CARRABELLE
AIRPORT

Airport Master Plan Update

JUNE 2020

Contents

1 Introduction

The City of Carrabelle has prepared the first Carrabelle Airport Master Plan using grant funds from the Florida Department of Transportation (FDOT). The purpose of this plan is to provide a comprehensive framework for safe, efficient, and environmentally compatible airport development that meets the needs and objectives of the City, Airport users and tenants, and the surrounding Airport service area. This comprehensive planning guide helps ensure the Airport meets State and Federal standards in a cost-effective manner and provides a basis for continued State investment. The City developed the Master Plan in coordination with Federal and State agencies, local officials, and interested Airport users and stakeholders. The Master Plan considers Airport needs over a 20-year planning period, including a short-term horizon (5 years), an intermediate horizon (10 years), and a long-term horizon (20 years).

This Master Plan evaluates the Airport's capabilities and role, forecasts future aviation demand, and plans for the timely development of new facilities to meet anticipated demand. In this way, the Master Plan is a proactive document that identifies a plan to accommodate future facility needs in advance of the actual need. This ensures the City can coordinate project approvals, design, finance, and construction in a timely manner.

1.1 Vision

The City of Carrabelle envisions the Airport as a general aviation facility that supports the aviation needs of the region. Located in Franklin County on the Gulf Coast, the Airport provides access to small communities and remote areas. Airport users range from recreational pilots to the Florida Forestry Service.

1.2 Master Plan Goals and Objectives

The primary objective of the Master Plan is to develop a long-term development program that satisfies aviation demand and is compatible with the surrounding area. To accomplish this objective, the City must evaluate existing facilities and future demand to determine what actions are necessary to maintain safe, adequate, and reliable airport facilities. Specific objectives of the Master Plan include:

- **Provide a foundation and justification for acceptance into the Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems (NPIAS)**. The NPIAS identifies existing and proposed new airports to serve commercial and general aviation needs. An airport must meet the following criteria to be considered for inclusion in the NPIAS:
    - Is included in the current State Airport System Plan, accepted by FAA
    - Have at least 10 based aircraft
    - Serves a community not located within 20 miles of another NPIAS airport
- **Identify and understand current operations and activity at the Airport.**
    - Facilities should meet operational needs at the Airport

- **Examine factors likely to affect aviation demand.**
    - Factors considered include current and expected population and economic growth
- **Anticipate a plan for future use of the Airport.**
    - Determine current and projected needs of Airport users
    - Plan to provide necessary facilities to fulfill the Airport's role in the local, regional, state, and national transportation system
    - Reflect the goals and vision of the surrounding area, especially those related to quality of life, business and development, and land use
- **Evaluate development alternatives.**
    - Remain compliant with State and Federal regulations
    - Ensure compliance with Americans with Disabilities Act (ADA) guidance
    - Identify environmental concerns that may impact development
    - Enhance safety at the Airport
    - Prioritize development needs
- **Improve the financial self-sufficiency at the Airport.**
    - Develop a financial program from development implementation
    - Analyze funding sources

1.3 Baseline Assumptions

Baseline assumptions used throughout the preparation of the Master Plan include:

- Carrabelle Airport will continue to be operated as general aviation airport through the planning period.
- The Airport will continue to seek general aviation-based tenants and transient operations.
- The Florida Forestry Service will continue to utilize the Airport while conducting prescribed burns.
- Both State and Federal aviation programs will be in place through the planning period to assist in funding future capital development needs.

1.4 Public Involvement

Throughout the life of the development of this master plan, a comprehensive public involvement program was implemented to ensure that the findings and recommendations of the master plan were in accordance with local requirements. The following were completed as part of the public involvement program for this master plan:

- **Project Review Committee and Advisory Board Meetings** – A Project Review Committee (PRC) was established to serve as a non-voting body to provide stakeholder input and advise the City and

airport staff on content and recommendations for the master plan through meetings and review of the interim working papers. The PRC also served as an information conduit to the PRC member's respective constituencies. PRC membership was coordinated and confirmed with the City. In addition to the Aviation Advisory Board's representation on the PRC, the master plan met with the Board separately to brief them on the Study findings and solicit input. These briefings were held at key points in the Study. Meetings with the PRC and advisory board were held on the following dates:

- 5/14/2018
- 2/27/2019
- 10/1/2019
- 2/3/2020

- **City Commission Workshop and Public Open House** – The City Commission was presented to at the beginning and end of the planning effort. These meetings were meant to present on the master plan to the City Commission in support of the City's adoption/approval of the MP. Additionally, the master plan was presented at public workshops and industry events throughout the life of the project. These events included Carrabelle Aviation Safety Day as well as standalone public workshops that were presented in an 'open house' format to allow for public comment. Meetings with the City Commission and Public Outreach were held on the following dates:
  - 5/12/2018
  - 9/6/2018
  - 5/28/2020

2 Inventory

The first step of the planning process is to develop a thorough inventory of an airport's existing conditions. This inventory summarizes airport facilities and related information to establish a baseline for the evaluation of future needs. Data sources include: site visits; stakeholder interviews; Federal Aviation Administration (FAA) data; and existing plans, documents, and studies. The Inventory chapter is organized as follows:

- Existing reports and studies
- Airport ownership and history
- Airport location and access
- Airport role
- Airport activity
- Airport facilities
- Air traffic, airspace structure, and approach capability
- Climate and meteorological conditions
- Socioeconomic data
- Land use and zoning
- Environmental conditions
- Recycling practices
- Financial data

2.1 Existing Reports and Studies

The following studies provide historical context to the Master Plan:

- Airport Layout Plan and Narrative, 2009
- Airport Capital Improvement Plan, 2017
- Carrabelle Airport Pavement Management Report, 2017
- Carrabelle Airport Security Assessment, 2012
- City of Carrabelle 2020 Comprehensive Plan
- Charting the Course for the Carrabelle Waterfront, Vision and Implementation Plan, 2008
- Florida Department of Transportation 5-Year Work Program

Analysts reviewed relevant information, and this report presents findings where appropriate. When referenced, source information is provided.

2.2 Airport Ownership and History

The City of Carrabelle owns and operates Carrabelle Airport. The Carrabelle Aviation Advisory Board (Advisory Board) oversees Airport activities. A Chair, Vice Chair, and three members comprise the Advisory Board. The City Administrator serves as the Airport Manager, while the Advisory Board Chair handles day-to-day activities at the Airport. The Advisory Board meets regularly to review the Airport's operational and financial data. The Airport Manager maintains the Capital Improvement Plan (CIP) in coordination with the Advisory Board.

In 1943, the United States Army Corps of Engineers built the Carrabelle Airport as an auxiliary landing field, then known as Carrabelle Flight Strip. The City of Carrabelle obtained ownership after World War II, and the public use airport now serves the general aviation needs of the region.

2.3 Airport Location and Access

Carrabelle Airport is located three miles west of the City of Carrabelle's central business district, near the Carrabelle River. The Airport is 20 feet above mean sea level. Highway 98 is the main road providing access to the Airport, via Airport Road (Figure 2.1.). Highway 98 connects the Airport to the City of Carrabelle and Franklin County. U.S. 319 connects to Highway 98, providing access to the City of Tallahassee.

Figure 2.1. Regional Airport Map

Sources: ESRI, Florida Department of Transportation, and Florida Geographic Data Library

2.4 Airport Role

Airports serve many functions and provide several community and economic benefits. An important aspect of this master planning effort is to ensure that Carrabelle Airport has the necessary facilities to adequately support the various roles that it may play in the national, state, and regional air transportation systems. The Federal Aviation Administration (FAA) and Florida Department of

Transportation (FDOT) have transportation system plans that classify airports based on their facilities and markets served. Carrabelle Airport's role in the local/regional market is influenced by: nearby airports, the City's ability to respond to market demands, and users' operational needs. The following describes the various system roles and classifications of Carrabelle Airport.

Carrabelle Airport is currently not included in the FAA's National Plan of Integrated Airport Systems (NPIAS). However, the Airport is seeking entry into the NPIAS as a Basic general aviation airport. The master planning process sets the stage for potential entry to NPIAS by demonstrating that the Airport meets minimum NPIAS entry criteria. A description of the NPIAS and a comparison of Carrabelle Airport to other non-NPIAS and NPIAS airports follows.

2.4.1 National Plan of Integrated Airport Systems

The FAA's NPIAS identifies airports that are important to the national air transportation system. The FAA uses the NPIAS to manage and administer the Airport Improvement Program (AIP) and support the FAA's strategic goals for safety, system efficiency, and environmental compatibility. The NPIAS classifies airports as one of the following roles within the national system:

- **Primary Commercial Service Airports.** Publicly owned commercial service airports that have more than 10,000 passenger boardings (known as enplanements) each calendar year and receive scheduled passenger service.
- **Nonprimary Commercial Service Airports.** Publicly owned commercial service airports that have at least 2,500 and not more than 10,000 passenger boardings each year.
- **Reliever Airports.** Airports designated by the FAA to relieve congestion at commercial service airports and to provide improved general aviation access to the overall community. These may be publicly or privately owned.
- **General Aviation Airports.** Airports included in the national system that are not categorized as commercial service or reliever airports are referred to as general aviation. Airports can be publicly or privately owned.

Recognizing the unique roles played by general aviation airports throughout the U.S., the FAA published a report titled *General Aviation Airports: A National Asset (ASSET)* in May 2012. The report documented the importance of the general aviation system and further categorized general aviation airports included in the NPIAS based on their general level of activity and operational characteristics. Figure 2.2 presents ASSET categories and criteria.

2.4.1.1 COMPARISON WITH PUBLIC USE NON-NPIAS AND BASIC NPIAS AIRPORTS

As previously mentioned, Carrabelle Airport is seeking entry into the FAA's NPIAS. Figure 2.3 provides a comparison of Carrabelle Airport to similar Public Use, Non-NPIAS and Basic NPIAS airports in Florida.

Figure 2.2. ASSET Airport Categories and Criteria

ASSET Category (number of NPIAS airports)	Criteria (meets one of the minimum criteria for annual activity)
National (88): Supports national and state system by providing communities with access to national and international markets in multiple states and throughout the U.S.	• 5,000+ instrument operations, 11+ based jets and 20+ international flights or 500+ interstate departures; or • 10,000+ enplanements and at least 1 enplanement by a large certificate air carrier; or • 500+ million pounds of landed cargo
Regional (492): Supports regional economies connecting communities to statewide and interstate markets	• In an MSA, 10+ domestic flights of 500 miles, 1,000+ instrument ops, and 1+ based jet or 100+ based aircraft; or • The Airport is in an MSA and the Airport meets the definition of commercial service
Local (1,278): Supplements local communities by providing access to intrastate and some interstate markets	• Publicly owned and 10+ instrument operations and 15+ based aircraft; or • Publicly owned and 2,500+ annual enplanements
Basic (840): Provides basic aeronautical needs in local economy	• Publicly owned with 10+ based aircraft (or 4+ based helicopters if a heliport); or • Publicly owned and located 30+ miles from nearest NPIAS airport; or • Identified and used by U.S. Forest Service, U.S. Marshall Services, U.S. Customs and Border Protection, or U.S. Postal Service or provides Essential Air Service; or • Publicly owned new or replacement airport that has opened since January 1, 2001; and • Is designated a reliever with 90+ based aircraft • Unique circumstances related to special aeronautical use

Source: Federal Aviation Administration, General Aviation Airports: A National Asset (ASSET). May 2012.

Figure 2.3. Airport Comparison Summary

Characteristic	Carrabelle Airport	Pierson Airport	Buchan Airport	Belle Glade Airport	Umatilla Airport
NPIAS Category	Public Use, Non-NPIAS	Public Use, Non-NPIAS	Public Use, Non-NPIAS	Basic NPIAS	Basic NPIAS
Proximity to Nearest NPIAS Airport (miles)	21 (AAF)	17 (DED)	7 (VNC)	7 (PHK)	12 (LEE)
Runway	Paved	Grass	Grass	Paved	Paved
Based Aircraft (2019)	14	21	8	11	25
Operations (2019)	4,261	14,040	2,701	1,800	5,000
Fuel	100LL (AvGas)	-	-	-	100LL (AvGas)
Special Uses	Military training; Forest Service; emergency medical	Local law enforcement; emergency medical	Military training	Local law enforcement	Florida Air National Guard

Source: 5010 Master Record, AirportIQ

As shown in Figure 2.3, compared to the other airports, Carrabelle Airport: (1) is the furthest from other NPIAS airports; (2) one of two airports that provides fuel; (3) has more based aircraft than the two Basic NPIAS airports; and (4) accommodated more annual operations than Belle Glade Airport.

2.4.2 Florida Aviation System Plan

The Florida Aviation System Plan (FASP) is a long-term strategic plan that comprehensively assesses Florida's Aviation System to understand relationships between facilities and users, and evaluates the existing systems ability to accommodate current and anticipated future demand. This helps the Florida Department of Transportation (FDOT) implement strategic plans, policies, and priorities that enhance the Florida Aviation System. The System includes all existing public-use airports that are owned and operated within the State and those public-use airports which will be developed and made operational in the future.

The FASP classifies Carrabelle Airport as a publicly-owned, public-use airport. Publicly-owned, public-use airports are owned by Counties, municipalities, or a special district (i.e., airport authority). Many of these facilities were originally military installations that the U.S. government transferred to local agencies. Many of these airport sponsors have accepted state and/or federal grant funding for new construction, maintenance, or other airport improvements. The acceptance and use of these grants come with certain assurances, one of which requires that the Airport to be used as an airport for a specified duration as determined by the Federal Aviation Administration (FAA), typically 20 years after the acceptance and use of grant funding.

2.5 Airport Activity

The following is a brief description of the historical activity at Carrabelle Airport, including aircraft operations and based aircraft. Historical activity data can facilitate the identification of trends that may impact future activity.

Since Carrabelle Airport is not in the National Plan of Integrated Airport Systems (NPIAS), the Airport is not included in the Federal Aviation Administration's (FAA's) Terminal Area Forecast (TAF), the FAA's

official forecast of aviation activity for U.S. airports, which also includes historical data. It is worth noting that all non-towered airports like Carrabelle (both NPIAS and non-NPIAS) can only estimate annual operations and TAF represents these estimates. Additionally, the Airport does not have a previous Master Plan with historical data, nor did past management record such information. Historical data provided herein is based on the data in the Florida Aviation Database (FAD) and airport management information. Since the Airport does not include an airport traffic control tower (ATCT), it is difficult to estimate a precise count and categorization of historical aircraft operations. Because historical data is limited, it is not accurate to estimate a breakdown of operations by aircraft type.

2.5.1 Aircraft Operations

A common measure of airport activity is the annual number of aircraft operations. An aircraft operation is either a departure or an arrival (also referred to as a take-off or landing, respectively). A touch-and-go operation, where an aircraft lands and takes-off without exiting the active runway, counts as two operations.

There are several ways to categorize aircraft operations; one of which is whether the operation is *itinerant* or *local* in nature. Itinerant operations are those conducted by aircraft arriving from, or departing to, an area beyond the Airport's local traffic pattern. Local operations are those conducted within the local traffic pattern. Touch-and-go training is an example of local activity, if the training originates from the Airport.

Once categorized as itinerant or local operations, the nature of the operator further categorizes aircraft activity. Itinerant (transient) aircraft operations are categorized into one of the following groups: air carrier, air taxi, general aviation, or military. Local operations are categorized as either general aviation or military.

With no air traffic control, it is difficult to determine a precise count and categorization of aircraft operations. Like most non-towered general aviation airports, Carrabelle Airport must rely on activity estimates from the FAA, Florida Department of Transportation (FDOT), and airport management. These estimates reflect an opinion of activity, but actual annual counts are not available. Figure 2.4 summarizes historical estimates of airport operations from the Florida Aviation Database (FAD), dating back to 2010.

Figure 2.4. Historical Aircraft Operations

Year	Itinerant Operations			Local Operations	Total Operations
	Air Taxi	General Aviation	Military	General Aviation	
2010	0	358	130	36	524
2011	0	358	130	36	524
2012	0	358	130	36	524
2013	0	358	130	36	524
2014	0	358	130	36	524
2015	0	358	130	36	524
2016	0	359	131	37	527
2017	0	360	132	37	529
2018	0	361	133	38	532
2019	0	362	134	39	535

Source: Florida Aviation Database, 2010-2019

However, airport management confirmed the operations reported by AirportIQ 5010, Airport Master Records and Reports[1] for 2019 more accurately reflect aviation activity when compared to FAD data:

- Itinerant General Aviation: 3,130
- Itinerant Military: 1,095
- Local General Aviation: 36
- Total operations: 4,261

Using data from FAA's Traffic Flow Management System Counts (TFMSC) database, the breakdown of operations by aircraft type for 2018 (the most recent full-year of data), can be determined. It is worth noting that data from the TFMSC only recognizes filed flight plans which can include both Visual Flight Rules (VFRs) and Instrument Flight Rules (IFRs) flights, but typically represents more IFR activity. As shown in Figure 2.5, piston aircraft comprise the majority of operations at Carrabelle Airport.

Figure 2.5. Operations from 2014-2018 by Physical Class

Aircraft Type	Total
Unknown	21
Jet	14
Piston	482
Turbine	44
Grand Total	**561**

Source: FAA Traffic Flow Management System Counts Database

[1] *The airport data accessible via www.gcr1.com/5010web/ is a service provided by GCR Inc. (GCR) and is structured in accordance with the Federal Aviation Administration's (FAA) Airport Master Record Forms (5010-1 & 5010-2). The data displayed is derived from the FAA's Aeronautical Information Services. The date of the data set matches the date of the most recent Airport Facilities Directory (AFD).*

2.5.2 Based Aircraft

The FAA defines a based aircraft as "an aircraft that is operational and airworthy, which is typically based" at an airport "for a majority of the year." Pilots store based aircraft in a hangar facility or tied down on an apron. The number and types of based aircraft at an airport typically fluctuate as aircraft owners relocate and/or change the type of aircraft they own.

Figure 2.6 summarizes based aircraft since 2010, sourced from the FAA's Form 5010, the Florida Aviation Database, and airport management.

Figure 2.6. Historical Based Aircraft

Year	Single Engine	Twin Engine	Helo
2010	5	0	0
2011	5	0	0
2012	6	0	0
2013	6	0	0
2014	7	0	0
2015	7	0	0
2016	8	0	0
2017	8	0	0
2018*	10	0	0
2019*	12	1	1

*Source: Florida Aviation Database, 2010-2017; *Airport Management, 2018-2019*

2.6 Airport Facilities

A site visit and follow up with airport management identified all airport facilities discussed herein. Most airport facilities can be grouped as airfield facilities and general aviation (landside) facilities. All facilities examined include:

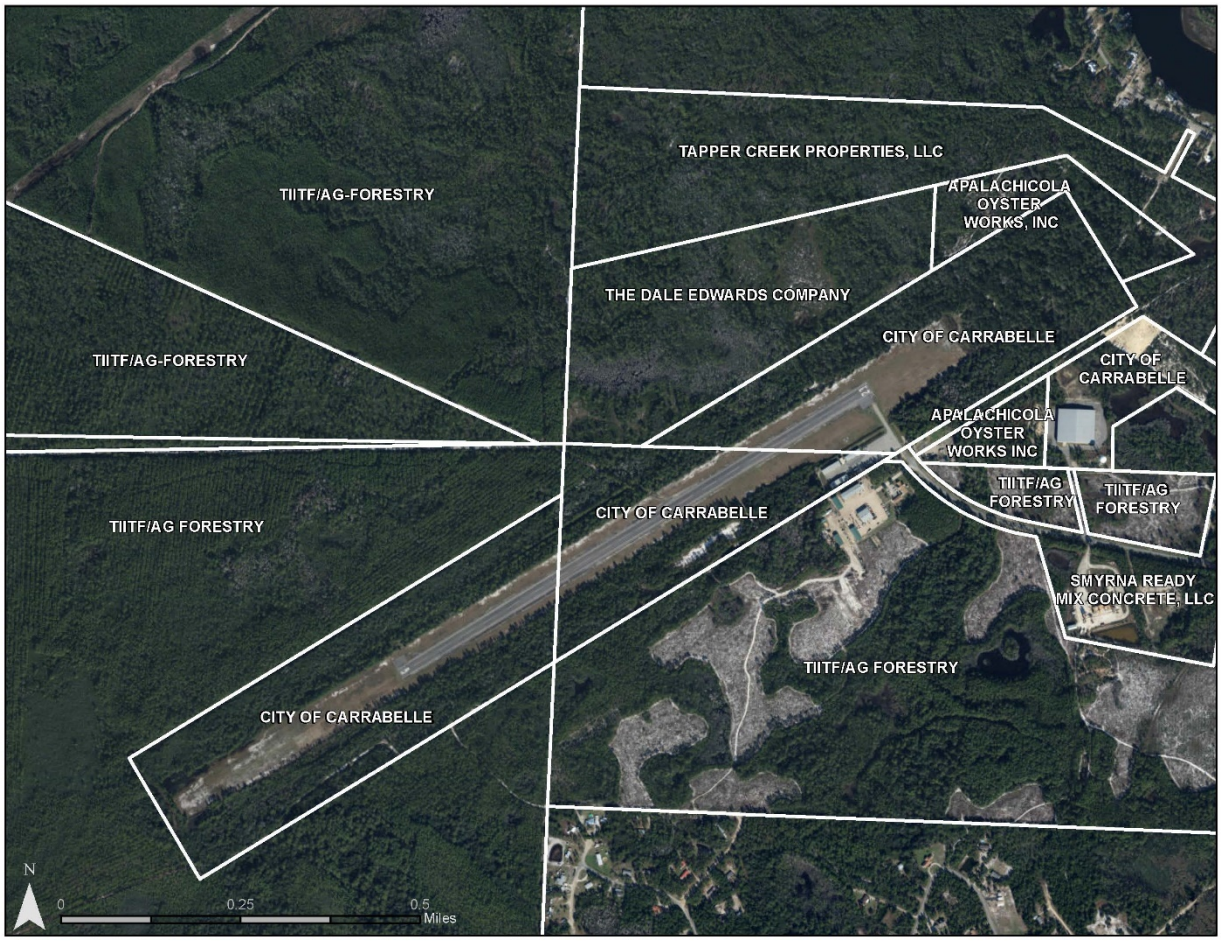
- **Land holdings**. Airport property
- **Airfield facilities**. Accommodate movement of aircraft
  - Runway
  - Taxiway
  - Apron
  - Visual and navigational aids
- **General aviation facilities**. Landside facilities that support aircraft and pilots
  - Storage (hangars and tie-downs)
  - Fuel
  - Terminal
  - Services
- **Ancillary/support facilities.** Ensure the Airport can operate properly
- **Utilities.** Providers at the Airport
- **Vehicle access, circulation, and parking.** Airport accessibility
- **Fencing and access.** Airport security

The inventory categories above comprise important components of airport infrastructure. Each component must provide sufficient capacity while also seamlessly integrating with other infrastructure components for the Airport to operate efficiently, meet operational needs, and accommodate future demand.

2.6.1.1 LAND HOLDINGS

Several property owners surround Carrabelle Airport (see Figure 2.7.). Tate's Hell State Forest (TIIF/AG Forestry), owned by the State of Florida, is adjacent to the western portion of the Airport. Four private property owners are adjacent to the eastern portion of the Airport. The City of Carrabelle owns 212 acres on which all airport facilities are located.

Figure 2.7. Property Map and Land Holdings

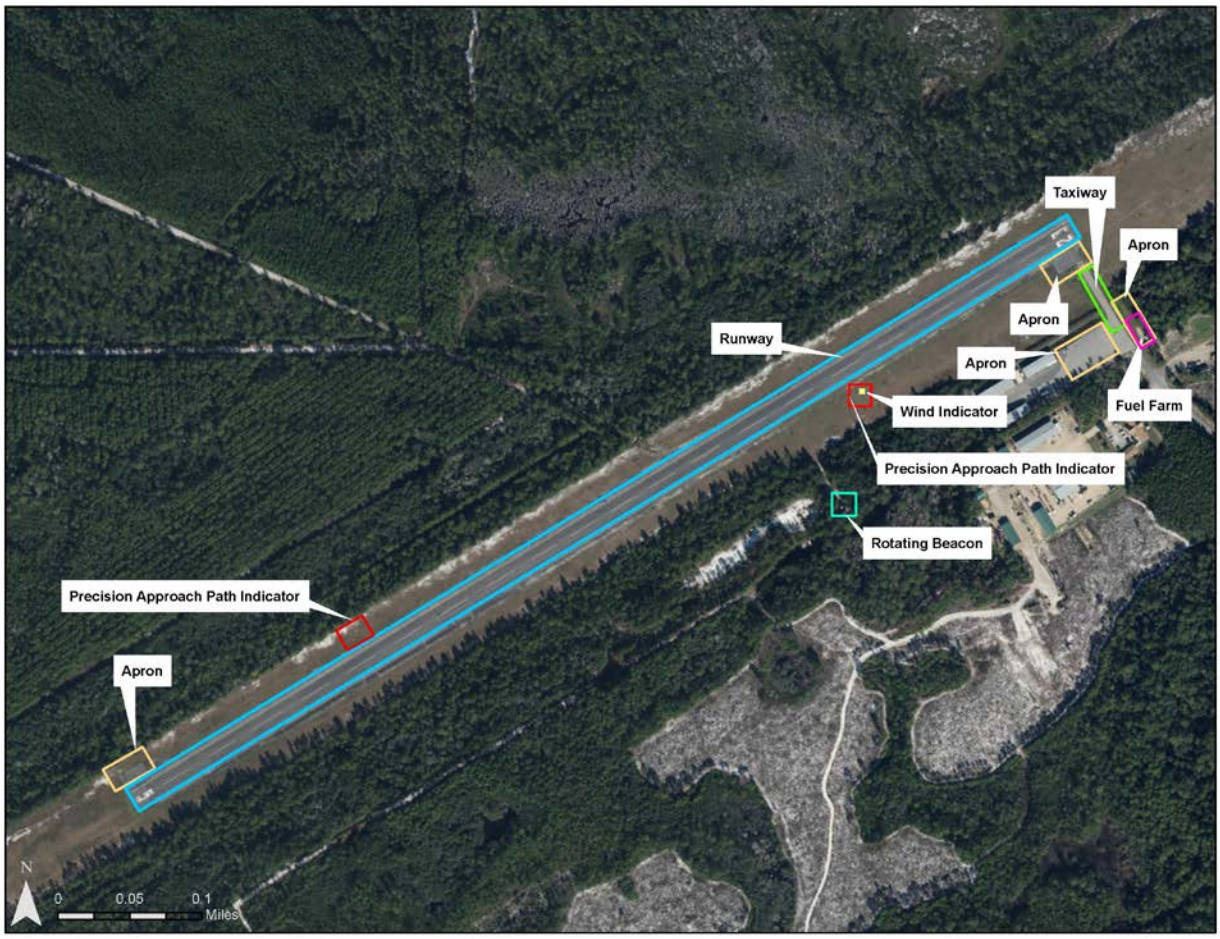


Source: Franklin County Property Appraiser

2.6.1.2 AIRFIELD FACILITIES

Airfield facilities accommodate the takeoff and landing of aircraft and the movement of those aircraft about the Airport. Facilities include: runways, taxiways, aprons, fencing and access, airfield lighting, visual and navigational aids, and marking and signage. The following describes these facilities, as displayed in Figure 2.8.

Figure 2.8. Airfield Facilities



Source: Kimley-Horn, 2019

2.6.1.2.1 Runway

The Airport's single Runway 05-23 is comprised of asphalt and is 4,039 feet long by 75 feet wide. Pavement markings are in fair condition and include a centerline, edge marking, and runway designation numbers (Figure 2.11). The maximum gross weight allowed is 12,500 pounds, single wheel. The Pavement Condition Index (PCI) is 58, and the condition rating is fair. The PCI is below Florida Department of Transportation's (FDOT's) recommended PCI of 75, and maintenance has not occurred since an overlay in 1991. The runway has medium intensity runway edge lights (MIRLs), and both ends of the runway have runway end identifier lights (REILs) (Figure 2.12 and Figure 6). A runway sign is located on the Runway 23 end. Figure 2.9 summarizes runway data.

Figure 2.9. Runway Data

Characteristic	Runway 05-23
Pavement marking / condition	- Centerline, edge marking, and runway designation numbers - fair
Pavement strength / condition	- 12,500 lbs - PCI: 58
Lighting	- MIRL - REIL

Source: Airport Management, 2019

FAA Advisory Circular (AC) 150/5335-5C defines the PCN as "a number that expresses the load carrying capacity of a pavement for unrestricted operations." As of March 2018, the Pavement Condition Number (PCN) is 9/F/B/Y/T. Each item represents: PCN # / Pavement Type / Subgrade Category / Allowable Tire Pressure / Determination Method. Figure 2.10 summarizes options for each item as follows:

Figure 2.10. PCN Items

PCN Number	Pavement Type	Subgrade Strength	Tire Pressure	Determination Method
Numerical Value	R – Rigid	A	W	T – Technical
	F – Flexible	B	X	U – Using Aircraft
		C	Y	
		D	Z	

Source: Florida Department of Transportation, PCN Evaluation Report

Figure 2.11. Runway Markings

Source for Figures 2.11, 2.12, and 2.13: Kimley-Horn, 2019

Figure 2.12. Medium Intensity Runway Edge Lights

Figure 2.13. Runway End Identifier Lights

2.6.1.2.2 Taxiway

A single connector Taxiway A provides access from the Runway 23 end to the aircraft parking apron. Taxiway A is 25 feet wide and has medium intensity taxiway edge lights (MITLs) (Figure 2.15 and Figure 8). No maintenance has occurred since 1995. Thus, the PCI is 49 (below the recommended PCI), and the pavement condition is poor. Pavement markings include a taxiway centerline and threshold bars (Figure 2.14).

Figure 2.14. Taxiway Characteristics

Characteristic	Taxiway A
Width (ft)	25
Pavement marking/ condition	- Centerline and threshold bars - Poor
Lighting	- MITL

Source: Airport Management

Figure 2.15. Taxiway

Figure 2.16. Medium Intensity Taxiway Edge Lights

Source for Figures 2.15 and 2.16: Kimley-Horn, 2019

2.6.1.2.3 Aprons

Airport apron areas serve several purposes, and may be classified by use, activity, or location. Carrabelle Airport has four apron areas (Figure 2.8):

1. **Run-up areas.** A run-up apron is at each end of Runway 05-23. The run-up area provides a space for pilots to perform run-up checks of their aircraft. Both are 100 feet long by 75 feet wide, and

the PCI is 48 and 55, respectively. An overlay occurred in 1991, and pavement is currently in poor condition.

2. **Aircraft parking apron.** The main aircraft parking apron accommodates based aircraft in hangars and tied down transient aircraft. The aircraft parking apron is 390 feet long by 130 feet wide and provides space for eight tie-down positions. The apron has a marked taxi line to ensure safety. No maintenance has occurred since 1995; the PCI is 66, and the pavement condition is fair.
3. **Aircraft parking apron expansion.** Prior to construction of a new hangar, the aircraft parking apron area was expanded in 2004. The additional area is 144 feet long by 80 feet wide. The PCI is 59, and pavement is in fair condition.
4. **Fuel apron.** Constructed in 2016, this apron provides space to accommodate aircraft using the new self-service fuel system.

2.6.1.2.4 Visual and Navigational Aids (NAVAIDS)

NAVAIDS assist pilots locate an airport and safely maneuver aircraft through landing and take-off in varying meteorological conditions, as well as support the control and movement of aircraft on the airfield. NAVAIDS are any visual or electronic device, airborne or on the ground, that provide point-to-point guidance, position information, or operational data to aircraft in flight. Carrabelle Airport has the following NAVAIDS:

- Runway sign located south of Runway 23 end (Figure 2.17)
- Two Precision Approach Path Indicators (PAPIs) at each runway end (Figure 10)
- Wind Indicator located on the south side of the airfield (Figure 2.19)
- Rotating Beacon located on the south side of the airfield (Figure 12)

Figure 2.17. Runway Sign

Figure 2.18. PAPIs on Runway 23

Figure 2.19. Wind Indicator

Figure 2.20. Rotating Beacon

Source for Figures 2.17, 2.18, 2.19, and 2.20: Kimley-Horn, 2019

2.6.1.3 GENERAL AVIATION FACILITIES

General aviation facilities are those outside of the runway/taxiway/apron environment that support aircraft, pilots, and passengers. General aviation facilities include: storage (hangars and tie-downs), fuel, services, terminal, and vehicle access and parking, as depicted in Figure 2.21.

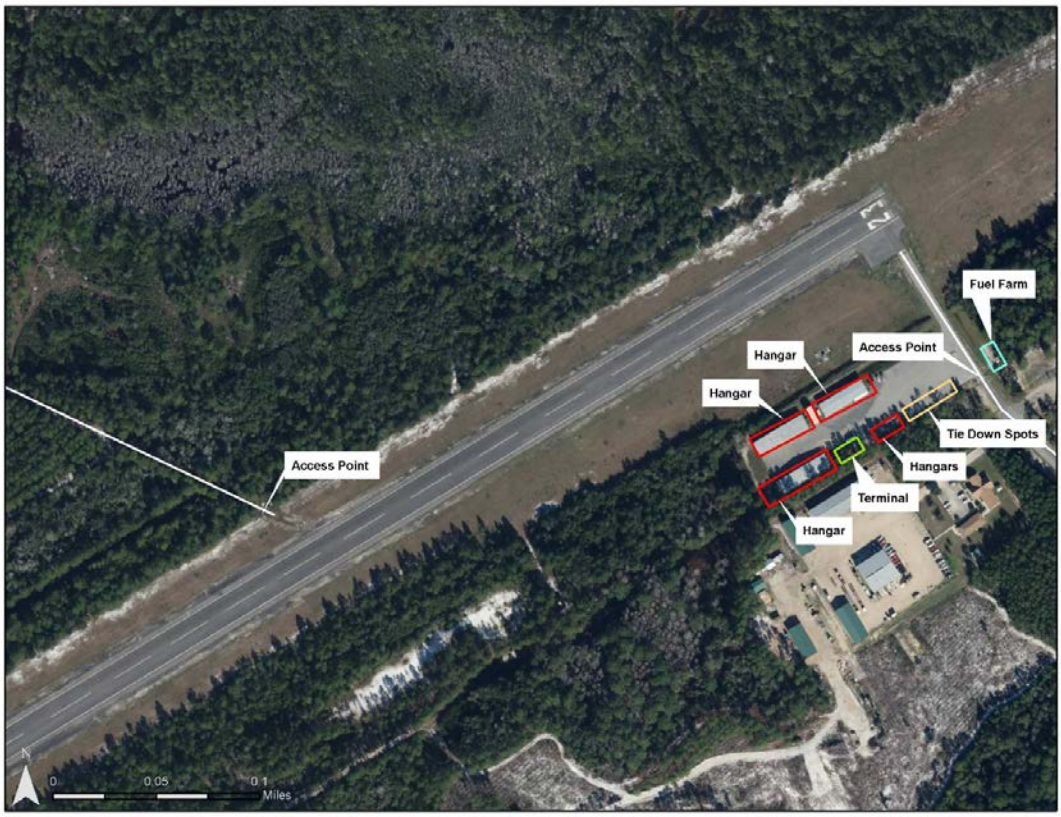


Figure 2.21. General Aviation Facilities
Source: Kimley-Horn

2.6.1.3.1 Storage (Hangars and Tie-Downs)

The Airport has four hangar facilities that are approximately 5,000 square feet each (Figure 2.23 and Figure 2.24); all in good condition. Three of the buildings have three units, and the fourth has two units, for a total of 11 units at the Airport. Units can accommodate multiple aircraft. All units are occupied, and 11 aircraft are on the waitlist (Table 9).

The Airport does not require a down payment to be on the waitlist. The fourth hangar, with two units, was recently completed and is already 100 percent occupied. As previously stated, eight tie-down positions are available on the main aircraft parking apron. The Airport has an additional five tie-down positions in the grass area between the runway and the aircraft parking area.

Figure 2.22. Hangar Waitlist

Number	Initials/Make/Model
1	Cessna 172
2	R
3	N
4	E
5	H
6	OB
7	Cessna 177
8	Cessna 172
9	S
10	Piper PA-28R
11	Cessna 172

Source: Airport Management

Figure 2.23. Hangars

Figure 2.24. Hangars and Tie Downs

Source for Figures 2.23 and 2.24: Kimley-Horn and Carrabelle Airport

2.6.1.3.2 Fuel

The Airport provides 100 Low-Lead (LL) fuel through a 24-hour self-serve fuel pump near the Airport entrance and aircraft parking apron (see Figure 2.21). The system includes a 6,000 gallon above ground tank and the self-service fuel pump. Figure 2.25 summarizes historical fuel sales. Sales increased after 2016 when the new fuel farm was installed.

Figure 2.25. Fuel Sales Summary

Year	AvGas (gallons)	Gross Sales
2014	0.05	$0.28
2015	0.15	$0.85
2016	0.00	$0.00
2017	4,412.90	$17,025.03

Source: Carrabelle Airport

2.6.1.3.3 Terminal

The Airport owned general aviation terminal is adjacent to the aircraft parking apron, between two hangars (Figure 2.26). The terminal was constructed in 2008 and is approximately 200 square feet. The terminal provides space for basic pilot services and flight planning.

Figure 2.26. Terminal Area

Source: Kimley-Horn

2.6.1.3.4 Services

The Airport has no fixed base operator or on airport businesses. However, flight instruction and aircraft maintenance does occur at the Airport. Mobile airframe & powerplant (A&P) mechanics operate occasionally from hangars; and local flight instructors utilize the Airport for flight training. Other activities at the Airport include: charters, air cargo operations, angel flights, agricultural operations, local law enforcement operations, military training and exercises, and general recreational flying. Most operations at Carrabelle Airport are recreational flying.

2.6.1.4 ANCILLARY/SUPPORT FACILITIES

Support facilities are those that ensure the Airport can operate properly. The Airport has equipment to maintain grass; however, there is no maintenance building on site. The Airport also has a low speed vehicle. The fuel farm has a backup generator in case of power loss. The City owns a manufacturing facility adjacent to airport property. This facility provides an opportunity for future aviation uses.

2.6.1.5 UTILITIES

Figure 2.27 summarizes utilities and providers at the Airport.

Figure 2.27. Carrabelle Airport Utilities

Utility	Provider
Electricity	Duke Energy
Potable Water	City of Carrabelle
Sanitary Sewer	Septic Tank (eastside of Terminal)
Solid Waste	Septic Tank (eastside of Terminal)
Telephone	Consolidated
Internet	Consolidated

Source: Airport Management

2.6.1.6 VEHICLE ACCESS, CIRCULATION, AND PARKING

The Airport has two controlled vehicle access points (Figure 2.28). The main access point, on Airport Road, is on the south side of the Airport near the fuel farm and has a gate with an access control system. Though not accessible to the public, a secondary access point is on the northeast side of the Airport, controlled by a padlocked fence. The Airport has no designated parking area; aircraft owners and tenant employees currently park near their hangars in non-designated parking spaces.

Figure 2.28. Vehicle Access

Sources: ESRI, Florida Department of Transportation, and Florida Geographic Data Library

2.6.1.7 FENCING AND ACCESS

FDOT conducted a security assessment at Carrabelle Airport in 2012. This assessment found the Airport needed access control via an electronic gate, additional lighting at the main access point, updated fencing, and documented security procedures. Since 2012, airport management has installed access control, additional lighting, and fencing and documented security protocol as recommended in the security assessment.

The FAA recommends perimeter fencing to promote safety, prevent unauthorized airfield access, protect airport facilities, and deter wildlife from entering aircraft operating areas. The Airport has installed partial chain-link fencing around airport property. A project is currently underway to complete perimeter fencing that will be complete in 2019. Other security measures at the Airport include an access control system to the Airport operating areas and closed-circuit television (CCTV).

2.7 Air Traffic, Airspace Structure, and Approach Capability

The U.S. National Airspace System (NAS) is an integrated collection of controls, procedures, and policies implemented by the Federal Aviation Administration (FAA) to ensure the safe and efficient movement and control of aircraft during flight. The NAS is divided into various airspace classes to designate the level of air traffic control (ATC) service and operating rules for a given area. The following describes the airspace classification, aeronautical chart, approach and departure procedures, traffic patterns and conflicts, and noise abatement measures at Carrabelle Airport.

2.7.1 Airspace Classification

Through Federal Aviation Regulations (FARs), the FAA has developed airspace classifications to promote the safe and efficient movement and control of aircraft during flight and approach/departure procedures. Airspace is generally categorized as controlled, uncontrolled, or special use as defined below:

- **Controlled.** Airspace that is supported by ground-to-air communications, Visual and Navigational Aids (NAVAIDS), and ATC services. Controlled airspace is further divided into five different classes (A thru E). The classification of any airspace is determined by its location.
- **Uncontrolled.** All airspace that has not been designated as controlled or special use and within which an ATC has neither the authority nor the responsibility for control. All uncontrolled airspace is considered Class G.
- **Special Use.** Designated airspace where unique or hazardous situations require special attention and/or impose operating restrictions (e.g., military activities).

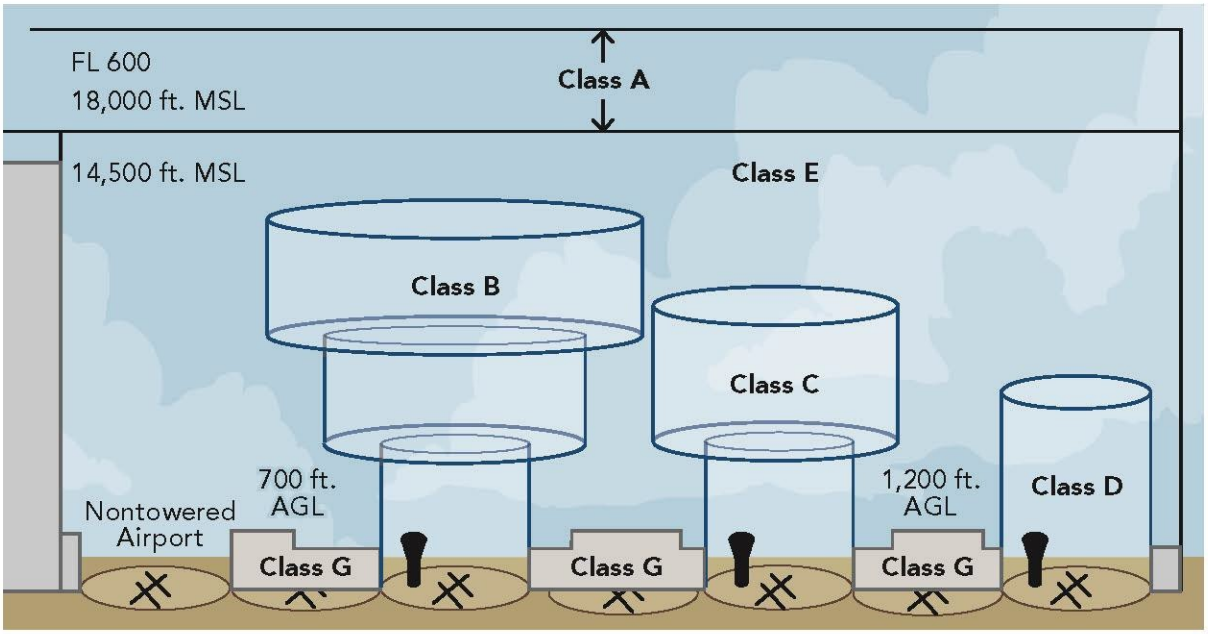
Within these categories, the Federal Aviation Regulations (FARs) Parts 71 and 73 establish specific airspace classifications that impose various requirements upon the operation of aircraft, including visibility minimums, cloud clearance, communication with the ATC, and specific aircraft equipment. The location and dimensions of these classification are based on the Airport and type of activity supported. Figure 2.30 is a visual representation of airspace classifications, and Figure 2.29 summarizes classifications as relevant to Carrabelle Airport. Figure 2.31 is a representation of airspace classifications surrounding Carrabelle Airport.

Figure 2.29. Airspace Classification Summary

Airspace Classification	Definition	Carrabelle Airport
Class A	Class A exists across the entire U.S. beginning at 18,000 feet above mean sea level (MSL) and extends to higher altitudes. FAR Part 71.193 designates this airspace for positive ATC control of aircraft. The Positive Control Area allows flights only operating under Instrument Flight Rules (IFR)[2], with a pilot who has an instrument rating, and prior ATC permission is required.	Class A airspace exists above the Airport but generally does not affect operations.
Class B	Class B airspace is around major airports. Pilots must get permission to enter this airspace from the controlling agency, typically the Terminal Radar Approach Control (TRACON) facility associated with the Airport and region.	Class B airspace does not exist near Carrabelle airport.
Class C	Class C airspace is the airspace from the surface to 4,000 feet above the Airport elevation. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a five-mile radius and an outer circle with a one- mile radius that extends from 1,200 feet to 4,000 feet above the Airport elevation. An aircraft must establish and maintain two-way radio communication with the controlling agency providing ATC services prior to entering the airspace	Class C airspace does not exist near Carrabelle Airport, but surrounds Tallahassee International Airport approximately 45 miles northeast of Carrabelle Airport.
Class D	Class D airspace exists at any airport with an operating ACTC where Class B or Class C airspace does not exist. Class D airspace typically extends five miles from the Airport to an altitude of 2,500 feet AGL. Pilots must establish two-way radio communication with the controlling agency, usually the ATCT, before entering this classification of airspace.	Class D airspace does not exist near Carrabelle airport.
Class E	Generally, if the airspace is not Class A, B, C, or D, and it is controlled airspace, it is class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures.	Class E airspace exists above the Airport but generally does not affect operations.
Class G	Class G airspace is referred to as uncontrolled airspace and is not depicted on aeronautical charts. This classification of airspace comprises all airspace not identified as another class. IFR flights typically do not operate in Class G airspace, as no ATC services are provided. VFR flights are permitted if visibility and cloud clearance minimums are met.	Carrabelle Airport is in Class G airspace.
Restricted Areas	Restricted areas denote the existence of unusual, often invisible, hazards to aircraft; examples include artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization may be extremely hazardous to the aircraft and its occupants.	Carrabelle Airport is near Military Operating Areas (MOAs).

Source: FAA, FARs Parts 71 and 73

[2] *Instrument Flight Rules (IFR) is one of two sets of regulations governing all aspects of aircraft operations. The FAA defines IFR as, "rules and regulations established by the FAA to govern flight under conditions in which flight by outside visual reference is not safe. IFR flight depends upon flying by reference to instruments in the flight deck, and navigation is accomplished by reference to electronic signals." Visual Flight Rules (VFR) are a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going. Specifically, the weather must be better than basic VFR weather minima, i.e. in visual meteorological conditions (VMC), as specified by the FAA. The pilot must be able to operate the aircraft with visual reference to the ground, and by visually avoiding obstructions and other aircraft.*



FL – Flight Level, MSL – Mean Sea Level, AGL – Above Ground Level

Figure 2.30. Graphical Representation of Airspace Classifications
Source: Federal Aviation Administration

Figure 2.31. Airspace Classifications around Carrabelle Airport. ***Class E Space is yellow and Class C space is green; Class G airspace is not depicted on aeronautical charts***

Source: Federal Aviation Administration ADS-B Coverage Map

2.7.2 Aeronautical Chart

The FAA's National Aeronautical Charting Office (NACO) publishes aeronautical charts (or maps) that pilots use to navigate through the National Air System (NAS). These charts are referred to as sectional charts, or sectionals, and provide detailed information on airspace classes, navigation routes and systems, and radio frequencies. They also depict topographical features identifiable from altitude, such as terrain elevations, ground features, and landmarks, that are important to aviators. Figure 2.32 is the sectional chart for Carrabelle Airport. As shown, the Tyndall E and G Military Operating Areas (MOAs) and Warning Areas are near the Airport. The Tyndall E MOA begins at 1500 ft. AGL, directly over the Airport. Warning Areas W-470A, W470-B, W151B, and W151D are directly south of the Airport over the Gulf of Mexico.

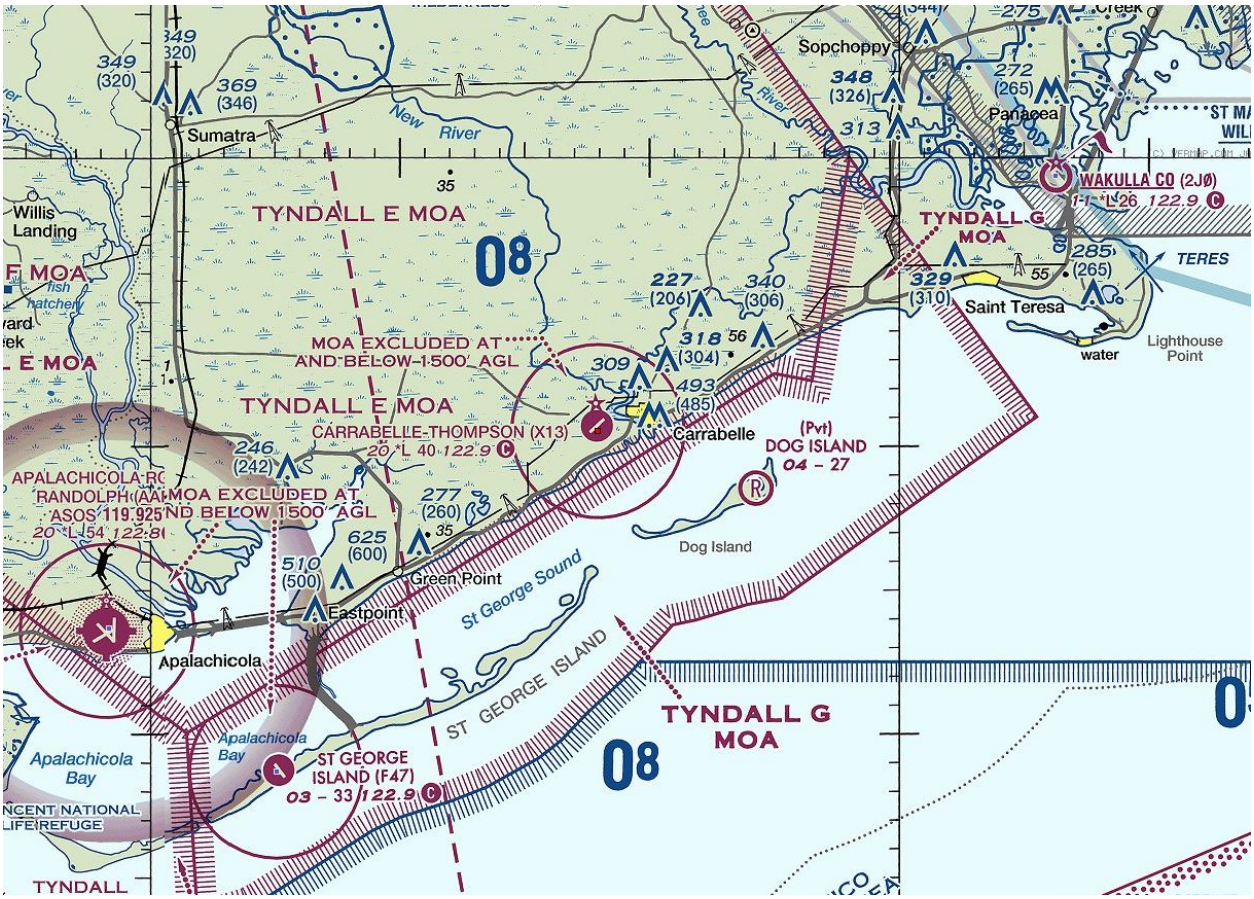


Figure 2.32. Sectional Chart
Source: Federal Aviation Administration, 2017

2.7.3 Approach and Departure Procedures

The ability of an approaching aircraft to land at an airport is predicated on weather conditions, the level of pilot training, the type of navigation equipment in the aircraft and on the ground, and any specific approach procedures established by the FAA. Under Visual Flight Rules (VFRs) conditions, pilots may approach an airport using only visual references to enter the traffic pattern and land. These are basic flight maneuvers that all pilots can perform at all public-use airports. Under Instrument Flight Rules (IFRs) conditions, properly trained pilots with adequately equipped aircraft can follow FAA published instrument approach procedures (IAPs) to land at an airport. An IAP is a series of predetermined maneuvers for guiding an aircraft from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. Carrabelle Airport does not have instrument approach capabilities; therefore, the Airport does not have a published IAP.

2.7.4 Traffic Pattern and Airspace Conflicts

Pilots at Carrabelle Airport follow a left-hand traffic pattern. As previously mentioned, Carrabelle Airport is within the Tyndall E MOA and near several Warning Areas. A MOA is airspace established outside Class A airspace to separate or segregate certain non-hazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. The Tyndall E MOA begins at 1,500 ft. AGL.

Warning Areas W-470A, W470-B, W151B, and W151D are directly south of the Airport over the Gulf of Mexico. A Warning Area is airspace of defined dimensions, (extending from 3 nautical miles outward from the coast of the United States), designated to contain activity that may be hazardous to nonparticipating aircraft. The purpose of a Warning Area is to warn non-participating pilots of the potential danger from activities being conducted.

2.7.5 Noise Abatement Measures

Aircraft noise is generally one of the most prominent concerns for land use around an airport, particularly for neighboring residents. To address this issue, the FAA has adopted a set of noise exposure guidelines to examine the compatibility of land uses in and around an airport relative to existing and projected noise levels. Figure 2.33 summarizes these guidelines and specifies the level of noise exposure considered by the federal government to be acceptable for residential, public, commercial, manufacturing, production and recreational land uses. Development surrounding Carrabelle Airport does not warrant a noise study or noise contours at this time.

Figure 2.33. FAA Noise Exposure Guidelines

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 1 0 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

Source: FAA Environmental Desk Reference for Airport Actions, October 2007

2.8 Climate and Meteorological Conditions

Temperature, wind speed, wind direction, and other meteorological conditions are key factors in the analysis and development of airfield facilities because they directly affect airport operations and aircraft performance. Therefore, these factors should be considered in the planning and design of runway facilities. The sections below summarize key climate and meteorological conditions.

2.8.1 Local Climate

According to the National Oceanic and Atmospheric Administration (NOAA)[3], conditions at the Airport are as follows:

- The average temperature is 68.3° F
- In the hottest month (August), the normal maximum temperature is 89.7° F, and the normal average temperature is 82.6° F
- In the coldest month (December), the normal minimum temperature is 49° F, and the normal average temperature is 66.7° F

2.8.2 Weather Conditions

Ceiling and visibility conditions at and around an airport play a major role in the usage and operational efficiency of its facilities. A ceiling is defined as the height above the ground or water of the base of the lowest layer of clouds covering more than half the sky. Low ceiling and/or poor visibility conditions limit the overall effective usage of an airport.

Seasonal thunderstorms are common throughout Florida, with the average annual precipitation in Apalachicola being 56.52 inches. Thunderstorms often cause poor visibility and low ceilings. During times of poor visibility, pilots must operate under IFR. When poor visibility occurs at Carrabelle Airport, the Airport is not operational because there is no IFR or IAP.

2.8.3 Wind Coverage

Wind speed and direction influence runway use; in turn, influencing airfield capacity and development decisions regarding runway orientation and length. Ideally, a runway is oriented with the prevailing wind, as landing and departing aircraft into the wind provides greater lift. Federal Aviation Administration (FAA) planning standards indicate that an airport should be capable of operating under allowable wind conditions at least 95 percent of the time. The 95 percent wind coverage is based on the crosswind not exceeding the following:

- 10.5 knots (12 mph) for small single-engine and light-twin aircraft
- 13 knots (15 mph) for the larger and heavier turboprop and medium jet type aircraft
- 16 knots (18.4 mph) for the larger corporate jet and narrow-body commercial aircraft

Wind conditions affect aircraft to varying degrees. Generally, the smaller the airplane, the more wind affects it, particularly crosswind components. Larger aircraft have a higher tolerance for crosswind than smaller aircraft due to their size, weight, and operational speed. When crosswinds exceed the allowable

[3] *The closest weather station to Carrabelle Airport is Apalachicola Airport weather station (USW00012832).*

tolerance for the aircraft categories using the Airport, the availability of a crosswind runway is highly desirable. Without one, arriving aircraft may need to divert to an alternate airport or wait for the wind conditions to change. Figure 2.34 summarizes wind coverage at Carrabelle Airport, calculated using the FAA's Airport Design Tools, Windrose File Generator. Wind analysis results indicate the wind coverage of the existing runway orientation is slightly below 95 percent using a 10.5 knot crosswind component.

Wind samples were gathered from the nearest Airport Automated Surface Observing System (ASOS), which is located at Apalachicola Regional Airport, approximately 20 miles southwest of Carrabelle.

Figure 2.34. Runway 05-23 Crosswind Coverage

Weather Class	10.5 kt (%)	13 kt (%)	16 kt (%)
All Weather	91.49	95.61	99.07
IFR	91.01	95.09	98.47
VFR	92.9	96.4	99.34

Source: FAA Windrose File Generator

2.9 Socioeconomic Data

The relationship between socioeconomic factors and an airport's role and activity levels is an important factor in the master planning process. In addition to providing a baseline understanding of existing conditions in an airport's market area, socioeconomic data informs the aviation forecasts since population, employment, and income are key indicators of aviation demand. Growth in these factors can represent economic vitality, which often increases the propensity for general aviation activity.

The following provides a comparative summary of the socioeconomic data for the City of Carrabelle, Franklin County, and the State of Florida. As evidenced by these data, the socioeconomic conditions suggest City and County growth is behind that of Florida in general. It is worth noting that Carrabelle's socioeconomic data may not be completely representative of the population and economic climate. Carrabelle has many second homes, and the agricultural/fishing industry is likely under reported. This may impact population, employment, and income figures presented herein.

The United States Census Bureau, American Community Survey, 5-year estimates are the source of socioeconomic data presented in this section. The chapter presents forecasted, or future, socioeconomic data from Woods and Poole.

2.9.1 Population

Figure 2.35 summarizes historical population growth in Franklin County and the City of Carrabelle.

Figure 2.35. Population Summary

Year	Florida	Franklin County	City of Carrabelle
2013	19,091,156	11,554	2,771
2014	19,361,792	11,636	2,790
2015	19,645,772	11,628	2,770
2016	19,934,451	11,705	2,776
2017	20,278,447	11,675	2,707
Change (%)	6.22	1.05	-.95

Source: U.S. Census Bureau, American Community Survey, 5 Year Estimates

2.9.2 Total Employment

Figure 2.36 summarizes employment and unemployment in Florida, Franklin County, and the City of Carrabelle.

Figure 2.36. Employment Summary

Year	Florida		Franklin County		City of Carrabelle	
	Percent Employed (%)	Unemployment Rate	Percent Employed (%)	Unemployment Rate	Percent Employed (%)	Unemployment Rate
2013	52.7	11.8	42.5	12	27.6	12
2014	52.7	10.9	42.6	11.2	28.1	11.6
2015	53.1	9.7	43.9	9.4	26.7	11.9
2016	53.6	8.4	43.3	9.2	24.4	14.8
2017	54.2	7.2	43.3	7.9	27.1	9.5

Source: U.S. Census Bureau, American Community Survey, 5 Year Estimates

2.9.3 Employment by Industry

Figure 2.37 provides a breakdown of employment by industry. Retail trade, professional services, educational and health care services, and recreational and food services comprise the greatest percentage of employment in Carrabelle. Franklin County's employment composition is similar.

Figure 2.37. Employment by Industry

Industry	Franklin County		Carrabelle	
	Estimate	Percent (%)	Estimate	Percent (%)
Agriculture, forestry, fishing and hunting, and mining	280	6.5	27	4.3
Construction	315	7.3	58	9.2
Manufacturing	75	1.7	12	1.9
Wholesale trade	148	3.4	15	2.4
Retail trade	373	8.7	71	11.3
Transportation and warehousing, and utilities	201	4.7	43	6.8
Information	52	1.2	10	1.6
Finance and insurance, and real estate and rental and leasing	306	7.1	19	3.0
Professional, scientific, and management, and administrative and waste management services	447	10.4	48	7.6
Educational services, and health care and social assistance	840	20	99	15.7

Industry	Franklin County		Carrabelle	
	Estimate	Percent (%)	Estimate	Percent (%)
Arts, entertainment, and recreation, and accommodation and food services	573	13.3	77	12.3
Other services, except public administration	214	5	88	14
Public administration	481	11.2	62	9.9
Total	4,305	100	629	100

Source: U.S. Census Bureau, American Community Survey, Five Year Estimates

2.9.4 Income

Figure 2.38 summarizes household income. Household income is lower in Carrabelle than the County and State. This may be due to the presence of second homes in Carrabelle, as well as a large retiree population.

Figure 2.38. Household Income

Household Income	Florida	Franklin County	City of Carrabelle
Mean Household Income ($)	$72,993	$62,661	$47,528
Median Household Income ($)	$50,883	$41,267	$35,641

Source: U.S. Census Bureau, American Community Survey, Five Year Estimates

2.10 Land Use and Zoning

Carrabelle Airport is on the Gulf Coast of Franklin County. The eastern half of the Airport is in the City of Carrabelle, and the western half is in Franklin County. The City of Carrabelle has land use and zoning authority of airport property. Guiding zoning documents include:

- City of Carrabelle Existing Land Use Map, 2006: designates land adjacent to the Airport as Vacant and Conservation (Figure 2.39)
- City of Carrabelle 2020 Future Land Use Map, 2018: depicts land adjacent to the Airport as Industrial, Conservation, and Low Density Residential (Figure 2.40)
- Franklin County Future Land Use Map, 2016: depicts land adjacent to the Airport as Agriculture (Figure 2.41)
- Franklin County Zoning Map, 2016: A-2: designates land adjacent to the Airport as Agriculture, Forestry (Figure 2.42)

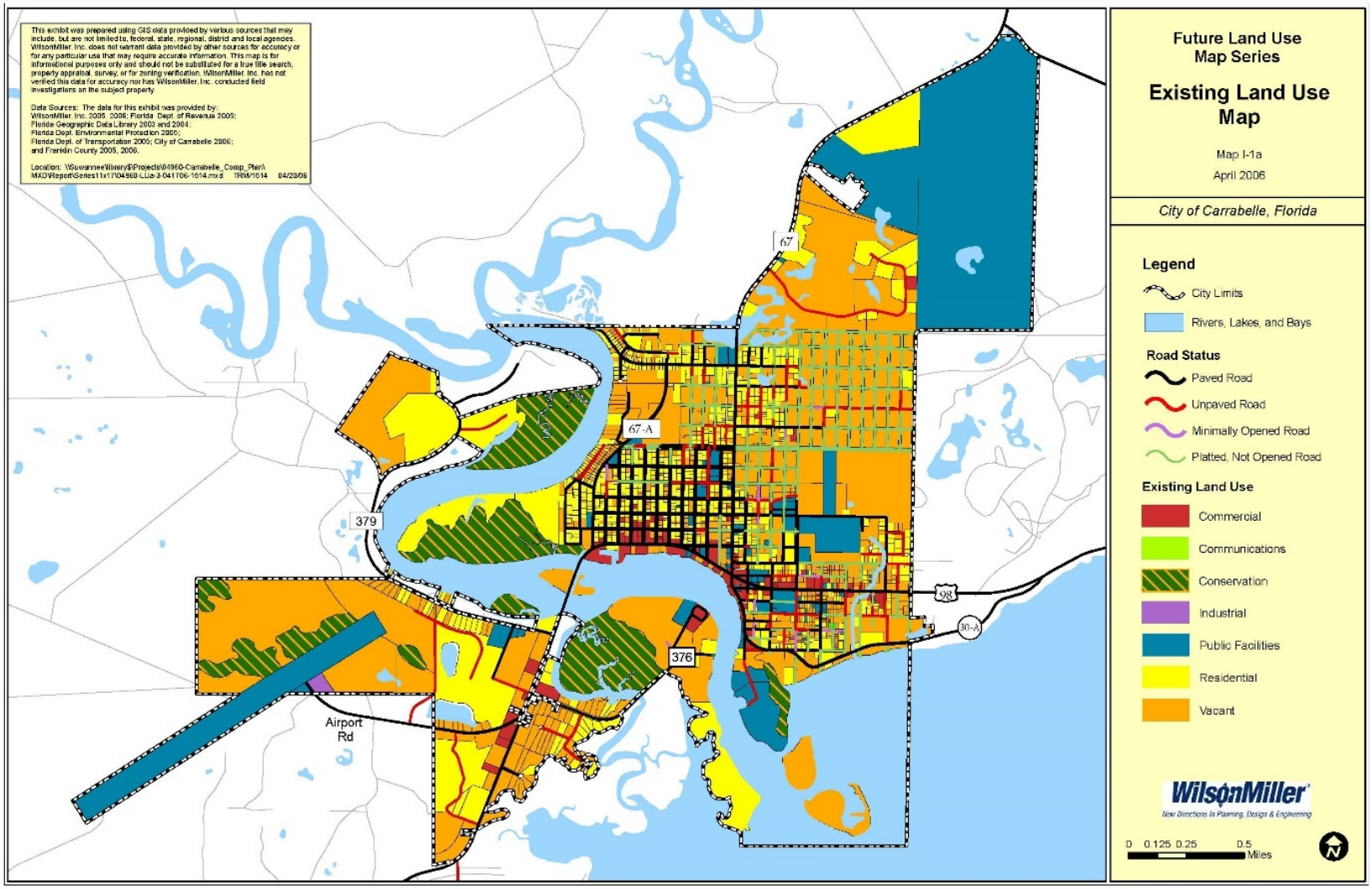


Figure 2.39. City of Carrabelle Existing Land Use Map

Source: City of Carrabelle

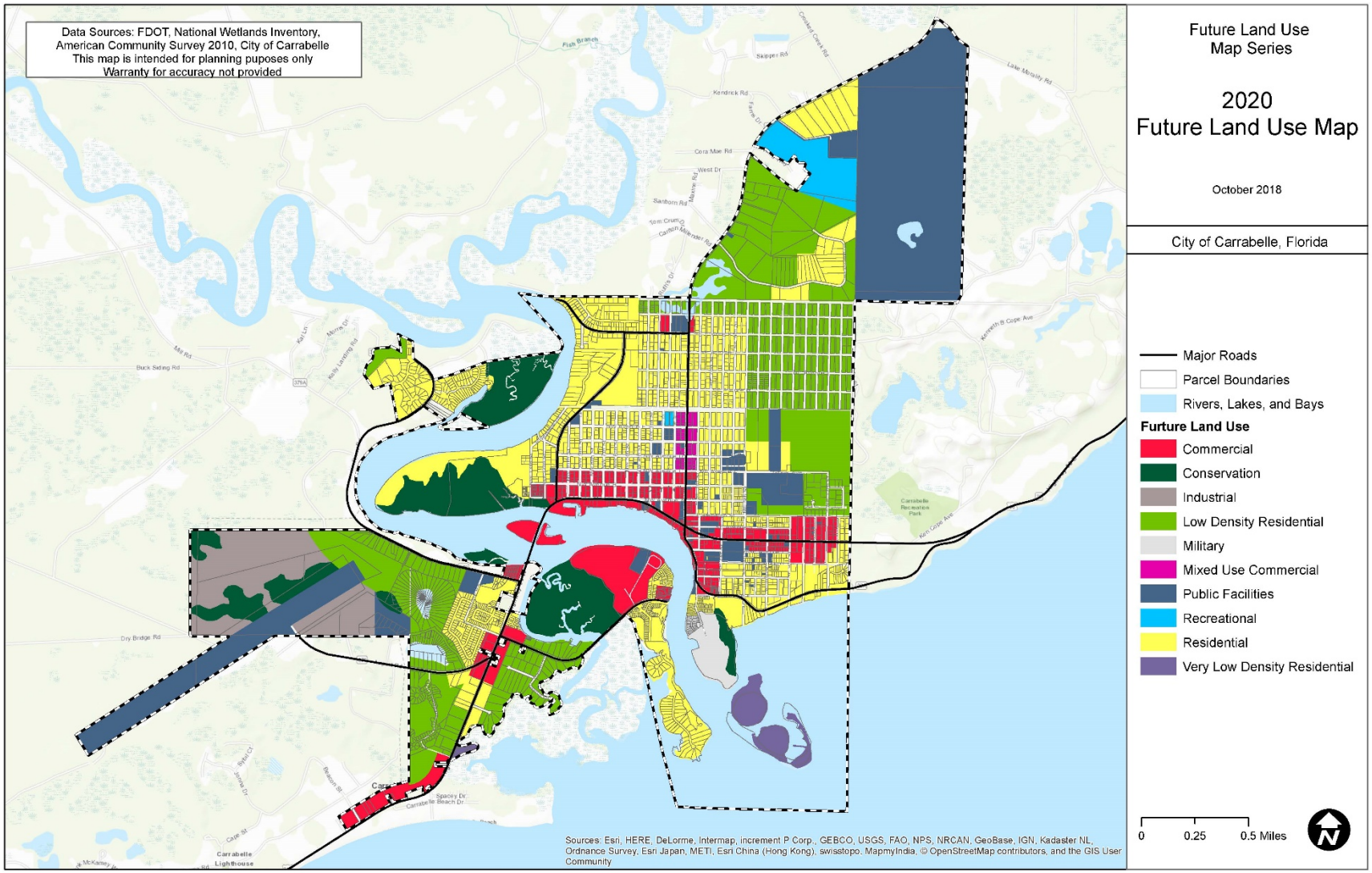


Figure 2.40. City of Carrabelle Future Land Use Map

Source: City of Carrabelle

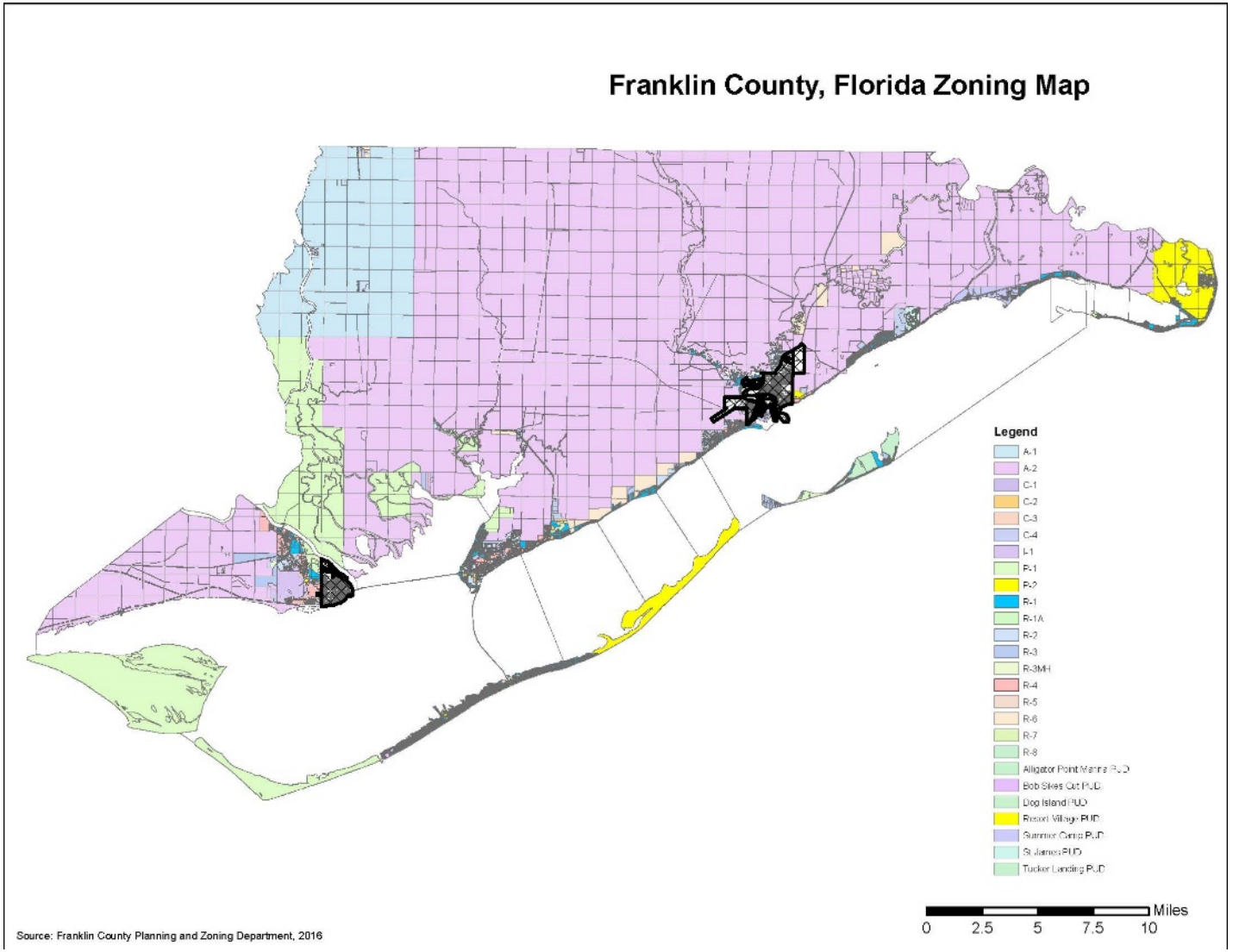


Figure 2.41. Franklin County Zoning Map

Source: Franklin County Planning and Zoning Department

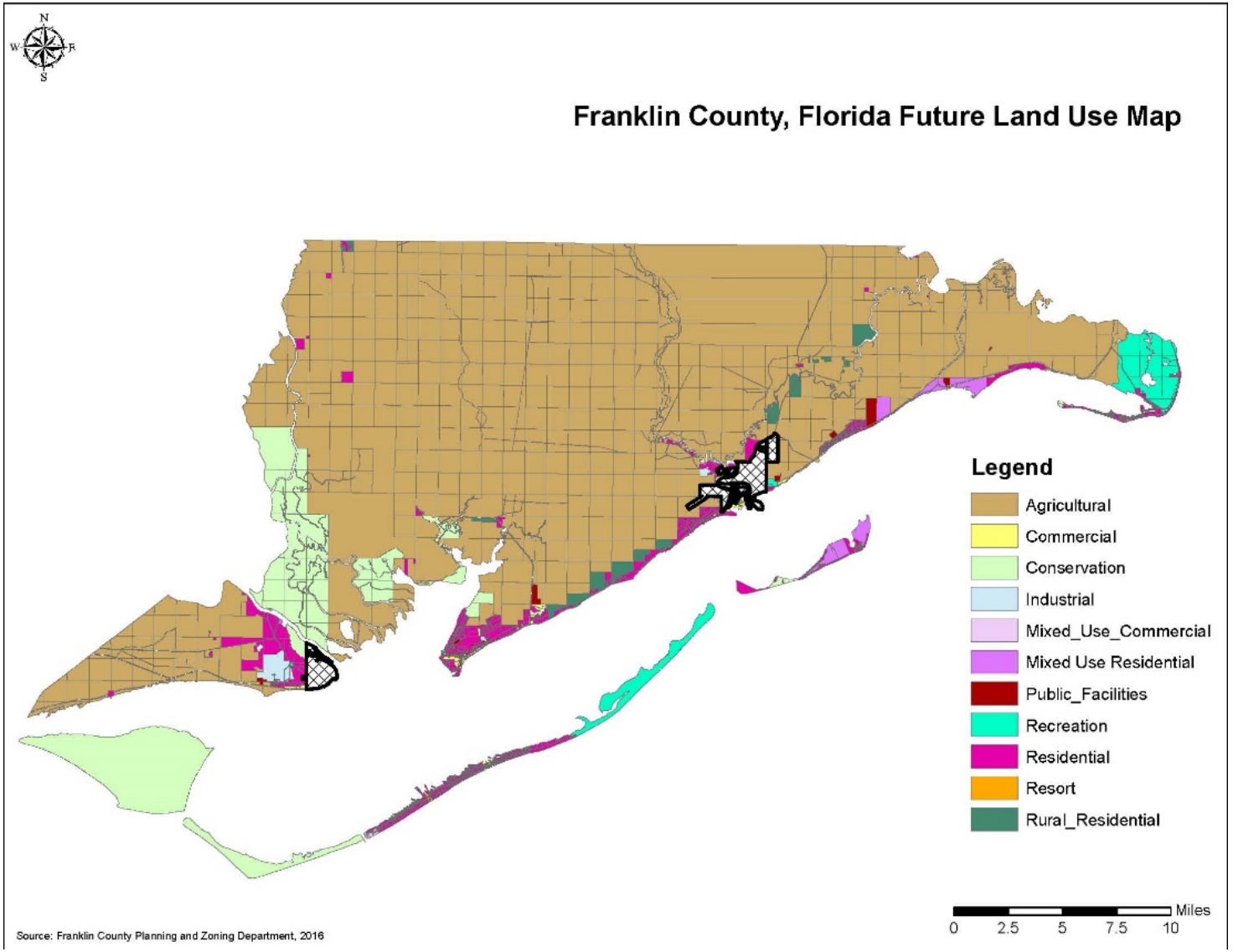


Figure 2.42. Franklin County Future Land Use Map

Source: Franklin County Planning and Zoning Department

2.10.1 Florida Statutes, Title XXV, Chapter 333: Airport Zoning (Chapter 333)

Chapter 333 requires political jurisdictions to adopt, administer, and enforce airport land use compatibility zoning regulations. At a minimum, airport land use compatibility zoning regulations must address:

- Landfills
- Incompatible land uses within noise contours, when appropriate
- Residential and education land uses within the area contiguous to the Airport, measuring half the length of the longest runway on either side of and the end of runway centerlines
- Incompatible land uses in general

Current airport zoning is in Article 18 of the Carrabelle Code of Ordinances. At this time, Article 18 does not reflect updates to Chapter 333. Nonetheless, based on a desktop analysis, the Low Density Residential land use adjacent to the Airport, shown on the City of Carrabelle 2020 Future Land Use Map, appears to be compatible with the Airport, in that the distance of the future Low Density Residential land use from Runway 23 end measures more than half the length of the longest runway on either side of and the end of runway centerlines. However, the City should conduct a Chapter 333 concurrency review if new residential development is proposed between the Airport property boundary and County Road 379 to ensure incompatible land uses do not occur.

2.11 Environmental Conditions

Environmental factors can influence how an airport develops, and, conversely, how airport development has the potential to impact environmental resources. In 1969, the U.S. Congress passed the National Environmental Policy Act (NEPA) that requires "federal government to use practicable means to create and maintain conditions under which man and nature can exist in productive harmony." Section 102 of the Act further requires federal agencies to incorporate environmental considerations in their planning and decision-making processes. Due to the Federal Aviation Administration's (FAA's) participation in airport planning and development projects, airport sponsors must incorporate environmental considerations into the master planning process.

FAA Order 1050.1E *Environmental Impacts: Policies and Procedures and the associated Environmental Desk Reference for Airport Actions* describes the various environmental resources that must be taken into consideration. Though not evaluated to the level of detail required for official agency approval of proposed capital improvement projects, the following provides an overview of the environmental resources and considerations within the environs of Carrabelle Airport. This information helps to identify and evaluate alternative development scenarios, ultimately leading to a recommended development program that is in concert with the community and environment. Further environmental evaluation and agency approval may be required for specific development projects prior to design and construction.

2.11.1 Endangered Species

Several statutes protect the fish, wildlife, and plant resources of the U.S., including the Fish and Wildlife Coordination Act of 1958, the Fish and Wildlife Conservation Act of 1980, the Migratory Bird Treaty Act (MBTA) of 1918, and the Endangered Species Act (ESA) of 1973. The Federal government enacted the ESA, as amended, to provide a program for the preservation of endangered and threatened species and the ecosystems upon which they depend for survival. The ESA requires federal agencies, including the

FAA, to implement protection programs for listed species and to use their authorities to further the purposes of the Act.

The United States Fish and Wildlife Service (USFWS), in conjunction with the Florida Fish and Wildlife Commission, has jurisdiction over federal and state listed endangered and threatened species in Florida. The USFWS defines an endangered species as a species in danger of extinction throughout all or a significant portion of its range. The USFWS defines a threatened species as a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Several endangered species are known to be in areas near the Airport (Figure 2.43), but no critical habitats are within airport property.

Figure 2.43. Endangered Species (Plants and Animals) near Carrabelle Airport

West Indian Manatee	Gopher Tortoise	Frosted Flatwoods Salamander	White Birds-in-a-nest
Piping Glover	Green Sea Turtle	Atlantic Sturgeon	American Osytercatcher
Red Knot	Hawksbill Sea Turtle	Florida Skullcap	Bachman's Sparrow
Red-cockaded Woodpecker	Kemp's Ridley Sea Turtle	Godfrey's Butterwort	Bald Eagle
Wood Stork	Leatherback Sea Turtle	Harper's Beauty	Black Skimmer
Eastern Indigo Snake	Loggerhead Sea Turtle	Telephus Spurge	Cerulean Warbler
Clapper Rail	Henslow's Sparrow	Le Conte's Sparrow	Marbled Godwit
Eastern Whip-poor-will	Kentucky Warbler	Least Tern	Nelson's Sparrow
Gull-billed Tern	King Rail	Lesser Yellowlegs	Prairie Warbler
Prothonotary Warbler	Re-headed Woodpecker	Red-throated Loon	Rusty Blackbird
Seaside Sparrow	Semipalmated Sandpiper	Short-billed Dowitcher	Sallow-tailed Kite
Whimbrel	Willet	Wilson's Plover	Wood Thrush

Source: U.S. Fish and Wildlife Service, Information for Planning and Consultation

2.11.2 Water Resources

Water resources on or near airport property have several implications for airport development. In addition to the wildlife hazard risks associated with open sources of water, airport development can affect, or be affected by, wetlands, floodplains, and water quality concerns. The following describes the water resources near Carrabelle Airport and any related concerns.

2.11.2.1 WATER BODIES AND FLOODPLAIN

Executive Order 11988 directs federal agencies to "take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains". Department of Transportation (DOT) Order 5650.2, Floodplain Management and Protection, contains DOT's policies and procedures for implementing the Executive Order. The Executive Order and the DOT order establish a policy to avoid taking action within a 100-year floodplain, where practicable. The Federal Emergency Management Agency (FEMA) is responsible for mapping the extents of floodplain areas and assessing flood risk in support of the National Flood Insurance Program for the U.S.

Figure 2.44 demonstrates Carrabelle Airport is about 0.5 miles west of the Carrabelle River, and about 1 mile north of the Gulf of Mexico. Figure 2.44 also shows flood zones A and X are present on airport property.

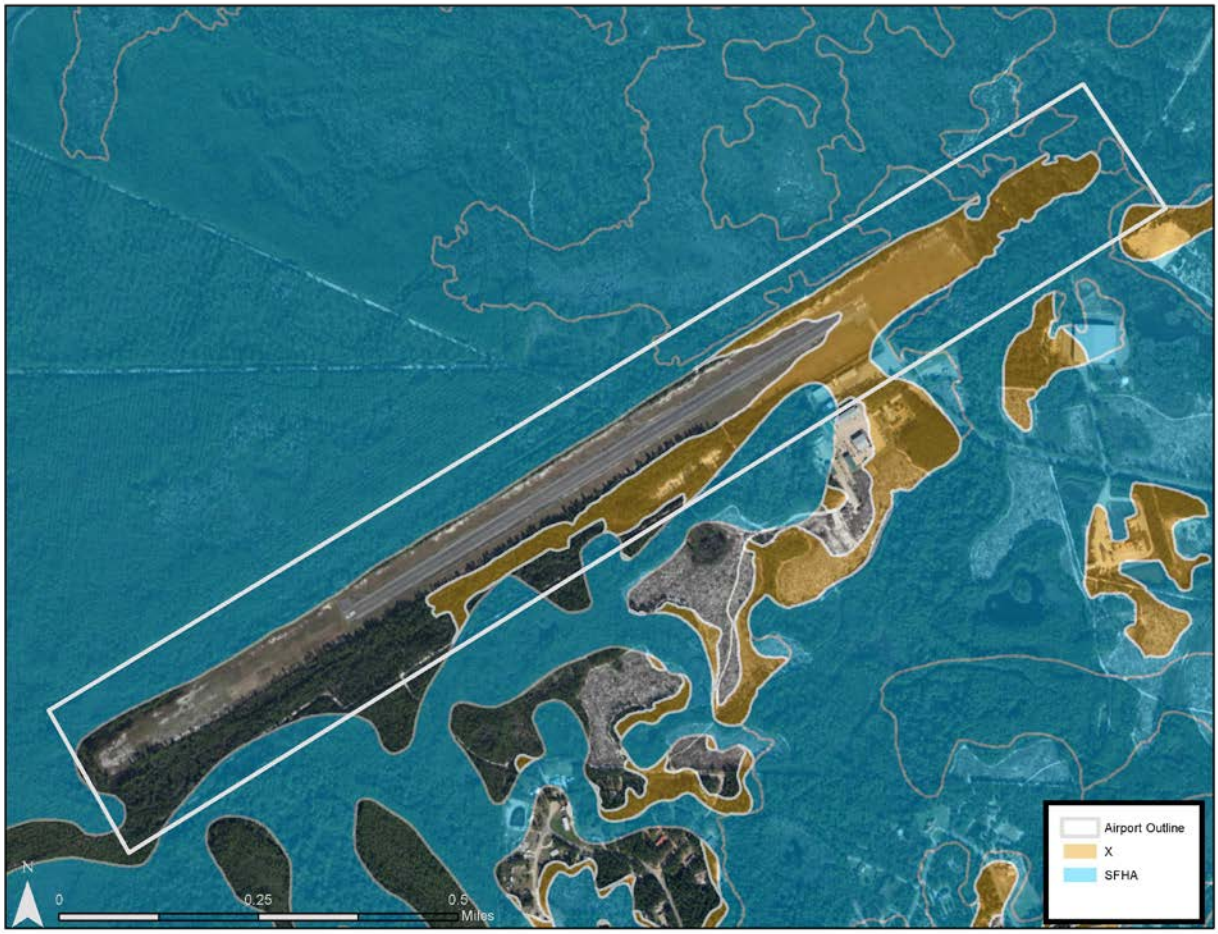


Figure 2.44. Waterbodies and Flood Zones

Source: Federal Emergency Management Agency

2.11.2.2 WETLANDS

Wetlands provide a multitude of ecological, economic and social benefits. They provide habitat for fish, wildlife and plants (many of which have a commercial or recreational value), recharge groundwater, reduce flooding, provide clean drinking water, help regulate the climate, offer food and fiber, and support cultural and recreational activities. Wetlands and the jurisdictional "Waters of the U.S." are protected under Sections 401 and 404 of the Clean Water Act (CWA) and Executive Order (EO) 11990, Protection of Wetlands. Federal agencies that regulate impacts on water resources within Florida include the U.S. Army Corps of Engineers (USACE), the United States Environmental Protection Agency (USEPA), and the USFWS. The USACE is the primary regulatory authority enforcing Section 404 requirements.

Section 404 of the CWA regulates the discharge of dredge and fill material into U.S. waters and wetlands. This includes fill for infrastructure development and the conversion of wetlands to uplands. According to the Section 404(b) 1 guidelines, project proponents must avoid and minimize impacts to U.S. waters and wetlands at the project site to the maximum extent practicable. For those impacts that are determined to be unavoidable – compensatory mitigation may be required either through regional conditioning or on a case-by-case basis. Mitigation could include replacement, purchasing credits in a wetland mitigation bank, or in-lieu fee. Figure 2.45 shows wetlands are on airport property.

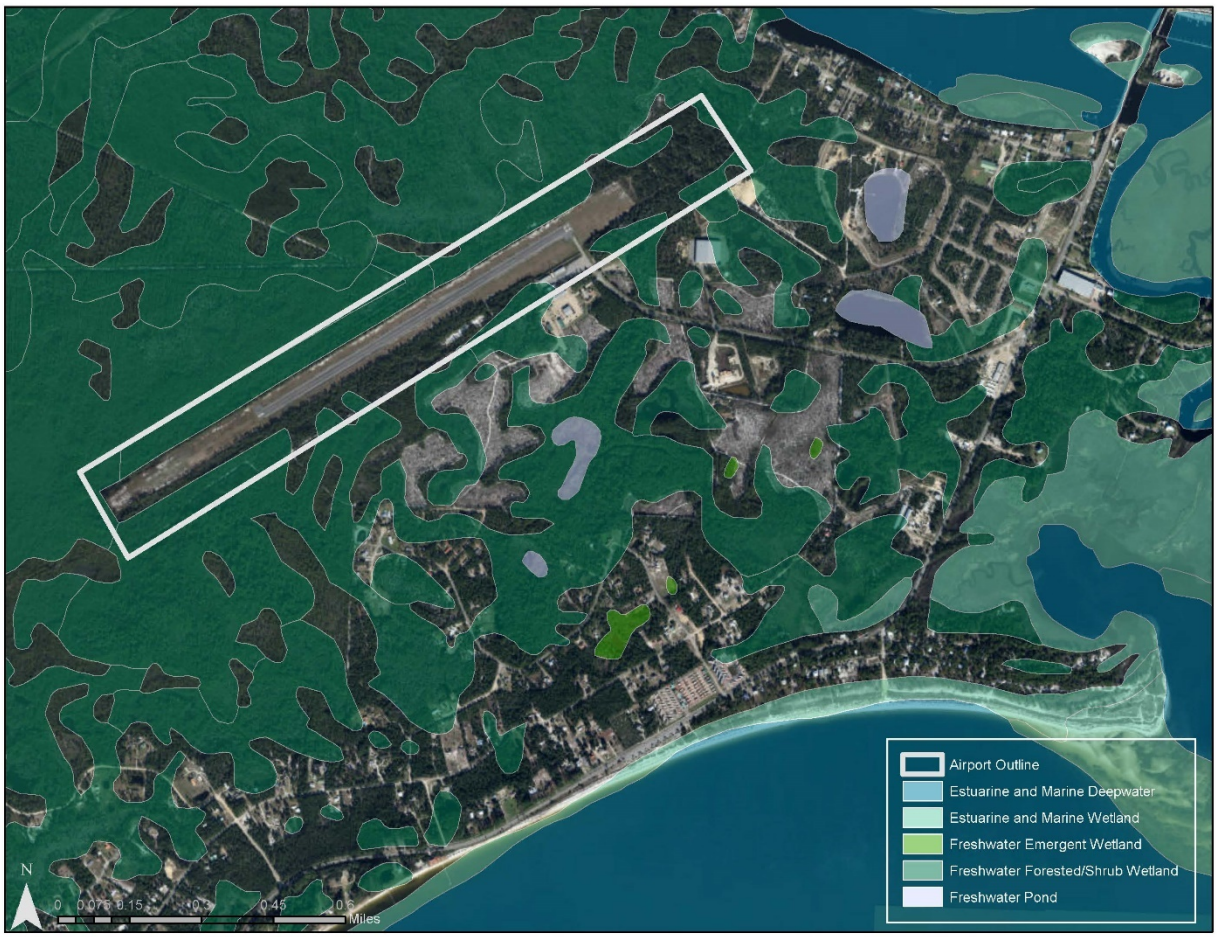


Figure 2.45. National Inventory of Wetlands Map

Source: US Fish and Wildlife, National Wetlands Inventory

2.11.2.3 STORMWATER MANAGEMENT

The Airport maintains a stormwater system originally installed when the military developed the Airport. A storm water swale can be found parallel to the southside of the runway, and a stormwater retention pond is adjacent to the T-hangars. The City does not have a Stormwater Pollution Prevention Plan or Spill Prevention Control & Countermeasures Plan.

2.11.2.4 SEA LEVEL RISE

The National Oceanic and Atmospheric Administration's (NOAA's) Sea Level Riser Viewer demonstrates Carrabelle Airport has low vulnerability to sea level rise. The local sea level rise intermediate scenario expects 0.95 feet of change by 2040, as depicted in Figure 2.46.

Figure 2.46. NOAA Expect Sea Level Rise by 2040

Source: NOAA Sea Level Rose Viewer

2.11.3 Prime Farmland

The Farmland Protection Policy Act (FPPA) of 1981 authorizes the U.S. Department of Agriculture (USDA) to minimize federal programs' contribution to unnecessary and irreversible conversion of farmland to nonagricultural uses. Prime farmland, as defined by the USDA, is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. There are similar classifications for unique farmlands, farmlands of state importance, and farmlands of local importance. According to the FPPA (PL 90-542), lands already committed to urban development or water storage do not meet the definition of prime or unique farmland.

In conjunction with the State of Florida, the USDA Natural Resource Conservation Service (NRCS) has jurisdiction over farmlands in Florida. The USDA-NCRS online Geographical Information System (GIS) classifies most of airport property as "Not Prime Farmland." As depicted in Figure 2.47, farmlands on Airport property include:

- 5: Aquents, nearly level (not prime farmland)
- 22: Leon sand, 0 to 2 percent slope (not prime farmland)
- 29: Resota fine sand, 0 to 5 percent slopes (not prime farmland)
- 31: Rutlege fine sand, 0 to 2 percent slopes (not prime farmland)
- 33: Scranton fine sand, 0 to 2 percent slopes (not prime farmland)

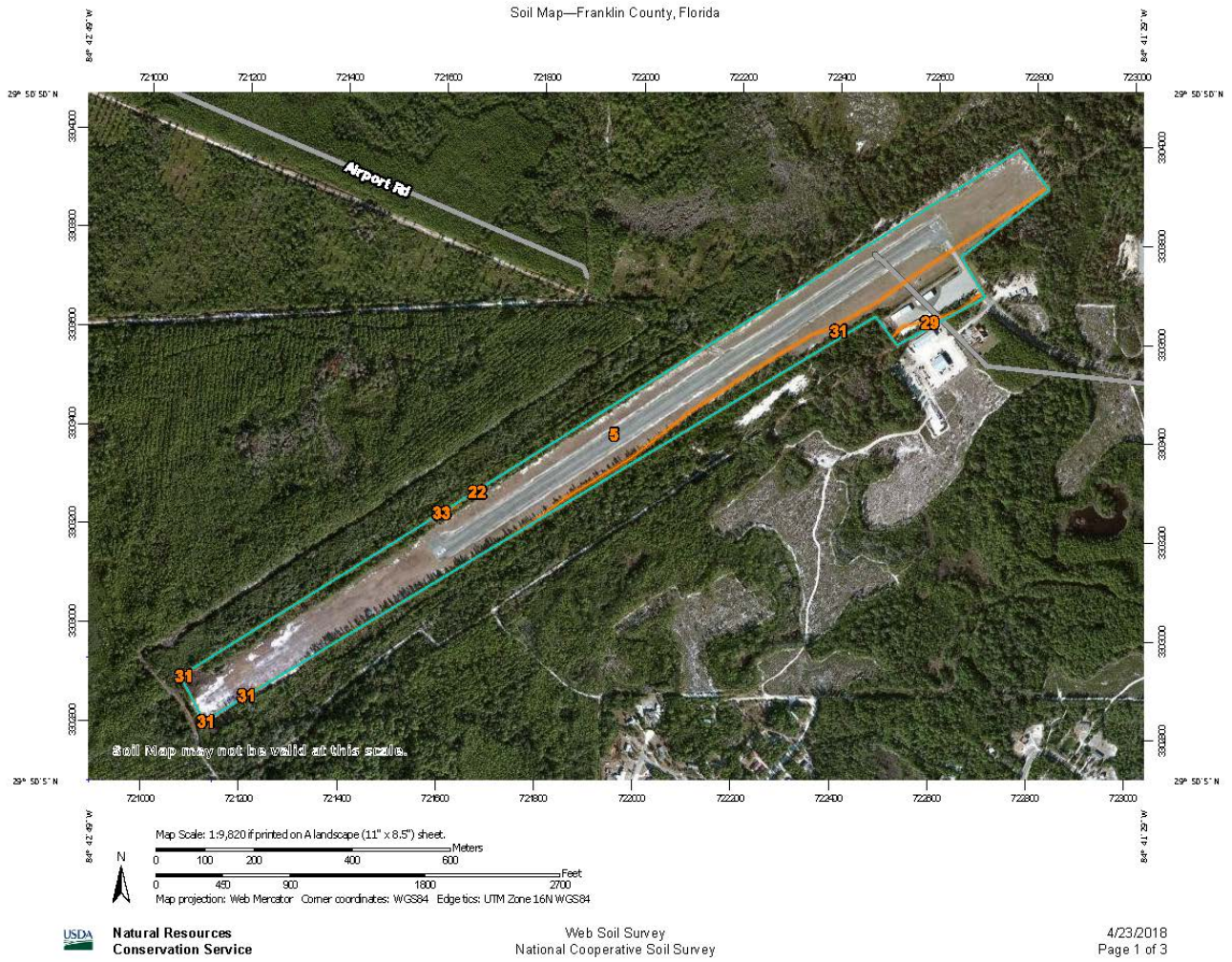


Figure 2.47. USDA Prime Farmlands

Source: Natural Resources Conservation Service

2.11.4 Historic Sites

The National Historic Preservation Act (NHPA), as amended, provides for the preservation of cultural resources eligible for inclusion in the National Register of Historic Places (NRHP). Section 106 of the NHPA directs heads of federal or independent agencies that have direct or indirect jurisdiction over a federal or federally assisted undertaking, to "consider the effect on any district, site, building, structure, or object that is included in or eligible for the inclusion in the National Register". The U.S. National Park Service is responsible for maintaining the NRHP. The State of Florida Historic Preservation Office (SHPO) also maintains a list of historic and archeological resources.

Figure 2.48 identifies NRHP structures near the Airport and a State archeological district on airport, designated due to World War II (WWII) amphibious training that once occurred in the area. However, no evidence of WWII activities was discovered during an archeological survey, and this area does not appear to contribute to the overall significance of the district.

Figure 2.48. Historic and Archeological Resources and Conservation Areas

Source: National Register of Historic Places, State Historic Preservation Office

2.11.5 Public Parks

Section 4(f) of the Department of Transportation Act of 1966 [Title 49, USC Section 1653 (f); amended and recodified in 49 USC Section 303] provides that the Secretary of Transportation (including the FAA) will not approve any program or project that requires the use of publicly owned land from a park, recreation area, or wildlife and waterfowl refuge of national, state or local significance or land from a historic site of national, state or local significance.

Section 6(f) of the Land and Water Conservation Fund Act (L&WCFA) [16 USC, Section 4601 et. seq.); 36 Code of Federal Regulations (CFR) Part 59] prohibits the taking of lands purchased with land and water conservation funds. While the Secretary of Transportation has jurisdiction over Section 4(f) lands, the Department of the Interior and National Park Service have jurisdiction over Section 6(f).

As previously mentioned, there are no known historic sites located on airport property. There are also no wildlife or waterfowl refuges located near the Airport. There is no city owned public park or recreation facility adjacent to the Airport. However, Tate's Hell State Forest surrounds most of airport property (public conservation area on Figure 2.48). The Florida Forestry Service manages Tate's Hell State Forest (Refer to Figure 2.7. for a map of property owners around the Airport). This land was purchased as forested watershed protection for Apalachicola Bay and for rare species protection, particularly the Florida black bear. Twenty-nine active red-cockaded woodpecker clusters have been found on site since purchase, in addition to several rare plant populations. Most the land was drained and planted to slash pine in the 1960's and 1970's and is now undergoing restoration to a more natural condition. The forest contains some native slash and longleaf pine forests of excellent quality.

2.11.6 Hazardous Materials Sites

The terms hazardous materials, hazardous waste, and hazardous substances are generally associated with industrial wastes, petroleum products, dangerous goods or other contaminates. The regulations governing hazardous materials, as it applies to airport development actions, are found in the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Community Environmental Response Facilitation Act (CERFA). These statutes address the use, storage, and disposal of hazardous materials and the environmental threats caused by mishandling these materials. To protect from potentially large clean-up costs and legal liabilities, airport sponsors should (to the extent possible) avoid hazardous waste sites and contaminated property that could affect, or be affected by, an airport development project.

According to the U.S. EPA Envirofacts, Facility Registry Service (FRS), the Airport is listed as a facility, as well as the Smyrna Ready Mix Concrete Plant east of the Airport and the Carrabelle Beach RV Park Stormwater Improvement project south of the Airport (Figure 2.49). The Facility Registry Service is an EPA managed list of facility data to support EPA's mission of protecting human health and the environment. There are no Superfund sites near the Airport.

Figure 2.49. Hazardous Materials Sites near Carrabelle Airport

Source: US Environmental Protection Agency

2.12 Recycling Practices

In recent years, the handling of solid waste and recycling at airports has become a focus of the Federal Aviation Administration (FAA) following the Modernization and Reform Act of 2012. Per this Act and Per 49 USC § 47102(5)(C):

> *"The Master Plan must address issues related to solid waste recycling at the Airport. This is a new Master Plan requirement under the FAA Modernization and Reform Act of 2012 (Public Law 112-95), and until APP-400 issues guidance on this requirement, the ADO must coordinate this portion of the Master Plan scope with APP-400. The FAA Modernization and Reform Act of 2012 (Public Law 112-95) also made the cost of a waste audit an allowable master planning element."*

Of the eight types of waste identified by the FAA, the following are typically produced at Carrabelle Airport:

- **Municipal Solid Waste (MSW)**. Everyday items that are used and then discarded, such as product packaging, bottles, food scraps, and newspapers.
- **Construction and Demolition Waste (C&D)**. Any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation, or repair of structures, roads, and utilities.
- **Green Waste**. Tree, shrub, and grass clippings, leaves, weeds, small branches, seeds, pods, and similar debris generated by landscape maintenance activities.

- **Spill Cleanup and Remediation Wastes**. Materials that are generated and remediation of contamination from a variety of sources on an airport (storage tanks, vehicular leaks, spills from maintenance activities, etc.).
- **Hazardous Waste**. Material that must be handled in accordance with stringent federal regulations. Wastes designated as "hazardous" are covered by regulations outlining legal handling, treatment, or disposal. Hazardous waste that may be found at the Airport include: solvents, caustic part washes, heavy metal paint waste and paint chips, wastewater sludges from metal etching and electroplating, unused epoxies and monomers, and waste fuels.

While there are currently no specific recycling guidelines at the Airport, the City could consider a program to minimize solid waste entering the local waste stream. According to the FAA document *Recycling, Reuse, and Waste Reduction at Airports,* there are 10 steps to design and implement an effective waste minimization program. Of these 10 steps, "waste identification" and "waste collection and hauling" are two components that could be implemented at Carrabelle Airport to better understand and manage waste removal at the Airport. It is also possible that just providing Airport tenants with recycling information and a consolidated collection facility for recyclables could reduce the amount of waste from the Airport entering local landfills.

Recycling can provide benefits to both an airport and its surrounding community. Reduction of waste and reuse of materials can lessen an airport's direct and indirect pollution output, and in some cases, can reduce operational costs or generate additional revenue. As such, the FAA is emphasizing that airports strive to implement some form of recycling program to support nationwide sustainability initiatives and promote community health.

2.12.1 Local Sustainability Initiatives

At this time, the Airport does not have any formal recycling program. A review of Airport-related activities reveals that the most typical items that may be recycled include scrap metals, industrial waste, petroleum products, and typical office materials such as plastic, paper, etc. Scrap metals and petroleum products may have some market value, but they also may have costs associated with their collection and disposal (i.e., disposal of waste oil and other hazardous materials). Currently, the individual tenants are responsible for managing their own waste streams.

The implementation of a formal Airport-wide recycling program would take time and a significant amount of coordination effort. A voluntary program could be established whereby Airport-related tenants could participate if prompted but would not be required to participate.

There are a multitude of resources that provide guidance on implementable actions to reduce, reuse, and recycle waste in an airport environment. These include the:

- FAA *Recycling, Reuse and Waste Reduction at Airports, A Synthesis Document* (http://www.faa.gov/airports/resources/publications/reports/environmental/media/recyclingsynthesis2013.pdf)
- Airport Cooperative Research Program (ACRP) Synthesis Report 42 *Integrating Environmental Sustainability into Airport Contracts* (http://www.trb.org/main/blurbs/169023.aspx)
- Airport Cooperative Research Program (ACRP) Report 42 *Sustainable Airport Construction Practices* (http://www.trb.org/main/blurbs/164240.aspx)
- Sustainable Aviation Guidance Alliance (SAGA) (http://www.airportsustainability.org/)

Recycling programs are completely scalable to the needs, resources, and operational environment of each individual airport. A commercial service airport may have more solid waste volume and more opportunity for reducing its waste stream than a general aviation airport, such as Carrabelle Airport. A northern airport may have the opportunity to recycle its glycol deicing fluids where a southern airport may not. Recycling efforts can address day-to-day operations as well as individual construction projects. The following is a small sample of potential recycling actions that might be implemented at Carrabelle Airport:

- Provide centralized recycling collection for airport tenants. Sortable, transportable recycling receptacles could be purchased or rented for frequently disposed materials such as paper, plastic, and aluminum.
- Recycling education and outreach — At a minimum, the City or Recycling Service could provide airport tenants with information on waste reduction and recycling opportunities and best practices.
- Require or incentivize engineers and contractors to incorporate recycled materials into their design and construction projects.
- Stockpile demolished pavement materials and excavated soils for future development projects.

3 Forecasts of Aviation Activity

Projections of future aviation activity at an airport provide the foundation for effective decision making in airport planning and development. Forecasts are used to determine the type, size, and timing of new or expanded airport facilities to meet anticipated user needs. They are also used to help justify the financial investment in those improvements.

As presented in this chapter, forecasts of aviation activity at Carrabelle Airport (X13 or Airport) were prepared using accepted Florida Department of Transportation (FDOT) and Federal Aviation Administration (FAA) guidance and methodologies that consider aviation and socioeconomic trends within the Airport's community and throughout the nation. These projections were prepared for near-term (2024), mid-term (2029), and long-term (2040) timeframes. Because 2019 is the most recent full year of data, it serves as the base-year for the analysis.

To prepare these forecasts, historical data were collected from Airport records and Airport management. In addition, demographic data for Franklin County and the State of Florida were used to identify local trends and conditions that could impact general aviation demand at the Airport.

It is important to recognize that fluctuations in an airport's activity can occur due to a variety of unanticipated factors such as local and national economic health, fuel prices, technological advancements, regulatory changes, and market competition. With acknowledgement of future uncertainties and the cyclical nature of the economy, which has a direct effect on general aviation activity, the objective of this forecasting effort is to identify the magnitude of change that can be expected over the planning horizon. It is not the intent to specifically predict activity on a year-by-year basis, but to forecast a growth trend that estimates long-term activity levels. The projections of aviation demand developed for the Airport are considered a reasonable representation of future activity levels and are described in the following sections:

- FAA Forecasts
- Previous Airport Forecasts
- Forecast Assumptions
- Based Aircraft Forecasts
- Aircraft Operations Forecasts
- Critical Aircraft
- Forecast Summary

3.1 FAA Forecasts

The Federal Aviation Administration (FAA) publishes annual Aerospace Forecasts that summarize anticipated trends in general aviation activity that provide a general framework for anticipated future levels of regional and national aviation activity. Many factors are considered in the FAA's forecasts, including U.S. and international economic trends and projected fuel costs. Measures of national general aviation activity that are monitored and forecast by the FAA include active pilots, active hours flown, and active aircraft fleet. Historical and projected activity in each of these categories is examined in the following sections for their relevance to forecasts for the Airport.

3.1.1 Active Pilots

An active pilot is defined by the FAA as those persons with a pilot certificate and a valid medical certificate. Figure 3.1 presents historical and projected U.S. active pilot data by certificate type. It should be noted that instrument rated pilots should not be added to other categories in deriving the total, as these are a subset of the total number of pilots. Instrument rated pilots are those that are capable of flying in a variety of weather conditions. This includes corporate jet aircraft and turboprop aircraft which are almost always flown under instrument flight plans.

Between 2010 and 2018, the total number of active pilots decreased by -1.1 percent, decreasing from a total of 508,469 to 465,513 active pilots. This decrease is likely due to the aging of the pilot population and the increase in the cost to own and operate aircraft. In the next 20 years, the total number of active pilots is projected to increase by a Compound Annual Growth Rate (CAGR) of 0.09 percent. More importantly for Carrabelle Airport, the active private pilots are forecast to decline (-0.69 percent). By 2039 the total number of active pilots is projected to be 478,015. Some of the projected increase in active pilots can be attributed to the recent passed legislation which relieves some of the limitations related to pilots obtaining medical certificates, and a need to train commercial airline pilots for the expected growth in airline activity around the world. An important note about the newer FAA Forecast does not include student pilots in the forecast, which it has in previous years, however the student pilot population has a minimal impact on the Airport.

3.1.2 Active Hours Flown

Aircraft hours flown is another statistic used to measure and project general aviation activity. Hours flown is a valuable measure because it captures several activity-related data including aircraft utilization, frequency of use, and duration of use. As shown in Figure 3.2, single-engine piston hours flown are projected to continue to diminish over the next 20 years. This is due to the declining fleet of single-engine aircraft, many of which are being retired and their aging owners are no longer flying. Multi-engine hours are also projected to decrease in hours flown, while turboprop and jet hours are anticipated to continue steadily increasing. The growth in turboprop and jet hours flown typically relates to projected growth in corporate and business activity, as previously noted. The CAGR of U.S. active hours flown from 2010-2018 increased by 0.4 percent while the total number of hours flown is projected to increase by 0.78 percent between 2018 and 2039.

3.1.3 Active Aircraft Fleet

The FAA tracks the number of active general aviation aircraft in the U.S. fleet annually. Active aircraft are defined by the FAA as those aircraft currently registered in the U.S. and flying at least one hour during the year. Figure 3.3 summarizes recent active aircraft trends (2014-2018) as well as future active aircraft by aircraft type (2019-2039). Like U.S. active hours flown and for the same reasons, the active single-engine and multi-engine piston aircraft fleet is projected to continually decrease through 2039 while active turboprop and jet aircraft will continue to increase. The total active fleet decreased at an annual rate of -0.60 percent from 2010 to 2018 and is projected to decrease at a rate of -0.04 percent 2019 through 2039.

3.1.4 FAA Forecast Summary

The cyclical nature of general aviation activity is illustrated in the historical national data presented in this analysis. While national general aviation activity experienced rebounding growth during the mid and late-1990's, the terrorist attacks of 2001 and the economic downturn of 2008 dampened this nationwide activity, even though there continued to be pockets of the U.S. that did realize growth in general aviation. FAA projections of U.S. general aviation activity, including active pilots, active aircraft, and hours flown all showed varied levels of growth and decline through the FAA's forecast horizon of 2039, with the growth focused in the corporate and business aviation sectors that are most often tied to turboprop and jet general aviation aircraft.

Figure 3.1. Historical and Projected U.S. Active Pilots

Certificate Type	Historical					Projected						Average Annual Growth (2019-39)
	2014	2015	2016	2017	2018	2019	2020	2024	2029	2034	2039*	
Recreational	220	190	175	153	144	140	135	120	95	80	60	-4.15%
Sport	5,157	5,482	5,889	6,097	6,246	6,515	6,790	7,925	9,360	10,680	11,705	2.97%
Private	174,883	170,718	162,313	162,455	163,695	164,550	164,900	162,800	156,350	149,100	143,400	-0.69%
Commercial	104,322	101,164	96,081	98,161	99,880	101,650	102,050	102,300	101,150	99,650	98,250	-0.17%
Transport	152,933	154,730	157,894	159,825	162,145	163,300	164,300	168,400	174,200	180,800	187,900	0.70%
Rotorcraft	15,511	15,566	15,518	15,355	15,033	14,750	14,550	14,650	15,850	17,550	19,450	1.39%
Glider	19,927	19,460	17,991	18,139	18,370	18,550	18,620	18,300	17,840	17,420	17,250	-0.36%
Total	**472,953***	**467,310***	**455,861***	**460,185***	**465,513***	**469,455***	**471,345***	**474,495***	**474,845***	**475,280***	**478,015***	**0.09%**
Instrument rated[1]	306,066	304,329	302,572	306,652	311,017	314,800	316,300	321,400	327,100	332,200	337,300	0.35%

Source: FAA U.S. Civil Airmen Statistics

[1]Instrument rated pilots should not be added to other categories in deriving total

**FAA Forecast only goes to 2039*

Figure 3.2. Historical and Projected U.S. General Aviation Active Hours Flown (in thousands)

Certificate Type	Historical					Projected						Average Annual Growth (2019-39)
	2014	2015	2016	2017	2018	2019	2020	2024	2029	2034	2039*	
Single-engine Piston	10,395	11,217	11,865	12,047	12,029	11,894	11,680	10,906	10,186	9,672	9,483	-1.13%
Multi-engine Piston	1,573	1,608	1,683	1,536	1,568	1,578	1,581	1,577	1,563	1,547	1,532	-0.15%
Turboprop	2,613	2,538	2,708	2,625	2,672	2,713	2,755	2,898	3,105	3,365	3,707	1.57%
Jet	3,881	3,837	3,847	4,065	4,294	4,528	4,754	5,571	6,417	7,173	7,916	2.83%
Rotorcraft	3,242	3,294	3,128	3,320	3,420	3,521	3,608	3,932	4,323	4,729	5,169	1.94%
Experimental	1,244	1,295	1,224	1,241	1,274	1,305	1,338	1,445	1,570	1,681	1,784	1.57%
Sport	165	191	187	209	221	233	246	301	374	456	542	4.30%
Other	158	162	193	168	169	170	171	173	175	176	177	0.19%
Total	**23,271**	**24,142**	**24,834**	**25,212**	**25,647**	**25,943**	**26,134**	**26,802**	**27,713**	**28,798**	**30,311**	**0.78%**

Source: FAA Aerospace Forecasts Fiscal Years 2019-2039

**FAA Forecast only goes to 2039*

Figure 3.3. Historical and Projected U.S. General Aviation Active Aircraft Fleet

Certificate Type	Historical							Projected				Average Annual Growth (2019-39)
	2014	2015	2016	2017	2018	2019	2020	2024	2029	2034	2039*	
Single-engine Piston	126,036	127,887	126,036	129,833	129,885	129,285	128,240	123,145	116,360	110,160	105,195	-1.03%
Multi-engine Piston	13,146	13,254	13,146	13,083	13,040	13,010	12,975	12,805	12,575	12,330	12,085	-0.37%
Turboprop	9,777	9,712	9,777	9,949	9,925	9,925	9,940	10,135	10,770	11,640	12,810	1.28%
Jet	12,362	11,637	13,440	14,217	14,585	14,970	15,385	17,025	19,110	21,100	23,050	2.18%
Rotorcraft	9,966	9,765	10,506	10,511	10,705	10,895	11,085	11,850	12,850	13,965	15,175	1.67%
Experimental	26,191	24,918	27,585	26,921	27,365	27,755	28,190	29,465	30,880	32,040	33,040	0.88%
Sport	2,231	2,056	2,369	2,551	2,665	2,790	2,915	3,420	4,100	4,820	5,555	3.50%
Other	4,699	4,277	4,986	4,692	4,715	4,745	4,765	4,820	4,865	4,880	4,890	0.15%
Total	**204,408**	**210,031**	**211,794**	**211,757**	**212,885**	**213,375**	**213,495**	**212,665**	**211,510**	**210,935**	**211,800**	**-0.04%**

Source: FAA Aerospace Forecasts Fiscal Years 2019-2039
**FAA Forecast only goes to 2039*

3.2 Previous Airport Forecasts

The only previous forecasts of aviation demand for the Airport were developed in the Florida Aviation System Plan (FASP) 2035 – which evaluates airports on a statewide level using existing data – and was completed in 2017.

3.3 Forecast Assumptions

Forecast assumptions have been developed based on input provided by Airport staff and an examination of the trends identified in previous sections of this chapter. These assumptions provide general guidelines that aid in the development of forecasts of aviation demand and include the following:

- The Airport will continue to operate as a general aviation airport through the planning period.
- Airports within the Leon and Franklin County area will remain open for the foreseeable future.
- The aviation industry on the national level will grow as forecasted by the FAA in its annual Aerospace Forecasts.
- The socioeconomic characteristics of Franklin County and the State of Florida will continue to grow as forecasted.
- Both federal and state aviation programs will be in place through the planning period to assist in funding future capital development needs.
- The forecasts are considered "unconstrained" and assume the Airport will be able to develop the various facilities necessary to accommodate future based aircraft and annual aircraft operations.

3.4 Based Aircraft Forecasts

Several sources were considered in the preparation of based aircraft forecasts. These include Woods and Poole Economics, Inc. (an independent firm that specializes in long-term county, statistical area, and state economic and demographic projections), *FAA Aerospace Forecasts Fiscal Years 2019-2039*, and the Florida Aviation System Plan (FASP) 2035. These sources were used to generate methodologies to develop forecasts of based aircraft demand through the 20-year planning period. Compound Annual Growth Rate (CAGR) is referenced throughout the forecasts. CAGR calculates a constant rate of change over a given time-period; it dampens the effect of volatility during periods that experience change, essentially a "smoothed" annual growth rate. Base-year (2019) based aircraft was determined to be 14 according to airport reports.

3.4.1 Based Aircraft Forecast Methodologies

The Terminal Aviation Forecast (TAF) is the official Federal Aviation Administration (FAA) forecast of aviation activity for U.S. airports and contains historic data and projections for active airports in the National Plan of Integrated Airport Systems (NPIAS). Carrabelle Airport is not included in the NPIAS and as such, these records are currently unavailable. It should be noted that certain typical forecast methodologies (e.g., regression analysis) are not useful for projections in this Master Plan because historical data is unavailable. Therefore, additional methodologies to project based aircraft have been developed.

The following sections summarize based aircraft forecasts using socioeconomic variables, previously generated forecasts from statewide studies, and trend analysis methodologies.

3.4.1.1 SOCIOECONOMIC METHODOLOGIES

Local socioeconomic factors do not always affect or reflect aviation-related activity at an airport; however, they can provide an indication of the overall health of the local economy, the potential type of aircraft activity that may be occurring at an airport, and propensity to travel or own an aircraft.

3.4.1.1.1 Population Variable Methodology

The population variable methodology assumes that between 2019 and 2040, the number of based aircraft at the Airport will increase at the same rate as the population of Franklin County and/or the State of Florida. Results of population forecasts are summarized in Figure 3.4.

- Using the Franklin County population variable, based aircraft at the Airport are projected to increase from 14 in 2019 to 18 in 2040, which reflects a CAGR of 1.10 percent.
- Using the State of Florida population variable, based aircraft at the Airport are projected to increase from 14 in 2019 to 18 in 2040, which reflects a CAGR of 1.32 percent.

Figure 3.4. Population Variable Methodology Based Aircraft Forecast

Year	Socioeconomic – Population			
	Franklin County		State of Florida	
	Population	Based Aircraft	Population	Based Aircraft
2019	12,539	14	21,320,443	14
2024	13,306	15	22,858,936	15
2029	14,098	16	24,477,523	16
2040	15,785	18	28,095,869	18
CAGR 2019-2040	1.10%		1.32%	

Sources: Woods and Poole Economics, Inc., Kimley-Horn

3.4.1.1.2 Employment Variable Methodology

Similar to the population variable methodology, the employment variable methodology assumes that between 2019 and 2040, the number of based aircraft will increase at the same rate as the growth of employment for the same geographic areas. Results of employment forecasts are summarized in Figure 3.5**.**

- Using the Franklin County employment variable, based aircraft are projected to increase from 14 in 2019 to 19 in 2040, which reflects a CAGR of 1.49 percent.
- Using the State of Florida employment variable, based aircraft are projected to increase from 14 in 2019 to 19 in 2040, which reflects a CAGR of 1.58 percent.

Figure 3.5. Employment Variable Methodology Based Aircraft Forecast

Year	Socioeconomic – Employment			
	Franklin County		State of Florida	
	Employment	Based Aircraft	Employment	Based Aircraft
2019	6,672	14	12,000,776	14
2024	7,253	15	13,103,305	15
2029	7,832	16	14,221,620	17
2040	9,099	19	16,678,199	19
CAGR 2019-2040*	1.49%		1.58%	

Sources: Woods and Poole Economics, Inc., Kimley-Horn
**Due to rounding, these two CAGRs net the same 2040 forecast*

3.4.1.1.3 Mean Household Income Variable Methodology

The mean household income variable methodology assumes that based aircraft at X13 will increase at the same rate as the mean household income of Franklin County and/or the State of Florida. Results of mean household income forecasts are summarized in Figure 3.6**.**

- Using the Franklin County mean household income variable, based aircraft are projected to increase from 14 in 2019 to 37 in 2040, which reflects a CAGR of 4.70 percent.
- Using the State of Florida mean household income variable, based aircraft are projected to increase from 14 in 2019 to 38 in 2040, which reflects a CAGR of 4.92 percent.

Figure 3.6. Mean Household Income Variable Methodology Based Aircraft Forecast

Year	Socioeconomic – Mean Household Income			
	Franklin County		State of Florida	
	MHI	Based Aircraft	MHI	Based Aircraft
2019	$84,739	14	$118,567	14
2024	$102,814	17	$144,708	17
2029	$130,609	22	$185,353	22
2040	$222,337	37	$324,972	38
CAGR 2019-2040	4.70%		4.92%	

Sources: Woods and Poole Economics, Inc., Kimley-Horn

3.4.1.1.4 Socioeconomic – Average Variable Methodology

Because population, employment, and income all indirectly relate to a regions propensity to travel or own an aircraft, the six growth rates were averaged and the result was 2.52 percent. As noted in the inventory, the Airport recently finalized a hangar development that brought the airport to a total of 14 based aircraft. This methodology applies the 2.52 percent socioeconomic average growth rate through the planning horizon, resulting in 24 based aircraft in 2040. Figure 3.7 summarizes the results of averaging the socioeconomic – average variable methodology.

Figure 3.7. Average Variable Methodology Based Aircraft Forecast

Year	Based Aircraft
2019	14
2024	16
2029	18
2040	24
CAGR 2019-2040	2.52%

Sources: Airport Management, Woods and Poole Economics, Inc., Kimley-Horn

3.4.1.2 FASP 2035 METHODOLOGY

The FASP 2035 forecasted based aircraft at Carrabelle Airport. Because the FASP was developed in 2015 and finalized in 2017, this methodology applies the based aircraft CAGR of 1.15 percent to the total number of based aircraft identified in 2019. Using this methodology, 18 based aircraft are projected at the Airport in 2040. Figure 3.8 displays the results as reported in the FASP.

Figure 3.8. FASP 2035 Methodology

Year	Based Aircraft
2019	14
2024	15
2029	16
2040	18
CAGR 2019-2040	1.15%

Sources: FASP 2035, Kimley-Horn

3.4.1.3 FAA AEROSPACE FLEET PROJECTION METHODOLOGY

Another methodology used to forecast based aircraft uses the FAA *Aerospace Forecast Fiscal Years 2019-2039* by comparing the national general aviation fleet to the Airport's based aircraft. This methodology assumes that based aircraft will increase at the same rate as the U.S. national general aviation fleet. According to the FAA Aerospace Forecasts, the national general aviation fleet will decrease at -0.04 percent from 2019-2039. As shown in Figure 3.9, the national general aviation fleet growth rate of -0.04 percent is applied to the based aircraft at the Airport in 2019 which projects no growth (14) based aircraft at the Airport in 2039.

Figure 3.9. U.S. National General Aviation Fleet Methodology Based Aircraft Forecast

Year	National Fleet	X13 Based Aircraft
2019	213,375	14
2024	212,665	14
2029	211,510	14
2039*	211,800	14
CAGR 2019-2039	-0.04%	

Sources: FAA Aerospace Forecasts Fiscal Years 2019-2039, Kimley-Horn
**FAA Forecast only goes to 2039*

3.4.2 Based Aircraft Forecast Comparison and Preferred Methodology

In total, six methodologies were examined to develop forecasts of based aircraft. The methodologies resulted in a range from 14 based aircraft to 38 based aircraft by 2040. The lowest projection was developed from the U.S. general aviation fleet comparison which applied the national average of negative -0.4 percent growth through 2040. This methodology is not considered reasonable based on the increase in based aircraft in the recent decade and the current aircraft storage waitlist.

The socioeconomic variables – for both Franklin County and the State of Florida – project a range of 18 to 38 based aircraft in 2040. These variables use growth rates that range from 1.1 percent (Franklin County population) to 4.92 percent (State of Florida MHI). It can be difficult to identify a stand-alone socioeconomic variable when there is a lack of factors to drive decision-making. It is understood that the City of Carrabelle is a fishing town and as such, there may be an underreported economy at an unknown magnitude. Additionally, due to the City's proximity to the coast, it is likely that families have second homes which could affect the growth rates reported for mean household income. Because of these underlying factors, an average growth rate was determined by averaging the socioeconomic growth rates from population, employment, and MHI in Franklin County and the State of Florida. The average growth rate of 2.52 percent was applied to the based aircraft anticipated in 2019 which projects 24 based aircraft in 2040.

Due the aircraft storage waitlist and regional and statewide socioeconomic conditions that affect demand at an airport, the socioeconomic average methodology was identified as the preferred methodology. Figure 3.10 summarizes the preferred forecast of based aircraft.

Figure 3.10. Preferred Based Aircraft Methodology

Year	Based Aircraft
2019	14
2024	16
2029	18
2040	24
CAGR 2019-2040	2.52%

Sources: Airport Management, Woods and Poole Economics, Inc., Kimley-Horn

3.4.3 Based Aircraft Fleet Mix Forecast

At most rural general aviation airports, the based aircraft fleet is primarily single-engine piston aircraft which is the case at Carrabelle Airport. It is anticipated that single-engine piston aircraft will remain the primary based aircraft type throughout the planning period. However, based on helicopter operations by the Florida Forest Service, the availability of fuel, and the hangar wait list, the Airport may experience a slight increase in based multi-engine piston and helicopter aircraft. Figure 3.11 summarizes based aircraft fleet mix over the planning horizon.

Figure 3.11. X13 Based Aircraft Fleet Mix Forecast

Year	Single-engine Piston	Multi-engine Piston	Turboprop	Jet	Helicopter	Other	Total
Preferred Based Aircraft Forecast							
2019	12	1	0	0	1	0	14
2024	14	1	0	0	1	0	16
2029	16	1	0	0	1	0	18
2040	19	4	0	0	1	0	24

Source: Kimley-Horn

3.5 Aircraft Operations Forecasts

As discussed previously, aircraft operations data are not readily accessible because of the lack of an airport traffic control center (ATCT) and estimates from sources such as the Federal Aviation Administration (FAA) Terminal Aviation Forecast (TAF). Consequently, a baseline estimate of 4,260 annual operations in 2019 is based on reports from the FAA 5010 Master Record. This figure was confirmed by Airport management and was used to project operational demand moving forward.

3.5.1 Aircraft Operations Forecast Methodologies

There are several factors that impact the number of operations that occur at an airport. The number of based aircraft, local demographics, national economic and aviation-related trends, proximity to other airports, capability and existing conditions of facilities, business needs, and several other factors. Like based aircraft, there is a lack of historical operations data available which influences the methodologies chosen to forecast operations in this Master Plan (MP). Methodologies for this MP include socioeconomic factors, operations per based aircraft (OPBA), and national trends.

3.5.1.1 SOCIOECONOMIC METHODOLOGIES

As with based aircraft, one methodology used to determine projections of aircraft operations was an examination of local socioeconomic data. The following sections project operational activity at the Airport using population, employment, and mean household income variables from Franklin County and the State of Florida. As with based aircraft forecasts, mean household income data obtained from Woods and Poole is reported in constant dollars (year 2019) to adjust for inflation over time.

3.5.1.1.1 Population Variable Methodology

The population variable methodology assumes that annual operations at the Airport will increase at the same rate as the population of the compared market area (Franklin County and the State of Florida). Results of this methodology are shown in Figure 3.12.

- Using the Franklin County population variable, total operations are projected to increase from 4,260 in 2019 to 5,360 in 2040, a Compound Annual Growth Rate (CAGR) of 1.10 percent.
- Using the State of Florida population variable, total operations are projected to increase from 4,260 in 2019 to 5,610 in 2040, a CAGR of 1.32 percent.

Figure 3.12. Population Variable Methodology Aircraft Operations Forecast

Year	Socioeconomic – Population			
	Franklin County		State of Florida	
	Population	Operations	Population	Operations
2019	12,539	4,260	21,320,443	4,260
2024	13,306	4,520	22,858,936	4,570
2029	14,098	4,790	24,477,523	4,890
2040	15,785	5,360	28,095,869	5,610
CAGR 2019-2040	1.10%		1.32%	

Note: Operations figures are rounded to nearest ten
Sources: Woods and Poole Economics, Inc., Kimley-Horn

3.5.1.1.2 Employment Variable Methodology

The employment variable methodology assumes that annual operations will increase at the same rate as the growth of employment for the same geographic areas. Results of employment forecasts are summarized in Figure 3.13**.**

- Using the Franklin County employment variable, total operations are projected to increase from 4,260 in 2019 to 5,810 in 2040, a CAGR of 1.49 percent.
- Using the State of Florida employment variable, total operations are projected to increase from 4,260 in 2019 to 5,920 in 2040, a CAGR of 1.58 percent.

Figure 3.13. Employment Variable Methodology Operations Forecast

Year	Socioeconomic – Employment			
	Franklin County		State of Florida	
	Employment	Operations	Employment	Operations
2019	$84,739	4,260	12,000,776	4,260
2024	$102,814	4,630	13,103,305	4,650
2029	$130,609	5,000	14,221,620	5,050
2040	$222,337	5,810	16,678,199	5,920
CAGR 2019-2040	1.49%		1.58%	

Note: Operations figures are rounded to nearest ten
Sources: Woods and Poole Economics, Inc., Kimley-Horn

3.5.1.1.3 Mean Household Income Variable Methodology

The mean household income (MHI) variable methodology assumes that annual operations will increase at the same rate as the mean household income of Franklin County and/or the State of Florida. Results of MHI forecasts are summarized in Figure 3.14**.**

- Using the Franklin County mean household income variable, total operations are projected to increase from 4,260 in 2019 to 11,180 in 2040, a CAGR of 4.70 percent
- Using the State of Florida mean household income variable, total operations are projected to increase from 4,260 in 2017 to 11,680 in 2040, a CAGR of 4.92 percent.

Figure 3.14. Mean Household Income Variable Methodology Operations Forecast

Year	Socioeconomic – Mean Household Income			
	Franklin County		State of Florida	
	MHI	Operations	MHI	Operations
2019	$84,739	4,260	$118,567	4,260
2024	$94,620	5,170	$144,708	5,200
2029	$102,012	6,570	$185,353	6,660
2040	$115,239	11,180	$324,972	11,680
CAGR 2019-2040	4.70%		4.92%	

Note: Mean household income and operations numbers rounded to nearest ten

Sources: Woods and Poole Economics, Inc., Kimley-Horn

3.5.1.2 FASP 2035 METHODOLOGY

Like based aircraft, the Florida Aviation System Plan (FASP) 2035 forecasted operations at Carrabelle Airport in the report's statewide forecasting effort from 2015-2035. Because the FASP was developed in 2015, this methodology applies the preferred operations CAGR of 1.15 percent to the total number of operations identified at the Airport in 2019. Using the FASP 2035 methodology, 5,420 annual operations are projected at the Airport in 2040. Figure 3.15 displays the results as reported in the FASP.

Figure 3.15. FASP 2035 Aircraft Operations Methodology

Year	Operations
2019	4,260
2024	4,510
2029	4,780
2040	5,420
CAGR 2019-2040	1.15%

Source: FASP 2035

3.5.1.3 OPERATIONS PER BASED AIRCRAFT METHODOLOGY

Operations per Based Aircraft (OPBA) is a methodology employed to calculate an average ratio of annual airport operations to total based aircraft. The OPBA for in 2019 was calculated by dividing the number of total annual operations (4,260) by the number of based aircraft at the Airport (14). This resulted in an average of 304 OPBA. To forecast operations through the planning horizon using this methodology, the

OPBA (304) was held constant through 2040 and multiplied by the number of based aircraft determined from the preferred based aircraft methodology. As shown in Figure 3.16, using this methodology it is estimated that by 2040, the Airport will experience 7,180 annual operations.

Figure 3.16. Operations Per Based Aircraft Forecast

Year	X13 Based Aircraft	X13 OPBA	X13 Operations
Preferred Operations Methodology			
2019	14	304	4,260
2024	16	304	4,820
2029	18	304	5,460
2040	24	304	7,180
CAGR 2019-2040	1.35%		

Note: Operations projections rounded to nearest ten
Sources: Kimley-Horn, Airport management

3.5.1.4 FAA AEROSPACE NATIONAL HOURS FLOWN METHODOLOGY

This methodology assumes that aircraft operations will increase at the same rate as the U.S. general aviation national hours flown. According to the FAA Forecasts 2019-2039, U.S. general aviation national hours flown are projected to increase by 0.78 percent annually through 2039. As discussed in the beginning of this section, the national increase in hours flown can be attributed to the increase in sport, experimental, rotorcraft, jet, and turboprop aircraft which offsets the slight national decline in single- and multi-engine piston hours flown. The 0.78 percent increase in hours flown of all aircraft types was an appropriate growth rate for Carrabelle Airport—as more sophisticated facilities may increase demand for more sophisticated aircraft—than the decreasing growth rate of single- and multi-engine aircraft. As shown in Figure 3.17, the 0.78 percent national growth rate was applied to the 4,260 aircraft operations in 2019 and held constant throughout the 20-year planning horizon. This methodology projects 5,020 total operations in 2040.

Figure 3.17. U.S. National General Aviation Fleet Methodology Based Aircraft Forecast

Year	National Hours Flown	X13 Operations
2019	25,943	4,260
2024	26,802	4,430
2029	27,713	4,600
2039*	30,311	5,020
CAGR 2019-2039	0.78%	

Source: FAA Aerospace Forecasts Fiscal Years 2019-2039
**FAA Forecast only goes to 2039*

3.5.2 Aircraft Operations Projections Comparison and Preferred Methodology

The range of projected annual aircraft operations using socioeconomic, FASP 2035, U.S. general aviation national hours flown, and OPBA methodologies is 5,020 (U.S. general aviation national hours flown methodology) to 7,180 (OPBA methodology). The U.S. general aviation national hours flown

methodology projects a minimal increase of annual operations over the planning horizon. This figure was determined to be low based on the types of activity identified at the Airport. Socioeconomic characteristics of Franklin County and the State of Florida and FASP 2035 methodologies project between 5,360 and 11,680 by 2040. It was determined that while these methodologies project steady growth, they weren't indicative of the activity at the Airport over the planning horizon. The OPBA methodology was selected as the preferred methodology. This methodology suggests that the Airport will experience an average of 304 OPBA throughout the planning period.

3.5.3 Forecast of Local/Itinerant Operations

The most accurate data to identify local vs. itinerant operations at the Airport are based on Airport Management observations. It is estimated that Carrabelle Airport experiences approximately 60 percent local and 40 percent itinerant activity. As summarized in Figure 3.18, these figures are applied to total projected operations and held constant throughout the projection period for the preferred forecasts.

Figure 3.18. Operations Forecast – Local/Itinerant Split

Year	Total Operations	Local Operations	% Local Operations	Itinerant Operations	% Itinerant Operations
Preferred Operations Forecast					
2019	4,260	2,560	60%	1,700	40%
2024	4,820	2,890	60%	1,930	40%
2029	5,460	3,280	60%	2,180	40%
2040	7,180	4,310	60%	2,870	40%

Note: Operations projections rounded to nearest ten

Sources: Airport Management, Kimley-Horn, Woods and Poole Economics, Inc.

3.5.4 Forecast of Military Operations

According to data reported in the FAA 5010 Master Record, 40 military operations occurred at Carrabelle Airport in 2018. Because military activity is tied to national defense needs, which are generally unknown, military operations were forecast to remain constant at 40 annual operations throughout the planning horizon and are assumed to be itinerant in nature.

3.5.5 Forecast of Daytime/Nighttime Operations

Estimations of daytime vs. nighttime operations are analyzed as potential aircraft noise impacts perceived by the community could be greater at night than during the day. For the purposes of noise evaluation, the FAA defines night operations as those occurring between the hours of 10:00 pm and 7:00 am local time. According to Airport management observations, approximately 90 percent of operations occur during the day with the remaining 10 percent at night. It is assumed that this daytime vs. nighttime operational split will remain constant throughout the planning period and is summarized in Figure 3.19 for the preferred operations forecasts.

Figure 3.19. Operations Forecast – Daytime/Nighttime Split

Year	Total Operations	Daytime Operations	% Daytime	Nighttime Operations	% Nighttime
Preferred Operations Forecast					
2019	4,260	3,830	90%	430	10%
2024	4,820	4,340	90%	480	10%
2029	5,460	4,910	90%	550	10%
2040	7,180	6,460	90%	720	10%

Note: Operations rounded to nearest ten

Sources: Airport management, Kimley-Horn, Woods and Poole Economics, Inc.

3.5.6 Forecast of Touch-and-Go Operations

A touch-and-go is defined as an operation by an aircraft that lands and departs on a runway without stopping or exiting. This type of operation is typically associated with flight training. It can be difficult to forecast touch-and-go operations at an airport where there is no ATCT or historical record to reference. Because the Airport does not currently have a full-time, on-airport flight school, touch-and-go operations are projected to account for a fraction of the annual operations. As shown in Figure 3.20, it is projected that touch-and-go operations comprise 15 percent of total operations at the Airport. This percentage of total annual operations is held constant through the planning period which forecasts approximately 1,080 touch-and-go operations using the preferred operations forecast by 2040.

Figure 3.20. Operations Forecast – Touch-and-Go

Year	Total Operations	% Touch-and-Go	Touch-and-Go Operations
Preferred Operations Forecast			
2019	4,260	15%	640
2024	4,820	15%	720
2029	5,460	15%	820
2040	7,180	15%	1,080

Note: Operations projections rounded to nearest ten

Sources: Airport management, Kimley-Horn, Woods and Poole Economics, Inc.

3.5.7 Peaking Characteristics and Peak Operations Projections

Although Carrabelle Airport receives a relatively low volume of operations, the Airport does have some inflated levels of seasonal activity and when special events, such as annual fly-ins, occur at the Airport. For this analysis, the periods used are as follows:

- Peak Month – the calendar month when peak volumes of aircraft operations occur
- Peak Month Average Day (PMAD) – the average day in the peak month; derived by dividing the peak month operations by the number of days in the month

The average peak month and PMAD operations projected for the Airport are summarized in

Figure *3.21*.

Figure 3.21. Peaking Characteristics Forecast

Year	Total Operations	Peak Month	Peak Month Average Day
Preferred Operations Forecast			
2019	4,260	920	30
2024	4,820	1,040	30
2029	5,460	1,180	40
2040	7,180	1,550	50

Source: Woods and Poole Economics, Inc., Kimley-Horn

3.6 Critical Aircraft

Facility planning for general aviation airports is impacted by existing and anticipated levels of aviation-related demand and the size and type of aircraft that currently operate and are projected to operate at an airport. As defined in FAA AC 150/5300-13A, Change 1, *Airport Design*, the FAA classifies airports by an Airport Reference Code (ARC) which subsequently prescribes the overall planning and design criteria for those airports. The ARC is assigned based on the size and operational characteristics of the most demanding aircraft that generally records at least 500 annual operations at that airport. This is referred to as the Airport's "critical aircraft" or "design aircraft" and can include either a specific aircraft model or a grouping of similar aircraft with similar characteristics that are considered collectively.

The ARC classification system is based on groupings of aircraft types relative to their operating performance and geometric characteristics. It is comprised of an alpha-numeric identifier representing the Aircraft Approach Category (AAC) and the Aircraft Design Group (ADG). The AAC reflects the approach speed of the aircraft, and the ADG reflects the aircraft's wingspan and tail height[4]. The classifications are summarized in Figure 3.22 and Figure 3.23 and it should be noted that both airports and aircraft can be referred to by their ARC.

Figure 3.22. Aircraft Approach Categories

Aircraft Approach Category (AAC)	
Category	Approach Speed
A	Less than 91
B	91 to 120
C	121 to 140
D	141 to 165
E	166 or greater

Source: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design

[4] AAC A and B aircraft include a sub-category for "small aircraft" and are defined as an aircraft with a maximum certified takeoff weight of 12,500 pounds or less.

Figure 3.23. Airplane Design Groups

Airplane Design Group (ADG)		
Group	Wing Span (feet)	Tail Height (feet)
I	Less than 49	Less than 20
II	49 to 78	21 to 29
III	79 to 117	30 to 44
IV	118 to 170	45 to 59
V	171 to 213	60 to 65
VI	214 up to but less than 262	66 up to but less than 80

Source: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design

Aircraft with approach speeds included in categories A and B are typically smaller piston-engine aircraft, whereas C, D, and E are normally larger turboprop or turbine powered aircraft. Similarly, the wingspan and tail height of small, piston-engine aircraft normally correspond to design group I. Typical aircraft in design group II would be a Beechcraft King Air, Cessna Citation, or smaller Gulfstream business jet. Design group III would include larger corporate jets such as Gulfstream G500/550 and air carrier aircraft such as the DeHavilland Dash-8 and Boeing B-737. Design group IV, and V would represent larger narrow body and wide body air carrier aircraft such as Boeing B-757 and B-747, respectively. Group VI would include the largest of aircraft, such as an Airbus A-380 or a C-5 military transport aircraft.

In the previous Aviation Layout Plan (ALP) Update with Narrative that was prepared in 2009, the critical aircraft at Carrabelle Airport was identified as a Beechcraft King Air 100 which resulted in the Airport being designed to B-I safety standards. An analysis of aircraft operations from the FAA's Traffic Flow Management System Counts (TFMSC) database at the Airport from 2013 through 2017 identified that the Beechcraft Baron 58 should be the existing and future Critical Aircraft. Although the Beechcraft Baron does not conduct anywhere near 500 annual operations, it is reflective of the type of aircraft that are currently and projected to operate at the Airport.

The Beechcraft Baron 58 is considered a "small aircraft" – one with a maximum certified takeoff weight of 12,500 pounds or less. Runway safety dimensional standards are decreased at airports where only small aircraft are anticipated to operate. It should be noted that while the Airport's critical aircraft is the Beech Baron 58, larger, more demanding turboprop and small jet aircraft are still able to safely operate at the Airport, including the Beechcraft Super King Air 300 and Cessna Citation V which were identified on the Airport's TFMSC report. The number of larger aircraft operations are not significant enough to warrant a change in critical aircraft or ARC classification; however, the presence of these larger aircraft at the Airport is justification for preserving the Airport's existing B-I safety dimensional standards, rather than reducing to B-I (small) safety standards.

3.7 Forecast Summary

It is anticipated that based aircraft and operations at Carrabelle Airport will continue to grow throughout the 20-year planning period. Figure 3.24 summarizes the projections of aviation demand for the preferred forecast methodology.

Figure 3.24. Forecast Summary

Category	Year			
	2019	2024	2029	2040
Preferred Forecast Methodology				
Local	2,560	2,890	3,280	4,310
Itinerant	1,700	1,930	2,180	2,870
Annual Operations	**4,260**	**4,820**	**5,460**	**7,180**
Single-engine Piston	12	14	16	19
Multi-engine Piston	1	1	1	4
Jet	0	0	0	0
Helicopter	1	1	1	1
Other	0	0	0	0
Total Based Aircraft	**14**	**16**	**18**	**24**

Note: Operations figures rounded to the nearest ten

Sources: Airport management, Kimley-Horn, Woods and Poole Economics, Inc.

4 Facility Requirements

Based on the results and selection of the preferred forecast methodology, this chapter compares the Airport's existing facilities and their ability to accommodate the projected aviation-related activity. Additionally, this chapter identifies specific enhancements that will be necessary to meet user demand and/or Federal Aviation Administration (FAA) design standards over the planning period. As previously noted, the Airport has indicated the desire to become recognized in the FAA's National Plan of Integrated Airport Systems NPIAS. This section identifies projects needed to meet FAA standards to achieve the Airport's goal of becoming accepted into the NPIAS when the opportunity presents itself. These evaluations also strive to adequately accommodate the needs of the flying public, Franklin County, Airport stakeholders, and the local community whether the Airport achieves NPIAS status or not.

This chapter provides a discussion of the minimum requirements for airside and landside facilities as well as airspace protection at Carrabelle Airport over the 20-year planning horizon. This chapter presents the facilities needed to meet baseline and forecasted activity, but does not consider timing, phasing, or feasibility of implementation. For recommendations that are more complex in nature, or have multiple solutions, an evaluation of alternative development scenarios will be provided in a subsequent chapter of this report. The ultimate needs resulting from the evaluation of facility requirements and alternatives assists the City of Carrabelle in defining and managing their overall Airport Capital Improvement Plan (ACIP). The following sections provide analysis on facility requirements related to:

- Airfield Demand and Capacity
- Airside Facilities
- Airspace Protection
- Landside Facilities
- Security

4.1 Airfield Demand and Capacity

Airfield capacity refers to the maximum number of aircraft operations (take-offs and landings combined) an airfield can accommodate in a specified amount of time (i.e. annually or hourly). The purpose of an airfield capacity analysis is to determine if the airfield facilities, specifically the number of runways and their alignment, are sufficient to meet both existing and future demand or if capacity-enhancing changes to these facilities are needed. FAA AC 150/5060-5, *Airport Capacity and Delay,* indicates that with a single, bi-directional runway and a fleet mix of predominately aircraft less than 12,500 pounds, Carrabelle Airport can accommodate up to 230,000 total annual operations (approx. 630 daily operations). Based on the selected and approved forecast, Carrabelle Airport is projected to have 7,180 total annual operations by 2040; which is well accommodated by the existing airport facilities.

Because annual operations are not the most accurate method to understanding airfield capacity constraints, FAA AC 150/5060-5, *Airport Capacity and Delay* further specifies that for Carrabelle Airport the maximum hourly capacity of the airfield is 98 operations during Visual Flight Rules (VFR) conditions

and 59 during Instrument Flight Rules (IFR) conditions. This analysis shows that the existing airfield provides more than sufficient capacity throughout the planning period. A summary of this information is provided in Figure 4.1.

Figure 4.1. Airfield Capacity

Factor	2019	2024	2029	2040
Annual Operations	4,260	4,820	5,460	7,180
Average Daily Operations	12	13	15	20
(ASV) Annual Service Volume	230,000	230,000	230,000	230,000
Demand/Capacity Ratio	1.85%	2.10%	2.37%	3.12%

Sources: Kimley-Horn, Airport Management

4.2 Airside Facilities

Airside facilities accommodate the take-off and landing of aircraft as well as the movement of those aircraft throughout the Airport. To better understand the function and ability of Carrabelle Airport's airside facilities, this section includes analysis of the following:

- Approach Capability
- Airport and Runway Classifications
- Runway System
- Taxiway System
- Lighting, Markings, and Navigational Aids (NAVAIDs)
- Helicopter Parking
- Summary of Airside Facility Needs

4.2.1 Approach Capability

The ability of an approaching aircraft to land at an airport is predicated on the weather conditions, the level of pilot training, the type of navigation equipment both in the aircraft and at the Airport, and the approach procedures established by the FAA. Under Visual Meteorological Conditions (VMC), which are defined as a cloud ceiling greater than 1,000 feet above ground level (AGL) and visibility conditions equal to or greater than three statute miles, pilots may approach an airport using only visual standards or cues. These are basic flight maneuvers that can be performed by all pilots at all public-use airports. Instrument Meteorological Conditions (IMC) occur when cloud ceilings are lower than 1,000 feet AGL and visibility becomes less than three statute miles. Under these conditions, properly trained pilots with adequately equipped aircraft can follow FAA-published Instrument Approach Procedures (IAPs) to land at an airport.

The FAA classifies standard IAPs, and the runways supporting those procedures, based on the type of electronic navigation guidance and the lowest approach minimums (visibility and decision height/HATh) provided by that procedure. The classifications include Non-Precision (NP), Precision (P), and Approach Procedures with Vertical Guidance (APV). Non-Precision approaches provide only lateral guidance from either ground based or satellite based Global Positioning System (GPS) navigational aids (NAVAIDs). Precision instrument approaches provide both lateral and vertical guidance and are traditionally

supported by multiple ground based NAVAIDs collectively called an Instrument Landing System (ILS). An ILS includes a Localizer (providing lateral guidance), a Glideslope (providing vertical guidance) and an approach lighting system (providing close-in visual guidance). Approach Procedures with Vertical Guidance are a relatively recent outcome of the FAA's Next Generation Air Transportation System (NextGen) program. These approach procedures use GPS technology to provide ILS-like approach capability without the need for traditional ground-based ILS NAVAID equipment.

Carrabelle Airport does not currently have any IAPs. Most aircraft operations that occur at the Airport are conducted by helicopters or small, single-engine piston aircraft. Based on the types of airport users, and the relatively low level of aircraft activity at the Airport, it is not anticipated that any IAPs or equipment will be needed in the 20-year planning horizon. It is important to note that Airport users and tenants have identified an approach procedure as a desired facility improvement to increase safety. It is recommended that the feasibility of implementing approach capabilities at Carrabelle Airport be re-examined in the next Master Plan update, particularly if activity increases at the Airport by that point in time.

4.2.2 Airport and Runway Classifications

The FAA classifies airports and runways by their current and planned operational capabilities. These classifications are used to determine the appropriate FAA design and airspace protection standards to which the airfield facilities should be developed.

4.2.2.1 CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE (ARC)

The FAA classifies airports and runways by their current and planned operational capabilities. These classifications, along with the aircraft classifications defined in Chapter 2, are used to determine the appropriate FAA standards, as per AC 150/5300-13A, to which the airfield facilities are to be designed and built. Although Carrabelle Airport is not mandated to adhere to FAA standards, it is recommended that facilities reflect those identified in FAA AC 150/5300-13A to the extent possible.

As noted in the previous Chapter, an Airport Reference Code (ARC) is an airport designation that represents the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the most demanding aircraft that the airfield is intended to accommodate on a regular basis. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at an airport.

The FAA identifies a Critical Aircraft as the most demanding airplane or group of airplanes that utilize a runway on a regular basis, which is defined as at least 250 takeoffs per year. Based on an analysis of historical operations at Carrabelle Airport using the FAA's Traffic Flow Management System Count database (TFMSC), the most demanding aircraft that regularly operates at Carrabelle Airport is the Beechcraft Baron 58.

Although more demanding aircraft have been observed operating at the Airport, this aircraft model is reflective of a more typical, regularly operating aircraft. With an approach speed of 96 knots and a wingspan of 38 feet, the ARC for the Beechcraft Baron 58 is B-I.

Consistent with FAA guidance, the Critical Aircraft anticipated to use the facilities over the planning horizon are those with an AAC and ADG of B-I. The ARC for Carrabelle Airport is anticipated to remain B-I throughout the planning horizon.

4.2.2.2 RUNWAY DESIGN CODE (RDC)

The RDC is used to signify the design standards which each specific runway is to be planned and built. This classification has three components: AAC, ADG, and the highest approach visibility minimums that either end of the runway is planned to provide. Within these classifications, instrument approach visibility minimums are expressed in runway visual range (RVR) values of 1200, 1600, 2400, 400, and 5000 feet, as presented in Figure 4.2. An airport's ARC will be consistent with the highest RDC of any of its runways. The RDC for Carrabelle Airport's Runway 05-23 is B-I-VIS.

Figure 4.2. Runway Visual Ranges

RVR (ft.)	Corresponding Visibility Category
VIS	Visual conditions (including instrument circling)
5000	Not lower than one mile
4000	Lower than one mile but not lower than ¾ mile
2400	Lower than ¾ mile but not lower than ½ mile (CAT-I ILS)
1600	Lower than ½ mile but not lower than ¼ mile (CAT-II ILS)
1200	Lower than ¼ mile (CAT-III-ILS)

Source: FAA AC 150/5300-13A, Airport Design

4.2.2.3 APPROACH AND DEPARTURE REFERENCE CODES (APRC & DPRC)

Approach and Departure Reference Codes (APRC and DPRC) describe the *current* operational capabilities of a runway and adjacent taxiways where no special operating procedures are necessary. In contrast, the RDC is based on *planned* development and has no operational application.

Like the RDC, the APRC is composed of three components: AAC, ADG, and visibility minimums. The APRC indicates which aircraft can operate on taxiways adjacent to a runway under particular meteorological conditions. The APRC classification is also used to identify several critical design standards including runway lighting and marking, threshold siting criteria, obstacle free zones, and other FAA obstacle identification surfaces. The APRC for Runway 05-23 is B-I-VIS.

The DPRC represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary. It is similar to the APRC, but is composed of two components, AAC and ADG. The DPRC for Runway 05-23 is B-I-VIS.

4.2.2.4 RUNWAY DIMENSIONAL STANDARDS

FAA AC 150/5300-13A, Change 1, identifies dimensional standards for runway-related separations that are essential to provide clearance from potential hazards affecting routine aircraft ground movements and protect people from incompatible land uses in the immediate approach and departure areas. Dimensional standards for these separations are determined by the RDC and relate to separation distances for taxiway hold lines, parallel taxiways, aircraft parking areas, obstacle free areas, safety

areas, as well as many other safety critical areas. The following sections describe the B-I safety and runway protection areas as they apply to Runway 05-23[5]. These are also conceptually depicted in Figure 4.3.

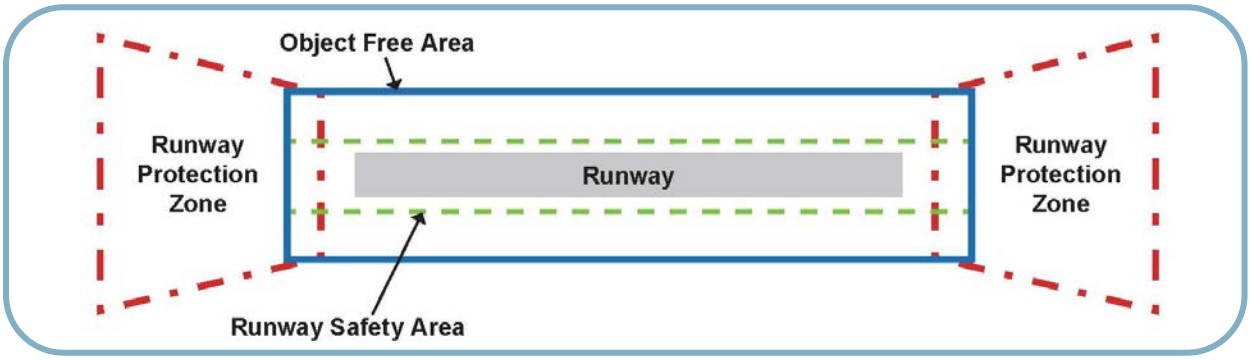


Figure 4.3. Runway Safety and Protection Areas
Source: FAA AC 150/5300-13A, Change 1, Airport Design

4.2.2.4.1 Runway Safety Area

The Runway Safety Area (RSA) is a defined surface surrounding the runway designed to reduce the risk of damage to aircraft in the event of an undershoot, an overshoot, or excursion from the runway. As indicated by FAA AC 150/5300-13A, an RSA must be:

- Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations.
- Drained by grading or storm sewers to prevent water accumulation.
- Capable, under dry conditions, of supporting snow removal equipment, Aircraft Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft without causing damage to the aircraft.
- Free of objects, except for objects that need to be in the RSA because of their function. Objects higher than three inches above grade must be constructed, to the extent practical, on frangible-mounted structures of the lowest practical height with the frangible point no higher than three inches above grade. Other objects, such as manholes, should be constructed at grade and capable of supporting the loads noted above. In no case should their height exceed three inches above grade.

RSA standards cannot be modified. A continuous evaluation of all practicable alternatives for improving each sub-standard RSA is required until it meets all standards for grade, compaction, and object frangibility. FAA Order 5200.8 explains the process for conducting this evaluation.

For B-I runways such as Carrabelle Airport, the dimensions of the RSA are 120 feet wide, extending 240 feet prior to the landing threshold, and 240 feet beyond the departure end of the runway. The existing

[5] *For B-I runways, design standard dimensions increase when visibility minimums are lower than ¾ mile. Since visibility minimums lower than ¾ mile are not a recommendation in this Master Plan, the increased design standard dimensions are not identified.*

RSA currently meets FAA standards. FAA RSA requirements are not enforced at Carrabelle Airport because the Airport is not in the NPIAS, however, the Airport has expressed the desire to become federally obligated. It is recommended that the Airport strive to meet FAA design standards over the planning horizon. Figure 4.4 depicts the RSA dimensions at the Airport.

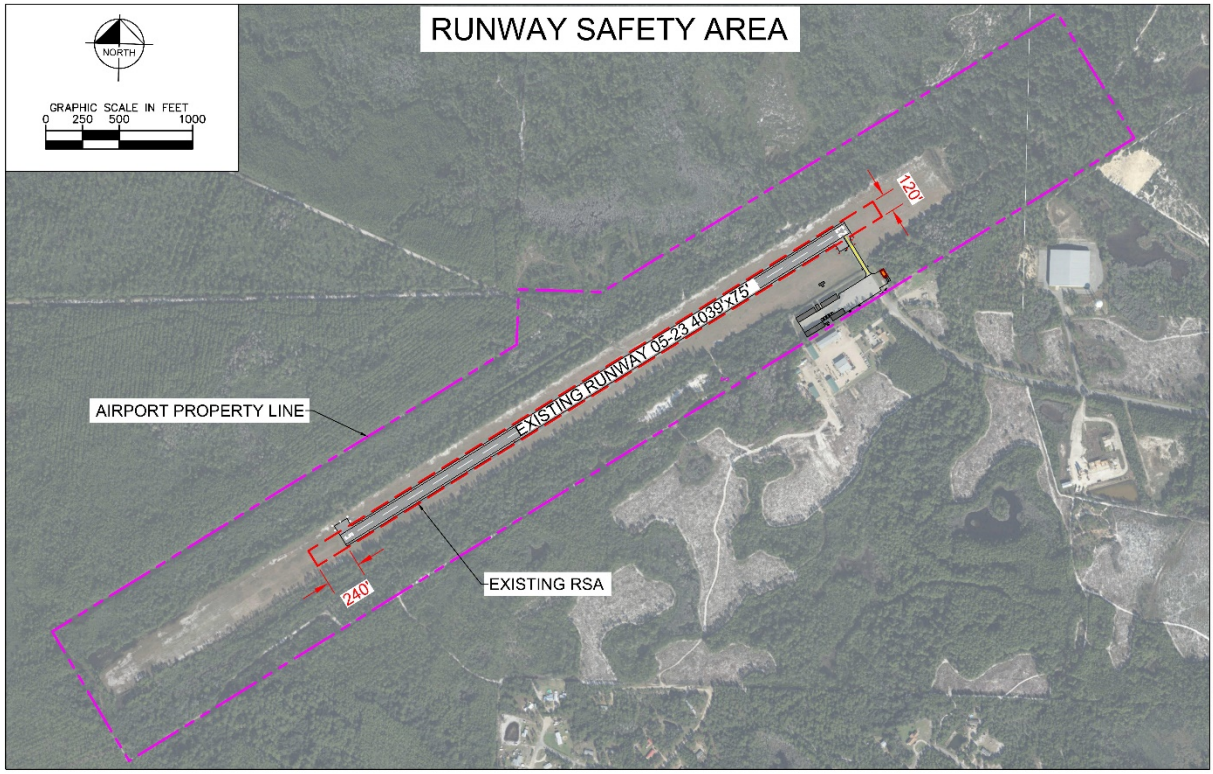


Figure 4.4. Carrabelle Airport RSA Dimensions
Source: FAA AC 150/5300-13A, Change 1, Airport Design

4.2.2.4.2 Runway Object Free Area

The Runway Object Free Area (ROFA) is an area centered on the runway centerline that is to be cleared of all above-ground objects that protrude above the RSA edge elevation. For new runways, terrain should not protrude above the nearest point of the RSA within a distance from the edge of the RSA equal to one-half the most demanding wingspan of the RDC of the Runway. If not practicable to apply this standard to existing runways, the FAA provides guidance in the AC 150/5300-13A. There is an exception for objects that must be in the ROFA for air navigation or aircraft ground maneuvering purposes (fixed by function). Objects that must remain in the ROFA are constructed on frangible mounts to minimize potential damage to aircraft in the event of an errant mishap. For Runway 05-23, this surface is 400 feet wide, extends 240 feet prior to the threshold, and 240 feet beyond the departure end of the runway. The existing ROFA currently meets FAA standards. Figure 4.5 builds on the previous graphic to depict the ROFA dimensions at the Airport. Please note, due to how the line-work in the graphic is depicted, it may appear as if the ROFA on the southwest side of the airport is penetrated by trees. Based on a survey of the airfield, this is not actually true and ROFA standards are being met.

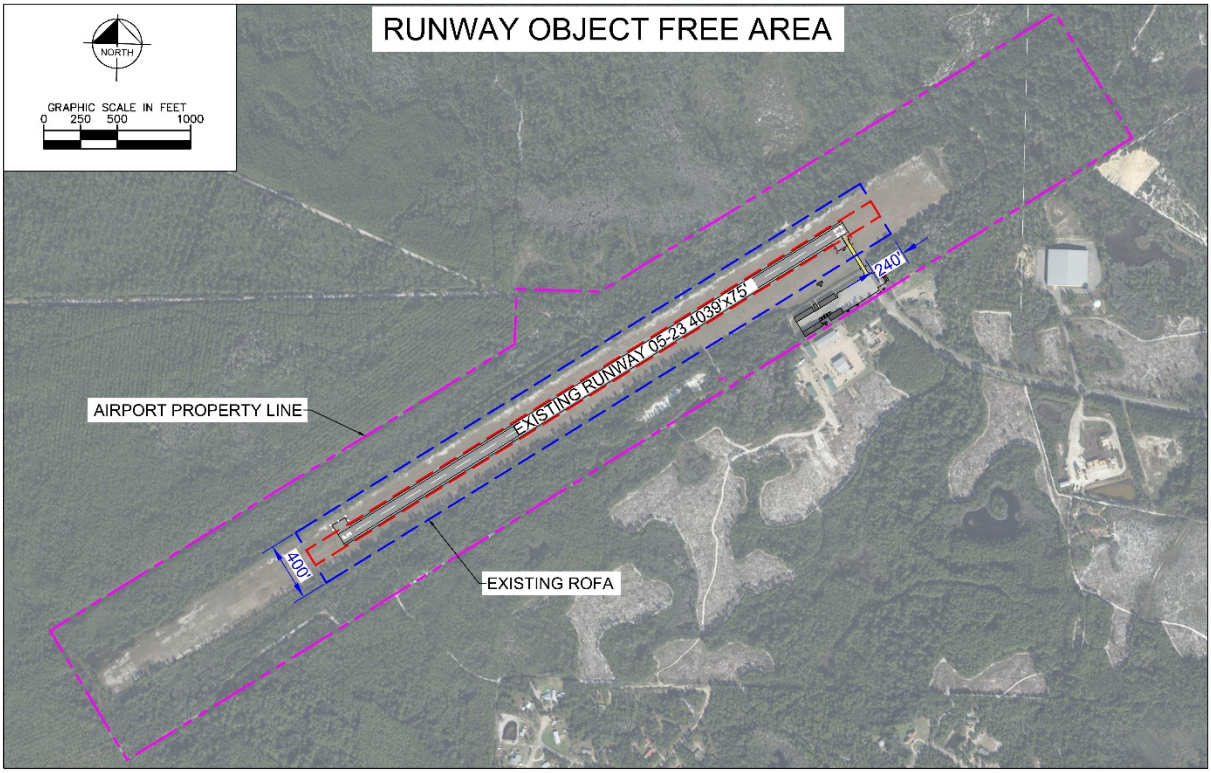


Figure 4.5. Carrabelle Airport ROFA Dimensions
Source: FAA AC 150/5300-13A, Change 1, Airport Design

4.2.2.4.3 Runway Obstacle Free Zone

The Runway Obstacle Free Zone (ROFZ) is defined by the FAA as a volume of airspace centered above the runway centerline that extends 200 feet beyond each end of the runway surface. This area prohibits taxiing or parked aircraft and object penetrations, except for frangible visual NAVAIDs that need to be in the ROFZ because of their functions.

- For operations by small aircraft:
  - 300 feet for runways with lower than ¾ statute mile approach visibility minimums
  - 250 feet for operations on other runways by small aircraft with approach speeds of 50 knots or more
  - 120 feet for operations on other runways by small aircraft with approach speeds of less than 50 knots
- 400 feet for operations by large aircraft

ROFZ width is determined by the approach speed of the critical aircraft (Beechcraft Baron 58) which is 96 knots. As such, the ROFA for Runway 05-23 is 250 feet wide which currently meets FAA design standards. Figure 4.6 builds on the previous graphic to depict the ROFZ dimensions at the Airport.

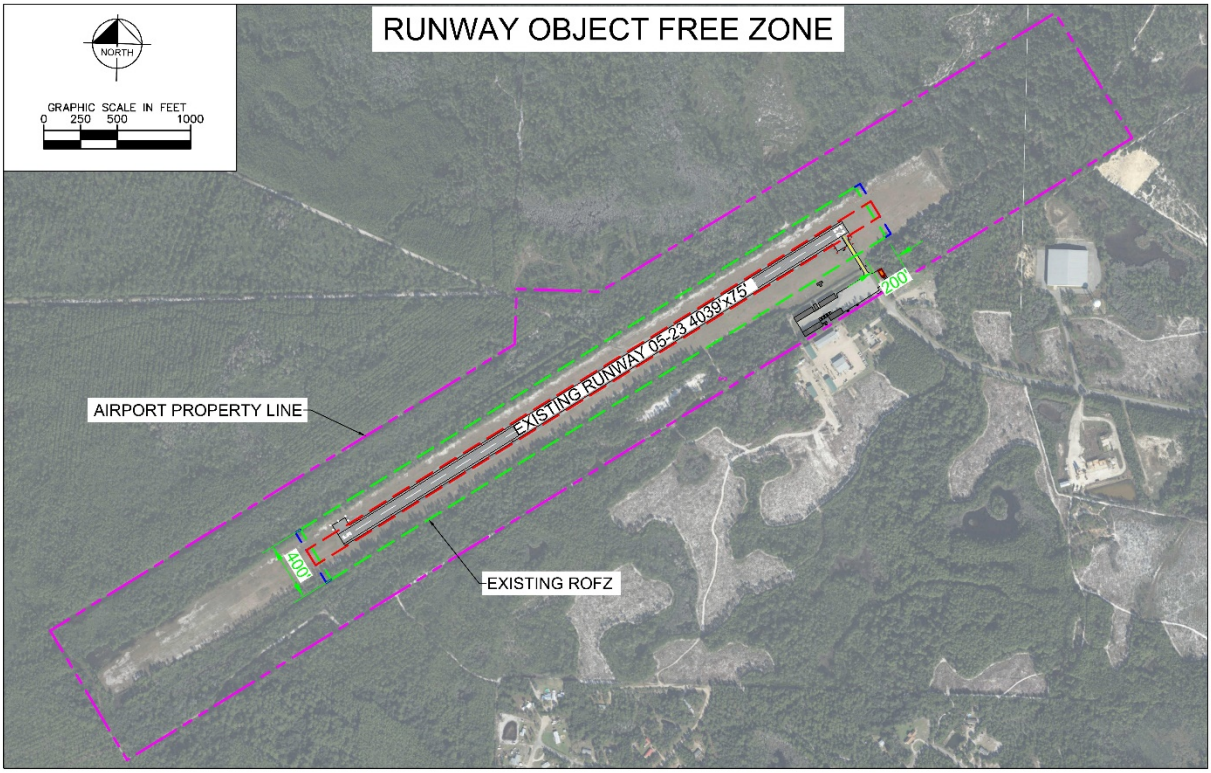


Figure 4.6. Carrabelle Airport ROFZ Dimensions
Source: FAA AC 150/5300-13A, Change 1, Airport Design

4.2.2.4.4 Runway Protection Zone

A Runway Protection Zone (RPZ) is trapezoidal area beginning 200 feet beyond the runway end and centered on the extended runway centerline. The RPZ is a safety and land use restricted area meant to enhance the protection of people and property on the ground. Airports should seek to maintain control over the RPZs through fee-simple acquisition, avigation easement, or use restrictions/agreements. For airports with displaced thresholds and declared distances, separate approach and departure RPZs may be needed; however, since Carrabelle Airport does not have any displacements, the approach and departure RPZs are the same. If the runway length were to increase, the Airport should be cognizant of the RPZs and make every effort to keep them on airport property, negotiate and avigation easement, or acquire the property immediately inside the ultimate RPZ.

The FAA has identified compatible and incompatible land use within an RPZ. Compatible land use within an RPZ includes:

- Farming that meets the design standards
- Irrigation channels that meet the requirements of AC 150/5200-33 and FAA/USDA manual, Wildlife Hazard Management at Airports
- Airport service roads, as long as they are not public roads and are directly controlled by the Airport operator

- Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable
- Unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ

According to the FAA's interim guidance on RPZ land use compatibility, incompatible land use within an RPZ includes:

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

For B-I runways, the dimensions of the RPZ vary depending on visibility minimums. For visual runways, such as Carrabelle Airport, the inner width of the RPZ is 500 feet, the outer width is 700 feet, and the length is 1,000 feet. This equates to 13.77 acres of land use protection. Both RPZs on Runway 05-23 are within the existing Airport property boundary. Figure 4.7 builds on the previous graphic to depict RPZ dimensions at the Airport.

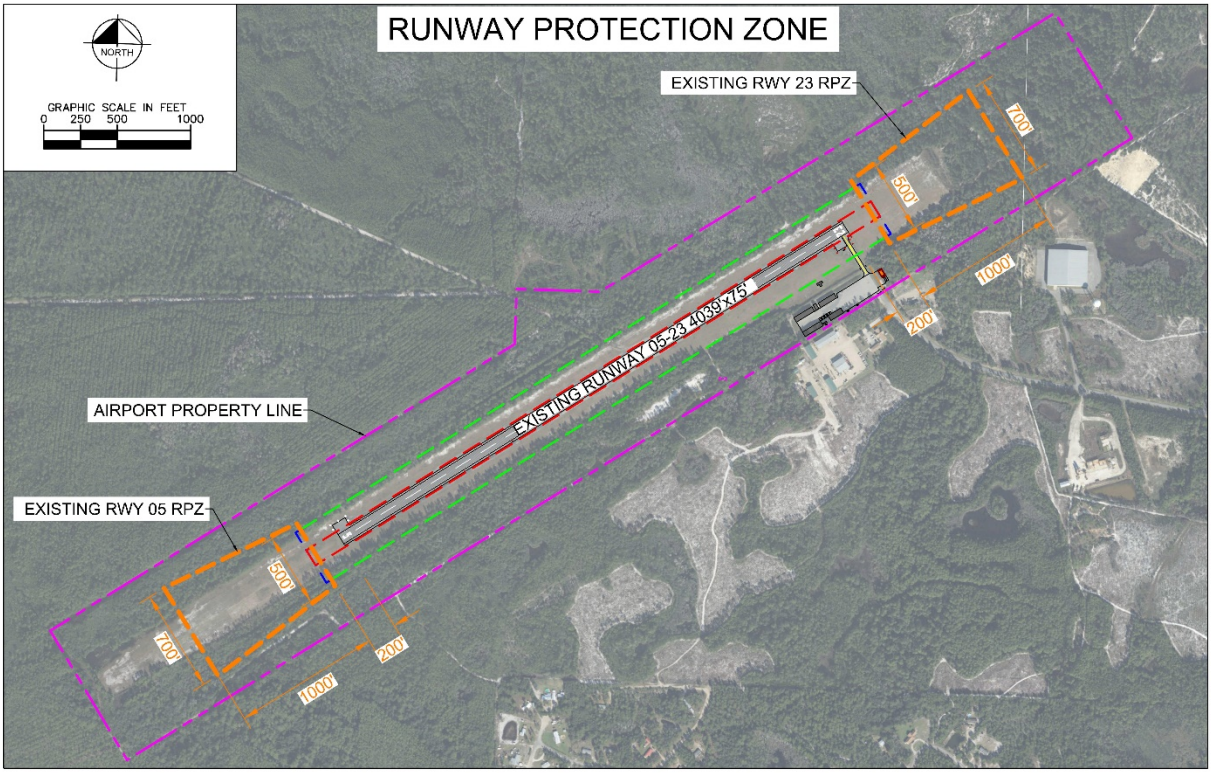


Figure 4.7. Carrabelle Airport RPZ Dimensions
Source: FAA AC 150/5300-13A, Change 1, Airport Design

Carrabelle Airport's existing dimensional standards along with the FAA design standards for a B-I runway with visual approach minimums are summarized in Figure 4.8.

Figure 4.8. Runway Dimensional Standards

Aircraft Type	Runway 05-23	
	Existing Conditions	B-I FAA Standards
Runway Design		
Width	75’	60’
Shoulder Width	—	10’
Runway Protection		
RSA Length beyond departure end	240’	240’
RSA Length prior to threshold	240’	240’
RSA Width	120’	120’
ROFA Length beyond departure end	240’	240’
ROFA Length prior to threshold	240’	240’
ROFA Width	400’	400’
ROFZ Length beyond runway end	200’	200’
ROFZ Width	400’	250’
RPZ Length	1,000’	1,000’
RPZ Inner Width	500’	500’
RPZ Outer Width	700’	700’

Sources: FAA AC 150/5300-13A, Change 1, Airport Design, Kimley-Horn

4.2.3 Runway System

The dominant feature on any airport is its runway(s). The pavement, orientation, dimensions, and associated lighting, NAVAIDs, and surrounding safety areas determine which aircraft, and under which conditions, those aircraft can be operated in a safe, efficient, and FAA-compliant manner. The following sections evaluate the physical and operational characteristics of the Runway 05-23 at Carrabelle Airport.

4.2.3.1 RUNWAY ORIENTATION

A runway is ideally oriented with the prevailing wind, as operating with a headwind increases lift and stability. FAA planning standards indicate that the primary runway should be capable of operating under allowable wind conditions at least 95 percent of the time. The 95 percent wind coverage is based on the crosswind (i.e., wind speed and direction vector compared to the aircraft’s direction of flight) not exceeding the following:

- 10.5 knots (12 miles per hour [mph]) for small single-engine and light-twin aircraft (Carrabelle Airport)
- 13 knots (15 mph) for the larger and heavier turboprop and medium jet type aircraft
- 16 knots (18.4 mph) for the larger corporate/military jet and narrow-body commercial type aircraft

Larger aircraft have a higher tolerance for crosswinds than smaller aircraft due to their size, weight, and operational speed. Availability of a crosswind runway is highly desirable when crosswinds exceed the allowable tolerance for the aircraft categories using the Airport. Without a crosswind runway, arriving

aircraft may need to divert to an alternate airport or maintain a holding pattern until wind conditions improve.

Wind data were obtained from Apalachicola Regional Airport (AAF), as it is the nearest facility with weather information available from an Automated Surface Observing System (ASOS). Wind data includes hourly observations from 2008 to 2017. Because no ASOS data is available at Carrabelle Airport, data from AFF must be used, though it was noted by airport management as well as several airport tenants that weather conditions often differ significantly. Wind coverage for Carrabelle Airport (using AAF data) is presented in Figure 4.9 with percent wind coverage for all aircraft types under all weather, IFR, and VFR conditions.

Figure 4.9. Runway 05-23 Wind Coverage

	10.5 knots	13 knots	16 knots
All Weather	92.70%	96.23%	99.20%
IFR	92.29%	95.78%	98.69%
VFR	92.74%	96.32%	99.33%

Source: AAF ASOS, Station #722200, 2008-2017 (accessed July 2018)

As shown, wind coverage for Runway 05-23 is slightly below the 95 percent FAA threshold under all weather conditions using a 10.5 percent crosswind component, which is applicable given the size of the aircraft expected to operate at the Airport. While the distance between AAF and Carrabelle Airport are relatively short (18 miles), weather patterns and wind conditions can differ necessitating the need for an on-site weather reporting system at the Airport to more accurately report on conditions at Carrabelle Airport.

In some instances, a crosswind runway is recommended in cases where wind conditions do not meet the 95 percent FAA threshold; however, it is recommended that prior to any planning effort for a crosswind runway, the Airport should install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter "Service A" and establishing it as the primary altimeter for Carrabelle Airport.[6] Confirmation of crosswind coverage at the Airport is necessary before considering the planning and design of a crosswind runway. More information on weather reporting systems can be found in the NAVAIDs section of this plan.

4.2.3.2 RUNWAY LENGTH

The existing Carrabelle Airport runway is 4,039 feet long. Previous planning efforts from the Airport's 2009 Airport Layout Plan (ALP) identified the City's desire to extend the runway to an ultimate length of 5,000 feet. Based on the runway length requirements for the current and anticipated critical aircraft at Carrabelle Airport, FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, prescribes the following design objective:

[6] *Service A provides barometric pressure and altimeter setting (in inches of mercury)*

The recommended length for the primary runway is determined by considering either the family of airplanes having similar performance characteristics or a specific airplane needing the longest runway. In either case, the choice should be based on airplanes that are forecast to use the runway on a regular basis.

FAA AC 150/5325-4B provides directions for calculating runway length requirements for three generalized aircraft categories based on their certificated maximum take-off weight (MTOW). The categories include:

- Small aircraft less than or equal to 12,500 pounds (e.g., Cessna 182 and Beechcraft Baron 58)
- Aircraft weighing over 12,500 pounds but less than 60,00 pounds (e.g., Citation XL, King Air 300, and Hawker 800)
- Large aircraft weighing more than 60,000 pounds (e.g., Gulfstream 550, Boeing 737, and Bombardier Global Express)

Based on the Beechcraft Baron 58, which has an MTOW of 5,500 pounds, the FAA methodology for small aircraft weighing less than 12,500 pounds was used to calculate the runway length needs at Carrabelle Airport. This methodology accounts for airport-specific factors including ambient temperature, airfield elevation, and effective runway gradient (for take-off only).[7]

With consideration of the Airport elevation (21 feet MSL), mean maximum temperature of the hottest month in Carrabelle (90 degrees Fahrenheit), and an effective runway gradient of four feet, the calculated runway length for the Beechcraft Baron 58 is 1,640 feet. The calculated take-off lengths have been increased at a rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline. Figure 4.10 presents the summary of the runway length requirements following this FAA guideline.

Figure 4.10. Runway 05-23 Length Requirements

Beechcraft Baron 58	
Item	**Runway Length (ft)**
MTOW (5,500 lbs)	1,600
4-foot gradient	40
Runway Length Requirement	**1,640**

Source: Kimley-Horn, 2019

[7] *Aircraft take-off performance decreases as the ambient temperature and/or runway elevation increases.*

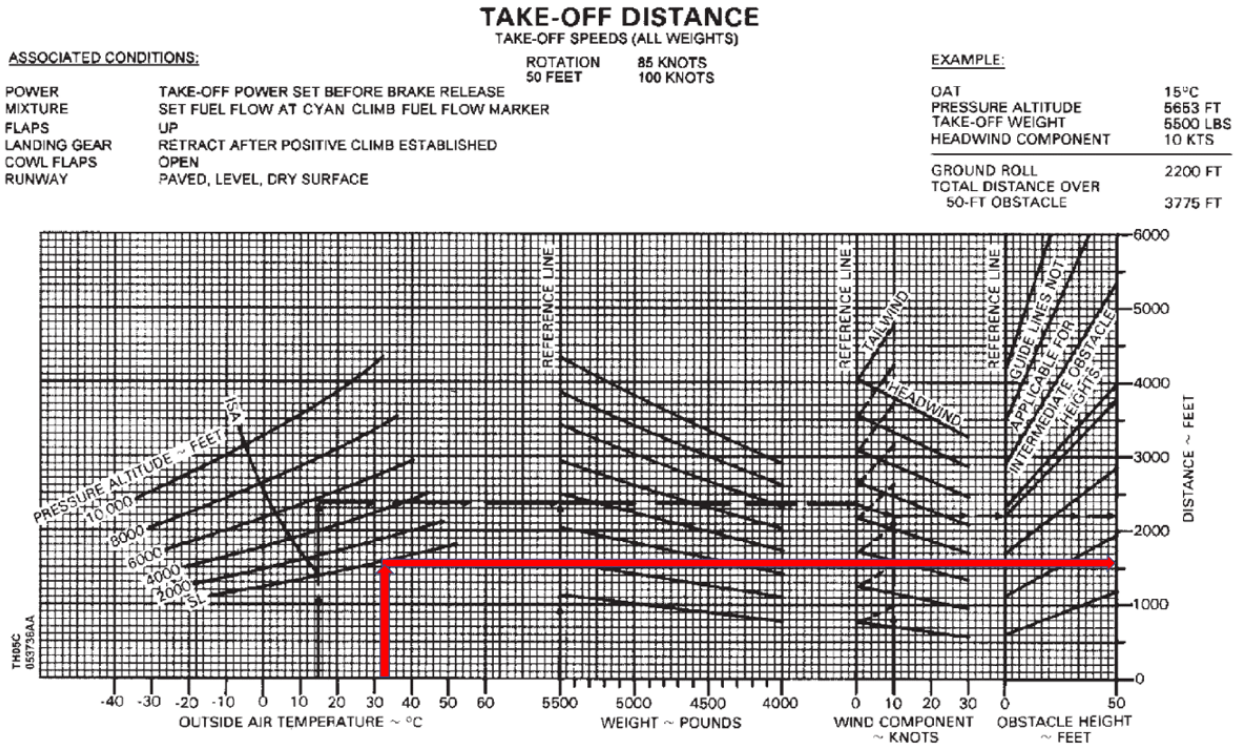


Figure 4.11. Beechcraft Baron 58 – Take-Off Distance
Source: Beechcraft Baron 58 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

Runway 05-23 is 2,399 feet longer than required to accommodate the existing and ultimate critical aircraft (both Beechcraft Baron 58) at Carrabelle Airport. Typically, runway length requirements are greater, but given the Airport's elevation and existing and projected operational fleet, aircraft won't need the full 4,039 feet to begin their take-off roll.

While additional runway length is not required to accommodate the existing and ultimate critical aircraft, TFMSC reports indicate the Airport is experiencing increased operations by more demanding aircraft. An ultimate runway length of 5,000 feet may attract more demanding aircraft, such as turboprop and small jet aircraft, to continue to use their facilities. An increase in annual operations from more demanding aircraft would increase Airport revenue in the form of aircraft hangar storage fees, land leases, and fuel flowage. Additionally, a longer runway would allow for increased operations by military aircraft in the area who are looking to train in crosswind conditions. Further, Carrabelle Airport serves as critical location for emergency responders when hurricanes or other dangerous weather affects the area. A 5,000-foot long runway would allow for a host of emergency aircraft to utilize the Airport, providing critical and lifesaving services to the area.

As such, it is suggested that the Airport continue to depict a runway extension to an ultimate length of 5,000 feet on the updated ALP. It should be noted that dimensional standards will increase commensurate with a runway extension. Design and construction of the runway extension will be

predicated on available state and local funds. The location of the extension and funding splits will be identified in future sections.

While the Airport is interested in extending Runway 05-23 to 5,000 feet, multiple aircraft types, all larger than those observed at the Airport, can operate safely on a 4,000-foot long runway. These aircraft include, but are not limited to:

- King Air C90 (B-I)
- Gulfstream 450 on reduced useful load (D-II)
- Pilatus PC-12 (B-II)

4.2.3.3 RUNWAY WIDTH

Runway 05-23 is currently 75 feet wide. The FAA design standard for runway width is based on the RDC of the runway. The standard width for a B-I runway, regardless of the approach visibility minimums, is 60 feet; therefore, the existing runway width—while 15 feet wider than FAA design standards—will sufficiently accommodate the critical aircraft anticipated to regularly use the Airport throughout the 20-year planning period. It should be noted that if the Airport were to gain entry into the NPIAS, the FAA may only fund the required 60 feet, leaving funding responsibility of the remaining 15 feet to the Airport and/or state. Until the Airport enters the NPIAS, it is suggested that the Runway remain 75 feet wide to provide pilots with more pavement, especially in crosswind conditions.

4.2.3.4 RUNWAY PAVEMENT STRENGTH

Runway pavement is critical to the operational ability of an airport. Ensuring that the runway conditions are adequate for use requires an analysis of the current pavement design and its relationship to three primary aircraft operational factors:

- Operating weight of aircraft anticipated to use the Airport
- Landing gear type and geometry
- Volume of annual aircraft operations by type

It should be noted that pavement strength is not the same as maximum allowable weight limit. Aircraft weighing more than the certified or estimated strength can operate on a runway on an infrequent basis; however, frequent activity by heavier aircraft can reduce the useful life of the pavement. Also, FAA regulations state that all federally obligated airports (airports that have accepted FAA funding and the associated grant assurances) must remain open to the public and cannot restrict an aircraft from using the runway due only to its weight exceeding the published pavement strength rating. The pilot of the aircraft decides which airports to use based on their determination that the Airport can support their aircraft in a safe manner.

According to the 2018 FAA 5010 Master Record as well as the Airport's 2009 ALP, Runway 05-23 has a pavement design strength of 12,500 pounds for single-wheel configuration aircraft. Asphalt runway pavements are typically designed for a 20-year lifespan, but can last longer depending on use, weather, and regular maintenance. To assist airports in planning and programming for runway rehabilitation and repair projects, FDOT and the FAA conduct the Florida Statewide Airfield Pavement Management Program (SAPMP) to determine the conditions of participating airports throughout the state. As of

September 2017, Runway 05-23 was listed as having a pavement condition index of 58, putting it in the range of 'very poor' to 'fair' However, after Hurricane Michael in October of 2018, Duke Energy staged heavy equipment at the Airport, further degrading the quality of the pavement to a PCI of 57. The Florida SAPMP identified 10-year major rehabilitation needs at Carrabelle Airport, which included a full-length asphalt concrete restoration of Runway 05-23. Consistent with the SAPMP, it is recommended that the Airport restore the pavement on Runway 05-23 as detailed in the Report.

4.2.3.5 RUNWAY SYSTEM NEEDS

Based on the previous analysis, the following are recommended based on the runway system needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters.

1. Extend Runway 05-23 to an ultimate 5,000 feet
2. Mill and Overlay Runway 05-23

4.2.4 Taxiway System

Taxiway systems provide safe access to and from runways and landside areas. As discussed previously, taxiways are designed according to the TDG, but the overall system needs to be reviewed to ensure there are no "hot spots" that could lead to runway incursions and that adequate access is provided to all areas. Currently, Carrabelle Airport has only one taxiway, Taxiway A, which connects the apron and fueling area to Runway 05-23. To ensure compliance with FAA standards, all airfield movement, including aircraft, pedestrians, and vehicles, must be analyzed.

As new taxiway and taxiway fillet designs were added with the change to FAA AC 150/5300-13A, *Airport Design* in 2012, all airfields should be reviewed for compliance. The advisory circular provides the following guidance that requires discussion with frequent users of the Airport:

- Eliminate "judgmental oversteering" to allow pilots to use a consistent taxi method throughout the Airport.
- Design taxiways so nose gear steering angle is no more than 50 degrees.
- Simplify taxiway intersections by ensuring pilots do not have more than three options at any intersection.
- Design turns to be 90 degrees when possible to increase visibility.
- Reduce possibilities of runway incursions by avoiding non-recommended taxiway designs such as, wide expanses of pavement, "dual-purpose" pavement, and limiting runway crossings and direct access without turns from an apron to a runway.

Taxiway A is positioned on the end of Runway 23 and is the sole taxiway to get to and from Runway 05-23. There is currently no method to get to the end of Runway 05 unless an aircraft back-taxis along the runway. Not only does back-taxiing decrease safety at the Airport, but it increases the amount of time an aircraft is on the runway. It is recommended that Carrabelle Airport design and construct a full-length parallel taxiway with 225-foot runway centerline to taxiway centerline separation on the developed (south) side of the Airport that complies with FAA guidance for TDG-1A taxiways. It is also recommended that the design of a full-length parallel taxiway include a mid-field connector taxiway to allow for

expedited exit of the Runway and alternative access to landside facilities as detailed in a subsequent section. Design and construction of the full-length parallel taxiway could be done in phases to accommodate funding and need.

Additionally, to eliminate the direct access from the apron area to Runway 05-23 that Taxiway A provides, which is currently non-compliant with the most recent FAA specifications, turn markings should be added to the pavement that eliminate the direct access without a turn from the apron to the runway. It is recommended that this be done with pavement markings only and that no pavement be removed from either the taxiway or apron in the near term.

It should be noted that the combination of a runway extension and full-length parallel taxiway would eliminate the existing direct access from the apron area to Runway 05-23. The additional two facilities would require a departing aircraft to make a turn from the apron area onto the full-length parallel taxiway, and then ultimately make a 90 degree turn from the taxiway to Runway 05-23.

4.2.4.1 TAXIWAY DIMENSIONAL STANDARDS

Similar to runway design standards, FAA AC 150/5300-13A, Change 1, *Airport Design* identifies dimensional standards pertaining to taxiways and taxiway-related separations that are intended to provide operational clearance between aircraft as well as fixed and moveable objects. These standards are based on both the ADG and the Taxiway Design Group (TDG) of the most demanding aircraft intended to use the facilities on a regular basis. The TDG is established by the overall Main Gear Width (MGW) and the Cockpit to Main Gear Distance (CMG) of the Airport's critical aircraft.

The Beechcraft Baron 58, the critical aircraft identified previously, is classified as a TDG-1A with an MGW of 9.58 feet and a CMG of 8 feet. As previously noted, Carrabelle Airport does not currently have a parallel taxiway; therefore, taxiway dimensional standards are not an issue at this time. Figure 4.12 presents TDG measurements as identified by the FAA.

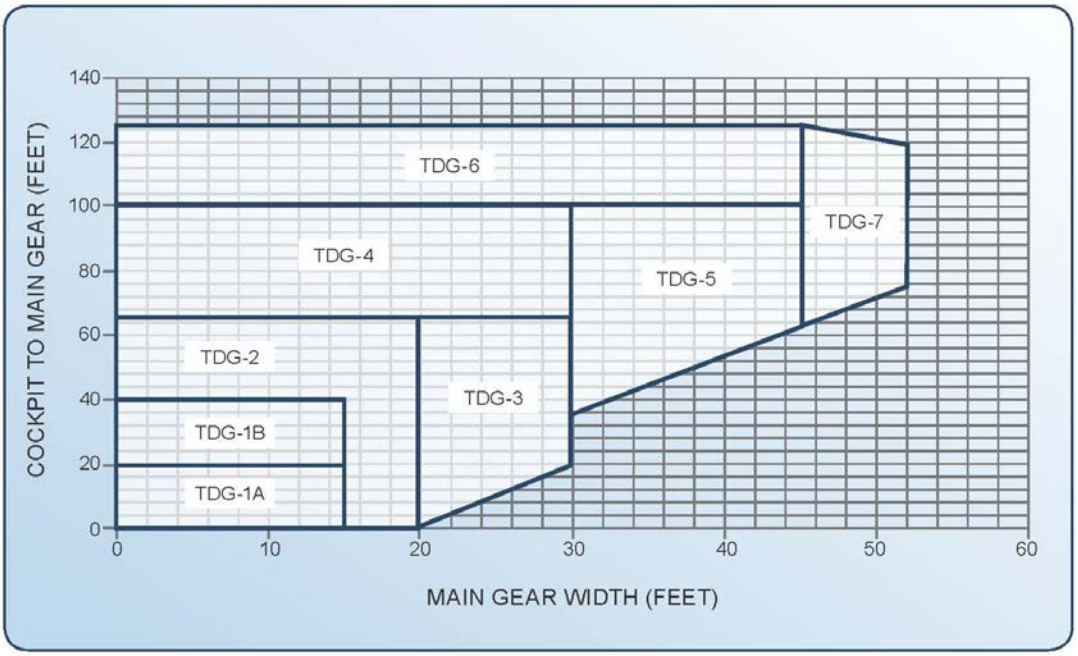


Figure 4.12. Taxiway Design Group Measurements
Source: FAA AC 150/5300-13A, Change 1, Airport Design

4.2.4.2 RUNWAY SEPARATION STANDARDS

There are additional standard separation distances required between the runway centerline and other airport facilities as established by the FAA to ensure operational safety on the airfield. These include:

- **Runway Centerline to Parallel Taxiway Centerline**: For B-I runways, the separation distance is 225 feet. Currently, Carrabelle Airport does not have a parallel taxiway.
- **Runway Centerline to Holding Position**: For B-I runways, the standard distance is 200 feet, which corresponds with the width of the ROFZ. The holding position on the existing taxiway connector is approximately 110 feet from the runway centerline, and as such, should be relocated an additional 90 feet away from the current hold position.
- **Runway Centerline to Edge of Aircraft Parking Area**: For B-I runways, the standard separation distance is 200 feet. The existing distance at Carrabelle Airport between the runway centerline and aircraft parking area is approximately 350 feet which will accommodate operational needs through the planning period. According to Airport staff, fixed-wing and rotorcraft park on the grass infield between Runway 05-23 and the existing apron area. To maintain compliance with FAA design separation standards, aircraft parking on the grass infield should be no further than 150 feet from the edge of the existing apron pavement. To increase the safety of operations at the Airport, aircraft should avoid parking on the grass infields unless all paved apron parking spaces are occupied.

Carrabelle Airport's existing dimensional standards along with the FAA design standards for a B-I runway with visual approach minimums are summarized in Figure 4.13.

Figure 4.13. Runway Separation Standards

Aircraft Type	Runway 05-23	
	Existing Conditions	B-I FAA Standards
Runway Separation		
Holding Position	110’	200’
Parallel Taxiway/Taxilane Centerline	N/A	225’
Aircraft Parking Area	350’	200’

Sources: FAA AC 150/5300-13A, Change 1, Airport Design, Kimley-Horn

4.2.4.3 TAXIWAY SYSTEM NEEDS

Based on the previous analysis, the following are recommended based on the taxiway system needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters.

1. Design and construct a full-length parallel taxiway with a mid-field connector taxiway
2. Add pavement markings to remove direct access conflict where Taxiway A connects from the apron to the runway
3. Relocate the hold position markings on Taxiway A to be 200 feet from the centerline of Runway 05-23

4.2.5 Lighting, Markings, and NAVAIDs

Lighting, markings, and NAVAIDs increase operational safety in all weather conditions, especially during nighttime and low visibility conditions.

4.2.5.1 LIGHTING

Runway 05-23 is currently equipped with medium intensity runway lights (MIRLs) that can be activated by pilots as well as runway end identifier lights (REILs). MIRLs illuminate the runway edge and REILs provide rapid and positive identification of the runway end, but do not improve visibility minimums. Both the existing MIRLs and REILs are in good condition and are considered adequate over the planning period, though regular maintenance should be provided to ensure proper operations throughout the planning horizon. Additionally, the REILs are currently not listed on the FAA’s 5010 Master Record; the Airport should work with the FAA to update the 5010 Master Record to identify the REILs at Carrabelle Airport.

4.2.5.2 MARKINGS

Carrabelle Airport does not currently have an IAP; pilots use visual cues to safely land at the Airport. Runways using visual approach procedures require markings which include a landing designator and a centerline. Runway markings at Carrabelle Airport are considered adequate through the planning horizon.

4.2.5.3 NAVAIDS

The Airport’s rotating beacon is located on a pole on the south side of the airfield. The rotating beacon will adequately serve the Airport throughout the planning period.

Each end of Runway 05-23 is equipped with a 2-light Precision Path Approach Indicator (PAPI). The PAPIs are in good condition and are considered adequate throughout the 20-year planning period.

There is currently no weather reporting system such as an Automated Weather Observing System (AWOS) or Automated Surface Observing System (ASOS) at Carrabelle Airport. The closest systems are 18 miles to the west (AAF) and 38 miles northeast (Tallahassee International Airport [TLH]). Without an on-site weather reporting system, the actual wind direction and speed are unknown. Pilots have indicated the wind conditions at the closest airport (AAF) are not necessarily representative of those at Carrabelle. A Type I AWOS measures wind speed and gusts, wind direction and variable wind direction, temperature, dew point, altimeter setting, and density altitude. A Type II also includes visibility and variable visibility as well as adds sky conditions, cloud ceiling height, and liquid precipitation accumulation. It is recommended that Carrabelle Airport install a Type I AWOS based on the siting criteria shown below.

FAA Order 6560.20C details the siting criteria for sensor placement at airports for weather reporting systems to ensure the observations are representative of the meteorological conditions affecting the Airport. The preferred siting of the cloud height, visibility, and wind sensors is adjacent to the runway 1,000 feet to 3,000 feet from the primary runway threshold and between 500 and 1,000 feet from the runway centerline. The wind sensor requires a 500-foot clear area where all obstructions must be at least 15 feet lower than the height of the sensor. The optional locations for the AWOS will be examines in a later chapter based on these requirements.

4.2.5.4 LIGHTING, MARKINGS, AND NAVAID SYSTEM NEEDS

Based on the previous analysis, the following are the recommended changes based on the lighting, markings, and NAVAID system needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters.

1. Work with the FAA to identify the Airport's REILs on the 5010 Master Record
2. Install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter "Service A"

4.2.6 Helicopter Parking

The U.S. Forest Service (USFS) operates out of Carrabelle Airport on a seasonal basis. During peak fire season, the USFS stages helicopters at the Airport, taking advantage of the close proximity to the Apalachicola National Forest as well as Tate's Hell State Forest. The USFS stages their helicopters on the grass in-field between Runway 05-23 as well as on the main apron.

Annual wildland firefighting operations at the Airport are unknown year-to-year. However, the USFS owns a permanent building that abuts Carrabelle Airport property, nearest the main apron and aircraft storage hangars. Assuming the USFS continues to operate near the Airport, it may be valuable to develop a permanent helicopter parking area as close to the USFS buildings as possible. A helipad will provide a designated landing area for the USFS helicopters as well as a location for potential based and transient helicopters to park when the USFS is not using the helipad. Segregating the USFS helicopter staging area from the Airport's general aviation patrons could increase airfield circulation and safety, while facilitating a positive relationship with one of the Airport's closest neighbors and fuel consumers.

4.2.6.1 HELICOPTER PARKING NEEDS

Based on the previous analysis, the following are recommended based on the helipad needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters.

1. Design and construct a designated parking area for rotorcraft

4.2.7 Summary of Airside Needs

The following summarizes the airside needs at Carrabelle Airport:

1. Extend Runway 05-23 to an ultimate 5,000 feet
2. Mill and Overlay Runway 05-23
3. Design and construct a full-length parallel taxiway with a mid-field connector taxiway
4. Add pavement markings to remove direct access conflict where Taxiway A connects from the apron to the runway
5. Relocate the hold position markings on Taxiway A to be 200 feet from the centerline of Runway 05-23
6. Work with the FAA to identify the Airport's REILs on the 5010 Master Record
7. Install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter "Service A"
8. Design and construct a designated parking area for rotorcraft

4.3 Airspace Protection

The safe and efficient operation of aircraft requires that certain areas on and near an airport remain clear of objects that could present a hazard to air navigation. Airports that are listed in the NPIAS and receive federal funding through the Airport Improvement Program (AIP) and are considered "federally obligated" are, as such, subject to FAA Grant Assurances 20 (Hazard Removal and Mitigation) and 21 (Compatible Land Use). These assurances require airport sponsors to take appropriate actions to protect the surrounding airspace from incompatible land uses and mitigate hazardous obstacles to air navigation. Additionally, FDOT provides 24 grant assurances that must be adhered to for any airport that accepts FDOT funding. Specific to airspace protection, FDOT grant assurances 4 (Hazard Removal and Mitigation), 5 (Airport Compatible Land Use), and 6 (Consistency with Local Government Plans) all align with federal grant assurances to ensure that airports develop in a safe manner. Further, Florida Statute 333 stipulates that all municipalities with an airport hazard located in their jurisdiction must adopt and enforce airport airspace and land use zoning protection for all public-use airports.

The FAA has established two primary sets of airspace protection standards. These include Federal Aviation Regulation (FAR) Part 77 Safe, Efficient Use, and Preservation of The Navigable Airspace, and Order 8260.3 United States Standard for Terminal Instrument Procedures (TERPS). While similar in nature and purpose, these standards have specific applications relative to approach procedures and minimums, usable runway length, AIP funding, and compatible land use planning. It should be noted that TERPS were not analyzed as part of this Master Plan since IAPs are not recommended for Carrabelle Airport over the planning horizon.

The following sections identify existing and ultimate airspace conditions at Carrabelle Airport per FAA Part 77 requirements. Carrabelle Airport, while non-NPIAS, still must adhere to airspace requirements as defined by the FAA. This section includes:

- Part 77 Requirements
- Hazardous and Wildlife Attractants
- Summary of Airspace Requirements

4.3.1 Part 77 Requirements

As directed by FAR Part 77, "imaginary surfaces" around the airfield are established for identifying potential hazards to air navigation. These standards are most applicable to promoting compatible land use and limiting the height of objects on and near an airport. These surfaces can vary in size, shape, and slope depending on the available approach procedures to each runway end.

Penetrations to these imaginary surfaces, either manmade or natural, are identified as obstructions and must be evaluated by the FAA to determine if they present a hazard to air navigation. If they are not able to be removed, many obstacles can be mitigated through appropriate marking and/or lighting to notify pilots of their presence. If determined to be a hazard, the obstacle should be removed or altered to mitigate the penetration. If not mitigated appropriately, obstacles could adversely affect approach and departure minimums and/or operational procedures.

Based on existing visual approach capabilities, the following describes the imaginary surfaces as applicable to Runway 05-23 at Carrabelle Airport. All references to a surface's slope are expressed in horizontal feet by vertical feet. For example, a 20:1 slope rises one foot vertically for every 20 feet horizontally. Any future changes in runway length or centerline alignment would shift these surfaces commensurately. All the surfaces noted below are for a visual runway. Any changes in approach type drastically alter the dimensions of each of the Part 77 surfaces. Figure 4.14 depicts FAA Part 77 Imaginary Surfaces discussed below.

4.3.1.1 PRIMARY SURFACE

This surface is longitudinally centered on the runway. The elevation of any point on the surface is the same as the elevation of the nearest point on the runway centerline. For Runway 05-23, this surface is 250 feet wide and extends 200 feet beyond the ends of the pavement usable for take-offs and landings.

4.3.1.2 APPROACH SURFACE

This surface is longitudinally centered on the extended runway centerline and extends outward and upward from the end of the Primary Surface. An Approach Surface is applied to each end of each runway, with the inner width being the same as that of the Primary Surface. The other dimensions of the Approach Surface are based upon the approach capability of that specific runway end. For Runway 05-23 (a visual runway), the inner width of the approach surface is 250 feet and it expands uniformly to an outer width of 1,250 feet. The Approach Surface extends for a horizontal distance of 5,000 feet at a slope of 20:1.

4.3.1.3 TRANSITIONAL SURFACE

This surface extends outward and upward from the sides of the Primary Surface and from the sides of the Approach Surfaces at a slope of 7:1 up the height of the Horizontal Surface.

4.3.1.4 HORIZONTAL SURFACE

This surface is horizontal plane 150 feet above the established airport elevation. The perimeter is constructed by swinging arcs of specified radii from the center of each end of the Primary Surface of each runway and connecting the adjacent arcs by lines tangent to those arcs. At Carrabelle Airport, the Horizontal Surface extends 5,000 feet from the ends on the Primary Surface, at an elevation of 171 feet above mean sea level (MSL).

4.3.1.5 CONICAL SURFACE

This surface extends outward and upward from the periphery of the Horizontal Surface. The Conical Surface extends at a slope of 20:1 for a horizontal distance of 4,000 feet.

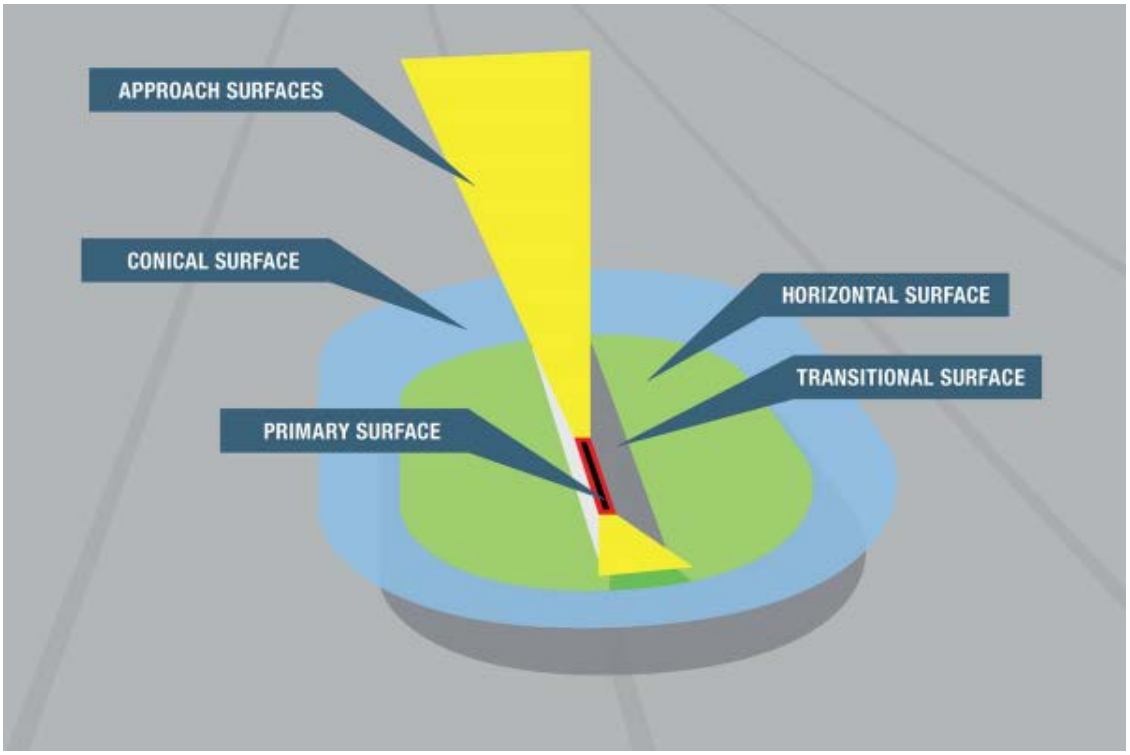


Figure 4.14. FAA Part 77 Imaginary Surfaces
Source: Kimley-Horn, 2019

Figure 4.15. Part 77 Surface Dimensions

Item	Visual Runway
Width of Primary Surface and Approach Surface Width at Inner End	250
Radius of Horizontal Surface	5,000
Approach Surface Width at End	1,250
Approach Surface Length	5,000
Approach Slope	20:1

Source: www.ngs.noaa.gov/AERO/oisspec.html

4.3.1.6 BUILDING RESTRICTION LINE

The Building Restriction Line (BRL) indicates the point closest to the runway at which vertical construction may occur. The BRL is calculated based on the Part 77 Imaginary Surfaces and a 35-foot high building – the BRL is located at the point where the Transitional Surface reaches a height of 35 feet. Based on a Primary Surface width of 250 feet (125 feet from each side of the runway centerline), Carrabelle Airport's BRL is located 495 feet from, and runs parallel to, the runway centerline.

4.3.1.7 PART 77 AREAS OF CONCERN

Using aerial photogrammetry combined with the FAA Digital Obstacle File data from 2018, an evaluation of obstructions to the existing Part 77 surfaces at Carrabelle Airport was performed. Noted areas of concern are depicted in Figure 4.16 and Figure 4.17 in red and are primarily vegetation penetrations to the approach and transitional surfaces. More details on the obstructions within these areas of concern and recommended mitigation measures are presented in the airspace sheets of the Airport Layout Plan Drawing Set. In general, obstructions within Airport property should be field-verified and removed.

Figure 4.15 presents Part 77 surface dimensions for visual approach procedure conditions.

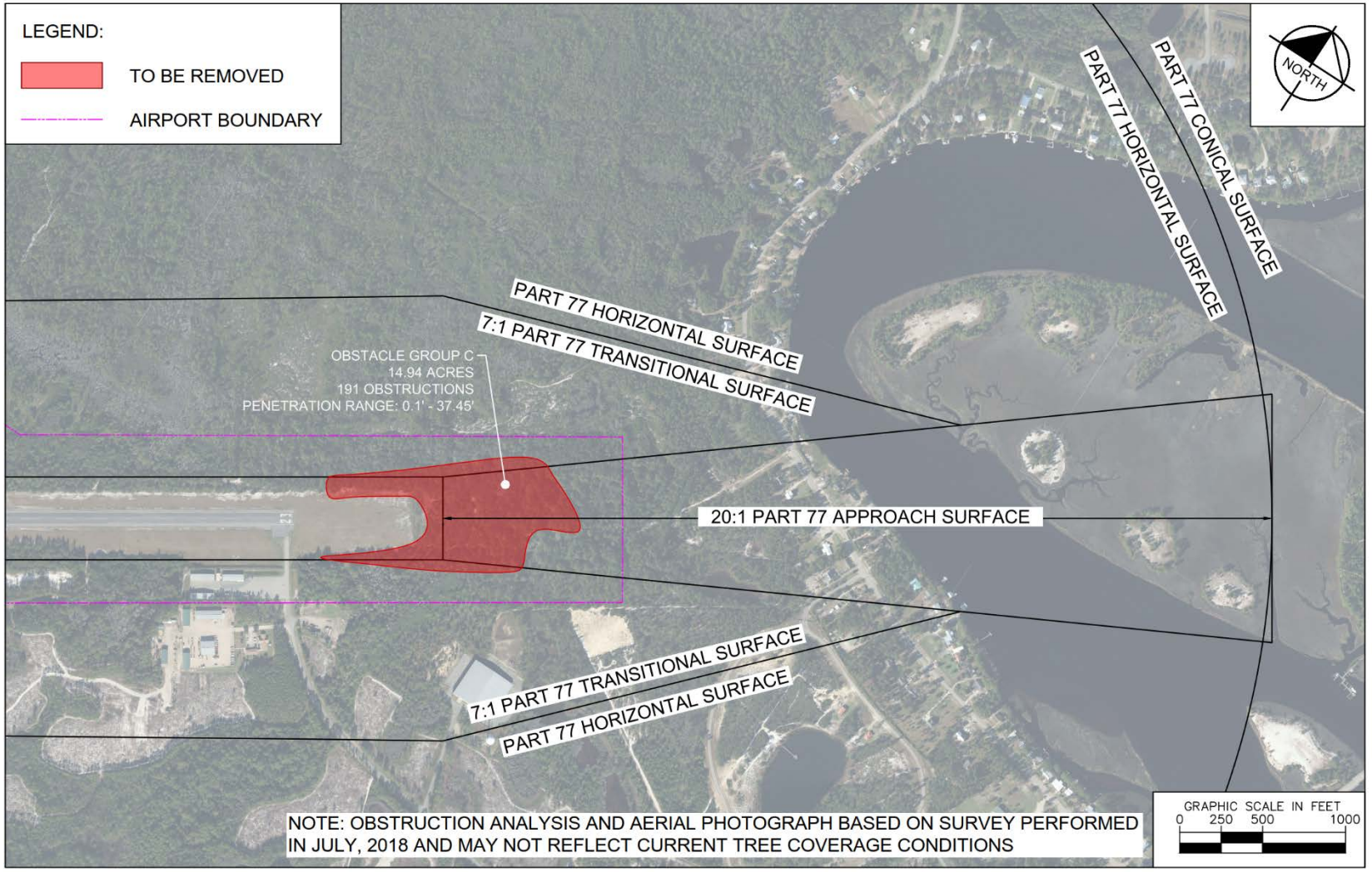


Figure 4.16. Part 77 Areas of Concern (North)
Source: Kimley-Horn, 2019

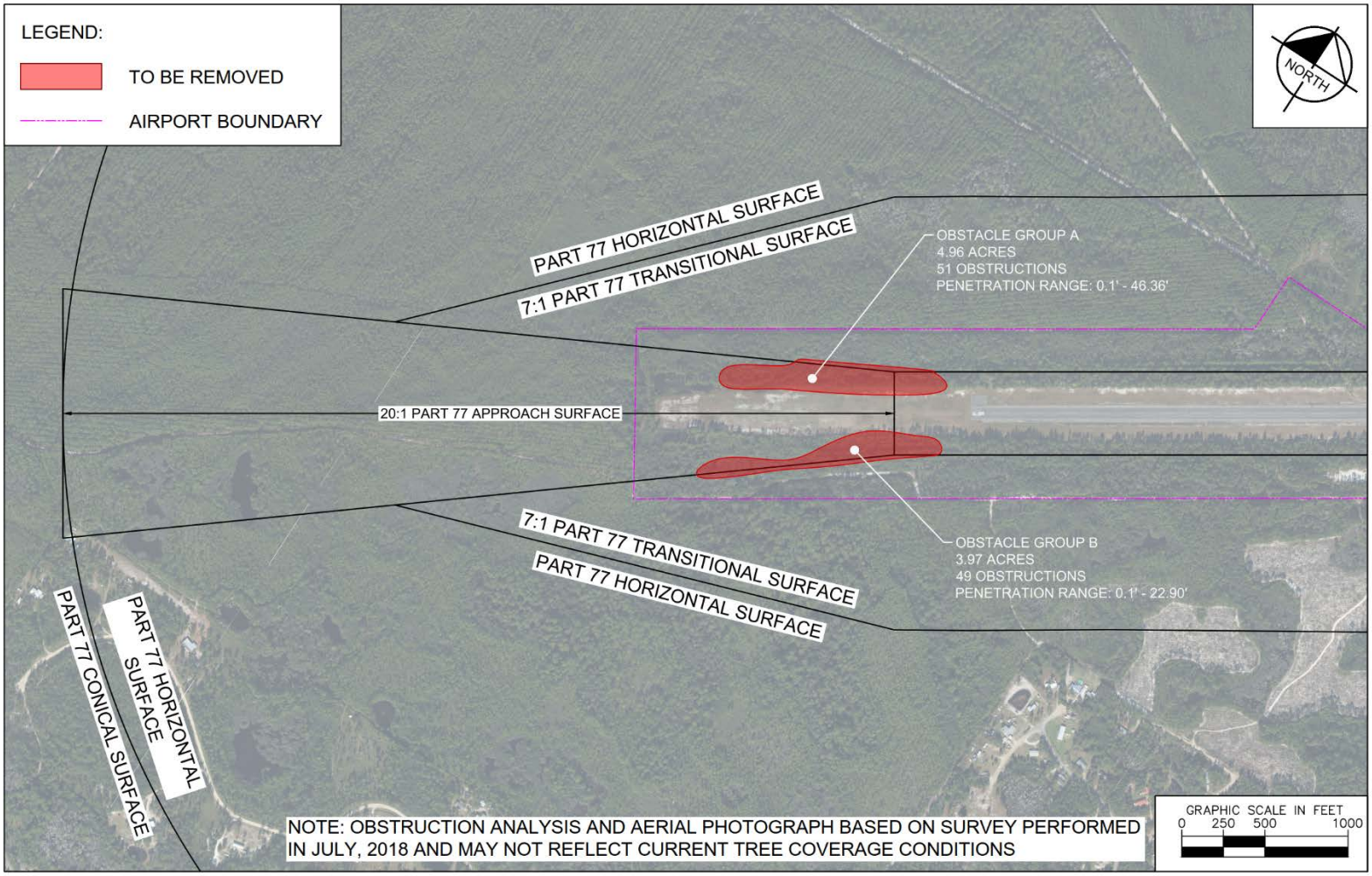


Figure 4.17. Part 77 Areas of Concern (South)
Source: Kimley-Horn, 2019

PART 77 NEEDS

Based on the previous analysis, the following are recommended based on the Part 77 needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters

1. Vegetation trimming/removal within Airport property (Approximately 30 acres).

4.3.2 Hazardous and Wildlife Attractants

Forested areas, large tracts of open land, bodies of water, wetlands, stormwater management facilities, landfills, and croplands near an airport can encourage wildlife to enter the airfield or approach and departure airspace. These habitats can provide food, water, and shelter for a variety of species, which can pose a threat to aircraft safety and cause serious damage to aircraft and injury to persons both on the ground and in the air.

FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, strongly recommends that a 10,000-foot minimum separation between wildlife attractants and the airfield be maintained for runways serving turbine-powered aircraft. It further recommends that a five-mile separation be provided within the approach and departure areas. The development of a wildlife hazard management plan (WHMP) is recommended for all public-use airports and required for all public commercial service airports operating under an FAA Part 139 certificate for attractants that cannot be relocated or must remain closer-than-desired to the airfield. These plans are prepared by a certified wildlife biologist in accordance with guidelines established by the FAA and U.S. Department of Agriculture. They identify methods of altering and/or maintaining facilities so they are not as attractive to the local and transient wildlife.

Hazardous wildlife attractants within the immediate approach and departure areas of a runway are of concern, especially open bodies of water, as they can attract large waterfowl such as ducks and geese Landfills also pose a large wildlife attractant as they attract a large volume of birds scavenging through the landfill.

Chapter 333, *Airport Zoning,* Florida Statutes, dictates the Airport zoning ordinance requirements within Florida. Specifically related to wildlife attractants, Chapter 333.03(2)(a) and (b) detail the requirements for restricting the development of new landfills and the mitigation of existing landfills near airports. Chapter 333 notes that local political subdivisions with an airport hazard area within its territorial limits must adopt airport zoning regulations that are compliant with Chapter 333 and, among other things, those regulations must prohibit the construction of new landfills within 10,000 feet of any runway used by turbine aircraft or within 5,000 feet of any runway used only by non-turbine aircraft, as well as the provision that existing landfills that attract or sustain bird movements in the approach or departure paths of aircraft must incorporate bird management initiatives to minimize the hazard to aircraft.

Acknowledging that the Airport is located near the Gulf of Mexico, and that many airports across the country are near bodies of water, it is recommended that the Airport and City monitor wildlife activity and aircraft/bird-strike incidents within a Wildlife Hazard Assessment (WHA). While a WHMP is not an

FAA requirement for Carrabelle Airport, the City may wish to proactively develop such a plan upon completion of a WHA to reduce potential hazards as aircraft activity increases.

HAZARDOUS AND WILDLIFE ATTRACTANT NEEDS

Based on the previous analysis, the following are the recommended changes based on the hazardous and wildlife attractant needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters**:**

1. Proactively develop a WHA

4.3.3 Summary of Airspace Needs

The following summarizes the airspace needs:

1. Vegetation trimming/removal within Airport property.
2. Proactively develop a WHA

4.4 Landside Facilities

This section describes landside facilities that are essential to the daily operation of the Airport. These facilities contribute to effectively meeting airport users' needs and include:

- Aircraft storage
- Airport access and automobile parking
- General maintenance facilities
- Utilities
- Fuel storage
- Terminal
- Summary of Landside Needs

4.4.1 Aircraft Storage

Based aircraft at Carrabelle Airport are stored in private conventional hangars as well as on the apron and grassy area between the runway and apron area (aircraft tie-downs). Currently, transient aircraft visiting the Airport are only able to be stored on the apron or the designated grass infields using tie-downs, as community or transient hangars are not available.

Aircraft storage facilities generally consist of either conventional hangars, T-hangars, or apron (aircraft tie-downs and designated aircraft apron parking spaces). Though Carrabelle Airport only has conventional hangars and aircraft tie-downs, below is a brief overview of each of the different aircraft storage types:

- Conventional hangar – in regard to hangars, Carrabelle Airport currently only has conventional hangars, which are all rented, and house aircraft operated by or in conjunction with the owner/operator of the hangar. Conventional hangars are typically a single large space which can house multiple aircraft in protective storage, and usually contains a large door through which

aircraft can pass. In some instances, conventional hangars are utilized by Fixed Based Operators (FBOs) for business purposes.

- T-hangar – Though Carrabelle Airport does not currently have any T-hangars, they are recommended for future development based on the size of the typical aircraft that is based at Carrabelle. This type of hangar is an individual storage unit for a small aircraft, usually a single-engine or light twin aircraft classified under Airplane Design Group (ADG) I. The "T" designation corresponds to the overall shape of the unit, which is similar to a "T". These individual hangars are generally grouped into linear buildings containing multiple units in a row.
- Aircraft tie-down – Carrabelle Airport currently has marked tie-down locations on the paved apron space as well as in the grassy area between the runway and apron. An aircraft tie-down is typically an on-apron parking space that includes fixed points, typically concrete, where an aircraft can be secured using straps or cables. There can also be tie-downs on grass or non-apron areas. Although tie-downs do not provide covered protection from weather elements, they do prevent an aircraft from moving and minimize damage attributed to high winds.

Apron areas are intended to accommodate based and transient aircraft parking. Transient aircraft typically require a greater area for shorter amounts of time (usually less than 24 hours). Typically, based aircraft require a smaller area for longer amounts of time as this represents their storage or base location at an airport. However, it has been determined that existing and projected based aircraft will utilize conventional and T-hangars (recommended in this plan) for storage purposes, leaving only transient aircraft to regularly use the apron areas.

For transient aircraft, consideration must be made for the aircraft parking area, taxilanes leading into and out of the parking positions, and circulation areas. Typically, itinerant apron requirements are contingent on the number and type of aircraft that will use the facility.

There is one combination taxilane and parking apron at Carrabelle Airport that encompasses a total area of approximately 60,000 square feet (SF), of which only 11,500 SF is designated as the aircraft parking area. Although there are five aircraft tie-downs located on the aircraft parking apron area, this area is primarily used by based aircraft taxiing to and from the conventional hangars. It is also used infrequently by transient aircraft during special events, such as the Carrabelle Airport Fly-In and Safety Day.

To better assess the requirements for future development of aircraft storage facilities, Figure 4.18 presents general planning assumptions utilized for aircraft storage. The footprints shown include area that would be necessary for maneuvering aircraft within storage areas.

Figure 4.18. Aircraft Storage Area Planning Assumptions

Aircraft Type	Footprint (SF)	Desired Storage Type
Single-engine	7,900	Paved tie-down
	2,000	T-hangar
	1,340	Conventional hangar
Multi-engine	7,900	Paved tie-down
	2,500	T-hangar
	2,000	Conventional hangar

Aircraft Type	Footprint (SF)	Desired Storage Type
Turboprop / Jet (small)	21,950	Paved tie-down
	3,000	Conventional hangar
Helicopter	1,250	Paved tie-down
	750	Conventional hangar

Source: Kimley-Horn, 2019

Figure 4.19 summarizes the projected based aircraft fleet mix as identified in the forecasts of aviation demand.

Figure 4.19. Based Aircraft Fleet Mix Projections

Year	Single-engine Piston	Multi-engine Piston	Helicopter	Total
Preferred Based Aircraft Forecast				
2019	12	1	1	**14**
2024	14	1	1	**16**
2029	16	1	1	**18**
2040	19	4	1	**24**

Source: Kimley-Horn, 2019

4.4.1.1 AIRCRAFT STORAGE NEEDS FOR BASED AIRCRAFT

Figure 4.20 presents based aircraft storage needs using the preferred based aircraft fleet mix forecast and the aircraft storage area planning assumptions. By 2024, Carrabelle Airport will need an additional 4,000 SF of T-hangars[8]. By 2040, Carrabelle Airport will need 14,000 of T-hangars and 5,150 SF of conventional hangar space depending on how airport activity is realized over the planning period. For maximum use of space, future single-engine based aircraft have been designated to utilize T-hangar facilities.

[8] *Aircraft storage deficit is the difference between the need and available space.*

Figure 4.20. Based Aircraft Storage Facility Requirements (SF)

	Preferred Forecast		
	T-hangar (SF)	Conventional (SF)	Apron (SF)
2019			
Available	0	17,500	11,500
2019 Need	0	16,650	0
Deficit/Surplus	-	850	-
2024			
Available	0	17,500	11,500
2024 Need	4,000	16,650	0
Deficit/Surplus	(4,000)	850	-
2029			
Available	0	17,500	11,500
2029 Need	8,000	16,650	0
Deficit/Surplus	(8,000)	850	-
2040			
Available	0	17,500	11,500
2040 Need	14,000	22,650	0
Deficit/Surplus	(14,000)	(5,150)	-

Source: Kimley-Horn, 2019, Google Earth

Because the projected based aircraft hangar storage needs differ widely between 2029 and 2040, it is recommended that the Airport re-evaluate aviation demand by way of a Master Plan update or Aviation Layout Plan (ALP) update with narrative prior to any design or construction effort after 2029. Because the Airport maintains a waitlist for hangar space, it should continue to develop hangars until demand is met.

4.4.1.2 AIRCRAFT STORAGE NEEDS FOR TRANSIENT AIRCRAFT

Transient aircraft storage needs are determined based on projected peak day transient operations, an assessment of the number of transient aircraft on the ground at any one time, the projected percentage of pilots that would desire access to overnight storage, and the overall footprint of the aircraft types.

General planning assumptions were made to determine transient aircraft storage needs by 2040. These assumptions include:

- 25 percent of transient aircraft will stay at Carrabelle Airport overnight
- All single-engine and helicopter overnight transient aircraft will utilize the apron instead of covered storage
- There are no repeat daily operations from transient aircraft (i.e., 10 transient operations during the peak day is the equivalent of five aircraft)
- Preferred baseline forecast transient aircraft will all be single-engine aircraft
- Overnight transient aircraft are all single-engine aircraft

The preferred baseline forecast projects 16 transient operations during the peak day in 2040. Using the established planning assumptions, 16 transient design day operations equates to 8 aircraft. Of those 10 aircraft, 25 percent will stay overnight at Carrabelle Airport which, after rounding, results in three overnight transient aircraft during the peak day in 2040. Figure 4.21 presents peak day overnight transient aircraft from 2019 to 2040.

Figure 4.21. Carrabelle Airport Peak Day Transient Aircraft

Year	Preferred Peak Day Forecast
2019	2
2024	2
2029	2
2040	2

Source: Kimley-Horn, 2019

Figure 4.22 presents the storage needs by type for transient aircraft based on the planning assumptions established over the planning period. Between 2019 and 2040, the forecast identifies a 4,300 SF apron space deficit.

Figure 4.22. Transient Aircraft Storage Facility Requirements

	Preferred Forecast		
	T-hangar (SF)	Shared (SF)	Apron (SF)
Available	0	17,500	11,500
2019 Need	0	0	15,800
Deficit/Surplus	-	-	(4,300)
2024 Need	0	0	15,800
Deficit/Surplus	-	-	(4,300)
2029 Need	0	0	15,800
Deficit/Surplus	-	-	(4,300)
2040 Need	0	0	15,800
Deficit/Surplus	-	-	(4,300)

Source: Kimley-Horn, 2019, Google Earth

Prior to the design or construction of any aircraft storage after 2029, it is recommended that Airport conduct an updated Master Plan or ALP update with narrative to re-evaluate aviation demand at Carrabelle Airport.

AIRCRAFT STORAGE NEEDS

Based on the previous analysis, the following are the recommended changes based on the aircraft storage needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters.

1. Design and construct 14,000 SF of T-hangars for based aircraft

2. Design and construct 5,150 SF of additional conventional hangar space for based aircraft
3. Design and construct 4,300 SF of additional apron space for transient aircraft

4.4.2 Airport Access and Automobile Parking

Currently, Airport users enter via Airport Road from US 98. The main Airport entrance has access control and leads directly to the apron and hangars. Another access point is on the north side of the Airport, across the runway from the main entrance and existing facilities; however, this gate is always locked and connects to an unpaved Florida Department of Forestry-maintained road in Tate's Hell State Forest and is not used by the Airport or any of its tenants. Expected future development will likely be near existing facilities on the south side of the runway rather than on the undeveloped (north) side of the Airport due to existing airfield layout, existing utilities, and property lines. These factors paired with expected activity growth, does not warrant the need for additional Airport access points. Nevertheless, additional access may necessary should an aviation-related business locate on the City's industrial site adjacent to the Airport.

No public transportation or alternative forms of transportation, such as shuttles, buses, or courtesy cars, are available at the Airport. Automobile parking is also not available at the Airport which forces Airport users to park their vehicles inside and/or next to hangar storage facilities. As Airport users increase, dedicated parking and alternatives forms of transportation may be necessary to meet user demand. At the very least, it is recommended that the Airport provide a courtesy car.

4.4.2.1 AIRPORT ACCESS AND AUTOMOBILE PARKING NEEDS

Based on the previous analysis, the following are recommended based on the Airport access and automobile parking needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters:

1. Create dedicated paved parking and provide alternatives forms of ground transportation
2. Provide a courtesy car for Airport users

4.4.3 General Maintenance Facilities

The Airport stores maintenance equipment in the firehouse building along with a firetruck between the two conventional hangars on the north side of the main apron. Airport equipment includes an open-air low-speed vehicle lawn mower, and other typical maintenance tools and supplies. In an effort to promote aviation-only related facilities, the Airport should consider a plan to relocate the local fire department vehicle from the Airport and use the facility specifically for general Airport maintenance needs. If the Airport were to gain entry into the National Plan of Integrated Airport Systems NPIAS, the Federal Aviation Administration (FAA) may require the Airport to obtain fair market value for leasing of property to others, including the City of Carrabelle, for all aviation and non-aviation users.

4.4.3.1 GENERAL MAINTENANCE FACILITY NEEDS

Based on the previous analysis, the following are recommended based on the general maintenance facility needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters:

1. Relocate the local fire department from Airport property

4.4.4 Utilities

Currently, Duke Energy, City of Carrabelle, and Consolidated provide utilities to the Airport. Based on projected growth, additional utilities will not be required; however, the Airport may need to expand utility infrastructure should it acquire new property for a terminal building, or the Airport begins to develop in previously undeveloped areas. Based on projected growth, additional T-hangars will be needed to meet Airport user demands. New hangars built on previously undisturbed land will necessitate expanded utilities.

4.4.4.1 UTILITIES NEEDS

Based on the previous analysis, the following are recommended based on the utility needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters**:**

1. Expand utilities when developing new aircraft storage and facilities

4.4.5 Fuel Storage

The Airport offers 24-hour, self-fueling with one 6,000 gallon above-ground tank of AvGas. 2017 fuel sales indicate Airport users purchase about 6,000 gallons of fuel a year. Based on projected aircraft operations and historical fuel sales data at Carrabelle Airport, the current fuel tank capacity is adequate to support aviation operations. Though, as the types of aircraft utilizing the Airport diversify in the future, the Airport may consider installing a Jet A fuel tank.

Fuel has a shelf-life and as such, cannot be stored indefinitely. To mitigate the potential for expired fuel, the Airport should consider procuring 3,000 gallons at a time, instead of filling the 6,000-gallon tank when empty.

4.4.5.1 FUEL STORAGE NEEDS

Based on the previous analysis, the following are recommended based on the fuel storage needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters**:**

1. Purchase lower quantities of fuel more regularly

4.4.6 Terminal

The Airport has a small manufactured terminal on the south side of the main apron. The terminal has a restroom, shower, and computer for pilots. Currently, the terminal building is in disrepair, with over half of the building being inaccessible due to structural issues. Based on this, it is recommended that the Airport develop a new terminal building and demolish the existing building. Additionally, it is recommended that the Airport provide wireless internet for pilot's flight planning needs.

4.4.6.1 TERMINAL NEEDS

Based on the previous analysis, the following are recommended based on the terminal needs. The application of these needs will be further discussed in the Alternatives and Airport Development chapters:

1. Develop new terminal building
2. Provide wireless internet access

4.4.7 Summary of Landside Needs

The following summarizes the support facility needs:

1. Design and construct 14,000 SF of T-hangars for based aircraft
2. Design and construct 5,150 SF of additional conventional hangar space for based aircraft
3. Design and construct 4,300 SF of additional apron space for transient aircraft
4. Create dedicated paved parking and provide alternatives forms of transportation
5. Provide a courtesy car for Airport users
6. Relocate the local fire department from Airport property
7. Expand utilities when developing new aircraft storage and facilities
8. Purchase lower quantities of fuel more regularly
9. Develop new terminal building
10. Provide wireless internet access

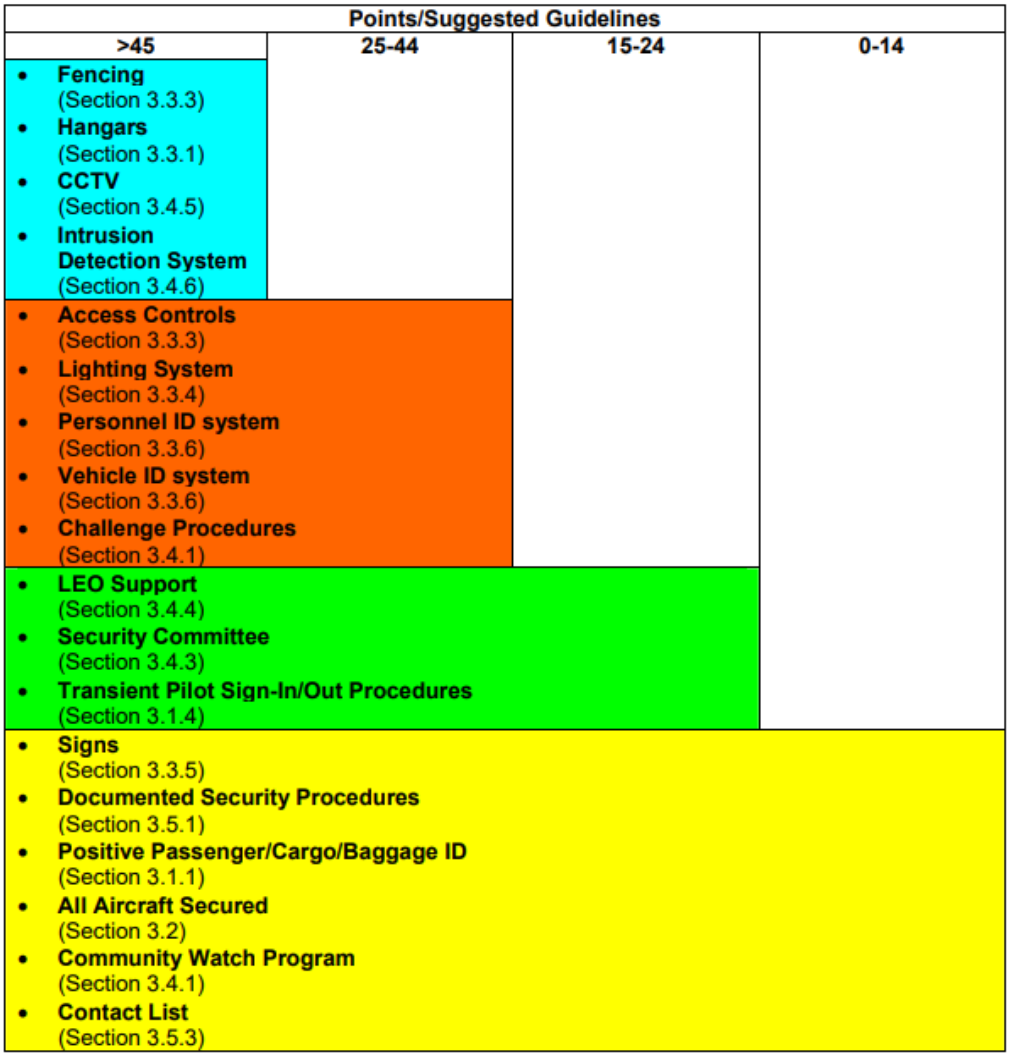
4.5 Security

The Transportation Security Administration (TSA) and FDOT recommend several features general aviation airports can implement to improve security. This Master Plan provides an opportunity to consider future security needs based on current and future facility needs and user demands. Advanced planning allows the Airport to make efficient and cost-effective decisions related to integrating security into any planned projects or initiatives.

In 2019, FDOT conducted a security assessment at Carrabelle Airport based on guidelines developed by the FAA and FDOT. The assessment found the Airport needed to improve access control, lighting, fencing, and security procedures. Based on these needs, Carrabelle Airport installed an access control system at the main access point, improved lighting at the main access point and on the apron, developed security procedures, and started updating the fencing. A project is currently underway to complete security fencing around the entire Airport.

The TSA's *Security Guidelines for General Aviation Airport Operators and Users, July 2017* describes recommended security enhancements for general aviation airports, and Figure 4.23 summarizes suggested security measures. These best practices and methods for determining enhancements are guidelines an airport may implement when considering the unique characteristics and security needs.

Figure 4.23. TSA GA Airport Security – Suggested Airport Security Enhancements[9]



Source: FAA TSA Security Guidelines for General Aviation Airport Operators and Users

Based on FDOT and Transportation Security Administration (TSA) guidelines, Carrabelle Airport maintains adequate security procedures and features. Nevertheless, planned future development may warrant the need for security enhancements. For example, the Airport will need to incorporate security features such as access control, signage, and lighting into the design of a future terminal building. Figure 4.24 summarizes security features the Airport may need to consider in the future.

[9] *Transportation Security Administration – Security Guidelines for General Aviation Airport, 2004*

Figure 4.24. Summary of Future Security Considerations

Future Project/Scenario	Security Considerations
Additional hangars	- Maintain access control - Lighting
Parking	- Lighting
Terminal building	- Access control - Signage - Lighting
Access road	- Access control - Signage - Lighting
Airport user growth	- Update Community Watch Program, contact list, and security procedures and plan - Develop ID badges for users, personnel, vehicles, etc.

Source: Kimley-Horn, 2019

4.6 Summary of Facility Requirements

Figure 4.25 summarizes the needed facility requirements identified in this Master Plan as well as an associated priority level. Low, medium, and high priority items correspond with the near- (0-5 year), mid- (5-10 year), and long-term (10-20 year) improvements, respectively.

Figure 4.25. Summary of Facility Requirements

Need	Priority
Airside	
Extend Runway 05-23 to an ultimate 5,000 feet	Low
Mill and overlay Runway 05-23	High
Design and construct a full-length parallel taxiway with a mid-field connector taxiway	Medium
Add pavement markings to remove direct access conflict where Taxiway A connects from the apron to the Runway	High
Relocate the hold position markings on Taxiway A to be 200 feet from the centerline of Runway 05-23	High
Work with the FAA to identify the Airport's REILs on the 5010 Master Record	Medium
Install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter "Service A"	Low
Design and construct a designated parking area for rotorcraft	Low
Airspace	
Vegetation trimming/removal within Airport property	High
Proactively develop a WHA	Low
Landside	
Design and construct between 8,000 SF and 18,000 SF of T-hangars for based aircraft	High
Design and construct between 2,750 SF and 4,750 SF of additional conventional hangar space for based aircraft	High
Design and construct 4,300 SF of additional apron space for transient aircraft	High
Create dedicated parking and provide alternative forms of ground transportation	Medium
Provide a courtesy car for Airport users	High
Relocate the local fire department from Airport property	High
Expand utilities when developing new aircraft storage and facilities	High
Purchase lower quantities of fuel more regularly	High
Develop new terminal building	High
Provide wireless internet access	High
Other	
Update Airport Master Plan and/or ALP with Narrative	Medium

Source: Kimley-Horn, 2019

5 Alternatives

To satisfy the safety objectives, user needs, and facility requirements identified in the previous section of this Master Plan, this chapter identifies alternatives and development scenarios that should be considered when developing the Airport. For this effort, several development options and site configurations were considered for each proposed improvement. Some of the recommended improvements identified in the Facility Requirements chapter are major components of the long-term development strategy for the Airport and warrant future evaluation. In most cases, recommended alternatives, or options, will consist of the scenario that provides the highest benefit to the Airport with minimal impacts. To evaluate various alternative improvement concepts and identify the preferred development strategy, the following items are addressed:

- Baseline Recommended Improvements
- Airside Facility Alternatives
- Landside Facility Alternatives
- Preferred Development Strategy

Alternatives were analyzed based on estimated project cost, construction and environmental impacts, consistency with existing airfield configuration and facilities, impacts to safety and efficiency of Airport users, and overall project feasibility. A phased development plan and cost estimates of recommended alternatives are presented in the subsequent chapter, “Airport Development”.

5.1 Baseline Recommended Improvements

There are several improvements for which alternatives are limited. Because of the minimal requirements associated with development, or because the alternatives only include a build or no-build scenario, the following projects are recommended and are not subject to alternatives analysis:

- Mill and Overlay Runway 05-23
- Add pavement markings to remove direct access conflict where Taxiway A connected from the apron to the Runway
- Relocate the hold position markings on Taxiway A to be 200 feet from the centerline of Runway 05-23
- Work with the Federal Aviation Administration (FAA) to identify the Runway End Identifier Lights (REILs) on the 5010 Master Record
- Perform drainage analysis, design, and construction along drainage ditch
- Provide a courtesy car for Airport users
- Relocate the local fire department from Airport property
- Expand utilities when developing new aircraft storage facilities
- Purchase lower quantities of fuel more regularly
- Develop new terminal building
- Provide wireless internet access
- Vegetation rimming/removal within the Airport property
- Proactively develop a Wildlife Hazard Assessment (WHA)

It should be noted that while the projects listed above do not require an alternatives analysis, they are equally important to develop, acquire, mitigate, and/or install at the Airport as described in the Facility Requirements chapter of this Master Plan.

5.2 Airfield Facility Alternatives

The following presents alternatives for airside improvements recommended in the Facility Requirements chapter. The following alternatives include an ultimate 1,000-foot long extension of Runway 05-23 and the recommended installation of an Automated Weather Observing System (AWOS).

5.2.1 Runway Extension

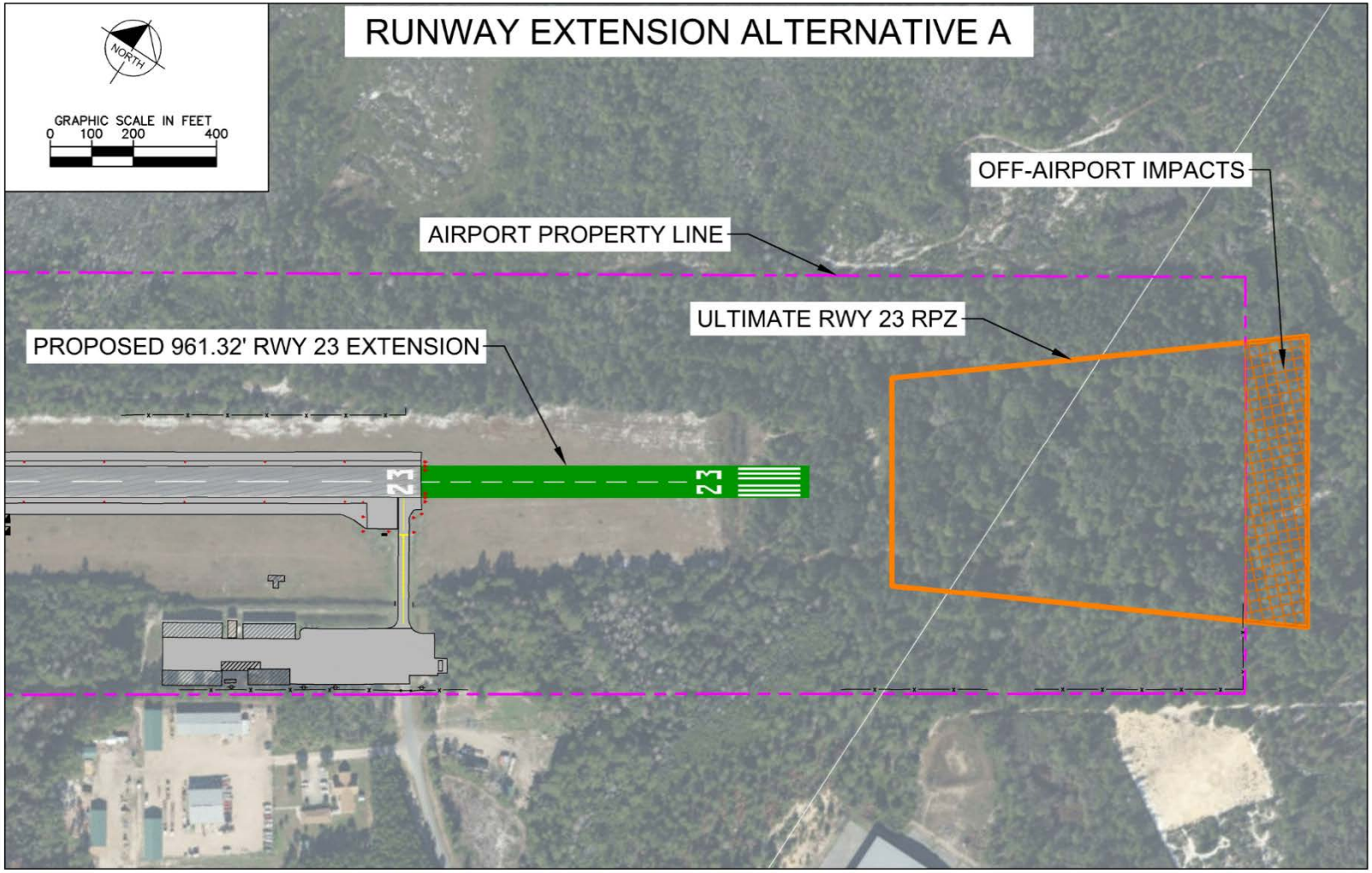
The facility requirements indicated that Runway 05-23, currently 4,039 feet long, is long enough to accommodate the Airport's critical aircraft, the Beech Baron 58 or a family of B-I aircraft based on runway length requirements contained in FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design*. While the current runway length is adequate based on projections of aviation demand over the 20-year planning horizon, Airport management indicated the desire for Runway 05-23 to have an ultimate length of 5,000 feet to allow and entice aircraft operators of larger, more demanding jet aircraft for corporate and air ambulance use. The following presents runway extension alternatives for a 5,000-foot long runway.

5.2.1.1 RUNWAY EXTENSION ALTERNATIVE A

Runway extension Alternative A proposes a 961-foot long extension to the end of Runway 23 which would increase the length of Runway 05-23 to 5,000 feet. The most significant negative impact of constructing the entire extension off the end of Runway 23 is the cost of removing trees and other vegetation to accommodate the extension and provide clear navigable airspace. Additionally, a northeastern extension of 961 feet pushes the Runway Protection Zone (RPZ) across the existing Airport property line. FAA guidance on RPZs and land use compatibility encourage airports to maintain full control of their RPZs. Full control would require the Airport to either own the property in which the RPZ covers (through fee simple acquisition) or acquire an avigation easement for the area of the RPZ not within Airport property.

Figure 5.1 depicts Alternative A, the 961-foot long extension off the end of Runway 23.

Figure 5.1. Runway Extension Alternative A



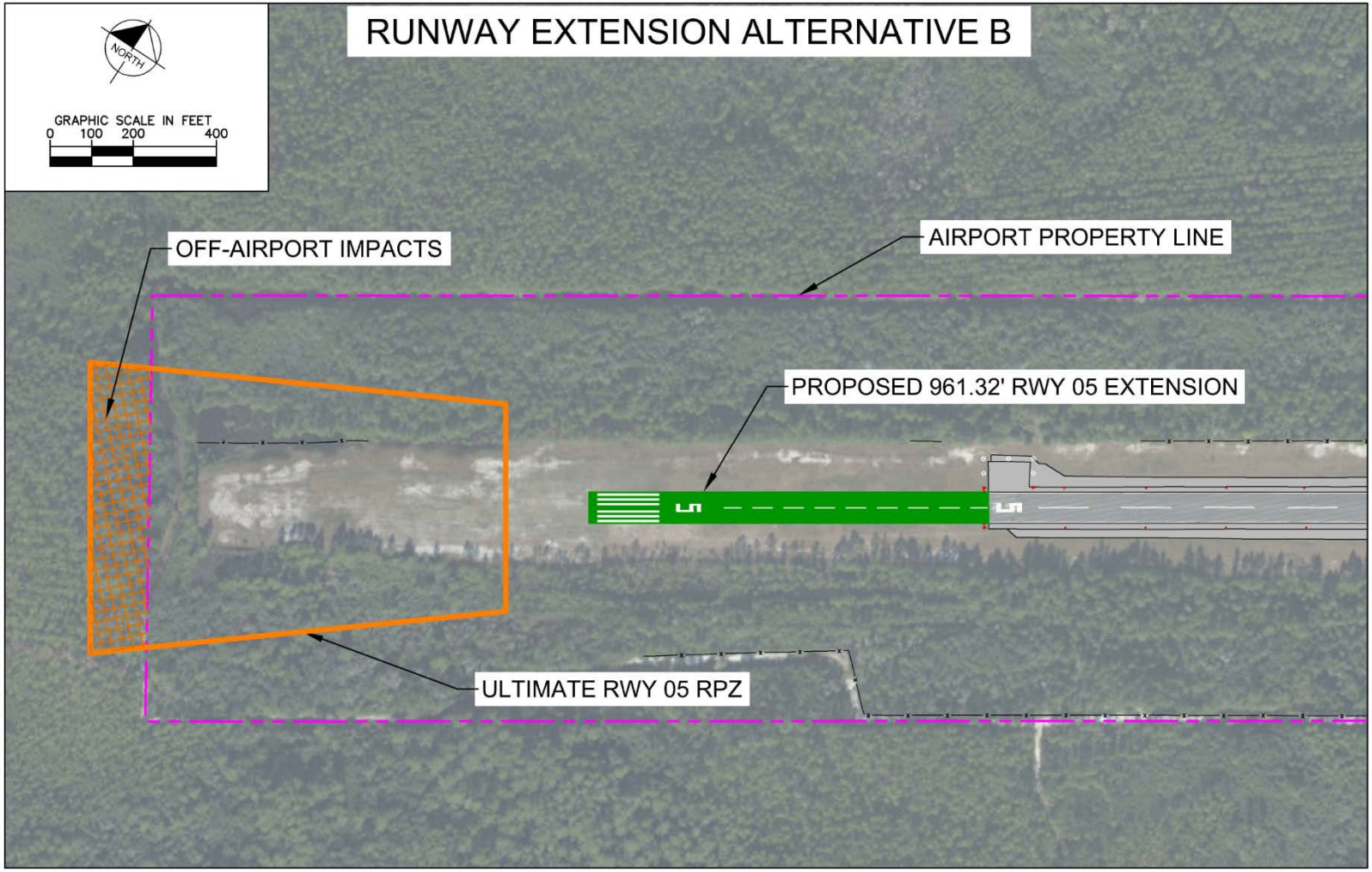
Source: Kimley-Horn, 2019

5.2.1.2 RUNWAY EXTENSION ALTERNATIVE B

Alternative B proposes a 961-foot long extension to the end of Runway 05 which would increase the length of Runway 05-23 to 5,000 feet. Constructing the runway extension off the end of Runway 05 would not require as much tree and vegetation removal as compared to Alternative A; however, the south end of Airport property is saturated with ponds, wetlands, and rough terrain that would require extensive National Environmental Policy Act (NEPA) documentation and would likely carry a very high cost. It is also common practice to locate the terminal area in a centralized airfield location, especially at airports with bi-directional runways like Carrabelle. An extension to the southwest would develop facilities away from the existing terminal and hangar area which may not be desirable for frequent Airport users. Similar to Alternative A, Alternative B pushes the ultimate RPZ over the existing Airport property line.

Figure 5.2 depicts Alternative B, the 961-foot extension off the end of Runway 05.

Figure 5.2. Runway Extension Alternative B



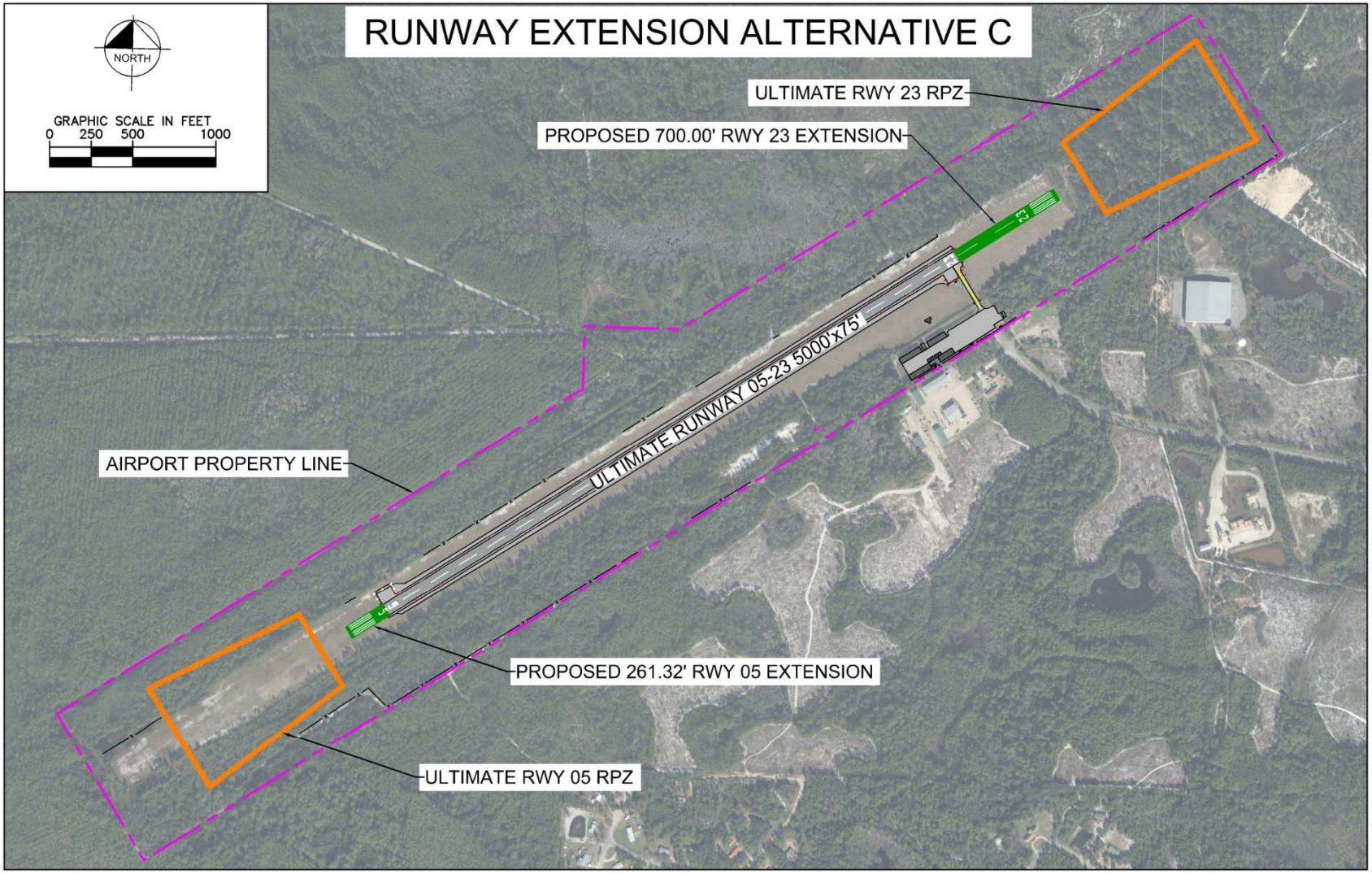
Source: Kimley-Horn, 2019

5.2.1.3 RUNWAY EXTENSION ALTERNATIVE C

Alternative C proposes a partial extension to both ends of Runway 05-23 to satisfy the desire for a 5,000-foot long runway. In this Alternative, an extension of 700 feet is constructed at the end of Runway 23 and an extension of 261 feet is constructed at the end of Runway 05. Alternative C would require vegetation and tree removal on the northeast (Runway 23 end) end, but not to the same extent as Alternative A. Extending both ends of the runway allows for the ultimate RPZs to stay within Airport property which satisfies FAA guidance regarding RPZs and land use compatibility. Additionally, most of the extension occurs on the Runway 23 end which allows the terminal and landside areas to be in a slightly more centralized area of the Airport. Unlike Alternative B, Alternative C would not require the same level of mitigation as the ponding, wetlands, and rough terrain areas are not as prevalent until approximately 500 feet off the end of Runway 05.

Figure 5.3 depicts the runway extensions to both runway ends as described for Alternative C.

Figure 5.3. Runway Extension Alternative C



Source: Kimley-Horn, 2019

5.2.2 Preferred Runway Extension Alternative

Because the runway extension has not been identified as a need to accommodate existing or future demand, the cost of design and implementation is the greatest factor for determining a preferred runway extension alternative. All three runway extension alternatives will require some NEPA processes and documentation as a large portion of the Airport is surrounded by wetlands. Alternatives A and B have the highest costs as both require land acquisition through fee simple or avigation easement to maintain RPZs on Airport property. Alternative B would incur extremely high design and construction costs because of the existing terrain around the southeast parcel of Airport property. As such, Alternative C is the preferred alternative for extending Runway 05-23 to an ultimate 5,000 feet. Alternative C promotes a centralized terminal area, incurs a lower cost for design and construction, and keeps ultimate RPZs on existing Airport property.

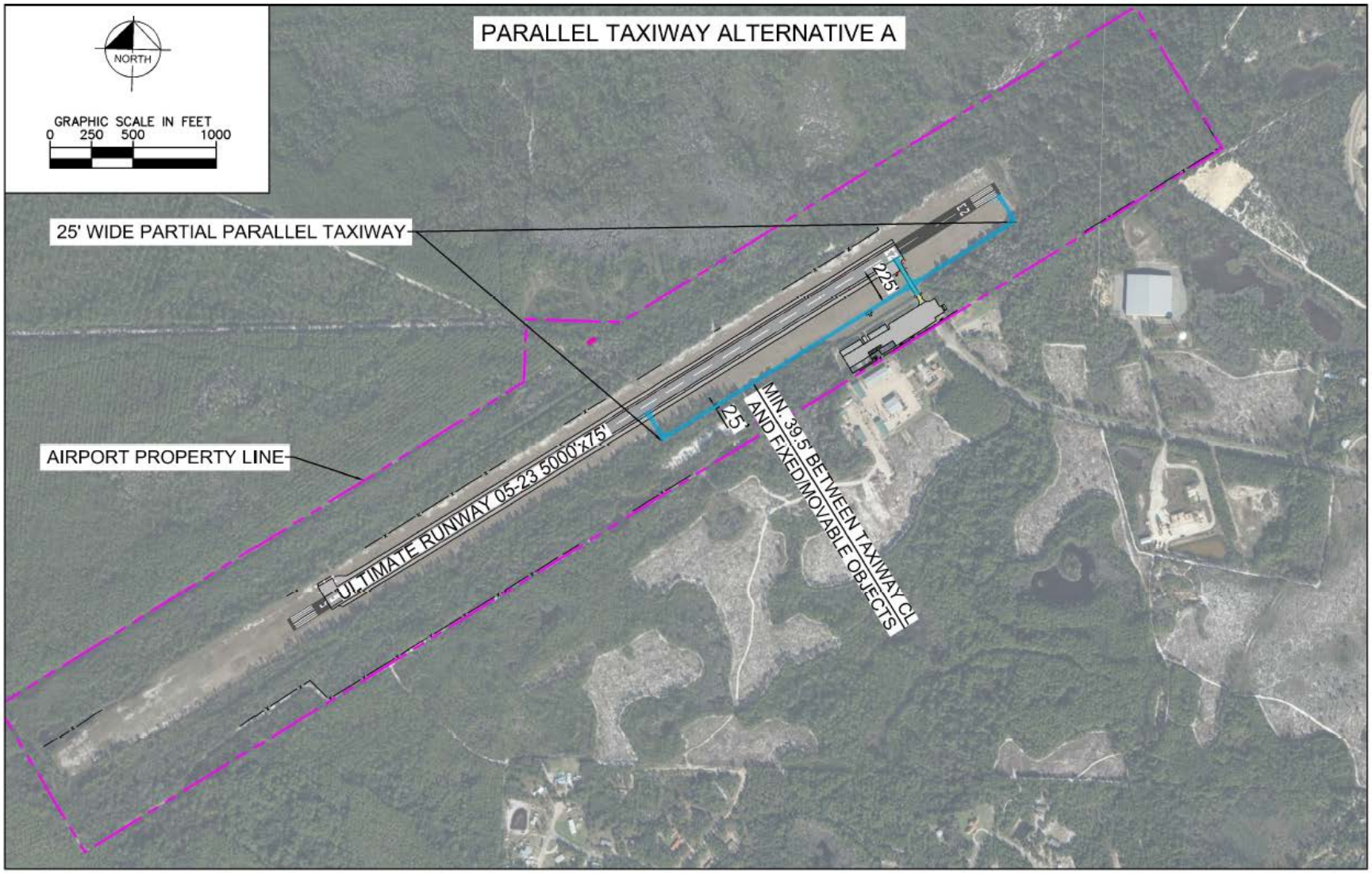
5.2.3 Parallel Taxiway

A full-length parallel taxiway eliminates use of a runway for taxiing, thus increasing airfield capacity and protecting the runway under low visibility conditions. Carrabelle Airport does not currently have a parallel taxiway, only a connector taxiway providing access from the apron area to the end of Runway 23. The following presents development alternatives for a parallel taxiway.

5.2.3.1 TAXIWAY ALTERNATIVE A

Taxiway Alternative A proposes development of a partial parallel taxiway on the terminal side (southeast) of Airport property. The partial parallel taxiway would connect from the mid-point of Runway 05-23 to the ultimate end of Runway 23. Constructing a partial parallel taxiway on the terminal-side would enhance Airport safety, somewhat eliminate back-taxiing, increase airport capacity, and promote development on the side of the Airport with existing facilities. A partial parallel taxiway, however, would not provide a connection to the end of Runway 05. This would affect aircraft with an approximate landing distance of greater than 2,500 feet to back-taxi on the Runway when approaching the Runway 23 end. Figure 5.4 depicts taxiway alternative A.

Figure 5.4. Parallel Taxiway Alternative A

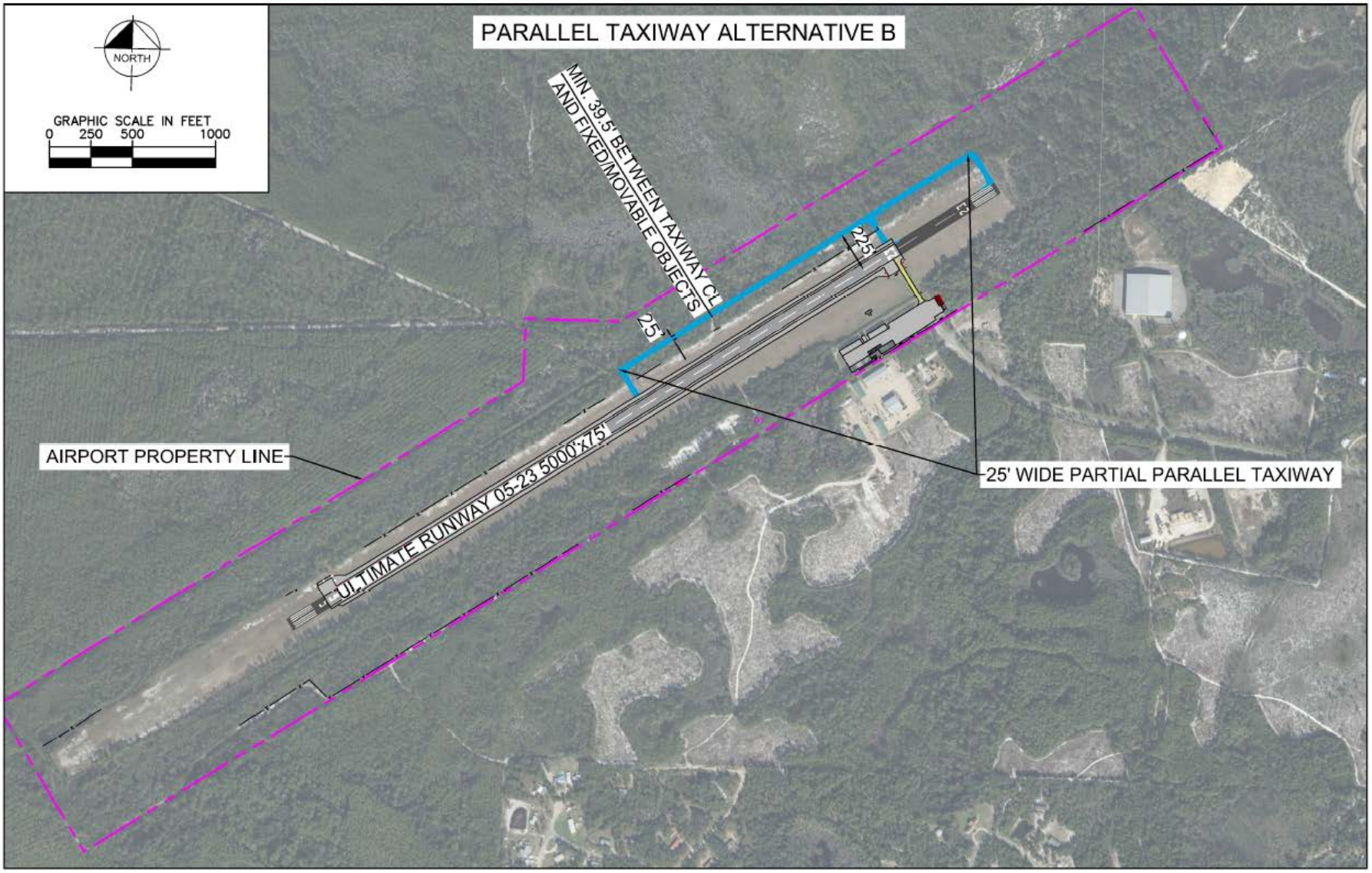


Source: Kimley-Horn, 2019

5.2.3.2 TAXIWAY ALTERNATIVE B

Taxiway Alternative B proposes development of a partial parallel taxiway on the undeveloped side (northwest) of Airport property. The partial parallel taxiway would connect from the mid-point of Runway 05-23 to the ultimate end of Runway 23. Constructing a partial parallel taxiway on the undeveloped would provide similar benefits of Alternative A (enhance Airport safety, somewhat eliminate back-taxiing, and increase airport capacity) but wouldn't be logical for daily aircraft circulation. Because of the limited number of daily operations, aircraft may disregard the parallel taxiway altogether which would be a poor investment that would require extensive clearing of vegetation. In addition, development of a partial parallel taxiway on the undeveloped side would not provide a connection to the end of Runway 05. This would also affect aircraft with an approximate landing distance of greater than 2,500 feet to back-taxi on the Runway when approaching the Runway 23 end. Figure 5.5 depicts taxiway alternative B.

Figure 5.5. Parallel Taxiway Alternative B

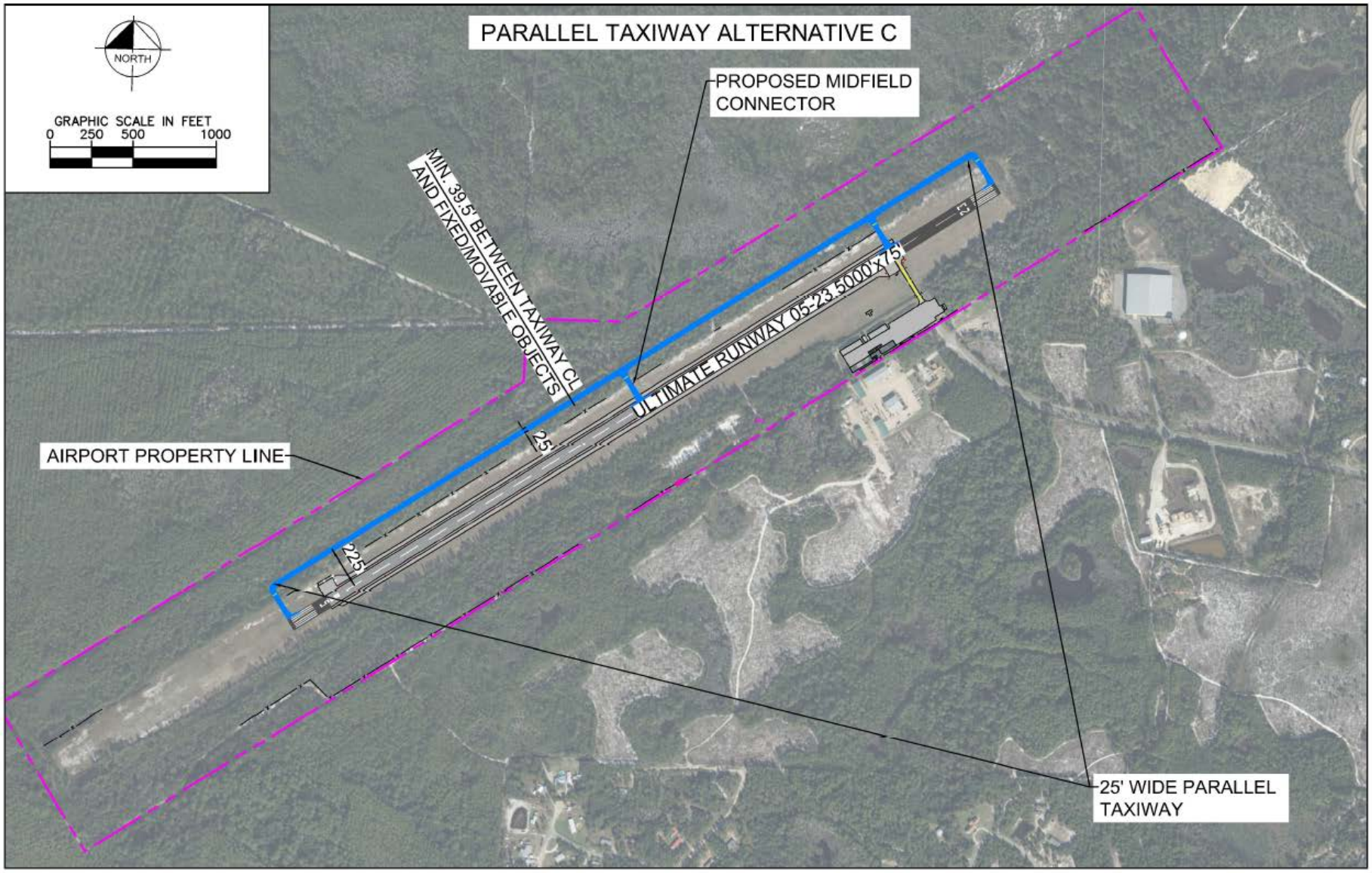


Source: Kimley-Horn, 2019

5.2.3.3 TAXIWAY ALTERNATIVE C

Taxiway Alternative C proposes development of a full-length parallel taxiway on the undeveloped side (northwest) of Airport property. The full-length parallel taxiway would connect from the ultimate end of Runway 05 to the ultimate end of Runway 23 on the undeveloped side of the Airport. Constructing a full-length parallel taxiway on the undeveloped side would provide benefits including enhanced Airport safety, elimination of back-taxiing, and increased airport capacity. However, similar to Alternative B, Alternative C wouldn't be logical for daily aircraft circulation as the full-length taxiway would be constructed on the undeveloped side of airport property which would require extensive clearing of vegetation. Figure 5.6 depicts taxiway alternative B.

Figure 5.6. Parallel Taxiway Alternative C

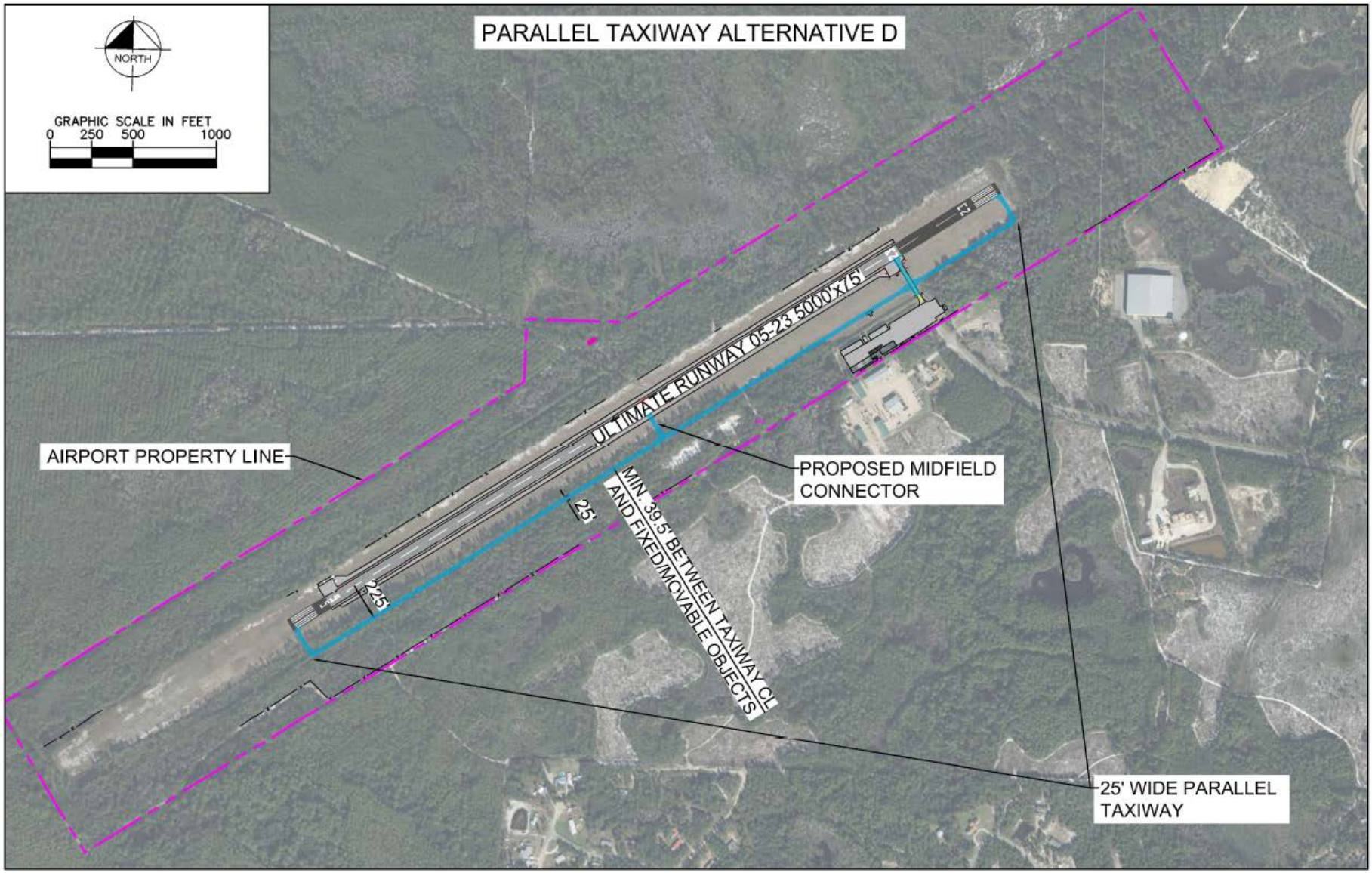


Source: Kimley-Horn, 2019

5.2.3.4 TAXIWAY ALTERNATIVE D

Taxiway Alternative A proposes development of a full-length parallel taxiway on the terminal side (southeast) of Airport property. The full-length parallel taxiway would connect from the ultimate end of Runway 05 to the ultimate end of Runway 23. Constructing a full-length parallel taxiway on the developed side would provide benefits including enhanced Airport safety, elimination of back-taxiing, increase airport capacity, and promote development on the side of the Airport with existing facilities. Similar to Alternatives A, B, and C, Alternative D would require extensive clearing of vegetation. Figure 5.7 depicts taxiway alternative D.

Figure 5.7. Parallel Taxiway Alternative D



Source: Kimley-Horn, 2019

5.2.4 Preferred Taxiway Alternative

Development of a parallel taxiway—full-length or partial—on the northwest side of the Airport would be illogical primarily due to the Airport lacking facilities on the undeveloped side. The Airport has not suggested a desire to develop the northwest side, nor do forecasts of aviation demand over the 20-year planning horizon indicate the need. As such, Alternative B and C are not adequate alternatives.

It is recommended that the Airport construct a parallel taxiway on the developed side of Airport property. With safety of the highest value, Alternative D is the preferred alternative. A full-length parallel taxiway provides the most benefit to the Airport in terms of safety, capacity, and airfield circulation.

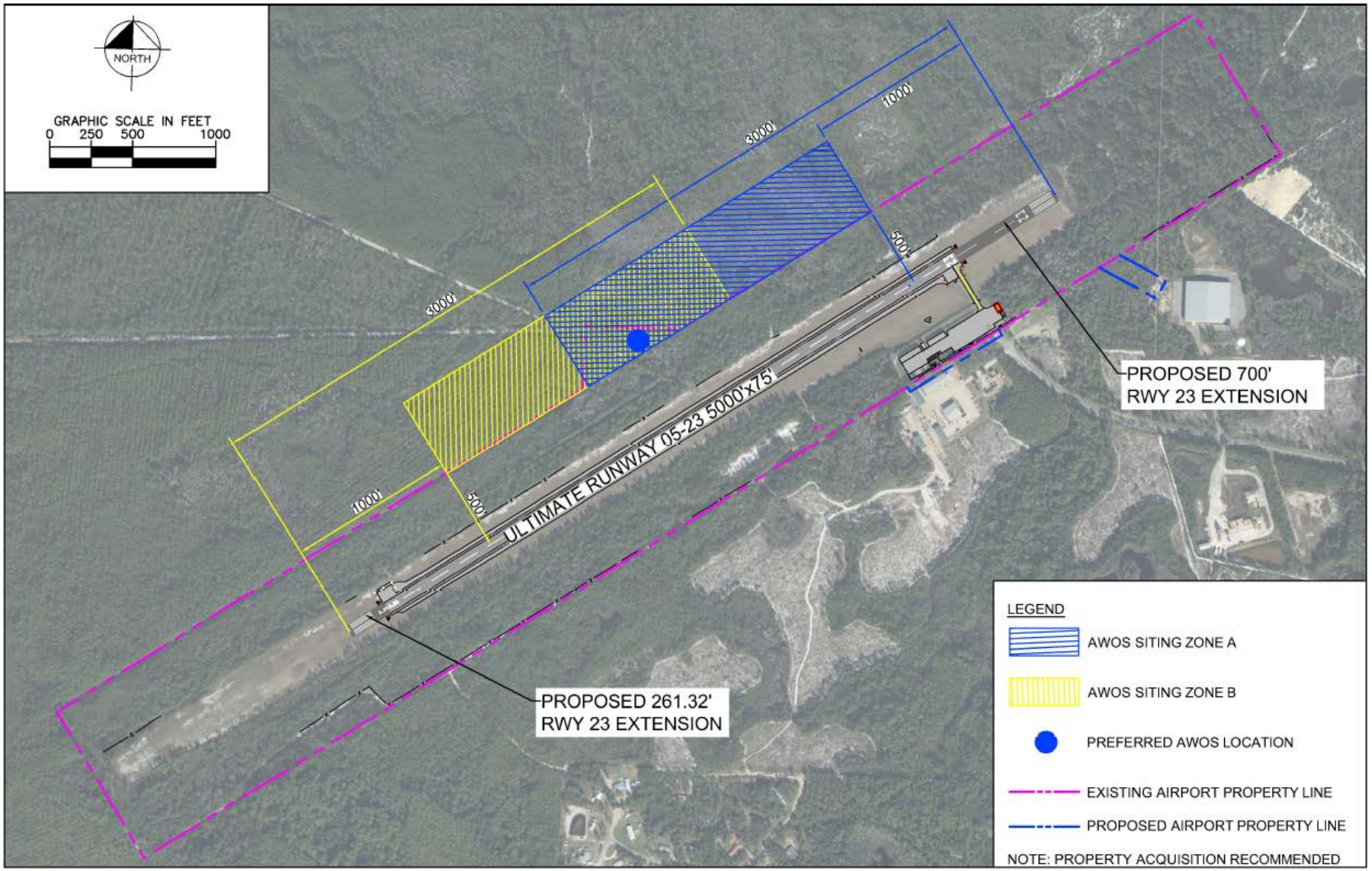
It is recommended that the Airport design and construct the full-length parallel taxiway in two phases. The first phase would design and construct the partial parallel in the near-term (Alternative A). The second phase would design and construct the remainder of the parallel taxiway in the long-term. Development in phases should ease the burden of acquiring adequate funding to support such a project.

5.2.5 Automated Weather Observing System (AWOS) Location

An AWOS collects weather data at airports and disseminates these data via radio and/or landline. A weather reporting station at the Airport is a facility that can improve safety in the form of accurate weather readings which pilots rely on. Accurate weather reporting can also be used to justify or verify the need for additional improvements such as a crosswind runway and instrument approach procedures. This section describes alternative locations for an Automated Weather Observing System (AWOS) at Carrabelle Airport. Routine maintenance for weather stations typically occurs on an annual basis and weather information is disseminated by radio frequency and computer-generated voice message available by a telephone dial-up modem service or via WIFI. AWOS maintenance can be outsourced to independent companies, or training courses are available to direct airports how to conduct the maintenance themselves. According to the FAA's Order 6560.20B, *Siting Criteria for Automated Weather Observing Systems (AWOS),* for airports with visual and non-precision instrument approaches, "the preferred siting of the cloud height, visibility, and wind sensors and associated data collection platform (DCP) is adjacent to the primary runway 1,000 feet to 3,000 feet down the runway from the threshold…The minimum distance from runway centerline shall be 500 feet. The maximum distance from the runway shall be 1,000 feet."

These criteria were applied at the Airport to determine the areas where the AWOS could be installed. The AWOS could be installed in Zone A, Zone B, or anywhere within the overlap of Zone A and Zone B. Carrabelle Airport is on a narrow parcel of land that does not provide much room for installation of the AWOS based on FAA siting criteria. Depending on the elevation of the ultimate AWOS site, the required distance from the runway centerline could increase or decrease, however, the distance is negligible as the land adjacent to the runway does not have significant elevation variances. The location of an AWOS would need to be somewhere that is easily accessible to conduct routine maintenance, but also within airport property. As such, the preferred location for the AWOS (which is depicted in Figure 5.8) is on the north side of airport property, within the overlap of Zones A and B, where the airport property line juts out.

Figure 5.8. Proposed AWOS Location



Source: Kimley-Horn, 2019

5.3 Landside Facility Alternatives

The Airport has chosen to preserve the land north of Runway 05-23 for a potential future runway shift beyond the planning horizon. This limits space available for landside development to two areas – northeast of the current fuel farm or west of the current hangar development. Because the options for landside development are limited, the Master Plan has identified two development concepts that include interrelated elements that were recommended in the Facility Requirements chapter:

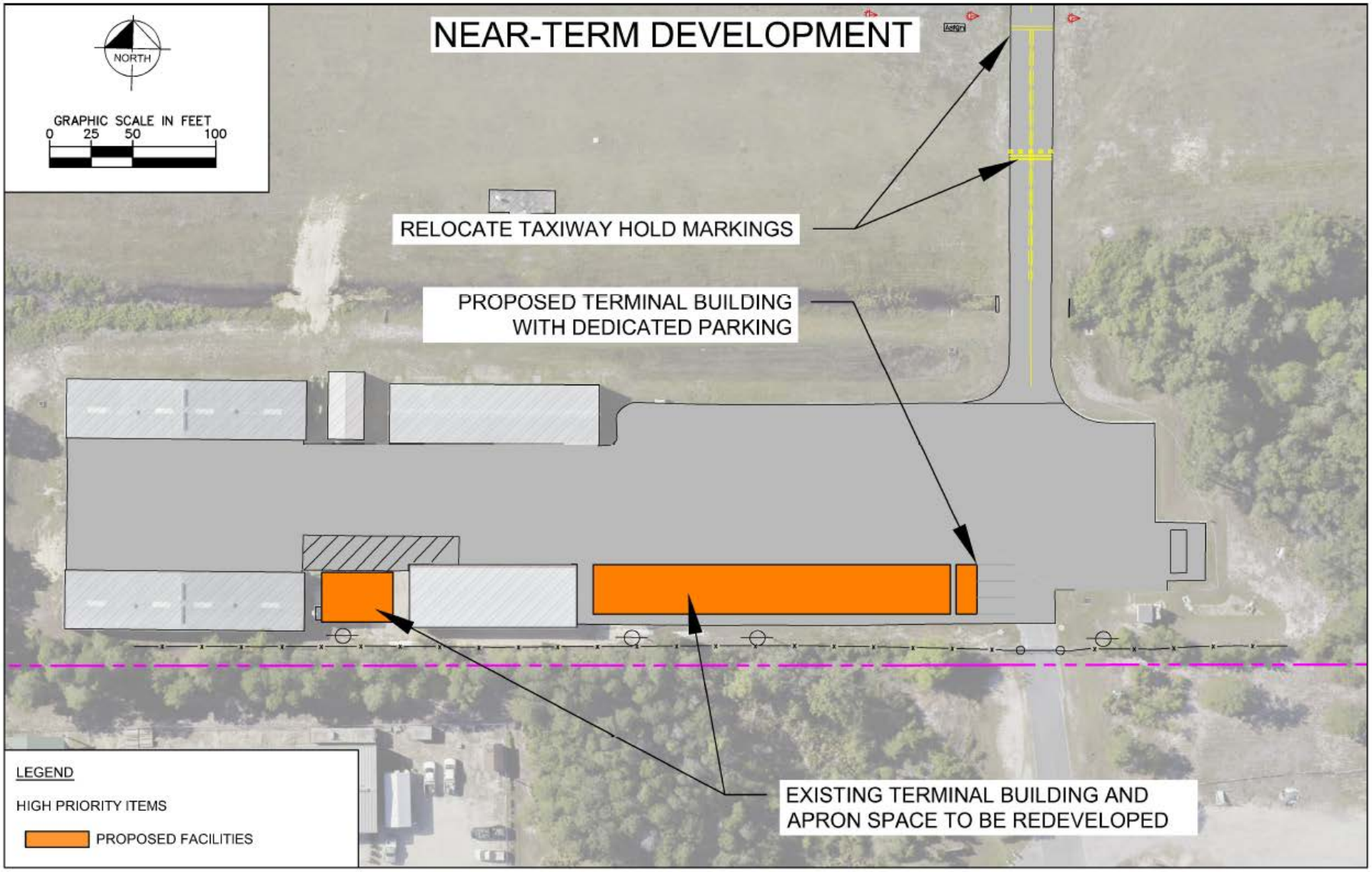
- New T-hangar and box hangar development
- Fuel farm expansion
- Improved access/roadway connection to the Airport
- New terminal building
- New Airport maintenance building
- Automobile parking

The following subsections describe the two development concepts in detail.

5.3.1 Near-Term Landside Development

In either of the following development scenarios, near-term future development focuses on converting tie-down spaces on the aircraft parking apron to conventional hangars with a new terminal that has a meeting space, bathrooms, a flight planning area, wireless internet, and a designated paved automobile parking area. This makes the location of the current terminal available for a new Airport maintenance building or hangar and would allow the Airport to remove the current maintenance building that is used by the local fire department. The aircraft parking apron site is the best available option for near-term future development because no environmental preparation would need to occur prior to development and utilities could be extended from the adjacent conventional hangars. A dedicated paved automobile parking area would be placed in front of the new terminal, connecting the terminal and main access road. The terminal would be designed so that it can be converted to an office or meeting space in the future, should an aviation related business become established at the Airport. Figure 5.9 displays near-term landside development plans.

Figure 5.9. Near-Term Landside Development



Source: Kimley-Horn, 2019

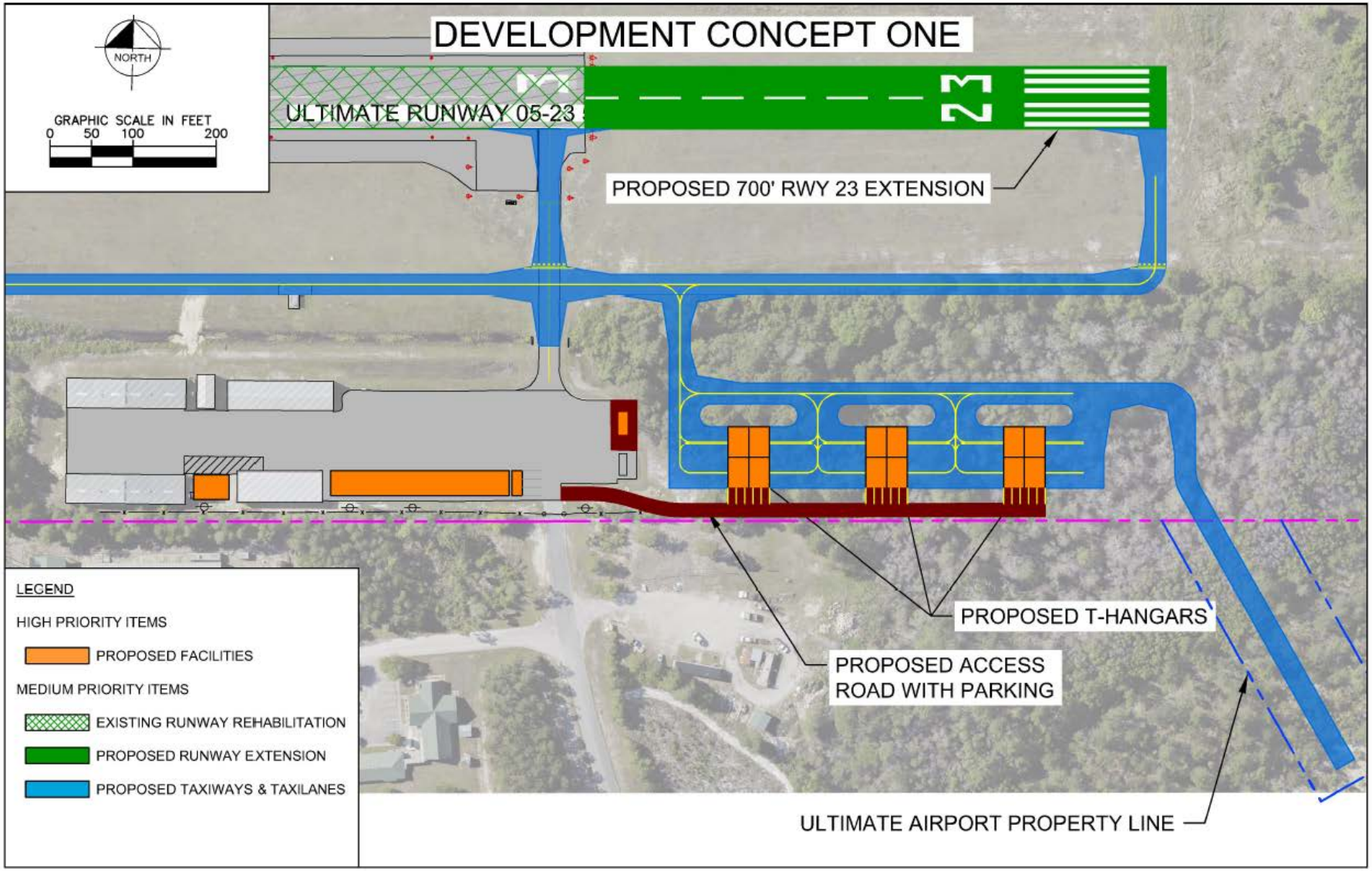
5.3.2 Development Concept One

In Development Concept One, mid-term future development is first focused north of the current fuel farm and would include additional hangar and apron space, as well as a larger terminal and additional paved automobile parking, if deemed appropriate. The main Airport access road would be extended to the new terminal building and paved automobile parking area. The Airport would have to extend utilities to this area prior to development. The space available for development is approximately one acre and is bounded by the Runway Protection Zone (RPZ) and building restriction line.

In this scenario, the Airport must phase future development in coordination with a future runway extension project because the existing RPZ restricts the available space. Figure 5.10 show how much and in what manner development could occur before a runway extension, approximately 50 percent of the one-acre area. With a runway extension, the RPZ will be shifted further north, making more space available for future development. All future development within the available space would be flexible by allowing development to occur in phases, while retaining the ability of hangars and apron space to be configured in accordance with market trends. The Airport would have to conduct significant environmental preparation before mid-term landside development can occur and may be able to coordinate this environmental preparation with a future runway extension or parallel taxiway as a single analysis.

Based on long-term demand, the fuel farm would be upgraded to include another tank so that the Airport could offer jet fuel to local and visiting pilots. The current tank that is used for AvGas could be converted to a jet fuel tank and an AvGas tank could be installed. If hangar demand continues to increase over time, the ultimate build-out scenario may also include hangar development west of the current hangar development. Ultimately, the build-out scenario for Development Concept One would be scalable, flexible, and configurable based on future market trends and demands at the Airport.

Figure 5.10. Development Concept One



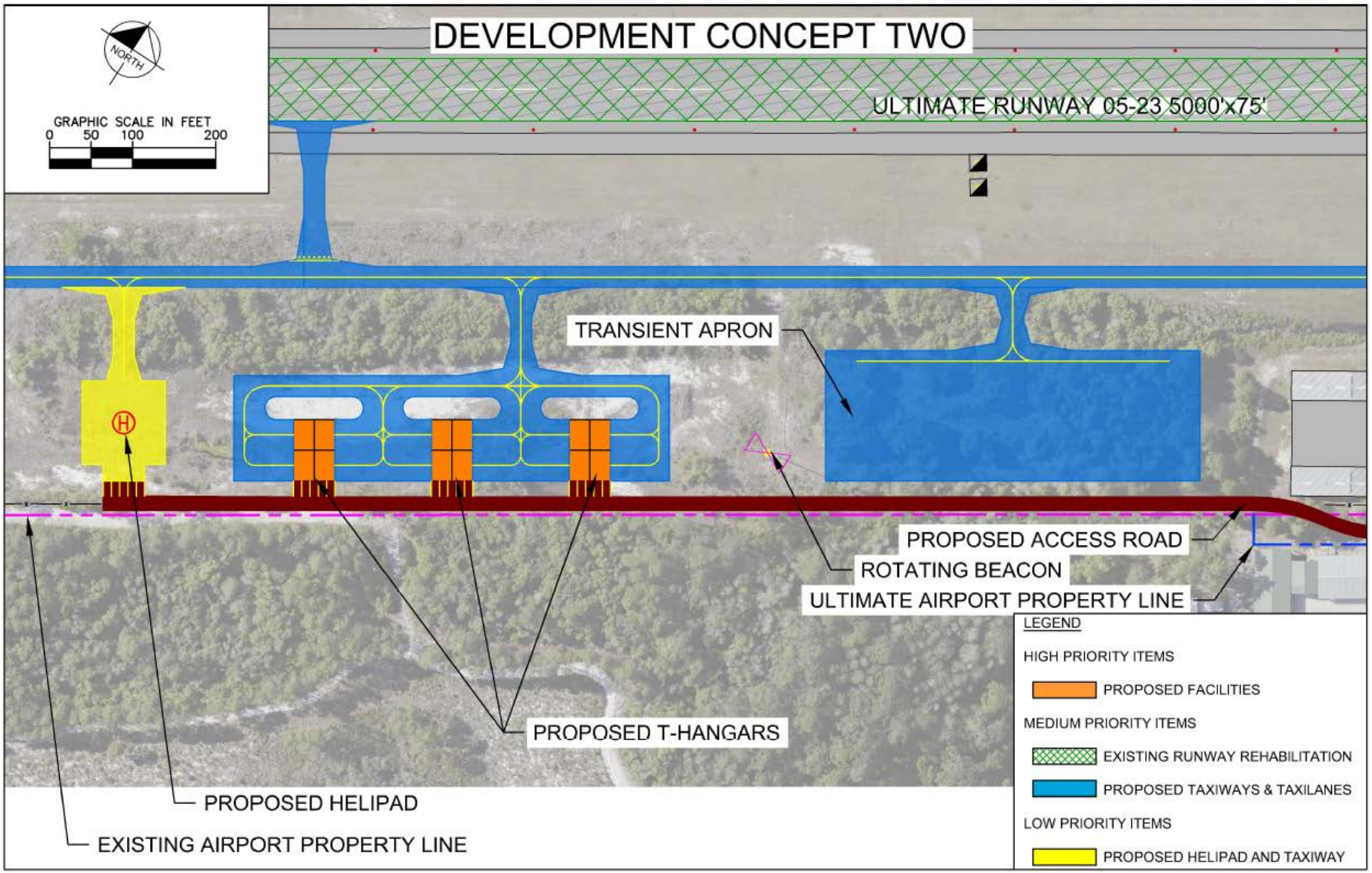
Source: Kimley-Horn, 2019

5.3.3 Development Concept Two

For Development Concept Two, mid-term future development would first begin west of the current hangar development. The space available for future development is about two and a quarter acre and would be connected to the current hangar development via a taxiway and apron. The Airport would also need to add an access road behind the current hangars adjacent to the Florida Forestry Service property to allow vehicles to access the new development without using an apron or taxiway for increased safety. The Airport may have to acquire land or an easement from Forestry Service to build the access road. Within the available development space, the Airport would first build additional T-hangars or conventional hangars, apron space, a taxiway, and paved automobile parking for tenants. The Airport may also build a larger terminal, if deemed necessary based on demand. Similar to Development Concept One, the Airport would have to conduct significant environmental preparation and expand utilities before mid-term landside development. The Airport may be able to coordinate this preparation with the preparation for a future parallel taxiway or runway extension.

Long term, the Airport may expand the current fuel farm north to include a tank for jet fuel in addition to the current tank that is used for AvGas. If demand for hangars continues over time, the ultimate build-out scenario will also include development northeast of the fuel farm. All future development would be phased based on demand, and the configuration would account for market trends. Figure 5.11 is an example of how development may occur in this scenario.

Figure 5.11. Development Concept Two



Source: Kimley-Horn, 2019

5.3.4 Preferred Landside Development Concept

In either landside development scenario, the Airport would have to conduct significant environmental preparation prior to mid-term development on greenfield sites and would need to extend utilities to the development site. Nevertheless, Development Concept One is the preferred alternative because future development is centralized around the near-term future terminal and existing fuel farm. This alternative also better aligns with the potential aeronautical use of a City owned industrial parcel northeast of the Airport. Finally, Development Concept One would not require the Airport to purchase land or obtain an easement for an access road.

6 Capital Improvement Plan

This chapter provides a summary of projects identified in the Facility Requirements chapter and recommended developments described in the Alternatives chapter over the 20-year planning period. This summary also includes planning level cost estimates and potential funding mechanisms.

6.1 Introduction

As noted previously, Carrabelle Airport is a non-NPIAS facility, meaning it is not eligible to receive FAA AIP grants. As such, the primary financial channel for Airport improvements other than local monies is through grants issued by the Florida Department of Transportation. Grant-eligible projects typically require a 20 percent local match to obtain 80 percent state funding; however, because Carrabelle is located in Franklin County, which qualifies a Rural and Economic Development Initiative (REDI) county, the local match may be waived. Projects are typically eligible for FDOT grants if they are related to safety, capacity enhancement, maintenance, or are projects related to environmental studies, planning, or land acquisition.

6.2 Airport Development Plan

The Airport Development Plan is derived from facility needs identified in **Chapter 4: Facility Requirements**. Airport development is planned to occur in three phases, as described below. Additional facilities have been conceptualized, however, these facilities do not have associated costs and are intended for planning and preservation purposes only.

6.2.1 Near-Term Improvements (FY 2020-2024)

Near-Term improvements include projects to be implemented in the zero to five-year timeframe (FY 2020-2024). The following projects are included in the near-term timeframe:

- Upgrade fuel farm system.
- Complete fencing project.
- Environmental and design for taxiways and hangars (east of current fuel farm).
- Design, environmental, and construction for stormwater upgrades along parallel drain.
- Phase 1 hangar and taxiway construction.
- Construct dedicated parking.
- Construct new general aviation terminal building.

6.2.2 Mid-Term Improvements (FY 2025-2030)

Mid-Term improvements include projects to be implemented in the six to 10-year timeframe (FY 2025-2034). The following projects are included in the mid-term timeframe:

- Design, environmental, and construction of Runway 05-23 rehabilitation.
- Design, environmental, and construction of full-length parallel taxiway with a mid-field connector.
- Design and construction of 4,300 SF of additional transient aircraft apron space.
- Phase 2 continued taxiway and hangar construction.
- Add pavement markings to remove direct access conflict at Taxiway A.

- Relocate the hold position markings on Taxiway A.
- Vegetation trimming/removal within Airport Property.

6.2.3 Long-Term Improvements (FY 2031-2040)

Long-Term improvements include projects to be implemented in the 10 to 20-year timeframe (FY 2031-2040). The following projects are included in the long-term timeframe.

- Design, environmental, and construction of Runway 05-23 to ultimate 5,000 feet.
- Design, environmental, and construction of parallel taxiway to match Runway 05-23 extension.
- Install AWOS.
- Phase 3 continued taxiway and hangar construction.

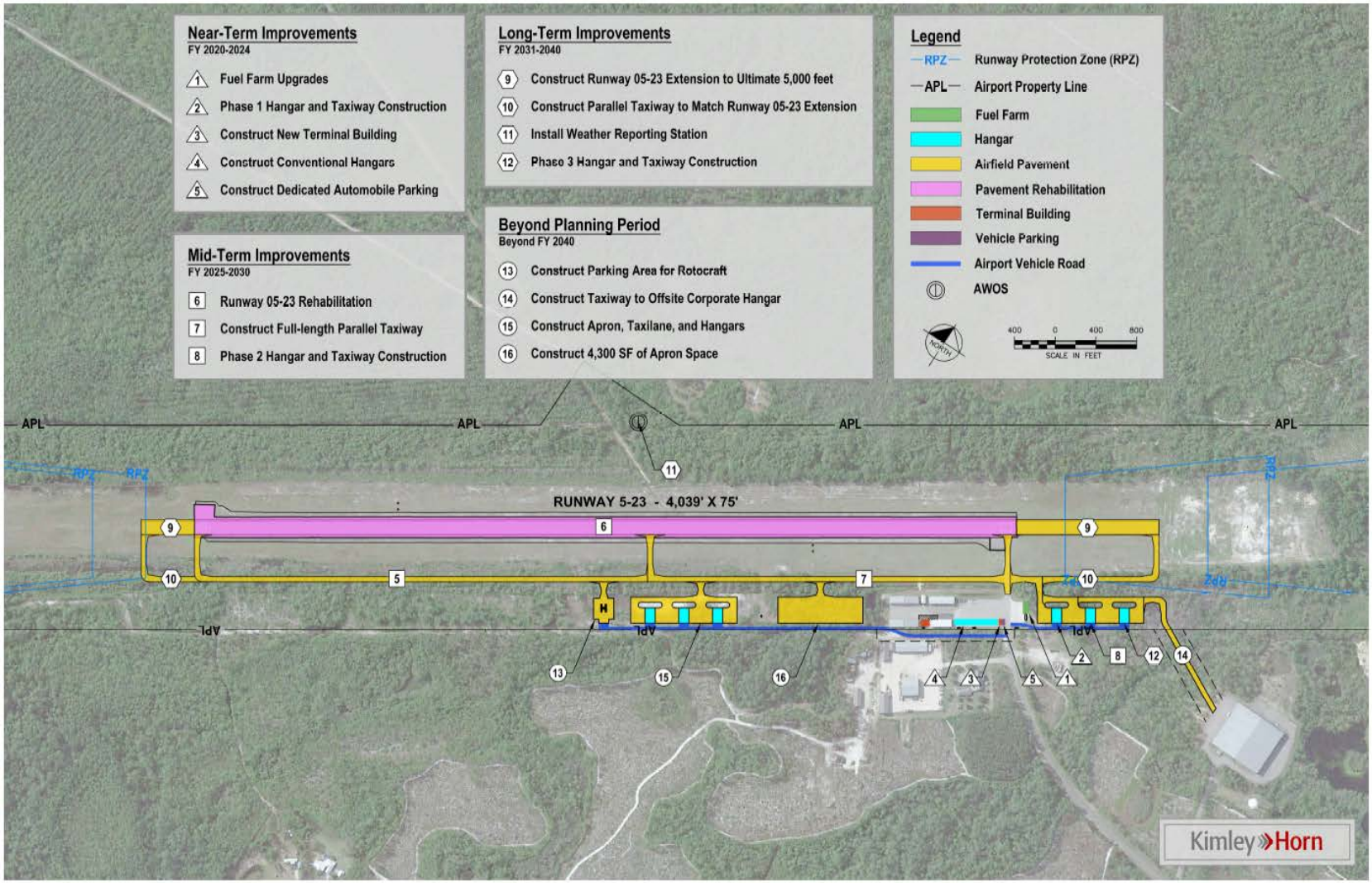
6.2.4 Beyond Planning Period Improvements (Beyond FY 2040)

Other projects have been identified for consideration beyond the 20-year planning period (beyond FY 2040). The following projects are included in the beyond planning period timeframe:

- Design, environmental, and construction of taxiway connecting to off-site corporate hangar.
- Design, environmental, and construction of additional apron, taxi lanes, and hangars.
- Design, environmental, and construction of airport access road.
- Design, environmental, and construction of rotorcraft parking area.

A compilation of all projects over the 20-year planning period is presented in Figure 6.1. It is recommended that these projects be re-evaluated in the Airport's future master plan based on changes in Airport activity and facility needs.

Figure 6.1. Airport Development Plan



Source: Kimley-Horn, 2020

6.3 Environmental Strategy

Because Carrabelle is not in the NPIAS and therefore not federally obligated, many projects will be able to be completed using the state's environmental standards. In the most broad terms, there are two primary environmental review types that FDOT employs: Documentation of Non-Major State Actions and State Environmental Impact Reports.

- **Documentation of Non-Major State Actions (NMSA)** – There is a category of actions which do not individually or cumulatively have a significant effect of the human environment – these are called NMSAs. Per FDOT guidance, "NMSAs are only required when FDOT is the lead agency and the project does not require a PD&E Study. NMSAs require an environmental evaluation and completion of the Non-Major State Action Checklist, Form No. 650-050-30 through the State Wide Environmental Project Tracker (SWEPT)."
- **State Environmental Impact Report (SEIR)** – The SEIR Form, Form No. 650-050-43 is a short, targeted document based on the results of engineering and environmental analysis and coordination. Per FDOT guidance, "The SEIR documents the social and economic, cultural, natural, and physical issues/resources evaluated as part of the project. Additional information for each category is included in attachments, as needed. Technical reports or memorandums should be summarized in each section with reference to the corresponding document for more details."

In certain instances, such as the need for federal permit/action from an agency such as the U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), U.S. Fish and Wildlife Service (USFWS), or National Marine Fisheries Service (NMFS), federal environmental provision should be followed. The following provides a strategy for obtaining required environmental approvals under National Environmental Protection Agency (NEPA) for the RDP. Other NEPA-related environmental considerations may include drainage and impacts to sensitive habitats or hazardous waste sites on Airport property.

There are three types of environmental review:

- **Categorical Exclusion (CatEx)** – there is a category of actions which do not individually or cumulatively have a significant effect of the human environment, and therefore, neither an EA or an EIS is required. The typical timeframe to document a CatEx and receive FAA approval is up to four months.
- **Environmental Assessment (EA)** - a public document that an airport sponsor prepares to provide sufficient evidence to determine whether a proposed action would require preparation of an Environmental Impact Statement (EIS) or a finding of no significant impact (FONSI). The average completion timeframe is up to two years.
- **Environmental Impact Statement (EIS)** – a public document required for airport development actions that may "significantly affect the quality of the human environment". The EIS describes the impacts on the environment as a result of a proposed action; the impacts of alternatives; as well as plans to mitigate impacts. The average completion timeframe is two to three years.

The projects included in the Airport Development Plan that are anticipated to require environmental review are presented in Figure 6.2.

Project	Anticipated Environmental Action
Near-Term (FY 2020-2024)	
Upgrade fuel farm system	None
Complete fencing project	None
Phase 1 hangar and taxiway construction	CatEx/SEIR
Mid-Term (FY 2025-2030)	
Design, environmental, and construction of Runway 05-23 rehabilitation	CatEx/SEIR
Design, environmental, and construct a full-length parallel taxiway with a mid-field connector taxiway	CatEx/SEIR
Design and construct between 15,000 SF of additional apron space for transient aircraft	EA/SEIR
Phase 2 continued taxiway and hangar construction	EA/SEIR
Expand utilities when developing new aircraft storage and facilities as required based on development	CatEx/SEIR
Develop new terminal building	CatEx/SEIR
Long-Term (FY 2031-2040)	
Design, environmental, and construction to extend Runway 05-23 to an ultimate 5,000 feet	EA/SEIR
Phase 3 continued taxiway and hangar construction	EA/SEIR
Install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter "Service A"	CatEx
Design, environmental, and construct a designated parking area for rotorcraft	CatEx

Figure 6.2. Potential Environmental Review Requirements

Sources: FAA Order 1050.1F Environmental Impacts: Policies and Procedures, Kimley-Horn 2019

6.4 Sources of Funding

The following sections describe State and Local funding mechanisms to potentially assist with implementation of projects identified in the master plan process.

6.4.1 Federal Funding

As a Non-NPIAS airport, Carrabelle Airport is not eligible for funding from the FAA.

6.4.2 State Grant Funding

As a publicly owned, public-use airport in Florida, Carrabelle Airport is eligible for funding through FDOT's Aviation Grant Program. The Aviation Grant Program was established to fund projects relating to airport planning, capital improvement, land acquisition, and economic development. In general, Florida law allows FDOT to fund any capital project on airport property and any services that lead to capital projects, such as planning and design services. The only off-airport projects allowed are the purchase of mitigation lands and avigation easements, noise mitigation, and access projects for intercontinental airports. To be eligible for the Florida Aviation Grant Program, airport projects must be consistent with the airport's role as defined in the FASP and, to the maximum extent feasible, with the approved local

government comprehensive plan. In addition, capital projects must be part of an FDOT-accepted airport master plan and/or approved airport layout plan, have an airport sponsor (local government), and be entered into the Florida Aviation Database (FAD) via the Joint Automated Capital Improvement Program (JACIP).

6.4.3 Third Party Investment

Many airports use private, third party investment when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for state funding. Projects of this kind typically include:

- Hangars
- Fixed-based operator (FBO) facilities
- Fuel storage
- Exclusive-use aircraft parking aprons
- Industrial aviation-use facilities
- Non-aviation office developments
- Commercial/industrial developments
- Other similar projects

Private development proposals at Carrabelle Airport should be considered on a case-by-case basis and coordinated directly with the City of Carrabelle. Often, Airport funds for enabling infrastructure, preliminary site work and site access are required to facilitate private development projects on airport property. Even if the project is not funded by FDOT, the development must be in accordance with the Airport Layout Plan (ALP) and be consistent with FDOT airport design and airspace protection criteria.

6.5 Proposed Airport Capital Improvement Plan (CIP)

The 20-year Airport CIP includes projects identified as a facility need in the MPU. When appropriate, projects may be combined or shifted between years to maximize resources and minimize airfield disruptions.

The CIP does not constitute all expenditures the Airport may incur on other projects, routine maintenance and repair, or daily operating expenses.

The City should provide adequate lead-time for environmental review, detailed design, permitting, and construction. The CIP also should be reviewed and updated on an annual basis under guidance of FDOT to consider the most recent conditions, opportunities, constraints, and desires.

Figure 6.3. 20-Year Airport CIP summarizes the Airport CIP for the near-term (FY 2020-2024), mid-term (FY 2025-2030), and long-term (FY 2031-2040). Estimated capital expenditures total approximately $13.25 million.

Figure 6.3. 20-Year Airport CIP

Project	Total Project Cost
Near-Term (FY 2020-2024)	
Upgrade fuel farm system	$33,000
Environmental and design for the taxiways and hangars	$550,000
Design for stormwater upgrades along the parallel drain	$100,000
Phase 1 hangar and taxiway construction	$535,233
Complete fencing project	$300,000
Near-Term Subtotal	**$1,218,233**
Mid-Term (FY 2025-2030)	
Design of Runway 05-23 Rehabilitation	$1,000,000
Environmental and construction of Runway 05-23 Rehabilitation	$1,500,000
Design, environmental, and construction of full-length parallel taxiway with a mid-field connector taxiway	$3,000,000
Design and construct between 15,000 SF of additional apron space for transient aircraft	$30,000
Phase 2 continued taxiway and hangar construction	$500,000
Add pavement markings to remove direct access conflict where Taxiway A connects from the apron to the Runway	$50,000
Relocate the hold position markings on Taxiway A to be 200 feet from the centerline of Runway 05-23	$50,000
Install a mechanism to control runway edge lights by pilots	$10,000
Vegetation trimming/removal within Airport property	$90,000
Create dedicated parking	$5,000
Expand utilities when developing new aircraft storage and facilities as required based on development	TBD
Develop new terminal building	$50,000
Airport master plan update	$400,000
Mid-Term Subtotal	**$6,685,000**
Long-Term (FY 2031-2040)	
Design, environmental, and construction to extend Runway 05-23 to an ultimate 5,000 feet	$3,500,000.00
Phase 3 continued taxiway and hangar construction	$500,000
Install a weather reporting station with FAA/National Weather Service-compliant systems providing altimeter “Service A”	$150,000
Design, environmental, and construct a designated parking area for rotorcraft	$1,000,000
Proactively develop a WHA	$180,000
Long-Term Subtotal	**$5,330,000**
Grand Total	**$13,233,233**

Source: Kimley-Horn 2019

6.6 Airport Layout Plan (ALP)

The recommended developments identified in the Facility Requirements, Alternatives, and Airport Development Plan chapters of this Master Plan are graphically represented in the Airport Layout Plan (ALP), which is included in the Appendix. The ALP has been prepared to graphically depict the recommended airfield layout, disposition of obstructions and uses of land within the proposed Airport property. The ALP is intended to represent existing and future conditions on the Airport and can be used as a "map" for recommended improvements. The ALP has been developed in accordance with FDOT standards and in conformance with FAA AC 150/5070-6B, "Airport Master Plans" to the extent reasonable. This set includes the following sheets:

- **Cover Sheet** – A separate cover sheet, with approval signature blocks, airport location maps, and other pertinent information.
- **Airport Data Sheet** – Identifies specific runway, taxiway, climatic, and Airport data.
- **Airport Layout Plan Drawing** – A drawing depicting the existing and future airport facilities. This sheet includes required facility identifications, description labels, imaginary surfaces, runway protection zones, runway safety areas and basic airport and runway data tables.
- **Airport Airspace Drawing** – Identifies existing airspace surfaces and obstacle information and dispositions.
- **Airport Airspace Profile Drawing** – Identifies existing airspace surfaces and obstacle information and dispositions.
- **Runway Centerline Drawing** – identifies the Runway (aerial and profile).
- **Inner Portion of the Approach Surface Drawing (Runway 05) –** Depicts profile view of the inner portion of the approach surface to Runway 05 and a tabular listing of all surface penetrations. The drawing also depicts the obstacle identification approach surfaces contained in 14 CFR Part 77, Objects Affecting Navigable Airspace.
- **Inner Portion of the Approach Surface Drawing (Runway 23) –** Depicts profile view of the inner portion of the approach surface to Runway 23 and a tabular listing of all surface penetrations. The drawing also depicts the obstacle identification approach surfaces contained in 14 CFR Part 77, Objects Affecting Navigable Airspace.
- **Land Use Map** – Depicts land uses within existing and ultimate Airport property boundary.
- **Airport Property Map** - Depicts the existing and ultimate Airport property boundary, various tracts of land that have been or will be acquired to develop the Airport, and the method of acquisition.