Aids	No Improvements Recommended
Aircraft Apron (2033)	Additional Apron Space
Based Aircraft Hangars (2033)	Additional Single-Unit Hangars Additional Bulk Hangars
Airport Terminal	Evaluated in Alternatives Analysis
Airport Maintenance Facilities	Evaluated in Alternatives Analysis
Fueling Facilities	No Improvements Recommended
Automobile Access	Evaluated in Alternatives Analysis
Automobile Parking	No Improvements Recommended
Airport Security Analysis	Evaluate Deficiencies Based on Table 4-20

Source: URS, 2014.

Chapter 5.0
Airport Alternatives Analysis



Tampa International Airport

Hillsborough County Aviation Authority

5.0 Airport Alternatives Analysis

5.1 Background

This chapter presents the preliminary alternatives for the Peter O. Knight Airport (TPF). The purpose of the preliminary alternatives is to evaluate options for satisfying the airfield and landside facility requirements that were identified in the previous chapter. At TPF, the most significant airfield recommendation consists of extending Taxiway G in order to provide additional landside development opportunities on the east side of the airport. The landside recommendations primarily include the provision of additional hangars and modifications to the terminal area. The preliminary alternatives are intended for discussion purposes between the various stakeholders including airport tenants, the Hillsborough County Aviation Authority (HCAA), and the public. The individual components of each preliminary alternative were evaluated to aid in the selection of a preferred alternative that represents the desired development plan for the 20-year planning period, which is presented in Chapter 6. For that reason, the preliminary alternatives should be viewed as flexible development plans that may be refined or combined to best satisfy the needs of the airport's stakeholders. They provide a clear understanding of the airport's possibilities and limitations for airfield and landside development.

- Runway Approach Analysis
- Airfield Alternatives
- Airport Land Use Analysis
- Landside Alternatives
- Airport Support Facilities
- Airport Ground Access

5.2 Runway Approach Analysis

As part of the airfield alternatives analysis, the associated instrument approach procedures were evaluated for the four runway ends at TPF. The analysis focused on identifying any existing or potential Threshold Siting Surface (TSS) obstructions. Unlike the Federal Aviation Regulations (FAR) Part 77 surfaces that are primarily used to adopt building height and land use restrictions around airports, the TSS is the surface that is evaluated to determine if one or more of the following actions are necessary.

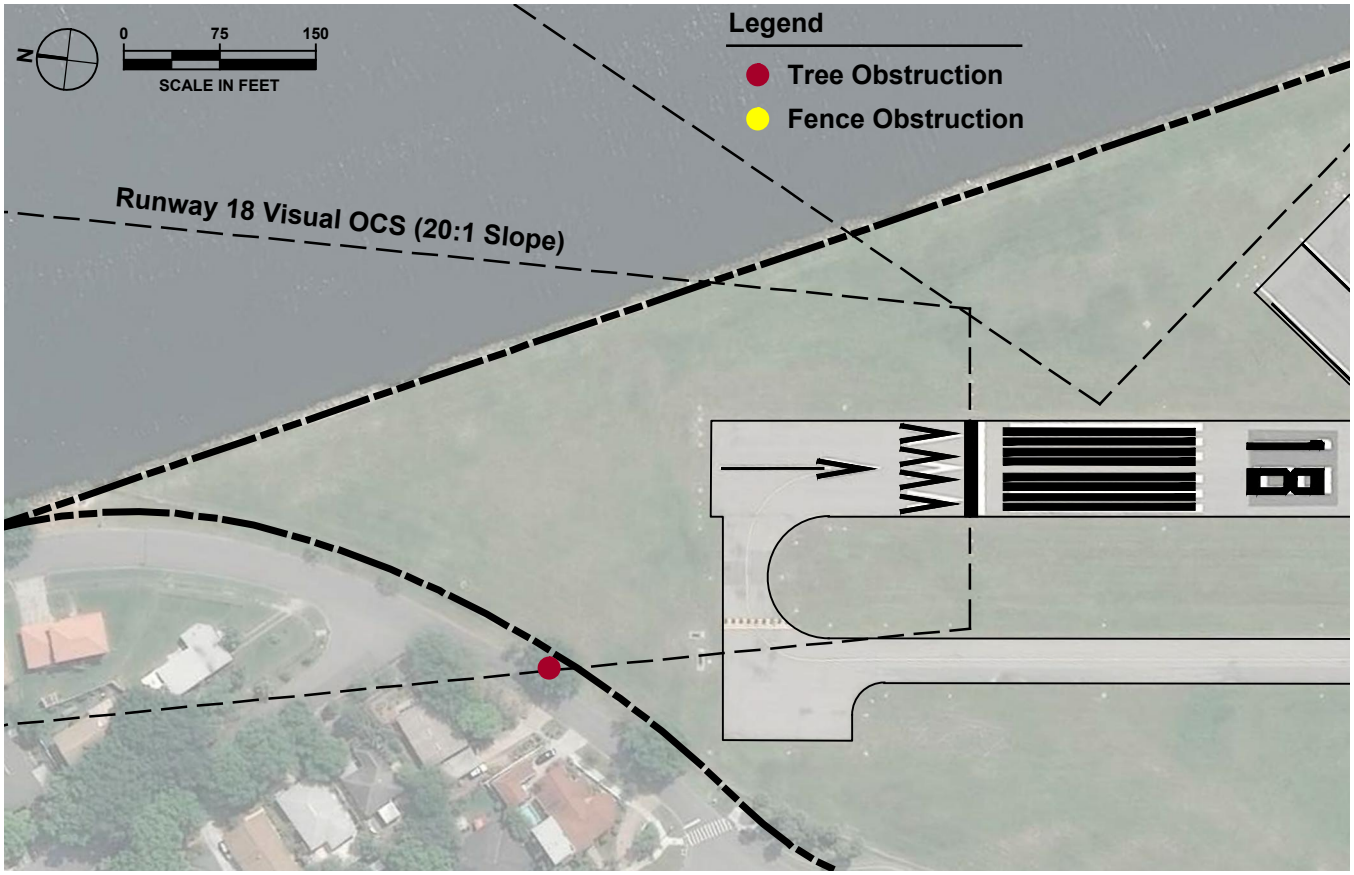
- Obstacle clearing, marking, or lighting is necessary within the TSS.
- Displacement of the runway threshold is necessary because obstacles cannot be cleared from the TSS, which results in a shorter landing distance.
- Modification of the approach glide path and/or threshold crossing height is necessary.
- Prohibition of nighttime operations may be necessary unless an approved Visual Glide Slope Indicator (VGSI) is in use.

At TPF, Runways 22 and 36 have published non-precision approaches that provide horizontal guidance to aircraft via GPS and Runways 4 and 18 do not have published approach procedures and are therefore considered visual. For the non-precision approaches to Runways 22 and 36, an Obstacle Clearance Surface (OCS) for runways that support instrument night operations was

evaluated. That OCS starts 200 feet beyond the threshold and extends out at a slope of one foot vertical for every 20 feet horizontal. For the visual approaches to Runways 4 and 18, the OCS starts at the threshold and also extends out at a slope of one foot vertical for every 20 feet horizontal. As shown in **Figure 5-1**, there are obstructions located within the approaches to Runways 18, 22, and 36. Within the Runway 18 approach, there is a single tree located along Hudson Avenue that penetrates the OCS by approximately 16 feet. The Runway End Identifier Lights (REILs) within the Runway 22 approach penetrate the OCS, but the light unit should be mounted on frangible couplings (i.e., break away couplings) that are permissible for navigational aids within the approach (not shown in Figure 5-1). The Runway 36 OCS contains a fence and tree that are located near the Davis Islands Dog Park. The FAA typically encourages airports to clear OCS obstructions, which would include removing or lowering the tree and fence penetrations within the Runway 18 and 36 approaches.

5.3 Airfield Alternatives

HCAA conducted multiple airfield projects at TPF in 2009 that primarily consisted of Runway Safety Area (RSA) improvements. For that reason, very few airfield requirements were identified for the airport as part of this planning effort. The main airfield recommendation includes the extension of Taxiway G to the Runway 36 end and to the Runway 22 end. As shown in **Figure 5-2** (refer to Section 5.4 for the land use analysis discussion), that project would provide access to Landside Development Areas 3 and 4 on the east side of the airport, which are the few remaining areas on the airport property where new development could occur. Other navigational aid improvements may be considered during the 20-year planning period, which are incorporated into the preferred alternative and Capital Improvement Program (CIP) for TPF.



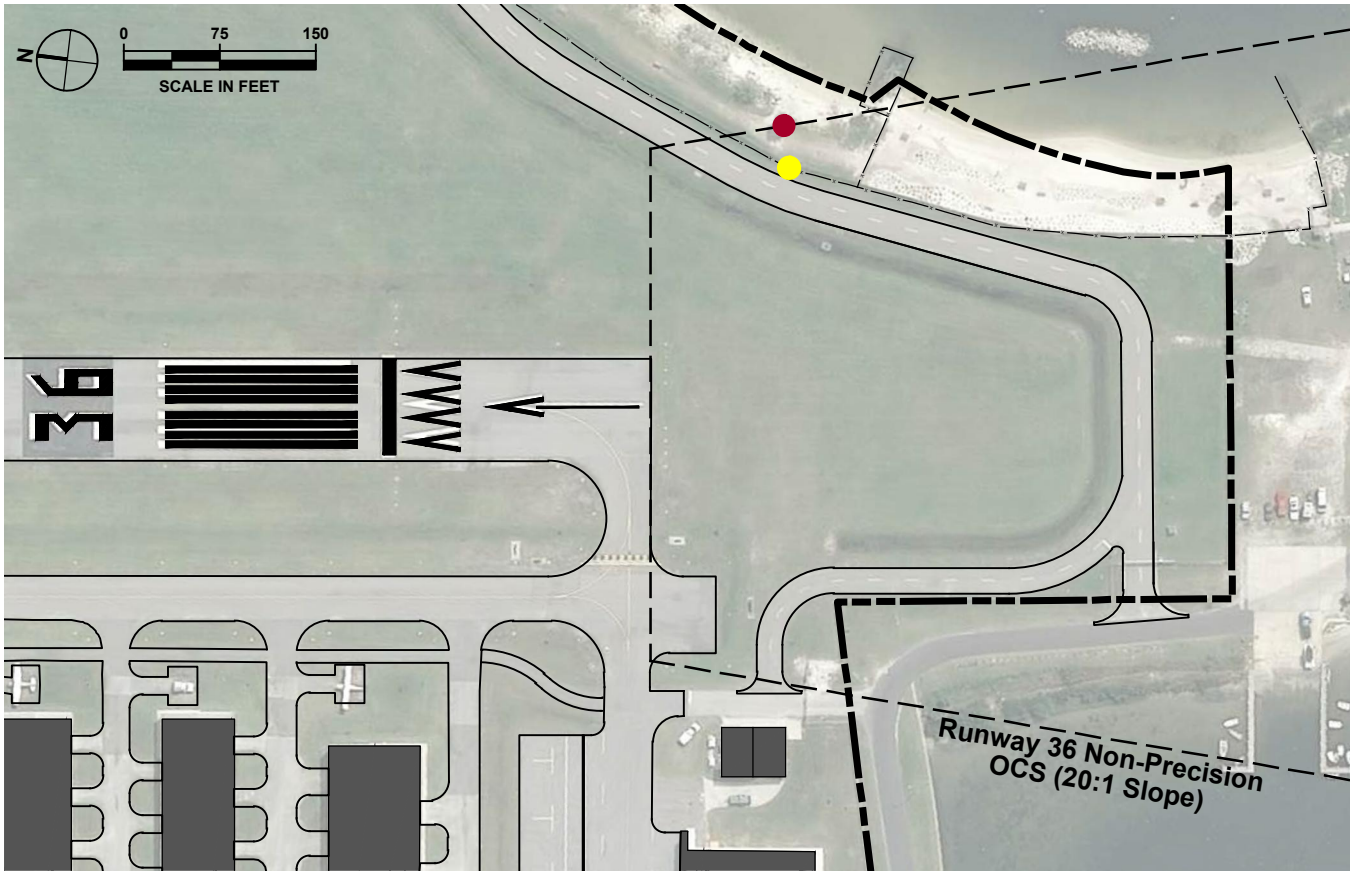


Figure 5-1 Runway Approach Analysis

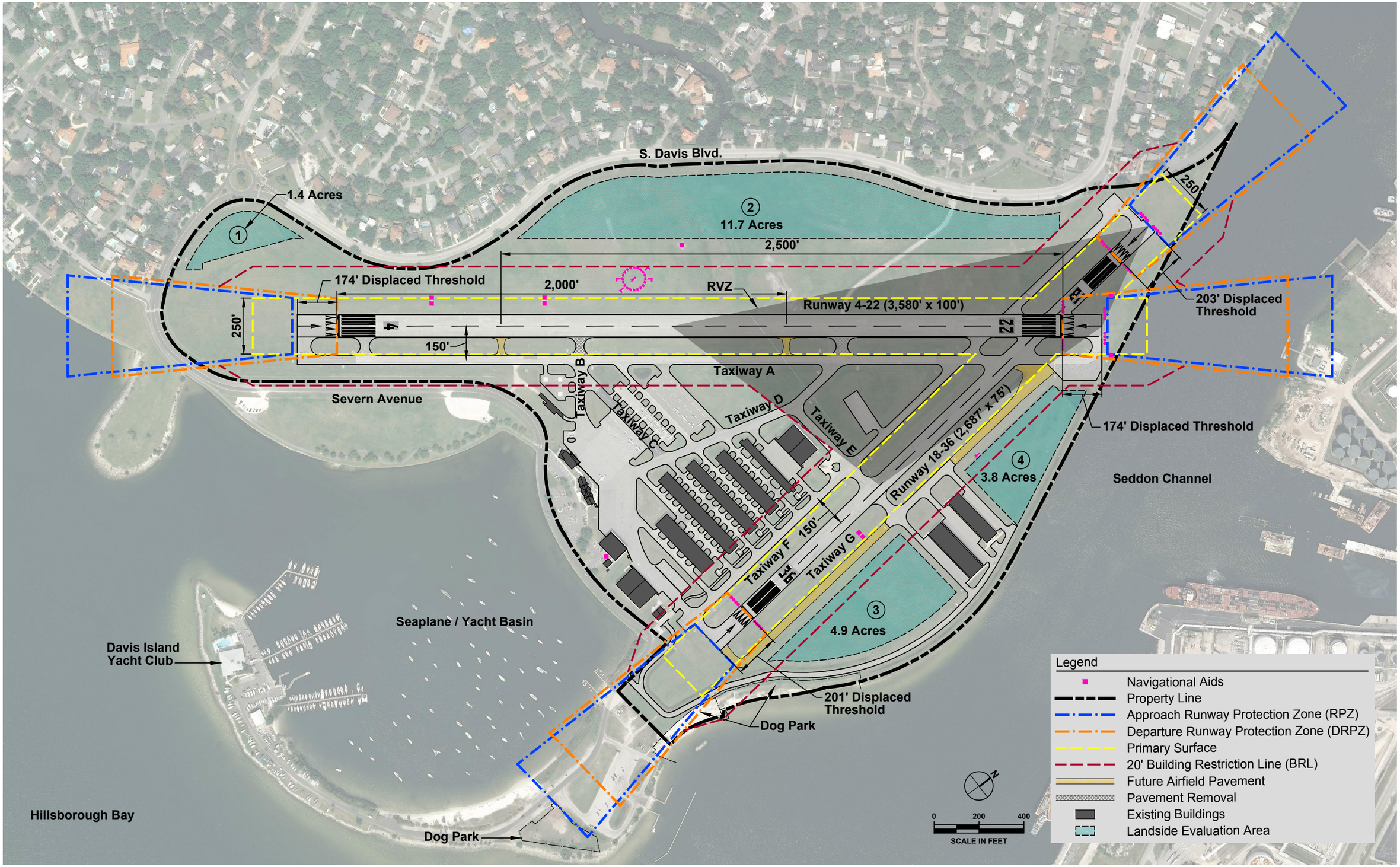


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Figure 5-2 Landside Evaluation Areas

5.4 Airport Land Use Analysis

TPF is situated on 143 acres of property that is bounded by the Davis Islands community to the east and water around the remaining perimeter. The remaining vacant sections of the airport property were analyzed in terms of their potential use, aircraft and automobile access, and feasibility of development. The intent was to evaluate the highest and best use for the vacant parcels, as well as to determine if additional property should be acquired to accommodate the airport's growth initiatives. Furthermore, this land use analysis should provide the airport with a plan to maximize development opportunities on the property and to generate additional revenues. The information included in this analysis places priority on reserving as much space as possible for aviation development and expansion. The results of the Peter O. Knight Strategic Business Plan, dated January 2016, should be viewed in conjunction with this analysis in order to determine practicable methods of encouraging both aviation and non-aviation development on the airport property. The parcels are illustrated in Figure 5-2 and evaluated in **Table 5-1**.

Table 5-1
Land Use Analysis

Landside Zone	Approximate Acreage	Potential Use	Access	Feasibility of Development
1	1.4 Acres	Open Space	The site is accessible from S. Davis Boulevard.	In 1999, HCAA signed a restrictive covenant on deed prohibiting the future development of this area.
2	11.7 Acres	Open Space	The site is accessible from S. Davis Boulevard.	In 1999, HCAA signed a restrictive covenant on deed prohibiting the future development of this area.
3	4.9 Acres	Aviation Development	Vehicle access would be provided from Severn Avenue. Airfield access would be provided from Taxiway G.	It is anticipated that this would be the next logical site for providing T-hangar and box hangar facilities.
4	3.8 Acres	Aviation Development	Vehicle access would be provided from Severn Avenue. Airfield access would be provided from Taxiway G.	It is anticipated that this would be the next logical site for providing T-hangars, box hangars and airport maintenance facilities.

Source: Michael Baker Jr., Inc., 2015.

5.5 Landside Alternatives

The purpose of conducting the landside alternatives analysis is to show options for meeting the hangar, apron, and support facility requirements and also to illustrate the overall development potential of the airport from a conceptual standpoint. Of the three general aviation airports owned by HCAA, TPF has the least space available for future facility development. Therefore, the landside alternatives analysis explored both new development and redevelopment opportunities for the airport, as discussed below. Many of the hangar dimensions that are discussed in this section are based on typical pre-fabricated facilities and/or typical sizes of corporate hangars.

Figures 5-3 and 5-4 illustrate potential landside development alternatives for the vacant sites along Runway 18-36. As shown in Landside Development Alternative 1, the proposed eastern landside development includes a combination of T-hangars, box hangars, and maintenance/bulk hangar facilities capable of accommodating aircraft with larger wingspans. Under this alternative, four additional T-hangar buildings shown would provide 23 additional units. The ten box hangars are 60 feet wide by 75 feet deep and could store a range of aircraft/helicopter sizes. Three bulk storage/maintenance hangars ranging in size from 8,000 square feet to 12,000 square feet are also provided with adjacent apron areas.

Landside Development Alternative 2 focuses on maximizing aircraft storage capacity by developing a series of standard size hangars and smaller box hangars. Under this alternative, the six T-hangar buildings shown would provide 49 additional units. Four of the box hangars are 56 feet wide by 62 feet deep, three of the box hangars are 42 feet wide by 33 feet deep, and two box hangars are 65 feet wide by 53 feet deep. On the south end, the area with the four box hangars could be utilized as a dedicated helicopter storage and parking area. This alternative also includes the construction of a new airport maintenance facility to replace the existing aging facility. Taxiway access improvements associated with Landside Development Alternatives 1 and 2 include the extension of and connections to Taxiway G. Automobile access and parking improvements are also incorporated into the landside development alternatives.

Figure 5-5 illustrates a series of improvements designed to promote terminal improvements, replace aging hangar facilities, and expand automobile parking capacity. Due to the limited land envelope available for future development, a new two-story terminal building and attached hangar is shown adjacent to the existing terminal building and over the aging maintenance hangar. The proposed terminal covers an area of approximately 7,000 square feet and the proposed hangar is 8,000 square feet. In addition to housing the Fixed Base Operator (FBO) at ground level, the upper level could accommodate a restaurant with meeting/banquet facilities and a view of Hillsborough Bay and downtown Tampa. It is important to note that the airport is located in FEMA Flood Zone AE. Therefore, the proposed terminal facility would be required to have a minimum finished floor elevation of 10 feet Above Mean Sea (AMSL). The size, shape, and location of the terminal building shown is intended for conceptual purposes and a more detailed analysis would be necessary to determine the actual footprint of the building. A potential location for aboveground fuel tanks is also shown in case the existing underground tanks need to be replaced. The remainder of the terminal area development alternative focuses on providing additional T-hangars to replace aging shade hangars during the 20-year planning period. Other T-hangar buildings could be replaced on site as existing facilities reach the end of their useful service life.

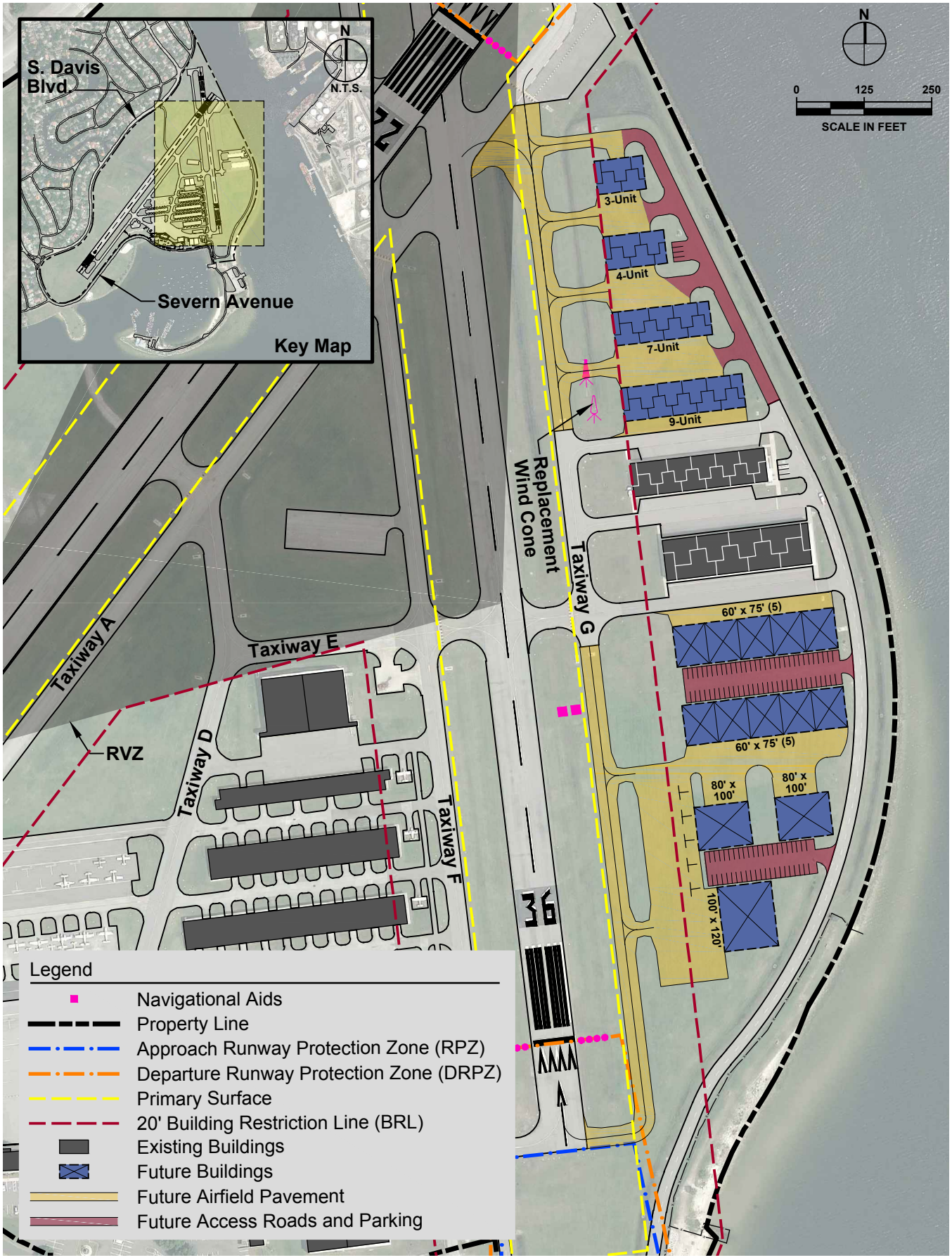

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Figure 5-3 Landside Development Alternative 1

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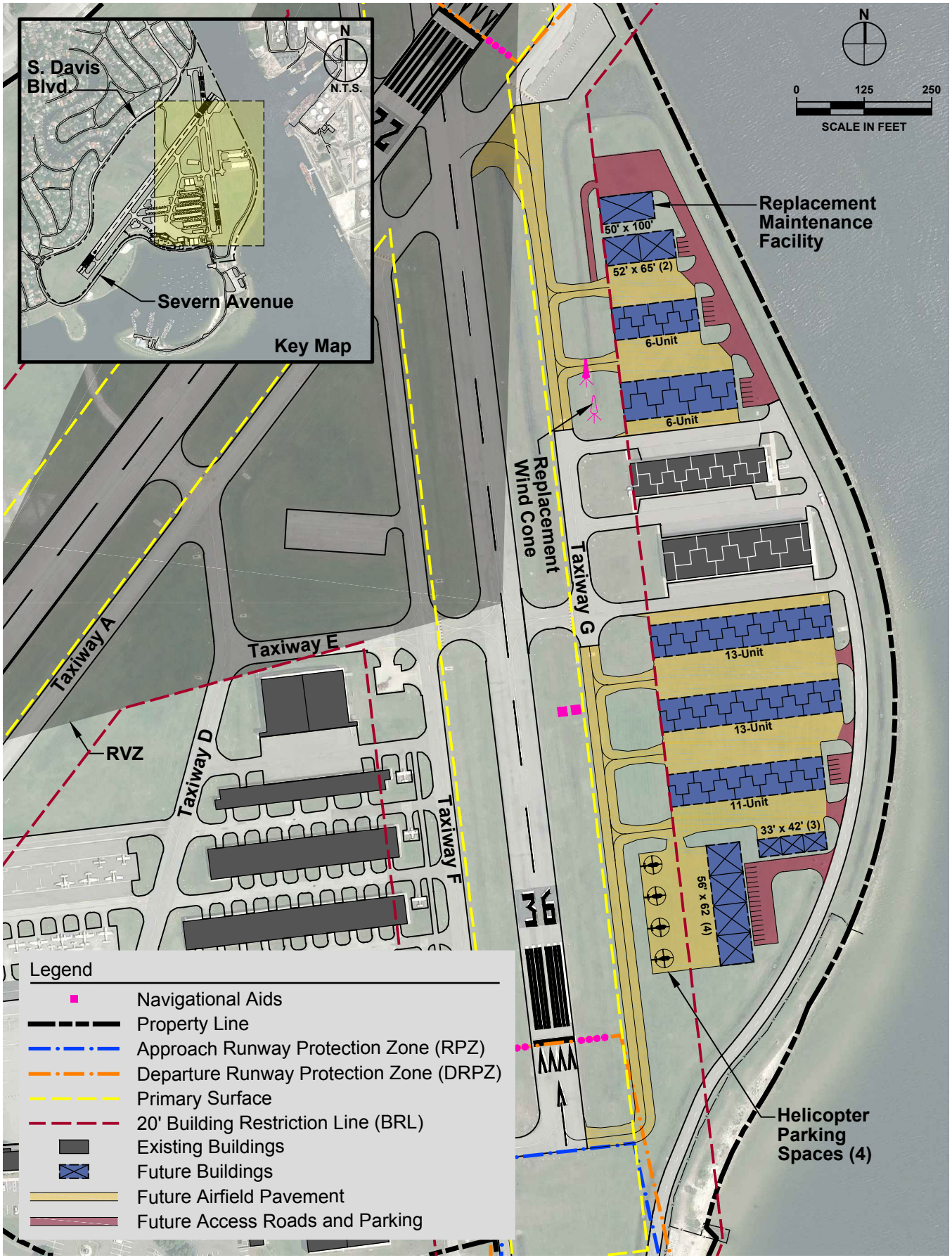

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Figure 5-4 Landside Development Alternative 2

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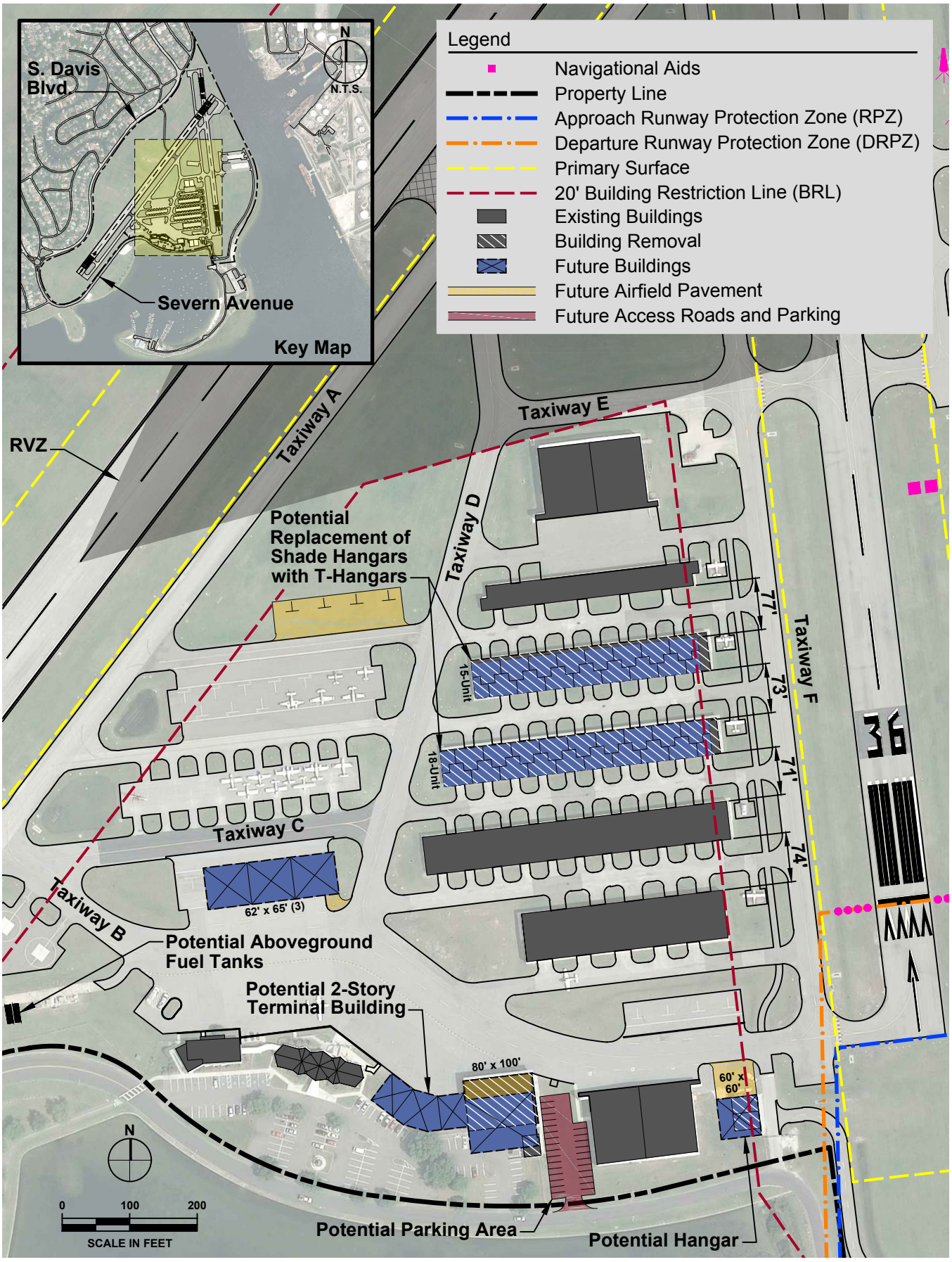

Figure 5-5 Terminal Area Development Alternative

5.6 Airport Support Facilities

The provision of support facilities was considered as part of the landside alternatives analysis. The main support facility improvements include the development of a new airport maintenance facility in the northeast corner of the airport, a replacement fuel truck parking area, a replacement terminal building and additional automobile parking near the terminal, and a potential location for aboveground fuel tanks should the need arise. The phasing for many of the support facility improvements is dependent upon the construction of a new terminal building, which HCAA has tentatively scheduled for 2019. Other projects such as the construction of a new airport maintenance facility and the replacement of the underground fuel tanks with aboveground tanks could occur at any time.

5.7 Airport Ground Access

This section describes the existing system of local roadways providing ground access to and from the airport. The existing roadway "section" design, routing, and adjacent land uses are also described with associated discussions regarding HCAA's desire to maintain and improve ground access to the airport to accommodate existing and anticipated airport-driven ground access demand. Since it was purchased from the City of Tampa in 1999, HCAA has continued to maintain and improve the airport by making airfield and landside improvements that have included, but were not limited to the demolition and reconstruction of multiple T-hangars, the construction of a new parallel taxiway, a new administration building, a new fuel farm, a designated helicopter parking area, an additional aircraft parking apron, and large enclosed hangars.

It is the expressed goal of HCAA to continue to develop the airport to accommodate and serve existing and anticipated increased future levels of demand of small/light recreational and commercial general aviation demand within the west central portion of Hillsborough County and the City of Tampa's downtown business district throughout the 20-year planning period. The airport is currently and is anticipated to remain designated by HCAA and the FAA within the FAA's National Plan of Integrated Airport Systems (NPIAS) as a Regional General Aviation Reliever Airport.

Because of its location on Davis Islands, there is a single public ground access route to the airport via South Davis Boulevard and Severn Avenue each of which meander through a densely populated residential neighborhood that surrounds and is in proximity to the airport (refer to **Figure 5-6**). These roads are designed to accommodate the 30 mile per hour surface traffic volumes that are considered to be sufficient to accommodate the associated trip generation of the airport and the adjacent and surrounding commercial and residential land uses.

Past ground access planning and feasibility studies have indicated that improvements to the existing local roads for airport access improvement were considered impracticable. For this reason, no further evaluations of TPF's access requirements were conducted as a component of this study. However, opportunities for on-airport automobile access and parking opportunities were illustrated in conjunction with the landside and terminal development alternatives in order to access new development areas and to provide additional parking near the terminal.

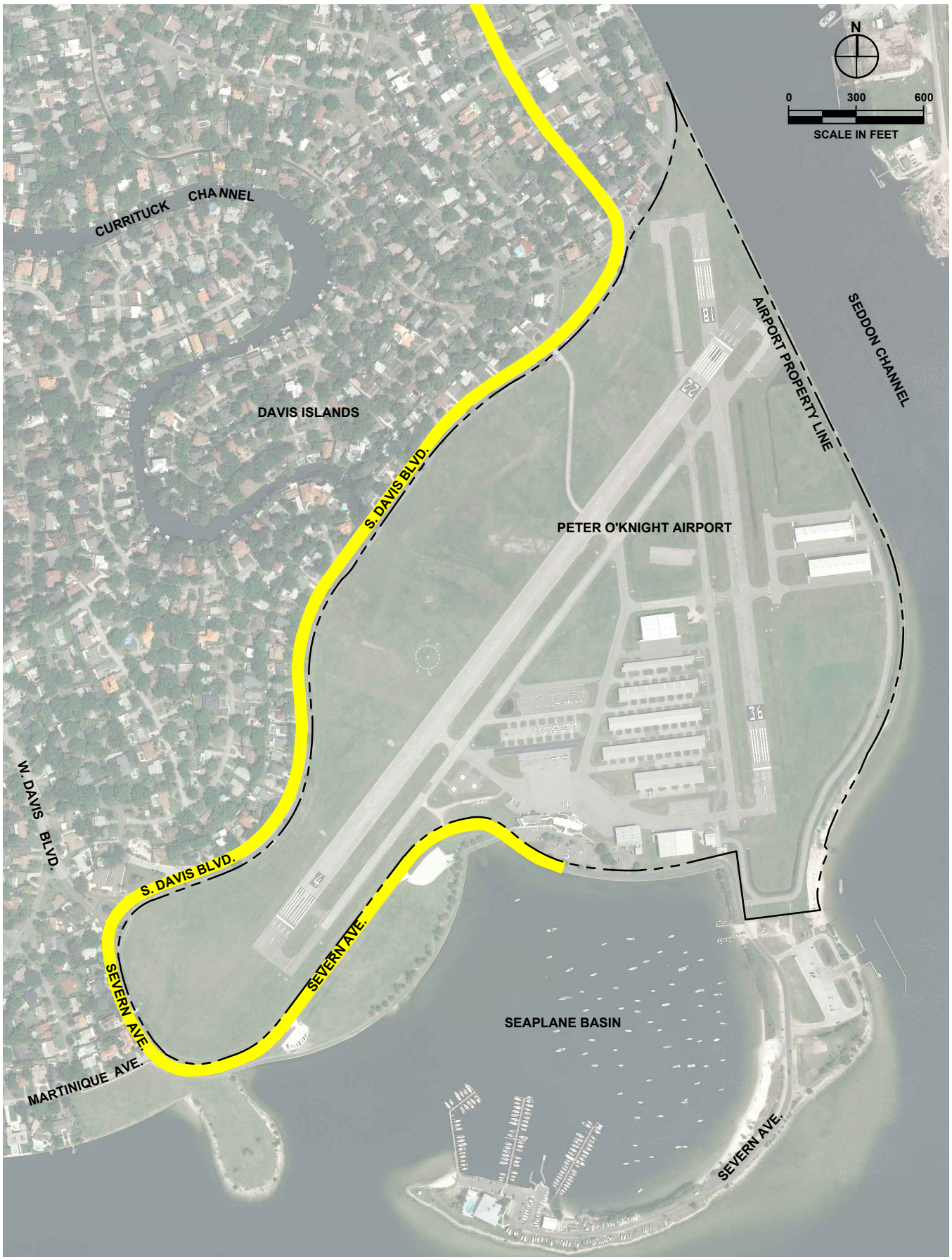

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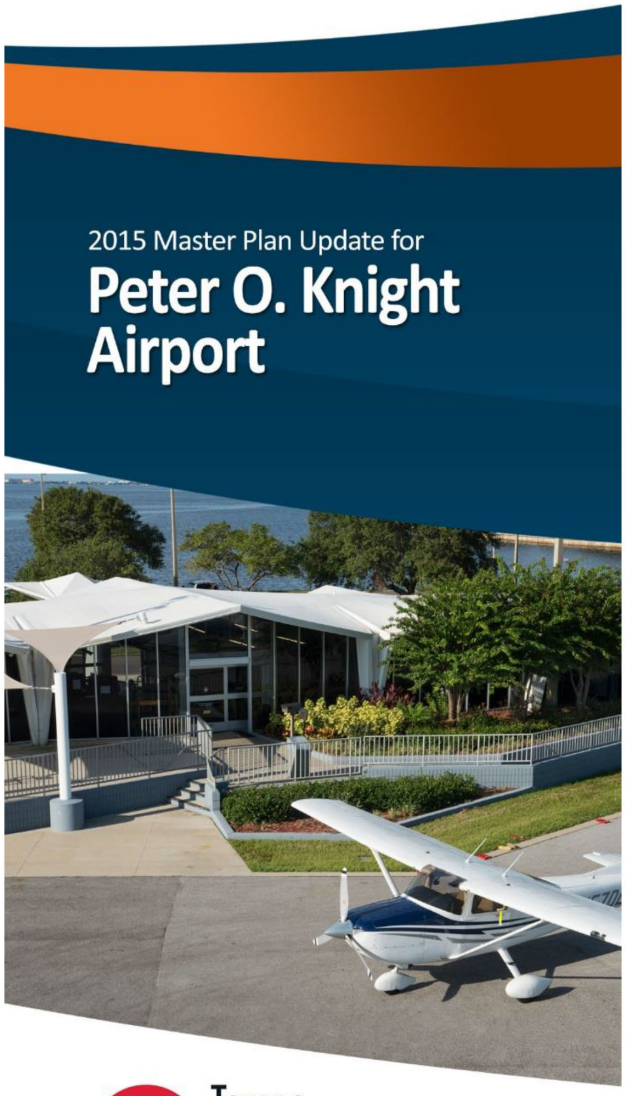
Figure 5-6 Existing Surface Access

Chapter 6.0
Refined Alternatives



6.0 Refined Alternatives

6.1 Background

The previous chapter presented the preliminary alternatives for TPF including options for conforming to current FAA airfield design guidelines and the continued expansion of the airport's landside facilities (e.g., the development of hangars, a new terminal and support facilities). The intent of the preliminary alternatives was to evaluate various scenarios for satisfying the identified facility requirements. A preferred alternative was ultimately selected that represented the recommended development concept for the 20-year planning period of this Master Plan Update. This chapter describes each component of the preferred alternative and also presents an environmental action plan that describes the potential environmental impacts and level of documentation that would be necessary to undertake the proposed developments. The cost estimates for the preferred alternative are presented in the next chapter in conjunction with a Capital Improvement Plan (CIP) that shows anticipated project phasing and funding sources over the course of the 20-year planning period.

6.2 Preferred Alternative

As shown in **Figure 6-1**, the preferred alternative includes a combination of the airfield improvements designed to support the landside development alternatives that were presented in the previous chapter. The primary airfield recommendations include relocated taxiway connectors between Taxiway A and Runway 4-22 and the extension of Taxiway G providing parallel taxiway access to proposed landside improvements on the eastside of the airport. A detailed listing of all airfield projects that are anticipated during the planning period is presented with the CIP.

The proposed landside improvements were tailored to meet future needs and support the highest and best use of airport property available for development. The development on the east side of the airport along Taxiway G is focused on providing facilities that maximizes aircraft storage capacity by developing a series of standard and smaller box hangars. The proposed development includes the provision of 2 additional T-hangar buildings with a total of 12 bays, 15 box hangars designed to support larger aircraft and business activities. On the south end, three corporate hangars could be utilized to support aviation-related business activities. The construction of a new airport maintenance building to replace the existing aging facility is also included.

Within the terminal area, the preferred alternative focuses on a series of improvements designed to replace aging hangar facilities, promote the development of larger hangars in support of business activities, and promote terminal improvements. Due to a limited land envelope available for future development, a two-story terminal building and maintenance hangar is proposed to provide additional revenue generating opportunities. It is recommended that the future layout of this area be further reviewed as part of a more detailed Terminal Area Study. This will enable HCAA to utilize current facilities to support other business activities at the airport. Other improvements include above ground fuel tanks and box hangars located near the terminal to support aviation-related business activities.

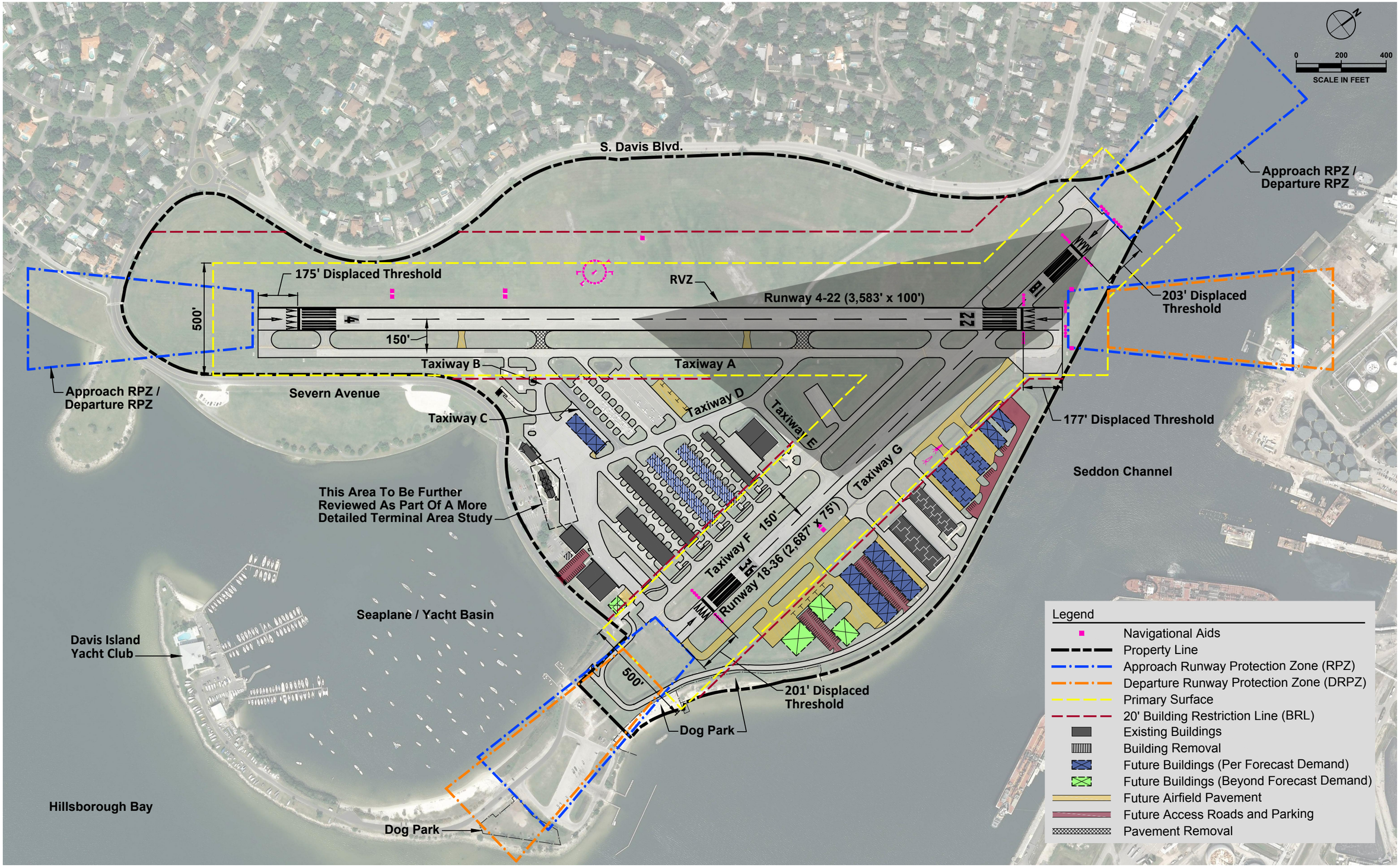


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Figure 6-1 Preferred Alternative

The remainder of the preferred development alternative focuses on providing additional T-hangars to replace aging shade hangars. In the future, existing T-hangar buildings could be replaced on site as existing facilities reach the end of their useful service life. Taxilane and automobile access/parking improvements in support of the proposed landside development are incorporated into the preferred development concept.

Recommended Capital Improvements

Table 6-1 summarizes the recommended capital improvements associated with the master plan projects only. The projects are presented in no particular order and can be seen in the key map in **Figure 6-2**. The following chapter of this study includes a detailed phasing and funding plan for the master plan recommendations, in addition to cost estimates and additional projects associated with the annual maintenance of facilities at TPF.

Table 6-1
Recommended Capital Projects

Figure 6-2 ID	Description	Project Details
A	Box Hangars	3 box hangars
B	Apron Expansion	To allow for additional aircraft parking
C	Taxiway	Relocated taxiways IAW design standards
D	Shade to T-hangars	Add doors & panels to enclose 18 bay shade hangar
E	Shade to T-hangars	Add doors & panels to enclose 15 bay shade hangar
F	Terminal/Maintenance Hangar	New terminal and maintenance hangar development
G	Box Hangar	1 box hangar
H	Taxiway G	Extension of taxiway to south
I	Taxiway G	Extension of taxiway to north
J	Box Hangars	5 box hangars, taxilane, road/parking
K	Box Hangars	5 box hangars, taxilane
L	Corporate Hangar	Corporate hangar, apron
M	Corporate Hangar	Corporate hangar, apron
N	Corporate Hangar	Corporate hangar, apron, road/parking,
O	T-hangars	1 6-bay T-hangar, taxilane, road
P	T-hangars	1 6-bay T-hangar, taxilane, road
Q	Box Hangars	2 box hangars
R	Airport Maintenance Facility	Maintenance building, road/parking
S	Fuel Farm	Removal of 2 USTs and replacement with 2 ASTs

Source: Michael Baker International, Inc., 2017.

Figure 6-2 Project Key Map

6.3 Noise Contours & Land Use Compatibility

The FAA's Integrated Noise Model (INM) computer program is used to generate airport noise contours and to evaluate incompatible noise exposure to sensitive land uses such as residential properties, schools, places of worship, and hospitals. At the time of the noise analysis for TPF, INM was the FAA-accepted program for generating airport noise contours, but the FAA switched to the Aviation Environmental Design Tool (AEDT) program in May 2015. The noise contours illustrate the Day-Night Average Sound Level (DNL) that occurs during an average day and are generated by inputting various airport-specific factors into INM (aircraft activity and fleet mix, flight tracks, runway utilization, day and night activity, etc.). According to the FAA's Environmental Desk Reference for Airport Actions, "DNL is the 24-hour average sound level in decibels (dB). This average is derived from all aircraft operations during a 24-hour period that represents an airport's average annual operational day. […] DNL adds a 10 dB noise penalty to each aircraft operation occurring during nighttime hours (10 p.m. to 7 a.m.). DNL includes that penalty to compensate for people's heightened sensitivity to noise during this period." The FAA identifies DNL levels of 65 dB and higher as incompatible with noise sensitive land uses.

Using the latest version of INM (Version 7.0d), DNL noise contours were generated for the following two scenarios at TPF: 1) existing 2013 activity levels, fleet mix, and runway configuration, and 2) forecast 2033 activity levels, fleet mix, and runway configuration. The INM inputs in **Table 6-2** were derived from the fleet mix forecast in Table 3-14 and by reviewing historical flight records to identify aircraft models that commonly operate at TPF. As shown in **Figure 6-3**, only small portions of the DNL 65 dB contour extend off the airport under the existing and forecast scenarios. The only potential area of concern is the residential area to the north of the Runway 18 end where the DNL 65 dB contour may extend over one or more homes in the future. However, because there are not changes recommended for the airfield, such a potential impact would be caused by the natural growth in operations that is forecast for the airport and not because of the master plan recommendations.

As discussed earlier in this study, the FAA recommends that airport owners own and control all property within RPZs, and therefore, easements are recommended within those portions of the existing and future RPZs that extend off the airport property. No other incompatible land use issues would be anticipated from the development of the preferred alternative. It is noted that the airspace surrounding the runways is protected in accordance with HCAA Resolution 2010-54, Airport Zoning Regulations.

Table 6-2
Integrated Noise Model (INM) Inputs

Aircraft Type	Model	INM Code	2013 Operations	2033 Operations
Single-Engine Piston	Cessna 182	CNA182	54,226	69,272
Multi-Engine Piston	Beechcraft Baron 58	BEC58P	2,946	3,763
Turboprop	Cessna Conquest	CNA441	492	1,279
Jet (Small)	Eclipse 500	ECLIPSE500	76	173
Helicopter	Bell 407	B407	1,178	2,046
Source: Michael Baker International, Inc., 2015.				

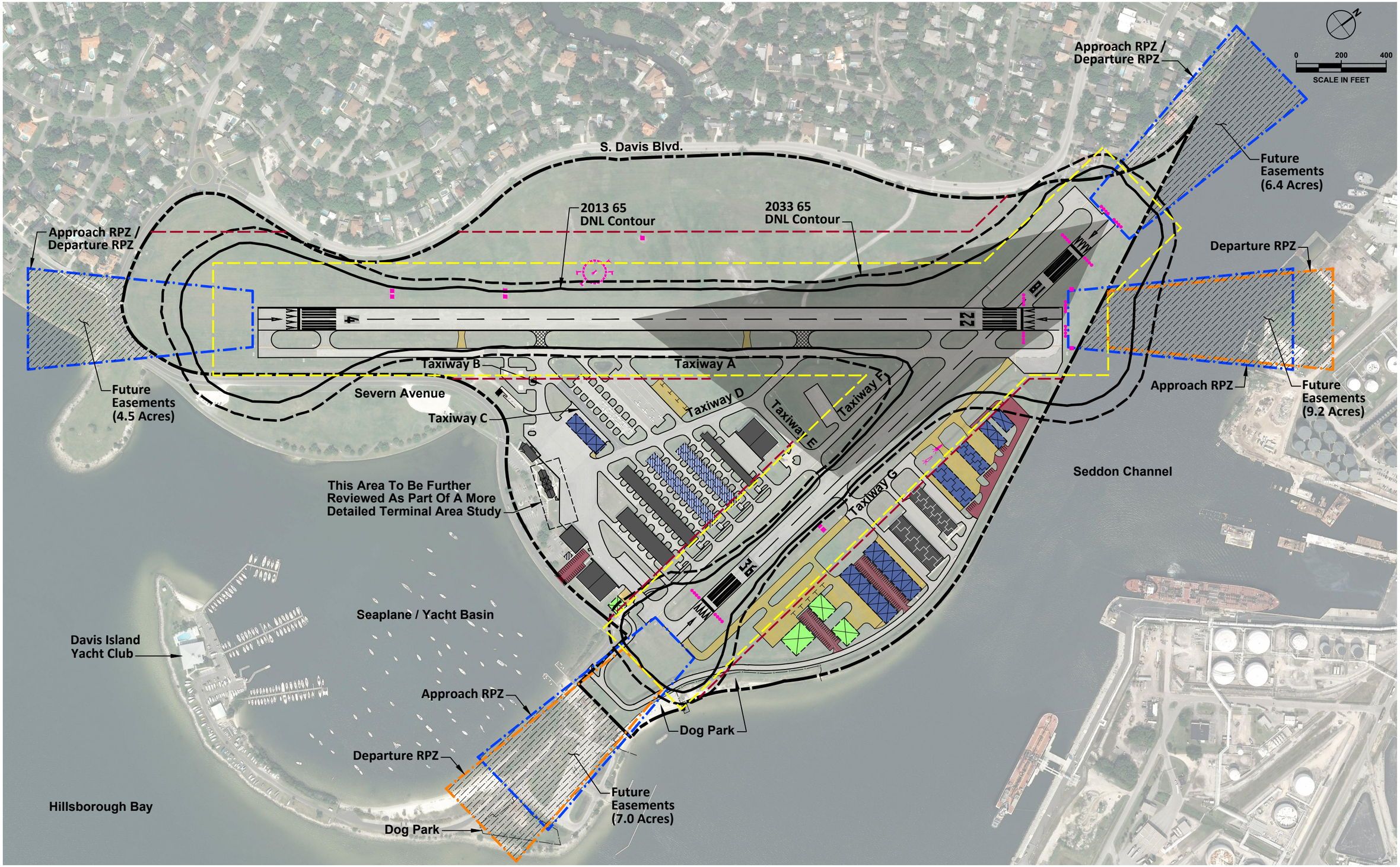

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Figure 6-3 Noise Contours & Land Use Compatibility

6.4 Potential NEPA Documentation and Environmental Permits

The following sections describe the necessary level of documentation and permitting that would be associated with undertaking the projects proposed within the preferred alternative, and identify potential environmental impacts that would be expected as a result of implementation of those projects.

Potential NEPA Documentation

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, provides the FAA policies and procedures that are implemented to ensure compliance with the requirements of the National Environmental Policy Act (NEPA) for FAA funded projects and lists the type of NEPA documentation required for each project type. Chapter 5 of FAA Order 1050.1F contains the list of the FAA's categorically excluded actions. Categorically excluded actions are those that meet the stated definition in 40 CFR 1508.4. These actions, under ordinary circumstances, do not require an Environmental Assessment (EA) or Environmental Impact Statement (EIS) and do not individually or cumulatively have a significant effect on the environment. Chapter 3 of FAA Order 1050.1F provides a summary of requirements for Environmental Assessments and findings of no significant impact (FONSI). Chapter 3 explains that actions that normally require an EA include those actions that do not fall within the scope of one of FAA's Categorical Exclusions and actions that would normally be categorically excluded but involve at least one extraordinary circumstance. Chapter 3 also provides a list of 16 examples of types of actions that typically require an Environmental Assessment. Furthermore, Chapter 3 of Order 1050.1F states that an EIS is required when an action would result in significant effects to the quality of the human environment.

All of the proposed projects in the Preferred Alternative are anticipated to meet NEPA requirements under a Categorical Exclusion.

Potential Environmental Regulatory Permits

Permitting requirements for each project type are based upon current federal, state, and local environmental regulations. The following criteria were used to determine the potential environmental permit that would be required for each project:

State Environmental Resource Permit (ERP)

An ERP is required if the project meets one of the following criteria:

- The project proposes work in, on or over wetlands and surface waters.
- The project proposes to construct more than 4,000 square feet of impervious or semi-pervious surface.
- The project proposed has an area that is greater than 1 acre.
- The project proposes impounding greater than 40-acre feet.
- The project includes construction of a dam that is greater than 10 feet in height.
- The project is part of a larger development plan.
- The project is a modification of an existing permit.

National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activity

An NPDES for Construction permit is required from the Florida Department of Environmental Protection (FDEP) if the project area is greater than 1 acre.

Section 404 Permit or Corps of Engineers (COE) Dredge and Fill Permit

A Section 404 Permit is required if the project proposes to fill or dredge wetlands or other Waters of the United States.

Environmental Protection Commission of Hillsborough County (EPC) permit to Perform Miscellaneous Activities in Wetlands (MAIW).

An EPC MAIW Permit is required for land alteration (including vegetation removal), surface water management, or construction in a wetland or surface water.

EPC Installation of Pollutant Storage Tank Systems and Storage Tank Registration

EPC is under contract with FDEP to regulate and inspect storage tanks containing petroleum or acids. Registration with the EPC is required for new fuel storage tanks.

Preferred Alternative Projects

The projects proposed for the preferred alternative were overlaid on a Florida Land Use, Cover and Forms Classification System (FLUCFCS) map and the most recent aerial photograph to determine if the proposed projects would potentially impact developed areas, wetlands, non-forested uplands, or forested uplands. The projects proposed for the preferred alternative; their potential impact to wetlands, forested uplands, and protected species; the anticipated level of documentation (Categorical Exclusion or Environmental Assessment) that will be required by the FAA to satisfy NEPA requirements; the section of FAA Order 1050.1F that each project falls under; and the regulatory permits that would be anticipated to be required to construct each project are listed in **Table 6-3**.

Projects with No Potential Environmental Impacts

Projects with no potential environmental impacts are located on developed areas within airport property and are not expected to require modification of the surface water management system (stormwater drainage system) at TPF. These include mowed upland or paved areas that do not require land acquisition and have a project area that is less than one acre. These projects are typically categorically excluded. Components of the preferred alternative that are no expected to have environmental impacts include the new terminal and maintenance hangar development, and the replacement of the tanks at the fuel farm, which will require updating of the Spill Prevention Control and Countermeasures Plan and Stormwater Pollution Prevention Plan, documented closures for the old tanks, and registration of the new tanks, but no anticipated permitting.

Projects with Potential Protected Species Impacts

Based on a review of available information, there are no protected species that would be impacted by the preferred alternative at TPF. If projects were planned that would eliminate ditches, there would be potential for impact to wood stork foraging habitat, but none of the proposed projects

would remove ditches. Areas where ditches would be piped, such as for taxilane crossings of ditches, are very small in scale and therefore would not be expected to impact wood storks.

Projects with Potential Surface Water Impacts

None of the projects at TPF would be anticipated to impact state or federally jurisdictional wetlands. However, numerous projects would be anticipated to require modifications to the surface water management system at TPF. These projects would likely be required to have an ERP from SWFWMD and an MAIW from EPC, as indicated in **Table 6-3** below. In some cases, ditches that would be impacted or modified may be considered Waters of the U.S., which are subject to the jurisdiction and permitting authority of the COE. In such instances, the projects would require a Section 404 or Dredge and Fill Permit. In the State of Florida there is a memorandum of agreement between the state and the COE for Joint Application such that the ERP application also serves as the application for the Section 404 Permit. Projects that involve minor impacts or modifications that can be permitted with a Section 404 Nationwide or General Permit would most likely be processed as Categorical Exclusions. Projects that would involve modifications to the surface water management system but would not impact ditches that are Waters of the U.S. would not require a Section 404 permit. The southern extension of Taxiway G may require a Section 404 permit because it would be located in very close proximity to a perimeter ditch that is connected to the waters of Tampa Bay, and changes to this ditch may be required. If no modifications to the ditch are required or if the COE does not claim jurisdiction over the ditch, then the Section 404 permit would not be necessary. Similarly, several of the hangar development projects on the southeastern side of Taxiway G would have the potential to impact the parallel ditch between the future taxiway extension and the hangar developments. It is anticipated that these projects would require ERP, Section 404, and MAIW permitting.

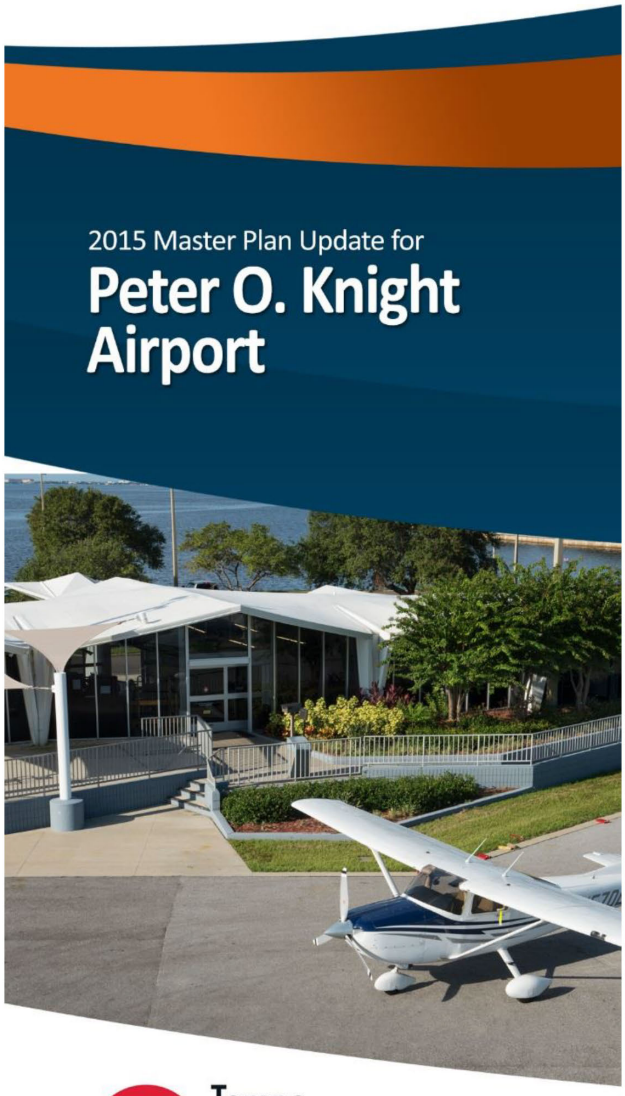
Table 6-3
Preliminary Environmental Review of Preferred Alternative - TPF

Project	Acreage	Noise	Air Quality	Wetland	Upland Forested	Protected Species	NEPA Documentation	1050.1E Reference	State Permit	Federal Permit	County Permit
3 Box Hangars	0.28	N	N	N	N	None	CatEx	5-6.4.f.	ERP	None	MAIW
Apron Expansion	0.25	N	N	N	N	None	CatEx	5-6.4.e.	ERP	None	MAIW
Relocation of Taxiway Connectors to meet Design Standards	0.33	N	N	N	N	None	CatEx	5-6.4.e.	ERP	None	MAIW
New Terminal and Maintenance Hangar Development	0.78	N	N	N	N	None	CatEx	5-6.4.h. 5-6.4.f.	None	None	None
Box Hangar	0.20	N	N	N	N	None	CatEx	5-6.4.f.	ERP	None	MAIW
Extend Taxiway G to the South	0.60	N	N	N	N	None	CatEx	5-6.4.e.	ERP	Section 404	MAIW
Extend Taxiway G to the North	0.36	N	N	N	N	None	CatEx	5-6.4.e.	ERP	None	MAIW
5 Box Hangars, Taxilane and Road/Parking	1.30	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.e. 5-6.4.a.	ERP, NPDES	None	MAIW
5 Box Hangars, Taxilane	1.10	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.e. 5-6.4.a.	ERP, NPDES	None	MAIW
Corporate Hangar and Apron	0.30	N	N	N	N	None	CatEx	5-6.4.f.	ERP	None	MAIW
Corporate Hangar and Apron	0.30	N	N	N	N	None	CatEx	5-6.4.f.	ERP	None	MAIW
Corporate Hangar, Apron, Road/Parking	1.80	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.e. 5-6.4.a	ERP, NPDES	Section 404	MAIW
6-bay T-hangar, Taxilane and Road	0.98	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.e. 5-6.4.a.	ERP	Section 404	MAIW
6-bay T-hangar, Taxilane and Road	0.74	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.e. 5-6.4.a.	ERP	Section 404	MAIW
2 Box Hangars	0.29	N	N	N	N	None	CatEx	5-6.4.f.	ERP	Section 404	MAIW
Maintenance Building, Road and Parking	0.45	N	N	N	N	None	CatEx	5-6.4.f. 5-6.4.a.	ERP	Section 404	MAIW
Fuel Farm – Remove 2 USTs and Replace with 2 ASTs	0.05	N	N	N	N	None	CatEx	5-6.4.u.	None	None	None

Source: Michael Baker International, 2017.

Notes:
ERP = Environmental Resource Permit
NPDES = National Pollutant Discharge Elimination System Permit for Construction Activity
Section 404 = Corps of Engineers Dredge and Fill Permit
GTRP = Gopher Tortoise Relocation Permit
FDEP IWP = FDEP Industrial Wastewater Permit
MAIW = Miscellaneous Activities in Wetlands
For each project a field review would be required to determine presence or absence of gopher tortoise.
Requirement of an ERP and MAIW will depend on whether SWFWMD and EPC claim jurisdiction over onsite stormwater system as “surface waters.” Previous projects at TPF have required ERPs.

Chapter 7.0 Implementation Plan



7.0 Implementation Plan

7.1 Background

The primary objective of this chapter is to analyze the financial feasibility of developing the projects included in the Capital Improvement Program (CIP) for TPF. The proposed financial plan was developed after evaluating the financial structure of TPF and identifying potential sources of revenue that may be available to fund capital improvement projects. The funding sources were then matched with projects over an estimated phasing schedule to determine the financial implications of undertaking the recommended capital improvements. The implementation plan presented herein describes the staging of proposed improvements and identifies various means of funding the improvements. It is the intent of this implementation plan to provide general financial guidance to HCAA for making policy decisions regarding the recommended development of the airport over the 20-year planning period. The information in this chapter presents a preliminary review of the CIP and financial structure of TPF. The business plan that was prepared in conjunction with this study provides more detailed recommendations for HCAA to consider to capture additional revenues from the operation and development of TPF and also identifies market opportunities.

7.2 Federal and State Funding Eligibility

The CIP identifies recommended projects and associated cost estimates for the 20-year planning period at TPF. FAA Order 5100.38C, Airport Improvement Program (AIP) Handbook, sets forth the official policy and procedures to be used in the administration of AIP grants. **Table 7-1** lists typical examples of eligible and ineligible AIP projects and is provided for reference purpose. Projects eligible for AIP funding may receive up to 90 percent of the project cost to be covered by the FAA with the Florida Department of Transportation (FDOT) and HCAA responsible for five percent each. HCAA receives $450,000 in entitlement funds from the FAA each year, which are spent on projects at Peter O. Knight (TPF), Plant City Airport (PCM) and Tampa Executive Airport (VDF). Those funds are mostly used for safety, pavement, lighting, and planning/design/environmental projects. If the airport is conducting a larger project that is more expensive, the FAA may provide additional discretionary funding.

The FDOT also has special funding programs that typically cover up to either 80 percent of the project cost for non-revenue generating projects or 50 percent of the project cost for revenue-generating projects, of which TPF is currently eligible for. It is noted that these are typical funding shares, but the shares at TPF tend to vary widely based on the individual project, local commitment to conduct projects, and funding availability. Therefore, the shares in the airport's CIP do not necessarily follow a standard funding scenario.

Table 7-1 Examples of Eligible vs. Ineligible AIP Projects	
Eligible Projects	**Ineligible Projects**
Runway construction/rehabilitation	Maintenance equipment and vehicles
Taxiway construction/rehabilitation	Office and office equipment
Apron construction/rehabilitation	Fuel farms*
Airfield lighting	Landscaping
Airfield signage	Artworks
Airfield drainage	Aircraft hangars*
Land acquisition	Industrial park development
Weather observation stations (AWOS)	Marketing plans
NAVAIDs such as REILs and PAPIs	Training
Planning studies	Improvements for commercial enterprises
Environmental studies	Maintenance or repairs of buildings
Safety area improvements	
Airport layout plans (ALPs)	
Access roads only located on airport property	
Removing, lowering, moving, marking, and lighting hazards	
Glycol Recovery Trucks/Glycol Vacuum Trucks**	

Source: FAA AIP Overview, http://www.faa.gov/airports/aip/overview/, accessed September 4, 2015.
*May be eligible. Contact your local Airport District or Regional Office for more information.
**To be eligible, the vehicles must be owned and operated by the Airport and meet the Buy American Preference specified in the AIP grant. Contact your local Airport District or Regional Office for more information.

In addition, the following must also apply for FAA to consider a project for AIP funding:
The project sponsorship requirements have been met.
The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located.
Sufficient funds are available for the portion of the project not paid for by the Federal Government.
The project will be completed without undue delay.
The airport location is included in the current version of the NPIAS.
The project involves more than $25,000 in AIP funds.
The project is depicted on a current airport layout plan approved by FAA.

7.3 Project Costs & Phasing

Project Costs

As shown in **Table 7-2**, a CIP and phasing plan were identified for the 20-year planning period that includes a mixture of the master plan recommendations and HCAA's detailed maintenance program. The CIP planning period is defined as 2015 through 2034. Each project within the CIP was assigned to a particular planning period or development phase (i.e., Phase 1, Phase 2, or Phase 3). The Phase 1 time period extends from 2015 to 2019, the Phase 2 period extends from 2020 to 2024, and the Phase 3 period spans the final 10 year timeframe from 2025 through 2034. A detailed breakdown of costs and phasing was produced for Phase 1 projects; however, the Phase 2 and 3 projects are listed in a more generalized order that should remain flexible. Although this study charts a course for planned development, it must be emphasized that the planning and development of an airport is a continuous process. The rehabilitation of existing facilities and development of new facilities must be predicated on sustained demand, which justifies the costs of improvements. As aviation demand may change at TPF and also specific project requirements and funding mechanisms may change, HCAA should consider the impact on the CIP and the potential need to modify certain elements of the Airport Layout Plan (ALP). For example, although HCAA has paid for hangar construction in the past, the current policy is only to pay for the infrastructure required to access new hangars and to have the actual facility to be privately paid for and constructed, which is why the largest share for future hangar developments is shown in the private column in Table 7-2. Because such policy changes tend to occur over time, they may have the impact not only on who is funding projects, but also on several of the airport's policy documents (e.g., minimum standards).

The estimated cost for each of the recommended airport improvements reflects a preliminary opinion of the probable implementation cost for the project. In addition to the estimated construction costs, anticipated fees for design, inspection, permitting, surveying, testing and administration were also included in the overall estimate where applicable. Each project cost is presented in the base year dollar value and therefore does not reflect unanticipated increases in labor and material costs or changes in environmental legislation. This is done for master planning purposes because the dates of project are generally identified in phases as opposed to specific years. In addition, a contingency was added to the overall costs of some projects to account for unforeseen variables. A detailed environmental analysis may be required to recognize the full scope of environmental and budgetary impacts associated with the proposed development. Some projects may also require mitigation measures to offset impacts to environmentally sensitive areas whereas others may require some level of environmental remediation based on conditions that may or may not have been identified as part of this study. For those reasons, it is important to note that the estimates shown are accurate based on the costs of labor, materials, and anticipated impacts calculated at the time of this writing. As such, it is important to revisit and update costs regularly to ensure that an accurate CIP is maintained.

Project Phasing

Since the airport's actual versus forecast activity levels may vary, it is important for the staging of proposed improvement projects remain sensitive to such variations. Some projects may take precedence over others, depending on their level of priority or due to the availability of funding. Thus, a list of prioritized improvements was established based upon the urgency of need, ease of

implementation, logic of project sequencing, and input from HCAA staff. The objective was to establish an efficient order for project development and implementation that meets or exceeds the forecasted aviation demands at TPF while meeting the needs expressed by HCAA staff and airport stakeholders.

The total cost of the 20-year CIP is estimated at $11,886,918 million in state investment, $34,307,746 million in HCAA investment, and $21,145,924 million in private investment. Those figures include all studies, infrastructure improvements, and proposed construction costs necessary to achieve the developments shown in the CIP. The CIP for each period presents the improvements slated for implementation during the period, but it does not assume how financially feasible it will be for HCAA to undertake the projects or whether or not funding will be available. Table 7-2 also presents the maintenance intervals for projects.

The funding for many of the projects in Phase 1 has been pre-determined between HCAA and FDOT, but can be subject to change on a case-by-case and annual basis. The Phase 2 projects include items that will be necessary based on the forecast demand and to provide anticipated maintenance activities. Many of the Phase 3 projects include routine maintenance and higher price private developments that would likely only be implemented as required by demand at the time. Unlike previous CIPs that have been developed for TPF, this CIP relies heavily on private investment to construct future hangars and also attempts to maximize the ability to obtain additional funds from FDOT in the later phases (i.e., illustrates the maximum funding shares that could be received for eligible projects). This will allow HCAA to know the level of funding that may be available for eligible projects throughout the duration of the planning period assuming current authorization levels for FDOT. The overall goal was to reduce HCAA's maintenance and development costs by taking advantage of potential funding opportunities and encouraging private facility development.

Consumer Price Index (CPI) Adjustment

The improvements shown in previous tables illustrate the facilities needed at TPF to meet the forecast demands through the end of the 20-year planning period and likely beyond as well. The cost estimates were determined in year 2015 dollars, so as time goes by the values should be reviewed to determine if any project cost adjustments have occurred. Although the costs for construction projects is highly variable due to the fluctuating cost of materials (e.g., asphalt, steel, and energy production), a reasonable estimate of future costs can be calculated by adjusting the 2015 costs by the appropriate Consumer Price Index (CPI) inflation factor. The Bureau of Labor Statistics (BLS) provides an online CPI inflation calculator that may be used to compare historical costs to present day cost and is available on this website (http://www.bls.gov/data/inflation_calculator.htm).

Table 7-2
Combined Capital Improvement Program for TPF (2015-2034)

Phase	Facility	Year (if Assigned)	Figure 6-2 ID	Project Title	Estimated Cost	AIP Grants	FDOT Grants	Authority Funds	Private Funds	AIP %	FDOT %	Authority %	Private %	Maintenance Interval
1	Lift Station	2015		Lift Station Rehab	$43,300	$0	$0	$43,300	$0	0.00%	0.00%	100.00%	0.00%	20
1	Beacon	2015		Rotating Beacon Replacement	$43,300	$0	$0	$43,300	$0	0.00%	0.00%	100.00%	0.00%	20
1	Seawall	2015		Seawall Rehab	$281,800	$0	$0	$281,800	$0	0.00%	0.00%	100.00%	0.00%	10
1	Trees	2016		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
1	AWOS	2016		AWOS Replacement	$282,800	$0	$100,000	$182,800	$0	0.00%	35.36%	64.64%	0.00%	20
1	Fence	2017		Perimeter Fence Replacement	$194,400	$0	$190,000	$4,400	$0	0.00%	97.74%	2.26%	0.00%	20
1	Runway 4-22	2017		Runway 4-22 Overlay	$2,800,000	$0	$2,240,000	$560,000	$0	0.00%	80.00%	20.00%	0.00%	10
1	Taxiway A	2017	C	Taxiway A Overlay & Connectors / Safety Improvements	$1,034,570	$0	$827,656	$206,914	$0	0.00%	80.00%	20.00%	0.00%	10
1	Taxiway C	2017		Taxiway C Overlay	$170,800	$0	$94,800	$76,000	$0	0.00%	55.50%	44.50%	0.00%	10
1	Tiedown I	2017		Tiedown Area I Sealcoat	$111,400	$0	$0	$111,400	$0	0.00%	0.00%	100.00%	0.00%	10
1	Taxilanes	2017		Hangar Taxilanes Overlay	$662,500	$0	$0	$662,500	$0	0.00%	0.00%	100.00%	0.00%	10
1	Area D	2017		Tiedown Area D Removal	$50,500	$0	$0	$50,500	$0	0.00%	0.00%	100.00%	0.00%	10
1	Taxiway E	2017		Taxiway E Sealcoat	$32,200	$0	$0	$32,200	$0	0.00%	0.00%	100.00%	0.00%	10
1	4400	2017		T-Hangar 4400 Panels	$415,200	$0	$332,100	$83,100	$0	0.00%	79.99%	20.01%	0.00%	10
1	3800	2017		T-Hangar 3800 Panels	$190,300	$0	$152,000	$38,300	$0	0.00%	79.87%	20.13%	0.00%	10
1	4800	2017		Maintenance Hangar 4800 (Project Removed)										10
1	Fuel	2018		Fuel System Refurbishment	$35,000	$0	$0	$35,000	$0	0.00%	0.00%	100.00%	0.00%	3
1	Helicopter	2018		Helicopter Parking Sealcoat	$30,200	$0	$0	$30,200	$0	0.00%	0.00%	100.00%	0.00%	10
1	Tiedown H	2018		Tiedown Area H Reconstruction (to Accommodate Box Hangars)	$600,400	$0	$480,300	$120,100	$0	0.00%	80.00%	20.00%	0.00%	10
1	Tiedown J	2018		Tiedown Area J Sealcoat	$79,400	$0	$63,500	$15,900	$0	0.00%	79.97%	20.03%	0.00%	10
1	Parking Lot	2018		Parking Lot Sealcoat	$104,300	$0	$52,100	$52,200	$0	0.00%	49.95%	50.05%	0.00%	10
1	Runway 18-36	2018		Runway 18-36 Sealcoat	$510,800	$0	$408,600	$102,200	$0	0.00%	79.99%	20.01%	0.00%	10
1	Service Road	2018		Service Road East of 18-36 Sealcoat	$21,900	$0	$0	$21,900	$0	0.00%	0.00%	100.00%	0.00%	10
1	Service Road	2018		Service Road West of 18-36 Sealcoat	$65,500	$0	$0	$65,500	$0	0.00%	0.00%	100.00%	0.00%	10
1	Taxiway F	2018		Taxiway F Sealcoat	$282,400	$0	$0	$282,400	$0	0.00%	0.00%	100.00%	0.00%	10
1	3000 & 2800	2018		Terminal 3000 / Admin 2800 Rehab	$370,400	$0	$0	$370,400	$0	0.00%	0.00%	100.00%	0.00%	5
1	Taxiway G	2018	H	Taxiway G Extension to 36 End (South End) & Sealcoat Existing Section	$257,879	$0	$206,303.20	$51,575.80	$0	0.00%	80.00%	20.00%	0.00%	10
1	Hangars	2018	J	5 Box Hangars Along Taxiway G	$3,732,639	$0	$0	$259,229	$3,473,410	0.00%	0.00%	6.94%	93.06%	10
1	Trees	2019		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
1	Maintenance Facility	2019	R	GA Maintenance Facility Modernization	$909,267	$0	$0	$909,267	$0	0.00%	0.00%	100.00%	0.00%	10
1	6600	2019		T-Hangar 6600 Clean & Paint	$145,400	$0	$0	$145,400	$0	0.00%	0.00%	100.00%	0.00%	10
1	4000	2019	E	Hangar 4000 Panels / Enclose	$371,871	$0	$0	$371,871	$0	0.00%	0.00%	100.00%	0.00%	10
1	4200	2019	D	Shade Hangar 4200 Panels / Enclose	$404,170	$0	$0	$404,170	$0	0.00%	0.00%	100.00%	0.00%	10
1	4600	2019		T-Hangar 4600 Panels	$213,400	$0	$0	$213,400	$0	0.00%	0.00%	100.00%	0.00%	10
1	Hangars	2019	A	Box Hangars (3) (South of Taxiway C)	$1,614,391	$0	$0	$0	$1,614,391	0.00%	0.00%	0.00%	100.00%	10
2	New Terminal	2020	F (Design)	Design of New Terminal & Hangar	$484,154	$0	$0	$484,154	$0	0.00%	0.00%	100.00%	0.00%	N/A
2	Apron	2020		Apron Sealcoat	$290,000	$0	$0	$290,000	$0	0.00%	0.00%	100.00%	0.00%	10
2	5400	2020		Bulk Hangar 5400 Clean & Paint	$182,100	$0	$64,400	$117,700	$0	0.00%	35.37%	64.63%	0.00%	10
2	Taxiway B	2020		Taxiway B Sealcoat	$250,000	$0	$0	$250,000	$0	0.00%	0.00%	100.00%	0.00%	10
2	Taxiway D	2020		Taxiway D Sealcoat	$234,000	$0	$0	$234,000	$0	0.00%	0.00%	100.00%	0.00%	10
2	Tiedown E	2020		Tiedown Area E Sealcoat	$34,000	$0	$0	$34,000	$0	0.00%	0.00%	100.00%	0.00%	10
2	New Terminal	2021	F (Construct)	Construction of New Terminal & Hangar	$3,616,914	$0	$0	$3,616,914	$0	0.00%	0.00%	100.00%	0.00%	5
2	Fuel	2021		Fuel System Refurbishment	$35,000	$0	$0	$35,000	$0	0.00%	0.00%	100.00%	0.00%	3
2	6800	2021		T-Hangar 6800 Clean & Paint	$126,000	$0	$0	$126,000	$0	0.00%	0.00%	100.00%	0.00%	10
2	Trees	2022		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
2	Tiedowns	2022	B	Replacement Tiedowns (Near Tiedown Area J)	$93,639	$0	$74,911.20	$18,727.80	$0	0.00%	80.00%	20.00%	0.00%	10
2	3000 & 2800	2023		Terminal 3000 / Admin 2800 Rehab	$370,400	$0	$0	$370,400	$0	0.00%	0.00%	100.00%	0.00%	5
2	3400	2023		Bulk Hangar 3400 Clean & Paint	$175,700	$0	$0	$175,700	$0	0.00%	0.00%	100.00%	0.00%	10
2	Hangars	2023	K	5 Box Hangars Along Taxiway G	$3,736,544	$0	$0	$263,156	$3,473,388	0.00%	0.00%	7.04%	92.96%	10
2	Fuel	2024		Aboveground Fuel Tanks (20 Years After UST Installation)	$410,168	$0	$328,134.40	$82,033.60	$0	0.00%	80.00%	20.00%	0.00%	15
2	Lighting	2024		Runway & Taxiway Edge Lighting Replacement	$1,664,000	$0	$412,800	$1,251,200	$0	0.00%	24.81%	75.19%	0.00%	15
2	REIL	2024		Runway 22 REIL Replacement	$49,600	$0	$0	$49,600	$0	0.00%	0.00%	100.00%	0.00%	20
2	PAPI	2024		Runway 36 PAPI Replacement	$115,500	$0	$0	$115,500	$0	0.00%	0.00%	100.00%	0.00%	20

Table 7-2
Combined Capital Improvement Program for TPF (2015-2034)

Phase	Facility	Year (if Assigned)	Figure 6-2 ID	Project Title	Estimated Cost	AIP Grants	FDOT Grants	Authority Funds	Private Funds	AIP %	FDOT %	Authority %	Private %	Maintenance Interval
2	Hangars	2024	N	Corporate Hangar and Apron Along Taxiway G	$2,632,469	$0	$0	$344,081	$2,288,388	0.00%	0.00%	13.07%	86.93%	10
3	Trees	2025		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
3	Seawall	2025		Seawall Rehab	$1,021,700	$0	$0	$1,021,700	$0	0.00%	0.00%	100.00%	0.00%	10
3	Signage	2026		Airfield Signage Rehab	$836,000	$0	$418,000	$418,000	$0	0.00%	50.00%	50.00%	0.00%	20
3	Fuel	2027		Fuel System Refurbishment	$35,000	$0	$0	$35,000	$0	0.00%	0.00%	100.00%	0.00%	3
3	Runway 4-22	2027		Runway 4-22 Reconstruction	$7,522,800	$0	$861,800	$6,661,000	$0	0.00%	11.46%	88.54%	0.00%	10
3	Taxiway A	2027		Taxiway A Sealcoat	$1,637,400	$0	$0	$1,637,400	$0	0.00%	0.00%	100.00%	0.00%	10
3	Taxiway C	2027		Taxiway C Sealcoat	$54,700	$0	$0	$54,700	$0	0.00%	0.00%	100.00%	0.00%	10
3	Tiedown I	2027		Tiedown Area I Overlay	$323,700	$0	$0	$323,700	$0	0.00%	0.00%	100.00%	0.00%	10
3	Taxilanes	2027		Hangar Taxilanes Sealcoat	$273,600	$0	$0	$273,600	$0	0.00%	0.00%	100.00%	0.00%	10
3	Taxiway E	2027	U	Taxiway E Overlay	$173,400	$0	$0	$173,400	$0	0.00%	0.00%	100.00%	0.00%	10
3	4400	2027		T-Hangar 4400 Clean & Paint	$276,800	$0	$0	$276,800	$0	0.00%	0.00%	100.00%	0.00%	10
3	3800	2027		T-Hangar 3800 Clean & Paint	$156,400	$0	$0	$156,400	$0	0.00%	0.00%	100.00%	0.00%	10
3	Wash Rack	2027		Aircraft Wash Rack Rehab	$283,000	$0	$226,400	$56,600	$0	0.00%	80.00%	20.00%	0.00%	20
3	Trees	2028		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
3	Helicopter	2028		Helicopter Parking Overlay	$101,000	$0	$0	$101,000	$0	0.00%	0.00%	100.00%	0.00%	10
3	Tiedown H	2028		Tiedown Area H Sealcoat	$344,800	$0	$275,800	$69,000	$0	0.00%	79.99%	20.01%	0.00%	10
3	Tiedown J	2028		Tiedown Area J Overlay	$265,500	$0	$212,400	$53,100	$0	0.00%	80.00%	20.00%	0.00%	10
3	Parking Lot	2028		Parking Lot Overlay	$348,600	$0	$0	$348,600	$0	0.00%	0.00%	100.00%	0.00%	10
3	Runway 18-36	2028		Runway 18-36 Reconstruction	$4,148,500	$0	$649,400	$3,499,100	$0	0.00%	15.65%	84.35%	0.00%	10
3	Service Road	2028		Service Road East of 18-36 Overlay	$73,000	$0	$0	$73,000	$0	0.00%	0.00%	100.00%	0.00%	10
3	Service Road	2028		Service Road West of 18-36 Overlay	$218,900	$0	$0	$218,900	$0	0.00%	0.00%	100.00%	0.00%	10
3	Taxiway F	2028		Taxiway F Overlay	$1,082,800	$0	$0	$1,082,800	$0	0.00%	0.00%	100.00%	0.00%	10
3	3000 & 2800	2028		Terminal 3000 / Admin 2800 Rehab	$370,400	$0	$0	$370,400	$0	0.00%	0.00%	100.00%	0.00%	5
3	6600	2029		T-Hangar 6600 Panels	$284,600	$0	$0	$284,600	$0	0.00%	0.00%	100.00%	0.00%	10
3	4000	2029		Hangar 4000 Clean & Paint	$173,400	$0	$0	$173,400	$0	0.00%	0.00%	100.00%	0.00%	10
3	4200	2029		Hangar 4200 Clean & Paint	$150,000	$0	$0	$150,000	$0	0.00%	0.00%	100.00%	0.00%	10
3	4600	2029		T-Hangar 4600 Clean & Paint	$289,600	$0	$0	$289,600	$0	0.00%	0.00%	100.00%	0.00%	10
3	Fuel	2030		Fuel System Refurbishment	$35,000	$0	$0	$35,000	$0	0.00%	0.00%	100.00%	0.00%	3
3	Apron	2030		Apron Overlay	$750,000	$0	$600,000	$150,000	$0	0.00%	80.00%	20.00%	0.00%	10
3	5400	2030		Bulk Hangar 5400 Panels	$260,550	$0	$0	$260,550	$0	0.00%	0.00%	100.00%	0.00%	10
3	Taxiway B	2030		Taxiway B Overlay	$478,042	$0	$382,433.60	$95,608.40	$0	0.00%	80.00%	20.00%	0.00%	10
3	Taxiway D	2030		Taxiway D Overlay	$450,000	$0	$360,000	$90,000	$0	0.00%	80.00%	20.00%	0.00%	10
3	Tiedown E	2030	T	Tiedown Area E Overlay	$1,814,100	$0	$1,451,280	$362,820	$0	0.00%	80.00%	20.00%	0.00%	10
3	Trees	2031		RPZ & Approach Areas - Aerial & Tree Trimming	$23,600	$0	$3,100	$20,500	$0	0.00%	13.14%	86.86%	0.00%	3
3	6800	2031		T-Hangar 6800 Panels	$172,665	$0	$0	$172,665	$0	0.00%	0.00%	100.00%	0.00%	10
3	Fuel	2033		Fuel System Refurbishment	$35,000	$0	$0	$35,000	$0	0.00%	0.00%	100.00%	0.00%	3
3	3000 & 2800	2033		Terminal 3000 / Admin 2800 Rehab	$370,400	$0	$0	$370,400	$0	0.00%	0.00%	100.00%	0.00%	5
3	3400	2033		Bulk Hangar 3400 Panels	$225,000	$0	$0	$225,000	$0	0.00%	0.00%	100.00%	0.00%	10
3	Hangars	MPU	L, M	Corporate Hangars and Aprons Along Taxiway G	$4,084,495	$0	$0	$282,689	$3,801,806	0.00%	0.00%	6.92%	93.08%	10
3	Taxiway G	MPU	I	Taxiway G Extension to 22 End & Overlay / Sealcoat Other Sections	$154,000	$0	$123,200	$30,800	$0	0.00%	80.00%	20.00%	0.00%	10
3	Planning	MPU		Master Plan Update	$350,000	$0	$280,000	$70,000	$0	0.00%	80.00%	20.00%	0.00%	10
3	Hangars	MPU	P, Q	6-Unit T-hangar & 3 Box Hangars Along Taxiway G	$3,355,004	$0	$0	$245,938	$3,109,066	0.00%	0.00%	7.33%	92.67%	10
3	T-Hangar	MPU	O	6-Unit T-hangar Along Taxiway G	$2,896,436	$0	$0	$231,307	$2,665,129	0.00%	0.00%	7.99%	92.01%	10
3	Hangar	MPU	G	Box Hangar in Location of Airport Maintenance Facility	$757,121	$0	$0	$36,775	$720,346	0.00%	0.00%	4.86%	95.14%	10
				Total All	**$67,337,588**	**$0**	**$11,886,918**	**$34,304,746**	**$21,145,924**					
				Total Phase 1 (2015-2019)	$16,109,587	$0	$5,153,559	$5,868,227	$5,087,801					
				Total Phase 2 (2020-2024)	$14,523,788	$0	$883,346	$7,878,666	$5,761,776					
				Total Phase 3 (2025+)	$36,704,213	$0	$5,850,014	$20,557,852	$10,296,347					
				Previous CIP Total (Dated 6-10-2015)	$50,932,000	$0	$8,194,400	$42,737,600	$0					
				Previous CIP Horizon 1	$8,063,100	$0	$4,694,600	$3,368,500	$0					
				Previous CIP Horizon 2	$16,100,000	$0	$314,400	$15,785,600	$0					
				Previous CIP Horizon 3	$26,768,900	$0	$3,185,400	$23,583,500	$0					

Table 7-2
Combined Capital Improvement Program for TPF (2015-2034)

Phase	Facility	Year (if Assigned)	Figure 6-2 ID	Project Title	Estimated Cost	AIP Grants	FDOT Grants	Authority Funds	Private Funds	AIP %	FDOT %	Authority %	Private %	Maintenance Interval
				Difference Total	32.21%		45.06%	-19.73%						
				Difference Horizon 1 (Previous to New)	99.79%		9.78%	74.21%						
				Difference Horizon 2 (Previous to New)	-9.79%		180.96%	-50.09%						
				Difference Horizon 3 (Previous to New)	37.12%		83.65%	-12.83%						
				Difference Total (New to Previous)	$16,405,588	$0	$3,692,518	-$8,432,854	$21,145,924					
				Difference Horizon 1 (New to Previous)	$8,046,487	$0	$458,959	$2,499,727	$5,087,801					
				Difference Horizon 2 (New to Previous)	-$1,576,212	$0	$568,946	-$7,906,934	$5,761,776					
				Difference Horizon 3 (New to Previous)	$9,935,313	$0	$2,664,614	-$3,025,648	$10,296,347					

Source: Michael Baker International, Inc., 2015.

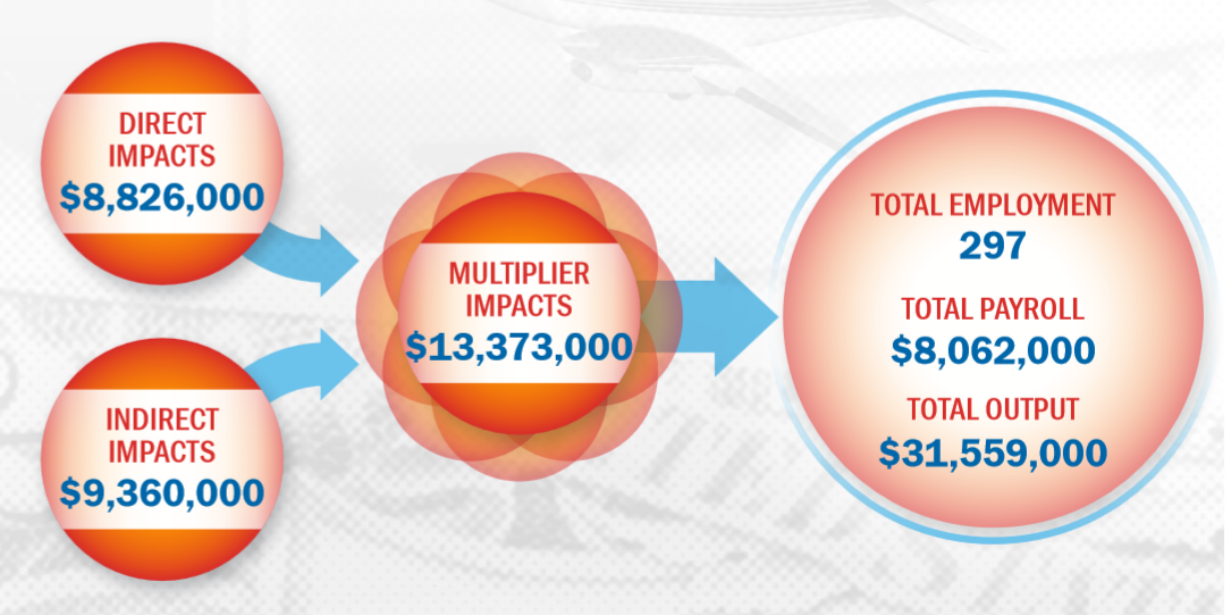
7.4 Airport Financial Structure

This section presents the historical revenues and expenses that were generated from HCAA's operation of TPF, as well as a forecast of revenues and expenses and a projection of annual cash outlays that will be required by HCAA after capital improvements are accounted for. The information in this chapter represents baseline conditions only and does not include strategies for increasing the revenues of TPF or decreasing HCAA's annual investment into the airport. Such strategies are considered in the business plan that was conducted in conjunction with this study.

Historical & Forecast Revenues & Expenses

In the most recent fiscal year ending September 30, 2014, TPF generated $343,332 in revenues for TPF. Principle sources of revenue include space rental, reimbursements for utilities, and a fuel flowage fee of $0.05 per gallon. During the same fiscal year, HCAA expenses were $289,825, which resulted in a gross profit of $53,507. That gross profit is prior to the consideration of HCAA's annual contributions for capital improvements, which as previously shown in Table 7-2, can be several hundred thousand dollars to several million dollars per year. Assuming a status quo scenario in which no major policy or revenue-enhancing changes are implemented, TPF would likely continue to operate with a positive cash flow between 2015 and 2019 (refer to **Table 7-3**). Although TPF operates with a positive cash flow, it is not uncommon for general aviation airports to operate with in a deficit and many airport sponsors are willing contribute funds for their operations and maintenance because of their importance to the overall economy and aviation system. For example, the August 2014 Florida Statewide Aviation Economic Impact Study Update indicates that TPF results in a total annual employment of 297 positions and a total annual output of $31,559,000 (refer to **Figure 7-1**). Therefore, the airport is an asset to the local economy that produces several hard-to-quantify benefits that are not discernable from a profit and loss statement. However, unlike many airport sponsors which are taxation authorities (e.g., cities and counties), HCAA does not collect any taxes associated with the total output of the airport (from businesses that are created because of the airport, sales of goods and services, employment, and other property development). HCAA must therefore allocate funds that are generated from revenues at Tampa International Airport (TPA) to cover losses and pay for capital improvements at TPF.

Figure 7-1
Annual Economic Impact of TPF



Source: FDOT Florida Statewide Aviation Economic Impact Study Update, August 2014.

Annual Capital Outlays

The bottom rows of Table 7-3 identify HCAA's annual cost for capital projects and the total capital outlays that can be expected between 2015 and 2019. After operating costs and capital costs are accounted for, HCAA can be expected to outlay between $148,531 and $1,986,162 per year during that time. Opportunities for enhancing revenues and reducing expenses are presented in the business plan.

7.5 Summary

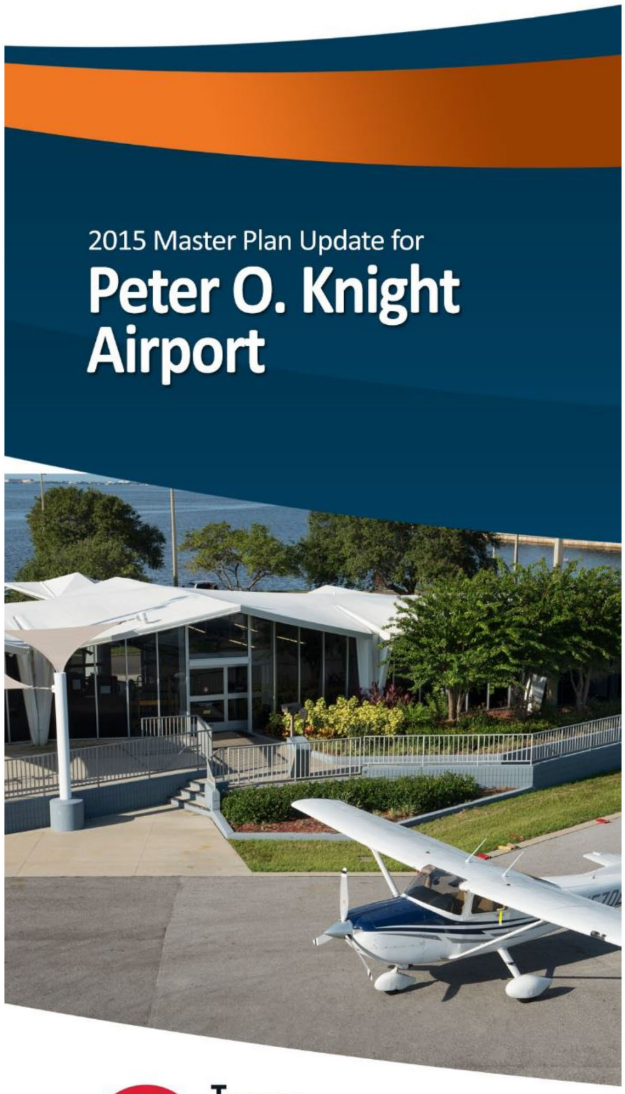
As presented in Table 7-2, the total cost of the airport's CIP is anticipated to be $67,337,588 between 2015 and 2034, with HCAA contributions totaling $34,304,745 during that time. It must be reiterated that the proposed CIP, including the sequence of project development and anticipated funding, is preliminary in nature and may change based on a variety of factors; however, the projects in Phase 1 are more likely to occur in the order shown because of prior funding arrangements with FDOT. Unlike previous CIPs that have been developed for TPF, this CIP shows all future hangar construction as being privately funded and subsequently may require some policy changes on behalf of HCAA to make that possible and affordable for prospective developers. Furthermore, this CIP attempts to maximize the funding that may be available from FDOT in future years, thereby reducing the outlay that may be required by HCAA. The overall goal was to capitalize on other funding and development opportunities in an effort to make the airport more financially self-sustainable. The business plan explores these concepts in greater detail.

Table 7-3
Historical & Forecast Revenues & Expenses for TPF

Item	Actual Revenue & Expenses for Fiscal Year Ending September 30					Projected Revenue & Expenses for Fiscal Year Ending September 30					Average Annual Growth		CPI		Operations
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2010-2014	2014-2019	2015	2016-2019	Growth
Operating Revenues															
Fuel Flowage	$7,770	$7,809	$8,225	$7,812	$8,125	$8,233	$8,341	$8,451	$8,563	$8,676	1.1%	1.3%	NA	NA	1.3%
FBO Concessions	$327,959	$320,166	$342,282	$298,551	$310,453	$311,384	$317,612	$323,964	$330,443	$337,052	-1.4%	1.7%	0.3%	2.0%	
Other GA Revenue	$14,738	$27,690	$25,465	$24,687	$24,754	$24,828	$25,325	$25,831	$26,348	$26,875	13.8%	1.7%	0.3%	2.0%	
Total Operating Revenue	**$350,467**	**$355,665**	**$375,972**	**$331,050**	**$343,332**	**$344,445**	**$351,278**	**$358,246**	**$365,354**	**$372,603**	**-0.5%**	**1.6%**			
Direct Operating Expenses															
Salaries & Benefits	$82,549	$73,845	$74,397	$96,366	$101,643	$101,948	$103,987	$106,067	$108,188	$110,352	5.3%	1.7%	0.3%	2.0%	
Contracted Maintenance	$44,219	$30,248	$33,417	$30,272	$37,811	$37,924	$38,683	$39,456	$40,246	$41,051	-3.8%	1.7%	0.3%	2.0%	
Supplies & Materials	$21,415	$19,693	$15,990	$19,924	$35,602	$35,709	$36,423	$37,152	$37,895	$38,653	13.6%	1.7%	0.3%	2.0%	
Utilities	$50,187	$48,349	$49,102	$52,881	$50,625	$50,777	$51,792	$52,828	$53,885	$54,963	0.2%	1.7%	0.3%	2.0%	
Insurance	$21,198	$17,198	$18,161	$18,900	$18,300	$18,355	$18,722	$19,096	$19,478	$19,868	-3.6%	1.7%	0.3%	2.0%	
Other Expenses	$3,350	$3,566	$3,875	$4,033	$3,569	$3,580	$3,652	$3,725	$3,799	$3,875	1.6%	1.7%	0.3%	2.0%	
Total Direct Operating Expenses	**$222,917**	**$192,900**	**$194,941**	**$222,376**	**$247,551**	**$248,294**	**$253,259**	**$258,325**	**$263,491**	**$268,761**	**2.7%**	**1.7%**	**0.3%**	**2.0%**	
Administration Expense Allocation	**$34,096**	**$35,795**	**$38,534**	**$37,128**	**$42,274**	**$42,401**	**$43,249**	**$44,114**	**$44,996**	**$45,896**	**5.5%**	**1.7%**	**0.3%**	**2.0%**	
Gross Profit (Before Capital Outlays)															
Gross Profit Before Capital Outlays	**$93,454**	**$126,971**	**$142,497**	**$71,546**	**$53,507**	**$53,750**	**$54,769**	**$55,808**	**$56,867**	**$57,946**	**13.0%**	**1.6%**			
Total Capital Outlays															
Capital Outlays	Only Forecast Information is Provided					**$368,400**	**$203,300**	**$1,825,314**	**$1,427,105**	**$2,044,108**					
Gross Profit After Capital Outlays						($314,650)	($148,531)	($1,769,506)	($1,370,238)	($1,986,162)					

Source: TPF Business Plan.

Chapter 8.0
Airport Layout Plan



Tampa International Airport

Hillsborough County Aviation Authority

8.0 Airport Layout Plan

8.1 Introduction

The purpose of an approved Airport Layout Plan (ALP) is to serve as the blueprint for future airport development. One condition of accepting and utilizing grant funding for airport improvement projects is to maintain an updated ALP. For the Peter O. Knight Airport (TPF), the updated development recommendations presented in this study are pictorially summarized in the ALP drawing set and include the preferred concepts for airfield development, landside facility development, and other reserved areas for non-aviation use. The ALP drawing set represents a scaled, graphic presentation of the airport's 20-year development program, thereby providing the airport with a feasible improvement plan that would increase the capability and safety of aircraft operations, promote compatibility with existing and proposed developments, and further upgrade the airport to effectively serve the anticipated demands of general aviation and corporate aircraft traffic. The drawings depict the recommendations of this study with regard to aviation development for the short, intermediate, and long-term planning periods.

The dimensional information provided in the drawings demonstrates compliance with minimum airport design standards established by federal, state, and local authorities. The ALP Drawing Set was developed in accordance with the guidance outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6, *Airport Master Plans*, AC 150/5300-13A, *Airport Design*, FAA ARP Standard Operating Procedure (SOP) 2.0, *Standard Operating Procedure for FAA Review and Approval of Airport Layout Plans and other supporting circulars and orders*. The ALP drawing set includes the following individual drawing sheets which are provided at the end of this chapter in reduced-size format:

- Title Sheet (Sheet 1)
- Airport Data Sheet (Sheet 2)
- Airport Layout Plan Drawing (Sheet 3)
- Airport Airspace Drawing (Sheet 4)
- Airport Airspace Approach Profiles (Sheet 5)
- Inner Portion of the Approach Surface Drawings (Sheets 6 and 7)
- Runway Departure Surface Drawings (Sheet 8)
- Terminal Area Drawings (Sheet 9)
- Land Use Drawing (Sheet 10)
- Exhibit "A" Property Map (Stand-Alone Document)

8.2 Title Sheet (Sheet 1)

The Title Sheet serves as the introduction to the ALP drawing set. It includes the airport name, a location map, vicinity map, and an index of drawings included in the ALP drawing set. Also highlighted on the Title Sheet are the project name, sponsor's name, and the FAA grant number.

8.3 Airport Data Sheet (Sheet 2)

The Airport Data Sheet summarizes key elements that are depicted on the Airport Layout Plan Drawing such as airport coordinates, runway end elevations, runway high and low points, and true azimuths for each runway. Supplemental tables, as required by the FAA ALP Review Checklist, are depicted on the Airport Data Sheet including the airport data table and runway data table.

8.4 Airport Layout Plan Drawing (Sheet 3)

The Airport Layout Plan Drawing, also referred to as the ALP, depicts all existing facilities and proposed developments planned over the 20-year planning period at TPF. These plans are reviewed by and must be approved by the FAA prior to authorizing federal funding for future improvement projects. The ALP provides clearance and dimensional information required to show conformance with applicable FAA design standards as outlined in FAA AC 150/5300-13A, *Airport Design*. The ALP also reflects planned changes to physical features on the airport property and critical land use changes near the airport property that may impact navigable airspace or the ability of the airport to operate. The features of the ALP include, but are not limited to: the runway, taxiways, lighting, navigational aids, terminal facilities, hangars, other airport buildings, aircraft parking areas, automobile parking, and airport access elements.

Key dimensional criteria for Runway 4-22 was based on Runway Design Code (RDC) B/I/(S)/VIS (RW4) and B/I/(S)/5000 (RW22).The RDC for Runway 18-36 was based on RDC B/I/(S)/VIS (RW18) and B/I/(S)/5000 (RW36).The RDC and other runway approach factors are used to determine the physical characteristics of the runways (e.g., length, width, and strength), taxiway widths, and dimensions for the Runway Safety Area (RSA), Runway Object Free Area (ROFA), Building Restriction Line (BRL), clearance areas around navigational aids, etc.

8.5 Airport Airspace Drawing (Sheet 4)

Federal Aviation Regulations (FAR) Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace, prescribes airspace standards, which establish criteria for evaluating navigable airspace. Airport imaginary surfaces are established relative to the airport runways and types of approaches they provide. The size of each imaginary surface is based on the runway category with respect to the existing and proposed visual, non-precision, or precision approaches for that runway. The slope and dimensions of the respective approach surfaces are determined by the most demanding, existing or proposed, approach for each runway. For Runway 4-22 at TPF, the dimensions of the imaginary surfaces are applicable to the non-precision GPS approach to the Runway 22 end with one mile horizontal visibility minimums and the visual approach to the Runway 4 end. For Runway 18-36, the dimensions of the imaginary surfaces are applicable to the non-precision GPS approaches to Runway 36 with one mile horizontal visibility minimums and the visual approach to Runway 18.

- Primary Surface – A rectangular area symmetrically located about the runway centerline and extending a distance of 200 feet beyond each runway end. Its elevation is the same as the nearest point along the runway edge. The primary surface for Runway 4-22 and Runway 18-36 is 500 feet wide.

- Horizontal Surface – An oval shaped, flat area situated 150 feet above the published airport elevation of 7.4 feet Above Mean Sea Level (AMSL) at TPF. Its dimensions are determined by connecting 5,000-foot arcs starting 200 feet beyond the future runway ends. The horizontal surface elevation for TPF is 157.4 feet AMSL.

- Conical Surface – A sloping area whose inner perimeter conforms to the shape of the horizontal surface. It extends outward for a distance of 4,000 feet measured horizontally, and slopes upward at a 20:1 ratio. At TPF, the conical surface extends upward to an elevation of 357.4 feet AMSL.

- Transitional Surface – A sloping area beginning at the edges of the primary and approach surfaces and sloping upward and outward at a ratio of 7:1.

- Approach Surface – This surface begins at the ends of the primary surface and slopes upward at a predetermined ratio while at the same time flaring out horizontally. The width and elevation of the inner ends conform to that of the primary surface, while the slope, length, and outer width are determined by the runway service category and existing or proposed instrument approach procedures.

8.6 Inner Portion of the Approach Surface Drawings (Sheets 6 and 7)

The Inner Portion of the Approach Surface Drawings show both plan and profile views of the approach surfaces beyond each runway end. The purpose of these drawings is to locate and document existing objects which represent obstructions to navigable airspace within the existing and proposed approach slopes for each runway. Additionally, the drawings show the ground profile and terrain features along the extended centerline of each runway end.

Any controlling structures, such as roadways, natural ground elevations, and trees, are also shown on the Inner Portion of the Approach Surface Drawings, if applicable. Additionally, fixed objects located along the extended runway centerlines are also illustrated on the sheets to provide an indication of the relative distance to the approach surfaces. As applicable, obstructions to navigable airspace are listed in an obstruction data table along with a recommended action for each obstruction.

8.7 Runway Departure Surfaces Drawing (Sheet 8)

The Runway Departure Surfaces Drawing consists of large scale plan views of departure surfaces for all runway ends at TPF. The Departure Surfaces Drawing depicts the ground contour along the extended runway centerline plus any significant natural or non-natural objects located along the extended runway centerline and also provides a top elevation for those objects. Commonly shown objects include buildings, roads, ditches, and trees. Surface penetration and disposition information is included in the associated obstruction data tables.

8.8 Terminal Area Drawing (Sheets 9)

The Terminal Area Drawings presents an enlarged view of the Fixed Base Operator (FBO) area and hangar areas adjacent to each runway at TPF and therefore provides additional dimensional details such as apron areas (existing and proposed) that are not easily visible on the ALP. These drawings denote the short and long-term developments and improvements within the vicinity of the FBO complex at TPF and also illustrates many of the surrounding landside development recommendations. Existing and proposed automobile access and parking improvements are also included.

8.9 Land Use Drawing (Sheet 10)

The Land Use Drawing designates various sectors of the property for specific uses and also shows an aerial view of the land surrounding TPF. Additionally, the 2013 and 2033 noise contours developed as a component of this study have been superimposed on the drawing to ensure that appropriate aviation-compatible zoning is maintained. The FAA has established national guidelines for land use compatibility related to airport-generated noise impacts. In most cases, noise sensitive land uses are considered incompatible if they are exposed to Day-Night Average Sound Levels (DNL) of 65 decibels or higher, unless noise mitigation measures are undertaken.

8.10 Exhibit "A" Property Map (Stand-Alone Document)

In order to comply with FAA grant requirements, airport owners must demonstrate that they hold "good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired." In order to meet the FAA's grant assurances, a sponsors' title must be free and clear of any reversionary interest, lien, easement, lease, or other encumbrance that would create undue risk that might deprive the sponsor of control or possession, interfere with its use for public airport purposes, or make it impossible for the sponsor to carry out the obligations and covenants in the grant agreement. Per Appendix 4 of AC 150/5100-17, satisfactory evidence of title is demonstrated through the development of an Exhibit "A" Airport Property map which is accompanied by an attorney's title opinion which is often referred to as the Exhibit "C".

For this effort, a boundary survey was integrated with newly acquired title search data and reflected on a stand-alone map which complies with the FAA's most recent guidance – *Standard Operating Procedure (SOP) for FAA Review of Exhibit "A" Airport Property Inventory Maps* (ARP SOP 3.00).

The purpose of the drawing and associated tables is to identify how property and easements have been acquired in the past as well as to illustrate properties and easements that should be obtained in the future as necessary to accommodate the proposed development plan.

8.11 Summary

The ALP Drawing Set is intended to depict TPF's capital development program in graphical form. Prior to incorporating the developments herein, preliminary plans were presented to the Hillsborough County Aviation Authority (HCAA) Board, Master Plan Committee, FAA, and to

the public for their review and approval. Thus, this plan set accurately reflects the goals and intentions of airport management and the adjacent community throughout the 20-year planning period.

AIRPORT LAYOUT PLAN SET

PETER O. KNIGHT AIRPORT

TAMPA, FLORIDA

LOCATION MAP
NOT TO SCALE

VICINITY MAP
NOT TO SCALE

NOTE:
DO NOT SCALE DRAWINGS. ACTUAL SIZE MAY HAVE BEEN MODIFIED DURING REPRODUCTION.

AUGUST 2017

PREPARED FOR:
HILLSBOROUGH COUNTY AVIATION AUTHORITY

Tampa International Airport

PREPARED BY:

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Campbell Causeway
Tampa, FL 33607-1462

IN ASSOCIATION WITH:

Michael Baker INTERNATIONAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY

BOARD MEMBERS

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COUNTY COMMISSIONER VICTOR D. CRIST - SECRETARY

CHIEF EXECUTIVE OFFICER

MR. JOSEPH LOPANO

DRAWING INDEX

NOTE: PROPERTY MAP INFORMATION INCORPORATED INTO STAND-ALONE EXHIBIT "A" PROPERTY MAP, DATED 6/24/2015

Drawing Number: 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

CONSTRUCTION DATA

PRIME CONTRACTOR

MAJOR SUBCONTRACTORS AND/OR SUPPLIERS

WORK: COMMENCED _____ , COMPLETED _____

COST: BID $_____ FINAL $_____

PROJECT ENGINEER/INSPECTORS:

ALL CONSTRUCTION PERFORMED UNDER THIS CONTRACT WAS COMPLETED IN SUBSTANTIAL CONFORMITY WITH THE DRAWINGS, NOTES AND SPECIFICATIONS CONTAINED IN THESE PLANS, ALL CHANGES FROM THE PLANS AS BID, HAVE BEEN NOTED TO THE BEST OF OUR KNOWLEDGE.

(CERTIFIED) _____ PROJECT ENGINEER _____ DATE

FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

FLORIDA DEPT. OF TRANSPORTATION

APPROVED _____ DATE _____

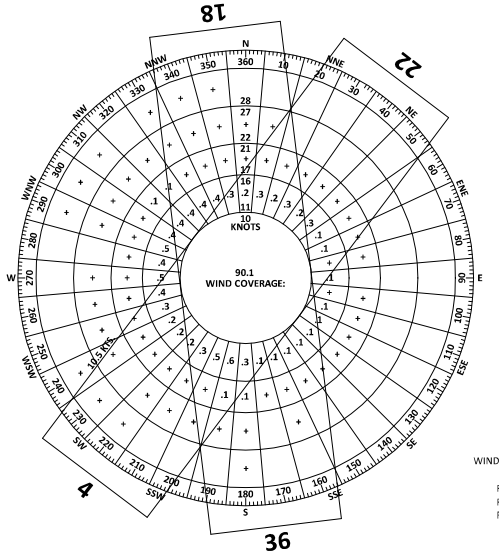
HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

APPROVED _____ DATE _____

A/E - CONSULTANT
CITY, STATE

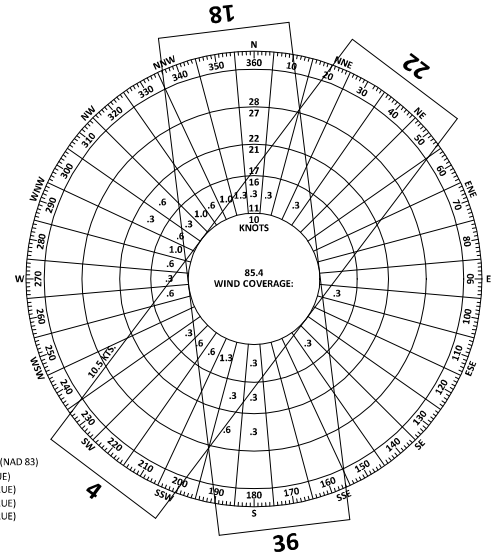
SUBMITTED _____ DATE _____
P.E. No. _____

S:\Projects_APPLAN\HCAA GA Master Plan\Tampa Portal\07\3\HCAA GA Master Plan Update\HCAA.dgb#RefHCAA GA Base File#ALP Sets\TPF_01_COVER.dwg Mod/Mod: Aug 07, 2017 - 2:09pm Plotted: Aug 08, 2017 - 10:07am bob.morris



ALL WEATHER WIND ROSE

METEOROLOGICAL CONDITION	RUNWAY	RUNWAY WIND COVERAGE BY PERCENT	
		10.5 KNOTS (12 MPH)	OBSERVATIONS
ALL - WEATHER	4/22	95.78	113,413
ALL - WEATHER	18/36	96.11	
ALL - WEATHER	COMBINED	98.05	



WIND ROSE DEPICTED RELATIVE TO TRUE NORTH (NAD 83)
RUNWAY 4 ORIENTATION: 36°57'03.6" (TRUE)
RUNWAY 22 ORIENTATION: 216°57'14.4" (TRUE)
RUNWAY 18 ORIENTATION: 173°01'44.4" (TRUE)
RUNWAY 36 ORIENTATION: 353°01'44.4" (TRUE)
MAGNETIC DECLINATION: 5°18' W

IMC WEATHER WIND ROSE

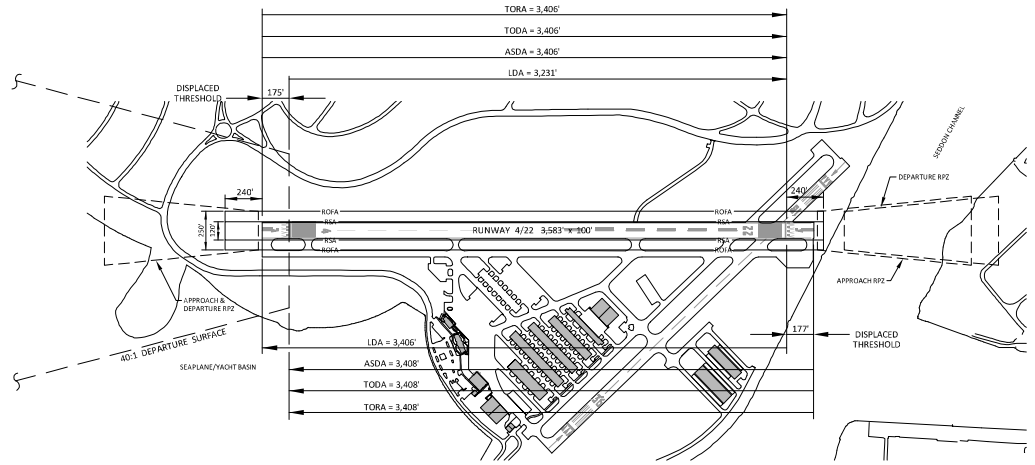
METEOROLOGICAL CONDITION	RUNWAY	RUNWAY WIND COVERAGE BY PERCENT	
		10.5 KNOTS (12 MPH)	OBSERVATIONS
IMC (LOWEST MIN.)	4/22	92.14	315
IMC (LOWEST MIN.)	18/36	95.49	
IMC (LOWEST MIN.)	COMBINED	96.72	

SOURCES:
U.S DEPARTMENT OF COMMERCE; NATIONAL CLIMATIC DATA CENTER (NCDC) ASHEVILLE, NORTH CAROLINA,
SURFACE OBSERVATION DATA OBTAINED FOR WEATHER STATION: TAMPA INTERNATIONAL AIRPORT
STATION NO.: 722110
RECORD PERIOD: 2004-2013
SURFACE OBSERVATION DATA COMPILED BY URS, 2014.

NOTES:
1. THIS GRAPHICAL CHART PLOTS, FOR THE DATA PERIOD LISTED, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED WHILE THE RECTANGULAR BOXES REPRESENT THE MAXIMUM ACCEPTABLE CROSSWIND COMPONENTS OF 10.5 KNOTS FOR THE RUNWAY BASED ON AIRC B-I SMALL AIRCRAFT DESIGN AND CROSSWIND LIMITATIONS. THE AIRFIELD COVERAGE CAPABILITY IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLE.
2. RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 5°18' W DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

RUNWAY DATA TABLE

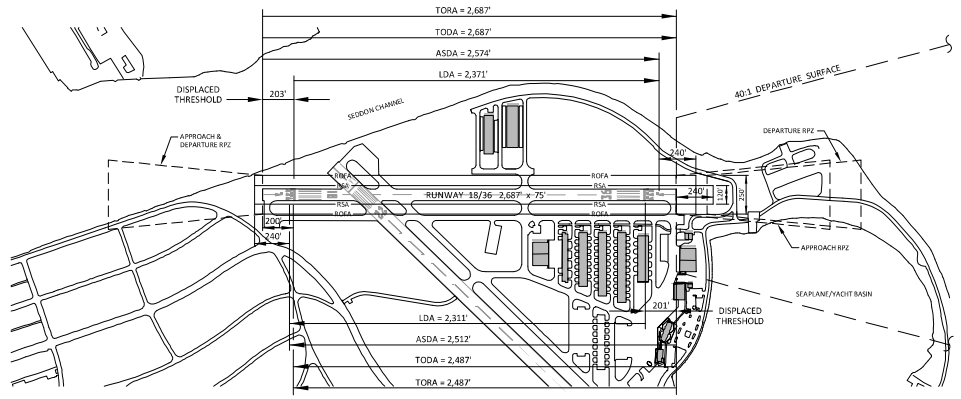
ITEM		RUNWAY 4/22				RUNWAY 18/36			
		EXISTING		FUTURE		EXISTING		FUTURE	
RUNWAY LENGTH/WIDTH (FT.)		3,583/100		SAME		2,687/75		SAME	
APPROACH REFERENCE CODE (APRC)		B/I/(S)/VIS (RW 4) B/I/(S)/5000 (RW 22)		SAME		B/I/(S)/VIS (RW 18) B/I/(S)/5000 (RW 36)		SAME	
DEPARTURE REFERENCE CODE (DPRC)		B/I/(S)		SAME		B/I/(S)		SAME	
RUNWAY DESIGN CODE (RDC)		B/I/(S)/VIS (RW4) B/I/(S)/5000 (RW 22)		SAME		B/I/(S)/VIS (RW18) B/I/(S)/5000 (RW 36)		SAME	
CRITICAL DESIGN AIRCRAFT		BEECHCRAFT BARON 58		SAME		CESSNA SKYLANE 182		SAME	
EFFECTIVE GRADIENT (%) / (MAXIMUM) (%)		0.010/(0.10)		SAME		0.010/(0.10)		SAME	
% WIND COVERAGE (ALL WEATHER) (10.5 KTS.)		95.78		SAME		96.11		SAME	
RUNWAY PAVEMENT	STRENGTH (000 lbs.)	20 SG		SAME		27 SG		SAME	
	PCN	NOT AVAILABLE/REPORTED		SAME		8/F/B/X/T		SAME	
	SURFACE TYPE/FRICTION	ASPHALT		SAME		ASPHALT		SAME	
MAXIMUM RUNWAY ELEVATION (ABOVE MSL)		6.81		SAME		7.36		SAME	
RUNWAY LIGHTING		MIRL		SAME		MIRL		SAME	
RUNWAY MARKING		NON-PRECISION		SAME		NON-PRECISION		SAME	
RUNWAY ENDS		4	22	4	22	18	36	18	36
END ELEVATIONS (NAVD 88) (MSL)		6.54	6.79	SAME	SAME	5.89	6.28	SAME	SAME
END COORDINATES (NAD 83)	LATITUDE	27°54'39.2088"N	27°55'07.5610"N	SAME	SAME	27°55'11.8551"N	27°54'45.4484"N	SAME	SAME
	LONGITUDE	082°27'14.6457"W	082°26'50.6356"W	SAME	SAME	082°26'53.2284"W	082°26'49.5933"W	SAME	SAME
DISPLACED THRESHOLD ELEVATIONS (NAVD 88) (MSL)		6.53	6.78	SAME	SAME	6.25	6.64	SAME	SAME
DISPLACED THRESHOLD COORDINATES (NAD 83)	LATITUDE	27°54'40.5963"N	27°55'06.1601"N	SAME	SAME	27°55'09.8638"N	27°54'47.4227"N	SAME	SAME
	LONGITUDE	082°27'13.4714"W	082°26'51.8236"W	SAME	SAME	082°26'52.9524"W	082°26'49.8603"W	SAME	SAME
DATUM	HORIZONTAL	NAD83	NAD83	SAME	SAME	NAD83	NAD83	SAME	SAME
	VERTICAL	NAVD88	NAVD88	SAME	SAME	NAVD88	NAVD88	SAME	SAME
RUNWAY PROTECTION ZONE (RPZ)	LENGTH	1,000'	1,000'	SAME	SAME	1,000'	1,000'	SAME	SAME
	WIDTH-INNER/OUTER	250'/450'	250'/450'	SAME	SAME	250'/450'	250'/450'	SAME	SAME
APPROACH LIGHTING		NONE	NONE	SAME	SAME	NONE	NONE	SAME	SAME
RUNWAY TOUCH DOWN ZONE ELEVATIONS (MSL)		6.81	6.81	SAME	SAME	7.36	7.36	SAME	SAME
C.F.R. PART 77 IMAGINARY AIRSPACE SURFACES	APPROACH CATEGORY	VISUAL	NON-PRECISION	SAME	SAME	VISUAL	NON-PRECISION	SAME	SAME
	APPROACH SURFACE SLOPES	20:1	20:1	SAME	SAME	20:1	20:1	SAME	SAME
RUNWAY DEPARTURE SURFACE		NO	YES	SAME	SAME	YES	NO	SAME	SAME
THRESHOLD SITING SURFACE		YES	YES	SAME	SAME	YES	YES	SAME	SAME
NAVAIDS	ELECTRONIC NAVIGATION AIDS	NONE	GPS	SAME	SAME	NONE	GPS	SAME	SAME
	VISUAL APPROACH AIDS	VASI-4	REILS	SAME	SAME	NONE	PAPI-2	SAME	SAME
TYPE OF INSTRUMENT APPROACH		N/A	RNAV(GPS)	SAME	SAME	N/A	RNAV(GPS)	SAME	SAME
TYPE OF SURVEY REQUIRED		N/A	N/A	SAME	SAME	N/A	N/A	SAME	SAME
APPROACH VISIBILITY MINIMUMS		VISUAL	1 MILE	SAME	SAME	VISUAL	1 MILE	SAME	SAME
RUNWAY SAFETY AREA (RSA) W=WIDTH BRE=BEYOND RUNWAY END		W=120' BRE=240'		SAME		W=120' BRE=240'		SAME	
RUNWAY OBJECT FREE AREA (ROFA) W=WIDTH BRE=BEYOND RUNWAY END		W=250' BRE=240'		SAME		W=250' BRE=240'		SAME	
RUNWAY OBSTACLE FREE ZONE (OFZ) W=WIDTH BRE=BEYOND RUNWAY END		W=250' BRE=200'		SAME		W=250' BRE=200'		SAME	



RUNWAY 4/22 DECLARED DISTANCES

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
4	3,406'	3,406'	3,406'	3,231'
22	3,408'	3,408'	3,408'	3,406'
18	2,687'	2,687'	2,574'	2,371'
36	2,487'	2,487'	2,512'	2,311'



RUNWAY 18/36 DECLARED DISTANCES

TAXIWAY DATA TABLE

TAXIWAY (TDG 1A)	WIDTH	T.S.A	T.O.F.A.	LIGHTING
A (EXISTING)	40'	49'	89'	MITL
B (EXISTING)	40'	49'	89'	MITL
C (EXISTING)	40'	49'	89'	MITL
D (EXISTING)	40'	49'	89'	MITL
E (EXISTING)	40'	49'	89'	MITL
F (EXISTING)	35'	49'	89'	MITL
G (EXISTING)	35'	49'	89'	MITL
G (FUTURE)	25'	49'	89'	MITL

AIRPORT DATA TABLE

		EXISTING	FUTURE
AIRPORT REFERENCE CODE		B-I (SMALL)	SAME
MEAN MAX. TEMPERATURE - HOTTEST MONTH		90.2° (AUGUST)	SAME
ESTABLISHED AIRPORT ELEVATION (NAVD 88)		7.4 (MSL)	SAME
AIRPORT NAVIGATIONAL AIDS		ROTATING BEACON	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	27°54'55.642"N	SAME
	LONGITUDE	082°26'57.828"W	SAME
MISCELLANEOUS FACILITIES		AWOS	SAME
AIRPORT REFERENCE CODE		B-I (SMALL)	SAME
CRITICAL AIRCRAFT		BEECHCRAFT BARON 58	SAME
MAGNETIC VARIATION		5°18'W	ANNUAL RATE OF CHANGE 0°6'W / YR.
DATE OF MAGNETIC VARIATION		01/01/2015	SAME
AIRPORT ROLE (NPIAS)		PU/GA/REGIONAL	SAME
AIRPORT ACREAGE (EXHIBIT "A", 6/24/15)		143.211 AC.	SAME

SURVEY MONUMENTS

DESIGNATION	TYPE	LATITUDE	LONGITUDE	ELEVATION
PETER	SACS	27°55'15.60644" N	082°26'54.07422" W	5.63
KNIGHTPORT	PACS	27°54'46.05134" N	082°26'50.56591" W	4.70
KNIGHTPORT AZ MK	SACS	27°55'01.21887" N	082°26'52.75218" W	5.90

MODIFICATION TO STANDARDS

NONE TO DATE

NOTES:

1. ALL ELEVATIONS ARE IN FEET (MSL).
2. HORIZONTAL DATUM NAD83, VERTICAL DATUM NAVD88.
3. DRAWING PREPARED IN FLORIDA STATE PLANE, WEST ZONE (0902), US FOOT.
4. BASE DRAWING UPDATED USING AERIAL PHOTOGRAPHY FLOWN IN 2014.

CONSTRUCTION NOTICE REQUIREMENT

TO PROTECT OPERATIONAL SAFETY AND FUTURE DEVELOPMENT, ALL PROPOSED CONSTRUCTION ON THE AIRPORT MUST BE COORDINATED BY THE AIRPORT OWNER WITH THE FAA AIRPORTS DISTRICT OFFICE PRIOR TO CONSTRUCTION. FAA'S REVIEW TAKES APPROXIMATELY 60 DAYS.

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FDOT AVIATION AND SPACEPORTS OFFICE ACCEPTANCE

THIS AIRPORT DRAWING IS APPROVED BY:

(SIGNATURE) _____ DATE: _____

NAME: _____

TITLE: _____

FAA APPROVAL BLOCK

AIRPORT SPONSOR APPROVAL

THIS AIRPORT DRAWING IS APPROVED BY:

(SIGNATURE) _____ DATE: _____

NAME: _____

TITLE: _____

REVISIONS

BY	DATE

URS Corporation Southern
7650 W. Courtney
Campbell Causeway
Tampa, FL 33607-1462

Michael Baker INTERNATIONAL

Tampa International Airport

PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

SHEET TITLE
AIRPORT DATA SHEET

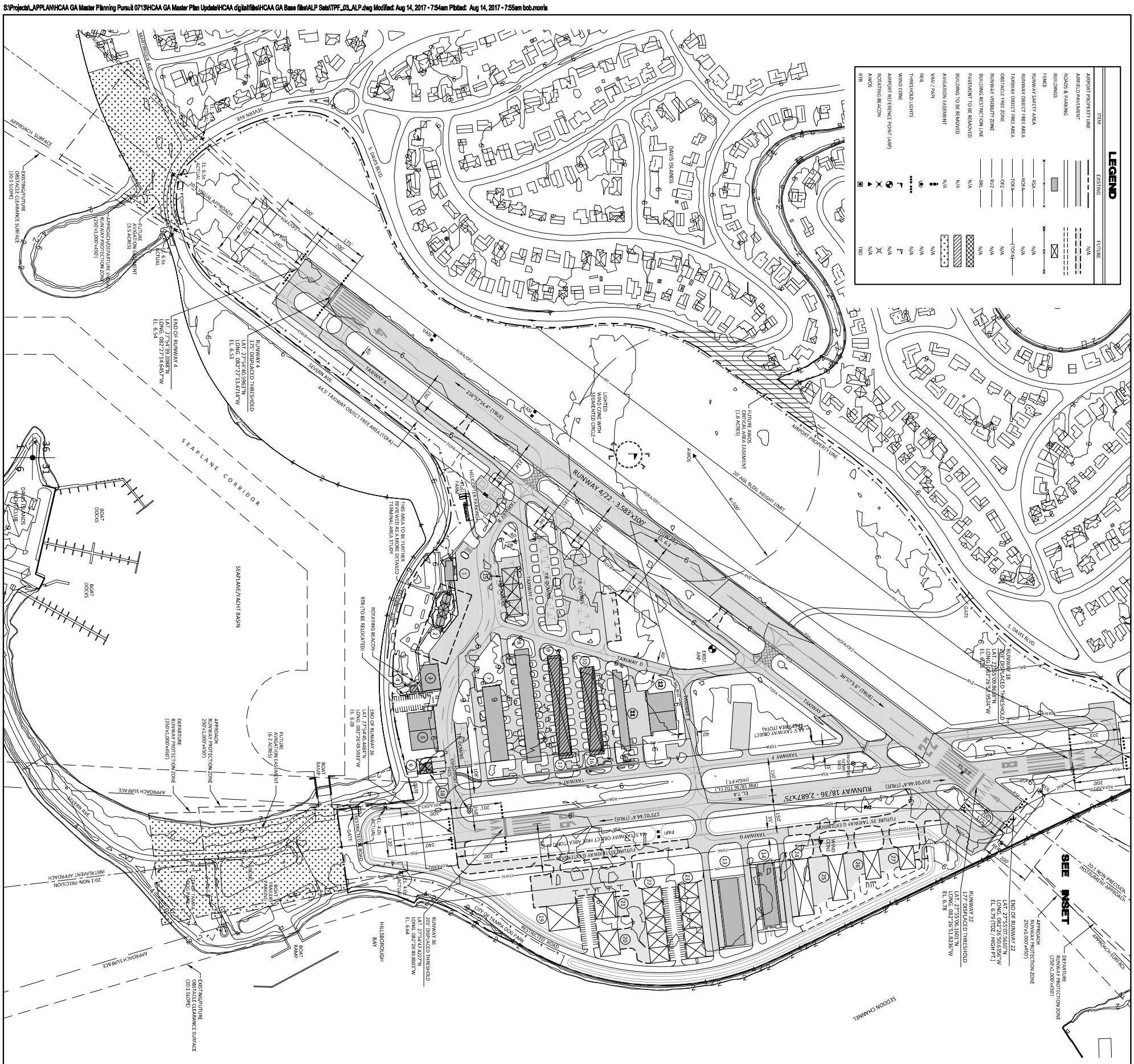
HCAA NO.: 6255 14
FDOT NO.: 415760-1

DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

Drawing Number:
2

LEGEND

ITEM	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
ROADS & PARKING		
BUILDINGS		
FENCE		
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
TAXIWAY OBJECT FREE AREA	TOFA	(TOFA)
OBSTACLE FREE ZONE	OFZ	
RUNWAY VISIBILITY ZONE	RVZ	N/A
BUILDING RESTRICTION LINE	BRL	N/A
PAVEMENT TO BE REMOVED	N/A	N/A
BUILDING TO BE REMOVED	N/A	N/A
AVIGATION EASEMENT	N/A	N/A
VASI / PAPI		N/A
REIL		N/A
THRESHOLD LIGHTS		N/A
WIND CONE		N/A
AIRPORT REFERENCE POINT (ARP)		N/A
ROTATING BEACON		N/A
AWOS		N/A
RTR		TBD



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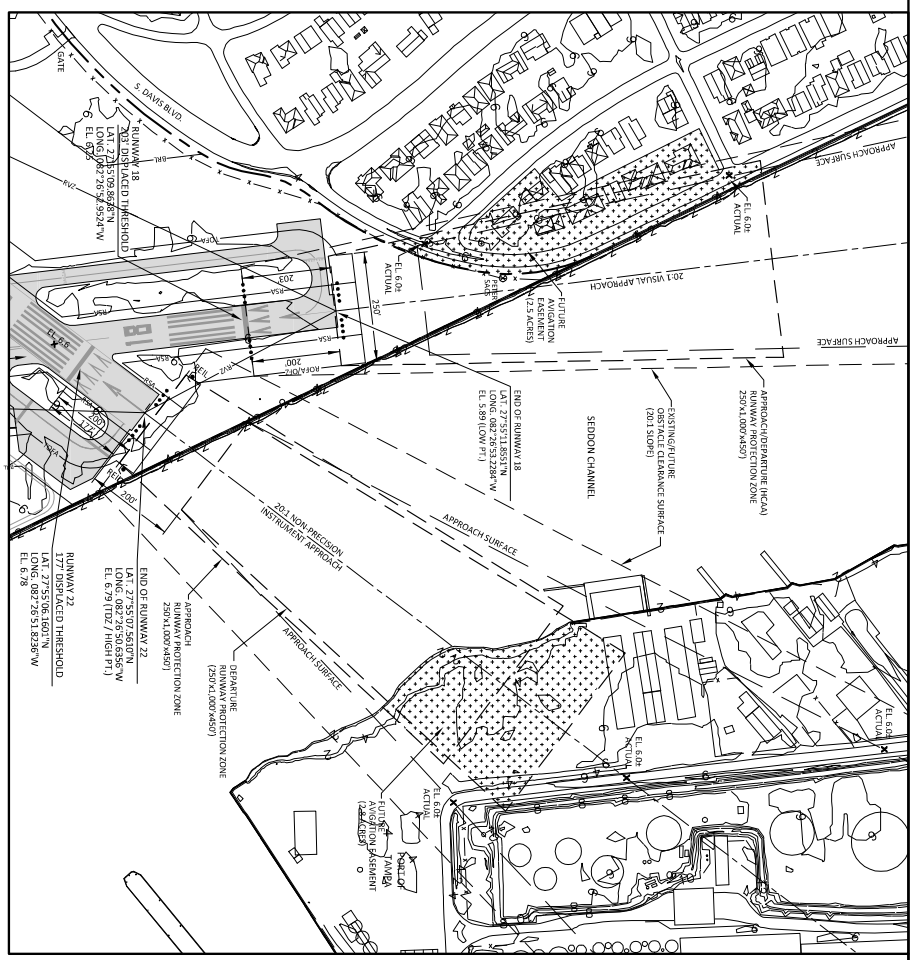

BUILDING/TENANT INDEX

NO.	BLDG. I.D.	DESCRIPTION	ELEVATION (FT.) MSL (ESTIMATED)
(1)	2800	ADMINISTRATION BUILDING	18.75
(2)	3000	TERMINAL BUILDING	21.87
(3)	4800	FBO MAINTENANCE HANGAR (TO BE REMOVED)	27.01
(4)	5200	MAINTENANCE STORAGE UNIT (TO BE REMOVED)	17.57
(5)	5400	BULK HANGAR	36.41
(6)	5600	OPERATIONS AND MAINTENANCE SHOP (TO BE REMOVED)	21.39
(7)	4600	ENCLOSED HANGAR (10 UNITS)	26.75
(8)	4400	ENCLOSED HANGAR (21 UNITS)	21.95
(9)	4200	SHADE HANGAR (19 UNITS) (TO BE REMOVED)	21.64
(10)	4000	ENCLOSED/OPEN PUSHBACK HANGAR (16 UNITS) (TO BE REMOVED)	22.66
(11)	3800	ENCLOSED HANGAR (10 UNITS)	22.39
(12)	3400	BULK HANGAR	30.32
(13)	6800	ENCLOSED HANGAR (8 UNITS)	33.00
(14)	6000	ENCLOSED HANGAR (10 UNITS)	27.00
(15)	7800	FUTURE HANGAR (3 UNITS)	TBD
(16)	4000	FUTURE T-HANGAR (18 UNITS)	TBD
(17)	4200	FUTURE T-HANGAR (15 UNITS)	TBD
(18)	5600	FUTURE HANGAR (60'x60')	TBD
(19)	8000	FUTURE HANGAR (100'x120')	TBD
(20)	7800	FUTURE HANGAR (80'x100')	TBD
(21)	7400	FUTURE HANGAR (80'x100')	TBD
(22)	7200	FUTURE HANGAR (60'x75') (5 UNITS)	TBD
(23)	7000	FUTURE HANGAR (60'x75') (5 UNITS)	TBD
(24)	6400	FUTURE T-HANGAR (9 UNITS)	TBD
(25)	6200	FUTURE T-HANGAR (7 UNITS)	TBD
(26)	6000	FUTURE T-HANGAR (4 UNITS)	TBD
(27)	5800	FUTURE T-HANGAR (3 UNITS)	TBD

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MAGNETIC DECLINATION: 5°34' WEST (5.3°) WEST
ANNUAL RATE OF CHANGE: 0°6' (0.1°) WEST/YEAR
(JANUARY 2015)

TRUE NORTH

GRAPHIC SCALE IN FEET
200 0 200

FDOT AVIATION AND SPACEPORTS OFFICE ACCEPTANCE

THIS AIRPORT DRAWING IS APPROVED BY:

[SIGNATURE] _____ DATE: _____

NAME: _____

TITLE: _____

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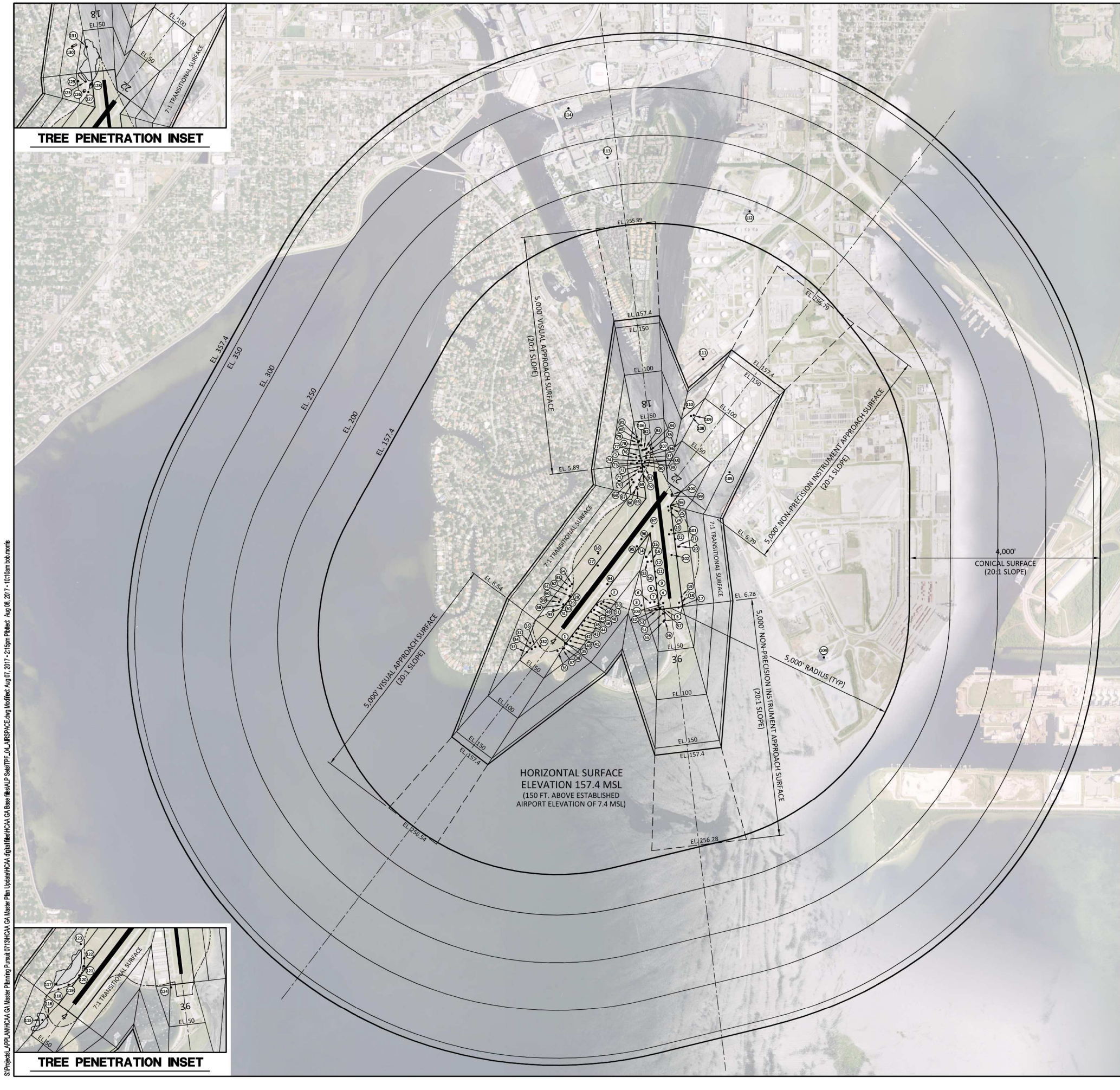
THIS AIRPORT DRAWING IS APPROVED BY:

[SIGNATURE] _____ DATE: _____

NAME: _____

TITLE: _____

DESIGNED: MJK DRAWN: RJM CHECKED: MLT DATE: AUGUST 2017	HCAA NO.: 6255.14 FDOT NO.: 415760-1	SHEET TITLE: AIRPORT LAYOUT PLAN DRAWING	PROJECT NAME: MASTER PLAN UPDATE PETER O. KNIGHT AIRPORT Tampa, Florida	Tampa International Airport	Michael Baker INTERNATIONAL	URS Corporation Southern 7650 West Courtney Campbell Causeway Tampa, FL 33607-1462	DATE / REVISIONS / BY	Drawing Number: 3



OBSTRUCTION DATA TABLE

OBJECT ID NO.	OBJECT DESCRIPTION	OBJECT ELEVATION (FEET MSL)	P77 SURFACE PENETRATED	P77 SURFACE PENETRATION (FEET)	EXISTING/PROPOSED DISPOSITION OF OBJECT
1	FENCE	12.22	RWY 4 APPROACH SURFACE	5.00	LIGHTED
2	POLE	37.56	RWY 4/22 TRANSITIONAL SURFACE	13.00	LIGHTED
3	BEACON	74.63	RWY 18/36 TRANSITIONAL SURFACE	17.00	LIGHTED
4	BUILDING	20.66	RWY 18/36 TRANSITIONAL SURFACE	14.00	NO ACTION
5	FENCE	11.00	RWY 36 APPROACH SURFACE	5.00	TO BE LIGHTED
6	BUILDING	37.34	RWY 18/36 TRANSITIONAL SURFACE	6.00	NO ACTION
7	BUILDING	28.78	RWY 18/36 TRANSITIONAL SURFACE	11.00	TO BE LIGHTED
8	BUILDING	76.46	RWY 18/36 TRANSITIONAL SURFACE	18.00	TO BE LIGHTED
9	BUILDING	21.68	RWY 18/36 PRIMARY SURFACE	16.00	NO ACTION
10	BUILDING	22.16	RWY 18/36 PRIMARY SURFACE	16.00	TO BE LIGHTED
11	BUILDING	22.14	RWY 18/36 PRIMARY SURFACE	16.00	NO ACTION
12	BUILDING	22.22	RWY 18/36 PRIMARY SURFACE	16.00	TO BE LIGHTED
13	BUILDING	39.88	RWY 18/36 TRANSITIONAL SURFACE	16.00	NO ACTION
14	BUILDING	35.74	RWY 18/36 TRANSITIONAL SURFACE	9.00	NO ACTION
15	BUILDING	37.76	RWY 18/36 TRANSITIONAL SURFACE	12.00	TO BE LIGHTED
16	BUILDING	28.70	RWY 18/36 TRANSITIONAL SURFACE	16.00	NO ACTION
17	FENCE	10.12	RWY 18/36 PRIMARY SURFACE	4.00	TO BE LIGHTED
18	FENCE	14.00	RWY 18/36 PRIMARY SURFACE	8.00	NO ACTION
19	FENCE	11.58	RWY 18/36 PRIMARY SURFACE	5.00	NO ACTION
20	BUILDING	33.90	RWY 18/36 TRANSITIONAL SURFACE	16.00	NO ACTION
21	BUILDING	31.87	RWY 18/36 TRANSITIONAL SURFACE	18.00	NO ACTION
22	BUILDING	28.16	RWY 18/36 TRANSITIONAL SURFACE	20.00	TO BE LIGHTED
23	WINDSOCK	28.26	RWY 18/36 PRIMARY SURFACE	22.00	LIGHTED
24	POST	10.36	RWY 18/36 PRIMARY SURFACE	4.00	TO BE LIGHTED
25	TRANSFORMER	10.06	RWY 18/36 TRANSITIONAL SURFACE	1.00	NO ACTION
26	ANTENNA	36.72	RWY 4/22 TRANSITIONAL SURFACE	15.00	LIGHTED
27	WINDSOCK	25.06	RWY 4/22 PRIMARY SURFACE	19.00	LIGHTED
28	POLE	24.68	RWY 4/22 TRANSITIONAL SURFACE	17.00	TO BE LIGHTED
29	FENCE	12.57	RWY 4/22 PRIMARY SURFACE	6.00	NO ACTION
30	FENCE	11.67	RWY 4/22 PRIMARY SURFACE	5.00	NO ACTION
31	FENCE	11.67	RWY 4/22 TRANSITIONAL SURFACE	3.00	NO ACTION
32	BUILDING	43.38	RWY 4/22 TRANSITIONAL SURFACE	9.00	NO ACTION
33	BUILDING	41.76	RWY 4 APPROACH SURFACE	3.00	NO ACTION
34	BUILDING	38.32	RWY 4 APPROACH SURFACE	5.00	NO ACTION
35	BUILDING	38.40	RWY 4 APPROACH SURFACE	9.00	NO ACTION
36	PUBLIC ROAD	21.70	RWY 4 APPROACH SURFACE	3.00	NO ACTION
37	PUBLIC ROAD	21.78	RWY 4 APPROACH SURFACE	9.00	NO ACTION
38	POLE	31.98	RWY 4/22 TRANSITIONAL SURFACE	18.00	LIGHTED
39	PRIMARY ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	12.00	NO ACTION
40	POLE	31.59	RWY 4/22 TRANSITIONAL SURFACE	19.00	LIGHTED
41	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	12.00	NO ACTION
42	POLE	31.78	RWY 4/22 TRANSITIONAL SURFACE	19.00	LIGHTED
43	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	17.00	NO ACTION
44	POLE	32.26	RWY 4/22 TRANSITIONAL SURFACE	20.00	LIGHTED
45	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	12.00	NO ACTION
46	POLE	31.46	RWY 4/22 TRANSITIONAL SURFACE	19.00	LIGHTED
47	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	12.00	NO ACTION
48	POLE	34.96	RWY 4/22 TRANSITIONAL SURFACE	22.00	LIGHTED
49	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	11.00	NO ACTION
50	PUBLIC ROAD	21.80	RWY 4/22 TRANSITIONAL SURFACE	2.00	NO ACTION
51	POLE	30.58	RWY 4/22 TRANSITIONAL SURFACE	12.00	LIGHTED
52	PUBLIC ROAD	20.00	RWY 18/36 TRANSITIONAL SURFACE	2.00	NO ACTION
53	POLE	30.70	RWY 18/36 TRANSITIONAL SURFACE	17.00	TO BE LIGHTED
54	PUBLIC ROAD	20.00	RWY 36 APPROACH SURFACE	9.00	NO ACTION
55	POLE	28.54	RWY 36 APPROACH SURFACE	9.00	TO BE LIGHTED
56	PUBLIC ROAD	20.00	RWY 36 APPROACH SURFACE	2.00	NO ACTION
57	PUBLIC ROAD	20.00	RWY 18/36 PRIMARY SURFACE	14.00	NO ACTION
58	POLE	37.36	RWY 4/22 TRANSITIONAL SURFACE	25.00	TO BE LIGHTED
59	BUILDING	30.95	RWY 4/22 TRANSITIONAL SURFACE	4.00	NO ACTION
60	BUILDING	42.59	RWY 4/22 TRANSITIONAL SURFACE	15.00	NO ACTION
61	POLE	38.10	RWY 4/22 TRANSITIONAL SURFACE	26.00	TO BE LIGHTED
62	BUILDING	40.27	RWY 4/22 TRANSITIONAL SURFACE	9.00	NO ACTION
63	POLE	43.94	RWY 4/22 TRANSITIONAL SURFACE	14.00	TO BE LIGHTED
64	POLE	32.73	RWY 4/22 TRANSITIONAL SURFACE	4.00	NO ACTION
65	POLE	44.60	RWY 18/36 TRANSITIONAL SURFACE	17.00	TO BE LIGHTED
66	POLE	44.94	RWY 18/36 TRANSITIONAL SURFACE	15.00	NO ACTION
67	POLE	45.46	RWY 18/36 TRANSITIONAL SURFACE	8.00	NO ACTION
68	POLE	44.18	RWY 18/36 TRANSITIONAL SURFACE	3.00	NO ACTION
69	POLE	35.74	RWY 18/36 TRANSITIONAL SURFACE	17.00	TO BE LIGHTED
70	POLE	36.71	RWY 18/36 TRANSITIONAL SURFACE	19.00	NO ACTION
71	BUILDING	32.80	RWY 18/36 TRANSITIONAL SURFACE	22.00	NO ACTION
72	BUILDING	20.84	RWY 18/36 PRIMARY SURFACE	15.00	NO ACTION
73	BUILDING	28.79	RWY 18/36 TRANSITIONAL SURFACE	8.00	NO ACTION
74	POLE	34.29	RWY 18/36 TRANSITIONAL SURFACE	20.00	NO ACTION
75	POLE	35.17	RWY 18/36 TRANSITIONAL SURFACE	11.00	TO BE LIGHTED
76	BUILDING	18.98	RWY 18/36 TRANSITIONAL SURFACE	4.00	NO ACTION
77	BUILDING	27.96	RWY 18 APPROACH SURFACE	8.00	NO ACTION
78	BUILDING	36.07	RWY 18 APPROACH SURFACE	11.00	NO ACTION
79	BUILDING	35.98	RWY 18 APPROACH SURFACE	8.00	NO ACTION
80	POLE	35.28	RWY 18 APPROACH SURFACE	6.00	TO BE LIGHTED
81	POLE	35.48	RWY 18 APPROACH SURFACE	1.00	NO ACTION
82	POLE	31.18	RWY 18 APPROACH SURFACE	11.00	NO ACTION
83	BUILDING	28.02	RWY 18 APPROACH SURFACE	8.00	NO ACTION
84	FLAGPOLE	33.06	RWY 18 APPROACH SURFACE	12.00	NO ACTION
85	POLE	20.64	RWY 18 APPROACH SURFACE	4.00	NO ACTION
86	BUILDING	19.78	RWY 18 APPROACH SURFACE	8.00	NO ACTION
87	POLE	21.04	RWY 18 APPROACH SURFACE	10.00	NO ACTION
88	BUILDING	19.36	RWY 18 APPROACH SURFACE	10.00	NO ACTION
89	BUILDING	17.70	RWY 18 APPROACH SURFACE	10.00	NO ACTION
90	POLE	26.61	RWY 18/36 PRIMARY SURFACE	11.00	TO BE LIGHTED
91	POLE	31.75	RWY 18/36 PRIMARY SURFACE	26.00	TO BE LIGHTED
92	POLE	28.45	RWY 18/36 TRANSITIONAL SURFACE	28.00	TO BE LIGHTED
93	POLE	32.87	RWY 4/22 TRANSITIONAL SURFACE	7.2000	TO BE LIGHTED
94	SIGN	7.92	RWY 4/22 PRIMARY SURFACE	1.6000	FIXED BY FUNCTION
95	SIGN	8.12	RWY 4/22 PRIMARY SURFACE	1.7000	FIXED BY FUNCTION
96	SIGN	7.89	RWY 4/22 PRIMARY SURFACE	1.5000	FIXED BY FUNCTION
97	SIGN	8.51	RWY 4/22 and 18/36 PRIMARY SURFACE	2.6000	FIXED BY FUNCTION
98	SIGN	8.04	RWY 18/36 PRIMARY SURFACE	1.2000	FIXED BY FUNCTION
99	SIGN	9.00	RWY 18/36 PRIMARY SURFACE	2.2000	FIXED BY FUNCTION
100	SIGN	7.76	RWY 4/22 PRIMARY SURFACE	1.00	FIXED BY FUNCTION
101	SIGN	9.09	RWY 18/36 PRIMARY SURFACE	1.90	FIXED BY FUNCTION
102	SIGN	9.09	RWY 18/36 PRIMARY SURFACE	1.90	FIXED BY FUNCTION
103	SIGN	8.62	RWY 18/36 PRIMARY SURFACE	2.30	FIXED BY FUNCTION
104	TANK	236.74	HORIZONTAL SURFACE	79.30	LIGHTED
105	CRANE	N/A	N/A	N/A	REMOVED
106	POLE	34.56	RWY 18 APPROACH SURFACE	9.70	TO BE LIGHTED
107	BUILDING	17.28	RWY 18 APPROACH SURFACE	1.50	NO ACTION
108	CELL TOWER	95.96	RWY 4/22 TRANSITIONAL SURFACE	7.80	REMOVED
109	CELL TOWER	120.16	RWY 4/22 TRANSITIONAL SURFACE	36.00	LIGHTED
110	CRANE	125.12	RWY 4/22 TRANSITIONAL SURFACE	5.80	LIGHTED
111	CRANE	232.96	HORIZONTAL SURFACE	75.60	LIGHTED
112	RIG/SUPERSTRUCTURE	217.54	CONICAL SURFACE	28.90	LIGHTED
113	BUILDING	233.16	CONICAL SURFACE	3.00	LIGHTED
114	BUILDING	300.04	CONICAL SURFACE	11.40	LIGHTED
115	TREE CLUSTER S. DAVIS BLVD.	55.58	RWY 4/22 TRANSITIONAL SURFACE	20.00	TO BE TRIMMED
116	TREE S. DAVIS BLVD.	34.54	RWY 4/22 TRANSITIONAL SURFACE	10.60	TO BE TRIMMED
117	TREE CLUSTER S. DAVIS BLVD.	65.16	RWY 4/22 TRANSITIONAL SURFACE	16.90	TO BE TRIMMED
118	TREE S. DAVIS BLVD.	39.25	RWY 4/22 TRANSITIONAL SURFACE	5.70	TO BE TRIMMED
119	TREE S. DAVIS BLVD.	41.79	RWY 4/22 TRANSITIONAL SURFACE	24.30	TO BE TRIMMED
120	TREE S. DAVIS BLVD.	24.21	RWY 4/22 TRANSITIONAL SURFACE	15.10	TO BE TRIMMED
121	TREE CLUSTER S. DAVIS BLVD.	31.96	RWY 4/22 TRANSITIONAL SURFACE	17.10	TO BE TRIMMED
122	TREE S. DAVIS BLVD.	35.99	RWY 4/22 TRANSITIONAL SURFACE	14.30	TO BE TRIMMED
123	TREE S. DAVIS BLVD.	63.26	RWY 4/22 TRANSITIONAL SURFACE	1.40	TO BE TRIMMED
124	TREE S. DAVIS BLVD.	16.08	RWY 36 APPROACH SURFACE	7.20	TO BE TRIMMED
125	TREE CLUSTER S. DAVIS BLVD.	57.40	RWY 18/36 TRANSITIONAL SURFACE	31.90	TO BE TRIMMED
126	TREE CLUSTER S. DAVIS BLVD.	36.68	RWY 18/36 TRANSITIONAL SURFACE	2.00	TO BE TRIMMED
127	TREE S. DAVIS BLVD.	28.56	RWY 18/36 TRANSITIONAL SURFACE	7.20	TO BE TRIMMED
128	TREE CLUSTER S. DAVIS BLVD.	42.28	RWY 18/36 TRANSITIONAL SURFACE	31.20	TO BE TRIMMED
129	TREE S. DAVIS BLVD.	48.39	RWY 18/36 TRANSITIONAL SURFACE	1.50	TO BE TRIMMED
130	TREE CLUSTER S. DAVIS BLVD.	78.88	RWY 18/36 TRANSITIONAL SURFACE	3.80	TO BE TRIMMED
131	TREE CLUSTER S. DAVIS BLVD/CHANNEL DR.	57.58	RWY 18/36 TRANSITIONAL SURFACE	24.70	TO BE TRIMMED
132	FUTURE PCAL WITH OBSTRUCTION LIGHT	24.00	RWY 4 APPROACH SURFACE	-1.80	TO BE LIGHTED

NOTES:

1. LOCAL ZONING IS CODIFIED AND ENFORCED VIA HCAA RESOLUTION 2017-37, AIRPORT ZONING REGULATIONS, UNDER THE PROVISIONS OF CHAPTER 333, FLORIDA STATUTES AND CHAPTER 2003-370, LAWS OF FLORIDA AS ADOPTED ON JUNE 1, 2017 FOR TPA, PCM, TPF AND VDF.
2. AIRPORT COMPATIBILITY DISTRICT "M-AP" ESTABLISHED BY CITY OF TAMPA.
3. SEE AIRPORT HEIGHT ZONING MAP "ZONE "A".
4. THE VERTICAL CLEARANCE (V.C.) OVER ROADS PER CODE OF FEDERAL REGULATIONS IS 17 FEET FOR INTERSTATE HIGHWAYS, 15 FEET FOR ANY OTHER PUBLIC ROADWAY, AND 10 FEET FOR A PRIVATE ROAD. THE VERTICAL CLEARANCE OVER OVER A RAILROAD IS 23 FEET.
5. VERTICAL CLEARANCES (V.C.) FOR ROADS/ RAILROADS ARE CALCULATED USING THE ELEVATION OF THE ROAD/RAILROAD AT THAT POINT MEASURING VERTICALLY TO THE INTERSECTION OF THE SPECIFIC SURFACE. ROAD ELEVATIONS ARE ESTIMATED.
6. BASE MAP IS FROM AERIAL PHOTOGRAPHY FLOWN IN 2014. ROAD ELEVATIONS ARE ESTIMATED.

LEGEND

GENERALIZED TREE PENETRATION AREA APPROACH / TRANSITIONAL SURFACE

SOURCE:
OBSTRUCTION SURVEY:
Aerometric, April 3-5, 2014
Compiled by URS, July 2015

MAGNETIC DECLINATION = 5°18' WEST (5.3°) WEST (JANUARY 2015)
ANNUAL RATE OF CHANGE: 0°6' (0.1°) WEST/YEAR

TRUE NORTH

1000 0 1000
HORIZONTAL SCALE IN FEET

BY | REVISIONS | DATE

URS Corporation Southern
1000 N. Ashley Drive
Suite 400
Tampa, FL 33602-2452

Michael Baker INTERNATIONAL

Tampa International Airport

PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

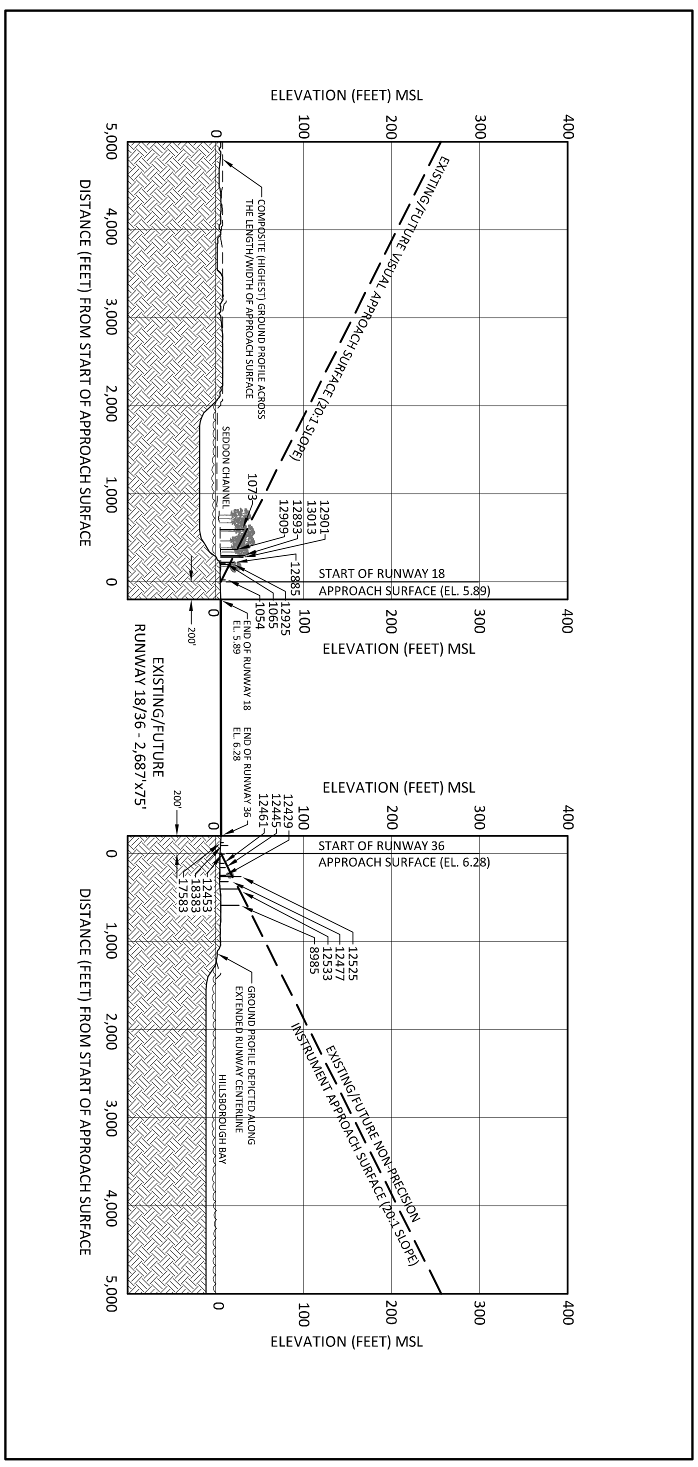
SHEET TITLE
AIRPORT AIRSPACE DRAWING

HCAA NO.: 6255 14
FDOT NO.: 415760-1

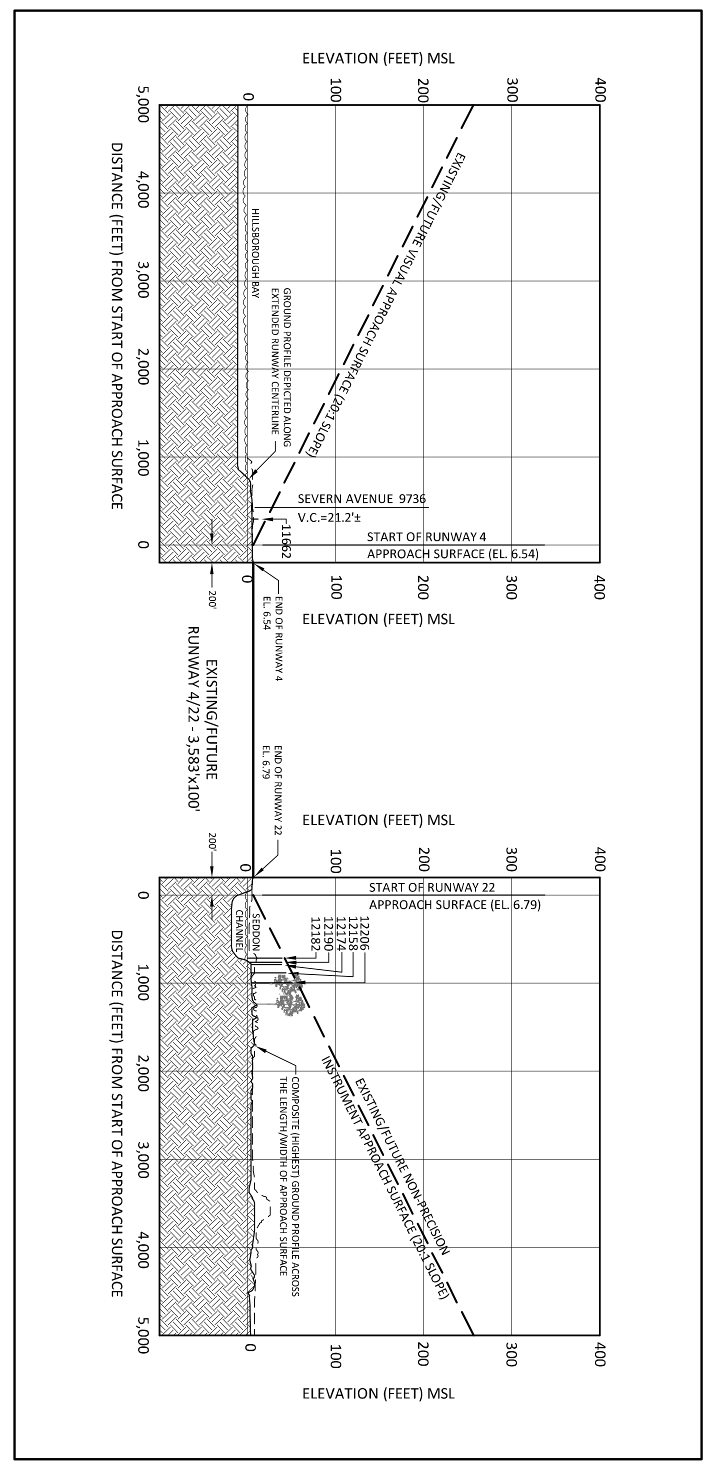
DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

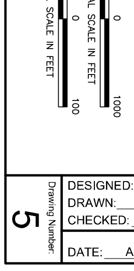
Drawing Number: 4

RUNWAY 18/36 PROFILE VIEW

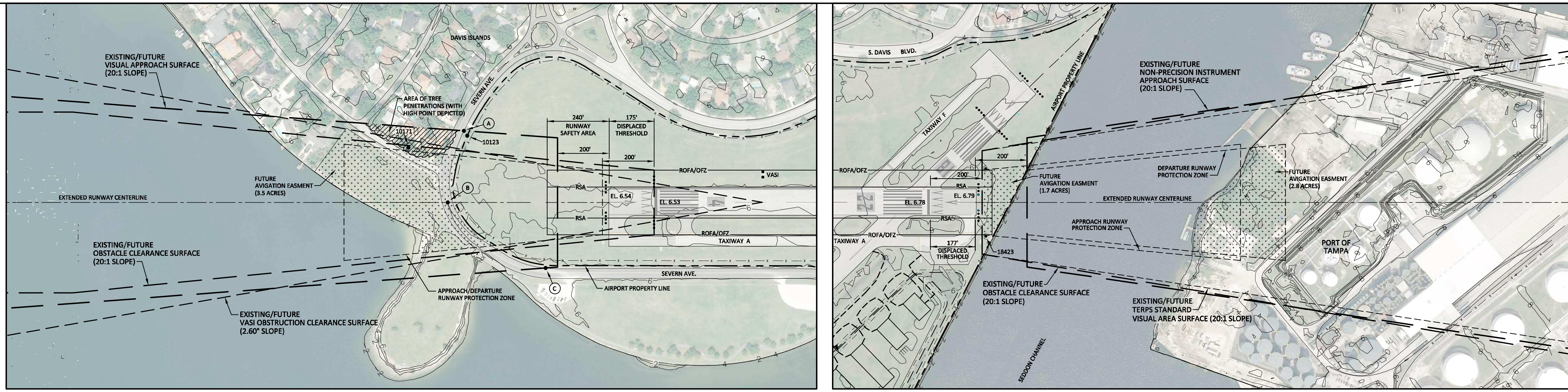


RUNWAY 4/22 PROFILE VIEW

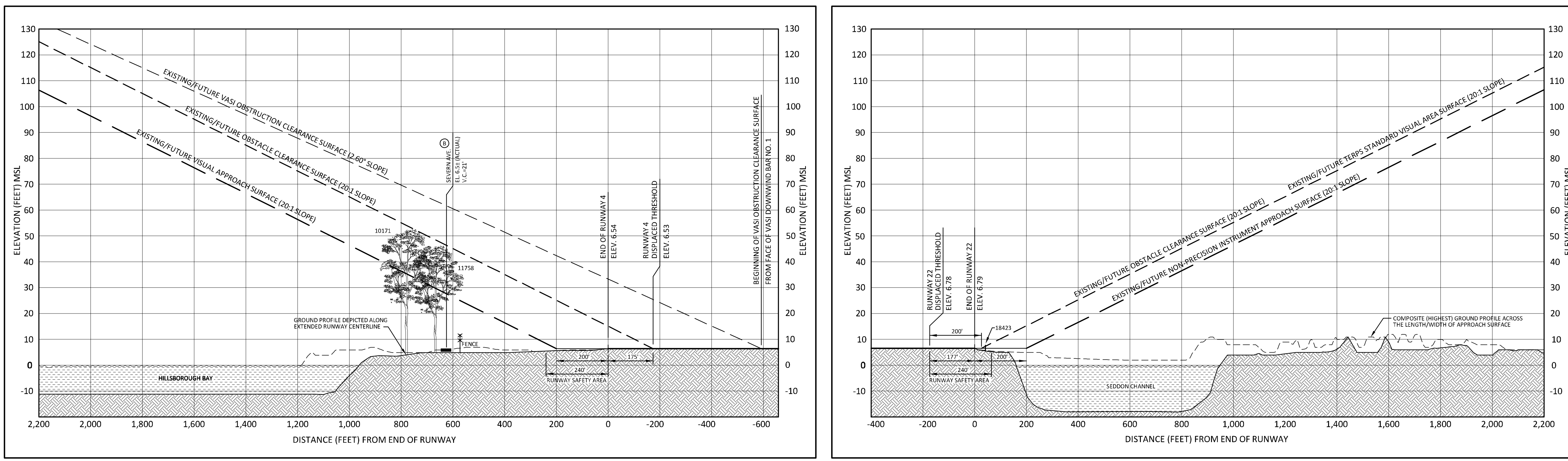




Drawing Number			SHEET TITLE	PROJECT NAME				DATE	REVISIONS	BY
5	DESIGNED: MJK DRAWN: RJM CHECKED: MLT DATE: AUGUST 2017	HCAA NO.: 6255 14 FDOT NO.: 415780-1	AIRPORT AIRSPACE APPROACH PROFILES	MASTER PLAN UPDATE PETER O. KNIGHT AIRPORT Tampa, Florida	Tampa International Airport	Michael Baker INTERNATIONAL	URS Corporation Southern 7650 West Courtney Campbell Causeway Tampa, FL 33607-1462			



RUNWAY 4/22 INNER APPROACH SURFACE PLAN VIEW



RUNWAY 4/22 INNER APPROACH SURFACE PROFILE VIEW

NOTES:

1. LOCAL ZONING IS CODIFIED AND ENFORCED VIA HCAA RESOLUTION 2010-54, AIRPORT ZONING REGULATIONS, UNDER THE PROVISIONS OF CHAPTER 333, FLORIDA STATUTES AND CHAPTER 2003-370, LAWS OF FLORIDA AS ADOPTED ON MARCH 1, 2010 FOR TPA, PCM, TPF AND VDF.
2. AIRPORT COMPATIBILITY DISTRICT MA-P" ESTABLISHED BY CITY OF TAMPA.
3. SEE AIRPORT HEIGHT ZONING MAP "ZONE "A".
4. THE VERTICAL CLEARANCE (V.C.) OVER ROADS PER CODE OF FEDERAL REGULATIONS IS 17 FEET FOR INTERSTATE HIGHWAYS, 15 FEET FOR ANY OTHER PUBLIC ROADWAY, AND 10 FEET FOR A PRIVATE ROAD. THE VERTICAL CLEARANCE OVER A RAILROAD IS 23 FEET.
5. VERTICAL CLEARANCES (V.C.) FOR ROADS/RAILROADS ARE CALCULATED USING THE ELEVATION OF THE ROAD/RAILROAD AT THAT POINT MEASURING VERTICALLY TO THE INTERSECTION OF THE SPECIFIC SURFACE. ROAD ELEVATIONS ARE ESTIMATED.
6. BASE IS FROM AERIAL PHOTOGRAPHY FLOWN IN 2014.

OBSTRUCTION DATA TABLE

RW End	Object ID No.	Object Description	Object Elevation [MSL]	Approach Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction	Triggering Event
RW4	10123	TREE	34.54	10.53	TRIM OR REMOVE	NONE
RW4	10171	TREE *	53.90	18.50	TRIM OR REMOVE	NONE

* REPRESENTS THE HIGH POINT WITHIN AN AREA OF TREE PENETRATIONS

OBSTRUCTION DATA TABLE

RW END	Object ID No.	Object Description	Object Elevation [MSL]	TERPS OCS Penetrated	TERPS OCS Penetration (Feet)	Existing / Proposed Disposition of Obstruction
RW22 OCS	18423	REIL	7.76	YES	0.4	NONE

SOURCE:
OBSTRUCTION SURVEY:
Aerometric, April 3-5, 2014
Compiled by URS, July 2015

LEGEND
FUTURE AVIGATION EASEMENT

CFR PART 77 APPROACH SURFACE ROAD CLEARANCES
(A) SEVERN AVENUE EL. 5.7± (ACTUAL) V.C.=19'
(B) SEVERN AVENUE EL. 6.5± (ACTUAL) V.C.=21'
(C) SEVERN AVENUE EL. 6.5± (ACTUAL) V.C.=2' (13' PENETRATION)

(5.3°) VAR. 5°18'W TRUE NORTH

MAGNETIC DECLINATION = 5°18' WEST (5.3°) WEST (JANUARY 2015)
ANNUAL RATE OF CHANGE: 0°6' (0.1°) WEST/YEAR

200 0 200 HORIZONTAL SCALE IN FEET
20 0 20 VERTICAL SCALE IN FEET

URS Corporation Southern
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

Michael Baker INTERNATIONAL

Tampa International Airport

PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

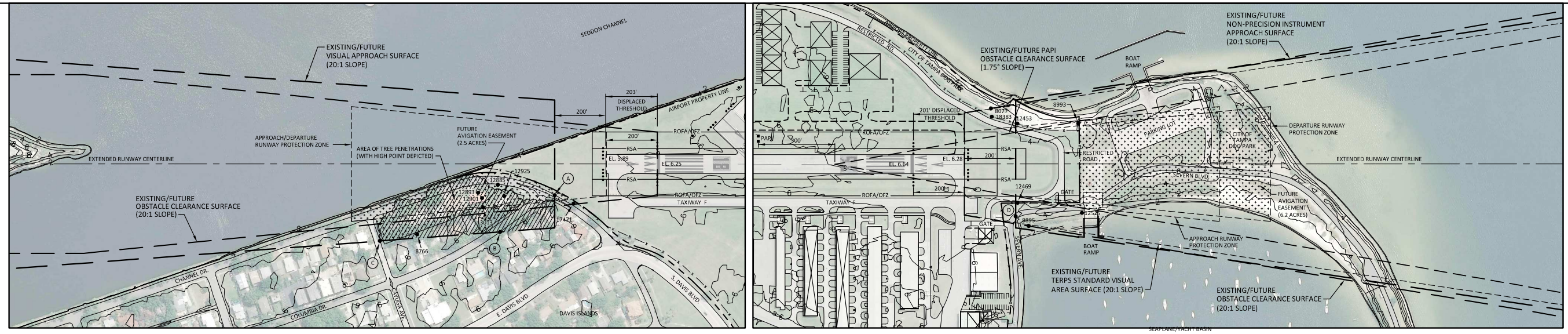
SHEET TITLE
INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY 4/22

HCAA NO.: 6255 14
FDOT NO.: 415760-1

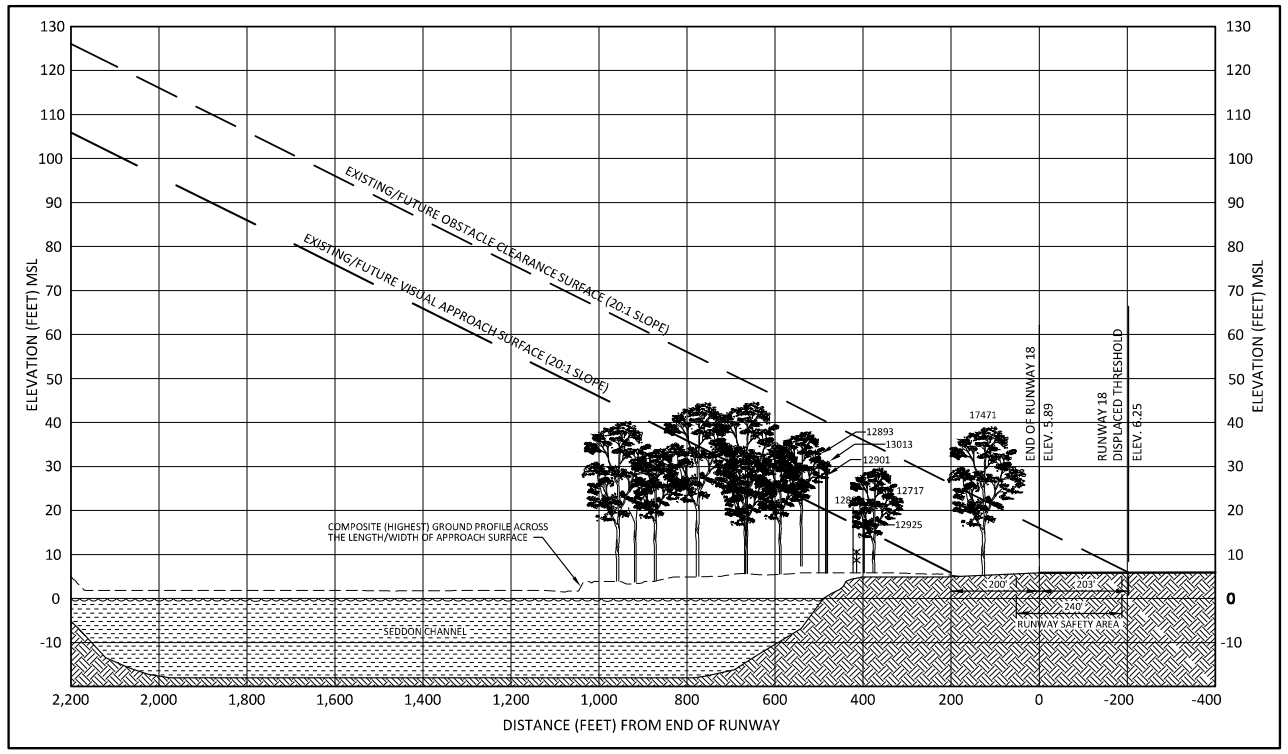
DATE	REVISIONS	BY

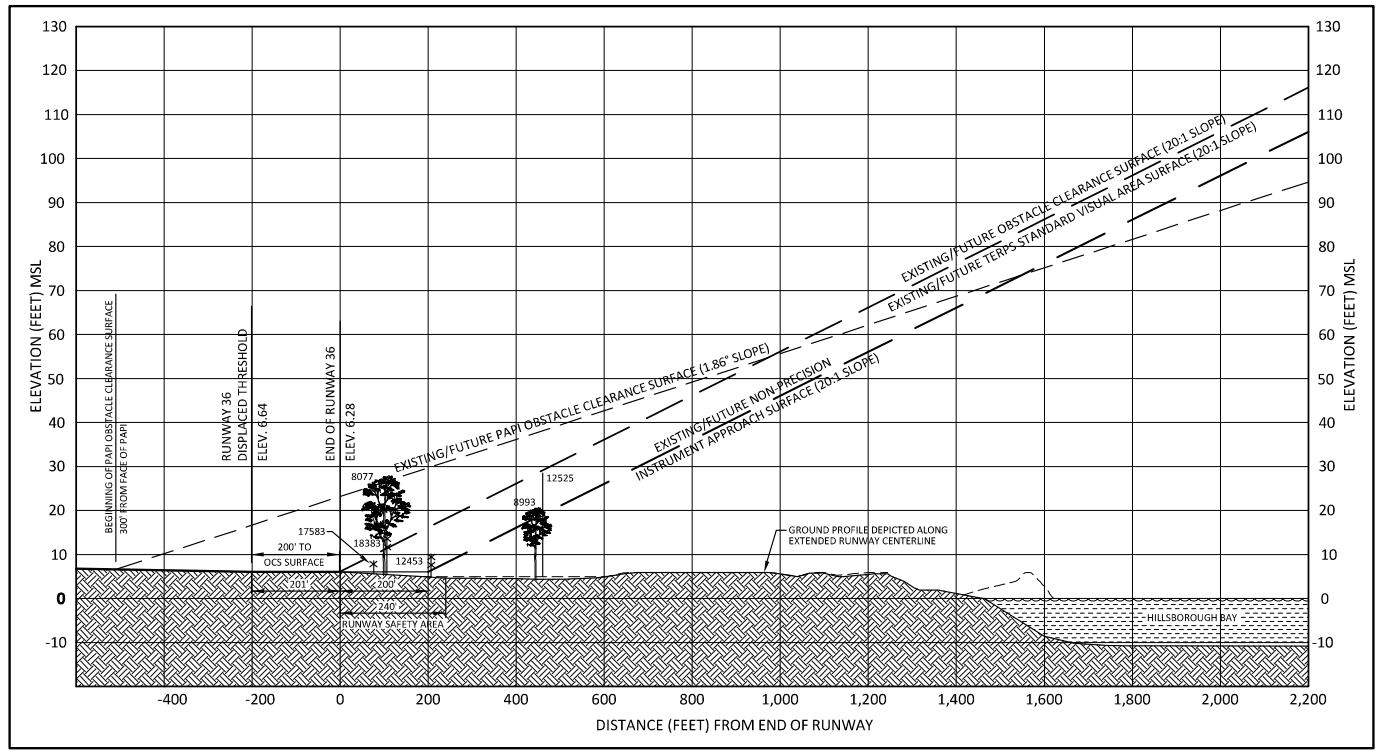
DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

Drawing Number: 6



RUNWAY 18/36 INNER APPROACH SURFACE PLAN VIEW





RUNWAY 18/36 INNER APPROACH SURFACE PROFILE VIEW

NOTES:

1. LOCAL ZONING IS CODIFIED AND ENFORCED VIA HCAA RESOLUTION 2010-54, AIRPORT ZONING REGULATIONS, UNDER THE PROVISIONS OF CHAPTER 333, FLORIDA STATUTES AND CHAPTER 2003-370, LAWS OF FLORIDA AS ADOPTED ON MARCH 1, 2010 FOR TPA, PCM, TPF AND VDF.
2. AIRPORT COMPATIBILITY DISTRICT "MA-P" ESTABLISHED BY CITY OF TAMPA.
3. SEE AIRPORT HEIGHT ZONING MAP "ZONE "A".
4. THE VERTICAL CLEARANCE (V.C.) OVER ROADS PER CODE OF FEDERAL REGULATIONS IS 17 FEET FOR INTERSTATE HIGHWAYS, 15 FEET FOR ANY OTHER PUBLIC ROADWAY, AND 10 FEET FOR A PRIVATE ROAD. THE VERTICAL CLEARANCE OVER A RAILROAD IS 23 FEET.
5. VERTICAL CLEARANCES (V.C.) FOR ROADS/RAILROADS ARE CALCULATED USING THE ELEVATION OF THE ROAD/RAILROAD AT THAT POINT MEASURING VERTICALLY TO THE INTERSECTION OF THE SPECIFIC SURFACE. ROAD ELEVATIONS ARE ESTIMATED.
6. BASE IS FROM AERIAL PHOTOGRAPHY FLOWN IN 2014.

OBSTRUCTION DATA TABLE

RW End	Object ID No.	Object Description	Object Elevation [MSL]	Approach Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction	Triggering Event
RW18	8766	TREE *	57.58	24.70	TRIM OR REMOVE	NONE
RW18	8895	TREE	16.08	7.24	TRIM OR REMOVE	
RW18	12589	TREE	36.76	13.78	TRIM OR REMOVE	NONE
RW18	12597	TREE	44.16	15.20	TRIM OR REMOVE	NONE
RW18	12613	TREE	44.08	9.8	TRIM OR REMOVE	NONE
RW18	12621	TREE	36.40	0.18	TRIM OR REMOVE	NONE
RW18	12645	TREE	31.68	2.03	TRIM OR REMOVE	NONE
RW18	12653	TREE	30.04	2.14	TRIM OR REMOVE	NONE
RW18	12661	TREE	33.12	7.86	TRIM OR REMOVE	NONE
RW18	12717	TREE	29.12	14.54	TRIM OR REMOVE	NONE

RW End	Object ID No.	Object Description	Object Elevation [MSL]	Approach Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction	Triggering Event
RW18	12885	POLE	20.64	3.60	NONE	NONE
RW18	12893	FLAG POLE	33.06	12.14	LIGHT	NONE
RW18	12901	BUILDING	28.02	7.87	NONE	NONE
RW18	12925	BUILDING	17.28	1.47	NONE	NONE
RW18	13013	POLE	31.18	11.25	NONE	NONE
RW36	8993	TREE	20.46	2.12	TRIM OR REMOVE	NONE
RW36	12453	FENCE	10.12	3.50	NONE	NONE
RW36	12469	FENCE	11.00	4.36	NONE	NONE
RW36	12525	POLE	28.54	9.25	NONE	NONE

* RERPRESENTS THE HIGH POINT WITHIN AN AREA OF TREE PENETRATIONS

OBSTRUCTION DATA TABLE

RW END	Object ID No.	Object Description	Object Elevation [MSL]	TERPS OCS Penetrated	TERPS OCS Penetration (Feet)	Existing / Proposed Disposition of Obstruction
RW18 OCS	17471	TREE	38.74	YES	16.05	TRIM OR REMOVE
RW36 OCS	8077	TREE	27.54	YES	15.75	TRIM OR REMOVE
RW36 OCS	18383	FENCE	14.00	YES	2.02	NONE

SOURCE:
OBSTRUCTION SURVEY:
Aerometric, April 3-5, 2014
Compiled by URS, July 2015

LEGEND
FUTURE AVIGATION EASEMENT
CFR PART 77
APPROACH SURFACE
ROAD CLEARANCES
(A) CHANNEL DRIVE
EL. 6.0± (ACTUAL)
V.C.=15.1' PENETRATION
(B) COLUMBIA DRIVE
EL. 6.0± (ACTUAL)
V.C.=11' (4' PENETRATION)
(C) CAYUGA AVENUE
EL. 6.0± (ACTUAL)
V.C.=34'
(D) SEVERN AVENUE
EL. 4.0± (ACTUAL)
V.C.=2' (13' PENETRATION)

TRUE NORTH
VAR. 5°18'W (5.3')
MAGNETIC DECLINATION = 5°18' WEST (5.3') WEST (JANUARY 2015)
ANNUAL RATE OF CHANGE: 0°6' (0.1') WEST/YEAR
HORIZONTAL SCALE IN FEET
VERTICAL SCALE IN FEET

REVISIONS

BY	DATE

URS Corporation Southern
3034 Rocky Point Drive
Carrollwood Causeway
Tampa, FL 33607-1462

Michael Baker INTERNATIONAL

Tampa International Airport

PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

SHEET TITLE
INNER PORTION OF THE
APPROACH SURFACE DRAWING
RUNWAY 18/36

HCAA NO.: 6255 14
FDOT NO.: 415760-1

DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

Drawing Number: 7

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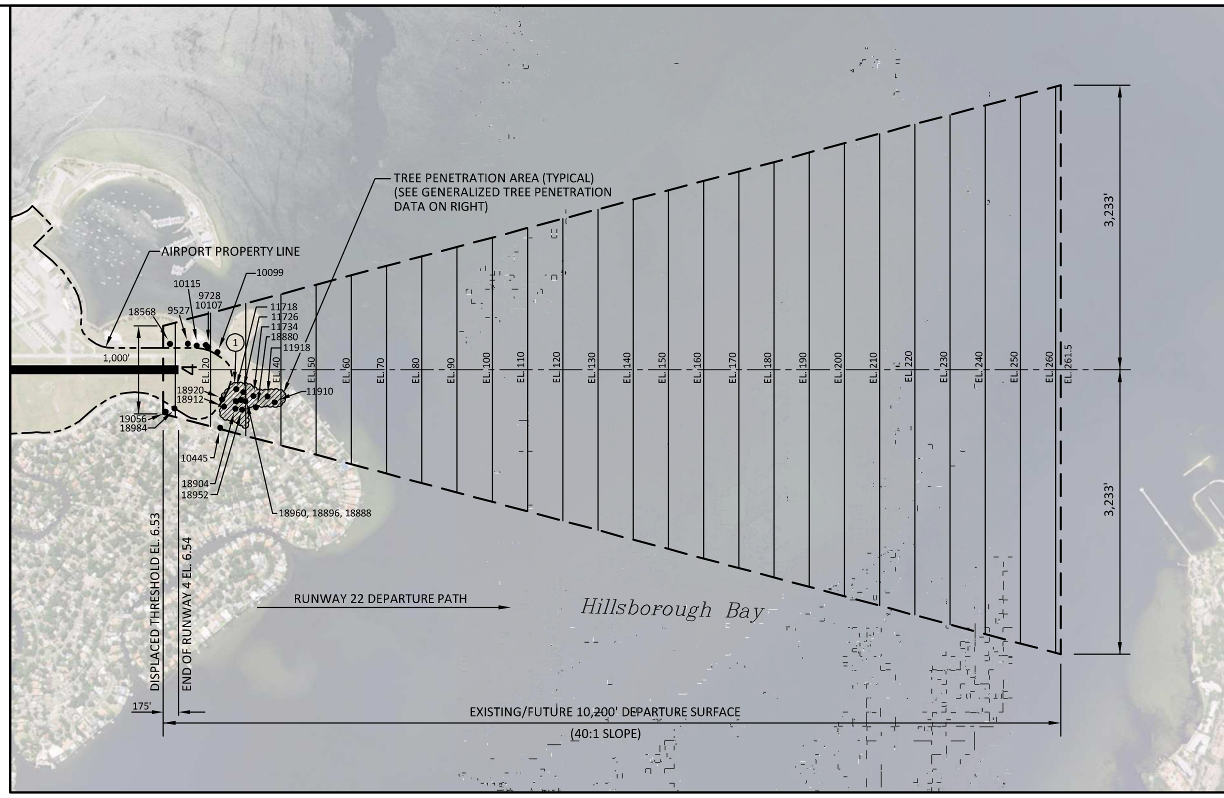
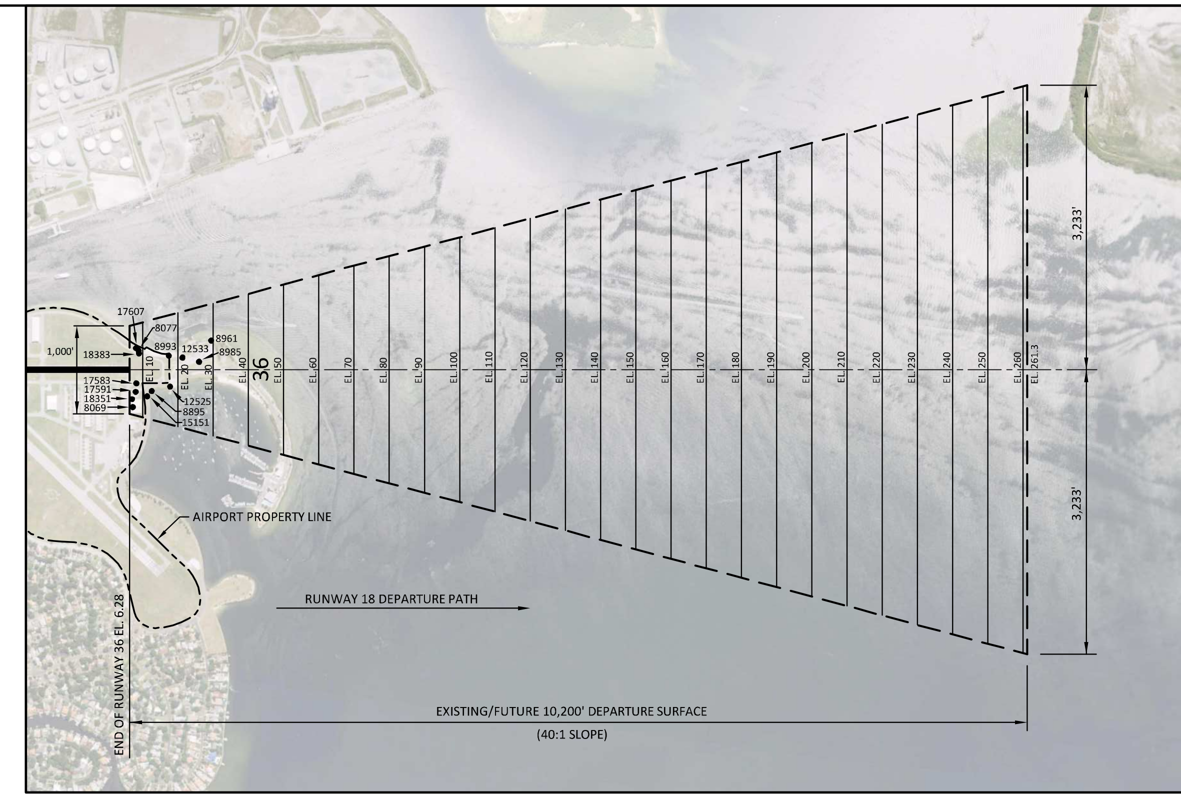


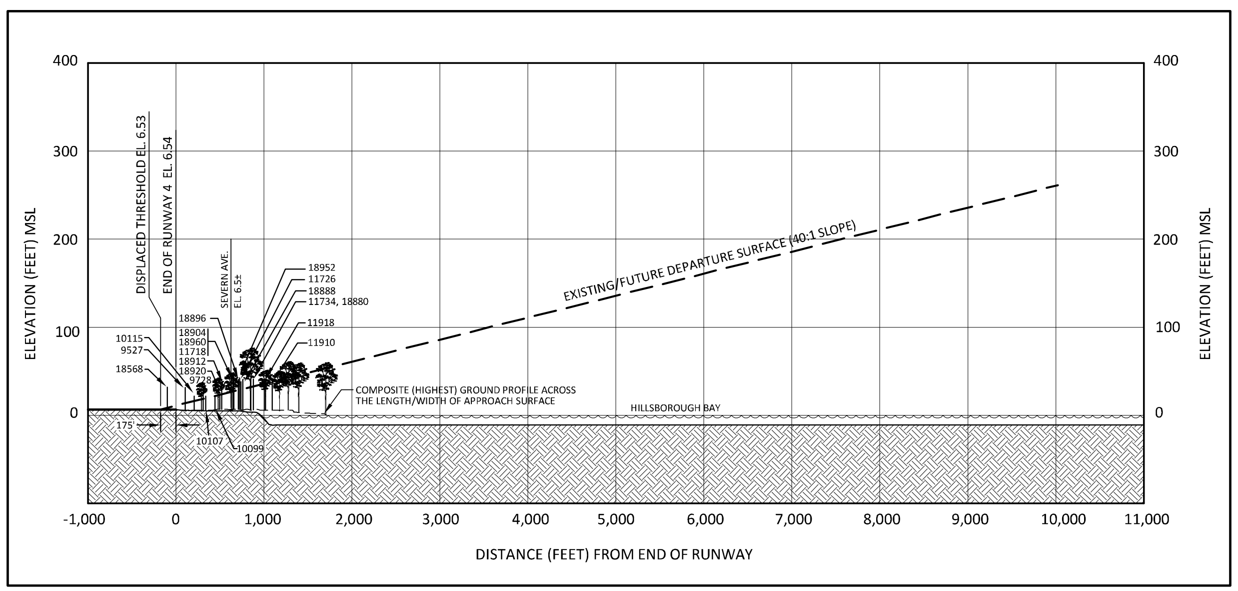


RUNWAY 22 DEPARTURE SURFACE PLAN VIEW

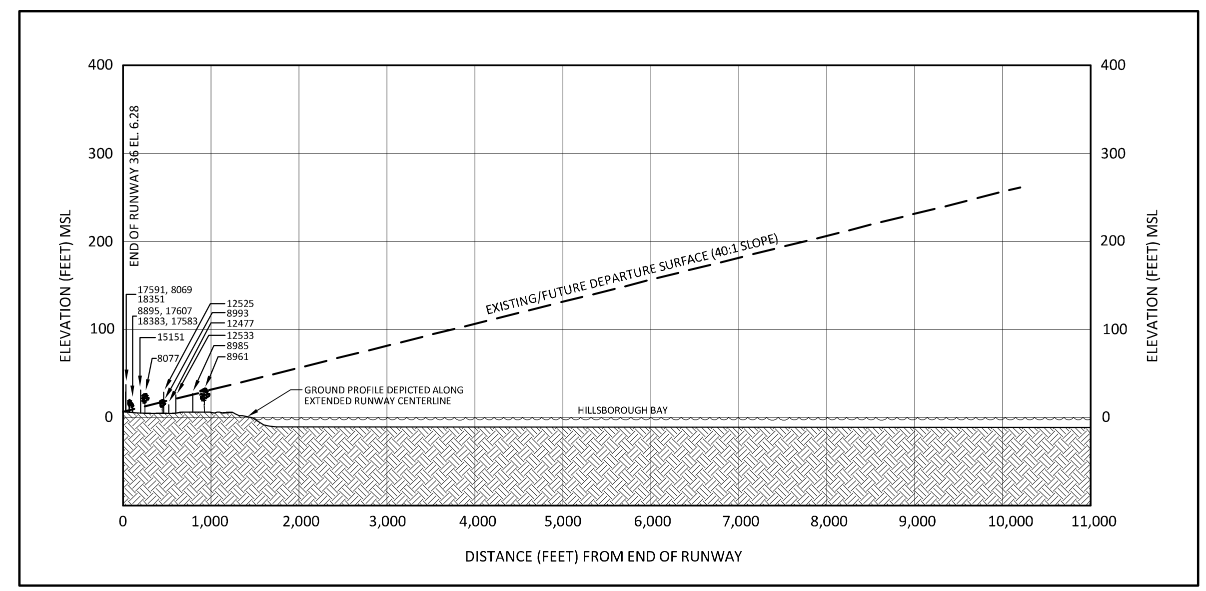
TRUE NORTH VAR. 5°18'W (5.3°)

RUNWAY 18 DEPARTURE SURFACE PLAN VIEW

TRUE NORTH VAR. 5°18'W (5.3°)



RUNWAY 22 DEPARTURE SURFACE PROFILE VIEW



RUNWAY 18 DEPARTURE SURFACE PROFILE VIEW

NOTES:

1. LOCAL ZONING IS CODIFIED AND ENFORCED VIA HCAA RESOLUTION 2010-54, AIRPORT ZONING REGULATIONS, UNDER THE PROVISIONS OF CHAPTER 333, FLORIDA STATUTES AND CHAPTER 2003-370, LAWS OF FLORIDA AS ADOPTED ON MARCH 1, 2010 FOR TPA, PCM, TPF AND VDF.
2. AIRPORT COMPATIBILITY DISTRICT "MA-P" ESTABLISHED BY CITY OF TAMPA.
3. SEE AIRPORT HEIGHT ZONING MAP "ZONE "A".
4. BASE MAP IS FROM AERIAL PHOTOGRAPHY FLOWN IN 2014.

OBSTRUCTION DATA TABLE

RW End	Object ID No.	Object Description	Object Elevation [MSL]	Departure Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction	RW End	Object ID No.	Object Description	Object Elevation [MSL]	Departure Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction	RW End	Object ID No.	Object Description	Object Elevation [MSL]	Departure Surface Penetration (Feet)	Existing / Proposed Disposition of Obstruction
18	8069	BUILDING	37.34	30.39	NONE	22	9527	POLE	31.59	22.55	LIGHT	22	18568	POLE	31.78	23.58	LIGHT
18	8077	TREE	27.54	18.69	TRIM OR REMOVE	22	9728	POLE	31.98	17.86	LIGHT	22	18880	POLE	40.74	12.36	LIGHT
18	8895	TREE	16.08	3.52	TRIM OR REMOVE	22	10099	PRIMARY ROAD	21.70	4.26	NONE	22	18888	POLE	40.38	14.98	LIGHT
18	8961	TREE	33.34	3.87	TRIM OR REMOVE	22	10107	PRIMARY ROAD	21.78	6.98	NONE	22	18896	POLE	40.41	16.25	LIGHT
18	8985	POLE	26.76	0.95	NONE	22	10115	PRIMARY ROAD	21.80	10.26	NONE	22	18904	POLE	41.75	19.22	LIGHT
18	8993	TREE	20.46	3.04	TRIM OR REMOVE	22	10445	TREE	79.96	57.48	TRIM OR REMOVE	22	18912	POLE	34.87	15.52	LIGHT
18	12525	POLE	28.54	10.97	NONE	22	11718	BUILDING	38.40	15.58	NONE	22	18920	POLE	24.72	5.94	LIGHT
18	12533	POLE	25.48	4.39	LIGHT	22	11726	BUILDING	38.32	13.47	NONE	22	18952	BUILDING	42.41	17.96	NONE
18	15151	POLE	30.70	19.63	LIGHT	22	11734	BUILDING	41.76	14.09	NONE	22	18960	BUILDING	43.38	20.67	NONE
18	17583	SIGN	8.62	0.64	NONE	22	11910	POLE	40.66	6.92	LIGHT	22	18984	TREE	39.25	29.75	TRIM OR REMOVE
18	17591	BUILDING	20.66	12.87	NONE	22	11918	POLE	40.06	8.38	LIGHT	22	19056	TREE	37.00	30.03	TRIM OR REMOVE
18	17607	TREE	20.11	12.00	TRIM OR REMOVE												
18	18351	BUILDING	28.78	22.02	NONE												
18	18383	FENCE	14.00	5.27	NONE												

SOURCE:
OBSTRUCTION SURVEY:
Aerometric, April 3-5, 2014
Compiled by URS, July 2015

LEGEND
TREE PENETRATION AREA - DEPARTURE SURFACE

GENERALIZED TREE PENETRATION DATA

GROUPING	RANGE OF PENETRATION
1	2 FT. - 29 FT.

MAGNETIC DECLINATION = 5°18' WEST (5.3°) WEST
(JANUARY 2015)
ANNUAL RATE OF CHANGE:
0°6' (0.1°) WEST/YEAR

HORIZONTAL SCALE IN FEET: 1000 0 1000
VERTICAL SCALE IN FEET: 100 0 100

DATE	REVISIONS	BY

URS Corporation Southern
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

Michael Baker INTERNATIONAL

Tampa International Airport

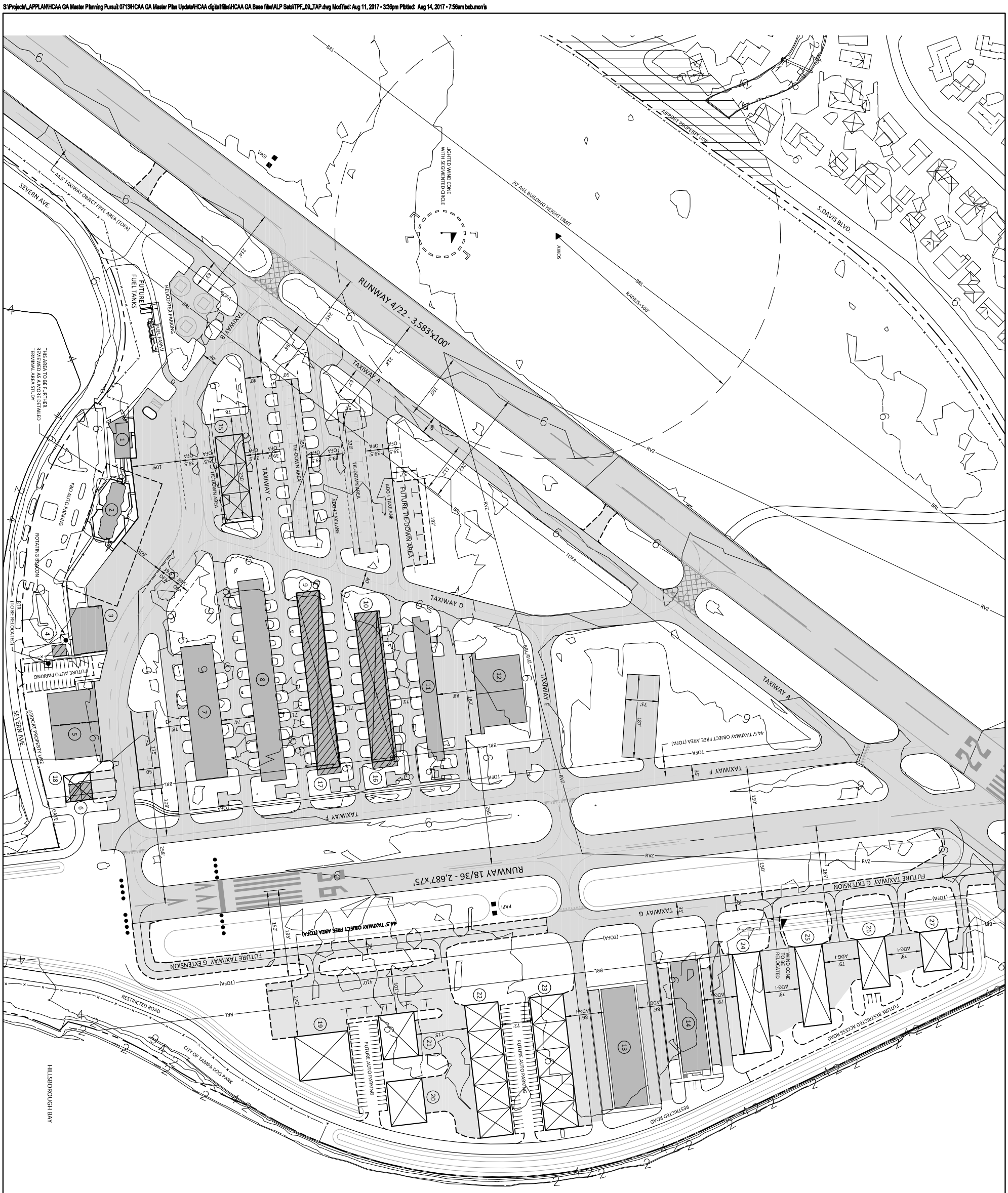
PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

SHEET TITLE
RUNWAY DEPARTURE SURFACES
PLAN AND PROFILE
RUNWAYS 22 AND 18

HCAA NO.: 6255 14
FDOT NO.: 415760-1

DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

Drawing Number: 8



LEGEND

ITEM	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
ROADS & PARKING		
BUILDINGS		
FENCE		
TAXIWAY OBJECT FREE AREA	TOFA	(TOFA)
RUNWAY VISIBILITY ZONE	RVZ	N/A
BUILDING RESTRICTION LINE	BRL	N/A
PAVEMENT TO BE REMOVED		
AWOS CRITICAL AREA EASEMENT	N/A	N/A
VASI / PAPI		N/A
THRESHOLD LIGHTS		N/A
WIND CONE		
ROTATING BEACON		N/A
AWOS		N/A
RTR		TBD

BUILDING/TENANT INDEX

NO.	BLDG. I.D. NO.	DESCRIPTION	ELEVATION (FT.) MSL (ESTIMATED)
1	2800	ADMINISTRATION BUILDING	18.75
2	3000	TERMINAL BUILDING	21.87
3	4800	FBO MAINTENANCE HANGAR (TO BE REMOVED)	27.01
4	5200	MAINTENANCE STORAGE UNIT (TO BE REMOVED)	17.57
5	5400	BULK HANGAR	36.41
6	5800	OPERATIONS AND MAINTENANCE SHOP (TO BE REMOVED)	21.39
7	4600	ENCLOSED HANGAR (10 UNITS)	26.75
8	4400	ENCLOSED HANGAR (21 UNITS)	21.95
9	4200	SHADE HANGAR (19 UNITS) (TO BE REMOVED)	21.64
10	4000	ENCLOSED/OPEN PUSHBACK HANGAR (16 UNITS) (TO BE REMOVED)	22.66
11	3800	ENCLOSED HANGAR (10 UNITS)	22.39
12	3400	BULK HANGAR	30.32
13	6800	ENCLOSED HANGAR (6 UNITS)	33.00
14	6000	ENCLOSED HANGAR (10 UNITS)	27.00
15	TBD	FUTURE HANGAR (3 UNITS)	TBD
16	4000	FUTURE T-HANGAR (18 UNITS)	TBD
17	4200	FUTURE T-HANGAR (15 UNITS)	TBD
18	5600	FUTURE HANGAR (60'x60')	TBD
19	8000	FUTURE HANGAR (100'x120')	TBD
20	7800	FUTURE HANGAR (80'x100')	TBD
21	7400	FUTURE HANGAR (80'x100')	TBD
22	7200	FUTURE HANGAR (60'X75') (5 UNITS)	TBD
23	7000	FUTURE HANGAR (60'X75') (5 UNITS)	TBD
24	6400	FUTURE T-HANGAR (9 UNITS)	TBD
25	6200	FUTURE T-HANGAR (7 UNITS)	TBD
26	6000	FUTURE T-HANGAR (4 UNITS)	TBD
27	5800	FUTURE T-HANGAR (3 UNITS)	TBD

MAGNETIC DECLINATION = 5°28' WEST (5.3°) WEST
ANNUAL RATE OF CHANGE:
0°6' (0.1°) WEST/YEAR

VAR. 5.18°W (5.3°)
TRUE NORTH

GRAPHIC SCALE IN FEET
100 0 100

DESIGNED:	MJK
DRAWN:	RJM
CHECKED:	MLT
DATE:	AUGUST 2017

Drawing Number: 6

HCAA NO.: 6255.14
FDOT NO.: 415760-1

SHEET TITLE: TERMINAL AREA DRAWING

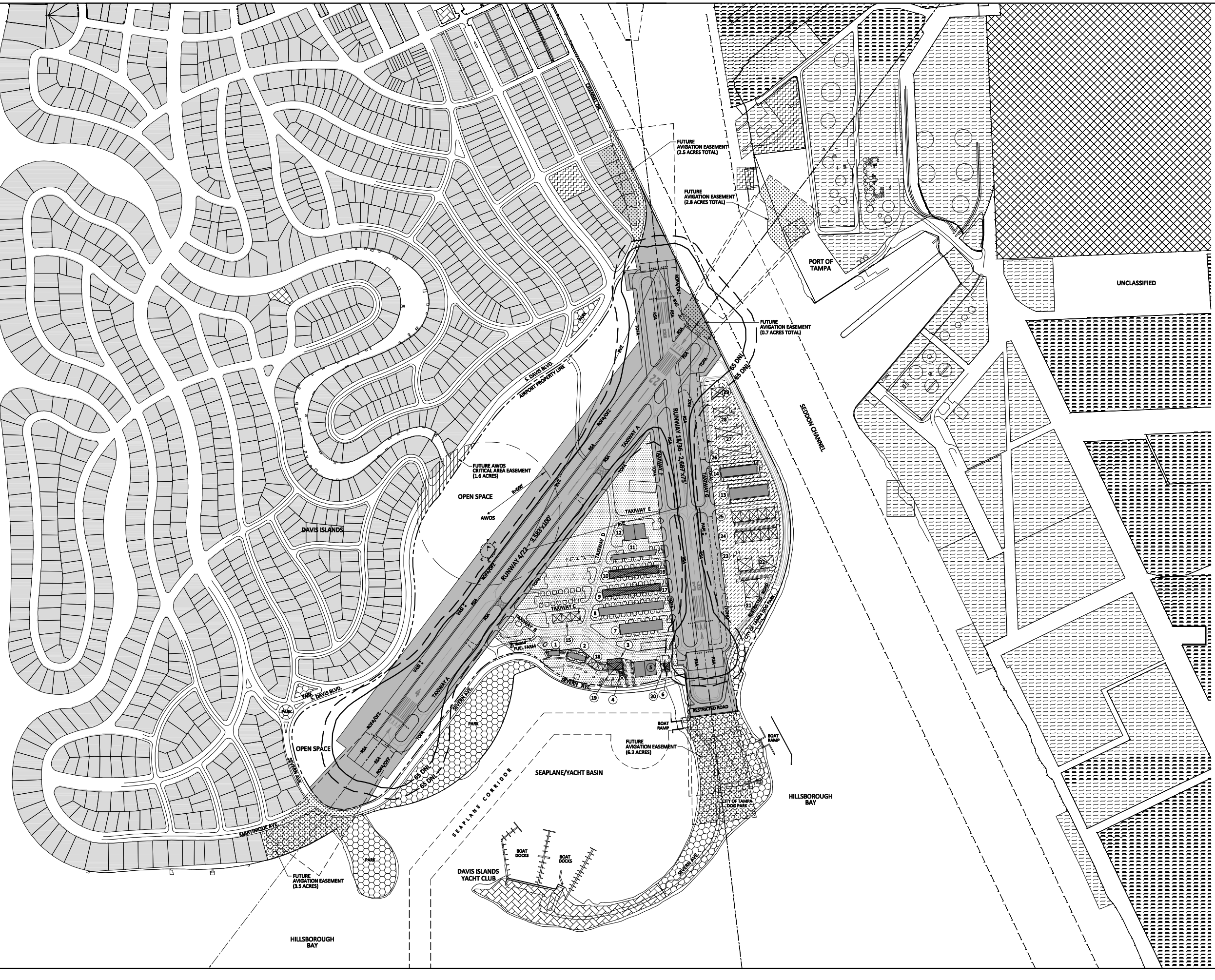
PROJECT NAME: MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

Tampa International Airport

Michael Baker INTERNATIONAL

URS Corporation Southern
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

DATE	REVISIONS	BY



BUILDING/TENANT INDEX

NO.	DESCRIPTION	ELEVATION (FT.) MSL (ESTIMATED)
1	ADMINISTRATION BUILDING	18.75
2	TERMINAL BUILDING	21.87
3	FBO MAINTENANCE HANGAR (TO BE REMOVED)	27.01
4	MAINTENANCE STORAGE UNIT (TO BE REMOVED)	17.57
5	BULK HANGAR	36.41
6	OPERATIONS AND MAINTENANCE SHOP (TO BE REMOVED)	21.39
7	ENCLOSED HANGAR (10 UNITS)	26.75
8	ENCLOSED HANGAR (21 UNITS)	21.95
9	SHADE HANGAR (19 UNITS) (TO BE REMOVED)	21.64
10	ENCLOSED/OPEN PUSHBACK HANGAR (16 UNITS) (TO BE REMOVED)	22.66
11	ENCLOSED HANGAR (10 UNITS)	22.39
12	BULK HANGAR	30.32
13	ENCLOSED HANGAR (8 UNITS)	33.90
14	ENCLOSED HANGAR (10 UNITS)	27.00
15	FUTURE HANGAR (3 UNITS)	TBD
16	FUTURE T-HANGAR (18 UNITS)	TBD
17	FUTURE T-HANGAR (15 UNITS)	TBD
18	FUTURE FBO BUILDING	TBD
19	FUTURE FBO HANGAR (100'x80')	TBD
20	FUTURE HANGAR (60'x60')	TBD
21	FUTURE HANGAR (4 UNITS)	TBD
22	FUTURE HANGAR (3 UNITS)	TBD
23	FUTURE HANGAR (11 UNITS)	TBD
24	FUTURE HANGAR (13 UNITS)	TBD
25	FUTURE HANGAR (13 UNITS)	TBD
26	FUTURE HANGAR (6 UNITS)	TBD
27	FUTURE HANGAR (6 UNITS)	TBD
28	FUTURE HANGAR (2 UNITS)	TBD
29	FUTURE MAINTENANCE BUILDING (100'x50')	TBD

LEGEND

- AOA
- TERMINAL AREA
- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- INSTITUTIONAL
- RECREATIONAL
- UTILITIES
- FUTURE EXPANSION AREA
- FUTURE AVIGATION EASEMENT
- AWOS CRITICAL AREA
- OPEN SPACE
- 2013 65 DNL NOISE CONTOUR
- 2033 65 DNL NOISE CONTOUR
- EXISTING BUILDING
- FUTURE BUILDING
- FUTURE PAVEMENT
- PAVEMENT TO BE REMOVED

NOTES:

1. LOCAL ZONING IS CODIFIED AND ENFORCED VIA HCAA RESOLUTION 2010-54, AIRPORT ZONING REGULATIONS, UNDER THE PROVISIONS OF CHAPTER 333, FLORIDA STATUTES AND CHAPTER 2003-370, LAWS OF FLORIDA AS ADOPTED ON MARCH 1, 2010 FOR TPA, PCM, TPF AND VDF.
2. AIRPORT COMPATIBILITY DISTRICT "MA-P" ESTABLISHED BY CITY OF TAMPA.
3. SEE AIRPORT HEIGHT ZONING MAP "ZONE "A".

MAGNETIC DECLINATION = 5°18' WEST (5.3°) WEST
(JANUARY 2015)
ANNUAL RATE OF CHANGE:
0°6' (0.1°) WEST/YEAR

300 0 300
HORIZONTAL SCALE IN FEET

BY	REVISIONS	DATE

URS Corporation Southern
3030 Clark Avenue
Carrollwell Causeway
Tampa, FL 33607-1462

Michael Baker INTERNATIONAL

Tampa International Airport

PROJECT NAME
MASTER PLAN UPDATE
PETER O. KNIGHT AIRPORT
Tampa, Florida

SHEET TITLE
LAND USE DRAWING

HCAA NO.: 6255 14
FDOT NO.: 415760-1

DESIGNED: MJK
DRAWN: RJM
CHECKED: MLT
DATE: AUGUST 2017

Drawing Number:
10

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