1.0 Inventory of Existing Conditions

1.1 Master Plan Overview

The City of Tallahassee contracted with Michael Baker International in 2015 to develop a Master Plan Update for the Tallahassee International Airport (TLH). Since the previous Master Plan Update was completed 2006, several changes in Federal Aviation Administration (FAA) design standards and policies occurred and it was necessary to reassess the airport's immediate and long-term compliance, maintenance, and development needs. The FAA periodically requires airports to conduct updated planning efforts and to maintain an updated Airport Layout Plan (ALP) Drawing Set that depicts the airport's proposed development program and boundaries. The FAA requires airport sponsors to agree to assurances or obligations to be eligible to receive federal grants from the Airport Improvement Program (AIP), one of which is to keep an up to date ALP Drawing Set at all times. The intent of this Master Plan Update is to provide the detailed justifications, methodologies, and reasoning for the proposed developments shown within the ALP Drawing Set. The airport was recently renamed as an 'international facility' to highlight its far reaching impacts that extend outside of the Tallahassee area. At the beginning of 2016, the City was actively pursuing making the airport property into a Foreign Trade Zone (FTZ) to provide a site where new facilities, jobs, and businesses could be fostered without being subject to high import/export fees. Those actions highlight the path moving forward for the airport and this Master Plan Update—to be able to capitalize on opportunities that will make TLH into a broader facility for air travel, business development, and trade. This Master Plan Update also emphasizes the need for sustainable developments that are in-line with Tallahassee's sustainability plan (GreenPrint) and environmentally- and financially-conscious strategies from the FAA and Florida Department of Transportation (FDOT) Aviation and Spaceports Office. As part of the City's commitment to sustainability and customer service, three Tesla charging stations were recently installed at TLH to improve technology and enhance amenities at the airport,

As stressed throughout this Master Plan Update, TLH has a lot of potential for continued growth. It is located in the Capital City of Florida that is home to large institutions like Florida State University (FSU) and a thriving technology sector. The airport is owned and managed by the City of Tallahassee and the airport operating budget (the Aviation Fund) is fully-covered by fees charged to users of TLH. The Aviation Fund does not require contributions from the City's General Fund and excess revenues are used to fund capital improvements and to offer incentives to airlines.

The primary objective of this Master Plan Update was to produce a 20-year development program that would maintain a safe, efficient, economical, and environmentally-acceptable aviation facility while also identifying recommendations for improving customer service and technology. The key elements of the planning process are shown in **Figure 1-1**. It is important to point out that a Technical Advisory Committee (TAC) was formed to provide input throughout the planning process and public participation was also encouraged. The TAC provided an integral role in the planning effort and consisted of representatives from government agencies, airport users, airport businesses, and the public. Several meetings were held throughout the study to present information to the TAC, and was furthermore presented and discussed in an open forum at community workshop/public meetings, Airport Advisory Committee meetings, and Tallahassee Commission Meetings. The goal was to keep all stakeholders informed about all study issues and recommendations.

1.2 Key Issues

Specific issues that were evaluated as part of the planning process are delineated below, and specific tasks were incorporated into the study in an effort to address these considerations. This is not intended to be an exhaustive listing of items that require consideration within this Master Plan Update, but identifies major concerns or issues that should be addressed in support of the City of Tallahassee's long-term goals for TLH. Some specific goals and objectives to be considered include:

- Assess the operational efficiency, effectiveness, and safety of the airport.
- Evaluate the airport facility layout for conformance with FAA guidance and regulations.
- Evaluate and incorporate the aviation needs of the both the community and users.
- Assess the needs of current tenants and requirements necessary to attract new tenants and/or to expand their facilities.
- Assist the airport in supporting aviation demand within the region.
- Identify existing and alternative funding sources for airport development.
- Identify areas of environmental concern and provide mitigation options for future development.
- Evaluate long-term development options for commercial passenger, cargo, general aviation and airport support facilities.
- Identify vertical obstructions and investigate the associated impacts and/or mitigation options.
- Collect additional survey data as necessary to meet FAA AC 150/5300-18B for Airport Layout Plans.

The airport master plan also provides sustainable guidance for future airport development that will satisfy aviation demand in a cost-effective, feasible manner while addressing aviation, environmental, and socioeconomic issues of the community. In support of this goal, the planning team conducted assessments of air quality, greenhouse gas emissions, natural resource consumption, and energy usage so that sustainability goals, initiatives, and improvements could be identified for daily activities and infrastructure improvement projects that occur throughout the 20-year planning period.

Another key expectation of the master plan was to interface with and consider the recommendations of several important and separate initiatives that were conducted simultaneously during the study. Each initiative referenced below had an impact on future facility needs and were carefully considered as future development alternatives were formulated.

- Air Service Development Campaign
- Establishment of a Foreign Trade Zone
- Establishment of Solar Farm Facilities
- Establishment of a Federal Inspection Services Facility
- Passenger Terminal Modernization Program
- Capital Circle Improvements

1.3 Inventory Background

The initial step in the planning process requires producing an inventory of existing conditions for the airport. This is necessary for understanding the framework for how the airport functions and to provide a foundation for evaluating the airport's existing and future facility requirements and development recommendations. The information collected as part of the inventory effort included the following:

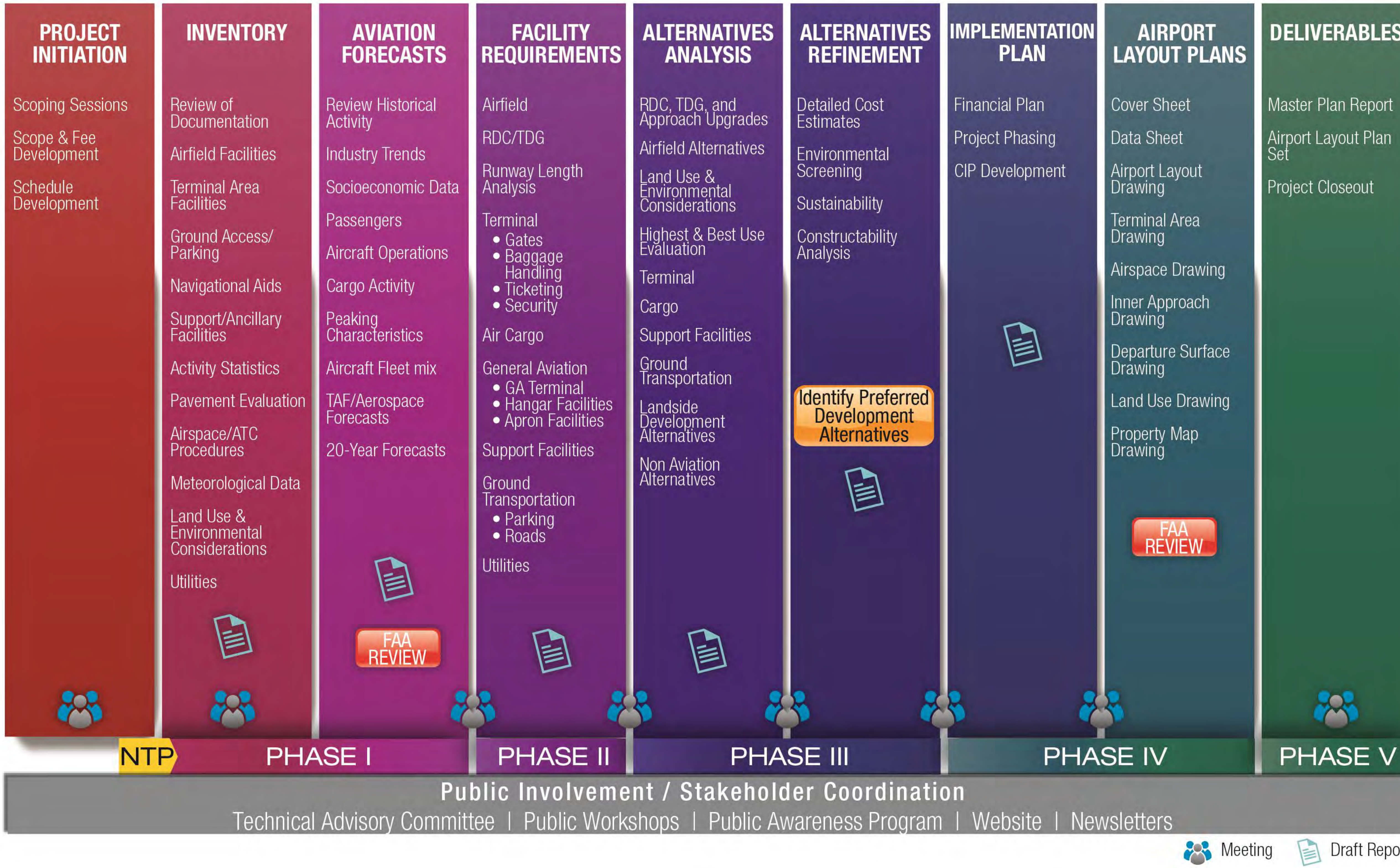
- Existing physical facilities such as runway, taxiways, aircraft parking aprons, navigational aids, the passenger terminal area, and information about other areas for general aviation, corporate, and aviation support activities.
- The airport's overall role in Northwest Florida including development history, location, and access relationship to other transportation modes.
- Previous studies that contain information related to the development and eventual implementation of projects at TLH.

In order to obtain an accurate depiction of the existing conditions of TLH and its surrounding community, it was necessary to obtain information from sources such as:

- Interviews with airport personnel
- Interviews with TLH users and tenants
- Correspondence with local, state, and federal agencies
- Updated aerial photography and mapping for the airport
- Available sources of updated facility information for the airfield, approaches, and activity
- Reference materials such as FAA publications, activity databases, and planning guidelines
- Review of airport and FAA statistical reports

The remaining sections of this chapter document the inventory of existing conditions for TLH.

Figure 1-1
Master Planning Process



1.4 Airport History

The airport was initially developed in 1928 as the first municipal airport in the City of Tallahassee and was located approximately where the James Messer Sports Complex is located today. It originally had a single turf runway and was named Dale Mabry Field after a famous World War I aviator and Florida native. In 1938, at the emergence of World War II, the United States Army established a fighter pilot training school on site, constructing three runways and significantly expanding the facility. In 1961, Dale Mabry Field was abandoned and Tallahassee Municipal Airport was established in its current location. Recently, Tallahassee Regional Airport was renamed Tallahassee International Airport to emphasize its far reaching contributions.

As shown in the picture on the right from 1983 (courtesy of the Tallahassee-Leon County Geographic Information Systems Department), the passenger terminal building used to be located on the North Ramp. TLH has undergone several major airfield improvements including the construction of Runway 9-27 in the early 1980s, which now handles most of the commercial activity. Runway 9-27 was recently reconstructed to address design standard deficiencies for line-of-sight issues. This was due to a hump in the middle of the runway preventing line-of-sight for aircraft from one end of the runway to the other. Reconstruction of the runway to rehabilitate the pavement and remove the hump was completed in 2015, which mitigated the safety risks, reduced delays for aircraft, and brought the runway to full compliance with FAA design standards. To increase the flexibility of the airfield, Runway 18-36 was recently extended from 6,076 feet to 7,000 feet. Several improvements have also been conducted for cargo and general aviation facilities as well. It is worth noting that many of the recommendations from the previous Master Plan Update have been implemented at TLH, which is another factor that prompted this new planning effort.

In addition to the airfield improvements, several landside improvements have been implemented at TLH. These improvements include a Terminal Modernization Project. This project includes multiple improvements to short- and long-term passenger demands and also to meet modern spacing requirements. The Terminal Modernization Project will enhance the customer experience for travelers by providing convenience and efficiency. The project will include reconfiguring TLH's lobby up to the Transportation Safety Administration (TSA) checkpoint, a new baggage claim system, ticket counters for airlines and rental car agencies, safety screening machines, a new TSA screening room, and other aesthetic upgrades.

1.5 Airport Location and Ground Access

Tallahassee International Airport is located in Florida's Panhandle and is approximately a six mile drive from Downtown Tallahassee and Interstate 10 (I-10), which runs between Santa Monica, California and Jacksonville, Florida. Capital Circle Southwest is the airport's northern border and is the road where all landside facilities are located along. It is currently a two-lane rural road, but FDOT is in the process of expanding the road into a six-lane urban roadway with bike lanes and sidewalks to provide improved access to and from TLH in accordance with Blueprint 2020. Springhill Road is the primary travel route between TLH and Downtown Tallahassee. It is a two-lane road near the airport until it intersects with West Orange Avenue and then it becomes a four-lane road everywhere north into the Downtown area. **Figure 1-2** illustrates the general location and vicinity of TLH in relation to the State of Florida. The airport property encompasses approximately 2,743 acres of property and is located in Leon County.

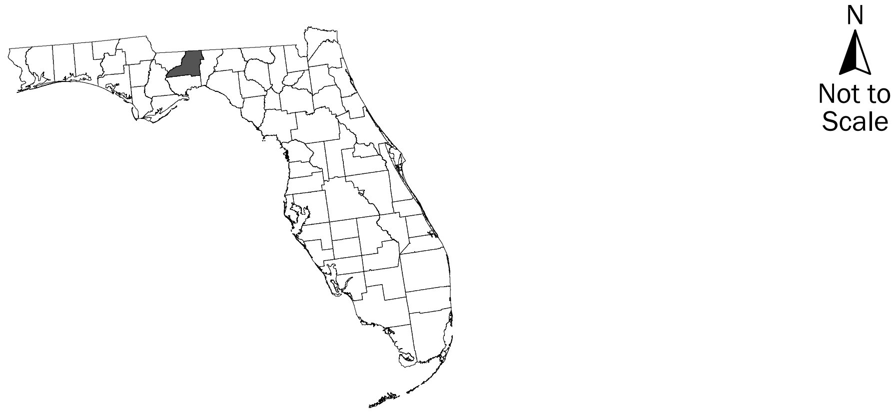
The City of Tallahassee is the largest city in Northwest Florida. The City is home to most state agency headquarters and employees as well as public facilities such as hospitals, FSU, Florida A&M University, and Tallahassee Community College (TCC).

1.6 Airport Management Structure

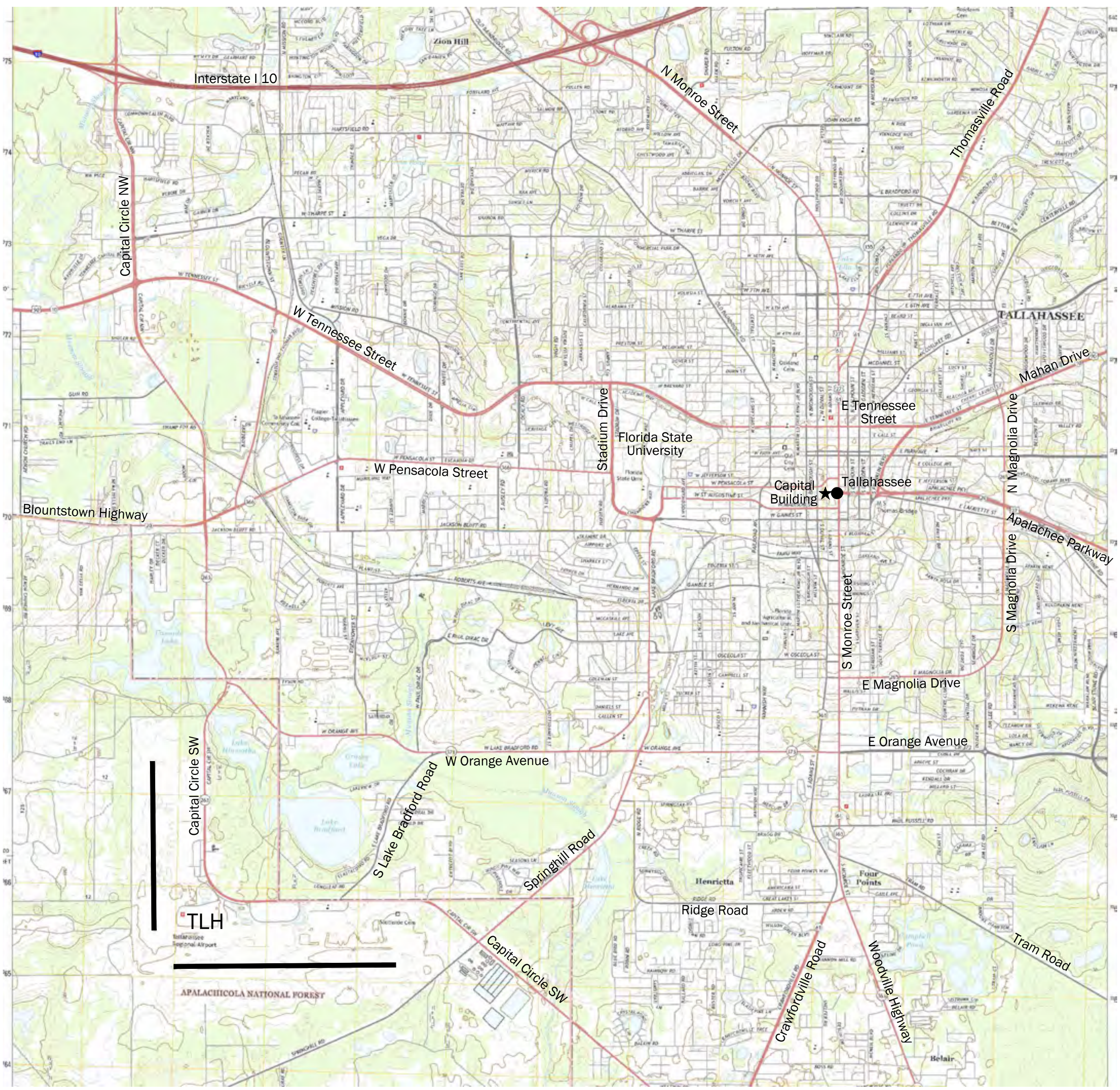
As the airport owner/sponsor, it is the City of Tallahassee's responsibility to determine the ultimate recommendations and long-term development objectives for TLH. Therefore, the City Commission has the ultimate approval authority for the airport. The airport is run by the Director of Aviation who serves at the pleasure of the City Manager. There are six divisions within the Aviation Department and approximately 50 employees. The following divisions fall under the Aviation Department:

- Executive Division
- Commercial Development Division
- Finance and Administration Division
- Facilities and Maintenance Division
- Operations, Security, and Information Technology Division
- Planning, Development, and Environmental/Technical Services Division

Each division plays an integral role at TLH and helps the Aviation Department support their five strategic cornerstones of "building a high performance organization, expanding for the future, preserving the airport's financial health, building stronger relationships in the community, and enhancing and delivering best-in-class customer service". There is also an Airport Advisory Committee consisting of 18 members that serve in an advisory capacity to the City and Aviation Department. The role of the group is to address issues related to TLH and promote economic development opportunities.



Leon County, Florida



Michael Baker INTERNATIONAL

Figure 1-2 Location / Vicinity Map

1.7 Previous Studies

During the course of this Master Plan Update, existing plans and studies were reviewed and evaluated in order to obtain relevant background information. These included but were not limited to previous planning studies, design drawings, the previous ALP Drawing Set, and relevant FAA and state role assessments. The following section provides an overview of the various studies during that were reviewed as part of this effort.

2006 Master Plan Update

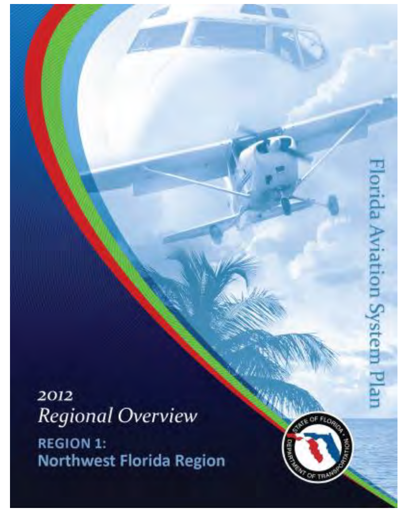
Below is a listing of major recommendations from the 2006 Master Plan Update for TLH. The recommendations included a mix of projects such as airfield modifications, terminal building upgrades, apron improvements, additional cargo facilities, and other landside and general aviation projects, many of which have been implemented at TLH. Some of the recommendations are also explored in this Master Plan Update for their continued need today and additional recommendations are identified in later sections of this study.

- Reconstruct Runway 9-27 to meet line-of-sight requirements ***(completed)***
- Extend Runway 18-36 to 7,000 feet ***(completed)***
- High speed exit taxiways along Runway 9-27 ***(unlikely to pursue moving forward due to changes in FAA criteria)***
- Taxiway configuration and sizing deficiencies ***(to be analyzed further)***
- Development of the general aviation aprons ***(ongoing)***
- Precision approaches to the Runways 9 and 18 ***(may reserve for the potential at TLH)***
- Installation of Local Area Augmentation System (LAAS) approaches ***(to be analyzed further)***
- Ten new helipads and a helicopter facility ***(to be analyzed further)***
- Relocation of the FedEx facility to the area east of the passenger terminal building ***(completed)***
- Extending the ticket lobby, baggage claim lobby, and the concourse layout ***(ongoing)***
- Terminal apron expansion ***(to be analyzed further)***
- Widening of Capital Circle Southwest ***(ongoing)***
- Developing a multimodal transportation center ***(to be analyzed further)***
- Developing a hotel on airport property ***(to be analyzed further)***

Other recently-completed projects not mentioned above include aesthetic, security, and concessions improvements within the passenger terminal building, apron rehabilitation, the preparation of various studies (terminal enhancement, safety management system, pavement management system, marketing and promotional study, FTZ Feasibility Study, etc.), and this Master Plan Update. Through 2021, there are plans to conduct a variety of additional improvements at TLH including further passenger terminal projects, reconstruction of the South Ramp, airfield maintenance projects, implementation of the FTZ, Terminal Apron improvements, airfield lighting and signage improvements, security fence and gate rehabilitations, the construction of a consolidated rental car facility, further upgrades to the Airport Traffic Control Tower (ATCT), new hangar development, utility upgrades, rehabilitation of the ARFF station, parking improvements, overlay of Runway 18-36, rehabilitation of the perimeter roads, modernization of computer systems, and study updates. This aggressive development plan over the next several years will require funds from the FAA, FDOT, the City's Aviation Fund, and other private sources, but will not require the use of local taxpayer dollars to pay for the aviation-related projects.

Continuing Florida Aviation System Planning Process (CFASPP)

The Continuing Florida Aviation System Planning Process (CFASPP) is FDOT's strategic plan for developing the state's 129 public-use airports. The CFASPP provides documentation of airports and related facilities needed to meet current and projected statewide aviation demands. The CFASPP is used to continually monitor Florida's aviation environment and determine the development requirements to best meet projected aviation demands. The CFASPP classifies the public-use airports in the state as follows:



- Commercial Service
- General Aviation Reliever
- General Aviation
- Heliport
- Seaplane Base

According to the CFASPP role classifications, TLH is a Commercial Service Airport that provides an existing and future role for tourism, business development, air cargo, and all facets of general aviation. The only role the CFASPP does not identify for TLH is for current and future international air service opportunities, which occur at larger airports in Florida like Miami International Airport (MIA), Orlando International Airport (MCO), and Tampa International Airport (TPA). A large amount of the passenger traffic at TLH is generated by state employee travel, student travel from the local universities, and athlete transport between FSU and competing athletic teams.

Federal Aviation Regulations (FAR) Part 139 Certification

The FAA provides certification of airports for commercial operations under Federal Aviation Regulations (FAR) Part 139, Certification of Airports. Airports with scheduled and unscheduled air carrier services with at least 30 seats and scheduled air carrier service with 10 to 30 seats must hold a FAR Part 139 Airport Operating Certificate (AOC) and comply with FAR Part 139 safety, facility, security, and recordkeeping requirements for the respective class. The FAR Part 139 certification categorizes airports into four classes, based on the type of air carrier operations at the facility. **Table 1-1** describes the FAR Part 139 categories based on the type of air carrier operations served. TLH obtained its FAR Part 139 Certification in May 1973 and undergoes an annual inspection by the FAA to keep the certification current. The airport currently has as a Class I AOC and is open to all sizes of air carrier operations (both scheduled and unscheduled).

Table 1-1 FAR Part 139 Categories	
Class	**Description**
Class I	Airports serving all types of scheduled operations of air carrier aircraft designed for at least 31 passenger needs.
Class II	Airports that serve scheduled operations of small air carrier aircraft and unscheduled operations of large air carrier aircraft.
Class III	Airports that serve only scheduled operations of small air carrier aircraft.
Class IV	Airports are those airports that serve only unscheduled operations of large air carrier aircraft.
Source: FAR Part 139, Certification of Airports.	

FAA National Plan of Integrated Airport Systems (NPIAS)

The FAA's National Plan of Integrated Airport Systems (NPIAS) is a five-year planning report submitted every two years to Congress which identifies development needs for certain airports throughout the country. The NPIAS identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and establishes priority grouping for funding initiatives for those airports included in the system. The airport service level illustrates the type of public-use the airport provides to the community. In addition, the service level reflects the funding categories established by Congress to assist in airport development. **Table 1-2** presents the NPIAS categories and descriptions.

The 2015-2019 NPIAS report includes 100 airports in the State of Florida. The report classifies TLH as Non-hub Primary Commercial Service Airport, which are defined as "commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements." There are 19 commercial service airports in Florida including four large hubs, three medium hubs, seven small hubs, and five non-hubs. The four other non-hub airports include Daytona Beach International Airport (DAB), Gainesville Regional Airport (GNV), Melbourne International Airport (MLB), and Punta Gorda Airport (PGD). The determination of the hub size is based on passenger enplanement activity as a certain percentage of nationwide enplanement activity. There are 29 large hubs in the country and they account for one percent or more of nationwide enplanements. Small hubs are those airports that enplane 0.05 percent to 0.25 percent of nationwide enplanements while medium hubs are in the 0.25 percent to one percent range. The potential for TLH to change from a non-hub to a small hub is explored later in this Master Plan Update, particularly considering that enplanement levels at TLH are near the levels of some small hub airports in Florida. **Figure 1-3** illustrates the NPIAS airports that are located in Northern Florida.

Table 1-2 FAA NPIAS Service Level	
Category	**Criteria**
Commercial Service – Primary	Public use commercial airports enplaning more than 10,000 passengers annually.
Commercial Service – Non-primary	Public use commercial airports enplaning between 2,500 and 10,000 passengers annually.
General Aviation – Reliever	General aviation airport having the function of relieving congestion at a commercial service airport and providing general aviation access to its community. Must have at least 100 based aircraft or 25,000 annual itinerant operations.
General Aviation	All other NPIAS airports.
Source: FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems.	

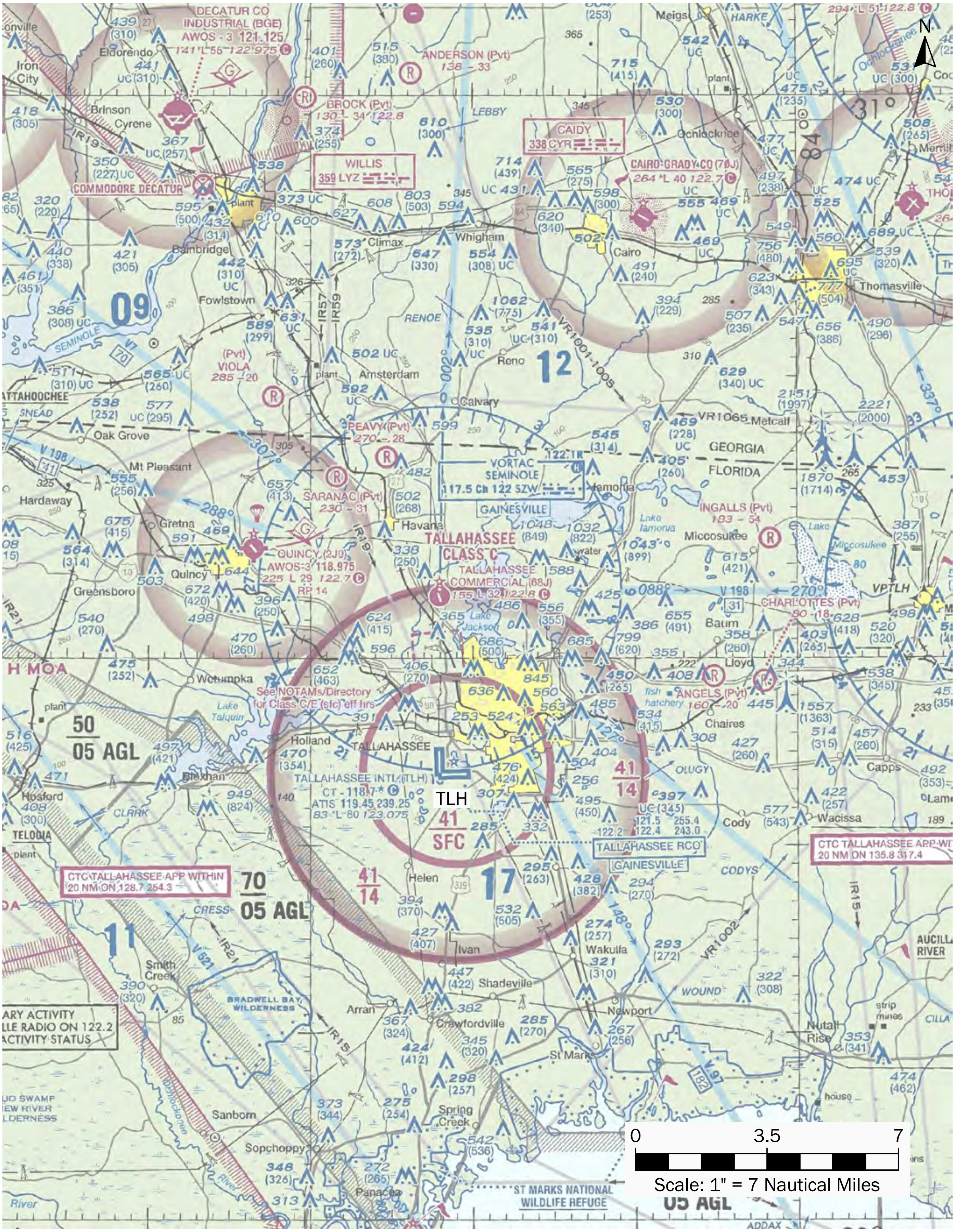


Figure 1-4 Sectional Aeronautical Chart

1.8 Climate

Weather conditions are important to the planning and development of an airport. Temperature is a critical factor in determining runway length requirements, while wind direction and speed are used to determine adequate runway orientation. Also, navigational aid and lighting needs are determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions.

Temperature Data

Tallahassee experiences a subtropical summer similar to the rest of Florida and has the mild moist climate characteristics of the Gulf States. TLH lies within the central portion of the Florida Panhandle at an elevation of approximately 83 feet Above Mean Sea Level (AMSL). The proximity to the Gulf of Mexico makes for a humid subtropical climate. The area experiences long summers, short mild winters, and drier springs and autumns. During the summer months, the average daily high temperature is above 90 degrees Fahrenheit while the average daily high temperature during the winter months is greater than 60 degrees Fahrenheit. **Table 1-3** lists historical climate data for Tallahassee that were obtained from the climate normals data that was evaluated over the period from 1981 to 2010 by the National Climatic Data Center (NCDC). The high month for precipitation tends to be in June with an average of 7.73 inches and the low month is April with 3.06 inches.

Table 1-3
Historical Climate Normals (1981-2010)

Month	Average Precipitation (Inches)	Average Daily High Temp (°F)	Average Daily Low Temp (°F)
January	4.34 In	63.5°	39.0°
February	4.85 In	67.5°	41.9°
March	5.94 In	73.8°	47.1°
April	3.06 In	79.9°	52.3°
May	3.47 In	87.0°	61.6°
June	7.73 In	91.0°	69.5°
July	7.17 In	92.1°	72.0°
August	7.35 In	91.5°	72.1°
September	4.69 In	88.4°	68.1°
October	3.23 In	81.4°	57.3°
November	3.50 In	73.0°	47.5°
December	3.90 In	65.3°	41.1°

Source: NOAA climate normals generated from the average of TLH ASOS records from 1981 to 2010.

Wind Data

Historical wind conditions were evaluated to determine the percentage of time that the runways at TLH provide sufficient crosswind coverage. The FAA recommends that runways achieve 95 percent crosswind coverage for the types of aircraft that regularly operate on them. If 95 percent crosswind coverage cannot be obtained by the runway configuration, additional runways may be needed. As shown in **Table 1-4**, both runways individually and together provide sufficient wind coverage at TLH. The historical wind observations were obtained from the Automated Surface Observing System (ASOS) at TLH for the period from 2005 through 2015. The ASOS is located in-between Connector Taxiways B7 and B8.

Table 1-4
Historical Wind Coverage Analysis (2005-2015)

Runway	All Weather Coverage % (Knots)				Visual Flight Rule (VFR) Coverage % (Knots)				Instrument Flight Rule (IFR) Coverage % (Knots)			
	10.5	13	16	20	10.5	13	16	20	10.5	13	16	20
9-27	98.94	97.90	99.63	99.95	95.67	97.47	99.24	99.85	95.98	97.98	99.70	99.97
18-36	96.09	97.88	99.48	99.88	96.11	97.63	98.99	99.64	96.05	97.91	99.56	99.92
Combined	99.60	99.92	99.99	100	99.32	99.80	99.97	100	99.65	99.95	100	100
	Ceiling = All Visibility = All 121,273 Observations				Ceiling ≥ 1,000’ Visibility ≥ 3 Miles 97,300 Observations				Ceiling < 1,000’ and ≥ 200’ Visibility < 3 Miles and ≥ ½-Mile 18,278 Observations			
Source: Station 722140 at Tallahassee International Airport, FL (2005-2015).												

In addition to the ASOS facility providing weather data, TLH is also equipped with lighted wind cones near Runways 9, 18, 27, and 36, all of which provide visual representation of the direction and intensity of the wind for pilots.. The facility east of Runway 18 is also located within a segmented circle. TLH is also served by a Low Level Wind Shear Alert System (LLWAS). The system monitors wind speed and direction, generating warnings when wind shear or microburst conditions are detected. Current wind speed, direction data, and warnings are provided to controllers in the Terminal Radar Approach Control (TRACON) that provide approach and departure clearances and controllers in the ATCT that provide ground clearances at TLH.

1.9 Socioeconomic Data

In addition to understanding the existing physical conditions of the airport environment, a variety of socioeconomic data was collected to understand the dynamics of growth within the geographic area served by the airport. This information provides essential background information in determining aviation service level requirements and plays an important role in aviation forecasting efforts. Tallahassee's Metropolitan Statistical Area (MSA) includes four counties; Gadsden, Jefferson, Leon, and Wakulla. Leon County is home to the Capital City and consists of approximately 449,278 acres of land.

The following sections discuss historical and forecast socioeconomic trends for the City of Tallahassee, Leon County, the State of Florida, and the country. It is intended to provide an understanding of how the local area measures up against the state and country and to determine what types of aviation facilities and services should the local population be able to afford. The City of Tallahassee is not like many parts of Florida that are major tourist destinations, but it does have factors like the strong state employee workforce and large universities that tend to drive much of the activity at TLH. However, because much of the population is composed of non-permanent students and politicians, there is a desire to improve air service to provide better connectivity to multiple markets, which would also be desirable for the year-round citizens. Enhanced connectivity between TLH and desired markets is recommended because that is key for the airport to provide enhanced customer service appeal for the local population and visitors.

Population

This section summarizes the historical and forecast population as shown in **Table 1-5**. In 2015, the population of Leon County was estimated at 288,619 and the City's population was estimated at 189,003. Therefore, the local area supports approximately 1.46 percent of Florida's total population. Much of the local population growth may be attributed to the growth that is occurring at FSU and new businesses that have relocated to the area. Between 2015 and 2020, it is projected that the population of Tallahassee will grow by more than 10,000 individuals which is just more than a growth rate of one percent per year. While slower than the anticipated growth rate for the state, the population of Tallahassee is projected to grow at a faster rate than the nation, which is illustrative of the potential need to provide added air service opportunities at TLH. **Table 1-6** illustrates the enrollment statistics for FSU for the past five years and the over 41,000 students that attend the university on an annual basis (mostly at the main campus in Tallahassee). As FSU continues to grow, such as with the $100 million donation to create the Jim Moran School of Entrepreneurship, so too should the population of the City.

Table 1-5 Socioeconomic Comparison (Local, State, & National)				
Variable	Tallahassee	Leon County	Florida	US
Population				
2000	157,348	239,450	15,982,389	281,422, 025
2010	181,253	275,487	18,801,310	308,745,538
2015	189,003	288,619	19,830,700	319,507,044
2020	199,287	304,418	21,166,004	332,559,851
AAGR 2000-2010	1.42%	1.41%	1.64%	0.93%
AAGR 2010-2015	0.84%	0.94%	1.07%	0.69%
AAGR 2015-2020	1.07%	1.07%	1.31%	0.80%
Median Age				
2000	26.6	29.6	38.7	35.5
2010	26.2	29.6	40.7	37.1
2015	26.1	29.9	41.4	37.5
2020	27.4	31.0	42.2	38.1
AAGR 2000-2010	-0.15%	0.00%	0.51%	0.44%
AAGR 2010-2015	-0.08%	0.20%	0.34%	0.21%
AAGR 2015-2020	0.98%	0.73%	0.38%	0.32%
Average Household Income				
2000	$45,204	$51,087	$53,531	$56,675
2010	$54,996	$62,754	$67,707	$73,387
2015	$59,402	$67,679	$68,349	$76,502
2020	$68,205	$77,010	$78,438	$87,705
AAGR 2000-2010	1.98%	2.08%	2.38%	2.62%
AAGR 2010-2015	1.55%	1.52%	0.19%	0.83%
AAGR 2015-2020	2.80%	2.62%	2.79%	2.77%
Median Household Income				
2000	$31,512	$37,728	$38,924	$42,257
2010	$34,645	$41,331	$46,143	$51,362
2015	$39,056	$47,789	$46,872	$53,423
2020	$45,669	$55,917	$54,995	$62,096
AAGR 2000-2010	0.95%	0.92%	1.72%	1.97%
AAGR 2010-2015	2.43%	2.95%	0.31%	0.79%
AAGR 2015-2020	3.18%	3.19%	3.25%	3.05%
Per Capita Income				
2000	$18,903	$20,593	$21,228	$21,242
2010	$23,800	$26,044	$27,039	$28,088
2015	$25,668	$28,071	$27,264	$29,272
2020	$29,462	$32,016	$31,361	$33,657
AAGR 2000-2010	2.33%	2.38%	2.45%	2.83%
AAGR 2010-2015	1.52%	1.51%	0.17%	0.83%
AAGR 2015-2020	2.80%	2.66%	2.84%	2.83%
Source: Alteryx, Inc. AAGR – Average Annual Growth Rate				

Table 1-6 FSU Student Enrollment (2011-2015)					
Level	**Fall 2011**	**Fall 2012**	**Fall 2013**	**Fall 2014**	**Fall 2015**
Undergraduate Enrollment					
Freshmen	5,634	5,242	5,817	5,470	5,594
Sophomore	6,532	6,427	6,520	6,713	6,907
Junior	8,944	9,096	8,897	8,984	8,796
Senior	10,741	11,178	11,042	11,454	11,162
Subtotal	**31,851**	**31,943**	**32,276**	**32,621**	**32,459**
Graduate Enrollment					
Masters	4,431	4,237	4.045	4,020	3,892
Specialists	131	102	114	99	123
Juris Doctorate	725	693	707	645	596
Doctorate	2,723	2,647	2,688	2,726	2,725
Medical	476	476	481	482	483
Subtotal	**8,486**	**8,155**	**8,015**	**7,972**	**7,819**
Unclassified					
Unclassified	1,373	1,203	1,166	1,180	1,195
Subtotal	**1,373**	**1,203**	**1,166**	**1,180**	**1,195**
Total					
Total	**41,710**	**41,301**	**41,457**	**41,773**	**41,473**
Source: Florida State University Student Enrollment Data.					

Economics

For reference purposes, Table 1-5 also presents statistics for median age, average household income, median household income, and per capita income. It is interesting to note that the median age is much lower in Tallahassee than the other geographies, which is indicative of the large student population and also helps to explain some of the lower income factors for the area. However, the stability of the local workforce associated with the universities and the state government help to maintain and grow the local economy.

Unlike most regions in Florida that benefit from tourism, the Tallahassee MSA is primarily recognized for its contributions to the technology sector, public service and education, construction and professional organizations, and business services. Although the central focus of Tallahassee's economy is the public service industry, a variety of other industries influence the local economy. These include education, printing and publishing, food processing, and the lumber industry. Tallahassee is also regarded as a high technology center, with institutions such as Innovation Park and Smart Park that position Tallahassee on the cutting edge of technology.

According to the Economic Development Council of Tallahassee, Leon County's two top employers in 2015 were the State of Florida (22,612) and Florida State University (12,512). Other top employers in the area include Leon County Public Schools (4,550), Publix Super Markets (3,439), Tallahassee Memorial HealthCare (3,190), City of Tallahassee (2,736), Walmart Stores (2,117), Leon County (1,919), Florida A&M University (1,759), Tallahassee Community College (1,631), and Capital Regional Medical Center (1,151).

1.10 Airline Passenger Activity

Airline service at TLH is currently provided by American Airlines, Delta Air Lines, and Sliver Airways. American provides daily service between TLH and Charlotte/Douglas International Airport (CLT), Dallas/Fort Worth International Airport (DFW), and Miami International Airport (MIA). Delta provides daily service between TLH and Hartsfield-Jackson Atlanta International Airport (ATL) and Silver Airways flies to Tampa International Airport (TPA), Orlando International Airport (MCO), and Fort Lauderdale International Airport (FLL). All flights by Silver Airways are conducted using 34-passenger Saab 340 turboprops. The other routes are all flown using regional jets, with the exception of flights operated by Delta Air Lines (and not under a codeshare agreement with a regional carrier) to/from ATL. Delta uses various narrow-body jets on those flights including Boeing 717s and 737s and McDonnell Douglas MD-88s.

1.11 Airspace

The National Airspace System (NAS) is an integrated collection of controls, procedures, and policies put in place and regulated by the FAA to ensure safe and efficient air operations. The NAS is divided into airspace classes using aeronautical charts to designate the level of service and operating rules for a given area. Airspace within the United States is generally classified as either 'controlled' or 'uncontrolled.' As shown in **Figure 1-4**, TLH is surrounded by controlled Class C airspace. The controlled airspace extends from the surface to 4,100 feet AMSL within five nautical miles around the airport and from 1.400 feet AMSL to 4,100 feet in the five to ten nautical mile range around TLH. To fly within the controlled Class C airspace, pilots must receive clearance from Tallahassee Approach/Departure Control (when available) or the Jacksonville Air Route Traffic Control Center (ARTCC). There is some Special Use Airspace (SUA) associated with a St. Mark's National Wildlife Refuge where pilots need to be cognizant of the endangered whooping crane population and several Military Operations Areas (MOAs) where there are airspace restrictions associated with Tyndall Air Force Base. The primary aircraft operating within the MOAs is the F-15 Eagle air-to-air fighter jet. In addition to the MOAs, there is also an established Instrument Flight Rules (IFR) Military Training Route (MTR). MTRs are designated airspace that has been generally established for use by high performance military aircraft to train below 10,000 feet AMSL. There are VR (visual) and IR (instrument) designated MTRs. IR15 begins at Apalachee Bay directly south of the airport and continues on a northwesterly direction passing to the southwest of TLH. Aircraft operating in that area need to be aware of the established military routes.

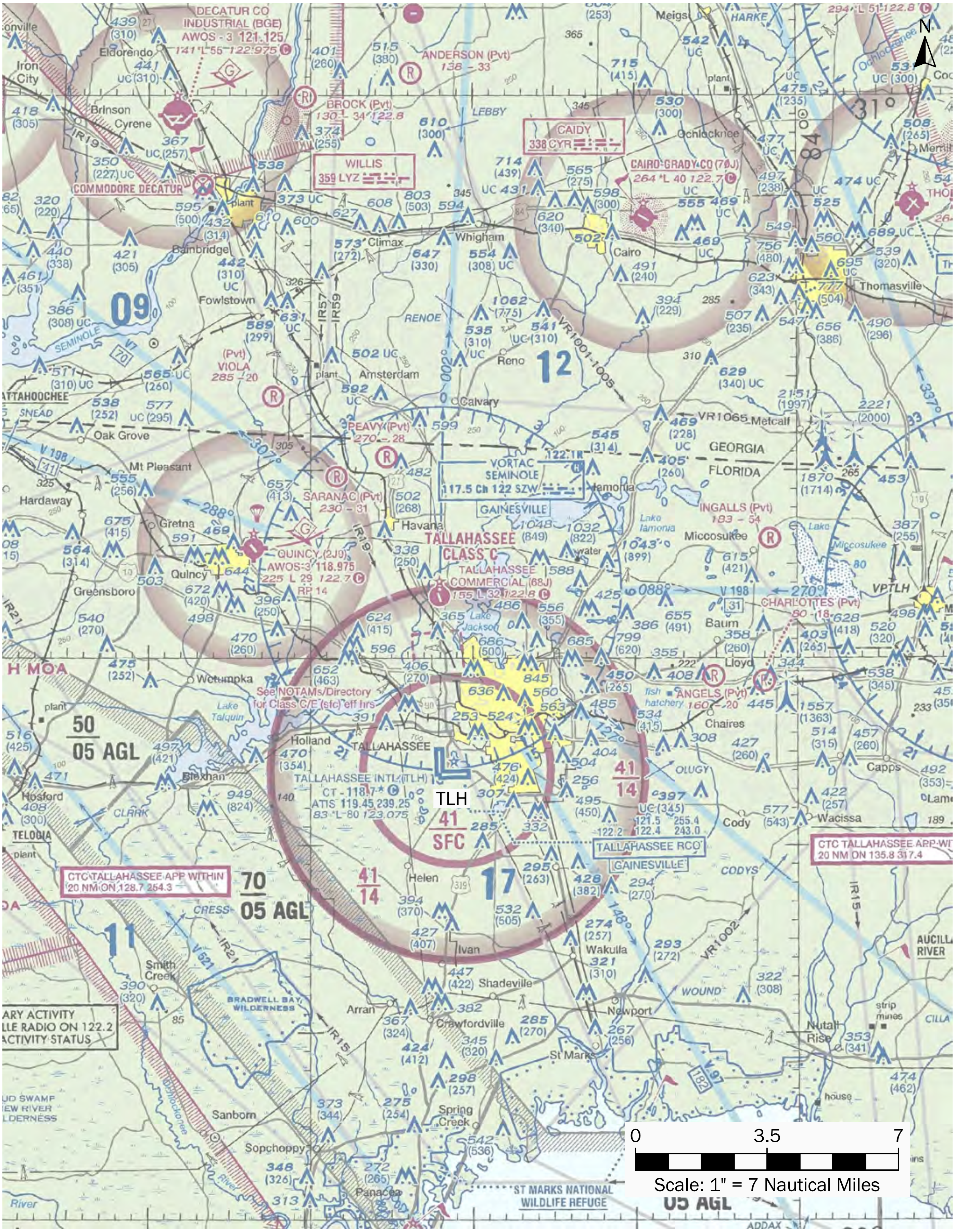
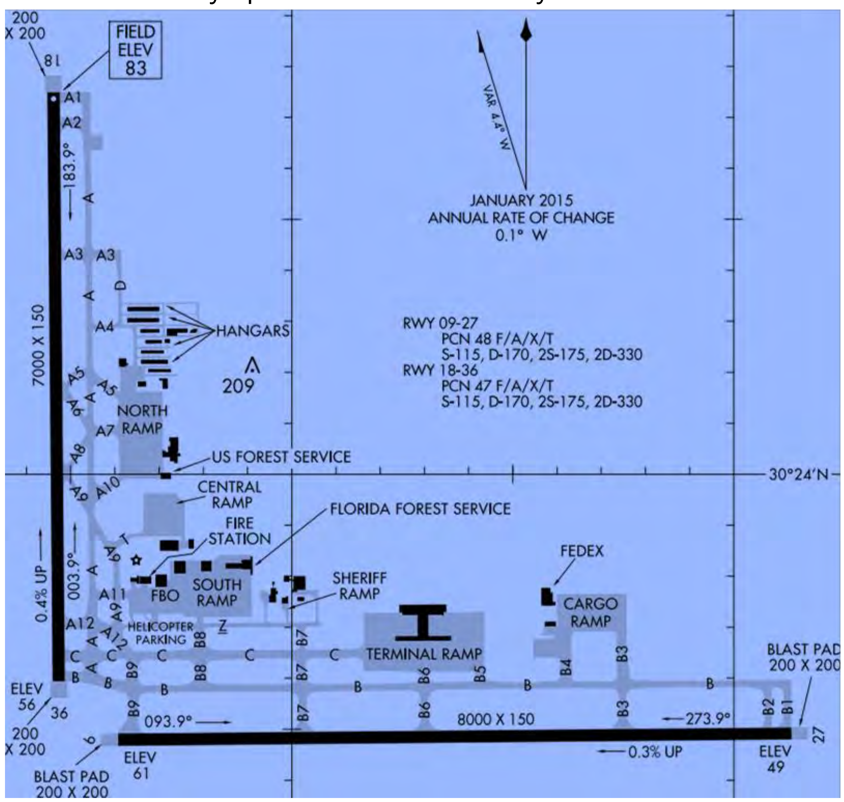


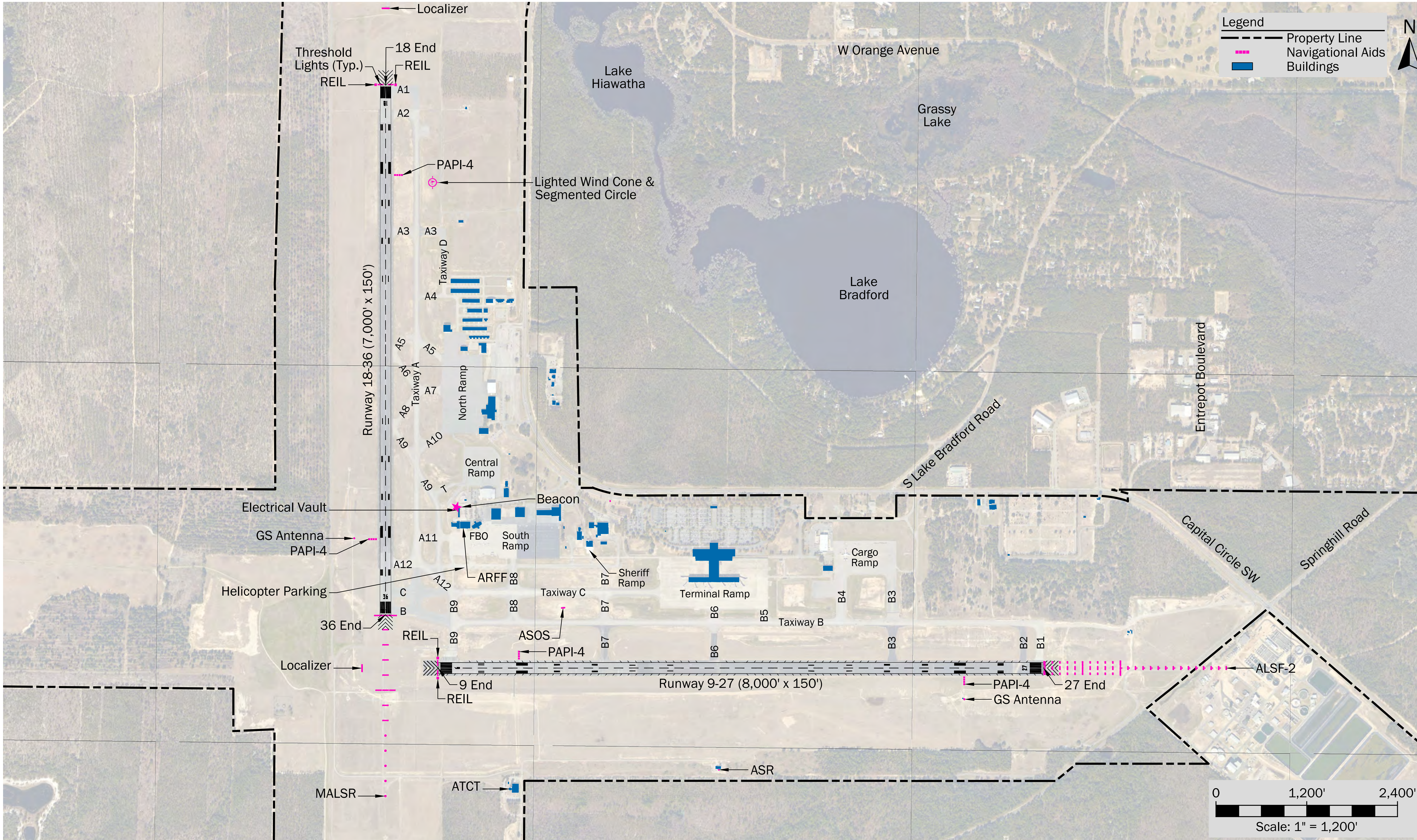
Figure 1-4 Sectional Aeronautical Chart

1.12 Airfield Overview

At TLH, the airfield consists of the two runways, taxiways, and their associated markings and lighting features. As illustrated in **Figure 1-5** and summarized in **Table 1-7**, Runway 9-27 is the primary runway at TLH and is oriented in an east-west configuration. The runway is 8,000 feet long, 150 feet wide, and has a grooved asphalt surface that is in good condition because its reconstruction was completed in 2015 to correct a line-of-sight issue associated with a hump that prevented pilots from being able to see aircraft at either runway end. The pavement strength of Runway 9-27 is rated at 115,000 pounds for aircraft with a single-wheel gear configuration, 170,000 pounds for aircraft with a dual-wheel gear configuration, and 330,000 pounds for aircraft with a double tandem wheel configuration. Therefore, Runway 9-27 is capable of supporting the commercial aircraft that routinely operate at TLH. Runway 18-36 is oriented in a north-south configuration, is 7,000 feet long and 150 feet wide, and has the same pavement strength ratings as Runway 9-27. Runway 18-36 is classified as the crosswind runway at TLH and is often used for general aviation operations; however, the runway was recently extended from 6,076 feet to its current length of 7,000 feet to better accommodate the crosswind demands of all airport users.



Taxiways provide a network for aircraft to maneuver safely and efficiently around the airfield. Both runways are supported by a taxiway system consisting of full-length parallel taxiways and connector taxiways. Taxiway B is the full-length parallel taxiway for Runway 9-27 and is the primary taxiway serving the passenger Terminal Apron and the Cargo Apron. The connector taxiways associated with Taxiway B are identified as B1 through B9 and provide access from the runway and to/from the various facilities to the north of Runway 9-27. Taxiway A is the full-length parallel taxiway for Runway 18-36 and connectors A1 through A12 provide access to the facilities to the east of the runway. Taxiway C is a parallel taxiway to Taxiway B and runs from the Terminal Apron west to the Runway 36 end. There are other taxiways that provide access around the various general aviation facilities at TLH. The conditions of all airfield pavements is shown in **Figure 1-6**, which illustrates that most pavements are in fair to good condition, with the exception of most of Runway 18-36 and some of the pavement on the South Ramp.


Legend
Property Line
Navigational Aids
Buildings
N
Localizer
18 End
Threshold Lights (Typ.)
REIL
REIL
A1
A2
PAPI-4
Lighted Wind Cone & Segmented Circle
Lake Hiawatha
W Orange Avenue
Grassy Lake
Lake Bradford
A3
A3
Taxiway D
A4
A5
A5
A6
A7
A8
Taxiway A
North Ramp
A9
A10
Runway 18-36 (7,000' x 150')
Central Ramp
A9
T
Beacon
Electrical Vault
GS Antenna
PAPI-4
A11
FBO
South Ramp
A12
A12
ARFF
Helicopter Parking
B8
B7
Sheriff Ramp
Terminal Ramp
Cargo Ramp
C
Taxiway C
B
B9
B8
B7
B6
B5
B4
B3
Taxiway B
36 End
REIL
ASOS
B9
B7
B6
B3
B2
B1
PAPI-4
Localizer
9 End
REIL
Runway 9-27 (8,000' x 150')
PAPI-4
GS Antenna
27 End
ALSF-2
S Lake Bradford Road
Entrepot Boulevard
Capital Circle SW
Springhill Road
ASR
ATCT
MALSR
0
1,200'
2,400'
Scale: 1" = 1,200'

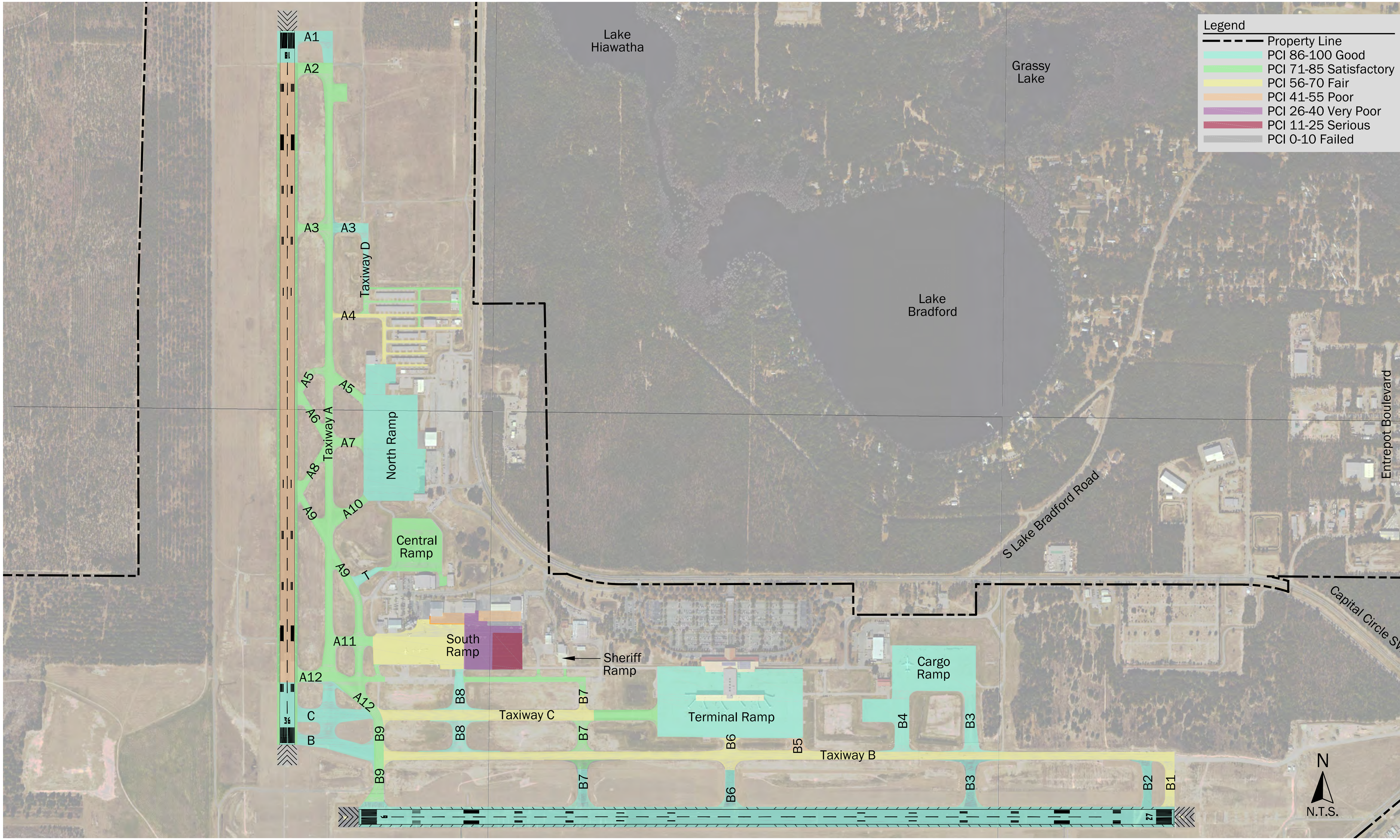


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Figure 1-6 Airfield Pavement Condition Index

Table 1-7
Airfield Overview

Runway Characteristics	09-27	18-36
True Bearing	89.46 / 269.47	179.48 / 359.48
Runway Length	8,000 Feet	7,000 Feet
Runway Width	150 Feet	150 Feet
Runway Surface	Grooved Asphalt	Grooved Asphalt
Runway Load Bearing Strength (Pounds)		
Single Wheel	115,000	115,000
Dual Wheel	170,000	170,000
Dual Tandem Wheel	330,000	330,000
Runway Lighting	High Intensity (HIRL)	High Intensity (HIRL)
Runway Markings	Precision	Precision
Taxiway Lighting	Medium Intensity (MITL)	Medium Intensity (MITL)
Apron Lighting	Yes (Pole Mounted)	
Approach Aids		
Visual Glide Slope Indicators (VGSI)	PAPI-4	PAPI-4
Runway End Identifier Lights (REIL)	Yes (9 End)	Yes (18 End)
Approach Lighting	ALSF-2 (27 End)	MALSR (36 End)
Weather Reporting	ASOS	
Lighted Wind Cones and Segmented Circle	Yes	
Control Tower	Yes	

Source: 2016 FAA Digital Airport/Facility Directory.
HIRL – High Intensity Runway Lights MITL – Medium Intensity Taxiway Lights
PAPI-4 – 4-Light Precision Approach Path Indicator ALSF-2 – Approach Lighting System with Sequence Flashing Lights
MALSR – Medium Intensity Approach Lighting System ASOS – Automated Surface Observing System

1.13 Instrument Approaches and Navigational Aids

There are several instrument approaches available to the runway ends at TLH that range from precision Instrument Landing System (ILS) approaches that utilize ground based equipment to provide horizontal and vertical course guidance to aircraft to other Global Positioning System (GPS) approaches that utilize satellite navigation. The most precise approaches at TLH are published for Runway 27 including a Category II (CAT II) ILS that can be flown by special aircrews when horizontal visibility minimums are as low as a Runway Visual Range (RVR) of 1,200 feet. Other approaches to Runway 27 include a CAT I ILS that is supported by a glide slope, localizer, and an Approach Lighting System with Sequence Flashing Lights (ALSF-2) that extends 2,400 feet beyond the runway end, as well as localizer-based and satellite-based procedures. The approaches to Runway 27 and the three other runway ends are supported by four-light Precision Approach Path Indicators (PAPI-4) that provides visual course guidance to pilots in the air to help them clear obstacles by staying on the appropriate approach path.

Runway 9 is supported by several GPS-based procedures including a Localizer Performance with Vertical Guidance (LPV) approach that provides satellite-based horizontal and vertical guidance to aircraft. The Runway 9 end has Runway End Identifier Lights (REILs) that help pilots navigate to the runway end during nighttime and poor visibility conditions. The horizontal approach visibility minimums for Runway 9 are higher than Runway 27 because the equipment is not as precise, but it is noted that the previous Master Plan Update recommended the installation of a CAT I ILS approach for Runway 27 to provide reduced minimums.

The capabilities for Runway 18-36 are similar to Runway 9-27 in that there is one runway end with a CAT I ILS approach (Runway 36 end) and other localizer-based and GPS-based procedures to the runway ends. Runway 36 has a Medium Intensity Approach Lighting System (MALSR) that supplements the ILS approach and extends 1,400 feet beyond the runway end and Runway 18 has REILs. As mentioned for Runway 27, the previous Master Plan Update also recommended the installation of a CAT I ILS approach for Runway 18. Both ends of Runway 18-36 have procedures that are based off the Seminole VHF Omni-directional Range (VORTAC) located just north of the Tallahassee Commercial Airport (68J). There are also approach procedures for Runway 18 that are designed for high-performance military aircraft.

Other navigational aids at TLH include the lighted wind cones that are located near Runways 9, 18, 27, and 36,, the ASOS, and the rotating beacon that is located near the fuel farm. These features are important for identifying the wind and weather conditions at TLH while in the air and on the ground through visual and electronic means. Furthermore, the rotating beacon helps pilots identify the airport at night. Although there are several other approach and navigational aids at TLH, these are the key ones that require emphasis as part of this planning effort. Additional needs for approaches and navigational aids, such as the potential to provide improved approach capabilities, are discussed as part of the facility requirements analysis.

1.14 Airfield Lighting, Markings, and Signage

Runway lighting is essential for safe operations and for pilots to define the lateral limits of the pavement. Both Runways 9-27 and 18-36 are both equipped with High Intensity Runway Lights (HIRL) along the runway edges and Runway 9-27 also has centerline and touchdown zone lights to supplement the CAT II ILS approach. According to FAA AC 150/5340-30H, "runway centerline and touchdown zone lighting systems are designed to facilitate landings, rollouts, and takeoffs. The touchdown zone lights are primarily a landing aid while the centerline lights are used for both takeoffs and landings." Those types of features particularly help pilots navigate to the runway while in-flight and on the runway during poor visibility conditions. At TLH, the lighting is consistent with what is required for the types of approaches available to each runway end. The taxiways at TLH are provided with Medium Intensity Taxiway Lights (MITL) along the edges which are the standard taxiway lighting system for airports with lighted runways. Other airfield lighting features include the lighting that is provided at each apron, which mostly include pole-mounted lights at the back side of each apron. On the Terminal Apron, the lights are also pole mounted but are located near each gate position.

The runways at TLH all have precision markings which meet or exceed the marking requirement for the approaches that are available to each runway end. Therefore, no adjustment to the runway markings should be needed except for routine maintenance. The information for airfield markings is documented in FAA AC 150/5340-1L, Standards for Airport Markings. Within that AC, there is a requirement for Part 139 Certificated Airports to have enhanced taxiway centerline markings that "provide supplemental visual cues to alert pilots of an upcoming runway holding position for minimizing the potential for runway incursions." All runway holding positions at TLH are marked with enhanced taxiway centerline markings and therefore comply with FAA requirements. Additionally, FAA AC 150/5300-13A, Airport Design, recently changed the requirements for taxiway filet or turn geometry, which has the potential to affect some of the existing markings at TLH. Those revised standards are evaluated as part of the facility requirements analysis and with the new mapping that was obtained for this Master Plan Update.

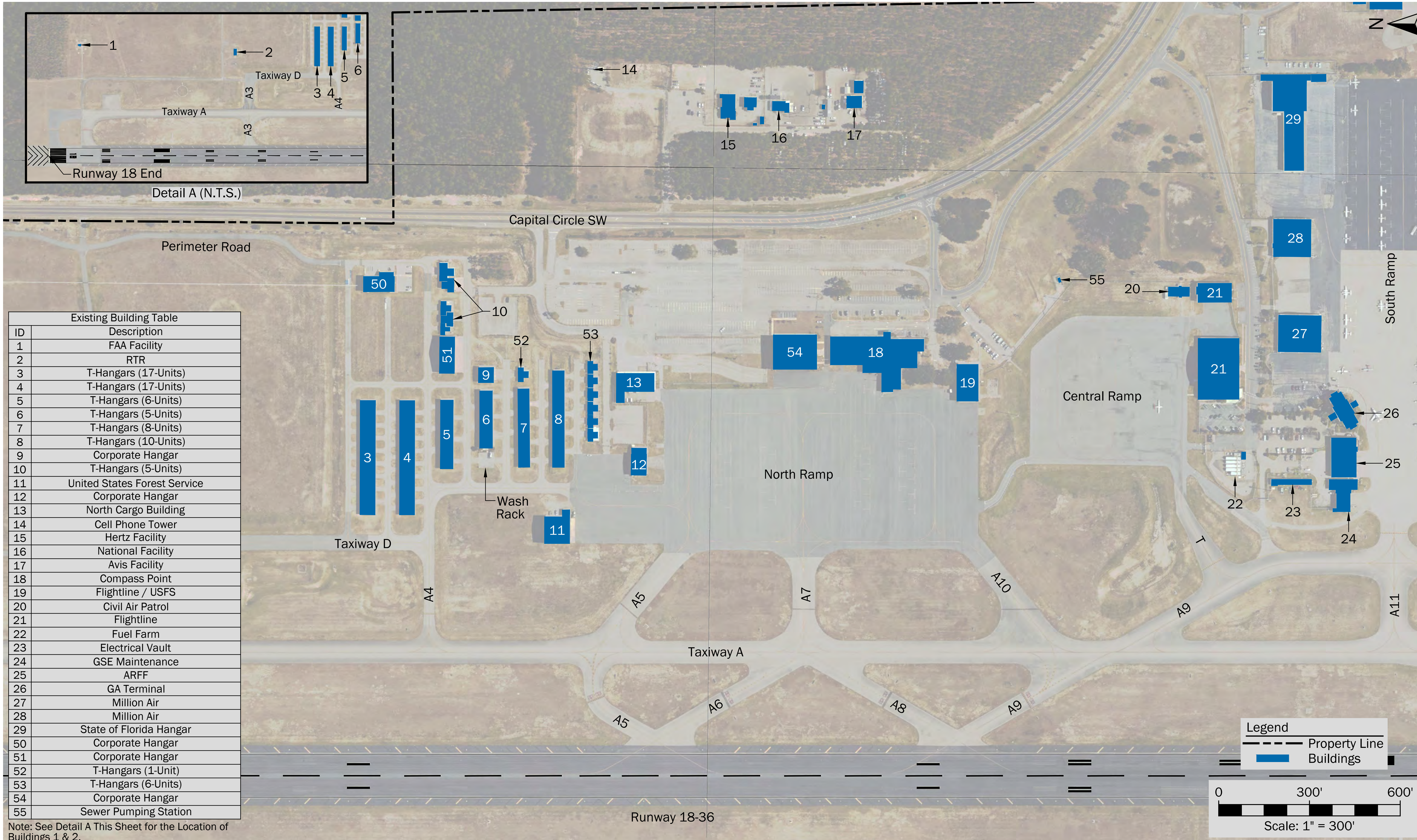
FAA AC 150/5340-18F, Standards for Airport Sign Systems, defines the requirements for airfield signage. The presence of an effective airfield signage system is necessary for the safe and efficient operation of the airport. The airport plans to conduct airfield signage improvements within the next five years. The airfield signage at TLH will be reviewed for its concurrency with FAA standards as part of the facility requirements analysis and recommended improvements will be identified for the electrical systems as well.

1.15 Airport Traffic Control Tower (ATCT)

Tallahassee International Airport is served by an ATCT and TRACON facility that is located south of Runway 9 near Springhill Road and adjacent to the airport service road. The facility is attended daily from 6:00 a.m. until 11:00 p.m., is owned and operated by the FAA, and provides several services including approach and departure clearances, Automated Terminal Information Services (ATIS), and ground control. When the ATCT and TRACON are closed, there is no local ground control provided at TLH, but approach and departure control reverts to the Jacksonville ARTCC. A project was recently conducted to renovate the Heating. Ventilating, and Air Conditioning (HVAC) systems of the ATCT and TRACON facility and further upgrades are planned during the next five years. An Airport Surveillance Radar (ASR) is located near the center and to the south of Runway 9-27 and is used by controllers to view the position of aircraft in the local airspace.

1.16 Landside Overview

The landside facilities for TLH are illustrated in **Figures 1-7** through **1-10**. Four different graphics were developed to clearly identify the distinct landside areas and their associated facilities. **Figure 1-7** illustrates the North General Aviation Apron, **Figure 1-8** illustrates the South General Aviation Apron, **Figure 1-9** illustrates the Terminal Apron, and **Figure 1-10** illustrates the Cargo Apron. The building numbers were obtained from the previous ALP Drawing Set and recently-constructed buildings were assigned new building numbers that were a continuation of that previous effort.



Existing Building Table	
ID	Description
1	FAA Facility
2	RTR
3	T-Hangars (17-Units)
4	T-Hangars (17-Units)
5	T-Hangars (6-Units)
6	T-Hangars (5-Units)
7	T-Hangars (8-Units)
8	T-Hangars (10-Units)
9	Corporate Hangar
10	T-Hangars (5-Units)
11	United States Forest Service
12	Corporate Hangar
13	North Cargo Building
14	Cell Phone Tower
15	Hertz Facility
16	National Facility
17	Avis Facility
18	Compass Point
19	Flightline / USFS
20	Civil Air Patrol
21	Flightline
22	Fuel Farm
23	Electrical Vault
24	GSE Maintenance
25	ARFF
26	GA Terminal
27	Million Air
28	Million Air
29	State of Florida Hangar
50	Corporate Hangar
51	Corporate Hangar
52	T-Hangars (1-Unit)
53	T-Hangars (6-Units)
54	Corporate Hangar
55	Sewer Pumping Station

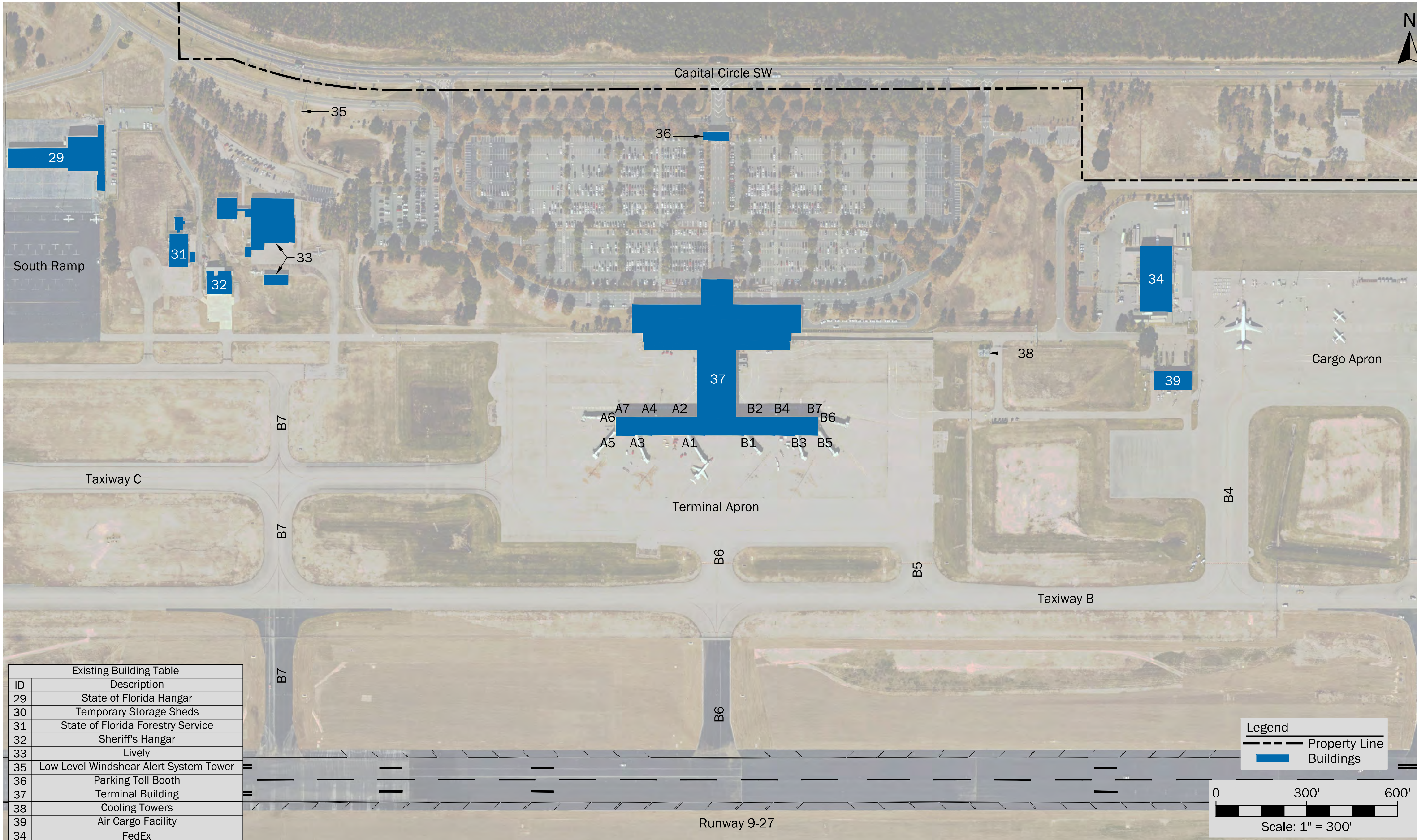
Note: See Detail A This Sheet for the Location of Buildings 1 & 2.

Figure 1-7 Existing Landside Facilities (North General Aviation Apron)

Existing Building Table	
ID	Description
20	Civil Air Patrol
21	Flightline
22	Fuel Farm
23	Electrical Vault
24	GSE Maintenance
25	ARFF
26	GA Terminal
27	Million Air
28	Million Air
29	State of Florida Hangar
31	Corporate Hangar
32	Sheriff's Hangar
33	Lively
35	Low Level Windshear Alert System Tower
36	Parking Toll Booth
37	Terminal Building
46	Airport Surveillance Radar
47	FAA ATCT Complex
48	FAA Facility-MALSR Power Control Shack
49	Storage Barn

Note: See Detail A This Sheet for Buildings 46-49.

Figure 1-8 Existing Landside Facilities (South General Aviation Apron)



Existing Building Table	
ID	Description
29	State of Florida Hangar
30	Temporary Storage Sheds
31	State of Florida Forestry Service
32	Sheriff's Hangar
33	Lively
35	Low Level Windshear Alert System Tower
36	Parking Toll Booth
37	Terminal Building
38	Cooling Towers
39	Air Cargo Facility
34	FedEx

Figure 1-9 Existing Landside Facilities (Terminal Apron)

Existing Building Table	
ID	Description
34	FedEx
38	Cooling Towers
39	Air Cargo Facility
41	Airport Maintenance Complex
42	National Weather Service
43	FAA Facility-ALSF-2 Power Supply

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Figure 1-10 Existing Landside Facilities (Cargo Apron)

North General Aviation Apron

The North General Aviation Apron is located east of Runway 18-36 and consists of a mix of hangars located along the North Ramp, the old passenger terminal building ("compass point"), and a small cargo building. On the other side of Capital Circle Southwest, there are several facilities for rental car storage and service (i.e., ready and return lots). The hangars within the North General Aviation Apron include a mix of T-hangars (75 units), corporate hangars, and larger bulk storage and maintenance hangars. The hangars and facilities on the North Ramp are accessible from Taxiway A and the various connectors. In order to improve situational awareness and to remove the potential for runway incursions at TLH, the FAA recommends removing direct connections between runways and aircraft parking aprons, which may need to be addressed on the North Ramp.

South General Aviation Apron

The South General Aviation Apron is also located to the east of Runway 18-36 and primarily covers the South Ramp. This area includes the Fixed Base Operator (FBO) facilities of Million Air, other airport businesses, the Aircraft Rescue and Fire Fighting (ARFF) facility, the fuel farm, the electrical vault, and the Ground Support Equipment (GSE) maintenance facility. There are also several apron tie-downs and helicopter parking positions on and around the South Ramp. Between the South Apron and the Terminal Apron, there are facilities that are occupied by the State of Florida housing the state's aviation fleet, Lively Technical Center, and the Leon County Sheriff's Department hangar. The facilities on the South Ramp are accessible by travelling along Taxiways A, B, and C. The South Ramp is used by many of the transient general aviation aircraft that are visiting TLH and utilizing the airport's FBO facilities and other maintenance services. Flightline Group provides aircraft sales, maintenance, avionics, aircraft storage, and other services and is located on the Central Ramp which is between the North Ramp and South Ramp. The Central Ramp is located to the east of Taxiway A and Runway 18-36 and is also home to the Civil Air Patrol facilities. The ATCT is located south of Runway 9-27 and is accessible from Springhill Road.

Terminal Apron

The Terminal Apron contains the passenger terminal building that consists of 14 gates, eight of which contain Passenger Boarding Bridges (PBBs). A detailed overview of the terminal is presented later in this chapter. The terminal building is accessible by aircraft from Taxiway B and by automobiles from Capital Circle Southwest. The direct connection from Runway 9-27 to the Terminal Apron is addressed later in this study to improve the situational awareness for pilots and to the help reduce the potential for runway incursions.

Cargo Apron

The Cargo Apron is located to the east of the Terminal Apron and contains the cargo facilities for the Delta, Dade GSE, DHL, FedEx, and USPS. The cargo facilities are accessible from Taxiway B, which also has a direct connection from Runway 9-27 that may need to be addressed as part of this study. The majority of the cargo activity at TLH is conducted by FedEx on regularly-scheduled flights between TLH and FedEx's hub at Memphis International Airport (MEM) using Boeing 757-200 freighter jets; however, FedEx also conducts feeder routes through airports like MCO, Jacksonville International Airport (JAX), and Mobile Downtown Airport (BFM) using Cessna 208 Caravan turboprops. The Delta cargo activity generally consists of belly cargo on scheduled Delta flights. Additional information pertaining to the cargo operations at TLH is presented as part of the forecasting effort. The airport maintenance facility located to the northeast of the Cargo Apron and adjacent to the Southside Cemetery, which is purposely located in a remote area that would not have a lot of potential to be utilized for future aviation development,

1.17 Terminal Inventory

The terminal area at TLH consists of the facilities essential for commercial air service including the passenger terminal building, the commercial service apron, the public parking lots, employee parking, and the rental car ready/return lot. This section describes each of these areas and identifies constraints and opportunities that will be considered during the alternatives evaluations later in this study. Other miscellaneous facilities located within or adjacent to the immediate terminal area include Lively Aviation School, the Sheriff's hangar, and air cargo facilities. **Figure 1-11** illustrates the key areas of the Terminal Area facilities.

Hourly Parking

The hourly or short-term parking is located north of terminal building directly across the terminal access road adjacent to the rental car ready/return lot. A short entry road from the access road is located 'upstream' from the terminal building in the northwest corner of the lot. Vehicles exit via a drive leading through the center of the daily parking lot to the common toll-plaza. Defined pedestrian pathways by means of striped out spaces and crosswalks lead to the terminal. Currently there are 307 hourly parking spaces, including handicapped spaces.

Daily Parking

The daily or long-term parking lot is located within the terminal access loop road north of the terminal building. Defined pedestrian pathways by means of striped out spaces and cross walks lead to the terminal. The first entrance to this lot is located "upstream" from the terminal building prior to reaching the entrance to the short-term lot, a second entrance is provided "downstream" from the terminal. An exit drive leading to the toll-plaza bisects the daily parking lot. All traffic exiting the hourly and daily parking lots use this toll-plaza. There are three exit lanes at the plaza. The daily lot has a total of 1,330 parking spaces.

Cell Phone Parking

Cell phone parking lots reduce dwell times at the curbfront and provide a passenger convenience for meeter/greeters who do not wish to enter the terminal building. At TLH a cell phone lot has been constructed near the terminal access road intersection with Capital Circle Southwest. The entry/exit drive to the lot makes it possible to return to the terminal via the terminal loop access road without leaving the airport road system. This lot has a total of 30 parking spaces.

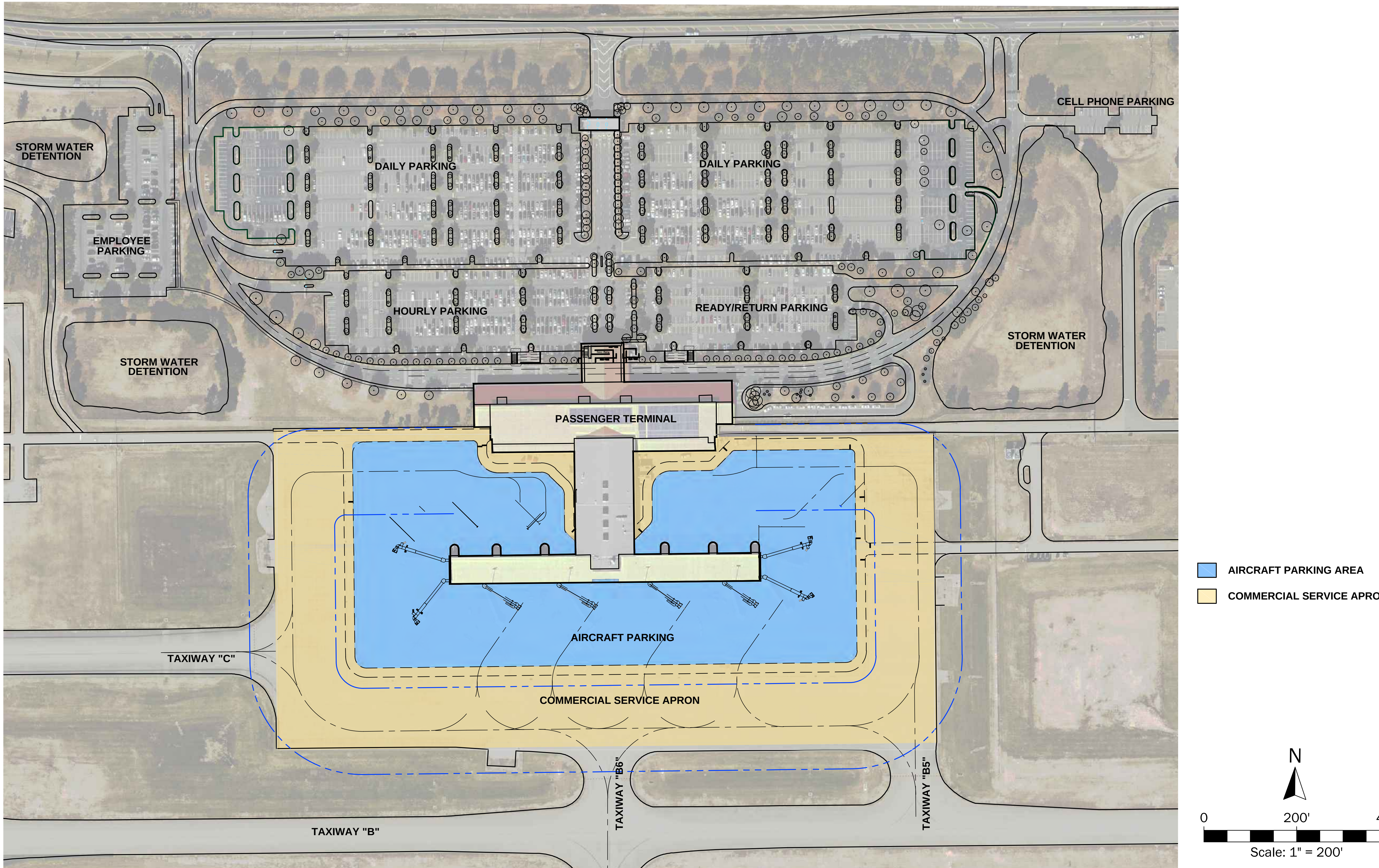


Figure 1-11 Terminal Area Facilities

Rental Car Ready and Return Parking

The rental car ready/return lot is located to the north of the terminal across the terminal area access road adjacent to the hourly and daily parking lots. The entry to the ready/return lot is located "downstream" from the terminal building. Traffic also exits the ready/return lot via a short exit drive, leading to the terminal access road. Defined pedestrian pathways by means of striped out spaces and cross walks lead to the terminal Currently this lot has 244 ready/return spaces.

Employee Parking

A large surface lot northwest of the terminal building outside of the terminal access loop road provides employee parking. Employees are provided access in and out of this lot via an entrance road off of Capital Circle Southwest. An emergency/maintenance access direct from the airport access loop road has been constructed. Spaces for handicapped and motorcyclesparking are included in the lot. Access to the terminal building is via a sidewalk from the southeast corner of the lot along the terminal access road to the ticketing area of the terminal. There are 210 employee parking spaces in this lot.

Existing Parking Lot Totals:

Table 1-8 summarizes the existing Terminal Area parking lot capacities:

Table 1-8
Existing Parking Lot Capacities

Parking Lot	Number of Spaces
Hourly Parking	307
Daily Parking	1,330
Cell Phone Parking	30
Rental Car Ready / Return	244
Employee Parking	210

Source: Michael Baker International, Inc., 2016.

Existing Commercial Service Apron

The commercial service apron at TLH is bordered by the passenger terminal building to the north, Taxiway B4 to the east, and Taxiway B to south. Taxiways B7, B8 and B9 to the west provide access to the FBO and other tenant operations. Taxiways B4 and B5 to the east provide access to air cargo operations. Commercial aircraft traffic flows between the apron and Runway 9-27 via the perpendicular Taxiways B1 through B9. The overall area of the commercial service apron is approximately 97,285 square yards, of which approximately 45,440 square yards is considered the effective aircraft parking area as indicated in Figure 1-11.

Terminal Building Layout

The existing passenger terminal facility (The Ivan Monroe Terminal) at TLH was opened in December 1989 to replace the original 1960s terminal structure. The three-story facility is now approximately 214,333 square feet in size including the covered areas under the main floor.

The majority of public activity at TLH occurs on the main level (second floor) of the terminal building (115,296 square feet) while administrative functions are located on the upper (third floor) and support functions on the lower (first floor) apron levels.

Major functions of the terminal, including ticketing, baggage claim, security screening, concessions, and passenger holding are all located on the main level. **Figure 1-12** illustrates the Main Level layout. Passengers enter the building from the curb road and parking lots from one of six vestibules located along the north face of the terminal. Two entry vestibules are located directly north of the ticket counters, two are located in the center of the building, and two are located directly to the north of baggage claim. After entering the building, the ticketing and baggage claim areas are visible. Signage reinforces direction to the major areas of the terminal. Once inside the terminal building, passengers either proceed to ticketing, or directly to the passenger screening area, depending on whether they must check baggage, obtain boarding passes, or coordinate with an airline representative.

The ticketing area is located at the far west end on the north (land) side of the terminal building. It includes the ticket lobby, ticket agent area, and airline ticket offices (ATO). Security regulations developed by the Transportation Security Administration (TSA) require that all checked baggage is screened prior to loading onto a commercial aircraft. Currently, there are three Explosive Detection Systems (EDS) fulfilling the screening requirements of TLH located in ticket lobby. Because they were placed in an already congested area, the baggage screening system at TLH significantly reduces the effective useable area of the ticket lobby. However as described in the Existing Terminal Building Construction section that follows, a current project should alleviate this problem by the fall of 2016.

The outgoing baggage make-up area for each airline is currently located on the lower level of the terminal building below the ATO. This will be changed as a part of the terminal renovations as well. Currently, Delta Airlines (and subsidiaries), American Airlines (and subsidiaries), and Silver Airways serve TLH in the spring of 2016.

After enplaning passengers have received the proper credentials at the ticket counters, the kiosks, or by early remote check-in, they proceed to a security screening area that includes two screening stations located in a north-south corridor that connects the ticketing and baggage claim areas to the secure concourse. Various concessions and miscellaneous functions including restrooms, stairways, etc., are located along this corridor on both sides. During peak periods the congestion at the security checkpoint queuing area obscures the view and access to the concessions and restrooms. The restrooms located along this corridor are the only public restrooms serving the un-secure side at the main level.

While the majority of concessions at TLH are located on the un-secure side of the terminal, passengers are afforded a modest selection of concessions in the secure passenger holding area. Traditionally, at airports the size of TLH, concessions were located on both sides of security. Often times a heavier percentage of concessions including restaurants and gift shops were located on the un-secure side. Since TSA regulations in effect since 9/11 have caused the security screening process to be more time intensive and stressful to passengers, airports the size of TLH must consider the balance of secure versus un-secure concessions. Since the trend of passengers is to now clear security as soon as possible, and arrive at their assigned holding area, they are more likely to utilize concessions in the secure area.

Once clearing the security checkpoint, enplaning passengers enter the secure concourse located on the south (air) side of the terminal building. This area is comprised of the holding areas (gates), limited concessions, restrooms, miscellaneous support spaces including small electrical, mechanical, and storage closets, and the concourse circulation. Eight of the gates in the concourse area utilize boarding bridges to accommodate narrow body and regional jet aircraft. Although bridges were renovated in 2004 to better accommodate the fleet mix at that time, they are currently in need of renovation/replacement as they reach the end of their useful service life. A series of stairwells located on the north side of the concourse provides access to the apron level for authorized personnel, emergency egress, and additional ground boarding capabilities for smaller aircraft.

Arriving passengers enter the secure concourse from their respective aircraft, and proceed past the security checkpoint on the deplaning side. If baggage was checked, it is retrieved at baggage claim located on the east end of the landside of the terminal. Two re-circulating sloped plate conveyor devices display baggage from inbound aircraft. Baggage is fed to the claim devices by inclined conveyors originating at the inbound baggage operations area located below baggage claim on the lower level. The baggage claim area also includes rental car agencies and baggage offices. Currently, seven rental car agencies serve TLH, including Avis, Alamo, Dollar, Enterprise, Hertz, National, and Thrifty. Each of the five available agency lease areas approximately the same square footage and service counter length. The rental car agencies are in a location that is convenient to passengers picking up luggage in baggage claim, and are adjacent to the vestibules leading to the curbside area closest to the rental car ready/return lot.

Outgoing and incoming bag operations areas are located on the apron (lower) level of the terminal building (66,382 square feet), as well as the airport storage area, the delivery area, and airline operations space. **Figure 1-13** illustrates the Lower Level of the terminal building. The majority of the major mechanical spaces are also located on this level. Incoming bags are delivered by baggage tugs from the aircraft to the inbound operations area located directly under baggage claim on the main level. At this point it is transferred from the tug carts to conveyors that transport the baggage up to the main level baggage claim devices. Outbound baggage is transported in a similar manner from the ATO's on the main level down to the lower level. Currently, this baggage goes directly to the individual airline's outgoing baggage make-up area under the terminal, since the CBIS function is in the ticketing lobby. From here it is delivered to its respective aircraft by tugs and carts. However, in the current Terminal Phase One renovation project, the CBIS will move to the area under the terminal, with a single sloped plate device shared by all airlines for outbound make-up, and then to their respective tugs got loading on aircraft.

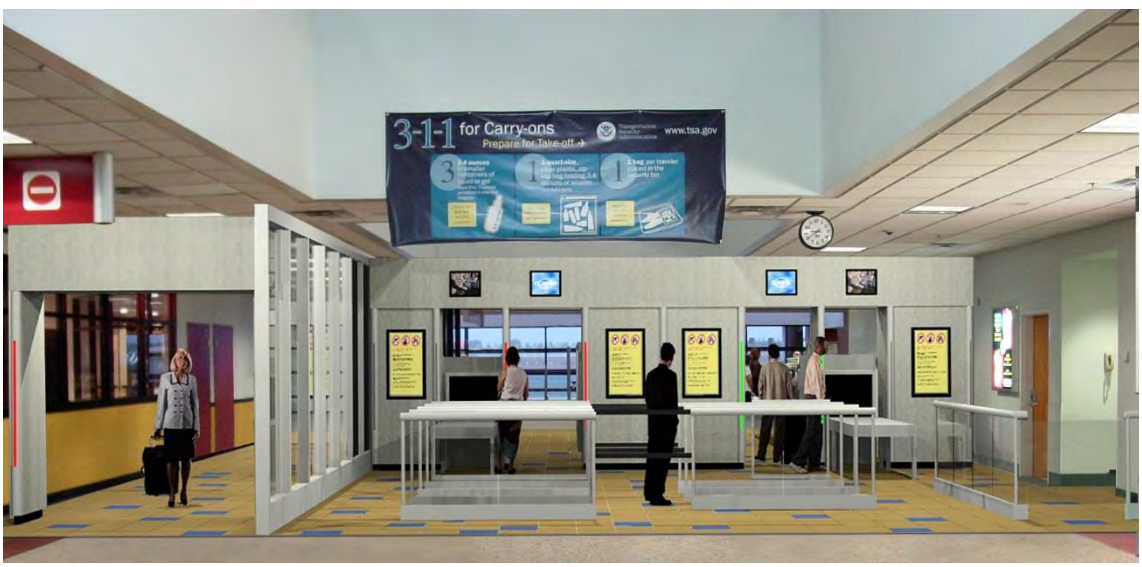
Deliveries to the terminal building arrive on the apron level through a covered gate entrance located on the east side of the building. A screening procedure allows certain deliveries to occur.

From the gated entrance, delivery trucks proceed down a ramp to a below-grade loading dock area located under the central circulation corridor connecting the main terminal area to the concourse area. This area allows enough space to turn around and exit the dock area via the same ramp from which it was entered. Service elevators and stairs area located adjacent to the dock area to transport deliveries to the upper levels of the terminal building.

The upper level of the terminal (32,655 square feet) houses all of the airport administration, airport facilities, TSA offices, and conference areas within the terminal building. An observation area located on the upper level provides the public with a view of the commercial service apron and immediate terminal area. **Figure 1-14** illustrates the layout of the Upper Level of the Terminal Building.

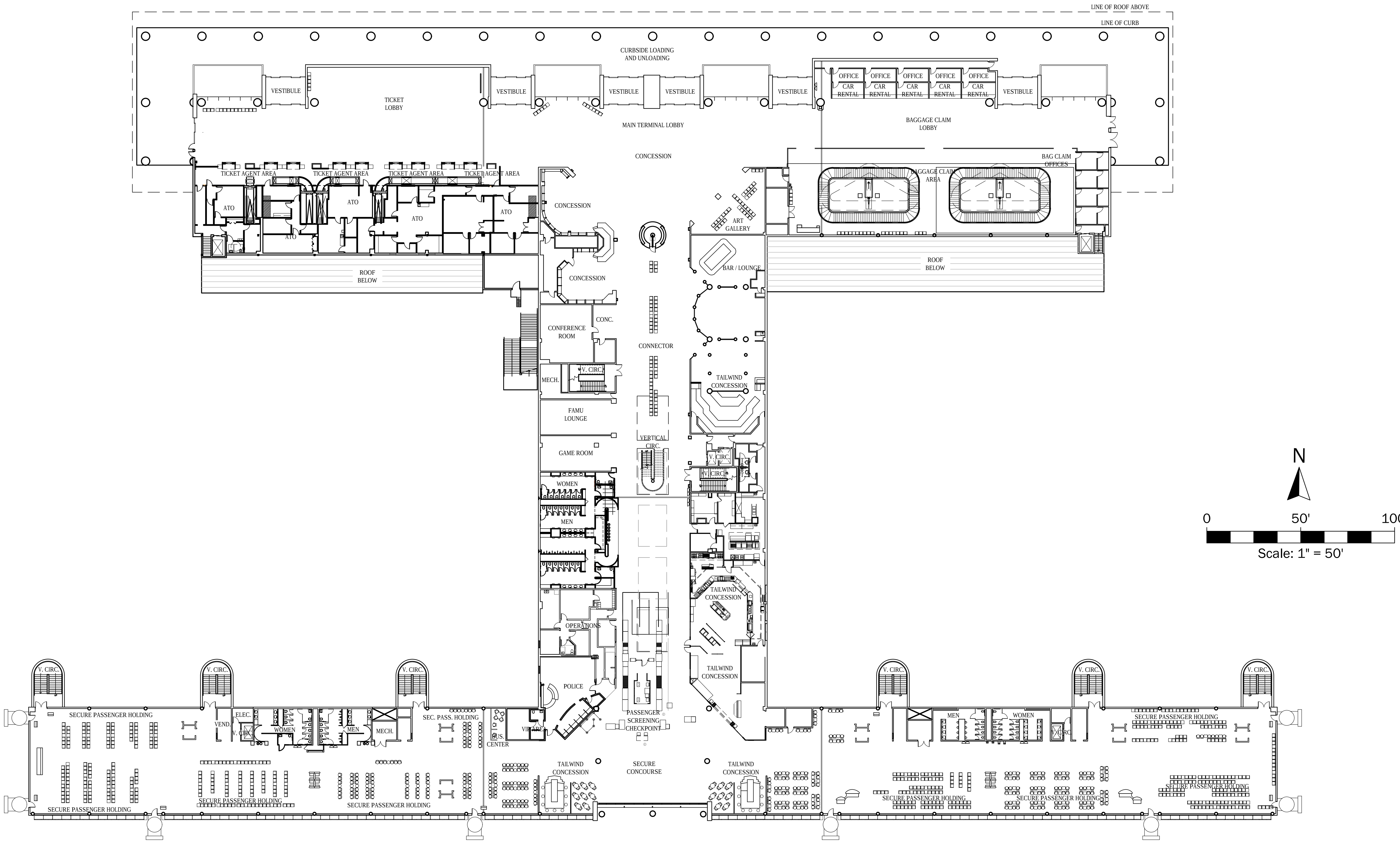
This level can be accessed via a large centrally located stair on the un-secure side of the corridor which connects the ticketing and baggage claim areas to the secure passenger holding concourse. The location of this stair creates congestion and blocks the visibility and access to restrooms and concessions located on the main level below.

Large openings in the upper level floor allow light from skylights above to reach the main terminal floor. One of these openings is was located above the passenger screening checkpoint, and posed a potential security risk. Renovations in 2007 moved the screening area toward the airside and created controlled entry and exit lanes that could be closed off from the openings above.



Relocated SSCP (2007) with security controlled entry points and exit lane

In addition to the main areas of the terminal building at TLH described above, there are many miscellaneous spaces including mechanical and electrical areas, restrooms, storage, circulation, and structural elements.


LINE OF ROOF ABOVE
LINE OF CURB
CURBSIDE LOADING AND UNLOADING
VESTIBULE
TICKET LOBBY
MAIN TERMINAL LOBBY
OFFICE
CAR RENTAL
BAGGAGE CLAIM LOBBY
CONCESSION
TICKET AGENT AREA
BAG CLAIM OFFICES
BAGGAGE CLAIM AREA
ATO
ART GALLERY
ROOF BELOW
BAR / LOUNGE
CONFERENCE ROOM
CONC.
CONNECTOR
MECH.
V. CIRC.
TAILWIND CONCESSION
FAMU LOUNGE
VERTICAL CIRC.
GAME ROOM
WOMEN
MEN
OPERATIONS
POLICE
PASSENGER SCREENING CHECKPOINT
SECURE PASSENGER HOLDING
SEC. PASS. HOLDING
VEND.
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BUS. CENTER
SECURE CONCOURSE
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Scale: 1" = 50'

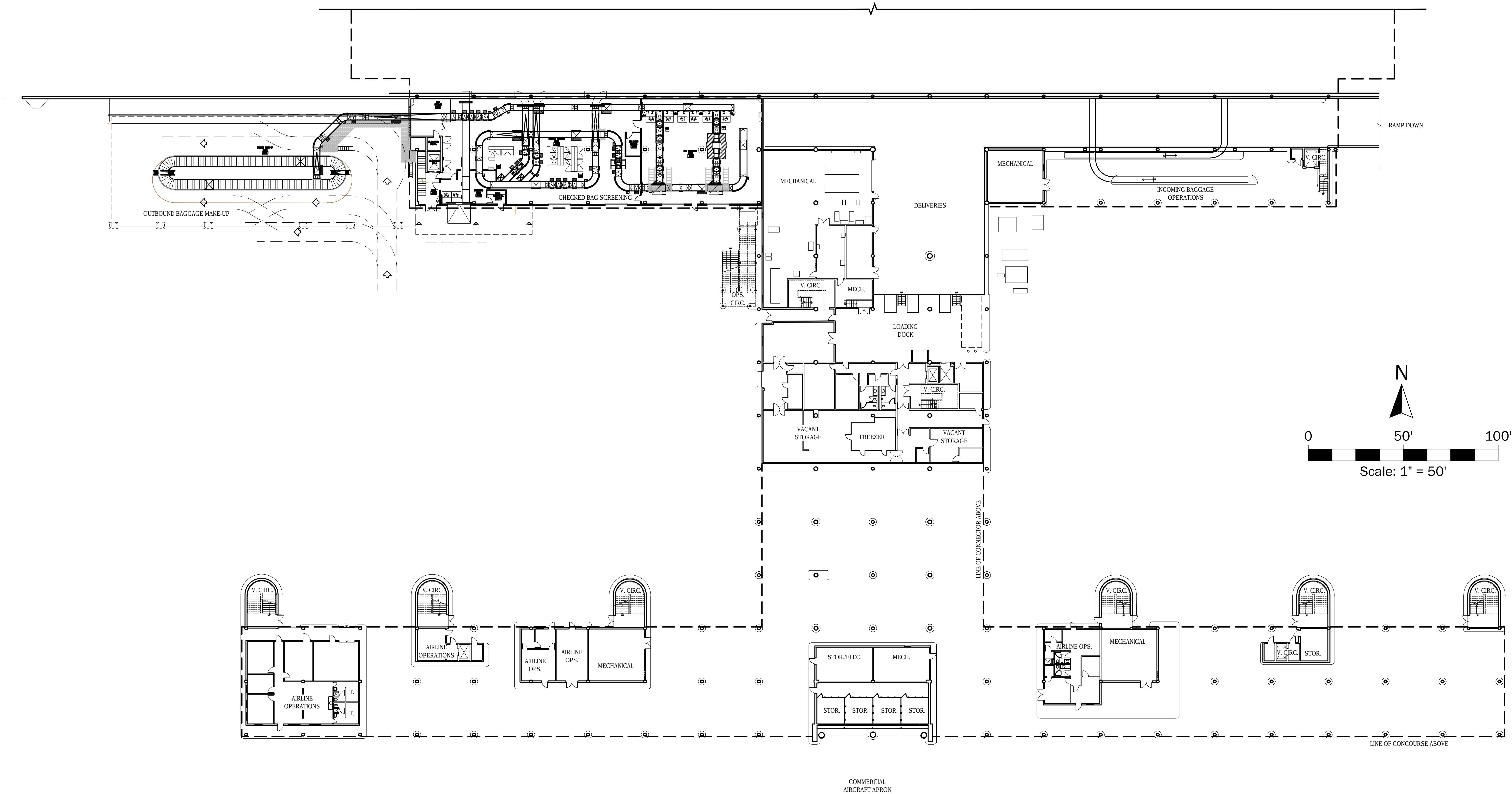
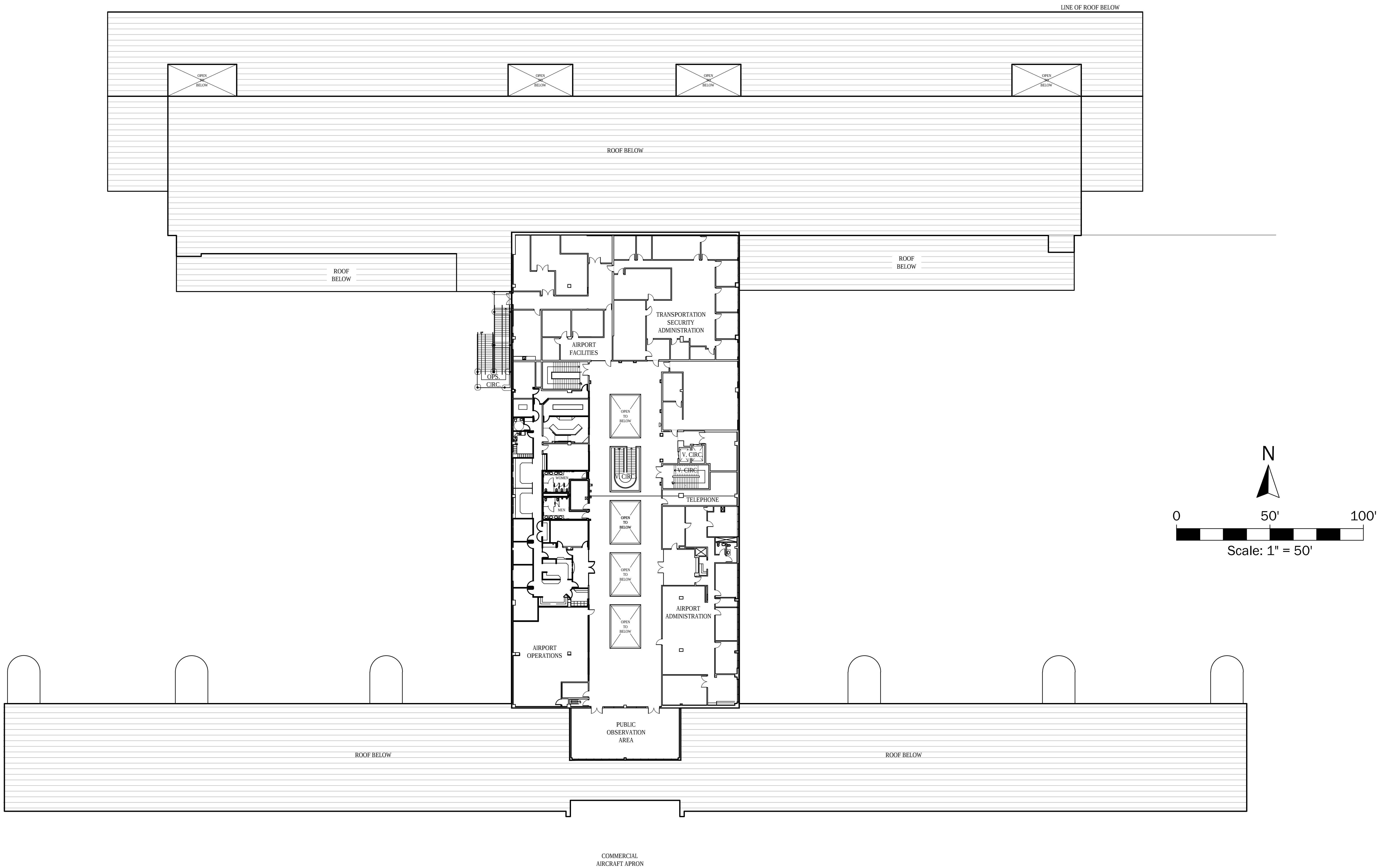


Figure 1-13 LOWER LEVEL 01


LINE OF ROOF BELOW
ROOF BELOW
ROOF BELOW
ROOF BELOW
TRANSPORTATION SECURITY ADMINISTRATION
AIRPORT FACILITIES
OPS. CIRC.
OPEN TO BELOW
V. CIRC
V. CIRC
V. CIRC
TELEPHONE
WOMEN
MEN
AIRPORT ADMINISTRATION
AIRPORT OPERATIONS
PUBLIC OBSERVATION AREA
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ROOF BELOW
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Existing Terminal Building Construction

The existing terminal building at TLH is framed primarily with a steel structural system on concrete piles and grade beams. The exterior walls are constructed of a combination of split ribbed concrete masonry units (CMU), brick, and an exterior insulated finish system on reinforced CMU walls on the lower level, and a steel frame on the two upper levels. Sloped roofs are framed with steel beams and concrete tiles, and flat roofs are constructed of a modified bitumen system. A monumental structural glazing system creates the glass façade on the north side of the main terminal building, and aluminum storefront systems comprise the remaining glazed areas.

Interior finishes include standard carpet, vinyl composition tile, ceramic tile, and exposed concrete (service areas) flooring. Ceilings are constructed of a linear metal suspended system in the ticketing and baggage claim areas and acoustical panel “lay-in” suspended ceiling throughout the majority of the terminal. Lighting throughout the terminal consists of a combination of concealed incandescent and lay-in fluorescent fixtures. The skylights on the roof provide natural lighting in the corridor connecting the ticketing and baggage claim functions to the secure concourse, and the upper level administrative area.

Reynolds, Smith, and Hills, Inc. (RS&H) completed a Terminal Conditions Summary in August, 2001. The intent of the Conditions Summary was to provide the airport with an assessment of the terminal buildings major components. Recommendations for correcting existing deficiencies and associated cost estimates were also provided as part of the report. Several of those projects and recommendations have been implemented each year as funds allowed. These improvements generally replaced antiquated systems, but did include improvements to the public restrooms, replacement and reconfiguration of baggage claim conveyors, relocation of airport operations, and infill of the airside atrium.

A more comprehensive renovation of the terminal in several phases is under design by RS&H and in construction. Phase One began construction in late 2015 and is projected to be competed in fall 2016. This initial phase includes terrazzo flooring in all public areas to the security screening checkpoint, new wall finishes, new airline ticket counters and new rental car counters. The EDS machines will be removed from the lobby and moved to the current first floor baggage make-up areas. A new exterior covered area with a sloped plate outbound name-up device will be shared by all airlines. The revised layout is reflected in the previous figures.

The Phase Two project is still in an early design stage. It will focus on improvements in the security checkpoint area, including reconfiguration of the screening lanes and improvements to finishes and building systems similar to Phase One. Phase Three will address the airside public spaces in a similar fashion.

Phase One Terminal Ticketing Lobby Renovations (Rendering courtesy RS&H)

Terminal Summary

Inventory information gathered and analyzed in this section provides a base for determining deficiencies with the existing terminal building and terminal area that will be discussed later in this report. The areas compiled in **Table 1.9** will be used in the Facility Requirements chapter to compare the existing capacity for each major component of the terminal building to the forecasted demand based on passenger activity forecasts over the next 20 years. Evaluations of the terminal area and terminal building facilities in this section help determine the most appropriate methods for providing future improvements in order to satisfy future demands. Conceptual alternatives for both the terminal building and the apron are to be explored in the Airport Alternatives chapter. Considerations in the development of terminal building concepts include deficiencies (square footage, conveyors, etc.), functionality of existing areas, and location of adjacent constraints, cost effectiveness, phasing, regulatory constraints, and many more issues.

A preliminary identification of deficiencies in the existing terminal building obvious prior to the completion of the facility requirements analysis, includes congestion in the ticketing lobby (overall depth, EDS functions, etc.), congestion in the connecting corridor north of the security screening area (location of security queuing, central stairs, etc.), lack of sufficient restroom facilities on the unsecure side, and the general location of concessions.

Several of these issues are being addressed in the current projects. Phase One terminal renovations will relocate the checked baggage screening out of the lobby and down to the apron level. Ticket counters and outbound conveyors will be replaced. Phase Two will include changes and improvements to the passenger screening area. To the extent these designs have been fully developed, they are reflected in this inventory narrative and the plans in the previous figures.

Existing Terminal Areas

Table 1-9 illustrates size of major areas of the existing terminal building.

Table 1-9
Existing Terminal Areas

Terminal Component and Unit	Existing Area
Check-in Positions/ Kiosks (ea.)	18 / 6
Ticketing Length (lf)	178
Ticket Agent Area (sf)	1,740
Ticket Lobby (sf)	5,120
Airline Ticket Offices (sf)	6,650
Outbound Baggage Make-Up (sf)	9,288
Checked Baggage Screening (sf)	10,166
Claim Devices (ea)	2
Conveyor Frontage (lf)	310
Claim Lobby (sf)	6,710
Inbound Bag Operations (sf)	4,370
Rental Car Areas (sf)	1,964
Public Waiting (sf)	5,015
Prime Concessions (sf)	10,512
Miscellaneous. Lease (sf)	8,348
Security Screening and Queue (sf)	2,626
Passenger Holding (sf)	21,200
Passenger Holding Circulation (sf)	11,586
Gates (ea)	10
Airline Operations Area (sf)	3,468
Area Subtotal (sf)	**108,763**
Support Space (sf)	69,442
Delivery Area (sf)	15,870
Administrative Space (sf)	13,711
TSA Administrative Space (sf)	6,547
Total Area (sf)	**214,333**

Source: Michael Baker International, Inc., 2016.

1.18 Support Facilities

According to FAA AC 150/5070-6B, support facilities "ensure the smooth and efficient airport operation, including the Aircraft Rescue and Fire Fighting (ARFF) stations, airport administrative areas, airport maintenance facilities, airline maintenance hangars, flight kitchens, aircraft fuel storage, heating and cooling systems, and FAA facilities. Although many support facilities have been documented throughout this chapter, **Table 1-10** summarizes the availability of these facilities at TLH.

Table 1-10
Summary of Support Facilities

Facility	Location	Notes
ARFF Station	South Ramp	ARFF Index C (for aircraft at least 126 feet in length but less than 159 feet)
Airport Administration Areas	Second Floor of Passenger Terminal Building	Additional Airport Facilities are Located Around the Airport
Airport Maintenance Facility	Northeast of the Cargo Apron along Capital Circle Southwest	For Maintaining the Airport Property
GSE Maintenance Facility	South Ramp	For Maintaining GSE Equipment
Aircraft Maintenance Hangar	Central Ramp	Most Aircraft Maintenance Services at TLH are Provided by Flightline Group
Flight Kitchen	South Ramp	The FBO (Million Air) Can Provide Catering Services
Fixed Base Operator (FBO)	South Ramp	Million Air's Services Include Fuel and Ground Services, Hospitality Bar, Conference Room, Wireless Internet, Pool Table, Pilots Lounge, Private Bathroom and Shower, Sleep Room, Crew Car, and Rental Cars
Aircraft Fuel Storage	Between Central and South Ramps (Aboveground Tanks)	Jet A – 120,000 Gallons (4 Tanks) 100LL – 25,000 Gallons (1 Tank) Unleaded – 10,000 Gallons (1 Tank)
Heating and Cooling Systems	Varies	Various Heating and Cooling Systems are Located Throughout the Property for Individual Facilities
FAA Facilities	South of Runway 9-27	Includes FAA ATCT and TRACON
Source: Michael Baker International, Inc., 2016.		

1.19 Land Holdings

As part of this Master Plan Update, an Exhibit 'A' Airport Property Inventory Map was developed in accordance with FAA Standard Operating Procedure (SOP) 3.00, SOP for FAA Review of Exhibit 'A' Airport Property Inventory Maps. The detailed Exhibit 'A' identifies all past, current, and proposed land holdings associated with the airport. The Exhibit 'A' efforts include a title search, property map development, and a legal review and title opinion. The information provided will help the City determine the history of land holdings associated with TLH for as long as there are records associated with the property. Future property acquisition may be needed to bring the airport into compliance with FAA design standards and to improve the airport's compatibility with surrounding land uses.

1.20 Land Use Considerations

This section identifies baseline information related to existing land uses in the vicinity of TLH. The areas to the south and west of TLH are largely undeveloped. According to the 2015 Existing Land

Use Map for the Tallahassee Urban Area, the airport property is designated as a Transportation/Communications/Utilities land use. Most areas to the south and west of the airport are designated as an Open Space Resource Protection land use, with the exception of some single-family homes along Springhill Road. There are also some single-family homes around Lake Bradford to the north of Capital Circle Southwest, as well as warehouses, offices, and vacant lands. Overall, the airport is not constrained in its ability to continue to develop based on encroaching developments. The Future Land Use Map for the Tallahassee Urban Area illustrates similar land use controls around the airport to prevent the construction of developments that may prevent TLH from continuing to grow.

The Land Development Code for the City of Tallahassee also defines specific height restriction zoning around TLH to prevent the erection of structures that may be obstacles to the airport's airspace. The height restrictions are based on Part 77 Imaginary Surfaces that surround both runways at TLH. The Land Development Code also identifies an Airport Vicinity District which "is intended to be located in the vicinity of and particularly off the ends of the runways at TLH which are subject to Day-Night Average Sound Levels (DNL) that exceed the threshold identified by the FAA and the state as being compatible with certain land use types." The Airport Vicinity District identifies principal and accessory uses that may be considered acceptable with the noise levels and also for standards related to height, glare, and electronic interference. A Federal Aviation Regulations (FAR) Part 150 Noise Study was also completed for TLH in 1996 that identified operational and land use measures for mitigating incompatible noise exposure to sensitive developments in the vicinity of the airport including the utilization of both runways to balance exposure, the adoption of close-in departure procedures, reducing the number of older and noisier planes, adoption of overlay zoning, amendment of building codes to require sound reduction measures, property acquisition, and soundproofing existing structures. Therefore, the City has done a comprehensive job to protect the ability to grow TLH and to make the airport compatible with the surrounding environment.

1.21 Environmental Overview

An environmental overview is defined in FAA Order 150-5070-6B, Airport Master Plans as an overview of environmentally sensitive features of an airport.[1] The environmental overview is a component of the inventory effort taking place at TLH during the Master Plan Update. The environmental information within this overview was compiled utilizing available resource materials and databases. This collection of data was based upon guidelines set forth in FAA Order 1050.1F, 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 14 impact categories that must be addressed in compliance with NEPA.

Potential environmental impact categories were considered based on the resource features present at the airport as a product of this Master Plan Update. In addition to known prior

[1] FAA, Order 150-5070-6B, Master Plan Updates http://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5070-6B-Change-2-Consolidated.pdf, (May 19, 2016)

environmental planning documents and information from various types of available environmental resource maps of the airport area. Identification of features that had the potential of being applicable to future development plans at the airport were addressed in the following sections:

Biological Resources

Airport habitats were evaluated with consideration to suitability for federal and state protected species in accordance with the Florida Endangered and Threatened Species Act, Section 7 of the Endangered Species Act of 1973, as amended, and the Bald and Golden Eagle Protection Act of 1940. A list of state- and federally-protected species that may occur in the vicinity of TLH was developed based on review of the Florida Natural Areas Inventory (FNAI) species database for Leon County, which was last updated in January 2016[2]; FNAI element occurrence data, obtained in May of 2016; and the U.S. Fish and Wildlife Service list for Leon County, dated February 3, 2016.[3]

Table A-1 and A-2 located in **Appendix A** lists state- and federally-protected species of potential concern that have the potential to utilize habitats within and surrounding the airport.

Hazardous Material, Solid Waste, and Pollution Prevention

Identification of potential waste and hazardous material sites was accomplished through the utilization of the USEPA NEPAssist database,[4] and review of a 2015 Phase 1 Environmental Site Assessment report that was performed for another project on TLH property.[5] Only one location with an operating storage tank, the FAA Tallahassee ATCT, was identified on the Federal Facilities Listing (FF Tanks) database. The FAA Tallahassee ATCT is a listed facility that currently uses a 2,000 gallon diesel UST. Million Air Tallahassee is a Fixed Base Operator (FBO) that have seven ASTs ranging in size from 1000 to 30,000 gallons. In addition to the above mentioned facility there are several tenants on the airport that are listed, according to the Resource Conservation and Recovery Act Information (RCRAInfo), as active and Conditionally Exempt Small Quantity Generators (CESQGs).[6]

Historic, Architectural, Archeological, and Cultural Resources

The National Register of Historic Places (NRHP) is an official list of the Nation's historic places worthy of preservation.[7] Based on review of the NRHP database, no NRHP-listed properties have

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[2] FNAI, "FNAI Tracking List, Leon County," http://www.fnai.org/bioticssearch.cfm, January 2016 (February 3, 2016).
[3] USFWS, "Federal Threatened, Endangered, and Other Species of Concern Likely to Occur in Leon County, FL," https://ecos.fws.gov/ipac/project/HFX7L5LKFJHLJG52SLQHOFH33A/resources, December, 2013 (February 3, 2016).
[4] USEPA, NEPAssist, http://nepassisttool.epa.gov/nepassist/nepamap.aspx?wherestr=3300+Capital+Cir+SW%2C+Tallahassee%2C+FL+32310 (February 2, 2016).
[5] AECOM, *Phase I Environmental Site Assessment for the First Solar Tallahassee Airport Project Site*, November 2015
[6] USEPA, Categories of Hazardous Waste Generators http://www.epa.gov/hwgenerators/categories-hazardous-waste-generators (February 3, 2016).
[7] National Parks Service, "Natural Register of Historic Places," http://www.nps.gov/nr/research/data_downloads.htm, (February 4, 2016).

been documented on, or in the near vicinity of, airport property. The CRAS report identified the Springhill Railroad Tramline, which has previously been recommended by the State Historic Preservation Office (SHPO), as eligible for listing on the NRHP[8]. This railroad corridor lies parallel to, and just outside of, a segment of the southernmost portion of the airport's property and crosses the eastern end of the airport's property. However, previous surveyors have reported that the portions of the tramline corridor that run adjacent to lack historic integrity due to past disturbance and alteration and are no longer contributing to the eligibility of the resource as a whole. After reviewing aerial photography the portion of the corridor that passes through the eastern end of the airport's property appears to no longer hold historical contribution to the resource due to mowing and maintenance of the airfield.

1.22 Water Resources

Surface Waters and Groundwater

The airport property is situated above the Upper Floridian aquifer and is within the Ochlockonee and St. Marks watershed (United States Geological Survey [USGS] Hydrologic Unit Code [HUC] 031200010602). TLH itself is within a closed basin. No water bodies that are listed by the Florida Department of Environmental Protection as impaired waters receive drainage from the airport. TLH has a National Pollutant Discharge Elimination System Multi-Sector Generic permit, FLR05A776-003, and a Stormwater Pollution Prevention Plan which is implemented to prevent exposure of stormwater to pollutants.

Wetlands and Other Jurisdictional Waters of the United States

Land use and vegetative cover are most frequently detailed using the Florida Land Use, Cover and Forms Classification System (FLUCFCS). This land use classification system was originally developed by FDOT but has since been employed by multiple state and federal agencies in Florida.[9] Referring to the FLUCFCS data, (**Figure A-2** located in **Appendix A**), there are two areas on airport property that contain wetland land cover types. Lakes, cypress, intermittent ponds, and mixed wetland hardwoods land cover types are mapped within an area approximately 23.9 acres in size that lies north of the approach end of Runway 18. The easternmost portion of the airport property contains an area approximately 7.7 acres in size that consists of mixed wetland hardwoods, wetland coniferous forest, lake, and riverine land cover types.

Floodplains

Executive Order (EO) 11988, Floodplains, and the United States Department of Transportation Order 5650.2, Floodplain Management and Protection, requires 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.

[8] SEARCH, *Phase 1 Cutlural Resources Survey for Tallahassee International Airport*, March 2016
[9] FDOT, Florida Land Use, Cover and Forms Classification System, January 1999.

Review of the most updated FEMA Flood Insurance Rate Maps (FIRM), showed that the majority of the Airport is located within Zone X which is defined by FEMA Zone classification as area determined to be outside the 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.[10]. There are small portions of the airport at both the very north and east ends of the airport property that fall within the Zone AE classification (**Figure A-3** located in **Appendix A**). Zone AE corresponds to the 100-year floodplains for which prior hydraulic studies have been completed and base flood elevations are available. The Zone AE floodplains located on airport property to the north and the east have defined base flood elevations of 38.2 and 38.26 feet, respectively.

[10] FEMA, "Zone Classifications," http://www.floodmaps.com/zones.htm (February 4, 2016).

2.0 Aviation Activity Forecasts

2.1 Background

This aviation forecasting effort was conducted in 2016 as part of the Master Plan Update for the Tallahassee International Airport (TLH). The forecasts were developed based on the most recently-available information and are utilized in later sections of this study to determine short- and long-term facility requirements and to provide the preliminary justifications for recommended improvements. The forecasts are presented over a 20-year planning period that extends from 2015 through 2035. Although several forecasting efforts have been conducted over the course of the airport's history, this is the first comprehensive forecasting effort that has been conducted since the name of the airport was changed from 'Regional' to 'International.'

The last comprehensive forecasting effort was conducted as part of the 2006 Master Plan Update (with a planning period from 2003 to 2023). That was several years before the new Northwest Florida Beaches International Airport (ECP) in Panama City, Florida opened in May 2010, after which time the number of airline operations and passenger enplanements sharply declined at TLH. Consequently, the previous Master Plan Update did not account for the reduction in airline services that occurred at TLH after the new airport opened in Panama City. The previous Master Plan Update was also conducted at a time when the general aviation industry was not impacted by factors such as rising fuel prices after Hurricane Katrina in 2005 and the economic recession of the late 2000s.

As discussed throughout this chapter, all sectors of aviation activity (airline, cargo, military, and general aviation) generally began to stabilize since 2011 at TLH. With recent upgrades to the airfield, ongoing enhancements to the passenger terminal building, and the City of Tallahassee's initiatives to improve customer service and technology, this forecasting effort had to consider what types of opportunities could be induced from those actions. It is also important to note that the City of Tallahassee intends to establish a Foreign Trade Zone (FTZ) at the airport which may also influence both aviation and non-aviation development and activity. Therefore, several ongoing and anticipated trends are identified in this chapter to evaluate the potential for future growth opportunities at TLH.

The following elements are addressed as part of this forecasting effort:

- Forecasting Limitations
- Historical and Baseline Activity Analysis
- Factors and Opportunities Affecting Activity Levels
- Airline Forecasts
- Air Cargo Forecasts
- Military Operations Forecasts
- General Aviation Operations and Based Aircraft Forecasts
- Combined Operations Forecasts

- Peaking Forecasts
- Forecast Summary

2.2 Forecasting Limitations

Forecasting aviation activity is a complex process that considers a multitude of factors, both controllable and beyond an airport's control. Forecasts are not to be construed with predictions of the future, but rather an educated guess of future activity based on a variety of predictors, calculations, assumptions, and subjective judgment. The accuracy of the estimates decline as the planning term is extended, potentially as a result of unforeseen local or geo-political events, natural disasters, and/or climatological events.

The FAA's forecast approval process typically constitutes an approval for planning purposes only, which allows the airport sponsor to depict projects that are consistent with the long-term growth expectations on the Airport Layout Plan (ALP) Drawing Set. In most cases, prior to issuing a grant, the FAA will require updated information demonstrating that a proposed project is justified by activity at the time, or by activity that would directly result from the implementation of the proposed project. This policy helps to ensure that funding is directed towards critical projects throughout the U.S.

2.3 Historical and Baseline Activity Analysis

Because TLH serves all sectors of aviation activity, there are several historical activity trends that must be analyzed to determine what the likelihood may be for growth opportunities during the planning period. It is also necessary to identify the baseline values from where all forecasts begin from, which are the actual 2015 values for TLH as determined primarily from the following resources which are referenced throughout this chapter:

- FAA Air Traffic Activity Data System (ATADS) Database
- FAA Traffic Flow Management System Counts (TFMSC) Database
- FAA Terminal Area Forecast (TAF)
- U.S. Department of Transportation (USDOT) Bureau of Transportation Statistics (BTS) Databases (T-100 Domestic Segment and Historical Load Factors)

The chapter was organized to present the airline forecasts first. The airline activity at TLH is composed of scheduled operations by American Airlines, Delta Air Lines, and Silver Airways, as well as unscheduled charter operations that are typically conducted to transport athletic teams for the local universities and visiting teams. For a Primary Commercial Service Airport such as TLH, the FAA distributes annual Airport Improvement Program (AIP) entitlement funding based on the number of passenger enplanements or the number of departing passengers.

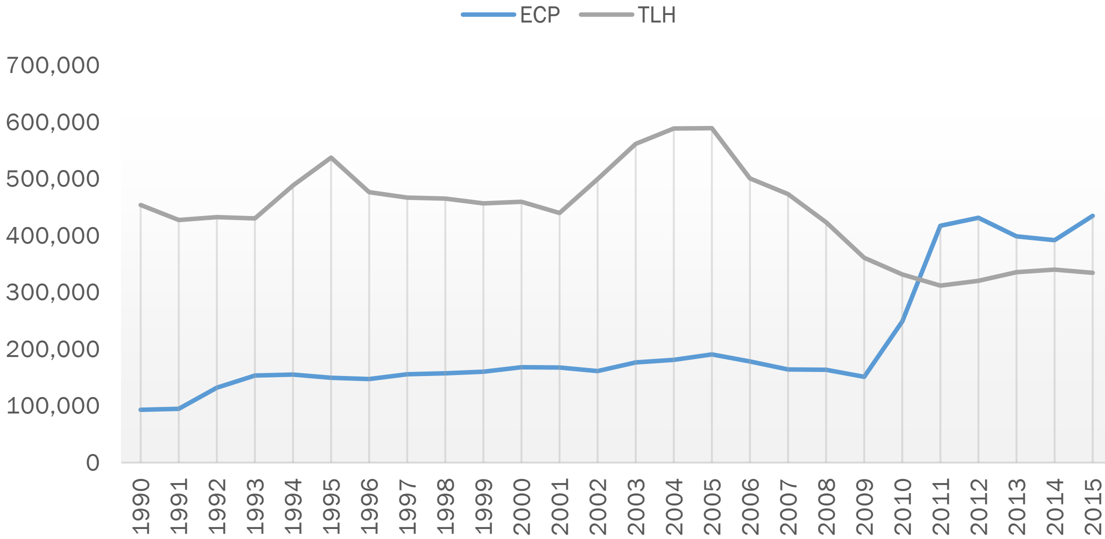
For comparison purposes, the historical number of enplanements since 1990 at both TLH and ECP are shown in **Table 2-1** and **Figure 2-1**. The 1990 through 2014 enplanement values were obtained from the FAA's 2015 TAF and the 2015 values were extracted from the BTS T-100 Domestic Segment database. Much of the growth at TLH in the early 2000s was attributable to when AirTran was flying there from 2001 through 2004 and the Continental Airlines service between TLH and George Bush Intercontinental Airport in Houston, Texas that began in 2004 and ended in 2008. Following the departure of those services and after the new airport opened in Panama City in May 2010, TLH continued to experience fewer enplanements than ECP which serves as a popular beachside tourist destination located approximately two hours from TLH by car. As shown in **Figure 2-2**, after the new airport opened in Panama City in 2010, the number of enplanements at TLH remained relatively stable and a linear growth trend was observed between 2011 and 2015. This trend predicts future enplanement growth to occur at an Average Annual Growth Rate (AAGR) of 1.74 percent assuming that no induced demand would occur (e.g., new airline service). Those types of historical short-term trends can be the most telling, particularly when activity has remained relatively stable with minimal increases/decreases from year-to-year. Unfortunately, many of the other historical activity characteristics at TLH do not produce statistical correlations that are beneficial for this forecasting effort.

Table 2-1
Historical Enplanement Comparison (1990-2015)

Year	ECP	TLH	% Difference (TLH vs. ECP)
1990	93,250 (Low)	454,178	387.05%
1991	94,653	427,243	351.38%
1992	131,900	432,253	227.71%
1993	153,541	430,091	180.11%
1994	154,833	488,381	215.42%
1995	149,635	537,663	259.32%
1996	147,456	476,515	223.16%
1997	155,948	466,741	199.29%
1998	157,509	465,454	195.51%
1999	160,242	456,776	185.05%
2000	168,244	459,514	173.12%
2001	167,423	440,015	162.82%
2002	161,136	499,836	210.20%
2003	176,620	561,777	218.07%
2004	181,083	588,969	225.25%
2005	190,815	589,418 (High)	208.90%
2006	178,059	500,932	181.33%
2007	164,078	472,964	188.26%
2008	163,287	423,587	159.41%
2009	151,227	360,976	138.70%
2010	248,663	331,766	33.42%
2011	417,172	311,579 (Low)	-25.31%
2012	431,547	320,343	-25.77%
2013	398,540	335,410	-15.84%
2014	391,670	340,114	-13.16%
2015 (Baseline)	434,869 (High)	334,263	-23.13%
AAGR 1990-2000	6.08%	0.12%	N/A
AAGR 2000-2010	3.98%	-3.20%	N/A
AAGR 2010-2015	11.83%	0.15%	N/A

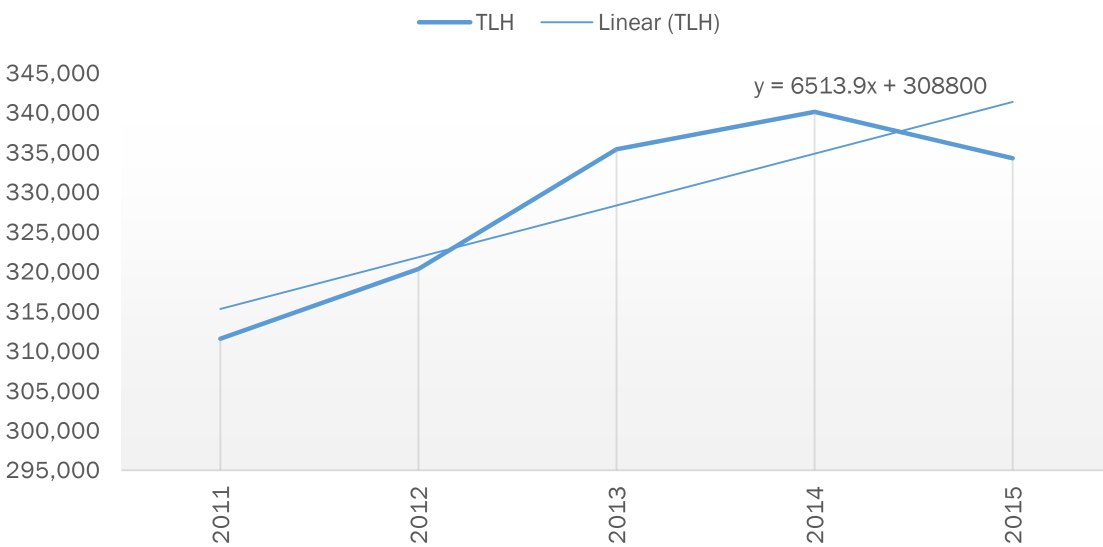
Sources: FAA 2015 TAF, BTS T-100 Domestic Segment database, and Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

Figure 2-1
Historical Enplanement Comparison (1990-2015)



Sources: FAA 2015 TAF, BTS T-100 Domestic Segment database, and Michael Baker International, Inc., 2016.

Figure 2-2
Historical Enplanements at TLH (2011-2015)



Sources: FAA 2015 TAF, BTS T-100 Domestic Segment database, and Michael Baker International, Inc., 2016.

A summary of the historical operations for TLH is presented in **Table 2-2** and was obtained from the FAA's ATADS database for the period between 1990 and 2015. The ATADS data for TLH represents the official records from the on-site Airport Traffic Control Tower (ATCT). There are several different activity characteristics listed in the table that are broken down in further detail within this chapter, but this is the traditional way that activity is categorized by the FAA and Air Traffic Control (ATC) personnel. Below are the definitions of TAF variables from the FAA Terminal Area Forecast Summary for Fiscal Years 2015-2040.

- **Local Operations** are conducted by aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
- **Itinerant Operations** are all aircraft operations other than local operations. Essentially, these represent takeoffs and landings of aircraft going from one airport to another.
- **Air Carrier Operations** represent either takeoffs or landings of commercial aircraft with seating capacity of more than 60 seats.
- **Commuter/Air Taxi** operations are one category. Commuter operations include takeoffs and landings by aircraft with 60 or fewer seats that transport regional passengers on scheduled commercial flights. Air taxi operations include takeoffs and landings by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights.
- **Itinerant General Aviation and Local Civil Operations** represent all civil aviation aircraft takeoffs and landings not classified as commercial.
- **Military Operations** represent takeoffs and landings by military aircraft. Operations are either itinerant or local flights.

As can be seen in Table 2-2, total operations at TLH dropped from a record high of 155,792 in 1990 to a record low of 56,114 in 2014 (the record low occurred when Runway 9-27 was being reconstructed and was closed). Most of the declines were experienced in the local and itinerant general aviation sectors, which was common for many airports as various events occurred throughout the nation that negatively impacted the general aviation industry and the ability for people to pay for the associated equipment and services (as discussed in the next section of this chapter). Although the airport experienced declining activity levels since the early 1990s, the airline, air cargo, and general aviation sectors operate in very different capacities today and aviation facility requirements are also evaluated very differently. **Table 2-3** summarizes the baseline activity levels for this aviation forecasting effort. Additional historical and baseline activity factors are presented within individual sections of this chapter.

Table 2-2 Historical Operations (1990-2015)											
Year	Itinerant (IT) Activity						Local (LOC) Activity				Total Operations
	Air Carrier	Air Taxi	GA	Military	IT Total	% Total	Civil	Military	LOC Total	% Total	
1990	18,337	23,179	61,052	4,590	107,158	68.78%	46,434	2,200	48,634	31.22%	155,792
1991	15,319	27,655	50,639	3,967	97,580	74.12%	31,718	2,358	34,076	25.88%	131,656
1992	15,214	27,265	47,300	4,108	93,887	75.88%	27,390	2,450	29,840	24.12%	123,727
1993	13,269	29,326	44,101	4,281	90,977	78.64%	21,846	2,868	24,714	21.36%	115,691
1994	14,496	33,158	41,319	3,634	92,607	78.65%	23,096	2,040	25,136	21.35%	117,743
1995	13,642	38,226	41,127	3,824	96,819	81.28%	20,580	1,718	22,298	18.72%	119,117
1996	6,690	41,315	39,722	4,588	92,315	81.85%	18,350	2,114	20,464	18.15%	112,779
1997	5,312	44,809	38,151	4,986	93,258	78.96%	21,530	3,324	24,854	21.04%	118,112
1998	5,138	38,828	39,807	5,225	88,998	79.49%	19,038	3,928	22,966	20.51%	111,964
1999	4,799	38,289	43,648	6,360	93,096	78.30%	18,996	6,810	25,806	21.70%	118,902
2000	4,298	38,409	43,443	7,192	93,342	77.14%	20,757	6,904	27,661	22.86%	121,003
2001	3,645	33,857	38,563	8,395	84,460	81.51%	13,577	5,588	19,165	18.49%	103,625
2002	6,895	30,674	38,700	12,257	88,526	81.61%	13,667	6,286	19,953	18.39%	108,479
2003	5,200	27,806	38,101	12,799	83,906	81.50%	14,202	4,838	19,040	18.50%	102,946
2004	5,618	28,270	38,817	11,001	83,706	83.32%	13,095	3,658	16,753	16.68%	100,459
2005	6,108	31,809	36,909	10,914	85,740	86.00%	11,113	2,849	13,962	14.00%	99,702
2006	4,849	29,620	38,077	12,743	85,289	83.40%	13,611	3,361	16,972	16.60%	102,261
2007	4,250	28,752	35,841	9,532	78,375	82.40%	13,724	3,014	16,738	17.60%	95,113
2008	4,712	26,239	32,774	8,929	72,654	81.24%	13,148	3,632	16,780	18.76%	89,434
2009	3,501	23,879	29,101	11,549	68,030	76.35%	15,466	5,611	21,077	23.65%	89,107
2010	4,513	19,752	26,621	12,627	63,513	79.59%	11,774	4,516	16,290	20.41%	79,803
2011	3,407	15,819	26,295	12,787	58,308	77.31%	13,373	3,742	17,115	22.69%	75,423
2012	3,072	16,062	23,318	9,878	52,330	82.02%	8,893	2,581	11,474	17.98%	63,804
2013	2,832	14,493	23,051	12,121	52,497	83.32%	7,296	3,215	10,511	16.68%	63,008
2014	4,601	11,081	22,196	9,744	47,622	84.87%	5,927	2,565	8,492	15.13%	56,114
2015 (Baseline)	5,339	10,123	22,197	10,151	47,810	82.54%	7,197	2,914	10,111	17.46%	57,921
AAGR 1990-2000	-13.50%	5.18%	-3.35%	4.59%	-1.37%	1.15%	-7.74%	12.12%	-5.49%	-3.07%	-2.50%
AAGR 2000-2010	0.49%	-6.43%	-4.78%	5.79%	-3.78%	0.31%	-5.51%	-4.16%	-5.16%	-1.13%	-4.08%
AAGR 2010-2015	3.42%	-12.51%	-3.57%	-4.27%	-5.52%	0.73%	-9.38%	-8.39%	-9.10%	-3.08%	-6.21%

Sources: FAA ATADS database and Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

Table 2-3
Baseline 2015 Activity Levels

Baseline Airline Factors

Item	Operations	Seats	Average Seats (Seats ÷ Operations)	Passengers	Load Factor (Passengers ÷ Seats)
Arrival/Passenger Deplanement Factors					
Scheduled Turboprop	1,142	38,896	34.06	24,586	63.21%
Scheduled Jet	5,464	419,462	76.77	307,874	73.40%
Unscheduled Jet	41	7,071	172.46	3,421	48.38%
Total Arrivals	**6,647**	**465,429**	**70.2**	**335,881**	**72.17%**
Departure/Passenger Enplanement Factors					
Scheduled Turboprop	1,150	39,134	34.03	23,966	61.24%
Scheduled Jet	5,472	419,838	76.72	307,107	73.15%
Unscheduled Jet	44	7,048	160.18	3,190	45.26%
Total Departures	**6,666**	**466,020**	**69.91**	**334,263**	**71.73%**
Total Airline Factors					
Total Operations	**13,313**	**931,449**	**69.97**	**670,144**	**71.95%**
Total Turboprops	**2,292**	**78,030**	**34.04**	**48,552**	**62.22%**
Total Jets	**11,021**	**853,419**	**77.44 (76.75 Scheduled)**	**621,592**	**72.84% (73.27% Scheduled)**

Sources: BTS T-100 Domestic Segment database and Michael Baker International, Inc., 2016.

Baseline Air Cargo Factors

Item	Operations	Cargo Volume (Pounds)
Inbound/Deplaned Cargo Factors		
Scheduled Turboprop	410	718,109
Scheduled Jet	262	7,601,097
Unscheduled Jet	2	132,103
Airline Belly Freight/Mail	N/A	232,522
Total Arrivals	**674**	**8,683,831 (Includes Belly Freight/Mail)**
Outbound/Enplaned Cargo Factors		
Scheduled Turboprop	432	741,149
Scheduled Jet	262	9,408,332
Unscheduled Jet	2	15,342
Airline Belly Freight/Mail	N/A	196,793
Total Arrivals	**696**	**10,361,616 (Includes Belly Freight/Mail)**
Total Air Cargo Factors		
Total Operations	**1,370**	**19,045,447 (Includes Belly Freight/Mail)**
Total Turboprops	**842**	**1,459,258**
Total Jets	**528**	**17,586,189 (Includes Belly Freight/Mail)**

Sources: BTS T-100 Domestic Segment database and Michael Baker International, Inc., 2016.

Baseline Military Factors

Item	Operations
Itinerant Operations / % of Total	10,151
Local Operations / % of Total	2,914
Total Operations	**13,065**

Sources: FAA ATADS database and Michael Baker International, Inc., 2016.

Baseline General Aviation Factors

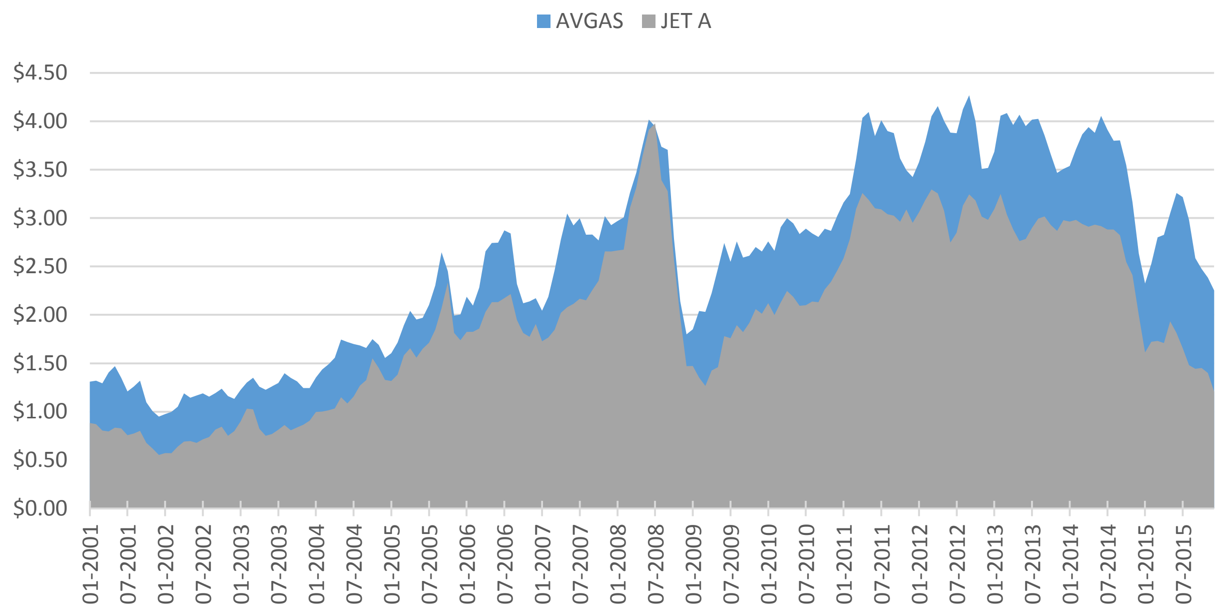
Item	Operations or Based Aircraft
Itinerant and Local Operations	
Itinerant Operations / % of Total	23,017 / 76.18%
Local Operations / % of Total	7,197 / 23.82%
Total Operations	**30,214**
Operations by Aircraft Type	
Single-Engine Piston (SEP)	17,133
Multi-Engine Piston (MEP)	2,560
Turboprop	3,346
Jet	5,161
Helicopter	2,014
Based Aircraft by Type	
Single-Engine Piston (SEP)	84
Multi-Engine Piston (MEP)	10
Turboprop	6
Jet	4
Helicopter	15
Total Based Aircraft	**119**

Sources: FAA ATADS database, FAA TFMSC database, and Michael Baker International, Inc., 2016.

2.4 Factors and Opportunities Affecting Activity Levels

This section describes past and present trends that may influence operations and based aircraft levels at TLH. As part of any forecasting effort, the FAA recommends the identification of historical factors that represented turning points for the U.S. aviation industry such as the terrorist attacks on September 11, 2001, sharp fuel price increases after Hurricane Katrina damaged Gulf Coast refineries in August 2005 (refer to **Figure 2-3**), and the economic recession of the late 2000s. Although some of those events were impossible to predict, their resulting consequences had considerable impacts on aviation activity throughout the U.S. Local trends are also important because they provide airport-specific information that can be used to support the selection of preferred forecasts. Trends evaluated include economic conditions, load factor tends, airport-specific factors, and the FAA Next Generation Air Transportation System (NextGen).

Figure 2-3
U.S. Aviation Gasoline Wholesale/Resale by Refiners (2001-2015)

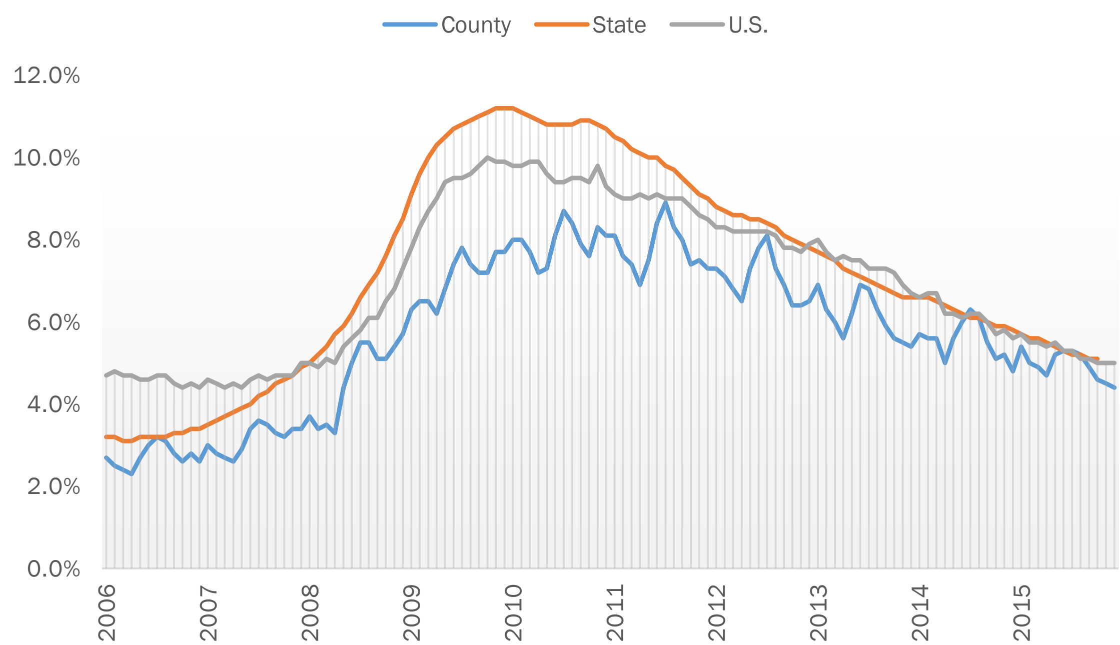


Sources: U.S. Energy Information Administration and Michael Baker International, Inc., 2016.

Economic Conditions

The previous chapter includes a review of historical and forecast socioeconomic conditions for the City of Tallahassee, Leon County, State of Florida, and U.S. The purpose was to see how local area socioeconomic conditions compared to those of larger geographies. For example, **Figure 2-4** illustrates the historical unemployment rates for Leon County, State of Florida, and U.S. It is anticipated that the high number of public sector jobs within the city (state government employees, university employees, etc.) helped to keep Leon County's unemployment lower than that of the state and country between 2006 and 2015; however, the unemployment rate for the state as a whole exceeded that of the country during much of the economic recession (primarily due to the largely tourism-based economy of the state and the 'housing bubble'). There are times when statistical relationships can be made between the economic growth of a local area and aviation activity levels. At TLH, such a statistical relationship would be difficult to ascertain as the population and employment within the local area have been increasing while aviation activity levels have been decreasing. Therefore, this forecasting effort did not rely heavily on historical and forecast economic trends to perform projections of future aviation demand for TLH.

Figure 2-4
Historical Unemployment (2006-2015)



Sources: U.S. Bureau of Labor Statistics and Michael Baker International, Inc., 2016.

An important consideration for this forecasting effort is that the Capital City has a large non-permanent population of students and state politicians that would prefer more convenient aviation transportation options due to the semi-remote location of Tallahassee compared to the large population areas in the state (particularly in South Florida). The same consideration applies to the year-round population of the local area. In the article, *GetBlue: An effort to bring JetBlue to Tallahassee* (FSView & Florida Flambeau: Florida State University, February 16, 2016), it discusses how it is inconvenient for students to travel between FSU and other areas of the state and country by air out of TLH. Students want more convenient air transportation options at TLH so they do not have to: 1) spend numerous hours in a car to reach their homes that poses safety risks and adds wear and tear to vehicles (e.g., 10 hours to Miami), 2) spend additional money and time to travel to an airport with greater connectivity, and/or 3) simply avoid travelling all together because of the inconveniences and therefore miss seeing their families entirely. The residents of Tallahassee started the GetBlue campaign (http://getbluetallahassee.com/) in an effort to encourage JetBlue to fly in and out of TLH. FSU recently pledged $1 million towards the effort and the goal is to connect TLH to Fort Lauderdale/Hollywood International Airport (FLL), which is a major connection point for JetBlue destinations.

The City of Tallahassee was also recently awarded a $750,000 grant from the USDOT's Small Community Air Service Development Program (SCASDP). The grant is awarded to communities that seek to provide assistance to:

- An air carrier to subsidize service to and from an underserved airport for a period not to exceed three years;
- An underserved airport to obtain service to and from the underserved airport; and/or
- An underserved airport to implement such other measures to improve air service both in terms of the cost of such service to consumers and the availability of such service, including improving air service through marketing and promotion of air service and enhanced utilization of airport facilities.

The grant is awarded to 11 airports each year and TLH was the only recipient in Florida in 2015. Because TLH currently has only one westbound route to/from Dallas/Fort Worth International Airport (DFW) on American Airlines, there have been discussions about using the grant to attract United Airlines to conduct flights between TLH and George Bush Intercontinental Airport (IAH) in Houston. Therefore, while it is important to have a strong economy to maintain and attract air service, these type of grants and 'requests for service' may help entice airlines to test a market to evaluate whether a long-term investment would be worthwhile.

Load Factor Trends

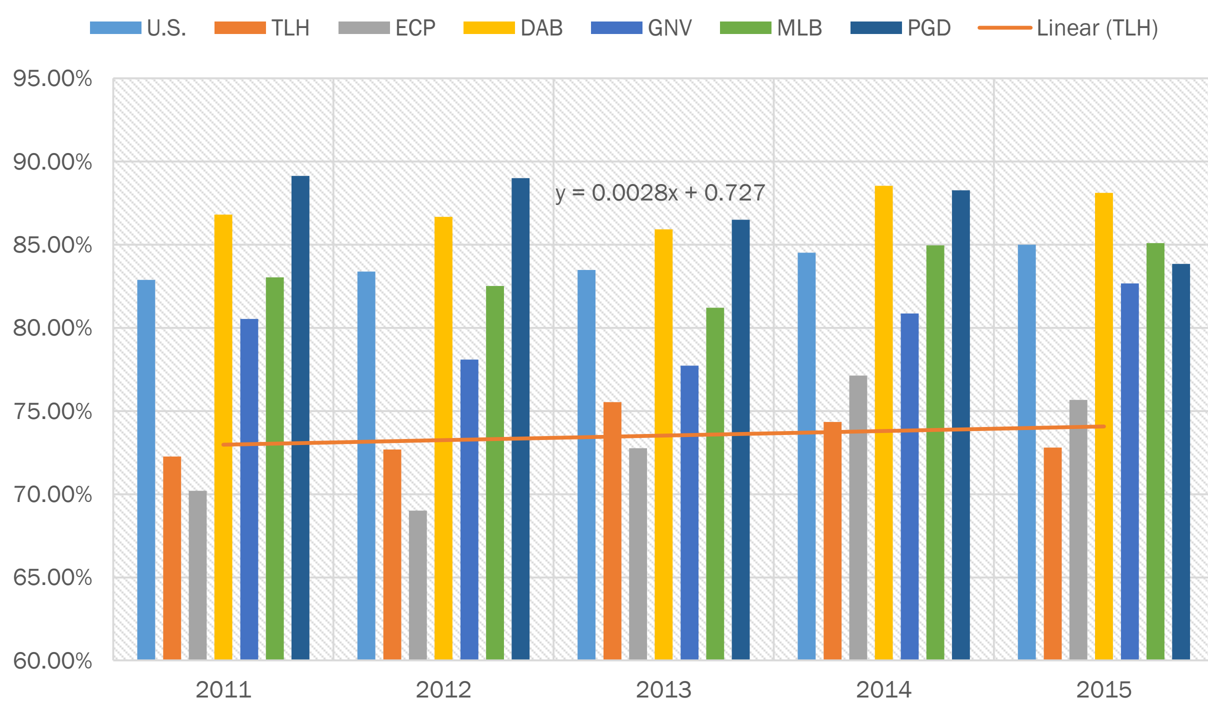
Historical load factors for scheduled airline service were also reviewed for all U.S. airports, TLH, ECP, and the four other Non-Hub Primary Commercial Service Airports in Florida: Daytona Beach International Airport (DAB), Gainesville Regional Airport (GNV), Melbourne International Airport (MLB), and Punta Gorda Airport (PGD). Load factors are defined as "passenger-miles as a proportion of available seat-miles in percent" and are tracked by the BTS. As shown in **Table 2-4** and **Figure 2-5**, scheduled airline load factors at TLH were lower than those for the U.S. as a whole and many Florida airports during the period between 2011 and 2015. This does not mean that airlines are not operating profitably at TLH. It is provided to highlight that there is room for passenger growth on existing scheduled flights without an immediate need to increase frequencies and/or utilize larger aircraft, which is often what occurs during peak period. Tallahassee is also a different market than many of the other airports shown because it does not serve beachfront tourist destinations where airlines increase service during the busy season; rather, TLH provides regular year-round service where seasonal fluctuations are not as extreme. In looking at the five years of data for TLH, a trend line was produced that may be useful for projecting the airport's future load factor growth (refer to Figure 2-5)--the trend line projects future values to grow at an AAGR of 0.45 percent. By increasing the previously-determined scheduled load factor percentages for turboprops and jets by the 0.45 percent AAGR, the future load factor percentages in **Table 2-5** were calculated. Within the FAA Aerospace Forecast Fiscal Years 2036, load factors for domestic regional jets are projected to be at 81.00 percent by 2035, which is nearly the same as the forecast for jets at TLH in the same year.

Table 2-4
Airport Load Factor Comparison (2011-2015)

Year	U.S.	TLH	ECP	DAB	GNV	MLB	PGD
2011	82.88%	72.26%	70.20%	86.81%	80.54%	83.03%	89.13%
2012	83.38%	72.68%	69.02%	86.68%	78.09%	82.52%	89.00%
2013	83.48%	75.54%	72.77%	85.93%	77.73%	81.21%	86.50%
2014	84.51%	74.34%	77.14%	88.55%	80.87%	84.97%	88.28%
2015	85.01%	72.81%	75.66%	88.12%	82.68%	85.09%	83.85%
AAGR 2011-2015	0.64%	0.19%	1.89%	0.38%	0.66%	0.61%	-1.52%
2015 Enplanements (Scheduled)		331,073	434,869	299,394	209,267	217,441	404,402

Sources: BTS Load Factor database, BTS T-100 Domestic Segment database, FAA 2015 TAF, and Michael Baker International, Inc., 2016.

Figure 2-5
Load Factor Comparison (2011-2015)



Sources: BTS Load Factor database and Michael Baker International, Inc., 2016.

Table 2-5 TLH Scheduled Airline Load Factor Forecast		
Year	Turboprop	Jet
2015	62.22%	73.27%
2020	63.64%	74.95%
2025	65.10%	76.66%
2030	66.59%	78.41%
2035	68.11%	80.20%
AAGR 2015-2035	0.45%	0.45%
Source: Michael Baker International, Inc., 2016.		

Airport-Specific Factors

The name of the airport was recently changed from 'regional' to 'international' and ongoing terminal improvements, air service campaigns, and other initiatives are helping to not only build local excitement about what is occurring at TLH, but the City of Tallahassee was also selected as the site for a nationwide air service development conference that was held in April 2016. The City intends to provide a continuously-improving customer service experience at TLH. The City also intends to designate the airport property as an FTZ in order to provide a site where new facilities, jobs, and businesses could be fostered without being subject to high import/export fees. Although it is difficult to apply numbers to what these and other initiatives may result in at TLH, the City's proactive approach to making the airport more marketable and ready for aviation development, non-aviation development, and international travel and trade opportunities may be encouraging for potential investors.

FAA Next Generation Air Transportation System (NextGen)

NextGen includes a series of improvements to the national aviation system that are intended to make air travel more safe, convenient, and dependable. By investing in new technologies and replacing aging systems, NextGen initiatives are focused on improving schedule predictability, reducing environmental impacts, flying more direct routes, limiting ground holding, better circumventing poor weather, providing better approaches and access to airports, and improving safety for accident avoidance. The FAA's investment in NextGen initiatives should help to improve access and approach capability for airports around the U.S., as has been the case at TLH with the rollout of Localizer Performance with Vertical Guidance (LPV) approaches that provide horizontal and vertical course guidance to aircraft via Global Positioning System (GPS). Through the recommendations of this study and the FAA's ongoing NextGen initiatives, it is anticipated that TLH will continue to become more accessible and that airlines will be able to continue to save time and money through more efficient route planning.

2.5 Airline Forecasts

The airline forecasts were conducted for both scheduled airline passengers and operations as well as for unscheduled airline passengers and operations that are typically associated with athlete transport by the local universities and visiting teams. For the FAA's purposes, the key variable for airlines is the number of passenger enplanements or departures that occur from a commercial service airport. The number of annual enplanements determines how much AIP entitlement funds an airport will receive for that year and also determines the airport's role within the National Plan of Integrated Airport Systems (NPIAS).

Two separate airline forecast scenarios were conducted for TLH. The first represents a baseline scenario where airline passengers and operations would continue to grow at a steady rate throughout the course of the 20-year planning period. The second scenario assumes that new service would be induced at TLH via the addition of new airlines and/or routes. The purpose of conducting two scenarios is because the FAA will typically only approve a forecast that is consistent with the latest edition of the TAF unless there is sufficient evidence to prove otherwise. Because there are no firm commitments at this time, it is important to produce a baseline forecast for FAA approval purposes and to have a separate and more aggressive forecast for planning purposes within this Master Plan Update. Below are descriptions of the two airline forecast scenarios. Note that only Scenario 1 was carried through the remaining sections of this chapter.

Airline Forecast Scenario 1

The first step for Scenario 1 was to select a growth rate that would be appropriate to conduct the baseline enplanement forecast. Multiple growth rates were reviewed from FAA, FDOT, the socioeconomic forecasts in Chapter 1, and previous studies for the airport; however, it was ultimately determined that recent history is the best predictor of how enplanements at TLH might grow without any new/induced demand. As mentioned earlier, the enplanement growth that occurred at TLH from 2011 to 2015 produced a trend line that results in an AAGR of 1.74 percent, which was applied through 2035 to determine the scheduled and unscheduled enplanement forecasts for Scenario 1 in Table 2-6. Enplanements under Scenario 1 increase from 334,263 in 2015 to 471,648 by 2035 (or 943,295 total passengers by 2035).

The airline operations forecasts under Scenario 1 were calculated based on the enplanement forecasts and the load factor forecasts in Table 2-5, with the exception of the unscheduled operations forecast that was maintained at a constant ratio due to the different operating scenario (i.e., charter). For the scheduled operations, the values were calculated as follows:

Scheduled Operations = Scheduled Enplanements x 2 ÷ (Average Seat Configuration x Load Factor %)

For 2020 scheduled turboprop operations, the equation would be:

Scheduled Operations (2,411) = 26,120 x 2 ÷ (34.04 x 63.64%)

This means that new scheduled operations would not be added each year until the forecast load factor percentage is exceeded. Therefore, unlike many forecasts which simply apply a similar growth rate to both enplanements and operations, this forecast assumes that a certain load factor threshold must be met before additional operations are added (refer to lower AAGRs for operations than enplanements in Table 2-6), which would be more appropriate considering some of the historical load factor percentages at TLH. Combined, scheduled and unscheduled airline operations are forecast to increase from 13,313 in 2015 to 17,116 by 2035.

Airline Forecast Scenario 2

Scenario 2 assumes that a new airline and/or route(s) would be added to TLH during the planning period in order to portray a scenario primarily for terminal planning purposes. Although the City of Tallahassee is actively pursuing new air service options, there are currently no firm commitments by operators. Scenario 2 builds upon Scenario 1 by adding the following flights to the mix:

- 2017 (JetBlue Embraer 190 with 100 Seats) – 1 Daily Departure and 1 Daily Arrival at 2017 Jet Load Factor Percentage
- 2017 (Possible New Airline or Route Based on Existing Sample) – 50% of 2015 DFW Passengers on American Airlines (34,208) at 2017 Jet Load Factor Percentage
- 2023 (JetBlue Embraer 190 with 100 Seats) – 2 Daily Departures and 2 Daily Arrivals at 2023 Jet Load Factor Percentage
- 2023 (Possible New Airline or Route Based on Existing Sample) – 100% of 2015 DFW Passengers on American Airlines (68,416) at 2023 Jet Load Factor Percentage

Following the addition of the flights described above, all of the procedures described under Scenario 1 were then performed to calculate the airline enplanement and operations forecasts for Scenario 2. Although the addition of these flights under Scenario 2 may seem arbitrary, they were specifically selected to complement previous capacity assessments and programming studies that have been conducted for the passenger terminal building. **Figure 2-6** illustrates the comparison between Scenarios 1 and 2 for total airline enplanements and **Figure 2-7** provides the comparison for total airline operations.

Under both scenarios in 2015 and 2035, the average passenger seating capacity for scheduled airline turboprops would be 34.04 and for scheduled airline jets would be 76.75. Therefore, the existing and forecast scheduled airline fleet is anticipated to remain similar to the current mix if 34-passenger turboprops, regional jets, and narrow-body jets. Peak airline passenger and operational demands are calculated in conjunction with the facility requirements.

2.6 Air Cargo Forecasts

The air cargo activity at TLH primarily consists of scheduled operations by FedEx using either Cessna 208 Caravan turboprops on feeder routes (primarily in Florida) or Boeing 757-200 Freighter jets that primarily fly between TLH and FedEx's hub at Memphis International Airport (MEM). FedEx previously flew 727-200 Freighter jets into Tallahassee, but the aircraft began to be phased out beginning in December 2010 until the 757 completely took over FedEx's jet operations at the airport in January 2013. Because it appears that FedEx will continue to utilize

757s for the foreseeable future at TLH, it is likely that a 757 will continue to be the airport's most demanding aircraft that conducts 500 or more annual operations (i.e., the critical aircraft).

Similar to the airline forecasts, forecasts of air cargo were conducted for scheduled and unscheduled operations, enplaned and deplaned cargo tonnage, by aircraft type, and also for belly cargo that is transported by the scheduled airlines. Since at least 2011 at TLH, the amount of enplaned and deplaned pounds of air cargo has steadily declined to a low in 2015. The recent 2015 trend is something that FedEx experienced for domestic air cargo primarily because the rapidly-growing e-commerce industry (e.g., Amazon and others) is relying heavily on ground transportation of shipments. In early 2016, Amazon announced that the company was going to lease several 767 Freighter jets to run its own/partnered air cargo service. These types of things are important to point out because of the growing influence of e-commerce in the U.S.

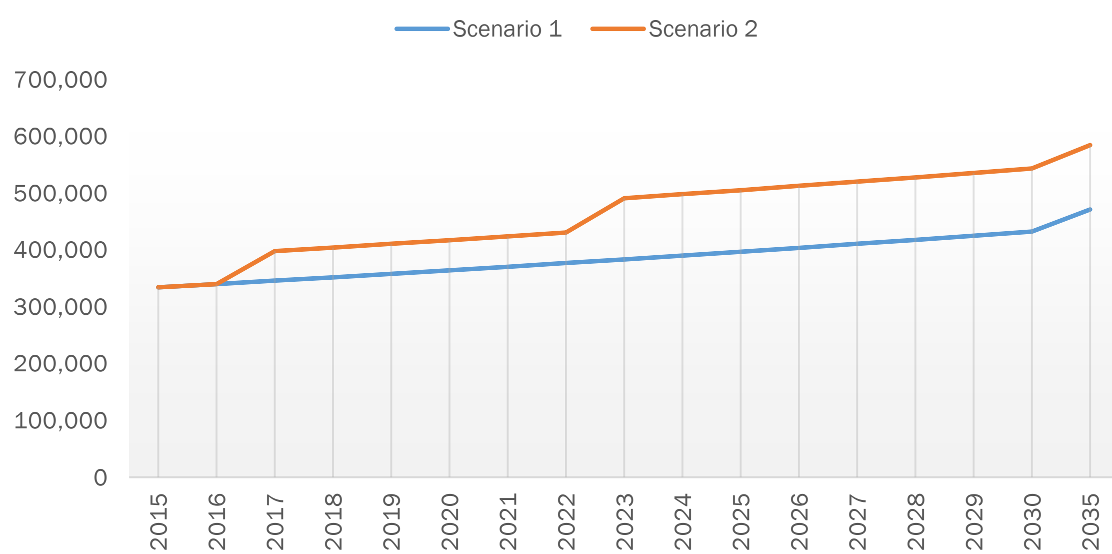
The FAA Aerospace Forecast Fiscal Years 2016-2036 continues to project that domestic Air Cargo Revenue Ton Miles (RTMs) will increase at an AAGR of 1.0 percent between 2015 and 2025. RTMs are the weight in tons multiplied by the mileage carried. All factors in **Table 2-7** were increased by an AAGR of 1.00 percent to calculate the air cargo forecasts for TLH.

Table 2-6
Airline Forecast Scenarios (2015-2035)

Year	Total Enplanements	Scheduled Enplanements				Unscheduled Enplanements		Total Passengers	Scheduled Operations				Unscheduled Operations		Total Operations
		Turboprop	Jet	Total	% Total Enplanements	Jet	% Total Enplanements		Turboprop	Jet	Total	% Total Operations	Jet	% Total Operations	
Airline Scenario 1															
2015	334,263	23,966	307,107	331,073	99.05%	3,190	0.95%	670,144	2,292	10,936	13,228	99.36%	85	0.64%	13,313
2020	364,401	26,120	334,713	360,833	99.02%	3,569	0.98%	728,803	2,411	11,638	14,049	99.33%	95	0.67%	14,145
2025	397,147	28,468	364,800	393,268	99.02%	3,879	0.98%	794,295	2,569	12,401	14,970	99.31%	103	0.69%	15,073
2030	432,809	31,027	397,591	428,618	99.03%	4,190	0.97%	865,617	2,738	13,213	15,951	99.30%	112	0.70%	16,063
2035	471,648	33,816	433,330	467,146	99.05%	4,501	0.95%	943,295	2,917	14,079	16,996	99.30%	120	0.70%	17,116
AAGR 2015-2035	1.74%	1.74%	1.74%	1.74%	0.00%	1.74%	0.00%	1.72%	1.21%	1.27%	1.26%	0.00%	1.74%	0.47%	1.26%
Airline Scenario 2															
2015	334,263	23,966	307,107	331,073	99.05%	3,190	0.95%	670,144	2,292	10,936	13,228	99.36%	85	0.64%	13,313
2020	417,394	26,120	387,705	413,825	99.15%	3,569	0.85%	834,787	2,411	13,481	15,892	99.41%	95	0.59%	15,987
2025	505,555	28,468	473,207	501,675	99.23%	3,879	0.77%	1,011,109	2,569	16,086	18,655	99.45%	103	0.55%	18,759
2030	543,694	31,027	508,477	539,504	99.23%	4,190	0.77%	1,087,388	2,738	16,898	19,636	99.43%	112	0.57%	19,748
2035	585,068	33,816	546,751	580,567	99.23%	4,501	0.77%	1,170,136	2,917	17,764	20,681	99.42%	120	0.58%	20,801
AAGR 2015-2035	2.84%	1.74%	2.93%	2.85%	0.01%	1.74%	-1.07%	2.83%	1.21%	2.46%	2.26%	0.00%	1.74%	-0.51%	2.26%

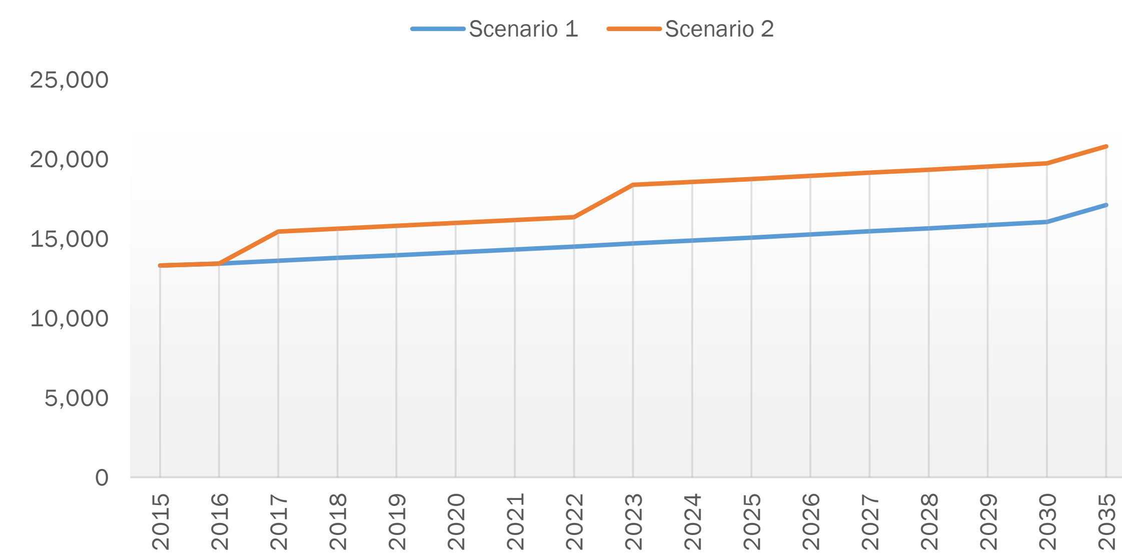
Source: Michael Baker International, Inc., 2016.

Figure 2-6
Airline Enplanements Forecast Comparison (2015-2035)



Source: Michael Baker International, Inc., 2016.

Figure 2-7
Airline Operations Forecast Comparison (2015-2035)



Source: Michael Baker International, Inc., 2016.

Table 2-7
Air Cargo Forecasts (2015-2035)

Year	Total Enplaned Cargo (lbs.)	Scheduled Enplaned Cargo				Unscheduled Enplaned Cargo		Enplaned Bell Freight/Mail		Total Cargo (lbs.)	Scheduled Operations (Critical Aircraft)				Unscheduled Operations		Total Operations
		Turboprop (lbs.)	Jet (lbs.)	Total (lbs.)	% Total	Jet (lbs.)	% Total	Airlines (lbs.)	% Total		Turboprop	Jet	Total	% Total	Jet	% Total	
2015	10,361,616	741,149	9,408,332	10,149,481	97.95%	15,342	0.15%	196,793	1.90%	19,045,447	842	524	1,366	99.71%	4	0.29%	1,370
2020	10,890,163	778,955	9,888,251	10,667,207	97.95%	16,125	0.15%	206,831	1.90%	21,780,325	885	551	1,436	99.71%	4	0.29%	1,440
2025	11,445,670	818,690	10,392,652	11,211,341	97.95%	16,947	0.15%	217,382	1.90%	22,891,341	930	579	1,509	99.71%	4	0.29%	1,513
2030	12,029,515	860,451	10,922,781	11,783,232	97.95%	17,812	0.15%	228,471	1.90%	24,059,029	978	608	1,586	99.71%	5	0.29%	1,591
2035	12,643,141	904,343	11,479,953	12,384,296	97.95%	18,720	0.15%	240,125	1.90%	25,286,281	1,027	639	1,667	99.71%	5	0.29%	1,672
AAGR 2015-2035	1.00%	1.00%	1.00%	1.00%	0.00%	1.00%	0.00%	1.00%	0.00%	1.43%	1.00%	1.00%	1.00%	0.00%	1.00%	0.00%	1.00%

Source: Michael Baker International, Inc., 2016.

2.7 Military Operations Forecast

According to the FAA Terminal Area Forecast Summary for Fiscal Years 2015-2040, "because military operations forecasts have national security implications, the Department of Defense (DOD) provides only limited information on future aviation activity. Hence, the TAF projects military activity at its present level except when FAA has specific knowledge of a change. For instance, DOD may announce a base closing or may shift an Air Force wing from one base to another." Therefore, the number of local and military operations were held at 2015 levels throughout the duration of the 20-year planning period (refer to **Table 2-8**).

Table 2-8
Military Operations Forecast (2015-2030)

Year	Itinerant (IT)		Local (LOC)		Total Military Operations
	Operations	% Total	Operations	% Total	
2015	10,151	77.70%	22.30%	2,914	13,065
2020	10,151	77.70%	22.30%	2,914	13,065
2025	10,151	77.70%	22.30%	2,914	13,065
2030	10,151	77.70%	22.30%	2,914	13,065
2035	10,151	77.70%	22.30%	2,914	13,065
AAGR 2015-2035	0.00%	0.00%	0.00%	0.00%	0.00%

Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

2.8 General Aviation Operations and Based Aircraft Forecasts

Many elements compose the broad definition of general aviation activity. In simplest terms, general aviation includes all segments of the aviation industry except those conducted by scheduled air carriers and the U.S. military. General aviation activities may include pilot training, sightseeing, aerial photography, law enforcement, and medical flights, as well as business, corporate, and personal travel. General aviation operations are divided into the categories of local or itinerant. Local operations are arrivals or departures performed by aircraft that remain within the airport traffic pattern, or those that occur within sight of the airport. Local operations are most often associated with training activity and flight instruction (e.g., touch-and-goes). Itinerant operations are arrivals or departures that do not remain within the airport traffic pattern and/or that originate from another airport. The FAA defines an operation as either a single aircraft landing or takeoff. Under this definition, touch-and-goes are considered two operations (one takeoff plus one landing) and are deemed local operations. Itinerant operations are typically comprised of private, business/corporate, and air taxi flight activity, but may also include law enforcement and medical flights.

Although the FAA does not project growth in general aviation operations for TLH within the 2015 TAF, the FAA Aerospace Forecast Fiscal Years 2016-2036 projects Itinerant General Aviation Operations at Airports with FAA and Contract Traffic Control Service to grow at an AAGR of 0.3 percent between 2015 and 2036 and Local General Aviation Operations to grow at an AAGR of 0.4 percent during the same time. Conversely, the 2015 TAF projects based aircraft at TLH to grow at an AAGR of 0.92 between 2015 and 2035. In order to be consistent with the FAA's general aviation based aircraft growth expectations for TLH, the forecast of itinerant and local general aviation operations in **Table 2-9** utilized the same 0.92 percent AAGR.

Table 2-9
GA Operations Forecast (2015-2030)

Year	Itinerant (IT)		Local (LOC)		Total GA Operations
	Operations	% Total	Operations	% Total	
2015	23,017	76.18%	7,197	23.82%	30,214
2020	24,101	76.18%	7,536	23.82%	31,636
2025	25,235	76.18%	7,891	23.82%	33,126
2030	26,423	76.18%	8,262	23.82%	34,685
2035	27,667	76.18%	8,651	23.82%	36,318
AAGR 2015-2035	0.92%	0.00%	0.92%	0.00%	0.92%

Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

As shown in **Table 2-10** and **Figure 2-8**, the general aviation operations by aircraft type forecast was determined by using projected growth rates from the FAA Aerospace Forecast Fiscal Years 2016-2036 for General Aviation and Air Taxi Hours Flown. Growth rates were specifically applied for turboprops, jets, and helicopters, while remainders were applied to piston aircraft based on their existing share of total general aviation operations. The general aviation based aircraft by type forecast in **Table 2-11** was also determined using projected growth rates from the FAA Aerospace Forecast, in addition to making realistic growth assumptions for based pistons and helicopters.

Table 2-10
GA Operations by Aircraft Type Forecast (2015-2035)

Year	Single-Engine Piston (SEP)	Multi-Engine Piston (MEP)	Turboprop	Jet	Helicopter	Total GA Operations
2015	17,133	2,560	3,346	5,161	2,014	30,214
2020	17,159	2,564	3,622	6,012	2,279	31,636
2025	17,071	2,551	3,922	7,004	2,578	33,126
2030	16,846	2,517	4,246	8,159	2,917	34,685
2035	16,458	2,459	4,596	9,504	3,301	36,318
AAGR 2015-2035	-0.20%	-0.20%	1.60%	3.10%	2.50%	0.92%

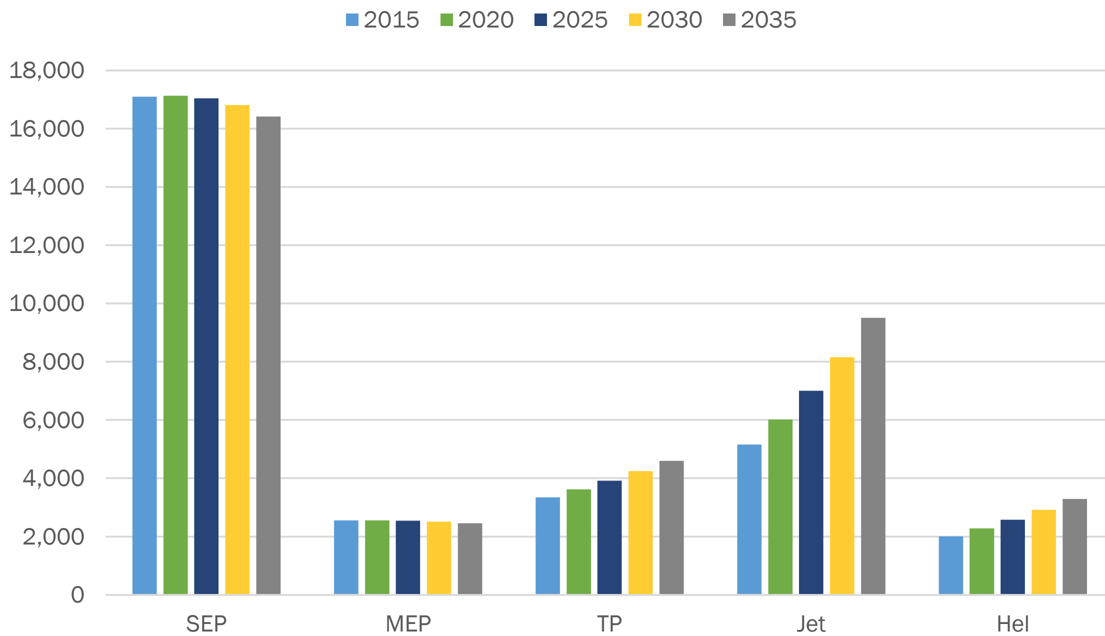
Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

Table 2-11
GA Based Aircraft by Type Forecast (2015-2035)

Year	Single-Engine Piston (SEP)	Multi-Engine Piston (MEP)	Turboprop	Jet	Helicopter	Total GA Based Aircraft
2015	84	10	6	4	15	119
2020	88	10	6	5	16	125
2025	92	10	7	5	16	131
2030	96	10	8	6	17	138
2035	101	10	8	7	18	145
AAGR 2015-2035	0.92%	0.00%	1.60%	3.10%	0.92%	0.98%

Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

Figure 2-8
GA Operations by Type Forecast (2015-2035)



Source: Michael Baker International, Inc., 2016.

2.9 Combined Operations Forecasts

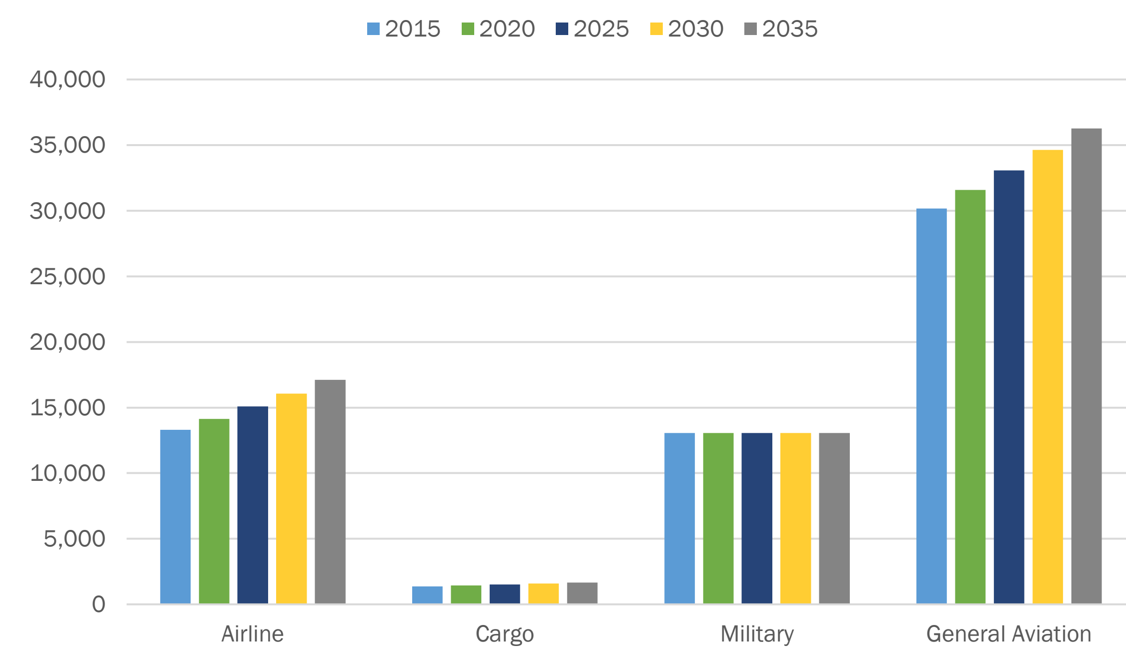
The previous forecasting efforts were combined to create the overall operations local and itinerant operations forecast in **Table 2-12**, which results in total operations at TLH increasing from 57,921 in 2015 to 68,122 by 2035. **Figure 2-9** illustrates the specific breakdown of operations by user group and shows that general aviation activity is forecast to remain the most prevalent category of aviation activity at TLH throughout the 20-year planning period. The combined operations by aircraft type forecast is presented in **Table 2-13**.

Table 2-12
Combined Local and Itinerant Operations Forecast (2015-2035)

Year	Itinerant (IT)						Local (LOC)				Total Operations
	Airline	Cargo	Military	General Aviation	IT Total	% Total Operations	Military	General Aviation	LOC Total	% Total Operations	
2015	13,313	1,370	10,151	22,976	47,810	82.54%	2,914	7,197	10,111	17.46%	57,921
2020	14,145	1,440	10,151	24,058	49,793	82.65%	2,914	7,536	10,450	17.35%	60,243
2025	15,073	1,513	10,151	25,190	51,928	82.78%	2,914	7,891	10,805	17.22%	62,733
2030	16,063	1,591	10,151	26,376	54,180	82.90%	2,914	8,262	11,176	17.10%	65,356
2035	17,116	1,672	10,151	27,618	56,557	83.02%	2,914	8,651	11,565	16.98%	68,122
AAGR 2015-2035	1.26%	1.00%	0.00%	0.92%	0.84%	0.03%	0.00%	0.92%	0.67%	-0.14%	0.81%

Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

Figure 2-9
Operations by User Group Forecast (2015-2035)



Source: Michael Baker International, Inc., 2016.

Table 2-13
Combined Operations by Aircraft Type Forecast (2015-2035)

Year	Jet					Turboprop					SEP		MEP		Helicopter		Military		Total Operations
	Airline	Cargo	GA	Total	% Total	Airline	Cargo	GA	Total	% Total	GA/Total	% Total	GA/Total	% Total	GA/Total	% Total	Total	% Total	
2015	11,021	528	5,161	16,710	28.85%	2,292	842	3,346	6,480	11.19%	17,099	29.52%	2,555	4.41%	2,012	3.47%	13,065	22.56%	57,921
2020	11,733	555	6,012	18,300	30.38%	2,411	885	3,622	6,919	11.48%	17,124	28.43%	2,559	4.25%	2,276	3.78%	13,065	21.69%	60,243
2025	12,504	583	7,004	20,091	32.03%	2,569	930	3,922	7,421	11.83%	17,035	27.16%	2,545	4.06%	2,575	4.10%	13,065	20.83%	62,733
2030	13,325	613	8,159	22,097	33.81%	2,738	978	4,246	7,961	12.18%	16,809	25.72%	2,512	3.84%	2,913	4.46%	13,065	19.99%	65,356
2035	14,199	644	9,504	24,347	35.74%	2,917	1,027	4,596	8,541	12.54%	16,419	24.10%	2,453	3.60%	3,296	4.84%	13,065	19.18%	68,122
AAGR 2015-2035	1.27%	1.00%	3.10%	1.90%	1.08%	1.21%	1.00%	1.60%	1.39%	0.57%	-0.20%	-1.01%	-0.20%	-1.01%	2.50%	1.67%	0.00%	-0.81%	0.81%

Source: Michael Baker International, Inc., 2016.
AAGR – Average Annual Growth Rate

2.10 Instrument Operations Forecast

According to the FAA report, Forecasting Aviation Activity by Airport, instrument operations consist of "arrivals, departures, and overflights conducted by an FAA approach control facility for aircraft with an Instrument Flight Rule (IFR) flight plan or special Visual Flight Rule (VFR) procedures." At TLH, IFR activity is tracked by the ATCT and consisted of 35,679 operations or 61.60 percent of total activity. During the forecast period, it is anticipated that the percentage of IFR operations will increase at the same AAGR as total operations, which equates to 49,353 operations by 2035 and 72.42 percent of total activity. The increasing IFR trend should be appropriate considering the FAA's ongoing NextGen improvements that are being conducted to improve access to airports and efficiency within the nation's airspace system.

Table 2-14
Instrument Operations Forecast (2015-2035)

Year	Total Operations	Instrument (IFR)		Visual (VFR)	
		Operations	% Total Operations	Operations	% Total Operations
2015	57,921	35,679	61.60%	22,242	38.40%
2020	60,243	38,645	64.15%	21,598	35.85%
2025	62,733	41,908	66.80%	20,825	33.20%
2030	65,356	45,467	69.57%	19,889	30.43%
2035	68,122	49,353	72.45%	18,769	27.55%
AAGR 2015-2035	0.81%	1.64%	0.81%	-0.85%	-1.65%
Source: Michael Baker International, Inc., 2016.					

2.11 Peaking Forecasts

This section includes the peaking forecasts for operations and general aviation passengers only. Peaking considerations for the passenger terminal and airline activity are presented as part of the facility requirements. Peaking forecasts are conducted so that airports can plan for times when the highest concentration of activity occurs. **Table 2-15** presents the peak activity forecasts for PHD and the methodology for each component is detailed below.

- **Average Peak Month (APM)** – Through a review of historical ATCT records, it was found that the APM represented 10.21 percent of annual activity in 2015.
- **Average Day Peak Month (ADPM)** – An average month contains 30.42 days (365 ÷ 12). The ADMP was calculated by dividing the APM by 30.42.
- **Average Day Peak Hour (ADPH)** – The ADPH at PHD can include a combination of touch-and-go training operations and itinerant activity and was estimated at 17.50 percent of the ADPM. The IFR and VFR peak hours were calculated based on the percentages shown in Table 2-14.

Table 2-15 Peaking Forecasts (2015-2035)					
Year	APM	ADPM	ADPH	IFT Peak Hour	VFR Peak Hour
2015	5,914	194	34	21	13
2020	6,151	202	35	23	13
2025	6,405	211	37	25	12
2030	6,673	219	38	27	12
2035	6,955	229	40	29	11
AAGR 2015-2035	0.81%	0.81%	0.81%	1.64%	-0.85%
Source: Michael Baker International, Inc., 2016. AAGR – Average Annual Growth Rate					

2.12 Forecast Summary

According to the FAA's June 2008 Review and Approval of Aviation Forecasts guidance, total enplanements, operations, and based aircraft forecasts are considered consistent with the TAF if they differ by less than 10 percent in the five-year forecast period and 15 percent in the 10-year forecast period. As shown in **Table 2-16**, all forecasts are consistent with the TAF even the based aircraft forecast. The TAF did not have the correct based aircraft values in 2015 as the airport reported, but the overall growth rates are very close for the Master Plan Update at TAF forecasts over the 20-year planning period.

Table 2-16 TAF Comparison Table						
Item	2015	2020	2025	2030	2035	AAGR 2015-2035
Enplanements						
Master Plan	334,263	364,401	397,147	432,809	471,648	1.74%
2015 TAF	335,550	366,077	405,823	433,429	468,366	1.68%
Difference	-0.38%	-0.46%	-2.14%	-0.14%	0.70%	N/A
Operations						
Master Plan	57,921	60,243	62,733	65,356	68,122	0.81%
2015 TAF	59,148	59,794	61,290	62,598	64,271	0.42%
Difference	-2.07%	0.75%	2.35%	4.41%	5.99%	N/A
Based Aircraft						
Master Plan	119	125	131	138	145	0.98%
2015 TAF	99	104	109	114	119	0.92%
Difference	-16.81%	-16.68%	-16.79%	-17.14%	-17.71%	N/A
Source: Michael Baker International, Inc., 2016. AAGR – Average Annual Growth Rate						

A.2 Coastal Resources

Legislation

The United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) administered the Coastal Zone Management Act (CZMA, 16 U.S.C. §§1451-1466). NOAA is the approving body of a state developed coastal zone management plan, CZMA provisions allow for the transfer of coastal zone management authority to the state. In 1981 NOAA approved the Florida Coastal Management Program (FCMP), and the FDEP became the lead agency for implementation of the FCMP through its Office of Intergovernmental Programs (OIP).

Regulatory Agencies

A requirement of the CZMA is federal consistency review. Any federal agency activity that affects coastal resources is required to be reviewed for consistency with respect to the requirements of the CZMA. Federal agency activities can include federal assistance (insurance, grants, loans, subsidies, etc.) to state or local governments, federal licensing, or federal permitting actions. The review process is coordinated by the Florida State Clearinghouse which is a part of OIP. Comments concerning consistency are received from nine state agencies, the five water management districts, as well as local governmental entities.

Existing Conditions

The airport is located within Florida's regulated coastal zone.[2] Federal actions at TLH are subject to review with respect to consistency with the FCMP.

A.3 Hazardous Material, Solid Waste, and Pollution Prevention

Legislation

The Resource Conservation and Recovery Act of 1976 (RCRA) Subtitle C established the federal program to manage hazardous wastes from cradle to grave. Subtitle C contains guidance for hazardous waste handling entities regarding generation, transportation, and treatment, storage or disposal of hazardous waste.

Regulatory Agencies

The Environmental Protection Agency (EPA) provides state and local agencies with information, guidance, policy and regulations to help regulate community waste and to enhance the environmental and economic benefits of source reduction and recycling of solid wastes. Notification of EPA is necessary if treatment, storage or disposing of hazardous waste is being conducted at a given facility in order to receive an EPA Identification Number unless hazardous waste generated at the facility has been exempt.

[2] NOAA, "Coastal Zone Management Programs," https://coast.noaa.gov/czm/mystate/ (February 4, 2016)

Existing Conditions

Review of the USEPA NEPAssist[3] utility, the Resource Conservation and Recovery Act Information (RCRAInfo) list of active and Conditionally Exempt Small Quantity Generators (CESQGs)[4], and the FDEP Contamination Locator map was used to determine if the airport was located in an area classified as a brownfield, superfund, petroleum or other hazardous waste site.[5] The airport in addition to four industrial use tenants are listed on the RCRAInfo database as a conditionally exempt small quantity generator (CESQG). In addition there is a closed landfill located in the northeastern portion of the airport property.

Potential Impacts

The projects described in this Master Plan are not anticipated to generate hazardous waste. Proposed projects are anticipated to result in typical construction debris that would be transported to the nearest operational landfill, which is located 5.5 miles northwest of the airport.

Recommendations

Potential hazardous material sites must be re-evaluated during the preparation of the NEPA document of each project to ensure consistency with RCRA regulatory requirements. A Phase One Environmental Site Assessment should be performed for each project, especially in areas where there is a potential for hazardous waste sites to be discovered and/or where construction is proposed.

A.4 Historical, Architectural, Archaeological, and Cultural Resources

Legislation

The National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would impact the historical, architectural, archaeological, or cultural resources.

Regulatory Agencies

The Department of State, Division of Historical Resources is responsible for preserving the historical, archaeological, museum, and folk culture resources in Florida.

Existing Conditions

The National Park Service's National Register Information System database contains records of documented historic and archaeological resources listed on the National Register of Historic Places (NRHP). A review of the NRHP database and a Phase I Cultural Resources Assessment

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[3] USEPA, NEPAssist, http://nepassisttool.epa.gov/nepassist/nepamap.aspx?wherestr=3300+Capital+Cir+SW%2C+Tallahassee%2C+FL+32310 (April 6, 2016).
[4] USEPA, Categories of Hazardous Waste Generators http://www.epa.gov/hwgenerators/categories-hazardous-waste-generators (April 6, 2016).
[5] http://webapps.dep.state.fl.us/DepClnup/welcome.do (April 7, 2016)

3.0 Capacity Assessment/Facility Requirements

3.1 Background

The facility requirements includes an assessment of the aviation and non-aviation components of the Tallahassee International Airport (TLH) including the runway and taxiway system, navigational aids and approaches, passenger terminal facilities, aircraft storage facilities, supporting infrastructure (e.g. roadways and parking), and undeveloped properties. The airport serves all sectors of aviation activity (airline, cargo, military, and general aviation). Because TLH is included in the Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems (NPIAS), it is necessary for the airport to comply with FAA design standards and current Advisory Circulars (ACs) such as AC 150/5300-13A, Airport Design. With the changing FAA design standards and changes in activity levels since the previous Master Plan Update was completed in 2006 (e.g., there were 102,261 operations at TLH in 2006 compared to 57,921 in 2015), it was necessary to conduct a comprehensive evaluation of the airport's needs over the course of the 20-year planning period for this Master Plan Update that extends from 2015 to 2035. Furthermore, many key recommendations of the previous master plan have been implemented at TLH since 2006, which necessitated the identification of new recommendations for the airport. An analysis of the following airport components is presented herein:

- FAA Grant History (2005-2016)
- Identification of Critical Aircraft
- Runway Use and Wind Coverage Analysis
- Airfield Capacity
- Airfield Design Standards Analysis
- Runway Length Analysis
- Runway Strength Analysis
- Airfield Lighting, Markings, Signage, and Navigational Aids
- Terminal Access
- Passenger Terminal Building
- General Aviation Facilities
- Support Facilities
- Land Area Requirements

It is important to point out that many recommendations of this Master Plan Update focus on the airport's recent renaming as an 'international facility.' The City of Tallahassee wants to continue to expand upon the far-reaching transportation and economic impacts of the airport by making the property into a Foreign Trade Zone (FTZ). The city is also focused on incorporating a greater number of sustainability initiatives into airport operations and development. The FTZ and sustainability efforts were studied as part of this Master Plan Update, but are summarized in separate documents that will ultimately become appendices.

3.2 FAA Grant History (2005-2016)

Table 3-1 is provided to illustrate the FAA Airport Improvement Program (AIP) funding history for TLH since the completion of the 2006 Master Plan Update. The airport received $57,770,358 in FAA AIP funding for runway, apron, roadway, security, terminal, and planning projects between 2005 and 2016. The airport receives entitlement funding from the FAA each year that is calculated based on the number of annual airline passenger enplanements. Much of the FAA's investment between 2005 and 2016 was spent on the reconstruction of Runway 9-27, which mostly came from discretionary funds from the FAA (i.e., remaining funds after entitlements are allocated). Several other projects have also been completed through funds from the Florida Department of Transportation (FDOT), airport/City of Tallahassee, and others. As mentioned throughout this study, the goal is continue to transform the airport into an economic catalyst for the region and to promote international travel and trade. The recommendations herein are intended to reflect the desire to provide the facilities and services necessary to achieve those goals.

Table 3-1
FAA Grant History for TLH (2005-2016)

Fiscal Year	AIP Federal Funds	Work Description
2005	$7,293,366	Construct Access Road, Construct Apron
2006	$1,417,432	Security Enhancements
2007	$100,000	Safety Management System (SMS) Program
2009	$2,409,655	Conduct Miscellaneous Study, Security Enhancements
2010	$300,000	Safety Management System (SMS) Program
2010	$7,104,144	Rehabilitate Apron , Rehabilitate Runway 9-27, Rehabilitate Terminal Building
2011	$12,798,468	Rehabilitate Runway 9-27
2013	$21,169,024	Rehabilitate Runway 9-27
2015	$530,368	Rehabilitate Terminal Building
2015	$654,711	Conduct Airport Master Plan Study
2016	$3,993,190	Rehabilitate Apron, Rehabilitate Terminal Building, Security Enhancements
Total	**$57,770,358**	**Total FAA Grants from 2005 to 2016**
Source: FAA Airport Improvement Program (AIP) Grant History.		

3.3 Identification of Critical Aircraft

Draft AC 150/5000-TBD, Critical Aircraft and Regular Use Determination, "defines the critical aircraft as "the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 operations, excluding touch-and-go operations. An operation is either a takeoff or landing." The existing critical aircraft must be identified based on documented aeronautical activity, typically for the most recent 12-month period that is available. The future critical aircraft is based on an FAA-approved forecast and any change to the existing critical aircraft must be supported by a credible forecast.

During the first Technical Advisory Committee (TAC) meeting, the forecasts of aviation demand were presented which indicated that total operations will increase from 57,921 in 2015 to 68,122 by 2035. The most demanding aircraft type that currently and is forecast to conduct 500 or more operations is a Boeing 757-200 Freighter jet that is flown by FedEx. Boeing 757-200s are forecast to increase from 524 operations in 2015 to 639 by 2035. FAA airfield design standards (e.g., required separations and safety area dimensions) are determined based on the approach speed and wingspan of the identified critical aircraft. As shown in **Table 3-2**, each runway is assigned a Runway Design Code (RDC) that is a function of the critical aircraft's Aircraft Approach Category (AAC) or approach speed in knots and Airplane Design Group (ADG) or wingspan in feet. With a Maximum Takeoff Weight (MTOW) of 255,000 pounds, a wingspan of 125 feet, and an approach speed of 137 knots, the Boeing 757-200 has an RDC of C-IV. Therefore, RDC C-IV design standards were reviewed for both runways and the associated parallel taxiways at TLH. Other areas of the airport, such as the general aviation ramps and taxiways, are designed in accordance with the aircraft that routinely operate in those areas.

Table 3-2
Runway Design Code (RDC) and Critical Aircraft

Aircraft Approach Category (AAC)		Airplane Design Group (ADG)		
Category	**Approach Speed (Knots)**	**Group**	**Tail Height (Feet)**	**Wingspan (Feet)**
A	<91	I	<20	<49
B	91 to <121	II	20 to <30	49 to <79
C	121 to <141	III	30 to <45	79 to <118
D	141 to <166	IV	45 to <60	118 to <171
E	>166	V	60 to <66	171 to <214
		VI	66 to <80	214 to <262

Critical Aircraft	Boeing 757-200 Freighter
Aircraft Type	Twin-Engine Jet
Aircraft Approach Category/Approach Speed	C / 137 Knots
Airplane Design Group/Wingspan	IV / 125 Feet
Runway Design Code (RDC)	RDC C-IV
Tail Height	125 Feet
Taxiway Design Group (TDG)	TDG-4
Max Takeoff Weight (MTOW)	255,000 Pounds
Max Landing Weight (MLW)	210,000 Pounds

Sources: FAA AC 150/5300-13A, Airport Design, Boeing Aircraft Performance Manual, and Michael Baker International, Inc., 2016.

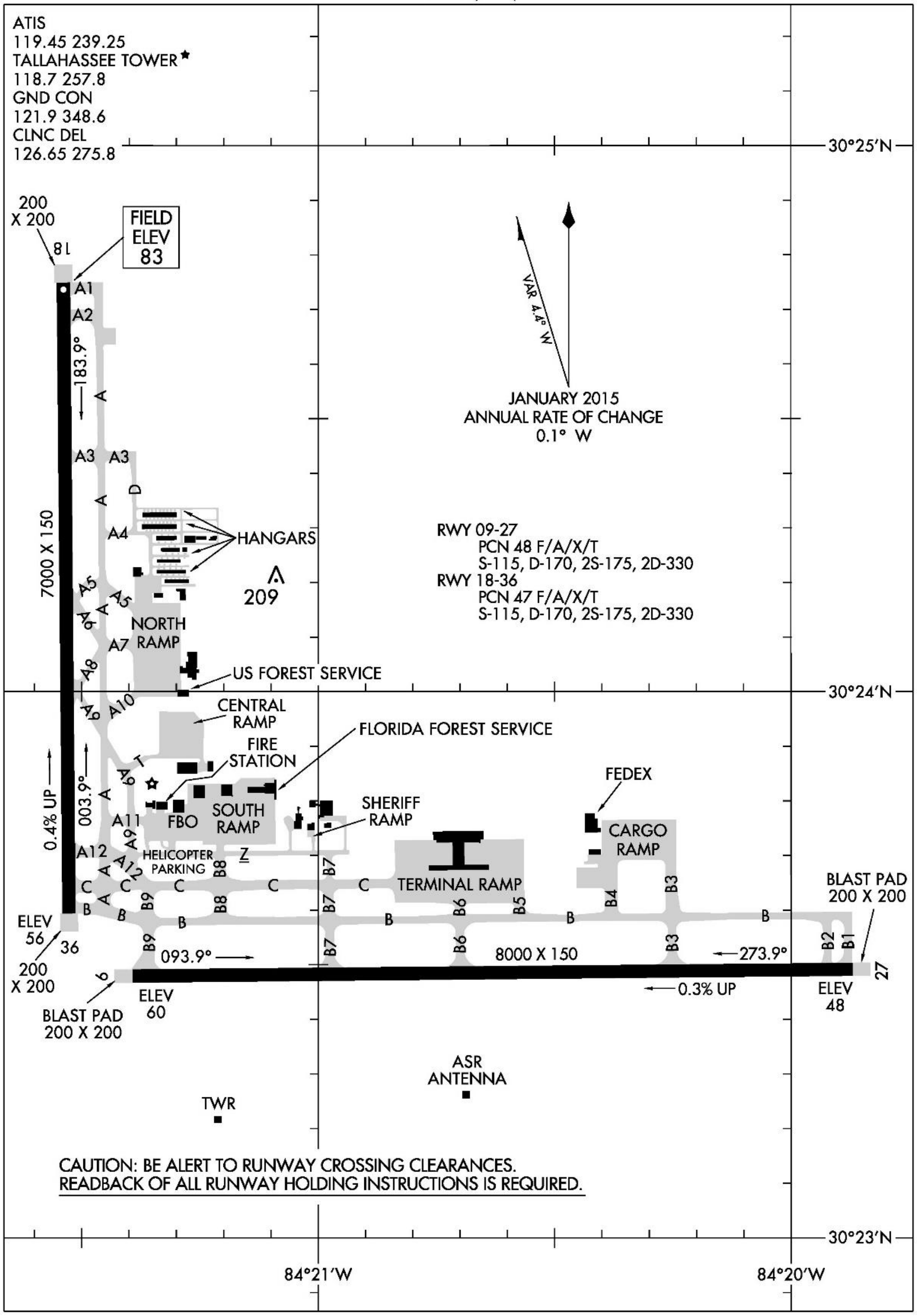
3.4 Runway Use and Wind Coverage Analysis

The FAA's airport diagram for TLH is presented in **Figure 3-1** to illustrate the two-runway airfield configuration in a simplified format. The airfield consists of two perpendicular runways (Runways 9-27 and 18-36). Runway 9-27 measures 8,000 feet in length, 150 feet in width, is served by full-length parallel Taxiway B, and is oriented in an east-west configuration. Runway 18-36 measures 7,000 feet in length, 150 feet in width, is served by full-length parallel Taxiway A, and is oriented in a north-south configuration. Operations on Runway 9-27 primarily occur in the westerly direction (i.e., takeoffs and landings on Runway 27) and Runway 18-36 activity primarily occurs in the northerly direction (i.e., takeoffs and landings on Runway 36).

According to AC 150/5300-13A, Airport Design, a crosswind runway is recommended when the primary runway orientation provides less than 95.0 percent wind coverage (see below for wind coverage requirements by RDC). Consequently, as the weight and approach speed of an aircraft increases, the aircraft has the ability to operate in higher crosswind speeds. For the Boeing 757-200 critical aircraft at TLH, a 20 knot crosswind component is used to determine if the runways provide sufficient wind coverage; however, because the airport accommodates regular activity by aircraft in all four crosswind component categories, wind observations were reviewed to determine if Runways 9-27 and 18-36 provide sufficient coverage. As previously shown in Table 1-4, the runways individually and collectively provide greater than 95.0 percent wind coverage for all categories, which means the four runway ends provide aircraft with flexible opportunities to operate in various wind conditions (e.g., wind speeds and directions). The FAA's Airport Improvement Program (AIP) criteria for runway funding eligibility is shown in **Figure 3-2**. The policy is provided to illustrate the FAA's policy regarding 'secondary runways' such as Runway 18-36 where the eligibility for FAA funding needs to be justified and accepted by the FAA.

- 10.5 knots for A-I and B-I
- 13 knots for A-II and B-II
- 16 knots for A-III , B-III, and C-I through D-III
- 20 Knots for A-IV through D-VI

Figure 3-1
FAA Airport Diagram



Source: FAA Airport Diagram.

Figure 3-2
FAA Airport Improvement Program (AIP) Runway Eligibility

FAA Policy on Secondary, Crosswind, and Additional Runways (FAA Order 5100.38D)

Per FAA policy, the ADO [FAA Airports District Office) can only fund a single runway at an airport unless the ADO has made a specific determination that an additional runway is justified. The requirements, justification and eligibility for runways are listed in Table 3-7 [see below].

Before planning a project on a runway, the ADO must determine the type of runway (primary, secondary, or additional).

A runway that is not a primary runway, a secondary runway, or a crosswind runway is considered to be an additional runway. It is not unusual for a two-runway airport to have a primary runway and an additional runway, and no secondary or crosswind runway. That is because the ADO can only designate a runway as a secondary or crosswind runway if it meets the specific operating and justification parameters in Table 3-7.

Additional runways are not eligible. Any development such as marking, lighting, or maintenance projects on an additional runway is also ineligible.

Table 3-7 Runway Types and Eligibility

For the following runway type…	Must meet all of the following criteria…	And is…
a. Primary Runway	**(1)** A single runway at an airport is eligible for development consistent with FAA design and engineering standards.	Eligible
b. Crosswind Runway	**(1)** The wind coverage on the primary runway is less than 95%.	Eligible if justified
c. Secondary Runway	**(1)** There is more than one runway at the airport. **(2)** The non-primary runway is not a crosswind runway. **(3)** Either of the following: **(a)** The primary runway is operating at 60% or more of its annual capacity, which is based on guidance developed by APP-400 as the threshold for considering when to plan a new runway, or **(b)** APP-400 has made a specific determination that the runway is required for operation of the airfield.	Eligible if justified.
d. Additional Runway	**(1)** There is more than one runway on the airport. **(2)** The ADO has determined that the nonprimary runway does not meet the requirements to be designated a crosswind runway. **(3)** The ADO has determined that the nonprimary runway does not meet the requirements to be designated a secondary runway.	Ineligible.

Source: FAA Order 5100.38D, Airport Improvement Program Handbook.

3.5 Airfield Capacity

The FAA defines airfield capacity as an estimate of aircraft that can be processed through the airfield system during a specific period with acceptable levels of delay. This section evaluates whether the existing airfield configuration of TLH is capable of accommodating forecast levels of demand during the planning period. Estimates of airfield capacity were developed in accordance with the methods presented in FAA AC 150/5060-5, Airport Capacity and Delay (Capacity AC). This methodology does not account for every possible situation at an airport, but rather the most common situations observed at U.S. airports when the Capacity AC was adopted. The Capacity AC provides a methodology for determining the hourly capacity, Annual Service Volume (ASV), and aircraft delay, which are defined below. The hourly capacity and ASV was calculated for existing conditions and for the last year of the planning period at TLH. The results are used for planning purposes to determine if airfield improvements are needed.

- **Hourly Airfield Capacity** – An airport's hourly airfield capacity represents the maximum number of aircraft that can be accommodated under conditions of continuous demand during a one-hour period. Using peak hour forecasts, the hourly airfield capacity is determined for both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) activity.
- **Annual Service Volume (ASV)** – The ASV estimates the annual number of operations that the airfield configuration should be capable of handling with minimal delays. The ASV accounts for peaking characteristics in its calculation of 12-month demand as well as periods of low-volume activity.
- **Delay** – The average anticipated delay is based on a ratio of forecast demand to the calculated ASV. According to the Capacity AC, "as demand approaches capacity, individual aircraft delay is increased. Successive hourly demands exceeding the hourly capacity result in unacceptable delays."

FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems, states that Chapter 2 of the Capacity AC (Capacity and Delay Calculations for Long-Range Planning) should be used for most airports. Because the airfield at TLH is not configured to efficiently process simultaneous operations on both runways, the capacity of the airfield was evaluated for a single-runway configuration; however, both runways are utilized for various reasons including to provide crosswind coverage, separate aircraft classes (e.g., commercial versus general aviation), and to reduce the airport's noise exposure footprint. Based on the information in the Capacity AC, an airport with that type of configuration has as an ASV of 195,000 operations, a VFR hourly capacity of 74 operations, and an IFR hourly capacity of 57 operations. **Table 3-3** presents the results of the airfield capacity calculations for the airfield at TLH. By 2035, the number of annual operations is expected to reach 34.93 percent of ASV, VFR peak hour operations may reach 14.86 percent of capacity, and IFR peak hour operations may reach 50.88 percent of capacity. **Figure 3-3** illustrates the NPIAS thresholds for when capacity-enhancing airfield improvements should be planned for and conducted. Because TLH has full-length parallel taxiways along both runways, it helps to enhance the efficiency of aircraft traffic flows throughout the airfield and maximize the hourly capacity and ASV. The bypass taxiways at Runway ends 27, 18, and 36 also help to enhance the efficiency of aircraft traffic flows, particularly during peak times, and the provision of an additional bypass taxiway at the Runway 9 end should be considered as a recommended capacity improvement.

Table 3-3
TLH Airfield Capacity Calculations

Year	Annual		Hourly			
	Operations	% ASV (195,000)	VFR Peak Hour	% VFR Capacity (74)	IFR Peak Hour	% IFR Capacity (57)
2015	57,921	29.70%	13	17.57%	21	36.84%
2035	68,122	34.93%	11	14.86%	29	50.88%

Source: Michael Baker International, Inc., 2016.

Figure 3-3
NPIAS Capacity Thresholds

Table 3-2 Activity Levels for Planning Capacity Development

CAPACITY DEVELOPMENT ITEM	ACTIVITY LEVEL	REMARKS
❒ New Runway	60% to 75% Annual Capacity	1. Parallel preferred. 2. Same length and strength as primary if serving same aircraft.
❒ Short Runway	75,000 Total Operations 20,000 Itinerant Operations	1. Small aircraft only. 2. Not necessarily parallel.
❒ Extension of Short Runway	60% to 75% Annual Capacity	1. If the critical aircraft changes, an extension may be warranted.
❒ Additional Exit Taxiways	60% to 75% Annual Capacity	1. If the critical aircraft changes, additional exit taxiways may be warranted.
❒ Holding Aprons/ By-Pass Taxiway	75,000 Total Operations 20,000 Itinerant Operations or 30 Peak Hour Operations	1. Consider effect on NAVAID's. 2. Limit holding apron to no more than 4 positions
❒ Terminal Aprons, Aircraft Loading Aprons, Parking Aprons	60% to 75% Annual Capacity	1. Recommend 5 years before aprons are expected to be congested during peak periods.
❒ Replacement/ Supplemental Airports	60% to 75% Annual Capacity	1. Timing depends upon forecasts, type of airport, location (metropolitan area), cost and other factors.
❒ Additional Instrumentation	Recommend 5 years before airport is forecast to reach activity levels specified in APS #1.	

Source: FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems.

3.6 Airfield Design Standards Analysis

The runways and taxiways at TLH were analyzed for compliance with FAA design standards. The FAA defines the requirements for airfield design standards in AC 150/5300-13A, Airport Design. These include numerous safety area and separation standards that must be followed to ensure that aircraft have adequate wingtip-to-wingtip clearances, overrun protection, and obstruction-free movement areas. **Tables 3-4** and **3-5** summarize the airfield design standards for existing conditions at TLH, with non-standard or non-preferential conditions identified in red. Although many airfield design standards are self-explanatory, important features such as the Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zone (RPZ) are defined below.

- **Runway Safety Area (RSA)** – The RSA is a rectangular surface that is centered on the runway. The FAA dictates that RSAs shall be: "1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations; 2) drained by grading or storm sewers to prevent water accumulation; 3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and 4) free of objects, except for objects that need to be located in the RSA because of their function."

- **Runway Object Free Area (ROFA)** – The ROFA must be clear of ground objects protruding above the RSA edge elevation and is a rectangular surface that is centered on the runway. The ROFA is intended to "enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes."

- **Runway Protection Zone (RPZ)** – "The RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ." In 2012, the FAA issued a memorandum on Interim Guidance on Land Uses within a Runway Protection Zone. The information in the memorandum will be used to coordinate any potential changes to the RPZs with the FAA. For the RPZ that currently extends off the airport property (beyond the Runway 27 end), some degree of control should be implemented (e.g., acquisition, easement, or zoning) in order to maintain land use compatibility within the vicinity of TLH and to allow the airport to remove obstructions beyond the runway ends.

As shown in **Figure 3-4**, the airfield complies with nearly every FAA design standard. The exceptions includes the RPZ beyond the Runway 27 end that encompasses 23.9 acres outside of the airport property and the lack of paved shoulders on the taxiways, which would likely be addressed as part of the next rehab project for each taxiway. It is noted that the FAA design criteria for taxiways recently changed, and while the Boeing 757-200 previously required 75 foot wide taxiways, the FAA only mandates 50 feet today. The fillet geometry (i.e., where taxiways/runways intersect or turn) also recently changed and is evaluated in conjunction with the Airport Layout Plan (ALP) for this Master Plan Update.

FAA Engineering Brief 75 (EB-75), Incorporation of Runway Incursion Prevention into Taxiway and Apron Design, provides guidance on design strategies of taxiways and aprons to help prevent runway incursions (the FAA defines a runway incursion as any unauthorized intrusion onto a runway, regardless of whether or not an aircraft presents a potential conflict). According to EB-75, "these design strategies are only recommendations. They are not a set of standards that must be followed whenever possible. Airfield design is often a process that must balance safety, efficiency, capacity, and other factors. There will be cases where the strict application of these recommendations is unjustified and unwise. Instead, use the recommendations as a checklist to insure the runway incursion aspects of any design proposal are properly considered." Many of these recommendations have also been incorporated into AC 150/5300-13A, Airport Design.

- Limit the number of aircraft crossing an active runway
    - The preference is for aircraft to cross in the last third of the runway whenever possible, since within the middle third of the runway the arriving/departing aircraft is usually on the ground and traveling at a high rate of speed
- Optimize pilots' recognition of entry to the runway (increase situational awareness) through design of taxiway layout, for example:
    - Use a right angle for taxiway-runway intersections (except for high speed exits)
    - Limit the number of taxiways intersecting in one spot
    - Avoid wide expanses of pavement at runway entry
- Insure the taxiway layouts take operational requirements and realities into account to:
    - Safely and efficiently manage departure queues
    - Avoid using runways as taxiways
    - Use taxiway strategies to reduce the number of active runway crossings
    - Correct runway incursion "hot spots"

EB-75 presents several additional design recommendations for preventing runway incursions. The airfield configuration at TLH has areas where improvements can be conducted to improve situational awareness for pilots and are incorporated into the study recommendations. As illustrated in **Figure 3-4**, there are various acute angled taxiways at TLH and direct connections between Runway 9-27 and aircraft parking aprons. Alternatives for addressing these non-preferential configurations are addressed later in this Master Plan Update.

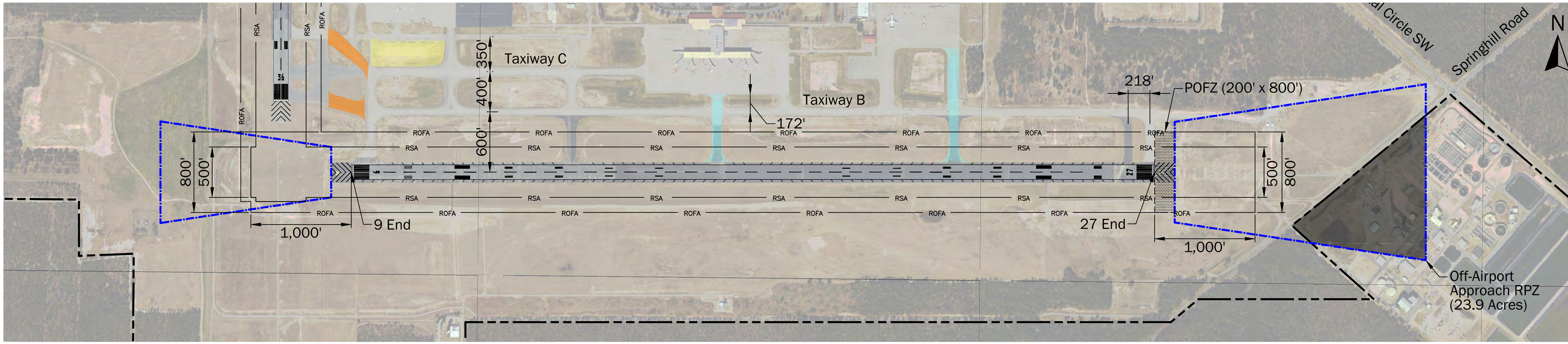
Table 3-4
Airfield Design Standards Analysis (Runway 9-27)

Design Standard	Required Dimension	Runway 9	Runway 27
Runway Design Code (RDC)	RDC C-IV		
Taxiway Design Group (TDG)	TDG-4		
RW Approach Visibility Minimums	Varies by End	1 Mile	CAT II
Runway (RW) Width	150 Feet	Meets Standards	
RW Safety Area (RSA) Width	500 Feet	Meets Standards	
RSA Length Beyond RW End	1,000 Feet		
RW Object Free Area (ROFA) Width	800 Feet	Meets Standards	
ROFA Length Beyond RW End	1,000 Feet		
RW Obstacle Free Zone (ROFZ) Width	400 Feet	Meets Standards	
ROFZ Length Beyond RW End	200 Feet		
RW Protection Zone (RPZ) Inner Width	9 (500 Feet) 27 (1,000 Feet)	Meets Standards	Extends Off Airport (23.9 Acres)
RPZ Outer Width	9 (1,010 Feet) 27 (1,750 Feet)		
RPZ Length	9 (1,700 Feet) 27 (2,500 Feet)		
RW Blast Pad Width	200 Feet	Meets Standards	
RW Blast Pad Length	200 Feet		
RW Shoulder Width	25 Feet	Meets Standards	
Taxiway (TW) Width	50 Feet	Meets Standards	
TW Safety Area (TSA) Width	171 Feet	Meets Standards	
TW Object Free Area (TOFA) Width	259 Feet	Meets Standards	
Taxilane (TL) Object Free Area Width	225 Feet	Meets Standards	
TW Shoulder Width	20 Feet	No Paved Taxiway Shoulders	
RW Centerline to Parallel TW Centerline	400 Feet	Meets Standards	
RW Centerline to Holdline	250 Feet	Meets Standards	
RW Centerline to Aircraft Parking Area	500 Feet	Meets Standards	
TW Centerline to Parallel TW/TL Centerline	215 Feet	Meets Standards	
TW Centerline to Fixed or Movable Object	129.5 Feet	Meets Standards	
TL Centerline to TL Centerline	198 Feet	Meets Standards	
TL Centerline to Fixed or Movable Object	112.5 Feet	Meets Standards	
RW Surface Gradient and Line of Sight	Max ±1.5%	Meets Standards	
Source: Michael Baker International, Inc., 2016.			

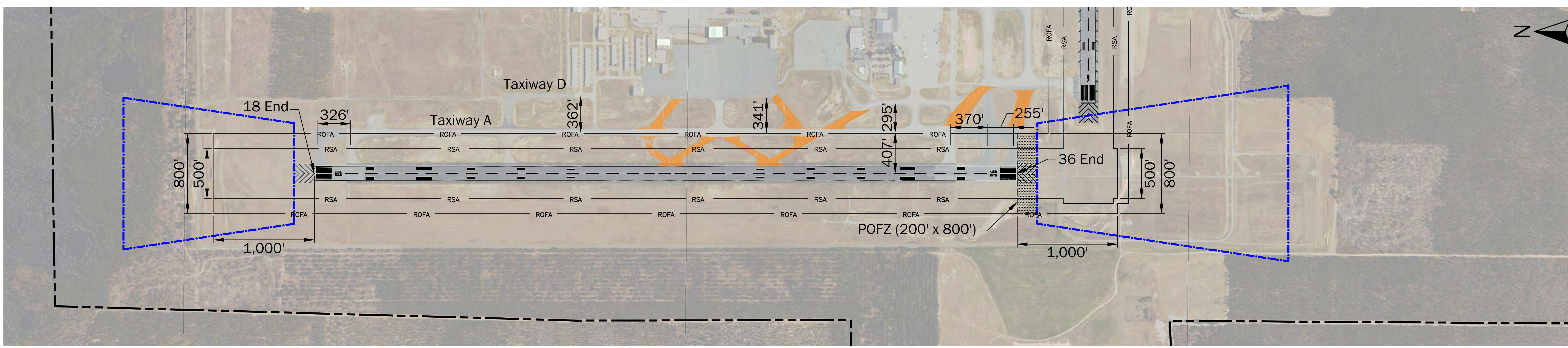
Table 3-5 Airfield Design Standards Analysis (Runway 18-36)			
Design Standard	**Required Dimension**	**Runway 18**	**Runway 36**
Runway Design Code (RDC)	RDC C-IV		
	TDG-4		
RW Approach Visibility Minimums	Varies by End	¾ Mile	½ Mile
Runway (RW) Width	150 Feet	150' (Meets Standards)	
RW Safety Area (RSA) Width	500 Feet	Meets Standards	
RSA Length Beyond RW End	1,000 Feet		
RW Object Free Area (ROFA) Width	800 Feet	Meets Standards	
ROFA Length Beyond RW End	1,000 Feet		
RW Obstacle Free Zone (ROFZ) Width	400 Feet	Meets Standards	
ROFZ Length Beyond RW End	200 Feet		
RW Protection Zone (RPZ) Inner Width	18 (1,000 Feet) 36 (1,000 Feet)	Meets Standards	
RPZ Outer Width	18 (1,510 Feet) 36 (1,750 Feet)		
RPZ Length	18 (1,700 Feet) 36 (2,500 Feet)		
RW Blast Pad Width	200 Feet	Meets Standards	
RW Blast Pad Length	200 Feet		
RW Shoulder Width	25 Feet	Meets Standards	
Taxiway (TW) Width	50 Feet	Meets Standards	
TW Safety Area (TSA) Width	171 Feet	Meets Standards	
TW Object Free Area (TOFA) Width	259 Feet	Meets Standards	
Taxilane (TL) Object Free Area Width	225 Feet	Meets Standards	
TW Shoulder Width	20 Feet	No Paved Taxiway Shoulders	
RW Centerline to Parallel TW Centerline	400 Feet	Meets Standards	
RW Centerline to Holdline	250 Feet	Meets Standards	
RW Centerline to Aircraft Parking Area	500 Feet	Meets Standards	
TW Centerline to Parallel TW/TL Centerline	215 Feet	Meets Standards	
TW Centerline to Fixed or Movable Object	129.5 Feet	Meets Standards	
TL Centerline to TL Centerline	198 Feet	Meets Standards	
TL Centerline to Fixed or Movable Object	112.5 Feet	Meets Standards	
RW Surface Gradient and Line of Sight	Max ±1.5%	Meets Standards	
Source: Michael Baker International, Inc., 2016.			

Legend

- Property Line
- Approach Runway Protection Zone
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Off-Airport Approach RPZ
- Non-Preferential Direct Access Taxiway
- Helicopter Rotor Backwash Disturbed Land
- Acute Angle Taxiways



Runway 9-27 (8,000' x 150')



Runway 18-36 (7,000' x 150')

0 1,000' 2,000'
Scale: 1" = 1,000'

3.7 Runway Length Analysis

Runway length requirements were evaluated in accordance with FAA AC 150/5325-4, Runway Length Requirements for Airport Design (Runway Length AC). The Runway Length AC presents methodologies for determining runway length requirements by aircraft type (refer to **Table 3-6**). Because the existing and forecast critical aircraft at TLH falls into the category of aircraft with MTOWs of 60,000 pounds or more, Chapter 4 of the Runway Length AC was used to calculate runway length requirements for the Boeing 757-200. It is noted, however, that the recent reconstruction of Runway 9-27 and the extensions to Runway 18-36 were viewed as the maximum runway expansion projects for the foreseeable future at TLH. In 2012, a two phase runway extension was conducted to increase the length of Runway 18-36 from 6,076 feet to 7,000 feet, which allowed the airport to remain operational when Runway 9-27 was fully reconstructed in 2014 to correct line-of-sight issues. Therefore, this runway length analysis was conducted to verify that the current runway lengths of 8,000 feet for Runway 9-27 and 7,000 feet for Runway 18-36 would continue to provide operational flexibility throughout the planning period. The typical stage lengths of the commercial and general aviation aircraft that regularly operate at TLH, as well as the particular aircraft models, would not likely produce runway length requirements greater than what is required to operate a Boeing 757-200.

Table 3-6
Runway Length AC Categories

Aircraft Weight Category Maximum Takeoff Weight (MTOW)			Design Approach	Location of Design Guidelines
12,500 Pounds or less	Approach Speed less than 30 knots		Family Grouping of Small Aircraft	Chapter 2: Paragraph 203
	Approach speeds of at least 30 knots but less than 50 knots		Family Grouping of Small Aircraft	Chapter 2: Paragraph 204
	Approach Speeds of 50 knots or more	With less than 10 Passengers	Family Grouping of Small Aircraft	Chapter 2: Paragraph 205 (Figure 2-1)
		With more than 10 Passengers	Family Grouping of Small Aircraft	Chapter 2: Paragraph 205 (Figure 2-2)
Over 12,500 pounds but less than 60,000 pounds			Family Grouping of Large Aircraft	Chapter 3: Figure 3-1 or 3-2 & Tables 3-1 or 3-2
60,000 pounds or more			Individual Large Aircraft	Chapter 4: Aircraft Performance Manual (APM)

Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

Multiple variables affect takeoff calculations including field elevation, average maximum temperature during the hottest month, runway conditions (e.g., wet runway), takeoff weight, and differences in runway end elevations. As previously shown in Table 1-3, the average maximum temperature during the hottest month is 92.1° Fahrenheit and occurs in July. Aircraft takeoff performance is maximized at lower elevations and colder temperatures, which means that aircraft operating at TLH benefit from the low elevation of 83 feet Above Mean Sea Level (AMSL) but may be restricted by the warm temperatures in Florida.

Chapter 4 of the Runway Length AC requires the use of Aircraft Performance Manuals (APMs) to determine recommended runway lengths using the procedures below. At TLH, Runway 9-27 is considered the primary runway and Runway 18-36 is considered a secondary primary runway. For additional primary runways, the recommended runway length is 100 percent of the primary runway length if it's intended for capacity justification, noise mitigation, or regional jet service, but if its purpose is to separate aircraft classes the additional primary runway may be designed for the next less demanding group of airplanes.

Procedures for Determining Recommended Runway Length (FAA AC 150/5325-4B)

Determine both takeoff and landing runway length requirements as prescribed below, select the longest resulting takeoff and landing runway lengths, then apply any length adjustments described in the following subparagraphs. The longest resulting the takeoff and landing runway lengths for the critical design airplanes under evaluation becomes the recommended runway length.

The Boeing 757-200s at TLH are operated by FedEx and generally fly to and from Memphis International Airport (MEM). Although the two airports are only about 400 nautical miles apart (which is a small percentage of the airplane's range capability of over 3,000 nautical miles), TLH should provide the flexibility for FedEx to operate the aircraft with a high volume of fuel and cargo, particularly during the busy holiday season. For that reason, the runway length analysis was conducted assuming that FedEx would prefer to be able to operate the Boeing 757-200 with unrestricted payloads at TLH. The resulting analysis is presented in **Table 3-7** for two different engine models that FedEx utilizes (Pratt & Whitney and Rolls Royce). The Runway Length AC indicates that takeoff lengths should be increased to account for non-zero runway gradients by increasing the obtained length by 10 feet per foot of difference in the high and low points of the runway centerline (i.e., the addition of 169 feet for Runway 9-27 and 267 feet for Runway 18-36), which were added to the lengths in the table. As shown, the length of Runway 9-27 meets all of the operational requirements of the two different FedEx engine models, while Runway 18-36 does not fully meet the MTOW demands of the Boeing 757-200; however, it is anticipated that the 7,000 foot length of Runway 18-36 is sufficient for the aircraft payloads that are routinely flown by FedEx at TLH.

Table 3-7
Boeing 757-200 Freighter Runway Length Requirements

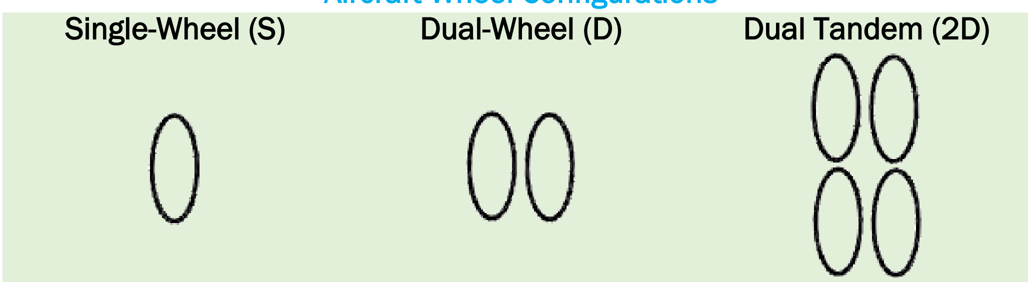
Operation	Runway	Condition	Pratt & Whitney (PW2040)	Rolls Royce (RB211-535E4)
Takeoff	Runway 9-27	MTOW, 83 Feet AMSL, 59° F	7,569 Feet	7,369 Feet
Takeoff	Runway 9-27	MTOW, 83 Feet AMSL, 84° F	7,969 Feet	7,669 Feet
Takeoff	Runway 18-36	MTOW, 83 Feet AMSL, 59° F	7,667 Feet	7,467 Feet
Takeoff	Runway 18-36	MTOW, 83 Feet AMSL, 84° F	8,067 Feet	7,767 Feet
Landing	Both	MLW, Dry Runway, 59° F	5,100 Feet	4,700 Feet
Landing		MLW, Wet Runway, 59° F	5,900 Feet	5,400 Feet

Sources: Boeing 757-200 Aircraft Performance Manual and Michael Baker International Inc., 2016.
MTOW –Maximum Takeoff Weight
MLW – Maximum Landing Weight

3.8 Runway Strength Analysis

One of the most important features of airfield pavement is its ability to withstand repeated use by the most weight-demanding aircraft operating at the airport. The current weight bearing capacity for both runways is 115,000 pounds for aircraft with a single-wheel gear configuration, 170,000 pounds for aircraft with a double-wheel gear configuration, and 330,000 pounds for aircraft with a double-tandem-wheel configuration (refer to **Figure 3-5**). Both runways have grooved asphalt surfaces—the pavement along Runway 9-27 is in good condition, as are the sections of Runway 18-36 that were recently extended, but the older sections of Runway 9-27 are reported to be in poor condition. Because the main gear of a Boeing 757-200 has a double-tandem wheel configuration, the current strength of both runways is sufficient to accommodate the demands of the critical aircraft throughout the planning period. The actual pavement strength requirements will be evaluated on a project-by-project basis as rehabilitation becomes necessary and is determined during the design phase through a review of recent and anticipated aircraft activity.

Figure 3-5
Aircraft Wheel Configurations



Source: FAA Order 5300.7, Standard Naming Convention for Aircraft Landing Gear Configurations.

3.9 Airfield Lighting, Markings, Signage, and Navigational Aids

Based on the findings from the inventory of existing conditions, the following section describes the requirements for airfield lighting, markings, signage, and navigational aids at TLH. As shown in **Table 3-8**, the requirements for those airfield features depend upon the specific approach capability of each runway end. As enhanced lighting, markings, and navigational aids are provided, it typically means that runway approach procedures can be flown in lower and lower visibility. Approach lighting guides aircraft to the runway end, runway lighting illuminates the runway, markings identify touchdown and aiming points, and navigational aids guide aircraft to the runway.

Based on the current approaches that are available at TLH, all four runway ends are provided with the lighting, markings, and navigational aids necessary to comply with FAA requirements. For example, Runway 27 is equipped with the most precise approach of the four runway ends—a Category II (CAT II) precision Instrument Landing System (ILS) approach that can be flown when horizontal visibility minimums are as low as 1,200 feet. According to FAA Order 8400.13D, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations, a qualified CAT II approach must be equipped with an ALSF-2 approach lighting system, High Intensity Runway Lights (HIRLs). Touchdown Zone (TDZ) lighting, and Runway Centerline Lighting (RCL), all of which are provided for the CAT II approach to Runway 27. The taxiways at TLH are equipped with Medium Intensity Taxiway Lights (MITLs). As taxiways and aprons are rehabilitated at TLH, the incandescent edge lights are being replaced with Light Emitting Diode (LED) lights. Other routine maintenance of lightings, markings, and navigational aids occurs as on as needed basis.

The guidelines for airfield signage are provided in FAA AC 150/5340-18F, Standards for Airport Sign Systems (Signage AC). **Figure 3-6** illustrates an airfield signage example for a complex airport. Besides traditional signage, TLH also has surface painted holding position signs to provide "supplemental visual cues to alert pilots of an upcoming holding position marking to help minimize the potential for runway incursions." The airfield signage at TLH consists of a mix of older non-LED signs in the middle 6,000 foot section of Runway 18-36 and newer LED signs along Runway 9-27 and the recently-extended sections of Runway 18-36. The older signs will ultimately be replaced with new LED signs. The distance remaining signs along Runway 9-27 are LED and the non-LED signs along Runway 18-36 will ultimately be replaced with LED signs.

Table 3-8
Standards for Instrument Approach Procedures (Table 3-4 of FAA AC 150/5300-13A, Airport Design)

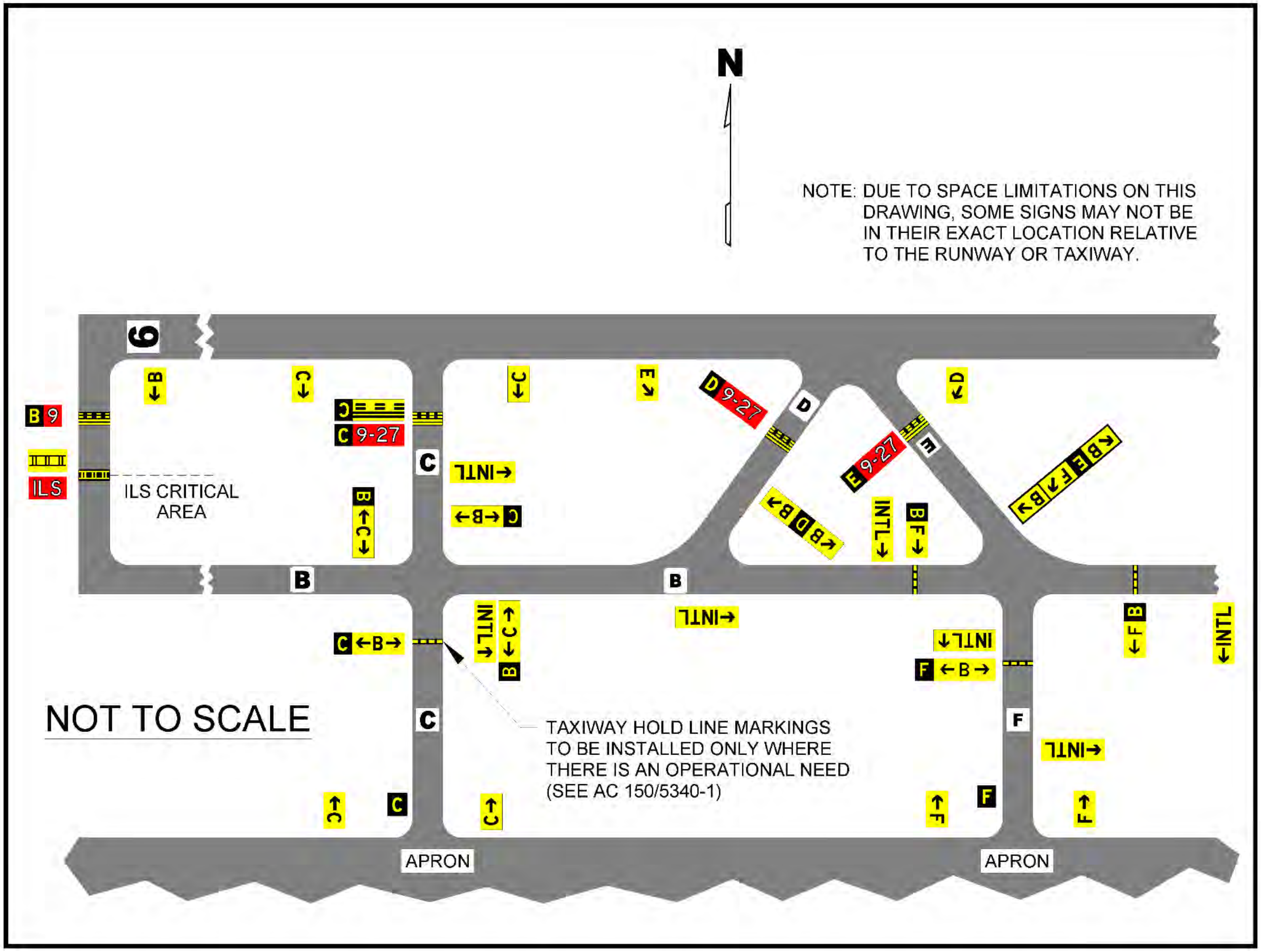
Visibility Minimums 1	< 3/4 statute mile	3/4 to < 1 statute mile	≥ 1 statute mile straight-in	Circling 2
HATh 3	< 250 ft	≥ 250 ft	≥ 250 ft	≥ 350 ft
TERPS GQS 4	Clear	Clear	Clear	Not applicable
PA final approach surfaces 5	Clear	Not Required	Not Required	Not applicable
POFZ (PA & APV only)	Required	Not Required	Not Required	Not applicable
TERPS Chapter 3, Section 3	34:1 clear	20:1 clear	20:1 clear 6	20:1 clear 6
ALP 7	Required	Required	Required	Recommended
Minimum Runway Length	4,200 ft (paved)	3,200 ft 8, 9	3,200 ft 8, 9	3,200 ft 8, 9
Runway Markings (See AC 150/5340-1)	Precision	Non-precision 9	Non-precision 9	Visual (Basic) 9
Holding Position Signs & Markings (See AC 150/5340-1, AC 150/5340-18)	Precision	Non-precision 9	Non-precision 9	Visual (Basic) 9
Runway Edge Lights 10	HIRL / MIRL	HIRL / MIRL	MIRL / LIRL	MIRL / LIRL (Required only for night minimums)
Parallel Taxiway 11	Required	Required	Recommended	Recommended
Approach Lights 12	MALSR, SSALR, or ALSF	Recommended 13	Recommended 13	Not Required
Applicable Runway Design Standards, e.g. OFZ	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums	Not Required
Threshold Siting Criteria To Be Met (Reference paragraph 303)	Table 3-2, row 7	Table 3-2, row 6	Table 3-2, rows 1-5	Table 3-2, rows 1-4
Survey Required 14	VGS	VGS (PA & APV)	NVGS 15	NVGS 16

Source: FAA AC 150/5300-13A, Airport Design (Table 3-4).

Notes:

1. Visibility minimums are subject to the application of Order 8260.3 ("TERPS"), and associated orders or this table, whichever is higher. To qualify for each visibility (or circling), all requirements within the same column must be met or exceeded.
2. All runways authorized for circling must meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308), and TERPS Chapter 3, Section 3 criteria.
3. Height Above Airport (HAA) for circling. The HATh/HAA indicated is for planning purposes; actual obtainable HATh/HAA is determined by TERPS and may be higher due to obstacles or other requirements. HATh less than 250 ft must comply with requirements in < 3/4 statute mile column regardless of published visibility.
4. GQS is applicable to PA and APV only. See Table 3-2, row 8.
5. Applicable to PA only, as defined by paragraph 102. If not clear, HATh must be increased to 250 ft or greater (as required by TERPS).
6. If not clear, obstacles must be lighted (see AC 70/7460-1) or procedure/circling runway restricted to day only. In certain circumstance, a VGSI may be used in lieu of obstruction lighting as defined in TERPS.
7. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
8. Runways less than 3,200 ft are protected by Part 77 to a lesser extent. However, runways as short as 2,400 ft could support an instrument approach provided the lowest HATh is based on clearing any 200-ft (61 m) obstacle within the final approach segment.
9. Unpaved runways require case-by-case evaluation by the RAPT.
10. Runway edge lighting is required for night approach minimums. High intensity lights are required for RVR-based minimums.
11. A full-length parallel taxiway must lead to the threshold.
12. To achieve lower visibility minimums based on credit for lighting, a full approach light system (ALSF-1, ALSF-2, SSALR, or MALSR) is required for visibility < 3/4 statute mile. Intermediate (MALSF, MALS, SSALF, SSALS, SALS/SALSF) or Basic (ODALs) systems will result in higher visibility minimums. An ALSF-1 or ALSF-2 is required for CAT II/III ILS.
13. ODALS, MALS, SSALS, and SALS are acceptable.
14. See AC 150/5300-18 for Vertically Guided Survey (VGS) and non-Vertically Guided Survey (NVGS) requirements.
15. For PA and APV only, the NVGS must be supplemented with the first 10,200 ft of the Vertically Guided Approach Surface.
16. Absence of the indicated survey does not preclude authorization to establish circling to a runway but may result in increased HATh and visibility.

Figure 3-6
Signing Example for a Complex Airport



Source: FAA AC 150/5340-18F, Standards for Airport Sign Systems (Figure 18).

3.10 Terminal Access

In order to be a functional terminal area, the passenger terminal building, airside apron, and landside roads and parking must work in harmony to serve the needs of airline passengers. The terminal area is a complex facility comprised of many interrelated parts and each part must be analyzed to determine the effectiveness of the system as a whole. This section provides the quantitative analysis for each component of the terminal area and identifies where and when changes may be needed during the planning period.

This section discusses ground access to the commercial terminal including primary access road demand, terminal curb frontage demand, and public, employee, and rental car parking demand for the years 2015, 2020, 2025 and 2035. Ground access and terminal roadways serve passengers, employees, visitors, and anyone who travels to and from the airport. Circulation systems within the airport boundaries should minimize congestion and support efficient access to the passenger terminal building. It is important to ensure that the access and terminal roadway systems provide adequate capacity to meet the projected demand imposed by vehicular traffic without creating excessive or unwarranted delay.

Primary Access Road

Primary access to the airport is provided by Florida Highway 263, the western portion of Capital Circle. In addition to serving as a perimeter highway around the western, southern, and eastern sides of Tallahassee, Capital Circle provides direct access to Interstate 10 which is located 6.5 miles north of the airport. FDOT has plans to expand Capital Circle SW near the airport from two-lane rural road to a six-lane urban roadway with bike lanes and sidewalks. Improvements will include enhanced connections and signalized intersections to accommodate existing and future demand and to increase the road's Level of Service (LOS) and ease of accessing TLH. The location of the proposed connections is later evaluated as part of the alternatives analysis. Overall, the primary access road system is anticipated to meet the requirements throughout the 20-year planning period.

Terminal Access Roads

Terminal access roads connect the primary access roads with the terminal buildings and parking facilities. They should be designed to allow smooth channeling of traffic into the appropriate lanes for safe and unobstructed access to the terminal curbs, parking lots, and other public facilities. Traffic circulation should be one-way in a counterclockwise direction for convenience of right-side passenger loading and unloading. Recirculation of vehicles to the passenger terminal should also be permitted. Additionally, traffic streams should be separated at an early stage and with appropriate signage to avoid congestion and assure lower traffic volume on the terminal frontage roads. Ground access to the airport terminal is provided via the Terminal Loop Road, which is a one way limited access roadway with two lanes that possesses all of the recommended attributes.

The guidance provided in AC 150/5360-13, Airport Terminal Planning and Design, recommends that terminal area access roads be planned to accommodate 900 to 1,200 vehicles per lane per hour, with a minimum of two 12 foot lanes. Based upon this criteria and anticipated peak hour demand, expansion of the terminal access roadway will not be required to accommodate anticipated commercial demand as shown in **Table 3-9**.

Table 3-9 Terminal Access Roadway Capacity Demand						
Year	Total Peak Hour Passengers	80% Automobile	Other	Avg. Day Peak Hour Vehicles [1]	Existing Roadway Capacity (VPH) [2]	VPH Surplus/ (Deficiency)
2015	1,000	800	100+200	1,100	1,800	700
2020	1,100	880	110+220	1,210	1,800	590
2025	1,200	960	120+240	1,320	1,800	480
2035	1,420	1,136	142+284	1,562	1,800	238

Sources: FAA AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities, and Michael Baker International, Inc., 2016.
Notes:
1) ADPH vehicles includes all arriving and departing passenger traffic. Other includes higher occupancy vehicles and an allowance of an additional 20% for vehicles serving non-passenger traffic.
2) Capacity per lane at grade primary access road at or below 30 mph = 900 vehicles per hour. Estimate that 80 percent of users arrive by private vehicle. Remaining 20 percent arrive via higher occupancy commercial vehicles.

Terminal Frontage Road

The terminal frontage road is that section of the access road directly in front of the terminal building. The number of traffic lanes typically increases in this section of the roadway to allow for vehicles stopping at the departure and arrival terminal curbs, vehicular maneuvering, and sufficient travel lanes for through traffic. The terminal frontage road is a critical element of the overall terminal access roadway system and should maintain vehicular flow with minimum congestion.

The terminal loop road is currently two lanes at the approach to the terminal, but splits into three lanes at a point about 300 feet west of the building. The terminal frontage road should be designed to accommodate 600 vehicles per lane per hour, when no obstructions are present. Since considerable merging from through lanes to and from the curb occurs on these roadways, at least two lanes should be provided adjacent to the curb. The inside lane is 15 feet wide and serves as curb parking and three 12 foot wide outside lanes provide vehicle maneuvering space to the terminal curb and for double parking during peak periods. With this configuration, designed for cars oriented parallel to the curbfront, the inside lane is considered to have no throughput capacity and the adjacent maneuvering lane is restricted to a capacity of 300 vehicles per hour. Two additional lanes are provided to meet the capacity required for circulating traffic at a rate of 600 vehicles per hour for each unrestricted 12 foot through lane. This results in a total capacity of 1,500 vehicles per hour. This should be adequate throughout the planning period.

Terminal Curb Frontage

Terminal curb frontage is required for loading and unloading passengers and baggage. The curb frontage is typically provided for private vehicles, taxis, limousines, and buses. The length is typically based upon the types of vehicles, and vehicle dwell times expected to occur at the terminal curb. At TLH, the curbfront includes a pick-up and drop-off lane adjacent to the curb, a maneuvering lane, and two through-lanes. Commercial taxi vehicles are currently parked in an area immediately to the east of the terminal with 24 spaces (at the exit from baggage claim). Eleven spaces are reserved for hotel shuttle, bus, and limousine pick-up along the curbside past baggage claim.

In order to determine the future curb-loading zone parking requirements, general constants must be assumed to take place. Since private automobiles are the predominant transportation mode, an average vehicle dwell time of two minutes per private vehicle, for each curb space, was allotted. This parking duration was based on the assumption of strict enforcement of the loading zone parking usage by airport security personnel. In addition to private automobile curbside requirements, space for limousine/buses must be considered. The location of commercial parking convenient to the baggage claim reduces the potential for long dwell times to cause congestion at the curb frontage. Increased commercial frontage will not be required through the year 2035 based upon anticipated peak hour demand.

Table 3-10
Terminal Passenger Curb Frontage Requirements

Item	2015	2020	2025	2035
Peak Hour Total Passengers	1,000	1,100	1,200	1,420
Vehicle (Lin Ft.) Demand	787	865	944	1,117
Existing Curb Length (Lin. Ft.)	950	950	950	950
Existing Double Parking Capacity (Lin Ft.)	1,900	1,900	1,900	1,900
Surplus/(Deficiency) (Lin Ft.)	1,113	1,035	956	783

Sources: FAA AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities; ACRP Report 25, Airport Passenger Terminal Planning and Design, and Michael Baker International, Inc., 2016.

Automobile Parking

Due to limited public transportation, passengers, visitors, and employees use private and rental automobiles to travel to and from the airport. Therefore, adequate parking facilities are essential to the passenger terminal.

Public Parking Requirements

In determining the demand for public parking, it is recognized that parking areas need to provide parking for a near-peak period. The FAA design guidance uses the terms "long-term" and short-term" to describe categories of parking on airports. As previously described in the inventory of existing conditions, public parking at TLH is accommodated in several areas within the Terminal Loop Road. Hourly (short-term) parking (307 spaces) is located north of terminal building directly across the terminal access road adjacent to the rental car ready/return lot. Daily (long-term) parking (1,330 spaces) is located north of the short-term parking area within the Terminal Loop Road.

According to the ACs 150/5360-9 and 150/5360-13, public parking spaces were determined by multiplying 1.5 times the number of peak hour passengers. According to the FAA design guidance, short-term use is estimated to be approximately 25 percent of the total parking requirements.

Long-term parkers are expected to occupy 75 percent of the available parking spaces. Terminal parking requirements are summarized in **Table 3-11**. Comparing the existing facilities and long-term demand, an expansion of public parking facilities may be needed during the planning period.

Table 3-11
Public Parking Requirements

Item	2015	2020	2025	2035
Peak hour Passengers	1,000	1,100	1,200	1,420
Total Public Parking Space Demand[1]	1,500	1,650	1,800	2,030
Long-Term Parking Space Demand [2]	1,125	1,237	1,350	1,522
Short-Term Parking Space Demand [3]	375	412	450	508
Existing Parking Space Capacity (LT/ST)	1,330/307	1,330/307	1,330/307	1,330/307
Public Parking Surplus / (Deficit) (LT/ST)	170/(68)	93/(105)	(20)/(143)	(192)/(201)

Sources: FAA AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities, and Michael Baker International, Inc., 2016.
Notes:
1) 1.5 times Peak Hour Passengers
2) .Long-term demand = 0.75 * Total Parking Space Demand
3) Short-term demand = 0.25 * Total Parking Space Demand

Rental Car Parking

Currently, seven rental car agencies serve TLH including Avis, Alamo, Dollar, Enterprise, Hertz, National, and Thrifty. The rental car ready/return lot is located to the north of the terminal across the terminal area access road adjacent to the hourly and daily parking lots. The existing 244 ready/return spaces are subdivided between the on-site rental car companies. The number of spaces required to accommodate the forecast levels of rental car activity is dependent upon several factors. At TLH, the number of cars rented in their peak month were determined to equal approximately 25 percent of the airport's peak month enplanements, and returned cars equaled approximately 25 percent. The ready/return parking lot capacity is less than 100 percent of the daily rented and returned cars because the rental car companies rotate their cars during the day from the return lot to the service area for cleaning and fueling, then to the storage or ready lot. At TLH, the intended capacity of the ready/return parking lot was projected to equal 25 percent of the average daily rented and returned cars, or each space accommodates four cars per day on average. The number of parking spaces in the ready/return lot depends on the staffing and operation of the agencies. A lower factor (fewer spaces) requires staff to rotate cars from the service and storage areas more often, whereas a higher factor (more spaces) allows a smaller staff and less frequent rotation of the cars.

As shown in **Table 3-12**, the total number of storage spaces is currently adequate, although the split between rental car companies may need review. The amount of rental car storage space at TLH is greater than airports of similar size due to a predominant business market with few rentals during the weekends. Therefore, the storage capacity needs to be 150 percent of the peak month average day rental activity. Comparing the existing facilities and long-term demand, an expansion of rental car ready/return parking facilities is warranted within the planning period. There are plans in the future to construct a consolidated rental car facility.

Table 3-12 Rental Car Parking Requirements				
Item	2015	2020	2025	2035
Peak Month Enplanements	31,100	33,900	36,900	43,900
ADPM Enplanements	1,003	1,094	1,190	1,416
Ready/Return Space Requirements[1]	251	273	297	354
Rental Car Parking Space Capacity	244	244	244	244
Rental Car Parking Surplus / (Deficit)	7	(29)	(53)	(110)

Source: Michael Baker International, Inc., 2016.
Note:
1) 25% of ADPM enplanements

Employee Parking Requirements

A large surface lot northwest of the terminal building outside of the terminal access loop road provides 210 employee parking spaces. This was considered adequate for the peak period which is based on the automobiles for the maximum number of employees who may be working at a given time. This time period usually reflects the time of shift changes where early and late shift employees are both utilizing the facilities simultaneously. The employee lot is paved and equipped with access control devices to limit parking to only airport employees.

Employee parking space requirements are related to enplaned passengers. On a national basis, employee parking spaces per 100,000 enplanements range from 25 to 40. Using the higher value of 40 yields the estimated employee parking requirements for the commercial terminal at TLH as presented in **Table 3-13**.

Table 3-13 Employee Parking Requirements				
Item	2015	2020	2025	2035
Existing Employee Parking Capacity (No.)	210	210	210	210
Employee Parking Required (No.)	133	146	159	188
Surplus/(Deficiency)	77	64	51	22

Source: FAA AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities, and Michael Baker International, Inc., 2016.

3.11 Passenger Terminal Building

The terminal building can be divided into many sub-areas each serving a specific function. Some of the main groups of activity areas include ticketing, baggage claim, and passenger holding. Each can then be further subdivided into specific sub-components, which are analyzed below.

The process of airport terminal planning is evolving to become more precise in its analysis. As a reflection of this changing process, the analysis contained in this study considers passenger LOS) as a variable factor. In general terms, LOS includes five classification levels: A, B, C, D, and E. Level A provides the highest and level E the lowest levels of service. Level A provides free activity without disruptions. Level B provides occasional reductions in activity efficiency. Level C is the point where comfort and convenience decline noticeably. Level D includes significant activity restrictions and operational problems. Level E is total breakdown of the activity. This planning study generally targets LOS B for its facility recommendations and assumes that anything less than LOS C is unacceptable.

[Passenger terminal requirements will be provided at a later date to allow for the review and analysis of the Phases 2 and 3 of the terminal design project. It is important that the master plan team gains a complete understanding of the terminal program development as it will serve as the basis for determining future passenger terminal facility requirements.]

3.12 General Aviation Facilities

The majority of the existing general aviation aircraft storage facilities at TLH are located on the west side of the airport, adjacent to Runway 18-36 and Taxiway A. The facilities located in this area support operations for recreational flying, corporate aviation, military, law enforcement operations, and some portions of cargo activity. The general aviation requirements contained in this section are based on data presented in the inventory, activity forecasts, and information obtained during meetings with TLH airport staff. The primary components associated with general aviation needs include:

- Based Aircraft Storage
- Transient Aircraft Storage
- General Aviation Terminal
- Fixed Base Operator (FBO)

Based Aircraft Storage

Flightline Aviation currently manages the apron tie-down and hangar leases for based aircraft at TLH. Based aircraft storage is primarily located in North General Aviation (GA) apron and Central Ramp, separated from the itinerant aircraft storage areas.

Apron and hangar storage areas for based aircraft include box hangars, T-hangars, and designated apron tie-down locations. In previous years it was assumed that a certain percentage of based aircraft, mostly single and multi-engine pistons, would desire apron tie-down parking because it is the lowest cost storage option. Today, most owners want to be able to protect their aircraft from poor weather and vandalism and therefore opt for hangar storage. At TLH, most fixed-wing aircraft are parked within hangars, although some aircraft park within the tie-down areas.

Although some of the existing facilities and tenants at TLH may be able to accommodate additional based aircraft, they are mostly occupied and it would be preferential for new facilities to be developed. For this analysis, it was assumed that all forms of aircraft storage are full at TLH. Therefore, new hangar construction will be needed in the future to accommodate demand.

The following section evaluates the need for based aircraft apron space and hangar storage at the airport throughout the 20-year planning period. Apron and hangar requirements were calculated in consideration of the airport's existing and forecast based aircraft mix, owner storage preferences, and transient aircraft parking demands. **Table 3-14** identifies the based aircraft parking preferences used to determine future based aircraft storage demand.

Table 3-14
Based Aircraft Parking Preferences

Storage Type	Single Engine	Multi-Engine	Turboprop	Jet	Helicopter
Apron Tie-down	20%	20%	0%	0%	50%
T-Hangars	80%	60%	0%	0%	10%
Conventional Hangar	0%	20%	100%	100%	40%
Total	100%	100%	100%	100%	100%
Source: Michael Baker International, Inc., 2016.					

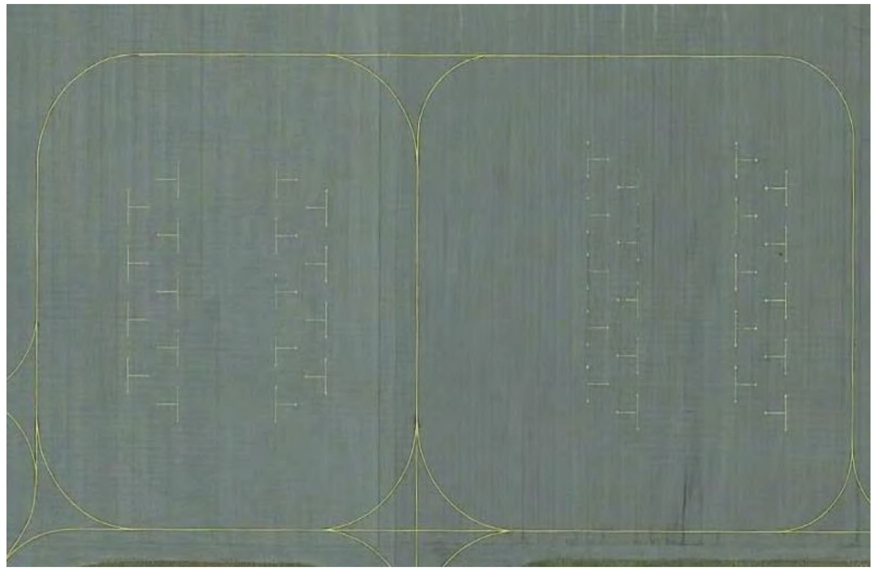
The aircraft storage preferences were applied to the based aircraft forecasts for the 20-year planning period to identify the storage needs at the five-year benchmarks. **Table 3-15** identifies the based aircraft storage requirements by aircraft type. **Table 3-16** illustrates the 2035 based aircraft capacity requirements for based aircraft. These include the addition of six apron tie-downs spaces, 16 T-hangar bays, and four conventional box hangar spaces.

Table 3-15
Aircraft Storage Demand

Storage Type	Single-Engine	Multi-Engine	Turboprop	Jet	Helicopter	Total
			2015			
Apron	17	1	0	0	8	26
T-Hangar	67	6	0	0	2	75
Conventional	0	2	6	4	6	18
Total	84	9	6	4	15	118
			2020			
Apron	18	2	0	0	8	28
T-Hangar	70	6	0	0	2	78
Conventional	0	2	6	5	6	19
Total	88	10	6	5	16	125
			2025			
Apron	18	2	0	0	8	28
T-Hangar	74	6	0	0	2	81
Conventional	0	2	7	5	6	20
Total	92	10	7	5	16	130
			2030			
Apron	19	2	0	0	9	30
T-Hangar	77	6	0	0	2	85
Conventional	0	2	8	6	7	23
Total	96	10	8	6	17	137
			2035			
Apron	20	2	0	0	9	31
T-Hangar	81	6	0	0	2	89
Conventional	0	2	8	7	7	24
Total	101	10	8	7	18	144
Source: Michael Baker International, Inc. 2016. Note: Numbers may not add up due to rounding.						

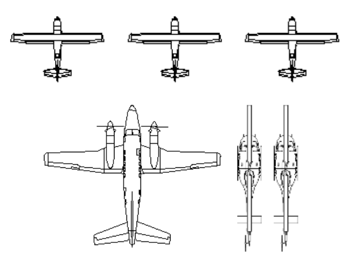
Table 3-16
2035 Based Aircraft Storage Requirements

Apron Tie-Down



2035 Requirement Calculation

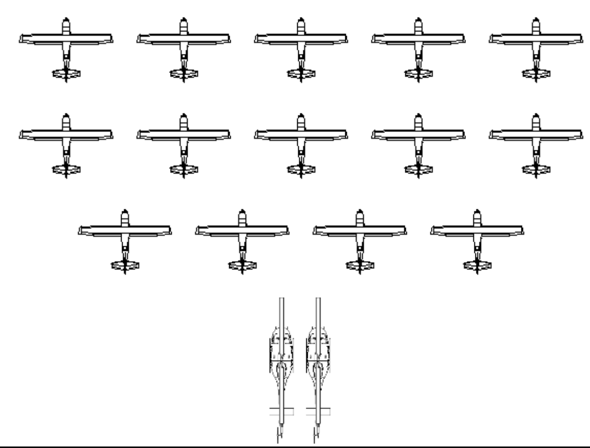
Aircraft	Piston	Multi-Engine	TP/ Jet	Helicopter
Requirement %	20%	20%	0%	50%
2035 Requirement	3	1	0	2
6 Tie-Downs Required by 2035				



T-Hangar

2035 Requirement Calculation

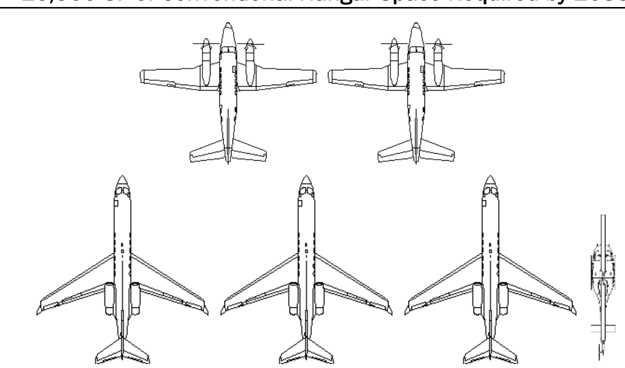
Aircraft	Piston	Multi-Engine	TP/ Jet	Helicopter
Requirement %	80%	60%	0%	10%
2035 Requirement	14	0	0	2
16 T-Hangar Bays Required by 2035				



Conventional Hangar

2035 Requirement Calculation

Aircraft Type	Piston	Multi-Engine	TP/ Jet	Helicopter
Requirement %	0%	20%	100%	40%
2035 Requirement	0	0	3	1
SF Requirement	1,500 SF	2,500 SF	5,000 SF	1,500 SF
2035 Requirement	0	0	15,000 SF	1,500 SF
16,500 SF of Conventional Hangar Space Required by 2035				



Source: Michael Baker International, Inc., 2016.

Transient Aircraft Apron

As previously noted in the inventory chapter, the South Ramp is the primary apron used for transient aircraft parking. The apron is located directly to the east of Runway 18-36, south of the Central Ramp and is approximately 649,980 square feet or 72,220 square yards (SY) in size. The apron accommodates GA transient aircraft parking (pistons, helicopters, turboprops, jets, etc.) and supports multiple businesses including the Fixed Base Operator (FBO – Million Air), the General Aviation Terminal, and Ground Support Equipment (GSE) maintenance.

The Airport Design AC suggests a method for estimating transient aircraft parking requirements using itinerant aircraft operations. Demand for itinerant aircraft parking is estimated to be 50 percent of Average Day Peak Month (ADPM) itinerant aircraft operations. The area required per aircraft for a typical itinerant/transient apron will vary based on the design aircraft or fleet mix. The calculation assumes space requirements of 300 SY for small aircraft and 1,000 SY for large aircraft (e.g., jets and multi-engine aircraft). According to historical operations data, 53 percent of the total itinerant aircraft were determined to be larger aircraft and 46 percent were determined to be small GA aircraft. Future transient apron requirements for TLH are presented in **Table 3-17.**

Table 3-17
Transient Apron Demands

Year	ADPM	50 % ADPM	300 SY Per Aircraft		1,000 SY Per Aircraft		Total (Square Yards)	Surplus/ Deficit (SY)
			46%	SY	53%	SY		
2015	194	97	45	13,386	51	51,410	64,796	7424
2020	202	101	46	13,938	54	53,530	67,468	4752
2025	211	106	49	14,559	56	55,915	70,474	1746
2030	219	110	50	15,111	58	58,035	73,146	-926
2035	229	115	53	15,801	61	60,685	76,486	-4266

Source: Michael Baker International, Inc., 2016.

General Aviation Terminal Building

The general aviation terminal is located on the South Apron adjacent to the ARFF building and is currently operated by Million Air. The facility is a two-story structure with a footprint of 4,980 square feet and provides a pilot's lounge, flight planning room, waiting room, pilot supplies, restrooms, and offices. The FAA recommends separation of general aviation facilities from the more highly secured areas near the airline terminal, which is the current practice at TLH.

Guidance contained in ACRP Report 113, Guidebook on General Aviation Facility Planning, was used to determine if the facility has sufficient capacity to accommodate forecast demands. The general aviation terminal requirements calculation is based on a factor of 2.5 people (pilots and passenger) per peak hour operation and an area of 100 square feet per person. As shown in **Table 3-18**, the general aviation terminal at TLH has sufficient capacity to accommodate forecast demands.

Table 3-18 General Aviation Terminal Demand						
Year	PAX Factor	SF Per PAX	Peak Hour Operations	Existing Building SF	Required Building SF	Surplus (Deficit)
2015	2.5	100	21	11,400 SF	5,250 SF	6,150 SF
2020	2.5	100	23	11,400 SF	5,750 SF	5,650 SF
2025	2.5	100	25	11,400 SF	6,250 SF	5,150 SF
2030	2.5	100	27	11,400 SF	6,750 SF	4,650 SF
2035	2.5	100	29	11,400 SF	7,250 SF	4,150 SF
Source: Michael Baker International, Inc., 2016.						

Fixed Base Operator (FBO)

Million Air is the current fixed base operator at TLH. The facility is co-located with the general aviation terminal building on the South Ramp. The FBO provides a range of services such as fueling, maintenance, and aircraft storage. Roadway access is available via Capital Circle SW and multiple automobile parking spaces are available. It is important to note that the FBO determines their own facility needs based on their own individual business models and demands for services; however, other sections of this chapter provide an evaluation of some of the services that the FBO provides in order to evaluate the overall long-term needs for the airport during the planning period.

3.13 Support Facilities

Support facilities are those airport features that are not necessarily specific to aircraft operations, movement, and storage, but which are vital to ensuring the efficiency, safety, and persistency of aircraft activity. A review of TLH's existing support facilities is presented in the following sections.

Airport Traffic Control Tower (ATCT) & Terminal Radar Approach Control (TRACON)

The Airport Traffic Control Tower (ATCT) is located south of Runway 8 near Springhill Road, adjacent to the airport service road. The building contains administrative support offices and the Terminal Radar Approach Control (TRACON). There are approximately 50 automobile parking spaces that serve the ATCT. These facilities are capable of meeting projected levels of demand and will meet all needs throughout the planning period. Although this is an FAA-operated ATCT, the airport is responsible for maintaining the structure throughout the planning period.

Aircraft Rescue and Fire Fighting (ARFF)

As part of the 14 CFR Part 139 certification requirements, airports providing air carrier operations are required to have an Aircraft Rescue and Firefighting (ARFF) faciliy. TLH is currently served by an ARFF building that is approximately 4,400 square feet and is located on the South Ramp in-between the GSE Maintenance building and the general aviation building. FAA AC 150/5210-15, Airport Rescue and Firefighting Station Building Design, recommends the ARFF facility to be placed in a central location that allows for rapid response time anywhere on the airport. The current central location of the ARFF allows personnel to meet the required response times.

CFR Part 139 certified airports are required to maintain equipment and personnel based on an ARFF Index established according to the length of aircraft and scheduled daily flight frequency. There are five indices, A through E, with A being applicable to the smallest aircraft and E the largest aircraft. TLH falls within the ARFF Index C, based on an average of five or more scheduled departures per day by large air carrier aircraft with a length between 126 feet and 159 feet (i.e., McDonnell Douglas MD-88). The FAA has established specific requirements for ARFF equipment. These requirements vary depending on the size of the aircraft regularly using the airport. **Table 3-19** presents the vehicle requirements and capacities for each index level.

Table 3-19
Aircraft Rescue and Firefighting Index Requirements

Index	Aircraft Length	Index Determination
Index A	<90'	One ARFF vehicle with 500 lbs. of sodium-based dry chemical or One vehicle with 450 lbs. of potassium-based dry chemical and 100 lbs. of water and AFFF for simultaneous water and foam application
Index B	90'-126'	One vehicle with 500lbs. of sodium based dry chemical and 1,500 gallons of water and AFFF or Two vehicles, one with the requirements for Index A and the other with enough water and AFFF for a total quantity of 1,500 gallons
Index C	126'-159'	Three vehicles, one having Index A, and two with enough water and AFFF for all three vehicles to combine for at least 3,000 gallons of agent or Two vehicles, one with Index B and one with enough water and AFFF for both vehicles to total 3,000 gallons
Index D	159'-200'	One vehicle carrying agents required for Index A and Two vehicles carrying enough water and AFFF for a total quantity by the three vehicles of at least 4,000 gallons
Index E	>200'	One vehicle with Index A and Two vehicles with enough water and AFFF for a total quantity of the three vehicles of 6,000 gallons

Source: 14 CFR Part 139.

Airport Maintenance Facilities

The airport's maintenance facilities are located northeast of the Cargo Apron, adjacent to the Southside Cemetery. The maintenance area encompasses approximately two acres and includes three buildings for equipment storage and office space. Access to the facility is provided via Capital Circle SW and on airport perimeter road. The current facility is adequate to meet the current and anticipated demands.

Airport Fuel Storage Facilities

Fuel storage facilities at TLH consist of multiple tanks located south of the Central Apron area. The fuel farm has six above ground storage tanks with three fuel types. The area is fenced, lighted, and has ample area available for fuel truck maneuvering. Fuel storage consists of 120,000 gallons of Jet A fuel, 25,000 gallons of 100LL (Low Lead), and 10,000 gallons of unleaded fuel. A remote self-serve 100LL fuel tank is also located on the east side of the South Apron. Fuel is delivered to the fuel farm via tanker truck and transferred to commercial, general aviation and air cargo aircraft by refueling vehicles. Refueling operations take place on the commercial apron, GA aprons, and cargo apron and are conducted by Million Air.

Fuel storage requirements are determined on the basis of forecast aircraft operations and historical annual fuel sales. Historical annual fuel sales from 2010 to 2015 are presented in **Table 3-20**. During the period of 2010 to 2015, an average of 3,787,406 gallons total Jet A fuel was sold. During the same period, an average of 155,504 gallons of 100LL was sold. Further analysis indicates that approximately 66 percent of the Jet A fuel sold at TLH is for commercial airline operations and approximately 34 percent is for GA operations (including military). On average, 96 percent of the total fuel sold at the airport is primarily Jet A fuel and four percent is 100LL.

The historical average of Jet A fuel sales per commercial airline operation is depicted in **Table 3-21**. As shown, an average of 136.01 gallons of fuel is sold per operation given that historically commercial airlines account for 96 percent of Jet A sales. The average gallons-per-operation ratio was then applied to the forecast operations to project future commercial airline Jet A fuel consumption. As shown, approximately 3,323,366 gallons of commercial airlines Jet A fuel are forecast to be sold at the airport by 2035. Forecast GA demand for Jet A fuel is expected to increase from approximately 1,184,428 gallons in 2015 to approximately 1,337,069 gallons in 2035.

To project general aviation fuel demand, a gallons-per-operation ratio for Avgas was derived from historical 2010 to 2015 records. Using the historical average of 4.74 gallons of fuel per general aviation aircraft operation, demand for AvGas is anticipated to increase from 146,488 in 2015 to 172,293 gallons by 2035.

Table 3-20
Historical Aviation Fuel Flowage

Year	Commercial Airline: Jet A		General Aviation: Jet A		Total Jet A		General Aviation: Avgas		Total Gallons
	Fuel (Gallons)	Percentage	Fuel (Gallons)	Percentage	Fuel (Gallons)	Percentage	Fuel (Gallons)	Percentage	
2010	3,516,379	73%	1,288,075	27%	4,804,454	96%	190,468	4%	4,994,922
2011	2,470,391	64%	1,385,044	36%	3,855,435	96%	154,098	4%	4,009,533
2012	2,451,107	69%	1,124,456	31%	3,575,563	96%	151,404	4%	3,726,967
2013	2,552,102	68%	1,214,382	32%	3,766,484	96%	152,957	4%	3,919,441
2014	2,169,928	62%	1,304,387	38%	3,474,315	96%	137,610	4%	3,611,925
2015	2,038,201	63%	1,209,984	37%	3,248,185	96%	146,488	4%	3,394,673
Average	2,533,018	66%	1,254,388	34%	3,787,406	96%	155,504	4%	3,942,910

Source: Michael Baker International, Inc. 2016.

Table 3-21
Historical and Forecast Fuel Demand

Jet A: Commercial

Historical Demand						Forecast Demand			
Year	Total Jet A Fuel (Gallons)	Jet-A Fuel (Gallons)	Percent of Historical Total Fuel Sales	Operations	Gallons Per Operation Ratio				
2010	4,804,454	3,516,379	96%	24,265	144.916				
2011	3,855,435	2,470,391	96%	19,226	128.492	Year	Forecast Operations	Average Gallons per Operations Ratio	Projected Annual Demand (Gallons)
2012	3,575,563	2,451,107	96%	19,134	128.102	2015	16,710	136.5	2,280,915
2013	3,766,484	2,552,102	96%	17,325	147.307	2020	18,300	136.5	2,497,950
2014	3,474,315	2,169,928	96%	15,682	138.371	2025	20,091	136.5	2,742,422
2015	3,248,185	2,038,201	96%	15,462	131.820	2030	22,097	136.5	3,016,241
Average	3,787,406	2,533,018	96%	18,516	136.501	2035	24,347	136.5	3,323,366
Jet A: General Aviation									
2010	4,804,454	1,288,075	34%	43,764	29.432				
2011	3,855,435	1,385,044	34%	42,824	32.343	2015	36,082	32.826	1,184,428
2012	3,575,563	1,124,456	34%	35,777	31.430	2020	37,166	32.826	1,220,011
2013	3,766,484	1,214,382	34%	38,387	31.635	2025	38,300	32.826	1,257,236
2014	3,474,315	1,304,387	34%	34,505	37.803	2030	39,488	32.826	1,296,233
2015	3,248,185	1,209,984	34%	35,262	34.314	2035	40,732	32.826	1,337,069
Average	3,787,406	1,254,388	34%	38,420	32.826	2035	40,732	32.826	1,337,069

Avgas

Historical Avgas Demand				Forecast Avgas Demand			
Year	Total AvGas Fuel (Gallons)	General Aviation Operations	Gallons Per Operation Ratio				
2010	190,468	38,395	4.961				
2011	154,098	39,668	3.885	Year	Forecast Operations	Average Gallons per Operation Ratio	Projected Annual Demand (Gallons)
2012	151,404	32,211	4.700	2015	29,394	4.744	139,445
2013	152,957	30,347	5.040	2020	31,636	4.744	150,081
2014	137,610	28,123	4.893	2025	33,126	4.744	157,150
2015	146,488	29,394	4.984	2030	34,685	4.744	164,546
Average	155,504	33,023	4.744	2035	36,318	4.744	172,293

Source: Michael Baker International, Inc. 2016.

Forecast demand and fuel storage requirements for Jet A and Avgas at TLH throughout the planning period are illustrated in **Table 3-22**. Approximately 4,660,435 gallons of Jet A fuel and 172,293 gallons of AvGas fuel is projected to be sold in 2035. As indicated, no additional capacity should be needed to store a seven day supply of Jet A or AvGas throughout the planning period. The current 120,000 gallon capacity for Jet A and 25,000 gallon capacity for AvGas storage should be sufficient to meet the future demands.

Table 3-22
Projected Demand and Fuel Storage Requirements

Demand/ Year	Commercial Demand	GA Demand	Total Demand	7-Day Demand	Available Capacity	Surplus/ Deficit
Jet A						
2015	2,280,915	1,184,428	3,465,343	66,641	120,000	53,359
2020	2,497,950	1,220,011	3,717,961	71,499	120,000	48,501
2025	2,742,422	1,257,236	3,999,658	76,917	120,000	43,084
2030	3,016,241	1,296,233	4,312,474	82,932	120,000	37,068
2035	3,323,366	1,337,069	4,660,435	89,624	120,000	30,376
AvGas						
2015	N/A	139,445	139,445	2,682	25,000	22,318
2020	N/A	150,081	150,081	2,886	25,000	22,114
2025	N/A	157,150	157,150	3,022	25,000	21,978
2030	N/A	164,546	164,546	3,164	25,000	21,836
2035	N/A	172,293	172,293	3,313	25,000	21,687

Source: Michael Baker International, Inc. 2016 .

Air Cargo Facilities

An evaluation of air cargo facility requirements was not included in the scope of services for this Master Plan Update; however, alternatives for air cargo expansion are presented later in the study.

Airport Utilities

Airport utilities include electric power, sanitary sewer, communications, and storm-water services. These utilities services have been determined to be sufficient to meet the existing and forecasted needs of existing facilities at the airport. TLH maintains its own system for storm sewer purposes. This system is considered to be adequate for the needs of the airport planning period. The current sanitary sewer system at TLH uses the adjacent Thomas P. Smith Water Reclamation Facility. The facility is located east of Runway 27 approach within the Runway 27 RPZ.

Future development of the northern and eastern portions of the airport necessary to support the expansion of the air cargo and general aviation areas will require a full complement of utility services. Also, additional development on the south and west side of the airfield would require significant utility extensions to support future development.

Airport Security

Security is a critical consideration when operating an airport. According to the Transportation Security Administration's (TSA's) Recommended Security Guidelines for Airport Planning, Design, and Construction (TSA Security Guidelines), "effective airside security relies heavily on the integrated application of physical barriers, identification and access control systems, surveillance or detection equipment, the implementation of security procedures, and efficient use of resources." It is critical to analyze the airport's general security requirements, general layout, and boundaries for conformance with TSA Security Guidelines. **Table 3-23** identifies the security requirements of 14 CFR Part 139 and current status at TLH. However, new technologies are constantly being introduced to deter from security concerns. Installation of more current and up-to-date airport security equipment should be planned for in the 20-year planning period.

Table 3-23
Airside Security Checklist

Standard/ Requirement	Status
Aircraft Operations Area Comply with AC 150/5300-13A distance requirements	*Meets Standards*
FAA Safety and Operational Areas:	
Aircraft Movement Areas - Comply with AC 150/5300-13A	*Meets Standards*
Runways, taxiways, ramps, and/or aprons- Comply with AC 150/5300-13A	*Taxiway design deficiencies*
FAA Safety and operational areas - Comply with AC 150/5300-13A	*Meets Standards*
Object Free Area (ROFA) - Comply with AC 150/5300-13A	*Meets Standards*
Building Restriction Line - Comply with AC 150/5300-13A	*Meets Standards*
Runway Protection Zone (RPZ) - Comply with AC 150/5300-13A	*Meets Standards*
Runway Safety Area (RSA) - Comply with AC 150/5300-13A	*Meets Standards*
Glide Slope Critical Area- Comply with AC 150/5300-13A	*Meets Standards*
Localizer Critical Area- Comply with AC 150/5300-13A	*Meets Standards*
Approach Lighting System- Comply with AC 150/5300-13A	*Meets Standards*
Passenger Aircraft Parking Areas:	
Safe distance to fence/ public access areas	*Meets Standards*
Safe distance to other parked aircraft	*Meets Standards*
Safe distance recommendations for prevention of vandalism	*Meets Standards*
Maintain visibility of areas around parked aircraft to monitor for unauthorized activity	*Meets Standards*
General Aviation Parking areas:	
Exclude GA from the SIDA	*Meets Standards*
Distance GA form terminal area	*Meets Standards*
Coordinate with tenants	*Meets Standards*
Isolated/Security Parking Position:	
At least 100 meters form other aircraft structures	*Meets Standards*
Ensure separation from utilities and fuel	*Meets Standards*
Use CCTV to view the aircraft surrounding area	*Meets Standards*
Accommodate emergency staging area	*Meets Standards*
Avoid public viewing/proximity to area	
Airside Roads:	
Restrict access to authorized vehicles	*Meets Standards*
Perimeter roads should be airside	*Meets Standards*
Perimeter roads should provide unobstructed views of the fence	*Meets Standards*
Positioning of roads	*Meets Standards*
Maintain fencing clear area	*Meets Standards*
Airside Vulnerable Areas:	
NAVAIDs	*Meets Standards*
Runway Lighting	*Meets Standards*
Communications Equipment	*Meets Standards*
Fueling Facilities	*Meets Standards*
FAA ATCT	*Meets Standards*
Sources: TSA Recommended Security Guidelines for Airport Planning Design and Construction, FAR 14 CFR Part 139, and Michael Baker International, Inc., 2016.	

3.14 Land Area Requirements

The purpose of the land area requirements is to review the airport's facilities in comparison to FAA standards in order to identify additional property that may be required for inclusion into the land property envelope. The additional properties may be necessary for land use compatibility purposes, future development needs, to correct non-standard issues, and/or to obtain control over an RPZ. For TLH, the main concern is to obtain control over the off-airport RPZ via acquisition, easement, or zoning. The need to acquire property is further evaluated in later sections of this Master Plan Update.

3.15 Requirements Summary

The facility requirements for TLH are summarized in **Table 3-24**. The remaining sections of this study present the recommendations to satisfy these facility requirements during the 20-year planning period.

Table 3-24
Summary of Facility Requirements

Category	Requirement
Critical Aircraft	Boeing 757-200 Freighter Jet
Runway Design Code (RDC)	RDC C-IV
Taxiway Design Group (TDG)	TDG-4
Airfield Capacity	Consider Bypass Taxiway at Runway 9 End
Wind Analysis	No Issues
Airfield Design Standards	Runway 27 RPZ Extends Off-Airport and Add Paved Taxiway Shoulders
Runway Length Analysis	Existing Runway Lengths are Sufficient
Runway Strength Analysis	No Improvements
Other Airfield Considerations	Remove Direct Taxiway Connections Between Runway 9-27 and Aprons and Correct Acute Angled Taxiways
Airfield Lighting	Complete Lighting Upgrades to LED
Airfield Markings	No Improvements
Airfield Signage	Complete Upgrades to LED
Navigational Aids	Ongoing Maintenance
Obstruction Removal	Continue to Monitor and Evaluate
Terminal Access	Add Additional Short-Term Parking and Rental Car Parking
Passenger Terminal	To be Determined
General Aviation Facilities	Add 6 Tie-Downs, 16 T-Hangar Bays, and 16,500 SF of Hangar Space
Support Facilities	Minimal Improvements
Land Acquisition	Consider Acquisition Needs as Part of the Alternatives Analysis

Source: Michael Baker International, Inc., 2016.

4.0 Preliminary Alternatives

4.1 Background

The previous chapter of this Master Plan Update presented the facility requirements for the Tallahassee International Airport (TLH). The identified requirements include improvements to the airfield for safety and conformance with design standards, expansion of aprons and additional hangars in the landside area, on-airport circulation improvements, support facility recommendations, and future expansions of the passenger terminal and cargo facilities. This chapter presents the preliminary alternatives for TLH that are intended to illustrate potential options for satisfying the identified requirements during the 20-year planning period (2015 through 2035). The preliminary alternatives are intended for discussion purposes between the various airport stakeholders including airport tenants, the Technical Advisory Committee (TAC), City of Tallahassee, 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 TLH, which is presented in Chapter 5. 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 are intended to provide a clear understanding of the airport's possibilities and limitations for airfield and landside development. An evaluation of the following is presented in this chapter:

- Airport Land Use Analysis
- Airfield Design Standards Alternatives
- Terminal Alternative
- Airport Access Alternatives
- Air Cargo Alternative
- General Aviation Alternatives

A meeting was held on March 29, 2016 to present the preliminary alternatives to the TAC and a public meeting was held on the following day (March 30, 2016). The input and comments from those meetings were used to determine the long-term recommended plan for TLH (i.e., the preferred alternative). It is noted that the preliminary alternatives do not present all facilities and equipment that would be needed during the 20-year planning period; rather, alternatives are shown to evaluate potential impacts, understand the desires of airport stakeholders, and to provide sample illustrations of what the airport is capable of accommodating. The preferred alternative and Airport Layout Plan (ALP) illustrate many of the more finite facilities with locations dictated by the FAA and the ultimate layout of airfield and landside facilities.

4.2 Airport Land Use Analysis

The vision for the TLH landside development is to create a balanced, self-sustaining, facility that attracts investment, capitalizes on emerging market trends, and supports economic growth for the Tallahassee region. The airport includes a viable base of tenants, a strong educational presence, availability of land and infrastructure, transportation access, and natural resources. The intent is to leverage these existing assets into development opportunities that differentiate TLH as a leading transportation, industrial, and commercial business center for the region.

Drawing from the findings determined earlier in the planning process, **Figure 4-1** depicts long-term opportunities that reflect coordinated actions among the public sector, private investors, and the airport. While individual projects and property development options may vary from the specific land uses shown, the uses shown should act as an overall benchmark for the highest, best, and most sustainable use of the parcels of airport property that are available for future development, as options for additional property acquisition are limited due to existing uses surrounding the airport. This land use framework will also act as the basis for more detailed site design in subsequent phases of the master planning process.

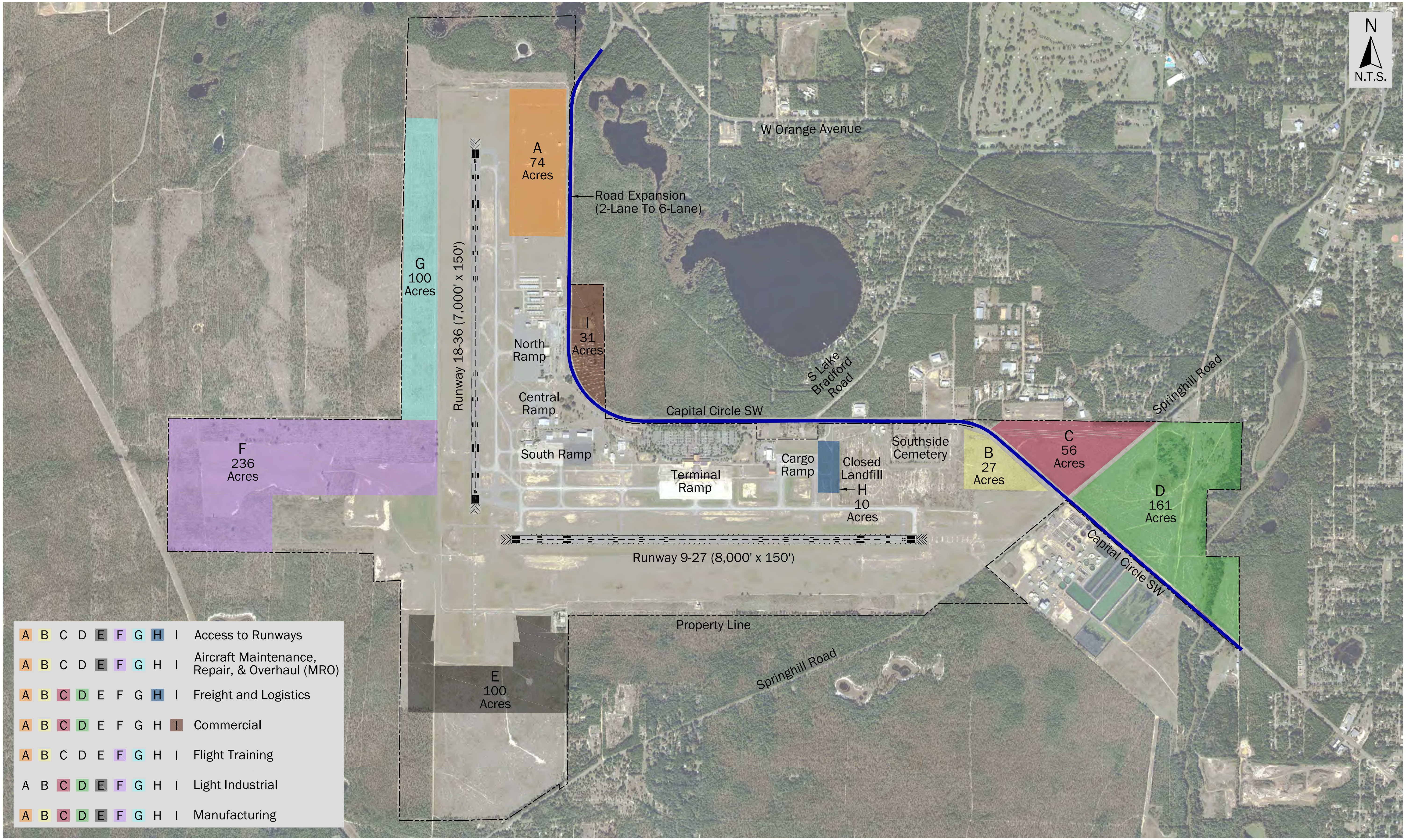
Considering the existing airfield configuration and preserving for the potential extension of Runway 9-27 to meet the airport's growing needs in the future, nine vacant parcels of developable airport property were analyzed in terms of their potential use, aircraft and automobile access, and feasibility of development. 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 space for aviation development and expansion before considering alternate uses. The results of this analysis were also coordinated with airport staff and the consultants responsible for establishing a new Foreign Trade Zone (FTZ) at the airport and attracting potential tenants/developers for the undeveloped parcels.

The parcels are illustrated in **Figure 4-1** and evaluated in **Table 4-1**. Development opportunities are organized into nine distinct areas. The consultant team initially considered each area's proximity to the runway system to determine the ability to support aviation-related activities, including aircraft Maintenance, Repair, and Overhaul (MRO) activities, freight and logistics, and flight training. Other economic development opportunities identified are associated with commercial, light industrial, and manufacturing uses. It is noted that stormwater improvements need to be conducted to make the parcels shovel-ready for development.

Table 4-1
Land Use Analysis

Parcel	Approximate Acreage	Access to Runways	Potential Use	Access	Feasibility of Development
A	74	Yes	MRO/Freight and Logistics/Commercial/Flight Training/Manufacturing	Vehicle access could be provided from Capital Circle SW.	This area is best suited for aviation-related development. Buildings to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. Development of this area is warranted by demand and will require the relocation of the Remote Transmitter/Receiver (RTR) to a location south of Runway 9-27.
B	27	Yes	MRO/Freight and Logistics/ Commercial/Flight Training/Manufacturing	Vehicle access could be provided from Capital Circle SW.	Buildings or hangars to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
C	56	No	Freight and Logistics/Commercial/Light Industrial/Manufacturing	Vehicle access could be provided from Capital Circle SW or Springhill Road.	Buildings to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
D	161	No	Freight and Logistics/Commercial/Light Industrial/Manufacturing	Vehicle access could be provided from Capital Circle SW or Springhill Road.	Buildings to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
E	100	Yes	MRO/Light Industrial	Vehicle access could be provided from Springhill Road and new road construction.	Buildings or hangars to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
F	236	Yes	MRO/Flight Training/Light Industrial/Manufacturing	Vehicle access could be provided from Airport Perimeter Road and new road construction from Springhill Road.	Eastern portion of this area is suitable for aviation-related development. Currently, the city is performing a study to determine the feasibility of developing portions of this site as an alternative energy resource. Buildings or structures to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
G	100	Yes	MRO/Flight Training/Light Industrial/Manufacturing	Vehicle access could be provided from Airport Perimeter Road and new road construction from Capital Circle SW.	Buildings or hangars to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional and inner approach surfaces. To be developed as warranted by demand.
H	10	Yes	Freight and Logistics	Vehicle access could be provided from Capital Circle SW and Air Cargo Road.	Proximity to the air cargo area makes this parcel ideal for freight and logistics related development and there is a potential to construct an Intermodal Logistics Center (ILC) for freight on the airport property. Buildings to be constructed in this area should not exceed a certain height to avoid encroachment of the transitional surface. To be developed as warranted by demand.
I	31	No	Commercial	Vehicle access could be provided from Capital Circle SW.	Site is ideal for hotel or other complementary commercial development. To be developed as warranted by demand. There are some soil contamination issues associated with this parcel.

Source: Michael Baker International, Inc., 2017.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N.T.S.
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Acres
Road Expansion
(2-Lane To 6-Lane)
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100
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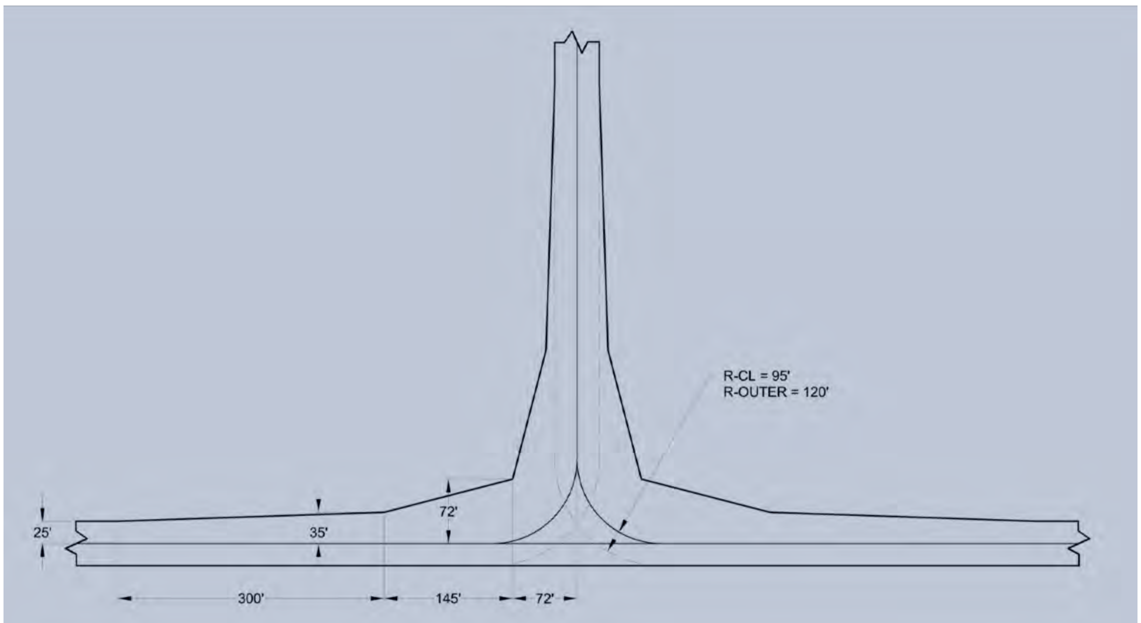
Runway 18-36 (7,000' x 150')
I
31
Acres
North
Ramp
Central
Ramp
S Lake
Bradford
Road
Capital Circle SW
Springhill Road
F
236
Acres
South Ramp
Terminal
Ramp
Cargo
Ramp
Closed
Landfill
H
10
Acres
Southside
Cemetery
B
27
Acres
C
56
Acres
D
161
Acres
Runway 9-27 (8,000' x 150')
Capital Circle SW
Property Line
Springhill Road
E
100
Acres
A B C D E F G H I Access to Runways
A B C D E F G H I Aircraft Maintenance, Repair, & Overhaul (MRO)
A B C D E F G H I Freight and Logistics
A B C D E F G H I Commercial
A B C D E F G H I Flight Training
A B C D E F G H I Light Industrial
A B C D E F G H I Manufacturing

4.3 Airfield Design Standards Alternatives

The purpose of the airfield design standards alternatives was to correct features of the airfield to conform to current FAA standards as outlined in Advisory Circular (AC) 150/5300-13A, Airport Design. This primarily included improvements at taxiway intersections to comply with revised fillet geometry standards. According to AC 150/5300-13A, "pavement fillets at taxiway intersections are designed for the entire selected Taxiway Design Group (TDG) and must accommodate all aircraft of all lesser TDGs." At TLH, the critical aircraft is the Boeing 757-200 freigther jet that falls into the TDG-4 category. The graphic below shows an illustration of the FAA's fillet geometry requirements for TDG-4 for a 90 degree intersection. While everything associated with parallel Taxiways A and B should be designed in accordance with TDG-4, as well as the connections to the Terminal Ramp and Cargo Ramp, many of the other taxiways that do not routinely accommodate 757-200 and larger aircraft may be designed to a lesser standard (e.g., many of the taxiways accessing the general aviation areas).



TDG-4 90

Other improvements were also identified to comply with the recommendations in FAA Engineering Brief No. 75 (EB-75), Incorporation of Runway Incursion Prevention into Taxiway and Apron Design, which are intended to improve situational awareness for pilots while taxiing around the airfield in an effort to prevent the chance of runway incursions. The FAA defines runway incursions as "any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft." As mentioned in the requirements analysis, EB-75 identifies the following airfield design strategies that should be considered to help prevent runway incursions, in addition to removing direct connections between runways and aircraft parking areas:

- Removal of excess pavement.
- Removal of direct connections from runways to aircraft parking areas.
- Correction of complex intersections and hot spots.
- Limit the number of aircraft crossing an active runway
    - The preference is for aircraft to cross in the last third of the runway whenever possible, since within the middle third of the runway the arriving/departing aircraft is usually on the ground and traveling at a high rate of speed
- Optimize pilots' recognition of entry to the runway (increase situational awareness) through design of taxiway layout, for example:
    - Use a right angle for taxiway-runway intersections (except for high speed exits)
    - Limit the number of taxiways intersecting in one spot
    - Avoid wide expanses of pavement at runway entry
- Insure the taxiway layouts take operational requirements and realities into account to:
    - Safely and efficiently manage departure queues
    - Avoid using runways as taxiways
    - Use taxiway strategies to reduce the number of active runway crossings
    - Correct runway incursion "hot spots"

The requirements analysis also identified the need to provide bypass taxiways at each runway end in order to help improve capacity during peak times. According to AC 150/5300-13A, "Air Traffic Control (ATC) personnel at busy airports encounter occasional bottlenecks when moving aircraft ready for departure to the desired takeoff runway. Bottlenecks result when a preceding aircraft is not ready for takeoff and blocks the access taxiway. Bypass taxiways provide flexibility in runway use by permitting ground maneuvering of steady streams of departing aircraft."

Therefore, considering the factors mentioned above regarding taxiway fillet geometry, the recommendations of EB-75, and the need for bypass taxiways at TLH, **Figure 4-2** illustrates the airfield design standards analysis for Runway 9-27 and **Figure 4-3** illustrates the analysis for Runway 18-36. A summary of the recommended improvements is provided below. It is likely that any fillet improvements would be conducted as part of the next rehabilitation project for each respective taxiway, while many of the EB-75 recommendations could be conducted as funding becomes available. Cost estimates for conducting these improvements are presented in conjunction with the preferred alternative.

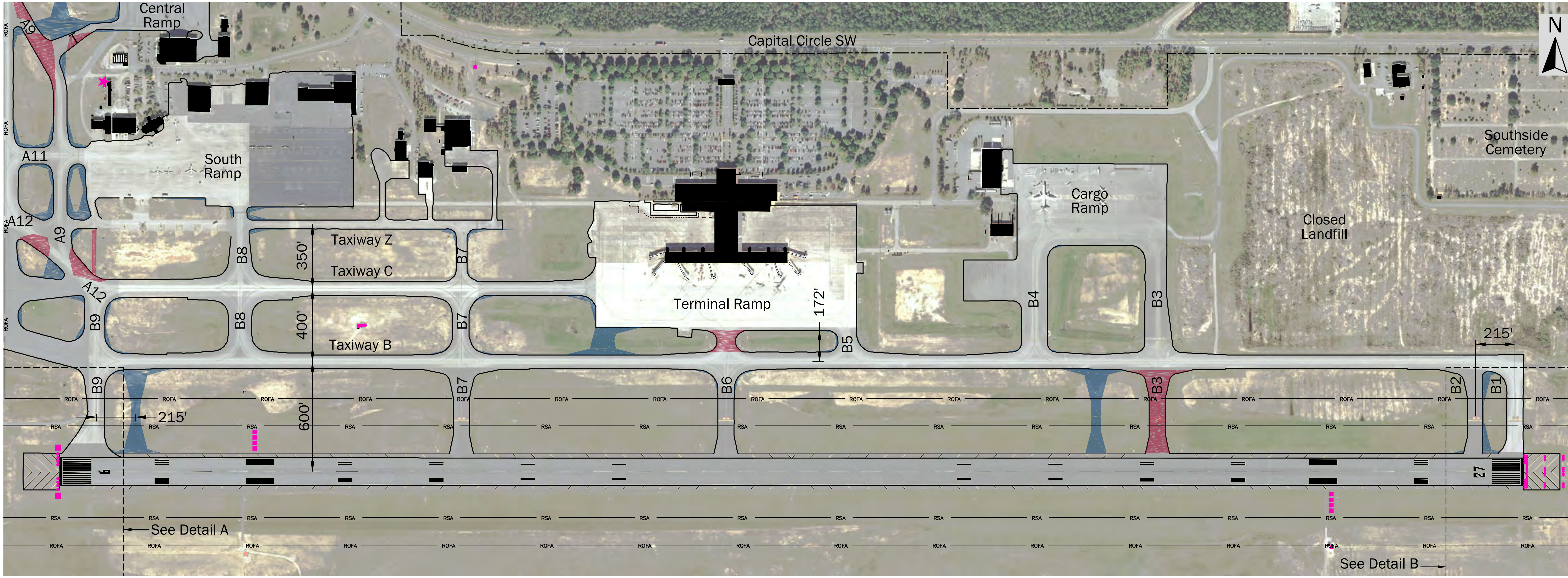
Figure 4-2 – Runway 9-27 Airfield Design Standards Alternative

1. Starting on the left side of the graphic (west side), fillet improvements may be conducted on Taxiway B9 (between Taxiways B and C).
2. Runway 9 is the only runway end without a bypass taxiway. Therefore, the provision of a bypass taxiway at that runway end would help improve airfield traffic flows when conditions favor the use of Runway 9 for departures.
3. Other fillet improvements could be conducted on Taxiway B8 (at the intersection of Taxiway Z and at the entrance to the South Ramp), Taxiway B7 (north of Taxiway B), and Taxiway B6 (at the intersection of Taxiway B).

4. The direct connection between Runway 9-27 and the Terminal Ramp is not desirable (i.e., Taxiway B6). As a replacement, a new connection to Taxiway B is shown on the west end of the Terminal Ramp.
5. The direct connection between Runway 9-27 and the Cargo Ramp is not desirable (i.e., Taxiway B3). Because the Cargo Ramp was built with the ability to expand and construct additional facilities along the perimeter, it was deemed more appropriate to show removal of Taxiway B3 south of Taxiway B and to provide a new connection between Runway 9-27 and Taxiway B at the midpoint between Taxiways B3 and B4.
6. The last recommendation on this graphic is the widening of Taxiway B2 to allow for bi-directional bypass operations if the need should arise to do that in the future.

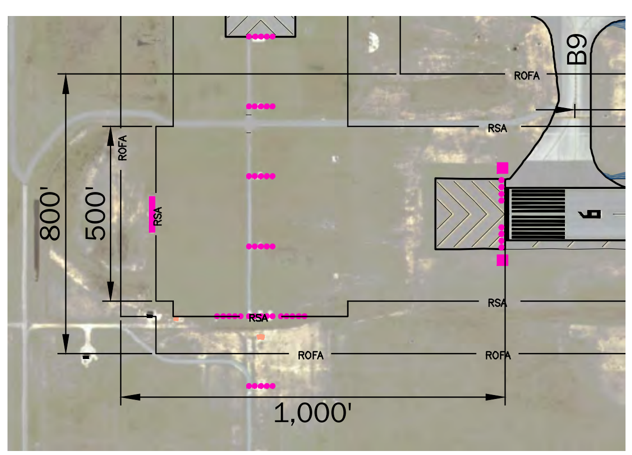
Figure 4-3 – Runway 18-36 Airfield Design Standards Alternative

7. Starting on the left side of the graphic (north side), Taxiway A2 could be widened to allow for bi-directional bypass operations if the need should arise to do that in the future.
8. Fillet improvements could be conducted along Taxiway A3 (between Taxiway A and Runway 18-36).
9. This graphic shows removal of all taxiways that do not currently have 90 degree angles (including Taxiways A5, A6, A8, A9, and A10). Replacement taxiways were added to help improve situational awareness for pilots near the north ramp and between Taxiway A and Runway 18-36.
10. A straight connection between Taxiway A and the Central Ramp was also added. To allow all general aviation aircraft to be able to access the Fixed Base Operator (FBO) facility on the South Ramp without having to travel along parallel Taxiway A, a connection between the North Ramp and Central Ramp could be considered.
11. Various fillet improvements are shown to the west and south of the South Ramp and the angled portion of Taxiway A12 is shown as replaced with 90 degree intersections.
12. The last recommendation on this graphic is the removal of Taxiway A12 (between Taxiway A and Runway 18-36) to eliminate the direct connection between Runway 18-36 and the helicopter parking positions.



Plan View Runway 9-27 (8,000' x 150')

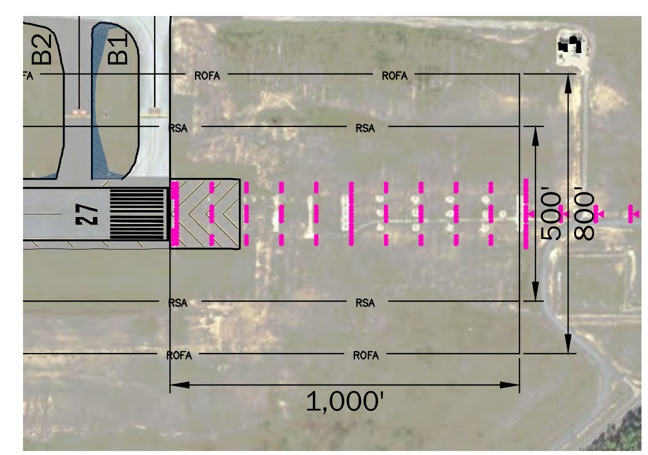
0 550' 1,100'



Detail A

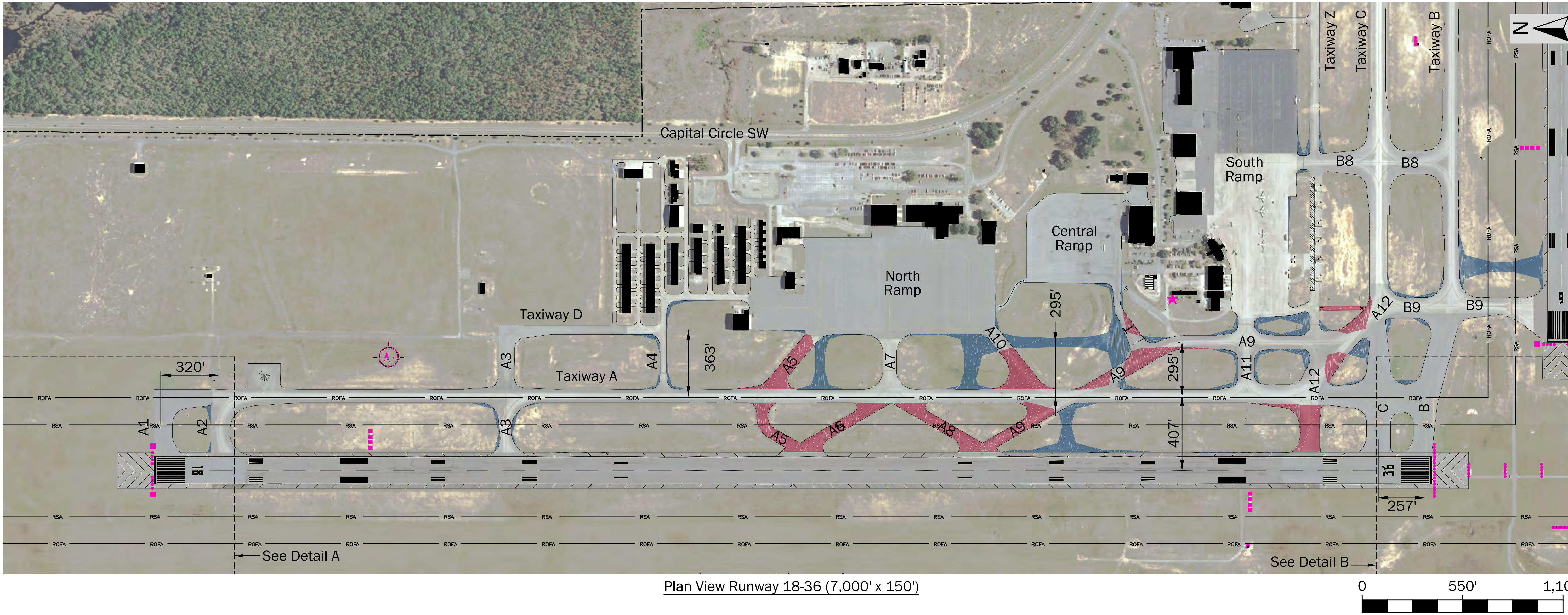
Legend

- Property Line
- Navigational Aids
- Buildings
- Potential Fillet Improvements
- Pavement Removal

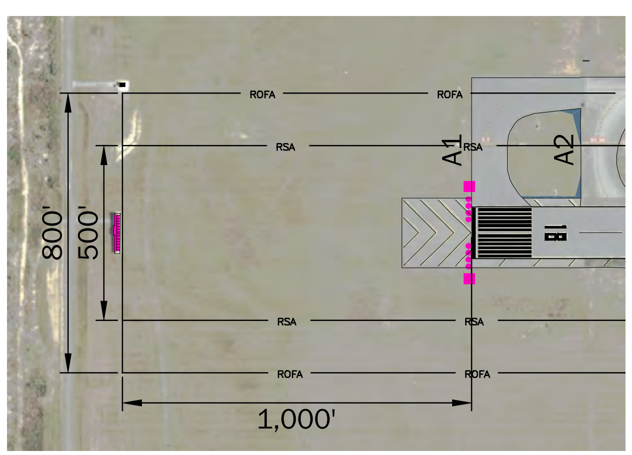


Detail B

Figure 4-2 Airfield Design Standards Alternative (Runway 9-27)



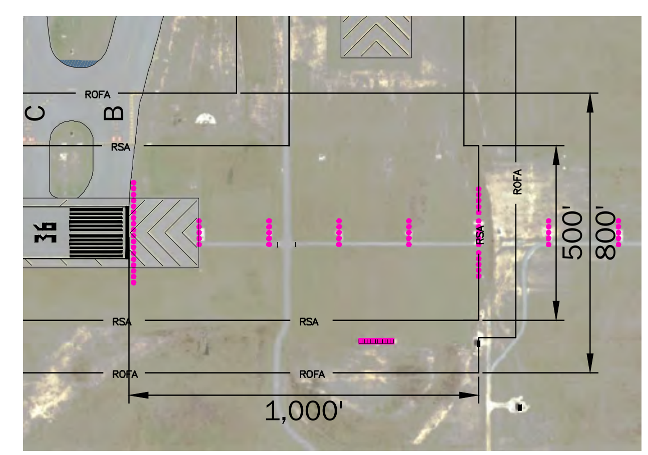
Plan View Runway 18-36 (7,000' x 150')



Detail A

Legend

- Property Line
- Navigational Aids
- Buildings
- Potential Fillet Improvements
- Pavement Removal



Detail B

4.4 Terminal Alternative

Previous terminal area planning efforts at TLH have analyzed the passenger terminal building in great detail. Within the terminal building, areas that were studied include ticketing, baggage claim, baggage screening, concessions, as well as passenger screening and holding areas. The overall plan for the passenger terminal includes the separation of outbound and inbound passengers and baggage, single passenger screening checkpoint, behind-the-scenes baggage screening, centralized concession locations, ease of future expansion, and simple circulation paths for travelers and airline employees. As a result of these previous planning initiatives, the airport is well into a Terminal Modernization Project that includes multiple improvements to accommodate short- and long-term passenger demands and meet modern spacing requirements. When completed, the project will include reconfiguring TLH's lobby up to the Transportation Safety Administration (TSA) security screening checkpoint, a new baggage claim system, ticket counters for airlines and rental car agencies, safety screening machines, a new TSA screening room, life and safety improvements, restroom renovations, and other aesthetic upgrades.

Building upon the Terminal Modernization Project, the proposed terminal development alternative calls for the expansion of the passenger terminal building to accommodate long-term baggage screening and baggage claim area needs, and an expanded concourse layout to provide additional gates and secure passenger holding area. In the near future, the airport will move forward with its plans to design and construct Federal Inspection Services (FIS) and Customs and Border Patrol (CBP) facilities in support of its international airport status. The FIS and CBP facilities will likely be constructed at ground level below Gate B5 with an alternate entry point for domestic and international flights. The FIS facility will be designed to accommodate up to 400 peak hour passengers, but the facility will initially be staffed for 200 passengers.

With the expansion of the secure concourse to the east and west, approximately 162,187 SF of additional aircraft parking apron area will be constructed to accommodate the parking and flow of passenger aircraft. Terminal Ramp improvements are currently slated for 2019 to fix cracks in the pavement. Additionally, a new location for connector Taxiway B6 is proposed to meet current FAA airfield design standards. These terminal area improvements are shown in **Figure 4 4**.

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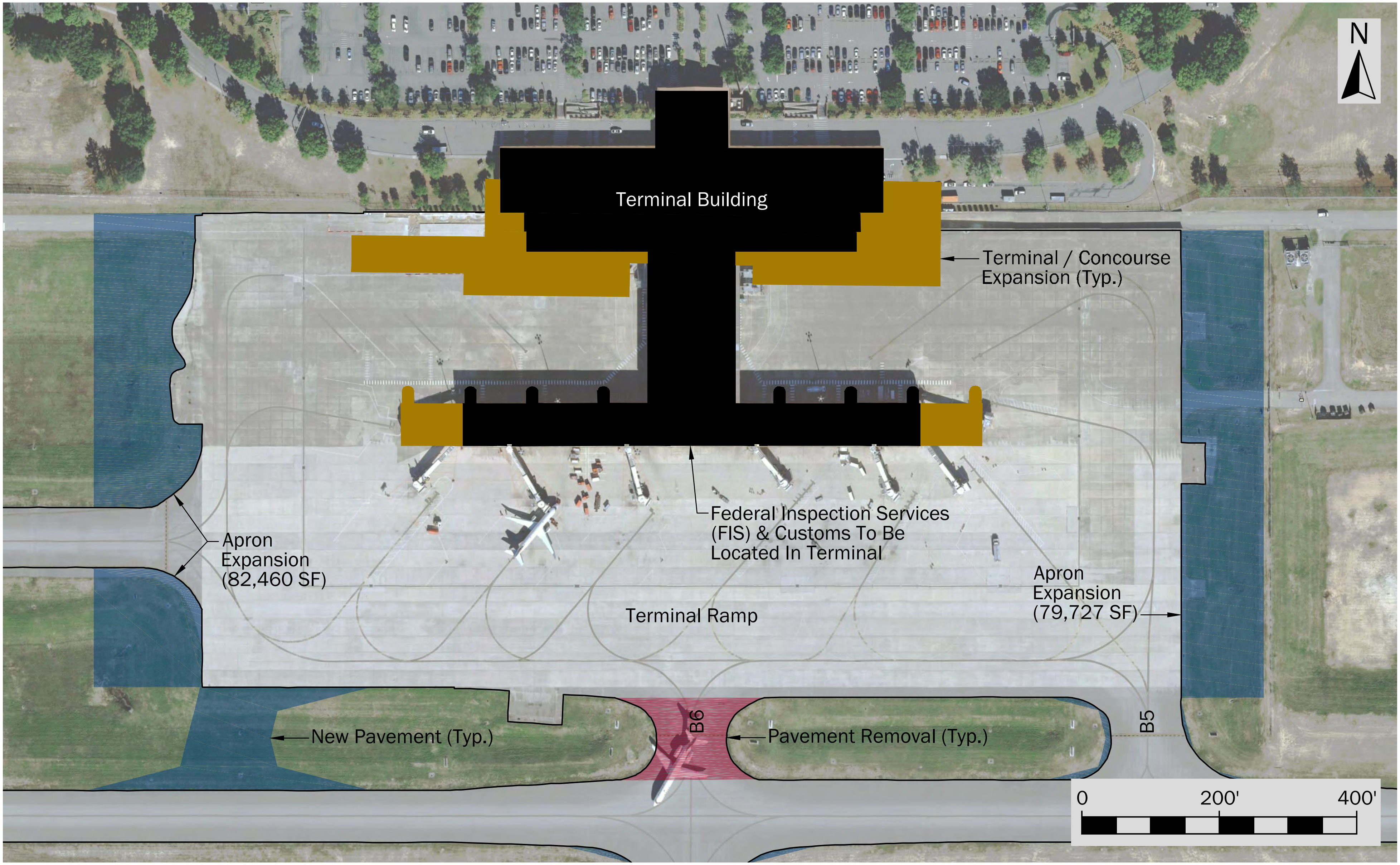

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Figure 4-4 Terminal Alternative

4.5 Airport Access Alternatives

As part of the landside and terminal area development process, several options for airport access improvements were considered. At the beginning of the master planning process, the consultant team and airport staff met with representatives from the Florida Department of Transportation (FDOT) to discuss their proposed alignment associated with the widening of Capital Circle SW in the future. As part of the coordination process, it was determined that the FDOT design would provide a main entry point and a controlled exit point and that FDOT would need to purchase right-of-way from the airport. The two airport access alternatives discussed in this section are designed to improve the flow of vehicular traffic throughout the terminal area, facilitate the flow of traffic on-airport between the general aviation and cargo facilities, accommodate short-term, long-term, and employee parking needs, and support future rental car facility improvements.

Figure 4-5 – Airport Access Alternative 1

Airport Access Alternative 1 provides an entry point and a controlled exit point aligned with the airport's existing entrance and exit. Although FDOT's proposed alignment provides for an exit at the existing parking plaza, there are future plans to relocate the parking plaza exit to the east side of the parking lot. Vehicles would exit onto the airport loop road and exit the airport at the main controlled exit. The relocation of the exit toll booth would also support future two-way access between existing general aviation and cargo facilities without having to pass in front of the terminal. This roadway also facilitates the flow of return traffic on the airport loop road. This road would also require an additional new roadway to the airport employee parking lot. The option for a secondary entrance is also provided.

Under this alternative, the recommendations are designed to improve the short-term and long-term parking configuration and flow of traffic. In addition, this concept includes the construction of a two level parking structure in front of the terminal that would provide the additional short-term parking on level 2 and rental car ready/return capacity on level 1 that is needed in the future. The structure would allow passengers to walk across from the terminal to the parking structure at the same floor level. In an effort to consolidate and streamline the cleaning and maintenance activities of the rental car companies on airport, a future six-acre rental car Quick-Turnaround (QTA) service facility is proposed in the areas east of the airport loop road and the airport exit along Capital Circle SW. This location will eliminate runners for rental cars. Additional road improvements would also be necessary to support the flow of vehicles between the rental car QTA and the ready/return facilities and keep rental car activities from occurring in front of the terminal. This includes the relocation of the existing cell phone lot to a more efficient location on the west side of the airport loop road near the airport entrance.

In an effort to further evaluate this alternative, the following pros and cons were identified:

<u>Pros</u>

- Two-way access between the general aviation and cargo facilities without having to pass directly in front of the terminal.

- Dedicated access for the QTA service facility.
- Single entry for parking.
- Relocated exit plaza.
- Relocated cell phone lot.
- Dedicated controlled entrance and exit.

Cons

- Access road is in close proximity to the entry/exit points (crossing movements).
- QTA service facility will require storm water pond revision.

Figure 4-6 – Airport Access Alternative 1

Airport Access Alternative 2 is similar to Alternative 1; however, it is designed to address some of the issues identified previously. This alternative preserves the area east of the airport loop road that is currently used for storm water retention. As a result, the proposed six-acre rental car QTA service facility is situated entirely along Capital Circle SW on a longer and wider parcel. Compared to the previous alternative, this configuration would improve the overall flow of cleaning and maintenance activities for multiple rental car companies. Due to its proximity to the existing roadway network, Alternative 2 also results in less new roadway construction. The following pros and cons were identified:

Pros

- Two-way access between the general aviation and cargo facilities without having to pass directly in front of the terminal.
- Preserves storm water basin.
- Dedicated access for the QTA service facility.
- Allows for a more streamlined layout of QTA service facility.
- Results in less new road construction.
- Single entry for parking.
- Relocated exit plaza.
- Relocated cell phone lot
- Dedicated controlled entrance and exit.

Cons

- Access road is in close proximity to the entry/exit points (crossing movements).

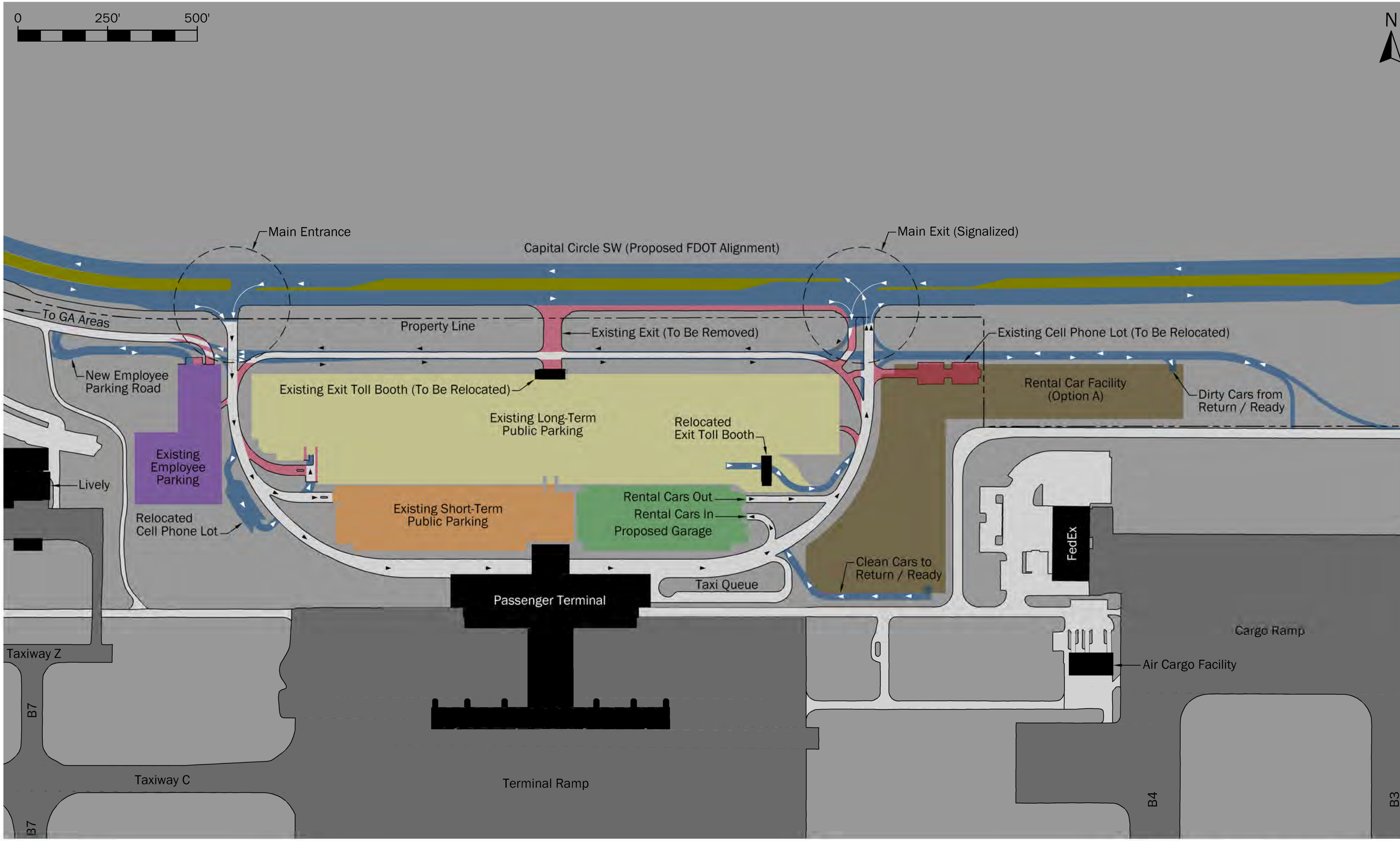

Figure 4-5 Airport Access - Alternative 1

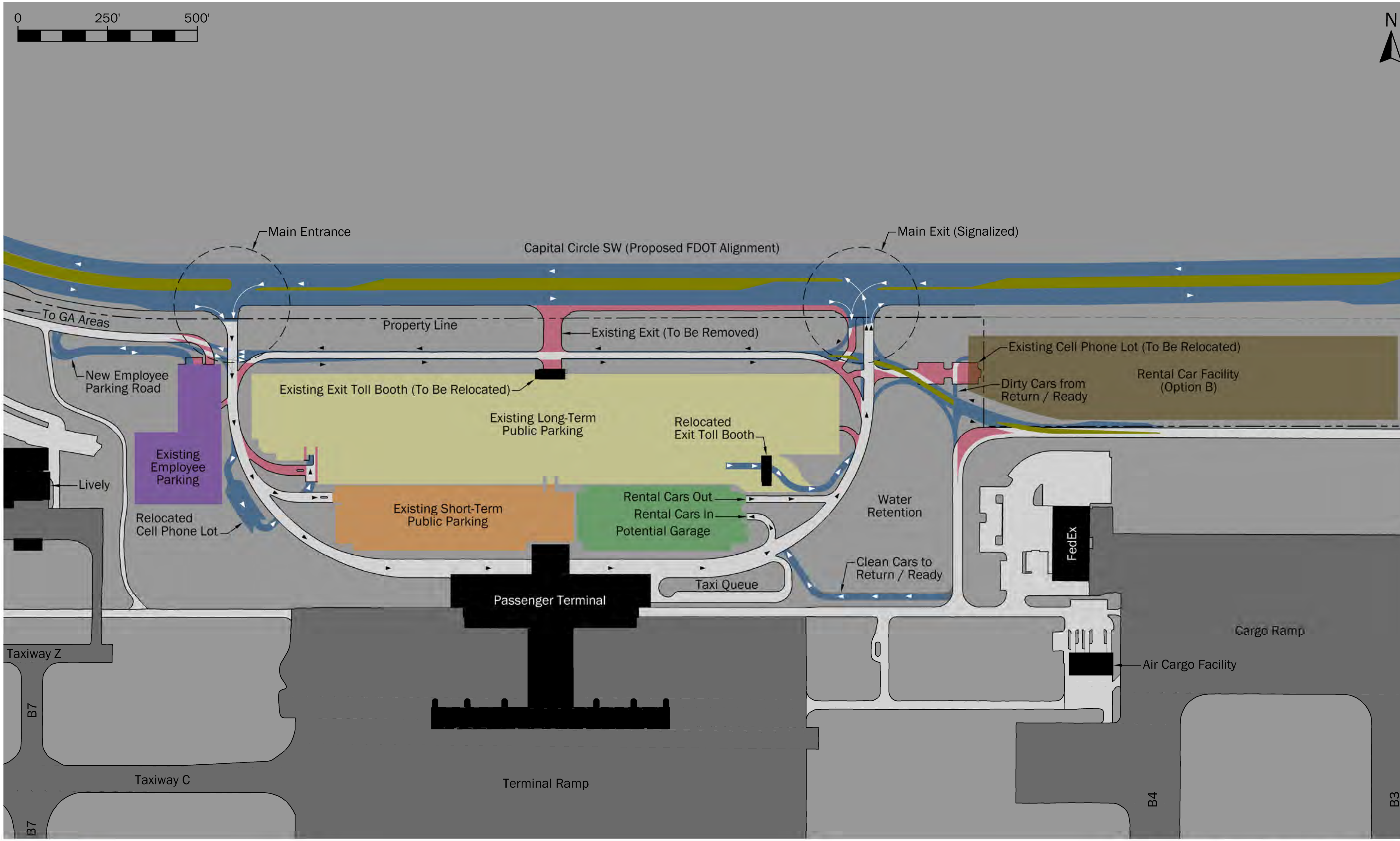

Figure 4-6 Airport Access - Alternative 2

4.6 Air Cargo Alternative

Current tenants occupying cargo facilities at TLH include Delta, Dade GSE, DHL, FedEx, and USPS. The majority of the cargo activity is conducted by FedEx on regularly-scheduled flights between TLH and FedEx's hub at Memphis International Airport (MEM) using Boeing 757-200 freighter jets; however, FedEx also conducts feeder routes through airports like Orlando International Airport (MCO), Jacksonville International Airport (JAX), and Mobile Downtown Airport (BFM) using Cessna 208 Caravan turboprops. The Delta cargo activity generally consists of belly cargo on scheduled Delta flights.

Although an evaluation of air cargo facility requirements was not included in the scope of services for this Master Plan Update, alternatives for air cargo expansion were considered. In light of anticipated plans for the airport property that specifically focus on attracting new cargo and logistics tenants, the need to reserve space for expanded air cargo operations and related support facilities is evident. The air cargo alternative shown in **Figure 4-7** includes provisions for approximately 90,480 SF of cargo facilities and an expansion of the cargo apron of approximately 351,479 SF to accommodate additional cargo aircraft activities. Vehicle and truck traffic would continue to access the area via the current access road off of Capital Circle SW. Truck docking and maneuvering areas would be located on the north side of the proposed cargo facilities and include space for the parking and storage of multiple semi-trailer trucks. In addition, this alternative includes the relocation of the portion of Taxiway B3 connecting Taxiway B to Runway 9-27 to meet current FAA airfield design standards.

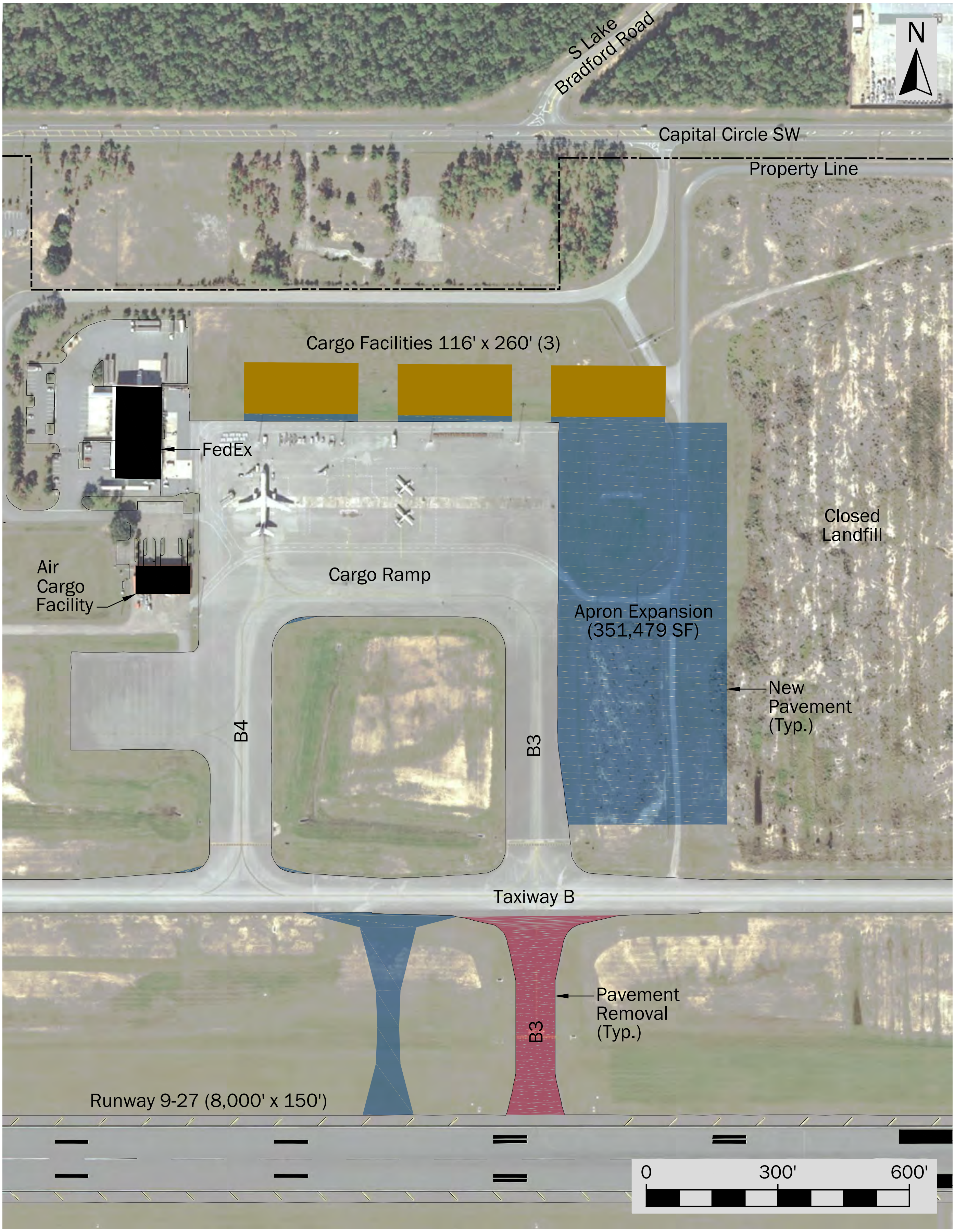

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Figure 4-7 Cargo Alternative

4.7 General Aviation Alternatives

The purpose of the general aviation alternatives is to illustrate examples of developments that could occur in the vicinity of the South, Central, and North Ramps at TLH, which are discussed in the sections below.

South Ramp

The South Ramp at TLH is located to the west of the Terminal Ramp near the ends of Runways 9 and 36. The airport's Fixed Base Operator (FBO) is located on the South Ramp and the apron is the most heavily utilized area for general aviation activity at TLH. The apron also routinely serves corporate, military, and commercial airline activity. The commercial airline activity is typically associated with athletic team transport for Florida State University (FSU) and visiting teams and the South Ramp can be particularly busy during major football games at FSU. At the time of this writing, there was a project to rehabilitate the South Ramp including the entire apron area in front of the FBO terminal, the tiedown area to the immediate east, the fuel truck parking area, and the helicopter parking positions. For that reason, it was important to evaluate the South Ramp and to develop a plan that would conform to current standards while considering the needs of the multiple users of the area.

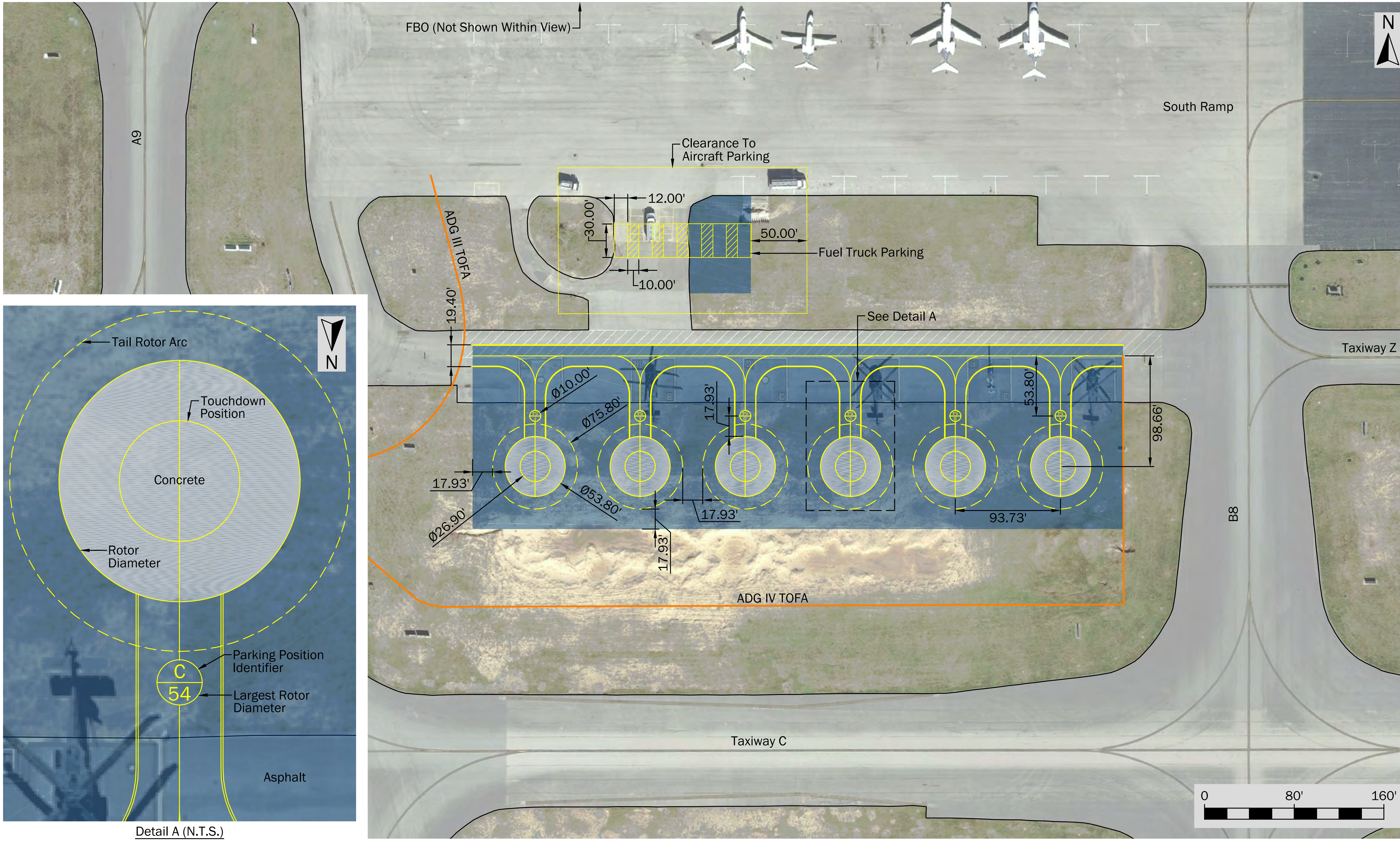
The initial area of attention for this effort was on the helicopter parking positions and to evaluate alternatives that attempted to conform to FAA AC 150/5390-2C, Heliport Design. The dimensions and markings on the existing helicopter parking positions do not reflect current standards as defined in AC 150/5390-2C. The first step was to identify the design helicopter, which is "a single or composite helicopter that represents the maximum weight, maximum contact load/minimum contact area, overall length, rotor diameter, rail rotor arc radius, undercarriage dimensions, and pilot's eye height of all helicopters expected to operate at the facility." The largest helicopters that currently operate at TLH are Boeing CH-47 Chinooks, which are very large military helicopters with two main rotors. Because of the large size of those helicopters and the limited frequency of their activity at TLH, the Sikorsky UH-60 Black Hawk was determined to be a more appropriate design helicopter, which has a main rotor diameter of 53.8 feet. AC 150/5390-2C identifies two different types of general aviation helicopter parking positions that may be considered. The first option is a turn-around position where the helicopter has room to fully turn around on the pad while landing or prior to departing. The second option is a taxi-through and back-out position where the helicopter does not have clearance to fully turn around; they must either have the clearance to taxi-through or must land and back-out in the same orientation (much like an automobile parking lot). The turn-around positions provide greater flexibility, but also require additional clearance to accommodate the swing maneuver of the tail rotor (and for the same reasons, can also require more pavement than the second option).

Two helicopter parking position alternatives were developed for TLH. As shown in **Figure 4-8**, Alternative 1 illustrates six helicopter turn-around positions in the same vicinity as the existing positions. Under this alternative, helicopters would taxi to the positions along the airport's existing taxi network and would have a dedicated helicopter taxi route to each position (A through F). It is likely that the pad where the helicopter sits would be constructed of concrete and the surrounding areas would be asphalt. The positions are located to provide proper clearance from taxiing aircraft. Alternative 1 covers a total area of 95,280 square feet. An expanded fuel truck parking area is also shown on this graphic with the required safety buffers as defined in National Fire Protection Association (NFPA) 407, Standard for Aircraft Fuel Servicing. As shown in **Figure 4-9**, Alternative 2 is a scaled-down version of Alternative 1 and reverses the direction that helicopters would approach the positions. The ground where the stabilized turf is shown on the graphic has eroded from continued helicopter propeller wash. Alternative 2 assumes that the turf will be stabilized with either a natural or artificial turf product that will be able to withstand continued helicopter propeller wash without eroding. For example, there are products such as Air FieldTurf that may be viable options for an artificial turf application, which will be further investigated as part of the design process for the helicopter parking positions. Alternative 2 covers a total area of 64,795 square feet and is considered the preferred turn-around helicopter parking position alternative for TLH. If a back-out position is considered more appropriate, it will be investigated as part of the preferred alternative.

Figure 4-10 illustrates an overall development alternative for the South Ramp with the turn-around helicopter parking positions, the fuel truck parking area, a concrete hot fueling pad, and a revised marking scheme. The concrete hot fueling pad would be intended to be used for helicopters to be fueled when the engines are running. It was sized to accommodate the Black Hawk helicopter and was located in an area that is infrequently used for aircraft parking. Therefore, when hot fueling activities are conducted, the remote area would allow for the helicopter operator and the fueling activities to meet required clearances. Two Boeing 767-300ER parking positions are also shown on the South Ramp, which would typically be associated with athletic charters. In order to be able to get such large wide-body jets onto the apron, the aircraft have to enter via either Taxiway A11 or B8 and do a quick turnaround so they are facing forward (north). Some degree of tiedown removal in the eastern portion of the South Ramp would be desirable in order to meet the clearance for a 767-300ER to be able to conduct that maneuver with a standard safety buffer area.

Central Ramp and North Ramp

Figure 4-11 illustrates development on the Central Ramp with the addition of two 6,000 foot hangars. There could be some additional options for utilizing the Central Ramp, but the grade change around it may make it costly to construct larger hangars in the vicinity. As mentioned earlier, a cleaner taxiway connection is also shown to the Central Ramp. **Figure 4-11** also shows development around the North Ramp including three 14,400 square foot hangars at the back of the apron, four smaller box hangars, and 16 T-hangar bays. Again, there are various options that could be explored for anyone looking to build a hangar or hangars around the North Ramp, but this graphic provides a general idea of what the opportunities are. The area on the left of the graphic (north side) is identified as an approximately 13-acre general aviation expansion area where any number of development options could be explored. The parking lot that used to be for the previous passenger terminal is highlighted because this is an approximately 10-acre area where any number of options could also be explored for development (aviation or non-aviation). It is not a heavily utilized parking lot, with the exception of serving as an overflow area for rental cars.


FBO (Not Shown Within View)
South Ramp
A9
N
Clearance To Aircraft Parking
12.00'
30.00'
50.00'
Fuel Truck Parking
10.00'
ADG III TOFA
19.40'
See Detail A
Taxiway Z
Ø10.00'
Ø75.80'
17.93'
53.80'
98.66'
17.93'
Ø26.90'
Ø53.80'
17.93'
93.73'
17.93'
B8
ADG IV TOFA
Taxiway C
0
80'
160'
Tail Rotor Arc
Touchdown Position
Concrete
Rotor Diameter
Parking Position Identifier
C
54
Largest Rotor Diameter
Asphalt
Detail A (N.T.S.)

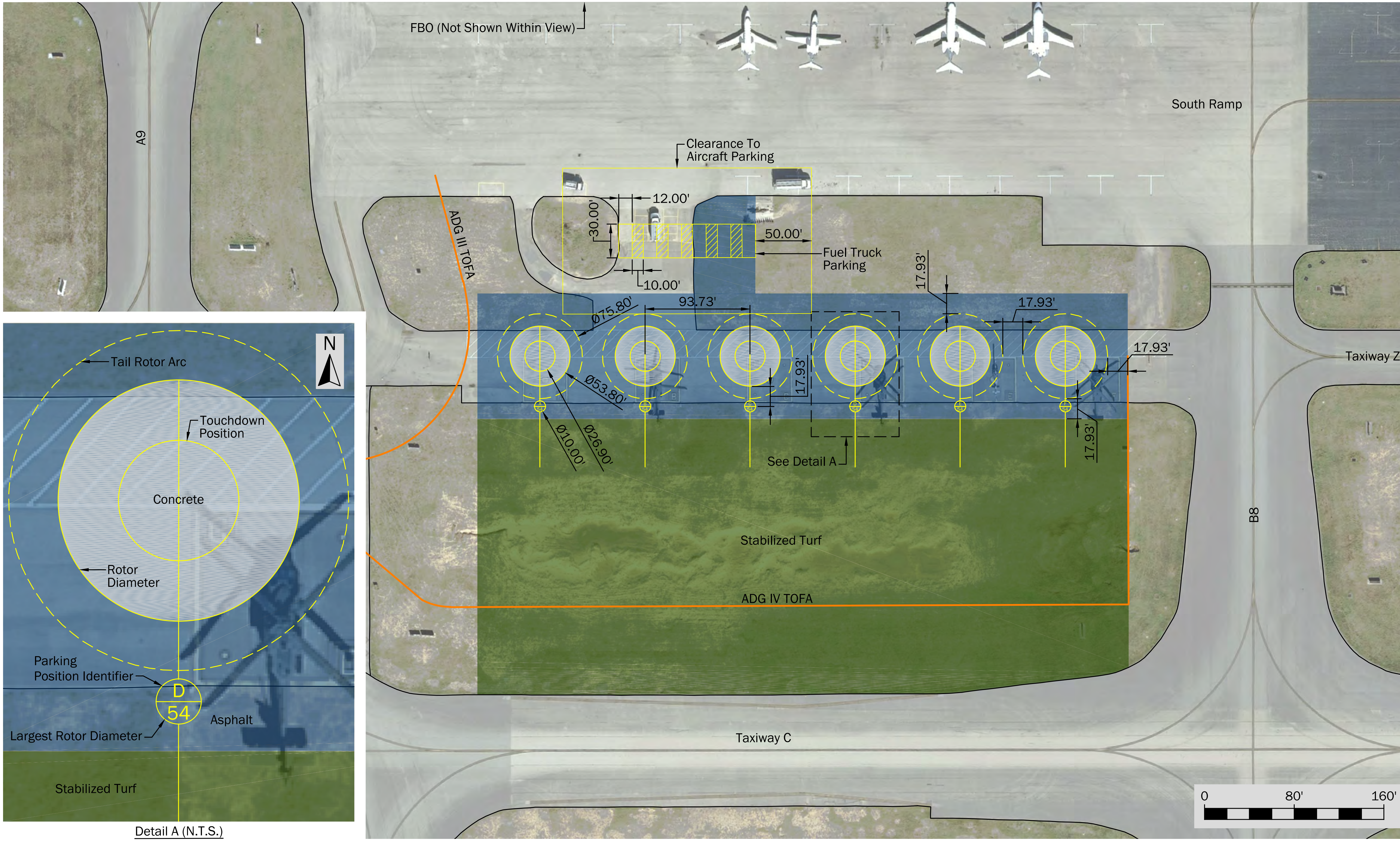


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Figure 4-9 Helicopter Parking Positions - Alternative 2

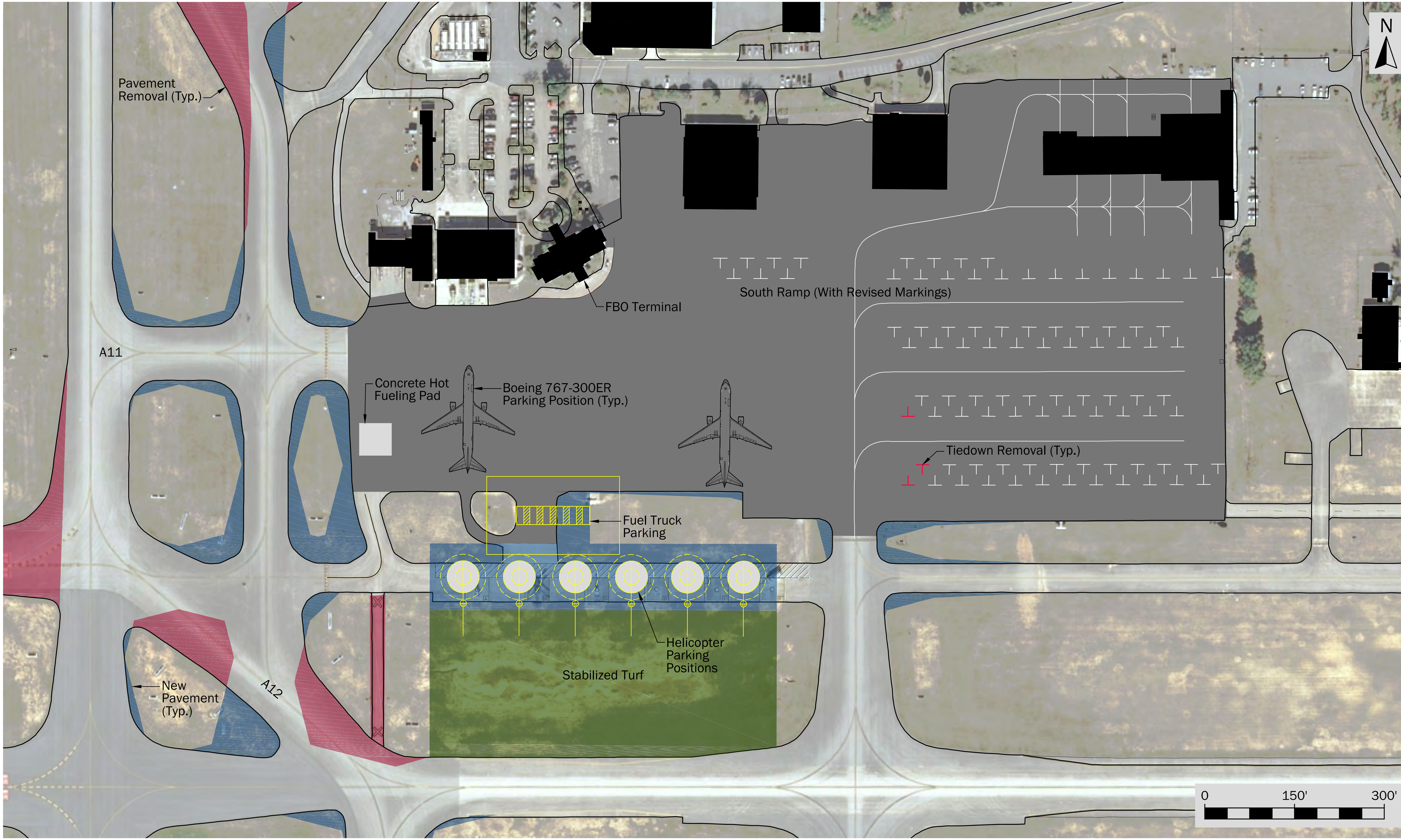

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Figure 4-10 South Ramp Alternative

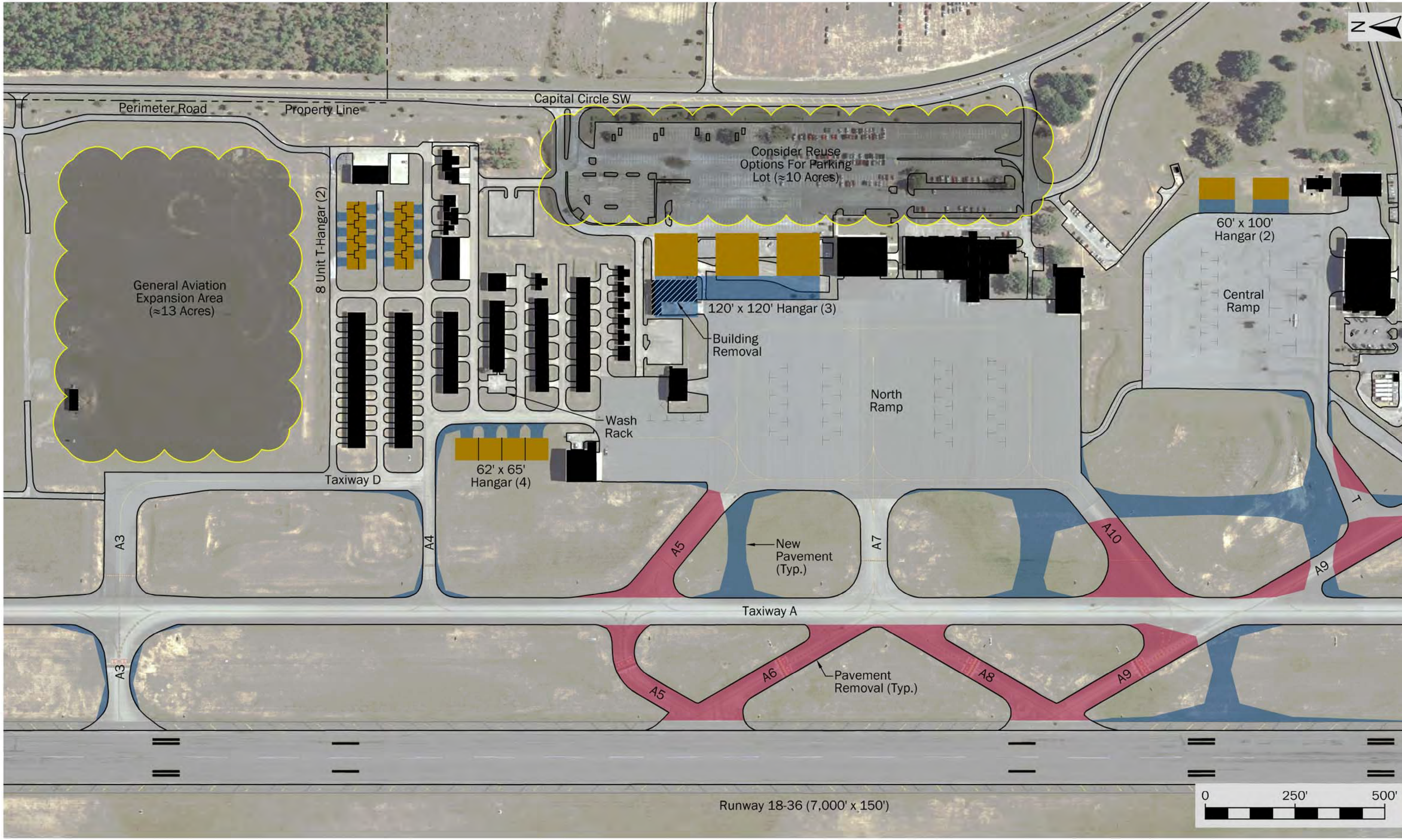

Figure 4-11 North General Aviation Areas Alternative

5.0 Alternatives Refinement

5.1 Review of Available Airport Development Areas

As previously discussed in Chapter 4, the vision for the on-going phased and balanced self-sustaining development of airport improvements will collectively serve to support the continued economic growth of the Florida Panhandle region and the City of Tallahassee. The primary and overriding intent of these recommended airport improvement projects is to leverage the airport's existing and proposed future aviation assets to facilitate the continued development of the airport and associated levels of commercial and general aviation services.

A total of nine on-airport land areas (referred to as parcels A through I) are located throughout the airport and each offers unique operational and facility development opportunities that are primarily based on their respective location, proximity to the airfield, and/or public adjacent roads. A brief description of each parcel and likely future land use considerations that guided the identification and selection of the preferred land use of each parcel is provided in the following subsections.

5.1.1 Parcel A

This parcel is approximately 62 acres in size and is situated east of the north end of Runway 18-36 and adjacent to and bordered by Capital Circle SW to the east. Through the development of one or more new taxiway connectors, this parcel could provide direct and unrestricted access to the airfield environment via Taxiway A.

Based upon its proximity to the runway environment and its contiguous size, the parcel would be best suited for aviation-related commercial development that would likely include, but would not be limited to:

- Aircraft Maintenance, Repair, and Overhaul (MRO),
- Air Cargo Freight and Logistics,
- Flight Training, and/or
- Manufacturing.

The extent of developable and leasable land was found to: 1) provide the necessary safety-related setbacks from Taxiway A to the west, 2) avoid environmental-sensitive wetland areas to the north, 3) preserve the capability to develop ADG IV apron area and apron-edge taxilanes, and 4) preserve the capability to develop general aviation areas immediately to the south to accommodate future infill of general aviation facilities as demand dictates along Taxiway A north of Taxiway Connector A4.

Vehicle access could be provided from Capital Circle SW or a future extension of the internal North Apron access road. The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond along and beyond the north end of Runway 18-36 as defined by Title 14: *Aeronautics and Space*, CFR part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*.

When this parcel is developed, the relocation of the Remote Transmitter/Receiver (RTR) facility will be required.

5.1.2 Parcel B

This parcel is approximately 27 acres in size and is situated north and east of Runway 9-27 and is bordered by Capital Circle SW to the northeast. Through the development of one or more new taxiway connectors, this parcel could provide direct and unrestricted access to the airfield environment via Taxiway B. Vehicle access could be provided from Capital Circle SW or Springhill Road.

Based upon its proximity to the runway environment and its contiguous size, the parcel would be best suited for aviation-related commercial development that would likely include, but would not be limited to:

- Commercial MRO,
- Air Cargo Freight and Logistics,
- Flight Training, and/or
- Manufacturing.

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond and along the east end of Runway 9-27 as defined by CFR part 77.

5.1.3 Parcel C

This parcel is approximately 56 acres in size and is situated outside of the Air Operations Area (AOA) north of Runway 9-27 and is bordered by Capital Circle SW and Springhill Road to the southwest and southeast respectively. Vehicle access could be provided from Capital Circle SW or Springhill Road. This parcel does not currently, nor will it in the future, provide access to the runway environment and will thus be limited to airport-compatible land uses that would likely include, but would not be limited to:

- Surface Freight Logistics,
- Light Industrial,
- Commercial Allied Aviation Services, and/or
- Manufacturing.

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond and along the east end of Runway 9-27 as defined by CFR part 77.

5.1.4 Parcel D

This parcel is approximately 161 acres in size and is situated east of and along the extended Runway 9-27 centerline, adjacent to and northeast of Capital Circle SW and adjacent to and southeast of Springhill Road. This parcel is bounded by Springhill Road to the northwest and Capital Circle SW to the southwest. Vehicle access could be provided from Capital Circle SW or Springhill Road. This parcel does not currently, nor will it in the future, provide access to the runway environment and will thus be limited to airport-compatible land uses that would likely include, but would not be limited to:

- Surface Freight Logistics,
- Light Industrial,
- Commercial Allied Aviation Services, and/or
- Manufacturing.

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond along and beyond the east end of Runway 9-27 as defined by CFR part 77.

5.1.5 Parcel E

This parcel is approximately 96 acres in size and is situated south of Runway 9-27 and south of and along the extended runway centerline of Runway 18-36 adjacent to the Airport Traffic Control Tower (ATCT). Vehicle access could be provided from Springhill Road. Through the development of one or more new taxiway connectors, this parcel could provide direct and unrestricted access to the airfield environment.

Based upon its proximity to the runway environment and its contiguous size, the parcel would be best suited for commercial airport-compatible land uses that would likely include, but would not be limited to:

- Commercial Aircraft Maintenance, Repair, and Overhaul (MRO),
- Air Cargo Freight and Logistics,
- Flight Training,
- Light Industrial, and/or
- Manufacturing.

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond along and beyond the South end of Runway 18-36 as defined by CFR part 77.

5.1.6 Parcels F and G

These two adjacent parcels, F and G, are 206 and 112 acres in size respectively. Both parcels are located west of Runways 18-36 and 9-27. Vehicle access could be provided by new road construction from Springhill Road. While neither parcel has direct taxiway/taxilane access to the runway environment, such connections to the airfield could be developed as demand dictates.

Based upon its proximity to the runway environment and its contiguous size, these parcels would best be suited for airport-compatible commercial or utility development that would likely include, but would not be limited to:

- Commercial Aircraft Maintenance, Repair, and Overhaul (MRO),
- Air Cargo Freight and Logistics,
- Flight Training,
- Light Industrial,
- Solar Power Generation, and/or
- Manufacturing.

Currently, the City is performing the required site development, environmental due diligence and required permitting actions to fully develop both parcels as *Solar Farm Number 2*, the second of two dedicated on-airport Solar Farms. The above ground height of temporary or permanent buildings and structures with each of the parcels would be limited by overlying protected navigable airspace surfaces established west of and parallel to Runway 18-36, and west of and along the extended runway centerline of Runway 9-27 as defined by CFR part 77.

5.1.7 Parcel H

This parcel is approximately 40 acres in size and is situated north of and parallel to Runway 9-27. The western-most extent of this parcel begins at the east and north edges of the current air cargo apron, extends to the east encompassing a capped and closed landfill and terminates at the southwest corner of Parcel B. The north, west, and east extent of the parcel is based on the need to provide sufficient setback distances from existing roadways and Taxiway B to protect future potential taxi operations by aircraft having ADG IV dimensional characteristics.

Vehicle access could be provided from Capital Circle SW and Air Cargo Road. Through the development of one or more new taxiway connectors, this parcel could provide direct and unrestricted access to the airfield environment via Taxiway B. Any development of Parcel H would need to give consideration for the unique demands of building over a capped landfill; however, the prime location adjacent to Taxiway B may make such efforts worthwhile.

Based upon its proximity to the runway environment and its contiguous size, the parcel would be best suited for aviation-related commercial development that would likely include, but would not be limited to:

- Commercial Aircraft Maintenance, Repair, and Overhaul (MRO),
- Air Cargo Freight and Logistics, and/or
- Intermodal Logistics Center (ILC).

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established along and parallel to the north side of Runway 9-27 as defined by CFR part 77.

5.1.8 Parcel I

This parcel is approximately 31 acres in size and is situated adjacent to and east of Capital Circle SW. Vehicle access could be provided via Capital Circle SW. The parcel is currently occupied by a Rental Car facility, but these will be vacated when the new Rental Car garage is built adjacent to the Airport Terminal. This parcel does not currently, nor will it have in the future, taxiway/taxilane access to the airfield environment.

Based upon its proximity to the runway environment and its contiguous size, the parcel would be best suited for non-aviation-related commercial retail development that would include but would not be limited to:

- Hotel
- Hospitality
- Restaurant
- Travel Plaza, and/or
- Other airport-compatible development.

The above ground height of temporary or permanent buildings and structures would be limited by overlying protected navigable airspace surfaces established along and east of Runway 18-36 as defined by CFR part 77.

5.2 Preferred Alternatives

Based on input received from the City, TLH management/staff, Technical Advisory Committee (TAC) members, and the public, airport facility development alternatives were recommended as part of this update of the Airport Master Plan. The process involved the examination and refinement of individual or combined facility development alternatives that were deemed to be ripe for implementation throughout the Master Plan's 20-year planning period. These preferred alternatives collectively serve to satisfy the City's airport development goals and to provide airport facility improvement concepts to accommodate future anticipated demand for airfield, air cargo, terminal, landside, and support facilities. The preferred alternatives will be utilized as the foundation for development of the Airport Layout Plan Drawing Set.

In addition, this section also includes a high-level discussion of potential airport improvement-generated environmental impacts, regulatory requirements, and mitigation measures.

A graphical overview of the nine on-airport land use parcels and the Airport Master Plan's recommended (i.e., "preferred") airport development alternatives are described in the following sections and are shown in **Figure 5-1.**

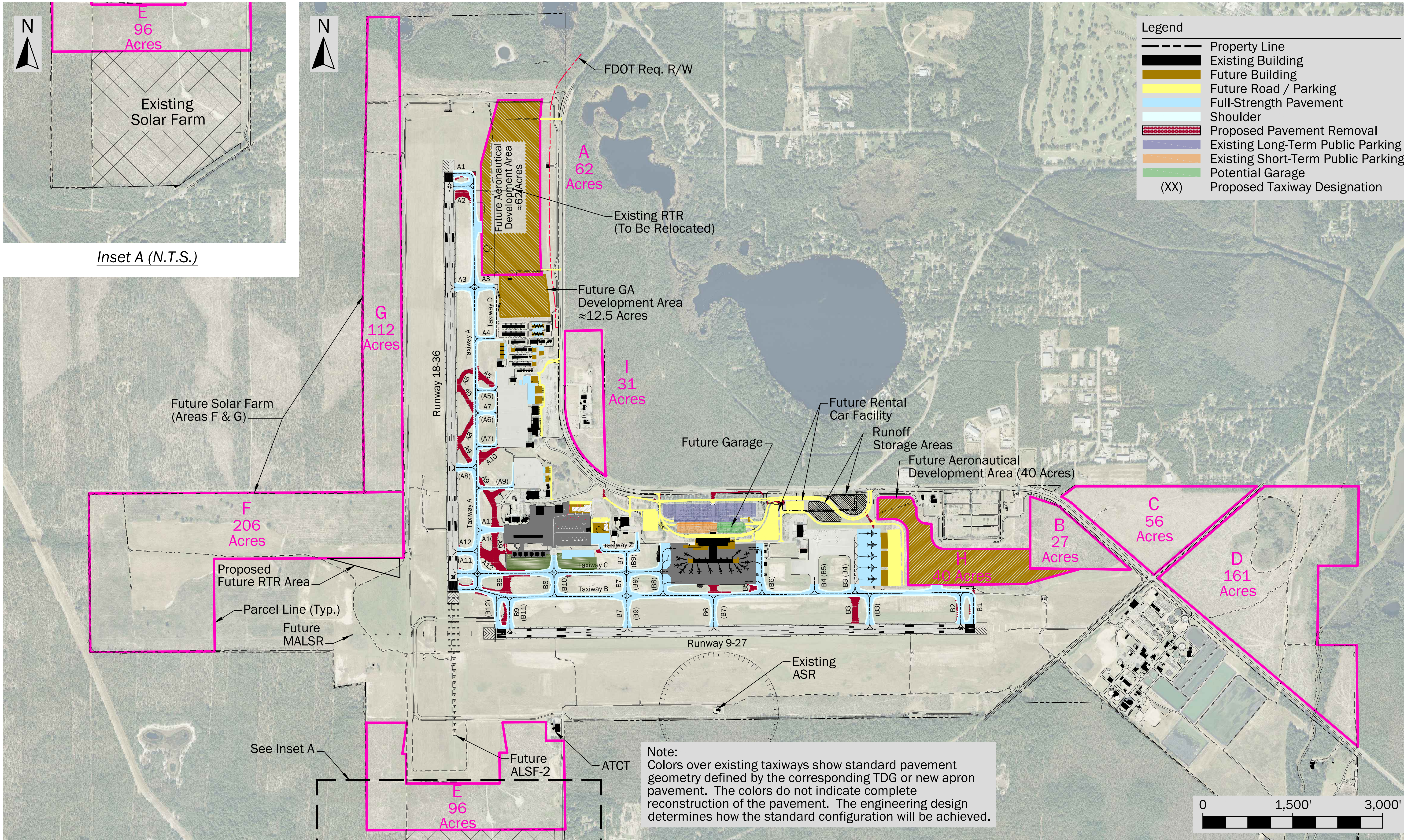

Figure 5-1 Preferred Development

5.3 Airport Access

During the development of preliminary airport access alternatives, the consultant team and airport staff met with representatives from the Florida Department of Transportation (FDOT) to discuss FDOT's proposed alignment associated with the widening of Capital Circle SW in the future. As part of the coordination process, it was determined that the FDOT design would provide several entry and exit points and that FDOT would need to purchase right-of-way from the airport. The two airport access alternatives discussed in the previous chapter improve the flow of vehicular traffic throughout the terminal area, facilitate the flow of traffic on-airport between the general aviation and cargo facilities, accommodate short-term, long-term, and employee parking needs, and support future rental car facility improvements. However, further discussion with airport staff indicated a strong desire to develop an on-airport access solution that improves connectivity between the general aviation, terminal and air cargo areas on airport property.

Currently, there are no signalized intersections serving the airport. The nearest signalized intersections are currently located at W. Orange Avenue to the west, and Springhill Road to the east. There is approximately 3.4 miles between the two existing signalized intersections. As part of the alternatives refinement process, airport staff requested that the consultant team further investigate the opportunity of developing a hybrid airport access alternative that establishes an on-airport access solution including a signalized main entrance at the intersection of Air Cargo Road and Capital Circle SW. In the future, there are plans to realign S. Lake Bradford Road with this intersection.

The proposed on-airport alignment is intended to provide improved accessibility, flexibility and mobility. The four-lane divided airport loop road would provide access to various aviation facilities and the terminal area on airport property. The preferred access alternative consolidates multiple access points to the airport. By reducing points of access, this refined alternative provides better access control and improves the safety of traffic entering and exiting the airport. It is recommended that the City petition FDOT to put infrastructure in place to easily add signals in the future.

New airport employee parking lot improvements are also included. This preferred development concept relocates the parking plaza exit to the east side of the parking lot. Vehicles would exit onto the airport road and exit the airport at the existing general aviation exit or the proposed main controlled exit. The relocation of the exit toll booth would also support future two-way access between existing general aviation and cargo facilities without having to pass in front of the terminal. This roadway also facilitates the flow of return traffic on the airport loop road.

Recommendations are designed to improve the short-term and long-term parking configuration and flow of traffic. In addition, this concept includes the construction of a two-level parking structure in front of the terminal that may provide a mix of additional short-term parking and rental car ready/return capacity on level 1 that is needed in the future. The structure would allow passengers to walk across from the terminal to the parking structure at the same floor level. To consolidate and streamline the cleaning and maintenance activities of the rental car companies on airport, a future rental car Quick-Turnaround (QTA) service facility is proposed in the area situated entirely along the east side of the airport loop road on a longer and wider parcel. The preferred configuration would improve the overall flow of cleaning and maintenance activities for multiple rental car companies.

This location will cut the distance required for running rental cars. Additional road improvements would also be necessary to support the flow of vehicles between the rental car QTA and the ready/return facilities and keep rental car activities from occurring in front of the terminal. This includes the relocation of the existing cell phone lot to a more efficient location on the west side of the airport loop road. The preferred Airport Access and Circulation alternative is shown in **Figure 5-2**.

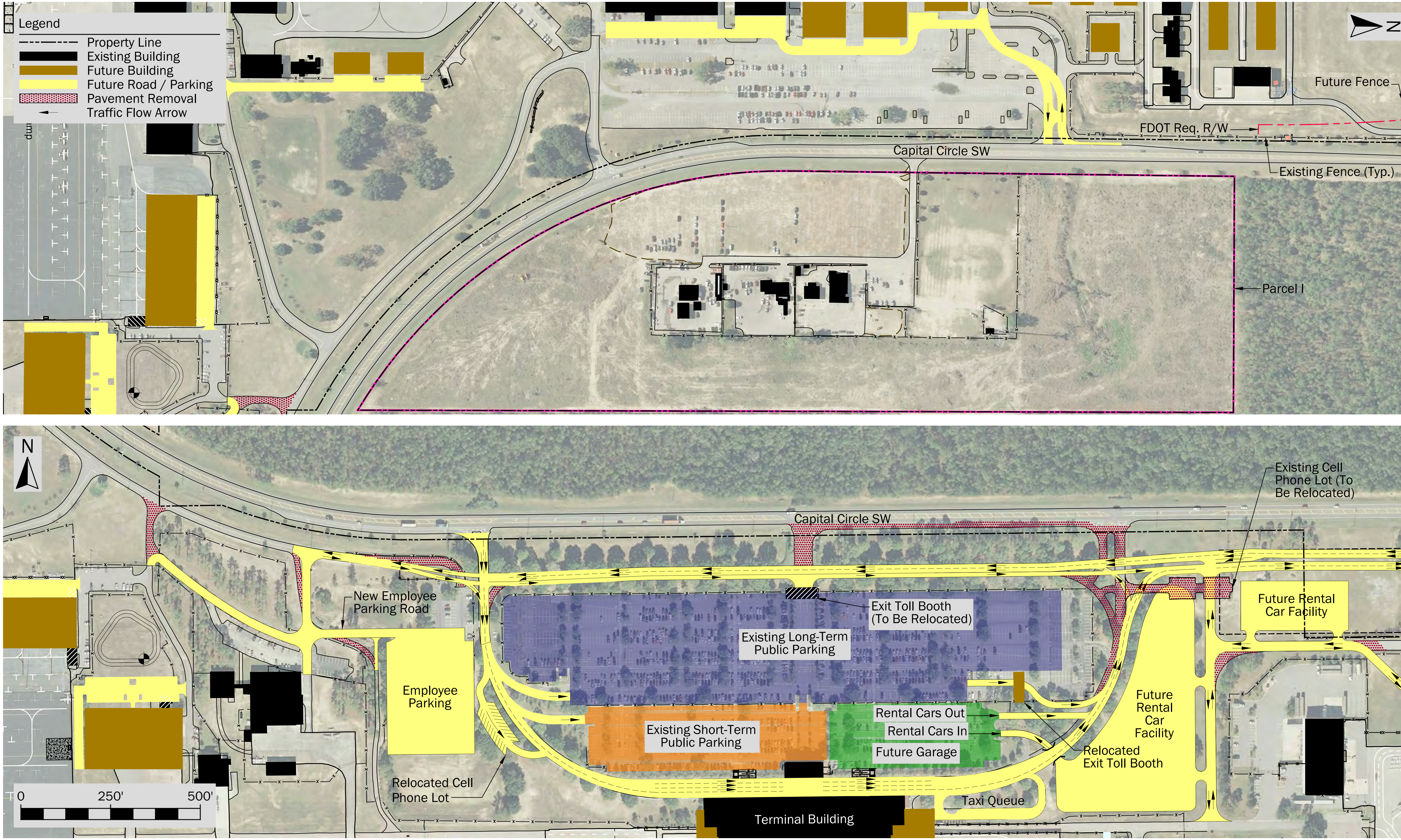

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Figure 5-2 Preferred Airport Access and Circulation Alternative

5.4 Taxiway Improvements

5.4.1 Current Taxiway System

The airport's current system of taxiways and taxiway connectors provide a safe and efficient network within which aircraft maneuver safely and efficiently throughout the airfield. Many of the current taxiways and taxiway connectors were constructed in the early 1960s and reflect previous (then current) FAA airport design standards. The geometric layout and design considerations for taxiways and taxiway connectors as recommended in this Airport Master Plan fully adhere to current FAA taxiway design standards and include, but are not limited to:

- Use of right-angled taxiway-to-runway connector intersections,
- Optimization of taxiway layouts and aircraft taxi paths to provide enhanced operational awareness for pilots entering and exiting the runway environment,
- Limiting the number of taxiways intersections while also reducing the possible choices for change of taxiway direction,
- Use of a "three-node concept" to provide pilots with no more than three choices at an intersection, ideally, left, right or straight ahead,
- Use of bypass taxiways at each runway end,
- Use of appropriate taxiway pavement widths,
- Use of Taxiway Design Group fillet design, and
- Use of FAA-mandated taxiway shoulder pavements.

Prior to the FAA's September 2012 update of Advisory Circular (AC) 150/5300-13, *Airport Design*, taxiway design standards were based on a FAA-prescribed Airplane Design Group (ADG) that referenced aircraft wingspans and/or tail heights, but not the dimension or location of an aircraft's undercarriage. The FAA's update of that same AC (150/5300-13A, Change 1) prescribes minimum taxiway pavement widths, centerline radii, and associated fillet geometries based upon a Taxiway Design Group (TDG) referencing an aircraft's undercarriage Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance, or an aircraft's wheel base when considering small aircraft. The TDG also includes the Taxiway Edge Safety Margin (TESM) establishing the minimum safe distance between the outer edge of the airplane's landing gear and the edge of the full-strength taxiway pavement while the aircraft's nose gear travels along the taxiway centerline.

Accordingly, the Airport Master Plan's recommendation regarding the modification or removal of existing taxiway pavements, or the planned construction of new taxiway connectors were based upon current FAA taxiway design planning standards that included, but were not limited to:

- Taxiway Design Groups (TDG) 2 and 4 based upon the respective MGWs and CMGs for the:
  - Boeing 757-200 Freighter having ADG C-IV operational and physical characteristics, and
  - Beechcraft King Air having ADG B-II operational and physical characteristics
- A maximum aircraft nose gear steering angle of 50 degrees,
- Pilot cockpit-over-centerline taxi path operations, and

- Avoidance of exit taxiway connectors located within the middle third of any runway where pilots would likely have the least control of maneuverability to avoid high energy collisions with other aircraft.

When reviewing the airport's current airfield taxiway layouts and geometric design, it was recognized that airfield taxiway geometries do not fully meet current FAA taxiway design standards for sustained use by ADG II or ADG IV aircraft. In most cases, the current taxiways or taxiway connectors were found to have layouts, centerline intersections, pavement widths, fillet tapers and centerline radii based on previous FAA taxiway design standards that have subsequently been updated and modified by the FAA for safety-enhancing purposes. For presenting recommended Airport Master Plan update, taxiway and taxiway connector improvements, current FAA-prescribed TDG 4 and TDG 2 taxiway design standards were used to fully accommodate the unrestricted and sustained taxi movement of general aviation ADG II aircraft and larger commercial ADG IV aircraft requiring minimum taxiway pavement widths of 35 feet and 50 feet and shoulder widths of 20 feet and 15 feet respectively.

It should be noted that current TDG 4 taxiway design standards required to support sustained taxi operations by the Boeing 757-200 require narrower taxiway pavement widths, different fillet geometries and centerline radii. While previous FAA taxiway design standards prescribed a minimum taxiway pavement width of 75 feet for that aircraft, current taxiway design standards require a minimum taxiway width of 50 feet. The airport's current taxiways and associated taxiway connectors that accommodate ADG IV aircraft taxi movements do not have edge shoulders that serve to provide resistance to blast erosion and to accommodate the passage of emergency and maintenance equipment and the occasional passage of aircraft when veering from the runway. The FAA currently mandates paved shoulders for taxiways accommodating aircraft having ADG IV and higher wingspans. Taxiway edge shoulders are recommended but are not required for taxiways accommodating sustained taxi operations by aircraft having ADG III or lower design characteristics.

While existing taxiway and/or taxiway connector pavement designs are, in some cases, wider than required to support TDG 2 and 4 taxiway design standards, the development of taxiway edge shoulders could conceivably include portions of taxiways and taxiway connectors that offer pavement widths greater than 35 or 50 feet. The use of these wider-than-needed taxiway pavements for use as designated taxiway edge shoulders, or with the addition of any additional new taxiway edge pavements will, where applicable and prudent, require the new pavement marking and the inward relocation of taxiway edge lights and signs.

Where "legacy-designed" taxiway layouts and/or associated intersections were found or considered to be redundant or did not fully satisfying current FAA taxiway design standards, certain taxiway connectors were recommended for removal (partially, or in their entirety). When appropriate, the construction of new taxiway exits and/or taxiway connectors was recommended as a measure to reduce the number of possible aircraft pilot choices for change of taxiway direction. These recommended taxiway intersection improvements serve to enhance the safe and efficient taxiing by aircraft. Careful consideration was also given, to the extent practicable, to minimizing the removal of, or addition of new airfield pavement.

Where the intersection of one or more taxiways was considered to represent a "complex intersection" offering more than three possible taxiway paths, the removal or realignment of intersecting taxiways was recommended. Where considered practicable, the use of the three-node concept was recommended to reduce, preclude or eliminate the potential for pilot confusion.

Also, where appropriate or needed, the addition of new or the modification of existing bypass taxiways were recommended having the minimum ADG IV standard taxiway-to-taxiway centerline separation distance to enhance pilot and aircraft operational safety and efficiency when entering the end of the runway for take-off operations. Right-angle taxiways are the recommended standard for all runway/taxiway intersections.

5.4.2 Preferred Development of Taxiway System Improvements

The following describes the planned modification, removal of existing taxiways and the planned future construction of new taxiway connectors to fully satisfy current FAA TDG 4 and TDG 2 taxiway design standards. It is anticipated that taxiway connector improvement or construction projects located between parallel Taxiway A and Runway 18-36 will likely occur at such time the runway is rehabilitated and reconstructed. Taxiway connectors east of parallel Taxiway A would be undertaken as general aviation facilities are development and related taxiway/taxilane improvements needed to support the continued growth or in-fill development of general aviation facilities in the North and Central General Aviation Apron areas. Likewise, recommended improvements to exit and connector taxiways serving Runway 9-27 would likely occur when improvements are made to either the Cargo Apron and/or Passenger Terminal Apron.

The recommended modifications of the layout, design and/or the addition or removal of taxiway connectors were based on the goal of fully satisfying FAA taxiway design standards and to enhance the safe and efficient operation of aircraft while operating within and throughout the entire system of runways and taxiways. In keeping with current FAA guidance prescribed in FAA AC 150/5340-18F, *Standards for Airport Sign Systems*, the re-designation of certain exit or connector taxiways is recommended at such time that removal of older, or construction of new exit or connector taxiways occurs.

Figure 5-3 graphically illustrates the application of recommended ADG II and ADG IV taxiway, taxiway connector, and taxiway shoulder pavements as superimposed over the airport's current system of taxiway pavements. This illustration serves to demonstrate the required width and geometry of each respective FAA--prescribed taxiway pavement design. The application and development of TDG 2 taxiway shoulders could be accomplished using existing outer-most portions of legacy-designed full-strength taxiway widths, and/or the use of stabilized soils and turf. Descriptions and explanation of these preferred taxiway system improvements are listed in **Table 5-1.**

The future application and full adherence to the TDG taxiway and taxiway connector design standards will require coordination with the FAA regarding the need and timing for these types of Airport Master Plan-recommended improvements. Accordingly, the prioritization, and execution of the recommended modification of the current taxiway system discussed in the following sections will be primarily based on pavement condition, pavement rehabilitation and/or reconstruction projects, FAA concurrence and availability of funding for such construction activities. As part of the modernization and related enhancement of airfield taxiways and taxiway connector pavement, (including the addition of taxiway edge shoulders to accommodate operations by ADG IV aircraft), an additional 9 acres of pavement will be constructed and 15 acres of pavement will be removed resulting in a net reduction of 6 acres of taxiway pavement.

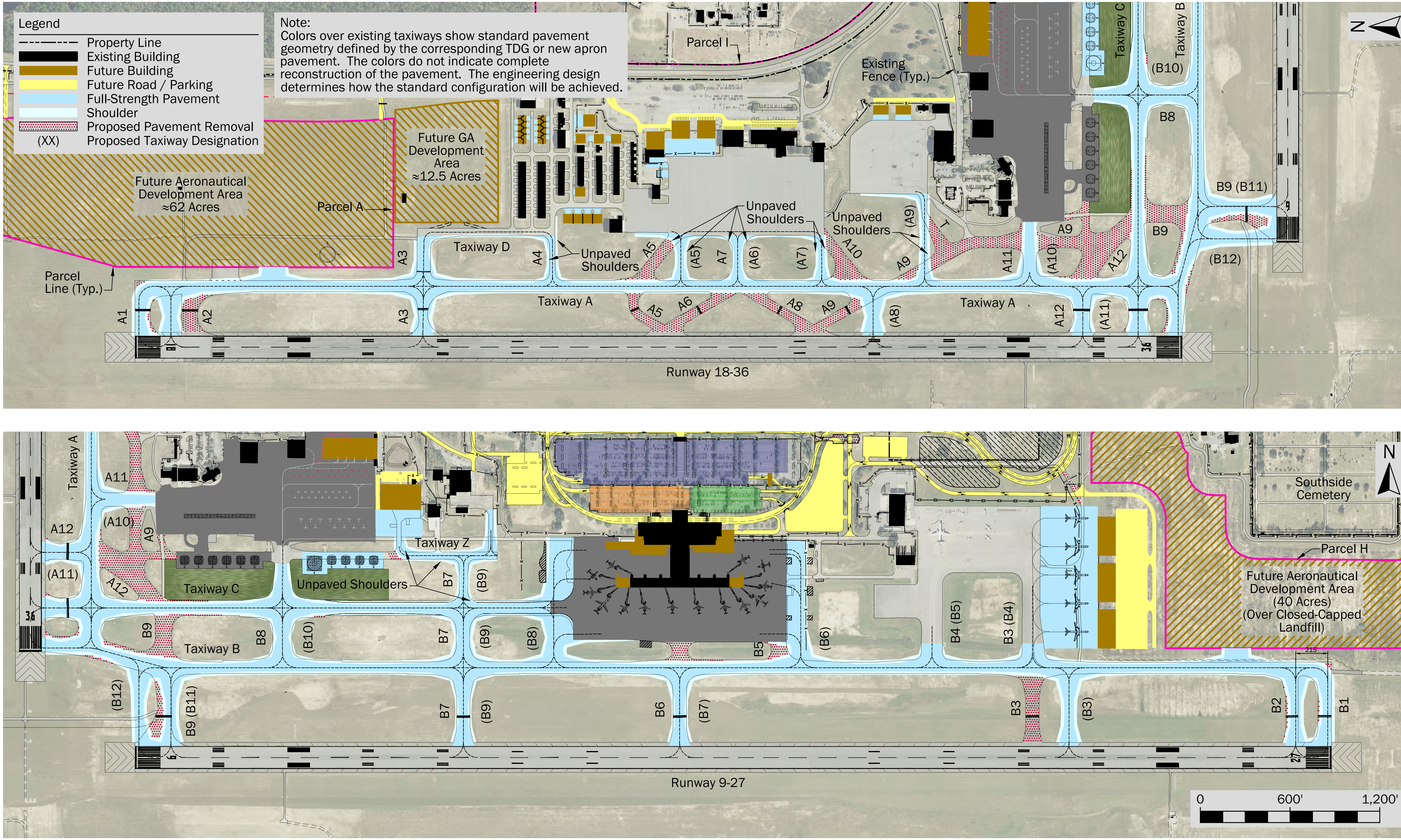


Figure 5-3 Preferred Taxiway System Alternative

Table 5-1 Summary of Preferred Taxiway Improvements													
Current Taxiway Designation	Proposed Future Taxiway Designation	Taxiway Type	Critical Aircraft Airplane Design Group (ADG)	Required Taxiway Design Group (TDG)	Required Taxiway Edge Safety Margin (TESM)	Required Full-Strength Pavement Width	Required Shoulder Width (X2)	Total Required Pavement Width	Existing Pavement Width	Required Additional Shoulder Pavement	Shoulder Marking of Excess Pavement	Explanatory Notes	Reason for Needed Actions
A	A	Full-length Parallel	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A1	A1	Entrance/Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A2	A2	Bypass/Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A3 West	A3	Exit 90°	IV	4	10'	50'	20'	90'	60'	30'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A3 East	A3	Connector 90°	IV	4	10'	50'	20'	90'	90'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A4	A4	Connector 90°	II	2	7.5'	35'	15'	65'	50'	15'	Yes	Note 2	Shoulders Needed to Satisfy Design Standards
A5 West	Remove	Exit 30° Angled	IV	4	10'	50'	N/A	N/A	60'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Angled Taxiway Exit / Middle Third of Runway
A5 East	Remove	Connector 30° Angled	IV	4	10'	50'	N/A	N/A	75'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Angled Taxiway Exit / Middle Third of Runway
N/A	New A5	Connector 90°	II	2	7.5'	35'	15'	65'	N/A	N/A	N/A	Construct When Removing A5, Note 2	Replacement for A5
A6	Remove	Exit 30° Angled	IV	4	10'	50'	N/A	N/A	60'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Angled Taxiway Exit / Middle Third of Runway
A7	A6	Connector	II	2	7.5'	35'	15'	65'	75'	15'	Yes	Note 2	Shoulders Needed to Satisfy Design Standards
A8	Remove	Exit 30° Angled	IV	4	10'	50'	N/A	N/A	60'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Angled Taxiway Exit / Middle Third of Runway
N/A	New A8	Exit 90°	IV	4	10'	50'	20'	90'	N/A	N/A	N/A	Construct When Removing Angled A9	Replacement For A(x) Series of Exit/Connector Taxiways
A9 West	Remove	Exit (30° Angled)	IV	4	10'	50'	N/A	N/A	60'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Angled Taxiway Exit / Middle Third of Runway
A9 East	Remove	Connector 30° Angled / Partial Parallel	IV	4	10'	50'	N/A	N/A	60'	N/A	N/A	Remove When Rehabilitating Runway 18-36	Redundant / Angled Taxiway Connector
N/A	New A9	Connector 90°	II	2	7.5'	35'	15'	65'	N/A	N/A	N/A	Construct When Removing Angled A9, Note 2	Replacement For A(x) Series of Exit/Connector Taxiways
A10	Remove	Connector 30° Angled	IV	4	10'	50'	N/A	N/A	75'	N/A	N/A	Remove When Removing A9	Redundant / Angled Taxiway Connector
N/A	New A7	Connector 90°	II	2	7.5'	35'	15'	0	N/A	N/A	N/A	Construct When Removing Angled A10	Replacement For A(x) Series of Exit/Connector Taxiways
A11	A10	Connector 90°	IV	4	10'	50'	20'	90'	90'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A12 West	A11	Exit 90°	IV	4	10'	50'	20'	90'	90'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
A12 East	Remove	Connector 30° Angled	IV	4	10'	50'	N/A	N/A	90'	N/A	N/A	Remove When Removing A9	Redundant Angled Connector
B	B	Full-length Parallel	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B	B	Exit 90° (RWY 18-36)	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B1	B1	Entrance/Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B2	B2	Bypass/Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B3 South	B4	Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards

Table 5-1 Summary of Preferred Taxiway Improvements													
Current Taxiway Designation	Proposed Future Taxiway Designation	Taxiway Type	Critical Aircraft Airplane Design Group (ADG)	Required Taxiway Design Group (TDG)	Required Taxiway Edge Safety Margin (TESM)	Required Full-Strength Pavement Width	Required Shoulder Width (X2)	Total Required Pavement Width	Existing Pavement Width	Required Additional Shoulder Pavement	Shoulder Marking of Excess Pavement	Explanatory Notes	Reason for Needed Actions
B3 North	Remove	Connector 90°	IV	4	10'	50'	N/A	N/A	N/A	N/A	N/A	Remove When Expanding Air Cargo Apron	Direct Connection Between the Air Cargo Apron and Runway 9-27
N/A	New B3	Exit 90°	IV	4	10'	50'	20'	90'	N/A	N/A	N/A	Construct When Removing B3 South	Replacement for B3 South
B4	B5	Connector 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B5	B6	Connector 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B6 South	Remove	Connector 90°	IV	4	10'	50'	N/A	90'	105'	N/A	N/A	Remove When Constructing New B8	Direct Connection Between the Terminal Apron and Runway 9-27
B6 North	B7	Exit 90°	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
N/A	New B8	Connector 90°	IV	4	10'	50'	20'	90'	N/A	N/A	N/A	Construct When Removing B6 North	Replacement for B6 North
B7 South	B9 South	Exit 90°	IV	4	10'	50'	20'	90'	90'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B7 Mid	B9 Mid	Connector 90°	IV	4	10'	50'	20'	90'	90'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B7 North	B9 North	Connector 90°	II	2	10'	35'	15'	65'	75'	0'	Yes	Note 2	Shoulders Needed to Satisfy Design Standards
B8 South	B10	Connector 90°	IV	4	10'	50'	20'	90'	125'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
B8 North	B10	Connector 90°	IV	4	10'	50'	20'	90'	100'	0'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
N/A	New B11	Bypass/Exit 90°	IV	4	10'	50'	20'	90'	N/A	N/A	N/A	Construct When Removing B9 North and South	Replacement for B9 North and South
B9 South	Remove	Entrance/Exit 90°	IV	4	10'	50'	N/A	N/A	90'	N/A	N/A	Remove When Reconstructing B9 (Future B11 and B12)	Not Located at End of Runway
B9 North	Remove	Connector 90°	IV	4	10'	50'	N/A	N/A	90'	N/A	N/A	Remove When Reconstructing B9 (Future B11 and B12)	Not Located at End of Runway
C	C	Partial Parallel	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
C	C	Exit 90° (RWY 18-36)	IV	4	10'	50'	20'	90'	75'	15'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
D	D	Partial Parallel	II	2	7.5'	35'	15'	65'	60'	30'	Yes	Note 1	Shoulders Needed to Satisfy Design Standards
T	Remove	Connector 30° Angled	II	2	7.5'	35'	15'	N/A	75'	N/A	N/A	Remove When Removing A9	Angled Connector
Z	Partial Removal	Partial Parallel	II	2	7.5'	35'	15'	65'	50'	15'	N/A	Remove When Removing A9, Note 3	Remove West Portion for Helipads

Source: Michael Baker International, Inc., 2018
Notes:
Note 1: Add Shoulder Pavement/Mark/ Relocate Edge Lights
Note 2: Add Stabilized Turf Shoulders
Note 3: Add Stabilized Turf Shoulders (Remaining TDG 2 Partial Length Parallel Taxiway)

5.5 Air Cargo Facility Expansion and Redevelopment of Closed Landfill (Parcel H)

The preferred expansion of the air cargo facilities includes the eastward expansion of the current air cargo apron (approximately 363,348 SF, or 8.3 acres), development of three additional air cargo handling/processing facilities (approximately 30,200 SF, or 2.2 acres) along the east side of the expanded apron and associated private vehicle/truck parking and access (approximately 268,150 SF, or 6.2 acres). The cargo apron expansion would accommodate a variety of large and mid-sized aircraft potentially having up to ADG IV wingspans. The removal and eastward relocation of exit taxiway connector B3 is also recommended to satisfy current FAA airport design standards and to eliminate the existing direct connection between the air cargo apron and Runway 9-27.

The 43-acre area adjacent to and east of the expanded air cargo apron is reserved for the future development of aviation-related commercial development and facilities that could possibly include, but would not be limited to Maintenance, Repair, and Overhaul Facilities

The western-most extent of this parcel begins at the east and north edges of the current air cargo apron, extends to the east encompassing a closed and capped landfill and terminates at the southwest corner of Parcel B. The north and west, and east extent of the parcel is based on the need to provide a sufficient setback distances from existing roadways and Taxiway B to protect potential future potential airplane taxi operations and parking by airplanes having ADG IV dimensional characteristics, (e.g., Boeing 757F Freighter/Cargo Jet having a 44.5-foot tail height). The east extent of the parcel terminates at the west and south edges of Parcel B based on proximity to Runway 9-27 and parcel Taxiway B.

Aircraft access to this parcel would be via Taxiway B and taxiway connectors as needed. The likely western- and southern-most extent of this parcel will be based upon the need to preserve and protect future ADG IV apron-edge taxi operations along the east side of the expanded air cargo apron as well as similar ADG IV aircraft taxi movements along Taxiway B. Vehicle access to this parcel would be via Capital Circle SW and Air Cargo Road.

The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established beyond along and beyond the north end of the runway as defined by Title 14: Aeronautics and Space, CFR part 77 and Runway 9 TERPS Departure Surface.

The location and preferred extent of Parcel H is shown in **Figure 5-4.**

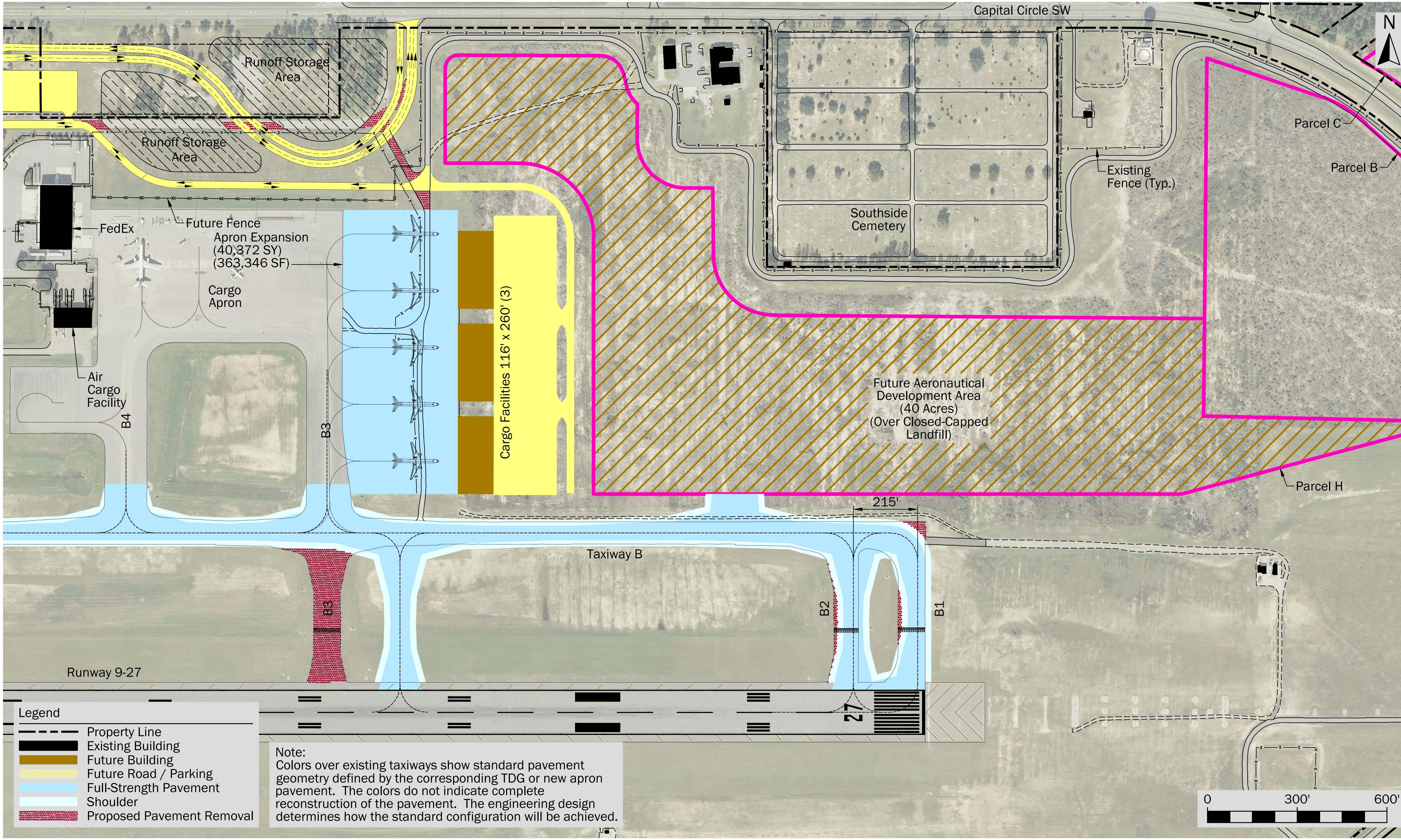


Figure 5-4 Preferred Air Cargo Expansion / Aeronautical Development Area (Parcel H)

5.6 Passenger Terminal Facilities

Currently, the City and airport management are undertaking a phased Passenger Terminal Modernization Program that includes multiple improvements to address short- and long-term passenger demands and meet modern spacing requirements. The Terminal Modernization Project is designed to enhance the customer experience for travelers by providing convenience and efficiency. The project has included reconfiguring TLH's lobby up to the Transportation Safety Administration (TSA) checkpoint, a new baggage claim system, ticket counters for airlines and rental car agencies, safety screening machines, a new TSA screening room, and other aesthetic upgrades.

The airport is currently moving forward with its plans to design and construct International Passenger Processing Facility (IPPF) and Customs and Border Protection (CBP) facilities in support of its international airport status. The IPPF and CBP facilities will likely be constructed within the Central Concourse at ground level below Gates A1 and B1 with an alternate entry point for domestic and international flights. The IPPF will be designed to accommodate up to 200 peak hour passengers, but could be expanded later to serve higher demand.

In addition to the terminal modernization project, the previous 2006 Master Plan's terminal planning efforts for TLH document and recommend the expansion of the existing ticketing and bag claim functions to the west and east in their respective directions. Additional area is also added to the south to gain critical depth in these spaces. The future expansion of the secure passenger holding concourse to the east and west would provide the ability to park all aircraft along the airside of the concourse.

The proposed expansion of the secure concourse will require the widening of the terminal apron to the east and the west necessitating the relocation and reconstruction of Taxiway Connector B5 to align with the new east apron-edge taxilane, the construction of a new additional a taxiway connector (future B8) be constructed to align with new west side apron-edge taxilane, and the removal of taxiway connector B6 (approximately 18,558 SF, or 0.43 acres) to eliminate the direct and unrestricted access between the terminal apron and Taxiway B and Runway 9-27. The construction of new expanded terminal apron and taxiway connectors will represent approximately 230,760 SF or 5.3 acres of new pavement.

The preferred Passenger Terminal Area Development alternative is shown in **Figure 5-5.**

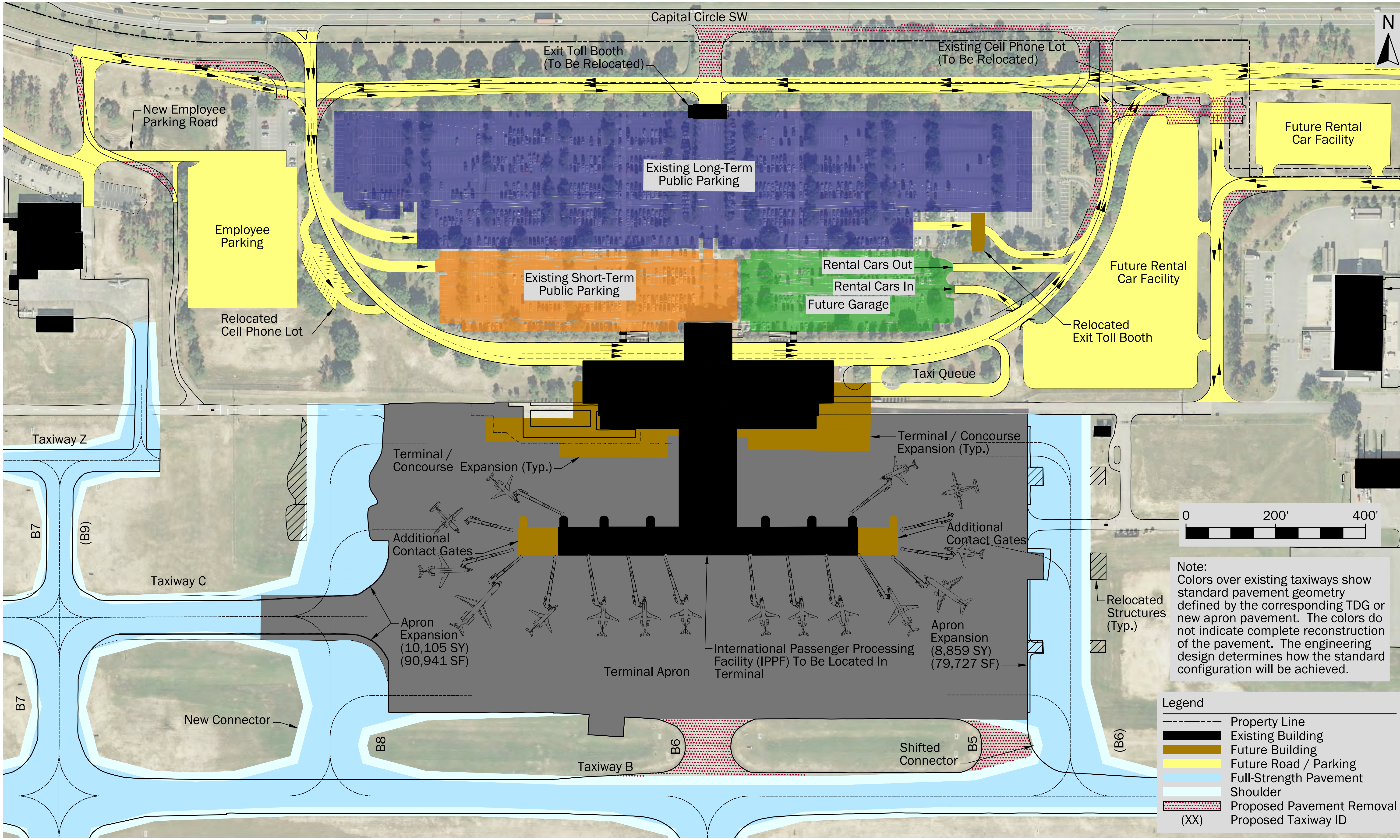


Fig 5-5 Preferred Terminal Alternative

5.7 North Aeronautical Development Area

The cleared, graded and maintained land area situated within the northern-most portion of the airport east of Runway 18-36, and adjacent to and bordered by Capital Circle SW (previously described in Chapter 4 as Parcel A) offers direct and unrestricted access to the airfield environment via Taxiway A. As part of this Airport Master Plan's goal to achieve the highest and best aviation-related commercial use of this parcel, the preferred alternative is to preserve this area for future Aircraft Maintenance, Repair, and Overhaul (MRO), Air Cargo Freight and Logistics, Flight Training, or Manufacturing.

The preferred north aeronautical development area is shown in **Figure 5-6**.

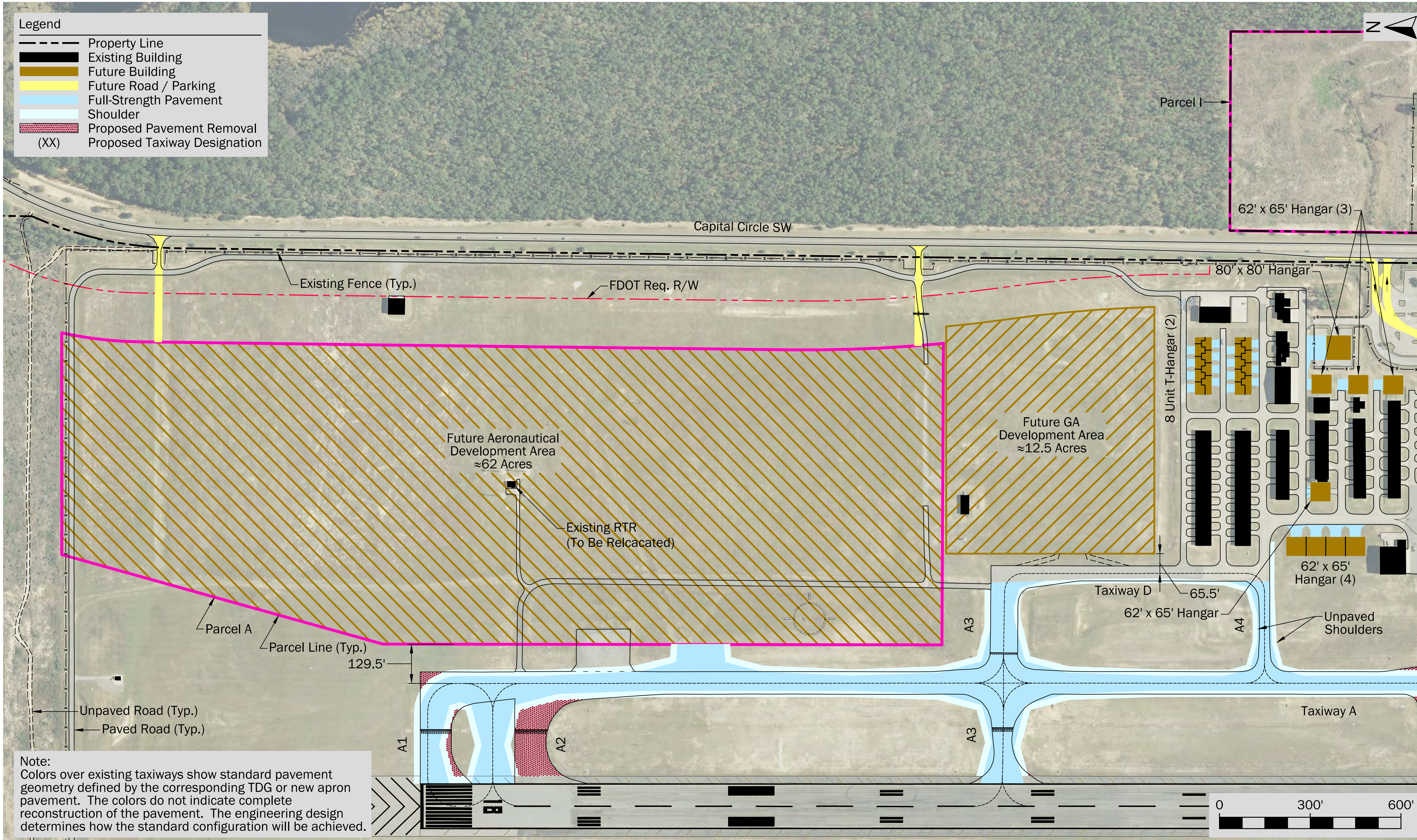


Figure 5-6 Preferred North Aeronautical Development Area Alternative

5.8 Future General Aviation Development Area

The cleared, graded and maintained land area (approximately 12.5 acres) situated adjacent to and north of the North Apron and east of Runway 18-36 offers direct and unrestricted access to the airfield environment via Taxiway A. As part of this Airport Master Plan's goal to achieve the highest and best aviation-related use of this area, it is recommended that this area be preserved for the continued future demand-driven phased in-fill development of general aviation facilities that will most likely include, but would not be limited to T-hangars, box hangars and aircraft parking aprons.

The western-most limit of leasable land within which to develop a new general aviation apron and facilities would begin at the eastern-most limit of the Taxiway A Object Free Area (TOFA). The above ground height of temporary or permanent buildings and structures and allowable aircraft tail height locations would be limited by overlying protected navigable airspace surfaces established along and beyond the north end of the runway as defined by CFR part 77.

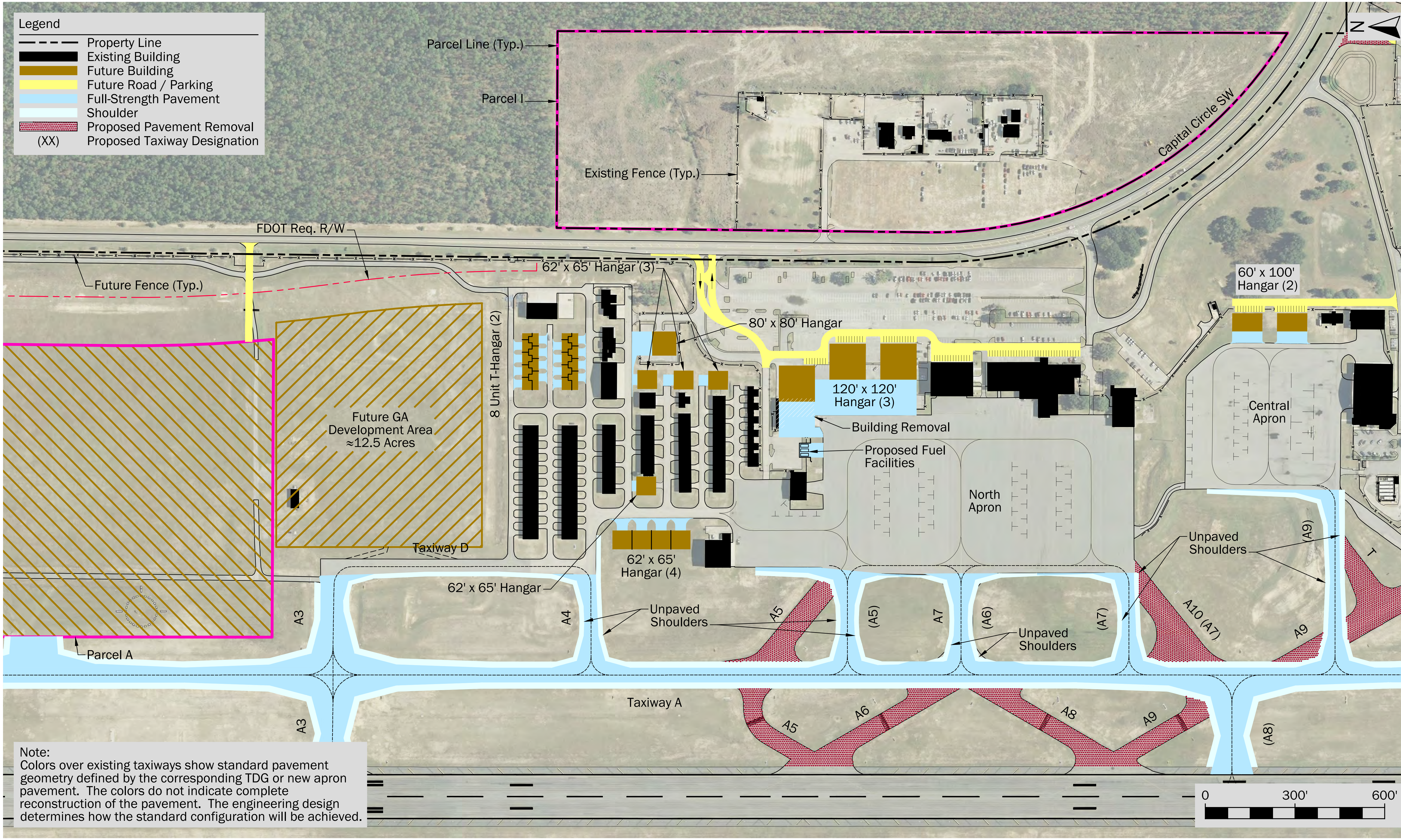
5.9 North and Central Aprons

The recommended preferred future development of the North Apron includes the continued in-fill development of hangar facilities that are envisioned to include, but would not be limited to: 16 T-hangars, eight 60' X 60' box hangars, three 120' X 120' box hangars, one 80' X 80' box hangar and a multi-tank/multi-product above ground fuel facility and apron area for airport fueler and aircraft pilot self-serve fueling operations. Improvements to the current apron area access roadway will be required to accommodate fuel tanker access and movement. Taxiway improvements are recommended to accommodate TDG 2 aircraft movement and eliminate confusing taxiway geometry (Taxiways A5 and A10).

The Central Apron is located between the North and South Aprons. The preferred future development of the Central Apron includes the development of two additional 100' X 60' multi-tenant box-type hangars, vehicular access and parking improvements, and the construction of a new taxiway connector (future A9).

Collectively, the total area of new impervious pavement of surfaces for both the North and Central Aprons is approximately 10 acres.

The preferred future development of the Central Apron alternative is shown in **Figure 5-7**.



Y:\Planning\TLH - Tallahassee Regional Airport\4_TLH Master Plan Update (Nov 2015)\Drawings\Report Figures\Fig 5-7_Preferred North and Central Ramp Development Alternative.dwg October 03 2018-16:27

5.10 South Apron Area

The preferred and recent development of the South Apron included the remarking of the apron area tie-down area, TDG 4 fillet geometry design improvements for taxiway connectors A11 and B8, construction of concrete hardstands to accommodate the access and parking demand needs of larger itinerant commercial charter aircraft (e.g., 767-300ER), and the redevelopment of existing and creation of additional helicopter parking positions to the east and west of taxiway connector B8 along what is now the western-most portion of Taxiway Z. The designation and preservation of an airport service road to facilitate the movement of airport and emergency vehicles through the area is also recommended.

Other preferred improvements to the east side of the South Apron include the potential future development of two separate multi-tenant bulk hangar facilities for civilian and/or State Aviation Agency use. The potential development of one hangar could occur at what is now the site of the William D. Martin Hangar facility formerly occupied and used by the Florida Bureau of Aircraft. Based on available South Apron area, ADG II taxilane requirements and adjacencies, a single 50,400 SF rectangular bulk-type hangar (approximately 140' X 360') with adjacent automobile access and parking could be developed.

Another similar type bulk-hangar hangar facility could be developed within the area directly east and adjacent to the North Apron area that was formerly occupied and used by the Florida Forest Service for storage of aviation aircraft and assets. Based on available developable space, existing taxiway connector, roadway and adjacencies, a single 45,900 SF rectangular bulk-type hangar (approximately 170' X 270') with adjacent automobile access and parking could be developed to replace the existing 27-year old 10,000 SF hangar. Approximately 56,700 SF, or 1.3 acres of adjacent apron area to tie in to the existing taxilane connecting to Taxiway Z is available for future development.

Collectively all preferred facility and pavement development would generate and encompass approximately 409,464 SF, or 9.4 additional acres of impervious areas or surfaces.

The preferred future development of the South Apron is shown in **Figure 5-8**.

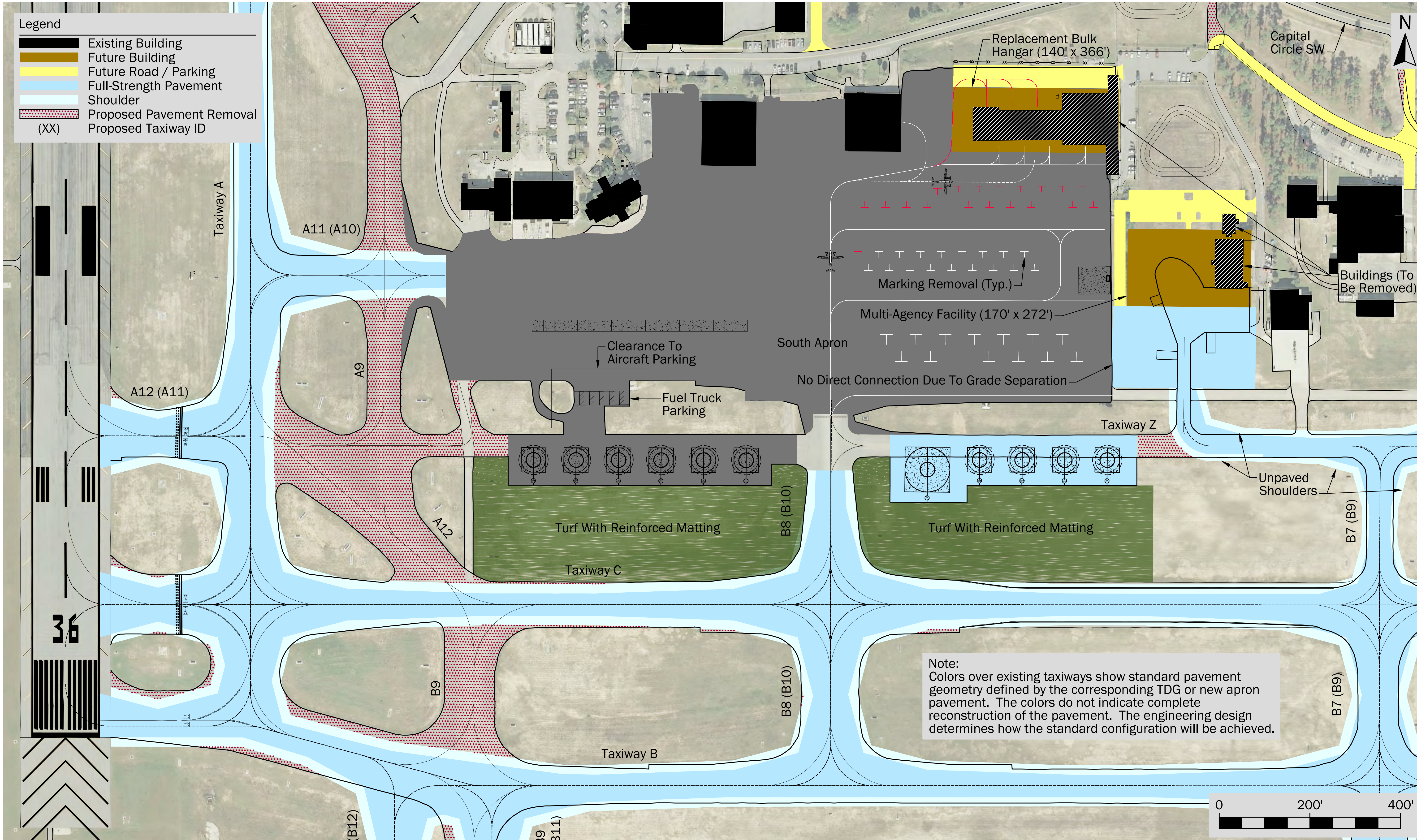


Figure 5-8 Preferred South Ramp Development Alternative

5.11 Support Facilities

5.11.1 Remote Transmitter/Receiver

As noted in the land use discussion of Chapter 4, the relocation of the Remote Transmitter/Receiver facility (RTR) will be required to support future aeronautical development north of the existing general aviation facilities (i.e., within Parcel A). During the 2006 Master Plan, the RTR was proposed approximately 785 feet west of Runway 36. However, this area (Parcel F) was determined to have a higher and better use as part of this Airport Master Plan update.

It will be the sole responsibility of the FAA to site, relocate and commission the RTR facility. It is envisioned that the relocation of this facility will:

- occur on airport property,
- would have a maximum Above Ground Level (AGL) height of no more than 55 feet,
- be below overlying CFR part 77 Civil Airport Imaginary surfaces, TERPS Approach and Departure surfaces,
- provide unobscured line of sight between the ATCT and Runways 9-27 and 18-36, and
- be outside of dimensional limits of the Approach and Departure Runway Protection Zones serving Runways 36 and 18 respectively.

Based upon the five siting assumptions, a triangular-shaped 4.5-acre area of land having an east/west orientation located 885 feet west of the Runway 18-36 centerline was identified as being suitable for the in-kind replacement of the four Remote Communication Facility antennas, their support towers and ancillary stand-alone buildings. The area would be immediately south of and adjacent to the proposed future development of Solar Farm 2.

5.11.2 Upgrade of Precision Instrument Approach Capability Serving Runway 36

In 2016, the FAA requested the City's response regarding its interest to participate in the FAA's *Enhanced Low Visibility Operations (ELVO)* program. The ELVO program was developed to safely achieve the lowest possible weather minimums for all operators in the National Airspace System by leveraging new and existing aircraft technologies combined with any necessary improvements to the existing ground structure. In response to the FAA's inquiry, the City submitted a Letter of Support for FAA's implementation and development of the ELVO program at TLH stating that Airport Management is inclined to take additional measures to ensure that the airport is equipped and prepared to meet the FAA's future NextGen demands.

If implemented at TLH, the ELVO would: 1) provide enhanced published instrument approach procedure minimums, 2) enhance airport operational capability and safety and, 3) increase the capability to accept and accommodate air carrier diversion activities during periods of local low visibility conditions.

It is envisioned that the City could leverage its existing Medium Approach Light System with Runway Alignment Indicator Lights (MALSR) and Runway Visibility Range (RVR) facilities to provide enhanced (i.e., lower) cloud ceiling base and visibility minimums supporting *Special Authorization (SA) Category I/II* Precision Instrument Approach Operations to Runway 36.

As part of the ELVO program, enhancements of existing, and development of new on-airport NAVAIDS that currently support Category-I Precision Instrument Approach capabilities to Runway 36 would be required as prescribe in FAA Order 8400.13D*, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations.* To facilitate the TLH-specific ELVO program, it is envisioned that on-airport facility improvements will likely be limited to the additional of a Mid-point RVR sensor and the enhancement of pavement markings, signage, electrical power back-up and remote NAVAID monitoring capabilities.

5.11.3 Approach Lighting System to Runway 9

Based upon discussions with airport operations and airport traffic control tower staff, a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) is proposed for Runway 9. This system is recommended to enhance runway instrument approach visibility issues historically experienced by pilots during nighttime or low visibility conditions primarily caused by the proximity of the vast open and undeveloped land west of the airport. This proposed approach lighting improvement will potentially serve to enhance the existing Runway 9 RNAV (GPS) non-precision instrument approach procedure with Localizer Performance with Vertical Guidance (LPV) offering cloud base ceiling and visibility minimums as low as 200 feet and ½ mile respectively. These minimums would be similar to that typically offered by Category-I Instrument Landing Systems.

5.12 Noise Contours and Land Use Compatibility

The FAA's Aviation Environmental Design Tool (AEDT, Version 2d) 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. 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.). The 10 dB penalty is intended to compensate for people's heightened sensitivity to noise during the night period. The FAA identifies DNL levels of 65 dB and higher as incompatible with noise sensitive land uses.

Using the AEDT, DNL noise exposure contours were generated for the following two scenarios at TLH: 1) existing 2015 activity levels, fleet mix, and runway configuration, and 2) forecast 2035 activity levels, fleet mix, and runway configuration. The AEDT inputs included in this section were derived from the fleet mix forecasts presented in the Forecast chapter of this Airport Master Plan update, and by reviewing historical flight records to identify aircraft models that commonly operate at TLH. The DNL 65 dB contours for the existing and future conditions are shown in **Figure 5-9**. The 2015 and 2035 DNL 65 dB contours do not encompass any sensitive land uses, and therefore, the preferred airfield development should not result in any significant noise impacts.

The contours presented in this section will be incorporated into the Land Use Plan Drawing of the Airport Layout Plan set associated with this Airport Master Plan update.

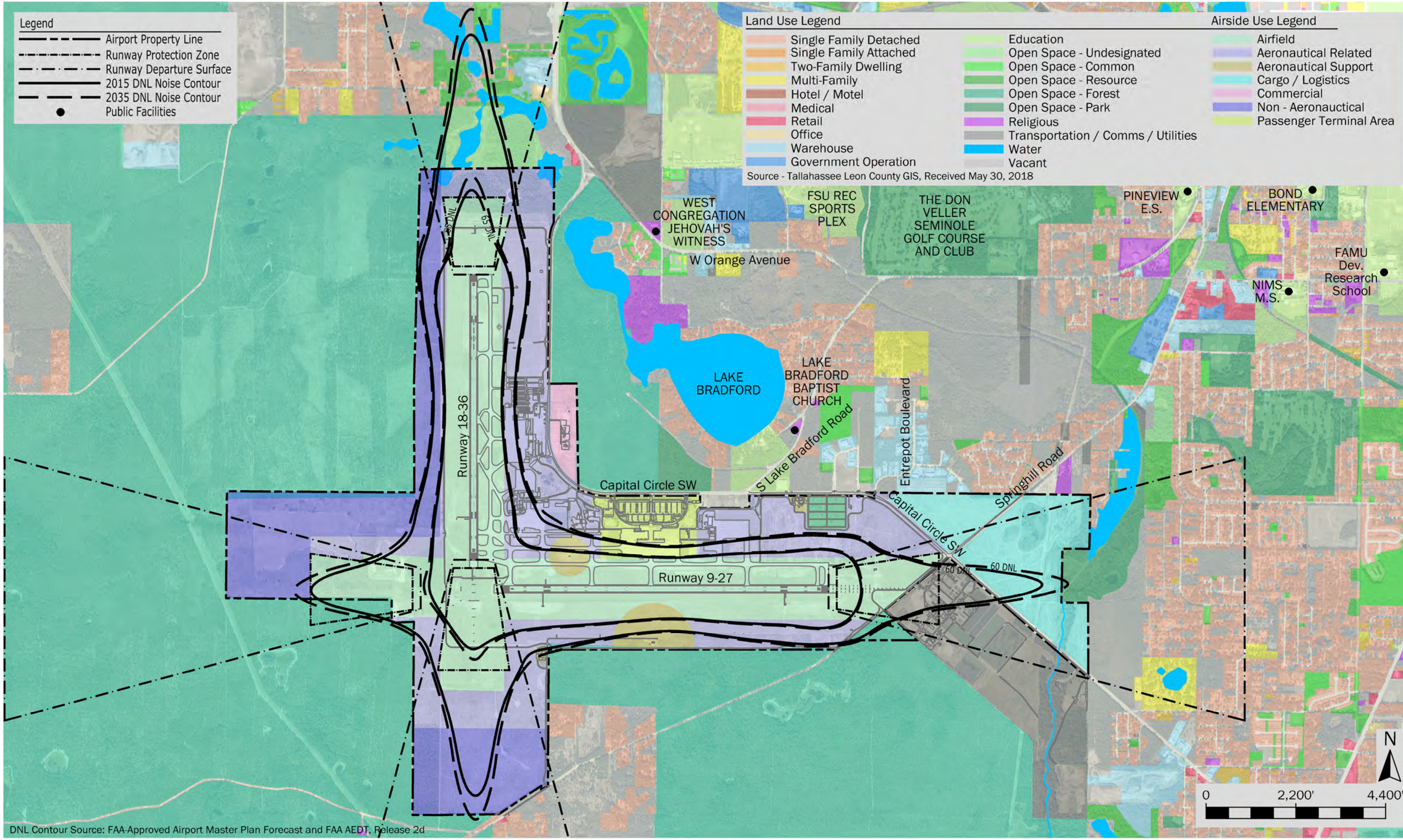


Figure 5-9 DNL Noise Exposure Map

The civil aircraft fleet mix shown in **Table 5-2** was estimated based on the analysis of historical flight activity for year 2015 retrieved from Flightwise (an online flight tracking service). It was assumed that the aircraft proportions in the civil aircraft fleet mix remain constant from 2015 to 2035. The number of aircraft operations in the sample were scaled to match the total operations (excluding military operations) for 2015 and 2035 as presented in the forecast chapter.

The day/night and arrival/departure splits were also determined based on the analysis of the Flightwise data. The civil helicopter fleet mix, shown in **Table 5-3**, was estimated based on an analysis of the FAA Traffic Flow Management System Counts (TFMSC).

Table 5-2 Civil Aircraft Fleet Mix

AEDT Aircraft	Description	Engine Type	Operations	
			2015	2035
1900D	Beech 1900D / PT6A67	Turboprop	3	4
717200	Boeing 717-200 / BR 715	Jet	1,375	1,661
737400	Boeing 737-400 / CFM56-3C-1	Jet	42	50
737700	Boeing 737-700 / CFM56-7B24	Jet	490	592
737800	Boeing 737-800 / CFM56-7B26	Jet	48	58
737N17	Boeing 737-200 / JT8D-17 Nordam B737 LGW Hushkit	Jet	8	10
757PW	Boeing 757-200 / PW2037	Jet	974	1,177
A300-622R	Airbus A300-622R / PW4158	Jet	3	4
A319-131	Airbus A319-131 / V2522-A5	Jet	472	570
A320-211	Airbus A320-211 / CFM56-5A1	Jet	13	15
BEC58P	Raytheon BARON 58P / TS10-520-L	Piston	2,038	2,462
CIT3	Cessna Citation III / TFE731-3-100S	Jet	192	232
CL600	Canadair CL-600 / ALF502L	Jet	610	737
CL601	Canadair CL-601 / CF34-3A	Jet	4,269	5,157
CNA172	Cessna 172R / Lycoming IO-360-L2A	Piston	1,238	1,496
CNA182	Cessna 182H / Continental O-470-R	Piston	544	657
CNA206	Cessna 206H / Lycoming IO-540-AC	Piston	502	606
CNA208	Cessna 208 / PT6A-114	Turboprop	3,126	3,777
CNA441	Cessna CONQUEST II / TPE331-8	Turboprop	1,746	2,109
CNA500	Cessna Citation II / JT15D-4	Jet	658	794
CNA55B	Cessna 550 Citation Bravo / PW530A	Jet	1,069	1,291
CNA680	Cessna Citation Sovereign 680 / PW306C	Jet	120	145
CNA750	Cessna Citation X / Rolls Royce Allison AE3007C	Jet	152	184
CRJ9-ER	Bombardier CL-600-2D15 / CL-600-2D24 / CF34-8C5	Jet	1,463	1,767
CRJ9-LR	Bombardier CL-600-2D15 / CL-600-2D24 / CF34-8C5	Jet	1,290	1,558
DC3	Douglas DC-3 / R1820-86	Piston	2	2
DC910	McDonnell Douglas DC-9-10 / JT8D-7	Jet	5	6
DHC6	De Havilland DASH 6 / PT6A-27	Turboprop	149	180
DHC8	Bombardier de Havilland DASH 8-100 / PW121	Turboprop	53	64
DO228	Dornier 228-202 / TPE 311-5	Turboprop	66	79
ECLIPSE500	Eclipse 500 / PW610F	Jet	237	286
EMB145	Embraer 145 ER / Allison AE3007	Jet	3,694	4,463
EMB14L	Embraer 145 LR / Allison AE3007A1	Jet	3	4

Table 5-2 Civil Aircraft Fleet Mix				
AEDT Aircraft	Description	Engine Type	Operations	
			2015	2035
EMB170	Embraer ERJ170-100	Jet	1,786	2,158
EMB190	Embraer ERJ190-100	Jet	3	4
F10062	Fokker 100 / TAY 620-15	Jet	203	246
GASEPF	1985 1-ENG FP PROP	Piston	454	548
GASEPV	1985 1-ENG VP PROP	Piston	5,125	6,192
GIIB	Gulfstream GIIB / GIII - SPEY 511-8	Jet	3	4
GIV	Gulfstream GIV-SP / TAY 611-8	Jet	91	110
GV	Gulfstream GV / BR 710	Jet	19	23
IA1125	IAI-1125 ASTRA / TFE731-3A	Jet	27	33
LEAR25	Learjet 25 / CJ610-8	Jet	37	45
LEAR35	Learjet 36 / TFE731-2	Jet	786	949
MD82	McDonnell Douglas MD-82 / JT8D-217A	Jet	18	21
MD83	McDonnell Douglas MD-83 / JT8D-219	Jet	1,213	1,466
MD9028	McDonnell Douglas MD-90 / V2528-D5	Jet	336	406
MU3001	Mitsubishi MU300-10 Diamond II / JT15D-5	Jet	1,026	1,239
PA28	Piper Warrior PA-28-161 / O-320-D3G	Piston	878	1,060
PA30	Piper Twin Comanche PA-30 / IO-320-B1A	Piston	5	6
PA31	Piper Navajo Chieftain PA-31-350 / TIO-5	Piston	336	406
SD330	Short SD3-30 / PT6A-45AR	Turboprop	21	25
SF340	Saab SF340B / CT7-9B	Turboprop	3,821	4,616
		Total	42,842	51,756

Source: Michael Baker International, Inc., 2018
Note: Numbers may not add up due to rounding

5-3 Civil Helicopter Fleet Mix				
AEDT Aircraft	Description	Engine Type	Operations	
			2015	2035
B407	Bell 407	Turboshaft	34	56
B212	Bell 412	Turboshaft	649	1,063
B429	Bell 429	Turboshaft	69	111
EC130	Airbus & Eurocopter Helicopters	Turboshaft	1,058	1,734
CH47D	Large helicopter Substitution	Turboshaft	68	111
S70	Sikorsky Black Hawk	Turboshaft	34	56
R44	Robinson R-44 Raven	Piston	102	168
		Total	2,014	3,301

Source: Michael Baker International, Inc., 2018
Note: Numbers may not add up due to rounding

As shown in in **Table 5-4**, the military fleet mix was estimated based on an analysis of the FAA TFMSC. It was assumed that the aircraft proportions in the fleet mix remain constant from 2015 to 2035. The number of aircraft operations in the selected sample were scaled to match the total military operations for 2015 and 2035 as presented in Chapter 3, Aviation Activity Forecasts. **Table 5-5** shows the military helicopter feet mix. Based on discussions with the TLH ATC Tower Manager, the number of military helicopters was estimated to be approximately 15% of the total military aircraft operations.

Table 5-4 Military Fleet Mix					
Aircraft Type Designator	AEDT Aircraft	Description	Engine Type	Operations	
				2015	2035
A10C	A10A	Fairchild A-10A Thunderbolt II	Jet	50	50
C130	C130HP	Lockheed C-130 Hercules	Turboprop	162	162
C17	C17	Boeing Globemaster 3	Jet	10	10
F18	F18EF	Boeing FA-18 Hornet	Jet	91	91
F5	F5E	Northrop F-5 Freedom Fighter	Jet	101	101
P8	737800	Boeing P-8 Poseidon	Jet	547	547
SBR1	T39A	North American Rockwell Sabre 40/60	Jet	111	111
T6/T-34C	T34	Beechcraft T-6 Texan II / Turbo Mentor	Turboprop	9,757	9,757
T38C	T-38A	Northrop T-38 Talon	Turboprop	374	374
			Total	11,105	11,105

Source: Michael Baker International, Inc., 2018
Note: Numbers may not add up due to rounding

Table 5-5 Military Helicopter Fleet Mix				
AEDT Aircraft	Description	Engine Type	Operations	
			2015	2035
CH47D	Bell-Boeing V22-Osprey Boeing CH-46 Sea Knight	Turboshaft	541	541
S70	Sikorsky Black Hawk	Turboshaft	744	744
S61	Sikorsky S-61	Turboshaft	135	135
S76	Sikorsky S-76	Turboshaft	270	270
B212	Bell 204	Turboshaft	270	270
		Total	1,960	1,960

Source: Michael Baker International, Inc., 2018
Note: Numbers may not add up due to rounding

Table 5-6 provides the approximate percentages of runway utilization. These percentages were applied to the total number of civil and military fixed wing operations. It was assumed that the utilization would remain constant over the 20-year planning period.

Table 5-6 Runway Utilization	
Runway	Runway Utilization
9	19%
27	27%
18	28%
36	26%

Source: Michael Baker International, Inc., 2018.

5.13 Summary of Potential NEPA Documentation and Anticipated Environmental Permits

The following subsections describe the level of documentation, in accordance with the National Environmental Policy Act (NEPA), that would be associated with undertaking the preferred alternative projects. These subsections also discuss potential environmental impacts that would be expected from project implementation in addition to state and federal permits that would be necessary.

5.13.1 Potential NEPA Documentation

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, provides the FAA policy and procedures to ensure compliance with the requirements of NEPA for FAA-funded projects or projects requiring FAA ALP approval and lists the type of NEPA documentation required for each project type. Chapter 5 of FAA Order 1050.1F contains descriptions of types of actions that, in the absence of extraordinary circumstances, are normally categorically excluded. Categorically excluded projects and actions are those that meet the description contained in 40 CFR 1508.4, *Categorical exclusion* and represent actions that do not normally 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 [a summary of Findings of No Significant Impact (FONSI) is provided in Chapter 6 of that document], and lists examples of actions or projects that normally require an EA, which include but are not limited to the following:

- Actions that are not normally categorically excluded, and
- Actions that are normally categorically excluded but involve at least one extraordinary circumstance that may have significant environmental impact.

The more detailed written analysis in an EIS is required when one or more environmental impacts are significant and cannot be mitigated so that the net impacts are less than significant. Significance thresholds for the various environmental impact categories considered under NEPA are defined in 1050.1F, Exhibit 4-1. Some actions that normally require an EIS include:

- Location of a new commercial service airport in a Metropolitan Statistical Area (MSA),
- A new runway to accommodate air carrier aircraft at a commercial service airport in an MSA, and
- Major runway extension.

None of the proposed projects included in the preferred alternative are anticipated to require an EIS to meet NEPA requirements.

5.13.2 Potential 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 permits that would be required for each project:

1. *Environmental Resource Permit (ERP)*

   An ERP is required if the project meets one or more of the following thresholds:

   a. The project proposes work in, on, or over wetlands or surface waters.
   b. The project proposes to construct more than 4,000 SF of impervious or semi-pervious surface subject to vehicular traffic.
   c. The project proposes to construct a total of more than 9,000 SF of impervious or semi-pervious surface.
   d. The project proposed has an area that is greater than 1 acre.
   e. The project proposed is capable of impounding greater than 40-acre feet of water.
   f. The project includes a dam that is greater than 10 feet in height.
   g. The project is part of a larger development plan that in total meets or exceeds one of the above thresholds.
   h. The project is a modification of an existing ERP.

   The ERP program regulates both construction and removal of impervious surfaces and semi-pervious surfaces. For projects that are located at the airport, the Northwest Florida Water Management District (NWFWMD) is the agency that has jurisdiction and is responsible for reviewing and issuing ERP permits.

   To expedite the review and issuance of ERP permits for the projects in the Preferred Alternative of this Master Plan, it is recommended that the airport consider applying for a Conceptual Permit with NWFWMD. The conceptual permit requires the development of an airport-wide Stormwater Master Plan and development of stormwater treatment facilities with capacity for treating stormwater runoff for future development. The NWFWMD would review the proposed stormwater treatment facilities for all proposed projects in the preferred alternative and issue a Conceptual Permit. An ERP application would be submitted as each project is constructed and since the water quality aspect of the project has already been reviewed, the permits are issued promptly.

2. *National Pollutant Discharge Elimination System (NPDES) Construction Generic Permit*

   An NPDES Construction Generic Permit is required if a project includes land disturbance of an area greater than or equal to one acre in size. These permits are issued by the Florida Department of Environmental Protection (FDEP). The NPDES Construction Generic Permit for large construction activity is required if the project disturbs five acres or greater. For projects that disturb areas less than five acres in size but equal to or greater than one acre in size, an NPDES Construction Generic Permit for small construction activity is required.

3. *Gopher Tortoise Conservation Permit*

   For projects that are to be constructed in uplands that are undeveloped or only partially paved, gopher tortoises may be present in the project area. A survey to determine the presence or absence of gopher burrows is required. If gopher tortoise burrows are present and will be impacted by the project, a Gopher Tortoise Conservation Permit from the Florida Fish and Wildlife Conservation Commission and relocation of tortoises from impacted burrows are required.

4. *FDEP Industrial Wastewater Permit*

   This permit may be required if a project has the potential to contaminate groundwater.

5. *Section 404 Permit or U.S. Army Corps of Engineers (USACE) Dredge and Fill Permit*

   A Section 404 Permit is required if a project proposes to fill or dredge wetlands or other waters of the United States that are subject to USACE jurisdiction. Potential presence of wetlands and other waters of the U.S. was evaluated using Florida Land Use, Cover and Forms Classification System (FLUCFCS) mapping from the NWFWMD.

6. *Underground and Above Ground Storage Tanks*

   The Florida Department of Environmental Protection (FDEP) regulates, inspects, and issues certifications for both underground and above ground petroleum storage tanks.

7. City of Tallahassee, Growth Management Department Review

   In addition to state and federal permitting requirements, new development within the limits of the City of Tallahassee is subject to review by the City of Tallahassee Growth Management Department. The first step in the process is to apply for Land Use Compliance Certificate (LUCC) to determine where the proposed project and use of the site is permitted under current City regulations. The second step is the development of a Natural Features Inventory that identifies significant natural features from each of several categories such as wetlands, endangered species, trees, floodplain, special development zone, and karst features on the project site. The third step is to develop the site plan and request Type A or Type B Site Plan and Concurrency review. The Concurrency Review will determine if there is adequate available capacity to accommodate the impact of the proposed project at or above the Level of Service. Dependent on the type of project proposed, the Concurrency Review may require a transportation or traffic analysis and/or a stormwater analysis. After the site plan and concurrency review are completed, an Environmental Impact Assessment is developed that describes and quantifies environmental impacts and describes the measures taken to mitigate those impacts. Following approval of the Environmental Impact Assessment, an application for an Environmental Management Permit is submitted. The plans, copies of the Site Plan and Environmental Impact Assessment approval letters, and the stormwater management design report are submitted with the Environmental Management Permit Application.

5.13.3 Preferred Alternative Projects

The projects proposed for the preferred alternative were overlaid on FLUCFCS mapping and the most recent aerial photography to determine if the proposed project would potentially impact previously developed areas, wetlands, non-forested uplands, or forested uplands. **Table 5-7** identifies the potential environmental impacts associated with the preferred alternative, the anticipated level of NEPA documentation for each project such as a Categorical Exclusion (CE) or Environmental Assessment (EA), and regulatory permits that may be needed for each project. Based on review of the characteristics of the projects associated with the preferred alternative and the project sites, potential for environmental impacts from the projects associated with the preferred alternative is low for most of the projects. However, some of the projects have the potential to impact wetlands or protected species.

Table 5-7 Potential Environmental and Regulatory Considerations of the Preferred Alternative													
Figure Reference	Preferred Alternative	Proposed Actions	Affected Previously Disturbed Land Area (Acres)	Affected Previously Paved Areas (Acres)	Potential Impact (Y or N)				Potential NEPA Document	FAA Order 1050.1F Reference	Potential City Permit	Potential State Permit	Potential Federal Permit
					Noise[a]	Air Quality	Water of U.S.	Protected Species					
5-1	Land Use Parcels and Preferred Alternatives	Summary Exhibit	N/A										
	Parcel B		27		N	N	N	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
	Parcel C		56		N	N	N	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
	Parcel D		161		N	N	Y	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	404
	Parcel E		107		N	N	N	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
	Parcel F	Solar Farm 2	206		N	N	N	Y	EA	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
	Parcel G	Solar Farm 2	112		N	N	N[b]	Y	EA	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES ERP	
	Parcel I		31		N	N	N	P	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	UST, GT, NPDES, ERP	
5-2	Preferred Airport Access and Circulation Alternative	Airport Roadway Access and Circulation Improvements	17		N	N	N	P	CE	5-6.4a	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
		Construction of Multi-Level Garage		19	N	N	N	N	CE	5-6.4h	LUCC, SP, CM, NFI. EIA. EMP	NPDES, ERP	
		Construction of Employee and Cell Phone Parking Lots		2	N	N	N	P	CE	5-6.4h	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
		Development of Rental Car QTA Facility		6	N	N	N	Y	CE	5-6.4h	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
		Removal of Existing Pavements	2		N	N	N	N	CE	5-6.4a		NPDES, EV	
5-3	Preferred Taxiway System Alternative	Rehabilitation / Reconstruction of Runway 18-36	24		N	N	N	N	CE	5-6.4e		NPDES, EV	
		Removal of Taxiway A Connectors	-9		N	N	N	N	CE	5-6.4e		NPDES, EV	
		Construction of New Taxiway A Connectors and Shoulders	6		N	N	N	P	CE	5-6.4e	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
		Removal of Taxiway B Connectors	-6		N	N	N	N	CE	5-6.4e		NPDES, EV	
		Construction of New Taxiway B Connectors and Shoulders	3		N	N	N	P	CE	5-6.4e	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
5-4	Preferred Air Cargo Apron Expansion/Connector and Three Cargo Handling Facilities (Parcel H)	Eastward Expansion of Air Cargo Apron	8		N	N	N	P	CE	5-6.4e	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
		Construction of Three Air Cargo Facilities and Access Road	8		N	N	N	Y	CE	5-6.4a & f	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
5-4	Preferred East Aeronautical and Freight Logistics Development Area Alternative (Parcel H – Utilizing Portion of Closed Landfill)	Future Remediation and Redevelopment of Closed Landfill	38		N	N	N	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
5-5	Preferred Terminal Alternative	Expansion of Terminal Concourse	1		N	N	N	N	CE	5-6.4h	LUCC, SP, CM, NFI. EIA. EMP	ERP, NPDES	
		Addition of Terminal Contact Gates	<1		N	N	N	N	CE	5-6.4h		ERP	
		East / West Expansion of Passenger Terminal Apron	5		N	N	N	P	CE	5-6.4e	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	
5-6	Preferred North Aeronautical Development Area Alternative (Parcel A)	Development of Cleared/Graded Land for Commercial Aeronautical and General Aviation Facilities	66		N	N	N	Y	EA[c]	3-1.2.a.(1)	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES, ERP	

Table 5-7 Potential Environmental and Regulatory Considerations of the Preferred Alternative													
Figure Reference	Preferred Alternative	Proposed Actions	Affected Previously Disturbed Land Area (Acres)	Affected Previously Paved Areas (Acres)	Potential Impact (Y or N)				Potential NEPA Document	FAA Order 1050.1F Reference	Potential City Permit	Potential State Permit	Potential Federal Permit
					Noise[a]	Air Quality	Water of U.S.	Protected Species					
5-7	Preferred North and Central Apron Development Alternative	Continued In-fill Development of General Aviation Facilities at North and Central Aprons	10		N	N	N	P	CE	5-6.4f	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES[d], ERP	
5-8	Preferred South Apron Development Alternative	Continued In-fill Development of General Aviation Facilities at South Apron	9		N	N	N	P	CE	5-6.4f	LUCC, SP, CM, NFI. EIA. EMP	GT, NPDES[d], ERP	

Source: Michael Baker International, Inc., 2018

Notes:

- Y = Impacts likely, N = No likely impact, P = Possible impacts; TBD = Insufficient information is available about planned development to determine if NEPA documentation will be required, and, if so, what level of NEPA document will be required; CE = Categorical Exclusion; EA = Environmental Assessment; NPDES = National Pollutant Discharge Elimination System Permit; UST/AST = State certifications for closure and or operations of underground or above ground storage tanks. In some cases, remediation for cleanup of contaminated soils is also necessary; GT = Florida Fish and Wildlife Conservation Commission Gopher Tortoise Conservation Permit; ERP = Northwest Florida Water Management District (NWFWMD) Environmental Resource Permit; EV = Request for verification of de minimis exemption from NWFWMD ERP; ITP = Project would have to be evaluated to determine if protected species are present. May require U.S. Fish and Wildlife Service Incidental Take Permit; 404 = U.S. Army Corps of Engineers Section 404 Permit
- CM = Concurrency Management; EIA = Environmental Impact Analysis; EMP = Environmental Management Plan; LUCC = Land Use Compliance Certificate; NFI = Natural Features Inventory; SP = Site Plan
- [a]None of the evaluated improvements would be anticipated to change the critical aircraft or significantly expand the 65 DNL noise contour.
- [b]Based on the limits for the current concept for Solar Farm 2, the wetlands at the north end of Parcel G will not be impacted. If the limits were extended to the northern limit of TLH property in Parcel G, wetland impact would occur.
- [c]Insufficient details are available at this time to determine the level of NEPA documentation required. Due to the relatively large amount of acreage, unless additional information becomes available so that it can be clearly demonstrated that the project qualifies for a CE, assume that an EA will be required.
- [d]If infill development is broken up and constructed as small individual projects, then those disturbing less than one acre of land may not require an NPDES permit.

Categorically Excluded Projects

As depicted in Table 5-7, several of the projects identified as part of the preferred alternative would be documented as CEs. These include projects to construct facilities such as taxiways, hangars, apron areas, improvements to the terminal that are not intended to increase capacity, parking lots, parking garages, and access roads that will not negatively affect the level of service of the existing road network adjoining TLH.

Projects Potentially Requiring Preparation of an Environmental Assessment

For parcels that are larger in size and for which insufficient details concerning future development are currently available, it is difficult to determine the level of NEPA documentation that would be required to develop the parcel. In these cases, such as for development of Parcels A, B, C, D, E, H, and I, it is recommended that it be assumed at this time that an EA would be required to satisfy NEPA documentation requirements. Additionally, for Parcels F and G, for which construction of a solar farm is planned, an EA will be required because the solar farm will be larger than three acres in size and therefore does not meet the requirements for the FAA's CE for solar farm projects.

Projects Requiring an NPDES Permit

All the projects that would result in greater than one acre of ground disturbance will require an NPDES permit. The only permit that will not require an NPDES permit based on available information is the project to add terminal contact gates as identified in Table 5-7.

Projects Requiring an ERP

All but four of the proposed projects would require an ERP. In most of these cases the ERP is required so that the NWFWMD can review the stormwater management aspects of the project because the project exceeds one or more of the thresholds described in 5.16.2 above. The development of Parcel D also has the potential to impact wetlands and surface waters subject to the jurisdiction and regulatory authority of the NWFWMD. If impacts to these wetlands or surface waters are proposed, issuance of the ERP would likely include a condition that wetland mitigation be provided to compensate for impacts to these jurisdictional wetlands.

Removal of impervious surfaces and reconstruction of existing pavements are also actions that are regulated by the NWFWMD. However, in most cases, projects such as these are considered to have negligible or no impact. Therefore, for the projects involving the removal of existing roadway pavements, removal of connector taxiways, and rehabilitation/reconstruction of Runway 18-36, a request for verification of exemption from ERP requirements would be submitted to the NWFWMD. It is anticipated that these projects would be verified as de minimis exemptions from ERP requirements.

Projects Potentially Requiring a USACE Section 404 Permit

As described above the development of Parcel D has the potential to result in impact to wetlands and Waters of the U.S. If such impacts are proposed a Section 404 permit from the USACE would be required and wetland mitigation would likely be required as a condition for the issuance of the permit. If an Individual Section 404 permit is required by the USACE then an EA would have to be developed to meet NEPA requirements.

Projects with Potential for Protected Species Impacts

Almost all the projects will have to be surveyed to determine whether gopher tortoise burrows and/or bent golden aster are present on the project site. For some of the projects the potential for gopher tortoises is low due to existing development in the project vicinity. However, gopher tortoises will occasionally use habitats in proximity to existing development, so their presence cannot be ruled out without reviewing the site in the field. Bent golden aster prefers areas adjacent to roads or the edges of upland forested habitat. For the development of Solar Farm 2 on Parcels F and G, it has already been determined that gopher tortoise and bent golden aster are present. Permitting for both will be required. For projects that will take place in areas that are currently completely paved, it can be concluded that no gopher tortoise permitting will be required.

Some of the projects would also be constructed in areas that could be utilized by the eastern indigo snake, a species that is listed as threatened under the Endangered Species Act. For projects that will occur in areas that are not currently paved, the construction contractor should be required to follow the United States Fish and Wildlife Service (USFWS) Standard Protection Measures for the Eastern Indigo Snake. In most cases doing so will support a finding by the USFWS that the project is not likely to adversely affect the eastern indigo snake.

Closure of Existing USTs

For the development of Parcel I, the removal of the existing underground storage tanks at the three rental car facilities will be required. If it is determined that one or more of the tanks has leaked, cleanup of contaminated soils may also be required. Due to the history of significant material use and storage at these sites, additional investigation to determine whether other contamination requiring remediation exists at the rental car facilities may also be warranted prior to redevelopment of Parcel I.

Development of the Old City of Tallahassee Landfill Site within Parcel H

Parcel H overlies a portion of the Old City of Tallahassee Landfill which was in operation from 1959 through 1976. Any proposed development on this site would have to be carefully coordinated with FDEP. It is likely that development of this site would require an assessment of existing contamination at the site. Development options should address the potential for capping landfill material as well as an excavation and disposal plan that would detail the methods proposed for the excavation of the buried solid waste at the site, the disposal of the recovered waste at another approved offsite solid waste landfill, and the protection of groundwater and surface water during the development of the site.

City of Tallahassee Growth Management Department Review

In addition to the permits and reviews described above, each of the components of the preferred alternative will be subject to the review of the City of Tallahassee Growth Management Department as described in 5.13.2 above. An LUCC, Site Plan A or Site Plan B review and Concurrency review are required. However, in cases where it can be demonstrated that a project site contains no resources eligible for conservation or preservation, is less than five acres in size (not including existing impervious surfaces), contains less than two acres of forested area, and has been issued a clearance letter from the Florida Department of State, Division of Historical Resources, the project may be exempt from Natural Features Inventory requirements. In such cases an Environmental Impact Analysis is also not required because the project contains no preservation or conservation areas.

Application for an Environmental Management Permit will be required for each project, including those projects that are determined to be exempt from Natural Features Inventory and Environmental Impact Analysis requirements.

A. Environmental Overview

The purpose of this chapter is to provide a review of existing environmental conditions and a preliminary assessment of potential environmental impacts of planned development at Tallahassee International Airport (TLH). The following information was assembled using available resource materials and databases. This overview does not constitute an Environmental Assessment (EA), as defined by the Federal Aviation Administration (FAA) Order 5050.4B. The analysis in this chapter is conducted according to the guidelines set forth in FAA Order 5050.4B, entitled National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. The Implementing Instructions in addition to FAA Order 1050.1F, Environmental Impacts: Policies and Procedures discuss 14 categories of potential areas of impact that must be addressed in compliance with NEPA. These categories are:

1. Air quality
2. Biological resources (including fish, wildlife, and plants)
3. Climate
4. Coastal resources
5. Department of Transportation Act, Section 4(f)
6. Farmlands
7. Hazardous materials, solid waste, and pollution prevention
8. Historical, architectural, archaeological, and cultural resources
9. Land use
10. Natural resources and energy supply
11. Noise and compatible land use
12. Socioeconomics, environmental justice and children's environmental health and safety risks
13. Visual effects (including light emissions)
14. Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

For the purpose of this overview, these environmental categories will only be addressed if they apply specifically to the airport. This environmental overview identifies potential environmental impacts that may require a more detailed analysis in a formal EA for the preferred development alternative. The proposed projects discussed in this Master Plan Update (MPU) are not anticipated to have impacts on the following categories and therefore were not addressed in this overview:

- Air quality
- Climate
- Department of Transportation Act, Section 4 (f)
- Farmlands
- Natural resources and energy supply
- Noise and compatible land use

- Socioeconomics, environmental justice and children's environmental health and safety risks
- Visual effects (including light emissions)

A.1 Biological Resources

Legislation

There are many state and federal regulations, statutes, executive orders, and other guidance that pertain to biological resources. Including the following:

Federal Regulations

- Bald and Golden Eagle Protection Act
- CEQ Biodiversity Considerations Policy Act 1993
- Endangered Species Act
- Executive Order 13186, Responsibilities of Fed Agencies to Protect Migratory Birds
- Executive Order 13112, Invasive Species
- Fish and Wildlife Coordination Act
- Migratory Bird Treaty Act

State Regulations

- Florida Statutes 379.2291, Endangered and Threatened Species Act

Regulatory Agency

The USFWS (and, in the case of marine and estuarine species, the National Marine Fisheries Service), the Florida Department of Agriculture and Consumer Services (FDACS), and Florida Fish and Wildlife Conservation Commission (FFWCC) have jurisdiction over and administer native endangered and threatened species permits for Florida. During the consultation process, the USFWS will determine the significance of potential impacts to federally protected species and will recommend methods to avoid or mitigate for impacts that may occur as a result of the proposed projects.

The FFWCC Threatened and Endangered Species Section reviews and issues permits that involve Florida's protected terrestrial animal species. The FFWCC Bureau of Protected Species Management reviews and issues permits that involve Florida's protected aquatic wildlife species. The FDACS Division of Plant Industry is responsible for providing protection to Florida's protected native plant species that are classified as endangered, threatened, or commercially exploited. The City of Tallahassee requires a Natural Features Inventory, Environmental Impact Analysis, and Environmental Permit for all development projects within the City limits.

Existing Conditions

Available GIS data and literature were reviewed to determine the types of plant communities and wildlife occurrences that have been previously documented within the airport property area. Data sources used in this evaluation included:

- FFWCC's 2014 Eagle Nesting Territory Locations and Activity Status;
- FFWCC's Wading Bird Colony Locations (1999);
- FFWCC's Wood Stork Colony Locations (2013);
- FNAI (Florida Natural Areas Inventory) Matrix of Habitat and Distribution of Rare/Endangered Species for Leon County (2016); and,

Lists of protected fauna and flora potentially occurring in Leon County, and their protection status, are provided in **Tables A-1** and **A-2**. Protected species that may be expected to occur within the proposed project development areas are those that are typically associated with pasturelands, turkey oak hammocks, pine flatwoods, and cypress wetlands.

Table A-1
List of Potentially Occurring Fauna

Scientific Name	Common Name	Status	
		USFWS	FFWCC
Herpetofauna			
Rana capito aesopus	Gopher Frog	-	SSC
Drymarchon corais couperi	Eastern Indigo Snake	T	ST
Gopherus polyphemus	Gopher Tortoise	C	ST
Notophthalmus perstriatus	Striped Newt	C	SSC
Pituophis melanoleucus mugitus	Florida Pine Snake	-	SSC
Avifauna			
Egretta caerulea	Little Blue Heron	-	SSC
Aramus quarauna	Limpkin	-	SSC
Egretta thula	Snowy Egret	-	SSC
Eudocimus albus	White Ibis	-	SSC
Egretta tricolor	Tricolored Heron	-	SSC
Falco sparverius paulus	Southeastern American Kestrel	-	ST
Picoides borealis	Red-cockaded Woodpecker	E	SE
Mycteria americana	Wood Stork	T	ST
Mammals			
Myotis grisescens	Gray Bat	E	SE

Source: Florida Natural Areas Inventory Tracking List for Leon County, FNAI. April 2016.
E = Federally listed as Endangered
T = Federally listed as Threatened
SSC = Species of Special Concern
ST = State population listed as Threatened by the FFWCC
SE = State population listed as Endangered by the FWCC
USFWS = United States Fish and Wildlife Service
FFWCC = Florida Fish and Wildlife Conservation Commission

According to FFWCC's Wading Bird Nesting Colonies database, the nearest wading bird colony is located approximately 8.05 miles northwest of the airport. FFWCC's Wood Stork Colony Location database indicates that the nearest wood stork colony is located approximately 6.1 miles north of the airport. Both colonies are sufficiently far away from all of the project areas where construction activity is not anticipated to adversely impact nesting activity. However the core foraging range, thirteen miles in North Florida Counties, of wood storks places the entire airport in the range of three different wood stork colony core foraging areas.

The “FNAI Species and Natural Community Occurrence Summary for Leon County” lists 27 plant species, 3 fish, 6 amphibian, 7 reptiles, 22 birds, and 7 mammals. FNAI element occurrence data for protected species locations in the vicinity of TLH are depicted in **Figure A-1.** The upland habitats within the airport have the potential to be utilized by four species of herpetofauna, 8 birds, 2 mammals, and 20 plants (**Tables A-1** and **A-2**).

Table A-2
List of Potentially Occurring Flora

Scientific Name	Common Name	Status	
		USFWS	FDACS
Aster georgianus	Georgie Aster	C	-
Calycanthus floridus	Sweet-shrub	-	SE
Erythonium umbilicatum	Trout Lily	-	SE
Hexastylis arifolia	Heartleaf	-	ST
Lilium superbum	Turk’s Cap Lily	-	SE
Magnolia ashei	Ashe’s Magnolia	-	SE
Magnolia pyramidata	Pyramid Magnolia	-	SE
Malaxis unifolia	Green Adder’s-mouth	-	SE
Pityopsis flexuosa	Bent Golden Aster	-	SE
Polygonum meisnerianum var. beyrichianum	Mexican Tear-thumb	-	SE
Pycnanthemum floridanum	Florida Mountain-mint	-	ST
Rhexia salicifolia	Panhandle Meadowbeauty	-	ST
Rhododendron alabamense	Alabama Rhododendron	-	SE
Rhododendron austrinum	Florida Flame Azalea	-	SE
Schwalbea americana	American Chaffseed	E	SE
Stachydeoma graveolens	Mock Pennyroyal	-	SE
Uvularia floridana	Florida Merrybells	-	SE
Xyris longisepala	Karst Pond Xyris	-	SE

Source: Florida Natural Areas Inventory Tracking List for Leon County, FNAI. April 2016.
E = Endangered
T = Threatened
ST = State population listed as Threatened by the FFWCC
SE = State population listed as Endangered by the FWCC
C = Candidate Species for which federal listing agencies have data to support proposing to list the species as Endangered or Threatened
USFWS = United States Fish and Wildlife Service
FDACS = Florida Department of Agriculture and Consumer Services

In Florida, land use and vegetative cover are frequently described using the Florida Land Use, Cover, and Forms Classification System (FLUCFCS) that was developed by the Florida Department of Transportation (FDOT) and is widely accepted and used by various state and local agencies.[1] The following descriptions of upland community types in and around the Airport Region of Interest (ROI) are based on review of the 2013 North West Florida Water Management District (NWFWMD) FLUCFCS mapping **(Figure A-2)**. The upland community types within the construction ROI at the airport are listed in **Table A-3** and described below.

Table A-3
Upland Habitats within the Airport ROI

FLUCS Code	Land Cover Description	Area (Acres)
4100	Upland Coniferous Forests	526
4110	Pine Flatwoods	528
4120	Longleaf Pine – Xeric Oak	288
4340	Hardwood Coniferous - Mixed	364
4410	Coniferous Plantations	1,436
8110	Airports	472

Sources: NWFWMD 2013, Michael Baker International 2016.
*Acreage is in thousands

Recommendations

Additional protected species have the potential to occur at the airport but have not been observed and documented. It is recommended that a protected species survey be completed during the Categorical Exclusion, EA or EIS phase of each project to:

- Update existing protected species data;
- Determine the presence and location of protected species in sections of the project area that were not previously surveyed;
- Determine the habitat suitability of the area that would be impacted; and
- Determine the type of mitigation necessary to complete the project.

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

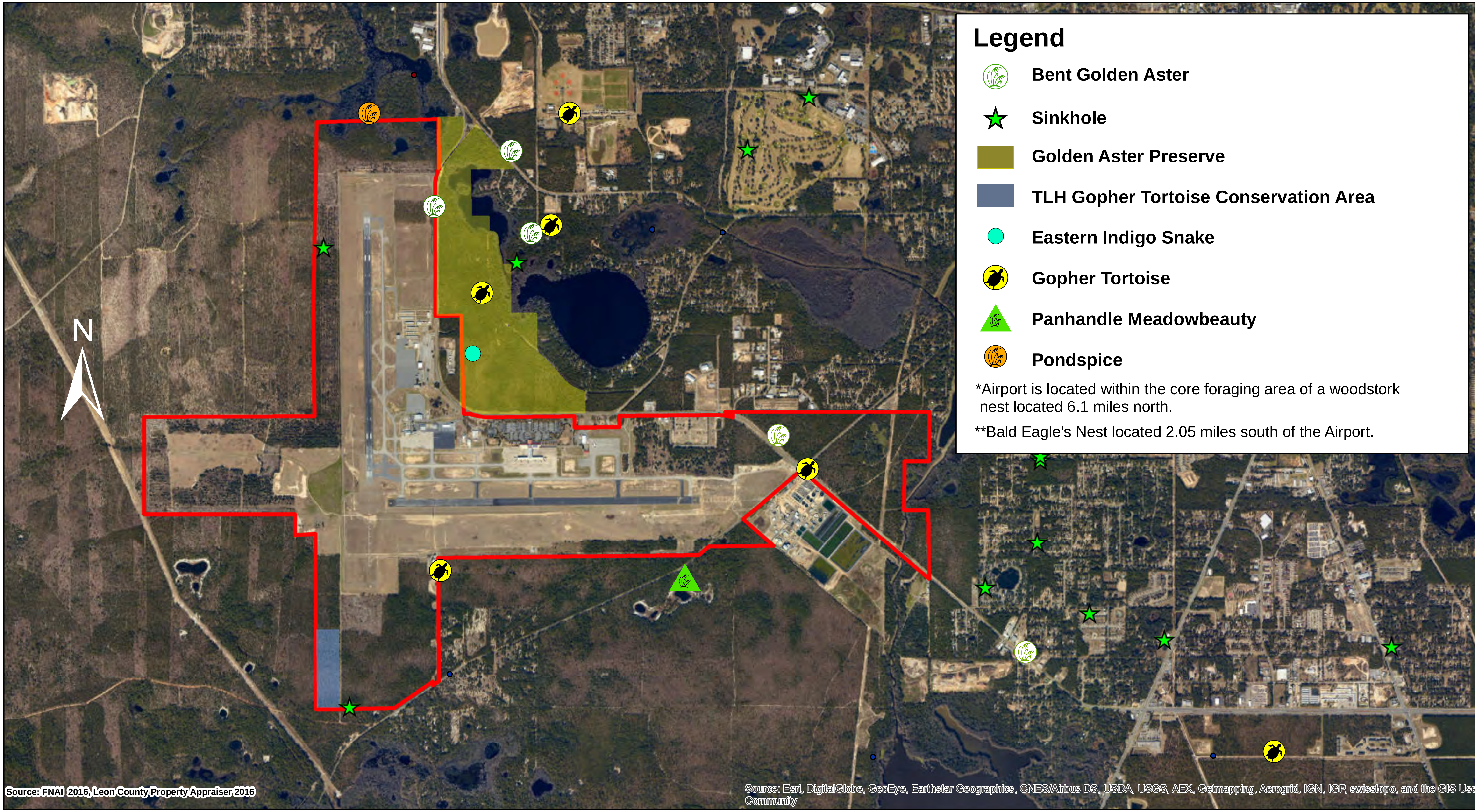
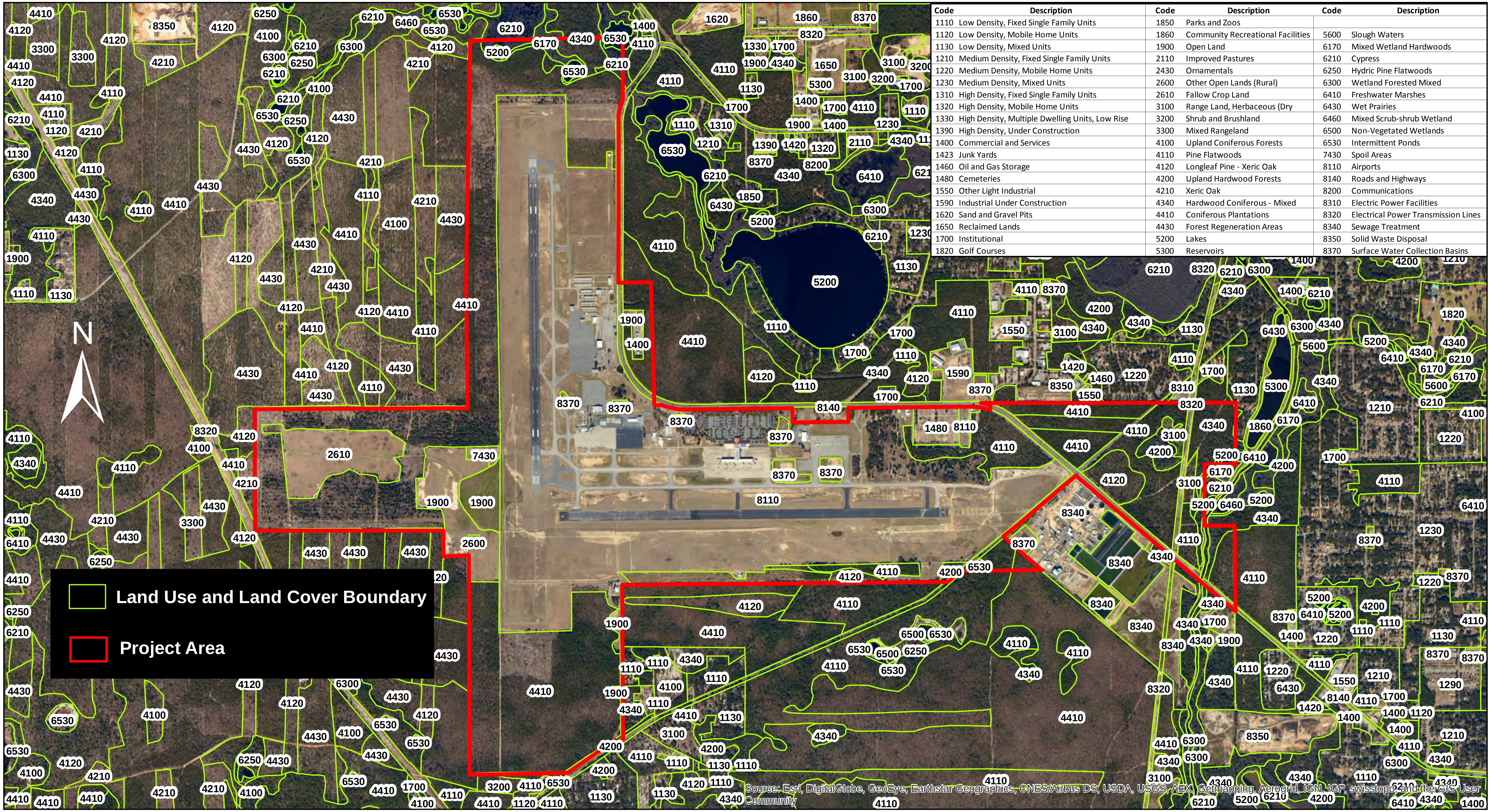


Figure A-1 Protected Species and Karst Location Map



Code	Description	Code	Description	Code	Description
1110	Low Density, Fixed Single Family Units	1850	Parks and Zoos		
1120	Low Density, Mobile Home Units	1860	Community Recreational Facilities	5600	Slough Waters
1130	Low Density, Mixed Units	1900	Open Land	6170	Mixed Wetland Hardwoods
1210	Medium Density, Fixed Single Family Units	2110	Improved Pastures	6210	Cypress
1220	Medium Density, Mobile Home Units	2430	Ornamentals	6250	Hydric Pine Flatwoods
1230	Medium Density, Mixed Units	2600	Other Open Lands (Rural)	6300	Wetland Forested Mixed
1310	High Density, Fixed Single Family Units	2610	Fallow Crop Land	6410	Freshwater Marshes
1320	High Density, Mobile Home Units	3100	Range Land, Herbaceous (Dry	6430	Wet Prairies
1330	High Density, Multiple Dwelling Units, Low Rise	3200	Shrub and Brushland	6460	Mixed Scrub-shrub Wetland
1390	High Density, Under Construction	3300	Mixed Rangeland	6500	Non-Vegetated Wetlands
1400	Commercial and Services	4100	Upland Coniferous Forests	6530	Intermittent Ponds
1423	Junk Yards	4110	Pine Flatwoods	7430	Spoil Areas
1460	Oil and Gas Storage	4120	Longleaf Pine - Xeric Oak	8110	Airports
1480	Cemeteries	4200	Upland Hardwood Forests	8140	Roads and Highways
1550	Other Light Industrial	4210	Xeric Oak	8200	Communications
1590	Industrial Under Construction	4340	Hardwood Coniferous - Mixed	8310	Electric Power Facilities
1620	Sand and Gravel Pits	4410	Coniferous Plantations	8320	Electrical Power Transmission Lines
1650	Reclaimed Lands	4430	Forest Regeneration Areas	8340	Sewage Treatment
1700	Institutional	5200	Lakes	8350	Solid Waste Disposal
1820	Golf Courses	5300	Reservoirs	8370	Surface Water Collection Basins

Figure A-2 NWFWMD Land Use and Land Cover Map

A.2 Coastal Resources

Legislation

The United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) administered the Coastal Zone Management Act (CZMA, 16 U.S.C. §§1451-1466). NOAA is the approving body of a state developed coastal zone management plan, CZMA provisions allow for the transfer of coastal zone management authority to the state. In 1981 NOAA approved the Florida Coastal Management Program (FCMP), and the FDEP became the lead agency for implementation of the FCMP through its Office of Intergovernmental Programs (OIP).

Regulatory Agencies

A requirement of the CZMA is federal consistency review. Any federal agency activity that affects coastal resources is required to be reviewed for consistency with respect to the requirements of the CZMA. Federal agency activities can include federal assistance (insurance, grants, loans, subsidies, etc.) to state or local governments, federal licensing, or federal permitting actions. The review process is coordinated by the Florida State Clearinghouse which is a part of OIP. Comments concerning consistency are received from nine state agencies, the five water management districts, as well as local governmental entities.

Existing Conditions

The airport is located within Florida's regulated coastal zone.[2] Federal actions at TLH are subject to review with respect to consistency with the FCMP.

A.3 Hazardous Material, Solid Waste, and Pollution Prevention

Legislation

The Resource Conservation and Recovery Act of 1976 (RCRA) Subtitle C established the federal program to manage hazardous wastes from cradle to grave. Subtitle C contains guidance for hazardous waste handling entities regarding generation, transportation, and treatment, storage or disposal of hazardous waste.

Regulatory Agencies

The Environmental Protection Agency (EPA) provides state and local agencies with information, guidance, policy and regulations to help regulate community waste and to enhance the environmental and economic benefits of source reduction and recycling of solid wastes. Notification of EPA is necessary if treatment, storage or disposing of hazardous waste is being conducted at a given facility in order to receive an EPA Identification Number unless hazardous waste generated at the facility has been exempt.

[2] NOAA, "Coastal Zone Management Programs," https://coast.noaa.gov/czm/mystate/ (February 4, 2016)

Existing Conditions

Review of the USEPA NEPAssist[3] utility, the Resource Conservation and Recovery Act Information (RCRAInfo) list of active and Conditionally Exempt Small Quantity Generators (CESQGs)[4], and the FDEP Contamination Locator map was used to determine if the airport was located in an area classified as a brownfield, superfund, petroleum or other hazardous waste site.[5] The airport in addition to four industrial use tenants are listed on the RCRAInfo database as a conditionally exempt small quantity generator (CESQG). In addition there is a closed landfill located in the northeastern portion of the airport property.

Potential Impacts

The projects described in this Master Plan are not anticipated to generate hazardous waste. Proposed projects are anticipated to result in typical construction debris that would be transported to the nearest operational landfill, which is located 5.5 miles northwest of the airport.

Recommendations

Potential hazardous material sites must be re-evaluated during the preparation of the NEPA document of each project to ensure consistency with RCRA regulatory requirements. A Phase One Environmental Site Assessment should be performed for each project, especially in areas where there is a potential for hazardous waste sites to be discovered and/or where construction is proposed.

A.4 Historical, Architectural, Archaeological, and Cultural Resources

Legislation

The National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would impact the historical, architectural, archaeological, or cultural resources.

Regulatory Agencies

The Department of State, Division of Historical Resources is responsible for preserving the historical, archaeological, museum, and folk culture resources in Florida.

Existing Conditions

The National Park Service's National Register Information System database contains records of documented historic and archaeological resources listed on the National Register of Historic Places (NRHP). A review of the NRHP database and a Phase I Cultural Resources Assessment

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[3] USEPA, NEPAssist, http://nepassisttool.epa.gov/nepassist/nepamap.aspx?wherestr=3300+Capital+Cir+SW%2C+Tallahassee%2C+FL+32310 (April 6, 2016).
[4] USEPA, Categories of Hazardous Waste Generators http://www.epa.gov/hwgenerators/categories-hazardous-waste-generators (April 6, 2016).
[5] http://webapps.dep.state.fl.us/DepClnup/welcome.do (April 7, 2016)

Survey (CRAS) for the Airport from a previous project[1] indicated that there are no NRHP listed cultural, historical, or archaeological resources within the airport property. The CRAS report identified the Springhill Railroad Tramline, which has previously been recommended by the State Historic Preservation Office (SHPO), as eligible for listing on the NRHP. This railroad corridor lies parallel to, and just outside of, a segment of the southernmost portion of the airport's property and crosses the eastern end of the airport's property. However, previous surveyors have reported that the portions of the tramline corridor that run adjacent to lack historic integrity due to past disturbance and alteration and are no longer contributing to the eligibility of the resource as a whole. After reviewing aerial photography the portion of the corridor that passes through the eastern end of the airport's property appears to no longer hold historical contribution to the resource due to mowing and maintenance of the airfield. Projects completed prior to the development of this Master Plan Update were determined to have no impact to archaeological or historical resources. Undocumented resources may be present in project areas that have not been subjected to previous disturbance.

Potential Impacts

Proposed projects that are located in previously undisturbed areas have the potential to impact cultural resources.

Recommendations

A Phase One Cultural Resources Assessment Survey should be performed for each project, especially in areas where there is a potential for archaeological artifacts to be discovered and/or where excavation is proposed.

A.5 Water Resources

Surface Waters and Groundwater

Legislation

The Federal Water Pollution Control Act, as amended by the Clean Water Act provides the authority to establish water control standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredged and filled materials into surface waters. The Fish and Wildlife Coordination Act requires consultation with the United States Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FFWCC) when any alteration and/or impounding of water resources is expected. Section 402 of the Clean Water Act created the Federal National Pollution Discharge Elimination System (NPDES) permitting program and provided regulations that govern the quality of stormwater discharges into water resources of the United States.

City of Tallahassee Ordinance 04-O-73AA (Land Development Ordinance) subjects all property within the corporate limits of the City to the provisions of Chapter 5, Environmental Management,

[1] SEARCH, *Phase 1 Cutlural Resources Survey for Tallahassee International Airport*, March 2016

which are enforced by the City's Growth Management Department and include natural resources and stormwater features.

Regulatory Agencies

The United States Army Corps of Engineers (COE), the Florida Department of Environmental Protection (FDEP), and the Water Management Districts (WMDs) have jurisdiction over and regulate activities that alter, or disrupt water flow to, wetland areas and surface waters through the Environmental Resource Permitting (ERP) Program in Florida. The program authorizes the WMD to receive ERP applications and forward permit application copies to other state and federal agencies including FFWCC and USFWS. In Leon County, where the Airport is located, the Northwest Florida Water Management District administers the ERP program. Permitting requirements for construction projects that disturb more than one acre are specified by NPDES and administered by the FDEP. Therefore, proposed improvement projects at the airport may require an NPDES permit, a state ERP, and City of Tallahassee permit prior to construction when jurisdictional wetlands and surface waters will be impacted or when more than one acre of ground disturbance will occur. Under the NPDES permit, stormwater runoff has to be treated prior to discharge to any waterbody.

Existing Conditions

The airport has an NPDES Multi-Sector General Permit Multi-Sector Generic Permit, a Stormwater Pollution Prevention Plan, and stormwater management system that consists of a stormwater conveyance system that drains to several dry retention ponds.

Potential Impacts

The projects proposed in this Master Plan would most likely result in an increase in impervious surface at the Airport and therefore would result in less infiltration of precipitation and increased stormwater runoff. These impacts would require mitigation through construction of existing stormwater treatment facilities or modification of existing stormwater treatment facilities. Short-term water quality impacts may also occur as a result of construction activities associated with the proposed projects.

Recommendations

It is recommended that coordination with the City of Tallahassee, FDEP, and NWFWMD be completed during the environmental review phases of each project for the development of the airport to determine the potential to reduce or minimize water quality, water quantity and environmental impacts.

Wetlands

Legislation

Executive Order 11990, Protection of Wetlands, mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance their natural values. This Executive Order and the permitting requirement of the Clean Water Act Section 404 requires a permit for impacts to Waters of the United States.

The City of Tallahassee Land Development Ordinance provides the Tallahassee Growth Management Department with the authority to regulate activities within City jurisdictional wetlands.

Regulatory Agencies

The COE, FDEP, and NWFWMD have jurisdiction over and regulate activities that impact and disrupt water flow to wetland areas and surface waters through the ERP Program in Northwest Florida. Therefore, proposed airport improvement projects that would impact jurisdictional wetlands or surface waters would require a Section 404 permit and a state ERP prior to construction.

As part of the permitting process, compensatory mitigation for unavoidable wetland impacts would be required. At a minimum, mitigation must meet the requirements of the COE and FDEP. However, the City of Tallahassee may determine that additional mitigation would be necessary in order to satisfy the requirements of the city's environmental permit.

Existing Conditions

Available GIS maps and literature were reviewed to determine the types of wetland systems that have been previously documented within the project study area. Data sources used in this evaluation included:

- USFWS National Wetlands Inventory (NWI) maps (2014);
- FLUCFCS maps (NWFWMD 1999); and,
- Project aerial photography;

The FLUCFCS map data indicates that there are wetlands within the project area. Three wetland types were identified using the above resources, they are classified according to FLUCFCS and listed below:

- Wetland Forested Mixed (6300)
- Mixed Scrub-shrub Wetland (6460) and
- Non-vegetated Wetlands (6500)

Potential Impacts

Early in the site selection and site layout phases of new projects at the Airport, **Figure A-2,** the FLUCFCS Map, and other available wetland mapping should be reviewed to identify potential wetlands in the area of construction. In addition, any potential wetland areas within the site boundary should be surveyed and delineated for clarification.

Recommendation

It is recommended that the limits and quality of the wetlands be determined during the EA or EIS of each project to determine the necessary mitigation to meet regulatory requirements.

Floodplains

Legislation

Executive Order 11988, "Floodplain Management" defines floodplains as lowland areas adjoining inland and coastal waters, especially those areas subject to one percent or greater chance of flooding in any given year.

Regulatory Agencies

The Federal Emergency Management Agency (FEMA) has produced Flood Insurance Rate Maps (FIRMs) for communities participating in the National Flood Insurance Program. These maps detail the 100-year and 500-year base flood elevations. The State of Florida administers and requires compensation for floodplain impacts through the Environmental Resource Permitting process in closed basins. The airport is within the jurisdiction of NWFWMD.

Existing Conditions

A review of FIRM mapping indicates that majority of the airport is not within the FEMA designated 100- or 500-year floodplain. The wetland located on northern most portion of the airport, at the end of Runway 18 is within the 100-year floodplain (**Figure A-3**).

Potential Impacts

Construction within the FEMA designated 100-year floodplain would require one for one flood storage compensation to avoid flooding on adjacent property.

Recommendations

It is recommended that potential floodplain impacts be re-evaluated during the EA or EIS of each project to ensure consistency with FEMA regulatory requirements.

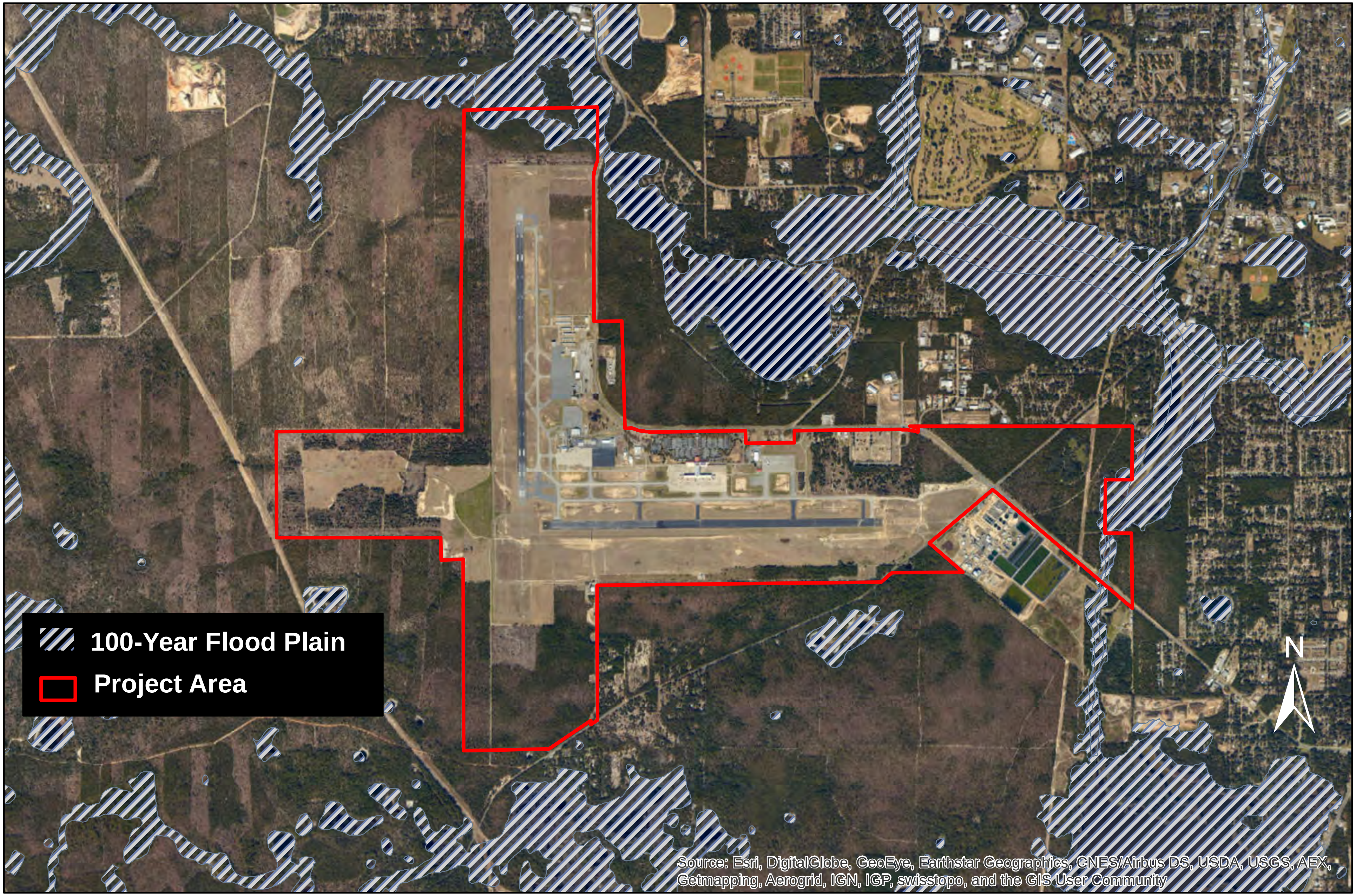

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Figure A-3 FEMA 100-Year Floodplains