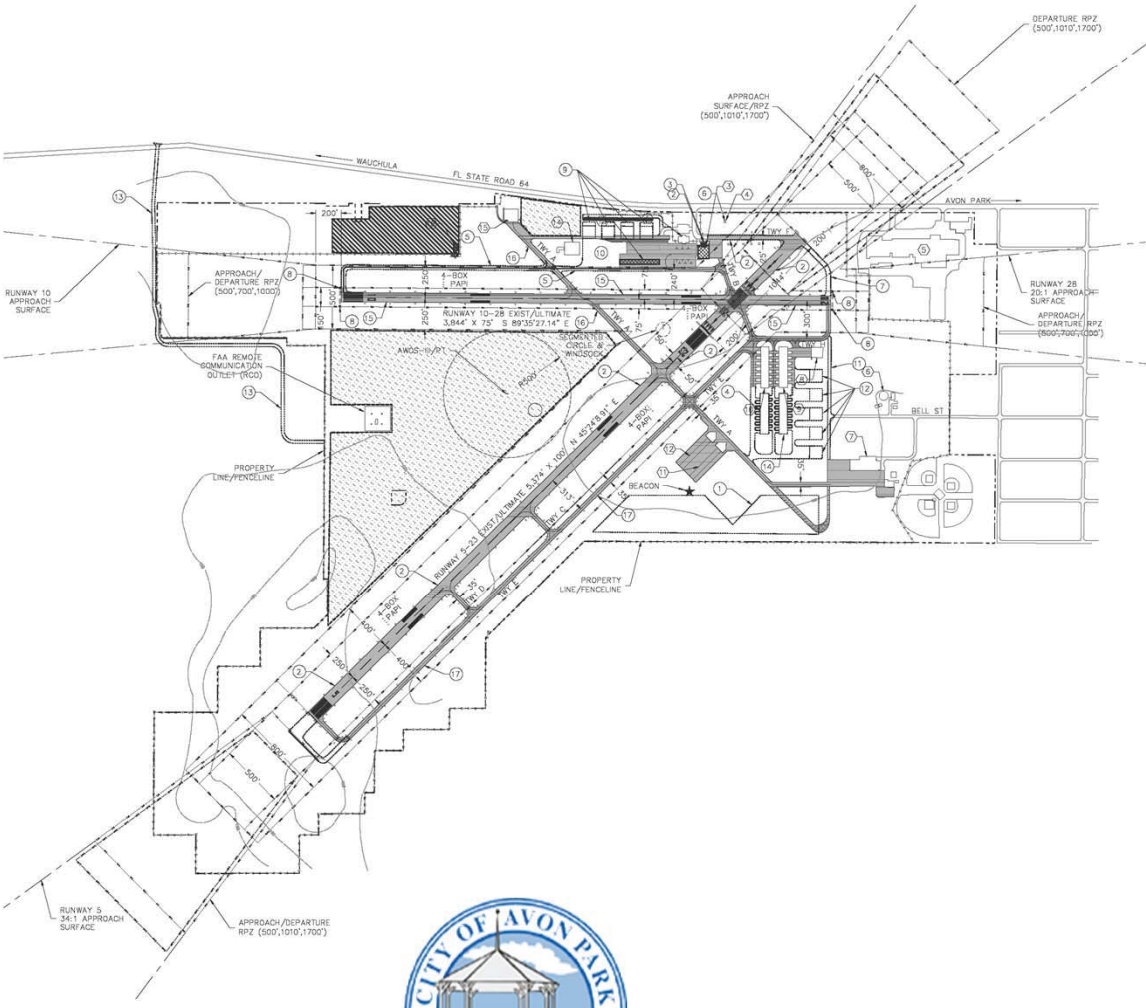
Avon Park Executive Airport

AIRPORT MASTER PLAN UPDATE



Prepared for:
The City of Avon Park, Florida
FAA AIP 3-12-0004-017-2011

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In association with:

AHC
AMHERST CONSULTING

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

Section Page

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF TABLES
(Continued)

LIST OF FIGURES

LIST OF FIGURES
(Continued)

SECTION 1
GOALS & OBJECTIVES

1.1 Introduction

This section provides general guidance and direction to the master plan update for the Avon Park Executive Airport (AVO or Airport). The general approach is to update existing facility information, identify forecast aviation demand, determine anticipated facility requirements and consider alternative airport development plans that will provide a 'balanced' airport system. The proposed alternatives will address landside/airside facilities, commercial development, and the Airport's role in Highlands County and the regional transportation system. Additionally, the master plan update for AVO will provide planning and development guidance to satisfy aviation demand and help stimulate the local economy. Ultimately, the master plan update will serve as a strategic development tool for the Airport and will be used as the general guideline for future development at AVO.

The master plan provides an effective written and graphical representation of the ultimate development of the Airport and of anticipated land uses on and adjacent to the Airport, while establishing a schedule of priorities and phasing for the various improvements proposed. The master plan will provide information and guidance to manage and develop facilities to meet the forecast growth and stimulate business investment at AVO and in the local economy. Realistic master planning is a continuing and evolutionary process, typically due to the long lead times usually required for airport projects. Though changes are likely to take place before any facilities are designed, approved, and built to completion, a comprehensive master plan and approved airport layout plan (ALP) is essential for an airport to qualify for and receive federal and/or state assistance, and will prove an invaluable guide for management decisions and marketing of the Airport to potential tenants.

Some of the key issues, in no specific order, to be addressed in the master plan update are as follows:

- Identify aviation demand that may be realistically anticipated at AVO.
- Be sensitive to the overall environmental characteristics and needs of the area surrounding the Airport.
- Address needs to improve Airport infrastructure, buildings, equipment, and facilities to meet forecast demand.
- Evaluate land use at AVO and identify areas available for future aviation and non-aviation development.
- Facilitate non-aviation commercial development opportunities.

The master plan update will be prepared in accordance with Federal Aviation Administration (FAA) Advisory Circulars AC 150/5070-6B, *Airport Master Plans*, and AC

150/5300-13, *Airport Design*, and other related federal standards. In addition, guidance will be incorporated from the FDOT Aviation Office, the Avon Park City Council, Airport Advisory Board and other applicable local government agencies as appropriate.

1.2 Study Goals

The master plan update for AVO will serve as a multi-purpose document. First, the document will provide the city of Avon Park (City) with planning guidance to help ensure that Airport facilities will be adequate to meet both short- and long-term demand for aviation services. In that respect, the intent of the document is to serve as a management guide for the implementation of necessary improvements to meet the expected growth in aviation demand over a planning period of 20-plus years, ending in 2035. Secondly, the document will provide the City with non-aviation development guidance. The outcome will be a document that not only ensures that the Airport will meet projected aviation demands, but also one that will work to guide and promote revenue diversification through the development of non-aviation commercial development at the Airport.

In order to address a number of internal and external factors that could affect AVO, a list of high-level goals and objectives have been identified in order to guide the study effort. These goals and objectives are listed below in no particular order.

1.2.1 Goal No. 1

Continue to provide and enhance the level of service provided to all Airport users.

Objectives:

- Provide safe and adequate runway, taxiway and apron capacity for forecast demand in terms of annual and hourly operations and aircraft fleet mix.

1.2.2 Goal No. 2

Provide planning and development guidance to satisfy anticipated aviation demand and stimulate non-aviation development at AVO.

Objectives:

- Identify development opportunities that may be enhanced by the Airport.
- Provide adequate airside and landside facilities to meet anticipated demand, while meeting all FAA requirements.
- Develop updated airport plans that illustrate the vision and ultimate development goals of the Airport.

1.2.3 Goal No. 3

Provide an Airport that is safe and reliable.

Objectives:

- Provide navigational, landing aids, and meteorological facilities, which enhance the safety and reliability of operations under all weather conditions.

- Provide FAA mandated safety areas, runway protection zones, and other clear zones.
- Minimize possible obstructions to air navigation.
- Develop facilities to meet the demands of the current critical aircraft.

1.2.4 Goal No. 4

Develop the Airport to minimize environmental impacts.

Objectives:

- Identify major environmental issues of concern on airport property.
- Minimize potential environmental impacts, and provide special attention to minimizing and/or avoiding increased noise, air and water pollution and wetland impacts.

1.2.5 Goal No. 5

Develop an Airport that supports local and regional economic goals while accommodating new development opportunities.

Objectives:

- Encourage a level of service and user convenience such that AVO continues to be a positive factor in regional economic development decisions.
- Provide appropriate and achievable commercial development opportunities at the Airport.
- Identify financial resources available for funding projects identified and recommended, as well as identify the priority of project implementation.
- Develop an ALP that easily integrates with existing and proposed transportation infrastructure to encourage economic growth.

1.3 Project Tasks

The key tasks involved in the master planning process at AVO include: evaluating existing and anticipated aviation activity, existing and future facilities, environmental constraints, and evaluating the Airport's ability to accommodate and/or encourage enhanced economic development. Another important component of the airport master plan process is a public forum for the development of the study. The master plan for AVO includes the following steps:

- **Inventory** – Data collection and inventory of existing airport facilities.
- **Forecasts** – Reviewing previous forecasts of aviation activity and preparing updated forecasts that will provide short, intermediate, and long range projections of aviation demand.
- **Demand / Capacity Analysis and Facility Requirements -** Determines the ability of existing facilities at AVO to accommodate the current and projected demand and identifies facility deficiencies so that facility requirements can subsequently be determined.

- **Alternative Development Concepts** – Identify development alternatives that meet the forecast demand and facility requirements and select a final airport development concept utilizing a strategic development approach.
- **Environmental Inventory** – Identify potential environmental factors and/or impacts that could affect the feasibility of the development concept for AVO.
- **Airport Layout Plan Development** – Graphic representation of existing and proposed development at AVO.
- **Capital Improvement Program** – Provides a list of all development items identified throughout the planning process and identifies the priority for development based on FAA criteria and forecast demand.
- **Financial Evaluation** - Completes a financial analysis that evaluates revenue enhancement strategies and project funding based on the preferred airport development concept.
- **Project Coordination / Public Involvement** – Coordination of project tasks, deliverables and progress throughout the entire planning process. Also, includes public information sessions to obtain input for the master planning process.

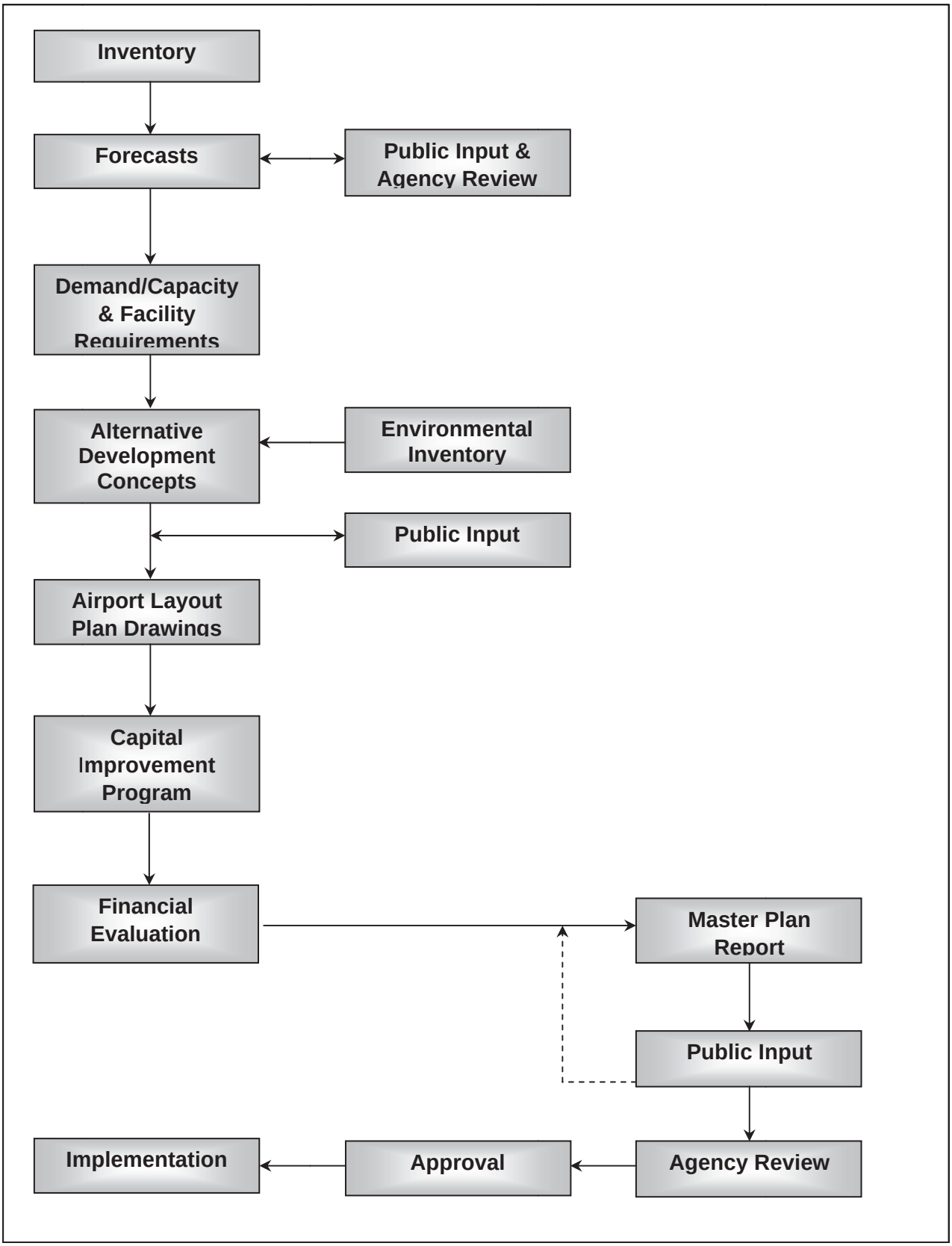
A graphic representation of this process is depicted in **Figure 1-1**, "Steps in the Master Planning Process."

1.4 Prior Planning Documentation

In the development of this master plan update, prior studies and reports regarding AVO that have been developed within the past ten years will be identified and used as supporting material. The studies for use are as follows:

- Avon Park Municipal Airport Master Plan Update - 1997
- Avon Park Executive Airport, Airport Layout Plan – 2008
- City of Avon Park, Unified Land Development Code - 2010
- Avon Park Executive Airport, Security Plan – 2011
- Avon Park Executive Airport, Rules and Regulations, 2011
- Avon Park Executive Airport, Minimum Standards, 2011
- Highlands County 2030 Comprehensive Plan - 2011

Figure 1-1 Steps in the Master Planning Process



SECTION 2
INVENTORY OF EXISTING FACILITIES

As outlined in Federal Aviation Administration (FAA) Advisory Circular 150/5070-6, *Airport Master Plans*, latest edition, the initial step in the master plan update for Avon Park Executive Airport (AVO or Airport) is the collection and evaluation of information about the Airport and the area it serves. This information includes:

- Physical inventories and descriptions of facilities and services now provided by AVO.
- Background information about the City of Avon Park and a description of development, which has recently taken place on the Airport.
- Population and socioeconomic information, which provides a sign of possible future development in Avon Park, Highlands County and the region.
- A review of the existing regional plans and studies, to determine potential influence on the development and implementation of the airport master plan.

The objective of the inventory task is to provide background information essential to completion of the master plan. The inventory task for AVO was accomplished through physical inspection of the facilities, field interviews, and review of appropriate airport management records. Additional information was gained from documents and studies about the Airport, the City and Highlands County.

This section provides a general description of AVO and its service area. It describes data relevant to the Airport's history, geographic locale, climate, and operational role in today's aviation environment.

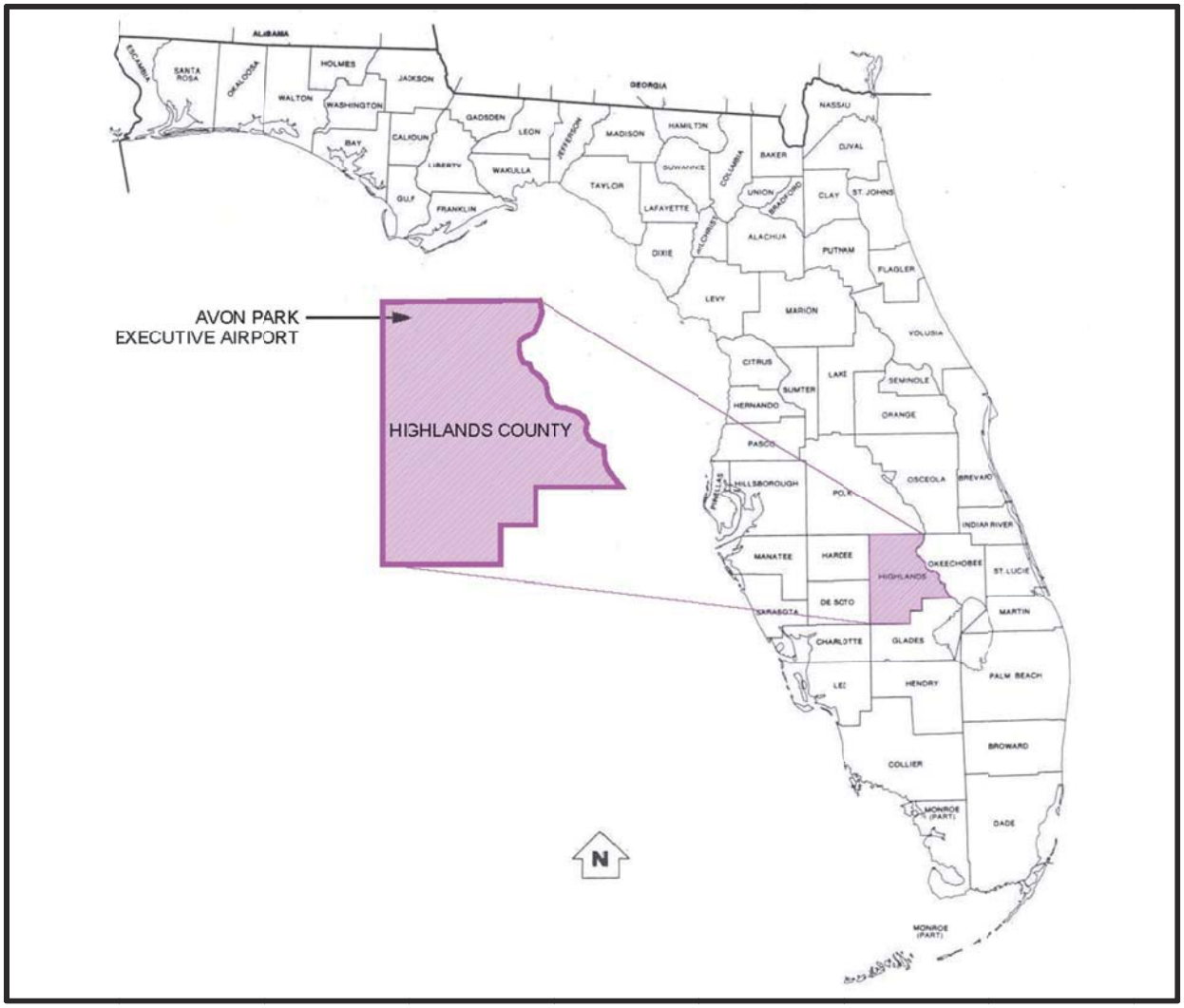
2.1 Airport Location and Description

AVO is located in the City of Avon Park (City). The city is located in the northwest corner of Highlands County, Florida, which is located in south-central Florida, northwest of Lake Okeechobee. The Airport currently encompasses 321 acres of land situated adjacent to the western edge of the City, west of US Highway 27 and south of State Road 64.

According to the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS), AVO is designated as a general aviation (GA) airport. The Florida Department of Transportation (FDOT) classifies the Airport as a community airport, in the Florida Aviation System Plan (FASP), serving the flight training and recreational/sport aviation needs of the local community.

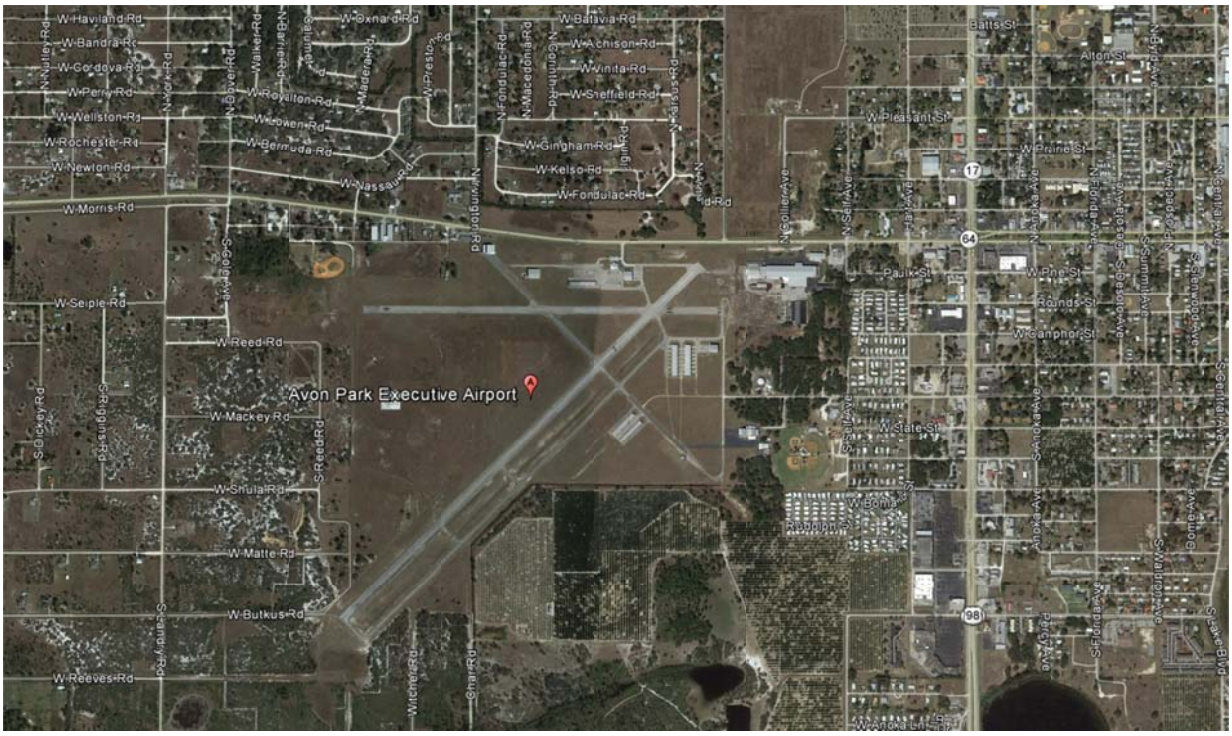
Figure 2-1 illustrates the County and Airport location within the State of Florida while **Figure 2-2** depicts the Airport relative to the surrounding community.

Figure 2-1 County and Airport Location within Florida



Source: CDM Smith, 2015

Figure 2-2 Airport Location Relative to the City of Avon Park



Source: Google Earth, 2015

2.2 Facility Design Criteria

The *Federal Aviation Administration* (*FAA) AC 150/5300-13, Airport Design*, latest edition, identifies the airport reference code (ARC) as a coding system that coordinates airport design criteria with characteristics of the aircraft intended to operate at an airport. Two separate components comprise the ARC, aircraft approach category and airplane design group. The aircraft approach category is an operational characteristic relating to the approach speed of an aircraft, and the approach categories are based on a factor of 1.3 times aircraft stall speed in landing configuration at maximum certificated landing weight. Approach categories are represented by a letter designation, as depicted in **Table 2-1.**

Table 2-1. Aircraft Approach Speed Categories

Approach Categories	Approach Speed
A	less than 91 knots
B	91 knots or more, but less than 121 knots
C	121 knots or more, but less than 141 knots
D	141 knots or more, but less than 166 knots
E	166 knots or more

Source: AC 150/5300-13.

The airplane design group is a physical characteristic defined by an aircraft's wingspan. While approach speeds only affect runway design, wingspan affects the design of runways, taxiways, taxilanes, and aprons. A Roman numeral depicts the airplane design group, as described in **Table 2-2**.

Airfield improvements are developed according to the established ARC for the Airport, and then for each particular runway. The current ARC for AVO is C-II. Runway 05-23 is the primary and classified as a C-II runway. Runway 10-28 is the secondary and classified as a B-II runway.

Table 2-2. Airplane Design Group by Wingspan

Group #	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	90 - <66	171 - <214
VI	66 - <80	214 - <262

Source: AC 150/5300-13.

2.3 Navigational Aids

Navigational aids (NAVAIDS) are designed to assist pilots and air traffic controllers in maximizing the safe and efficient use of the Airport under all meteorological conditions. NAVAIDS refer to any facility used in, available for use in, or designed for use in aid of air navigation. NAVAIDS include lights or any apparatus or equipment used for disseminating weather information, for signaling, for radio direction finding, or for radio or other electronic communication; and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air and/or the landing or takeoff of aircraft.

2.3.1 Terminal Area Navigation and Landing Aids

Terminal area navigation and landing aids are used to assist pilots during aircraft landings and take-offs. Terminal area NAVAIDS and landing aids at AVO include; precision approach path indicators (PAPIs), windsock and published satellite based global positioning system (GPS) procedures for Runways 05 and 10.

Precision approach path indicators PAPIs are located on both ends of Runway 5-23 and Runway 10-28. Both runways are equipped with a typical four-light PAPI system which displays two white lights and two red lights when aircraft fly on the glide slope. When aircraft are below the glide slope the system displays three red lights and one white light for aircraft flying slightly below glide slope and all red lights for aircraft flying well below glide slope. When aircraft fly above the glide slope the system displays three white lights and one red light for slightly above and all white to those flying well above the glide slope.

The windsock is a landing aid that indicates wind direction. The windsock provides wind direction near the touchdown zone of the runway. AVO utilizes one windsock near the intersection of the two runways. The windsock is complemented with a lighted segmented circle and is in good condition. The segmented circle has a two-fold purpose. First, it helps to identify

the overall location of the windsock and the direction of prevailing winds. Second, extensions are depicted on the segmented circle if the traffic pattern is other than left-handed traffic.

Additionally, there are two Global Positioning System (GPS) approaches at AVO. The GPS system provides enhanced accuracy in air navigation and non-precision approaches. Both GPS approaches at the Airport are published in the U.S. Terminal Procedures for the Southeast (SE-3) by the U.S. Department of Commerce, the National Oceanic and Atmospheric Administration (NOAA) and the National Ocean Service (NOS). GPS approaches are available for Runway 05 and Runway 10. Non-precision approach minimums for Aircraft Approach Categories A, B, and C at AVO are 450 feet mean sea level (MSL) for Runway 05 and 640 feet MSL for Runway 10. The minimum visibility required for both approaches is 1 mile. These minimums mean that non-precision landing or approaches can be safely executed into the airport when cloud cover is at or above those stated heights and visibility is 1 mile or greater. Provided aircraft have the equipment necessary to fly the GPS approach, a more precise approach can be flown into the Airport, thereby increasing operational capacity and safety.

2.3.2 Airport Lighting Aids

Lighting aids assist pilots in the identification of an airport facility, during approaches and landings and while taxiing on the airfield. Lighting aids at AVO include a rotating beacon, runway end identification lights (REILs), and runway and taxiway edge lighting.

A rotating beacon helps pilots identify lighted airports from the air. Beacons that alternate flashes of green and white light identify civilian use land airports. Rotating beacons are generally in use from dusk to dawn and when weather conditions deteriorate to a ceiling of less than 1,000 feet and visibility less than three miles (IFR conditions). The rotating beacon at AVO is located roughly midfield east of Runway 05-23 and south of the T-hangar buildings.

Runway end identification lights (REILs) are installed to give the pilot positive visual identification of the approach end of the runway. Both ends of Runway 05-23 are equipped with runway end identification lights (REILs). Runway edge lights are used to outline the edge of the runway and runway end lights designate the runway ends during periods of darkness or restricted visibility conditions.

Airfield pavement lighting offers guidance to taxiing aircraft during nighttime operations and periods of low visibility. Both Runway 5-23 and Runway 10-28 are equipped with medium intensity runway lights (MIRLs). Taxiway 'A' and portions of taxiways, 'B', 'C', 'D' and 'E' are equipped with medium intensity taxiway lights (MITL).

Pilots may use the Unicom/Common Traffic Advisory Frequency (CTAF) on 122.8 megahertz (MHz) in order to activate the MIRLs, PAPIs and REILs at AVO.

2.4 Existing Airside Facilities

2.4.1 Runways

There are two active runways serving AVO; Runway 05-23 and Runway 10-28. The overall characteristics of these runways are listed in **Table 2-3**. The primary runway, Runway 05-23, is 5,374 feet long and 100 feet wide and in good condition. The Runway 23 threshold is displaced 1,044 feet. The runway is oriented in a northeast/southwest direction with an asphalt surface and load bearing capacity of 26,000 pound for single wheel aircraft. This runway, which currently falls within the standards specified in FAA AC 5300/13 for ARC C-II, has non-precision instrument markings consisting of threshold designators and centerlines. The markings are in fair condition. As mentioned earlier, Runway 05-23 is equipped with REILs, PAPIs, and MIRLs. **Figure 2-3** illustrates the orientation of Runway 05-23.

Runway 10-28 provides crosswind coverage, is oriented in an east to west direction, and is 3,844 feet long and 75 feet wide. The runway is in good condition and consists of an asphalt surface with a load bearing capacity of 110,000 pound for single wheel aircraft. There are no displaced thresholds on this runway. Pavement markings for Runway 10 consist of non-precision instrument markings in good conditions. The pavement markings for Runway 28 are basic visual runway markings in good condition. Runway 10-28 currently falls within the standards specified in AC 5300/13 for ARC B-II. **Figure 2-3** illustrates the orientation of Runway 10-28.

2.4.2 Taxiways

The existing taxiway system, also illustrated in **Figure 2-3**, connects the runways to the terminal area and other airport facilities. The primary runway, Runway 05-23, is served by a full length parallel taxiway, Taxiway 'E'. Taxiway 'E' is located on the east side of the runway and extends approximately 1,447 feet from the end of Runway 05, connecting with Taxiway 'D', it extends approximately 2,327 feet connecting with Taxiway 'C', approximately 3,830 feet to connect with Taxiway 'A' and extends approximately 4,615 feet to connect with Taxiway 'B'. Taxiway 'E' is 35 feet wide and has 310 feet of separation from the Runway 05-23 centerline. The 310 foot separation exceeds FAA Airplane Design Group (ADG) C-II by 10 feet.

In addition to the taxiway discussed above, Runway 05-23 and the fuel farm can be accessed by Taxiway 'F' and Taxiway 'B'. Taxiway 'B' connects the east T-hangars south of Runway 10-28 to the fuel farm and terminal building by crossing Runway 05-23. The portion of the taxiway north of 10-28 is 30 feet wide which is 5 feet short of the FAA required standards for C-II aircraft. In addition, Taxiway 'F', which connects the displaced end of Runway 23 to the FBO facility, is also 30 feet wide and does not currently meet C-II design requirements.

Runway 10-28 is served by a partial parallel taxiway, Taxiway 'H'. Taxiway 'H' is located on the south side of Runway 10-28. Taxiway 'H' is 35 feet wide and has 300 feet of runway centerline to taxiway centerline separation. The width of Taxiway 'H' meets ADG II standards.

Table 2-3 Runway Specifications

	RW 05-23	RW 10-28
Length	5,374’	3.844’
Width	100’	75’
Surface Material	Asphalt	Asphalt
Surface Treatment	None	None
Load Bearing Capacity by Gear Type		
SWL (pounds)	26,000	90,000
Approach Slope	34:1; 20:1	24:1; 20:1
Effective Gradient	0.1%	---
Longitude	27° 35’ 04.14”	27° 35’ 36.70”
	27° 35’ 41.66”	27° 35’ 56.58”
Latitude	81° 32’ 06.50”	81° 32’ 04.16”
	81° 31’ 24.15”	81° 31’ 21.67”

CDM Smith, 2014

2.4.3 Aircraft Parking Aprons

There is one main aircraft-parking apron located on the Airport. The parking apron is located on the north side of Runway 10-28 and west of Taxiway ‘B’ and serves the terminal, FBO and administration building. The apron has approximately 44,500 square feet of area. This apron is in good condition with minimal cracking. The aircraft parking area is shown in **Figure 2-3**.

Figure 2-3 Aircraft Parking Area

Source: Google Earth, 2015

2.5 Existing Landside Facilities

The landside facilities at AVO generally include; Airport administrative and maintenance buildings, Fixed Base Operator (FBO), fuel farm, maintenance hangars, several aircraft storage hangars and auto parking. Generally, the landside facilities at AVO can be divided into the following categories:

- Airport Administration/Terminal
- FBO
- Maintenance Hangars
- Fuel Storage
- Aircraft Storage Hangars
- Non-Aviation

Table 2-5 presents the existing landside facilities at AVO along with the current condition of the facility. **Figure 2-4** depicts the location of the primary landside facilities located at the Airport.

2.5.1 Airport Administration/Terminal

The airport's administration building/terminal building is located north of Runway 10-28 and south of West Main Street. The building encompasses roughly 5,000 square feet of space and includes; offices, reception area, conference room, FBO, pilots lounge and restrooms. The automobile parking area located north of the building includes 19 parking spaces.

2.5.2 Fixed Based Operator

Currently, AVO is without a full-service Fix Base Operator, and has plans to advertise for a replacement. Historically, the FBO has operated out of the main terminal/administration building and provided the following services.

- Aviation fuel (100LL and Jet A) – 24 hour service
- Major and minor maintenance
- Flight training
- Aircraft repair
- Tie-down space
- T-hangar rental
- Phones and restrooms
- Pilot Lounge
- Rental cars
- Hangar rental
- Used aircraft sales

- Charter services
- Weather and flight planning rooms
- Courtesy transportation

2.5.3 Maintenance Hangars

There are currently three maintenance hangars located on the airfield. The first is located next to the terminal building and is scheduled for demolition to allow for the installation of a new fuel farm. The second is located north of Runway 10-28 and west of the terminal building. The last is located on the southeast quadrant of the airfield and is privately owned and houses Highlands Aviation, an aircraft painting and re-furbishing business.

2.5.4 Fuel Storage Facilities

In January 2015 the City of Avon Park assumed the responsibility of providing fuel services at the Airport when the previous FBO terminated its business. The previous FBO owned the fuel facility located adjacent to the FBO, north of the maintenance hangar north of Runway 10-28, which was removed in March 2015. The Florida Department of Transportation 2015 has funded a project to construct a new fuel farm comprised of two 12,000 gallon storage tanks (Jet-A and 100LL). Based on the construction schedule the fuel farm is expected to be operational in the summer of 2015.

2.5.5 Aircraft Storage Hangars and Tie-Downs

There are currently 5 T-Hangar buildings located on the airfield. The first is located north of Runway 10-28 while the other 4 are located on the east side of Runway 05-23. There are a total of 58 T-Hangar spaces at AVO with six currently available for lease. AVO has 13 tie-down spaces located on the main apron adjacent to the terminal building. Currently, 6 of the tie-down spaces are unoccupied.

2.5.6 Non-Aviation

Classic Caladiums is currently the only non-aviation tenant at the airport. Classic Caladiums leases the 123,000 square foot building located on the northeast quadrant of the airport, east of the terminal building and conducts their office, processing, and warehousing functions at this location.

Table 2-5 Existing Landside Facilities

#	Owner	Material	Condition*	Use	Area (Sq. Ft.)	Associated Apron Space (Sq. Ft.)
1	AVO	Metal/Stucco	Excellent	Terminal/FBO/Administration	4,000	44,500
2	AVO	Metal	Fair	Hangar/Aircraft Maintenance	8,500	15,000
3	AVO	Metal/Wood	Poor to Fair	Agriculture	123,000	N/A

4	AVO	Metal	Poor	T-Hangar	11,600	30,700
5	AVO	Metal	Fair	Aircraft Engine Maintenance	12,300	N/A
6	Ben Hill Griffin	Metal	Excellent	Hangar	10,700	16,000
7	AVO	Wood	Poor	Not Used	1,700	N/A
8	AVO	Metal	Fair	T-Hangar	11,300	N/A
9	AVO	Metal	Poor	T-Hangar	11,300	N/A
10	Jim Renfro	Metal	Good	Aircraft Maintenance (Highlands Aviation)	21,900	67,150
11	Jim Renfro	Metal	Good	Aircraft Maintenance (Highlands Aviation)	3,950	11,400
12	AVO	Metal	Good	T-Hangar	20,400	N/A
13	AVO	Metal	Good	T-Hangar	21,800	N/A
14	AVO	Metal	Good	Hangar	7,080	8,580

CDM Smith, 2012

2.6 Automobile Parking and Ground Access

An automobile parking lot consisting of approximately 19 automobile spaces is located to the north of the airport terminal building (see **Figure 2-5**). Additionally, the agriculture building and the private maintenance hangar provide additional parking for their facilities.

Ground access to the Airport is provided via several transportation routes, which are shown in **Figure 2-5**. There is one north main access road, and one east access road; both branch off of U.S. 27.

Access to the GA terminal building is provided by State Road 64, which connects to U.S 27 approximately .7 miles to the east of the airport. In addition, the T-hangars and maintenance hangar can be accessed via West Bell Street which connects to U.S. 27 approximately one-half mile from the airport.

2.7 Meteorological Conditions

Operations at airports are dramatically affected by weather patterns and associated regional meteorological conditions. The amount of rainfall, prevailing winds, and average amount of inclement weather all work to determine runway orientation, instrument approach types, and NAVAIDS required to provide the safest and most efficient operations possible.

2.7.1 Climate

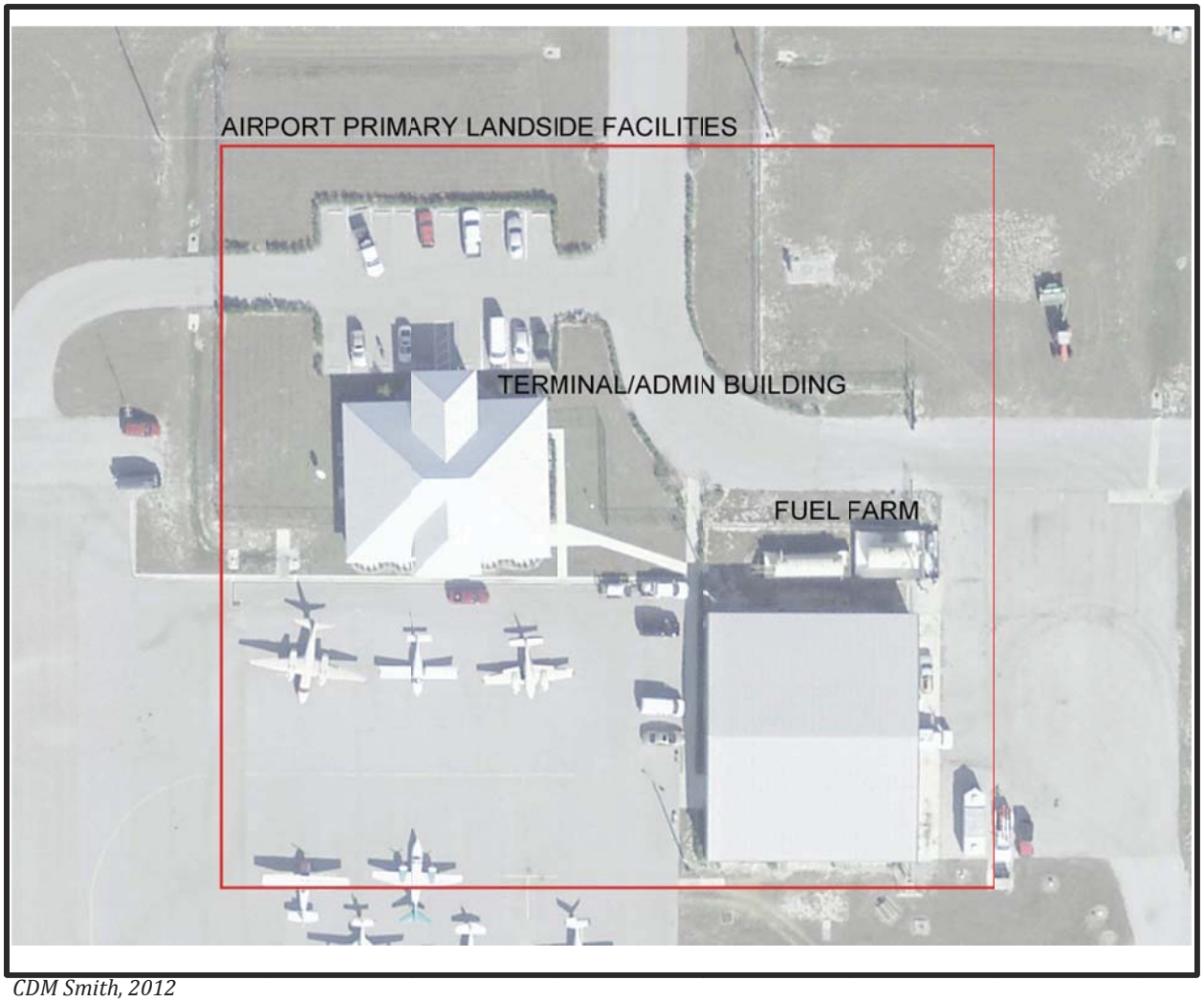
AVO is geographically located in the northwest corner of Highlands County in central Florida, approximately 65 miles southwest of Orlando. Weather conditions at AVO are typical of south-central with hot summers, mild winters, and abundant rainfall. Temperatures are generally warm

to mild, with an average annual temperature of 72 degrees. The average annual high temperature is 82.8 degrees, and the average annual low temperature is 61.1 degrees. The mean maximum temperature of the hottest month is 90.0 degrees. The average annual precipitation is 49.1 inches.

2.7.2 Wind

The prevailing winds at AVO are predominantly calm and out of the northeast favoring the east-west layout. The crosswind runways provide operational flexibility for occasional north-south winds. **Figure 2-6** illustrates the Wind Rose for the Airport. The runway layout of the Airport provides the FAA-required 95 percent minimum wind coverage with an all-weather coverage of 99.3 percent.

Figure 2-4 Airport Primary Landside Facilities

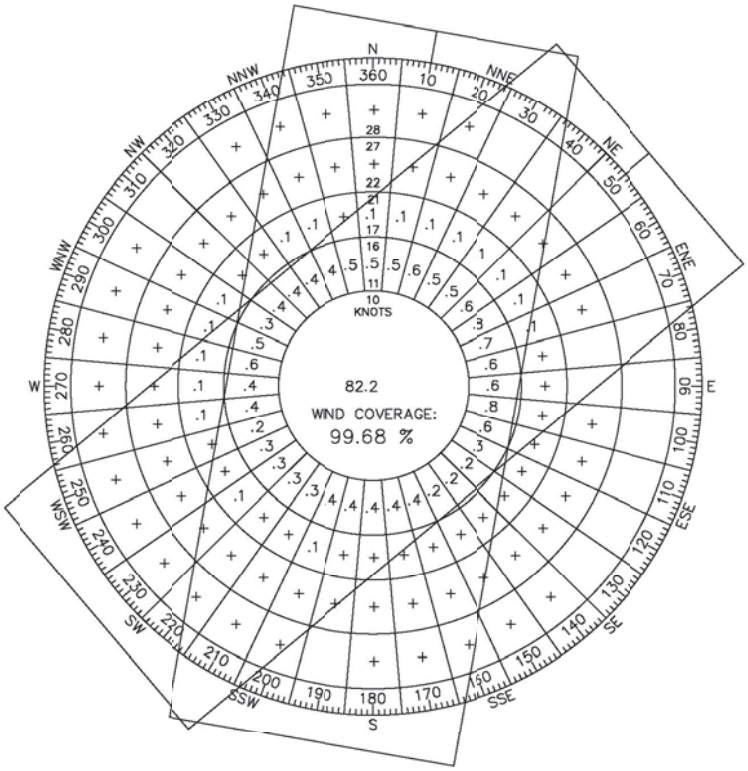


CDM Smith, 2012

Figure 2-5 Primary Automobile Parking

CDM Smith, 2012

Figure 2-6 All Weather Wind Rose



ALL WEATHER WINDROSE

Source: https://airports-gis.faa.gov/airportsgis/publicToolbox/windroseForm.jsp

2.8 Land Use

Land use planning and zoning for the City of Avon Park is performed by the Development Services Division of Highlands County. Highlands County Code of Ordinances lists the available zoning districts and land use categories allowed in each district. The zoning district categories are shown in **Table 2-5**.

Table 2-5 Highlands County Zoning Districts

Code	Category	Uses	(Intent of Use)
AU	Agricultural District	Single family homes, churches, parks and recreation, schools, agricultural and livestock farms.	Primarily Agricultural
EU	Estate District	Single-family residential Single family homes, federal, state or local recreation buildings, publically owned galleries, schools, Wastewater treatment plants	Single-family residential
R-1A	Residential District	Single-family residential	Single family homes with minimum lots, any EU use
R-1	Residential District	Single-family residential	Same as R-1A with minimum floor area of 750 square feet
R-2	Two-family District	Any R-1 use, two-family dwellings, Churches, Wastewater treatment facilities.	Two-family dwelling
R-3	Multiple-family including Motel and Hotel district.	Retirement Home Schools Sanitariums, Convalescent Cultural Organizations Colleges Federal Property, Utilities	Churches Orphanages Rest Homes Military Hospital Municipal, Right-of-way
R-3 NC	Non –commercial multiple family dwelling	Community residential homes licensed by Florida DCF, Home occupations, assisted living facilities, adult day-cares, health services	Mixture of multiple-family dwelling units with higher densities that would be buffered from incompatible and disruptive activities that belong in non-residential

			districts.
M-1	Mobile Home District	Mobile homes and Wastewater treatment facilities	To be a mobile home residential area, medium density with minimum lot area
M-1S	Mobile Home and Residential Subdivision District	One-family dwelling, Mobile homes	to encumber certain existing recorded and unrecorded subdivisions in which residential use is accomplished by conventional construction and mobile homes
M-2	Mobile Home Parks District	Mobil homes placed on rental spaces, Community utilities, community recreation facilities, wastewater treatment facilities	regulate the establishment and approval of mobile home parks where mobile homes are placed on rental spaces on transient, seasonal or permanent basis
RV (FUD)	RV parks	RVs, Mobile homes	regulate the establishment and approval of RV parks where RVs, park models, mobile homes, and manufactured homes are placed on rental spaces on transient, seasonal or permanent basis
CG-1	Campground District	Public use campsites, sanitary facilities, community recreational facilities, fish camps	regulate the establishment and approval of campgrounds for public use of campsites rented for use as temporary living quarters for recreational purposes
CG-2	Campground District	Public use campsites, sanitary facilities, community recreational facilities, fish camps	to include private not-for-profit, quasi-public, and public camps, e.g., Boy Scouts or Girl Scouts, with facilities for daily, weekly or monthly operation
CG-3	Campground District	Same as CG-1	Only 11 sites per acre allowed
B-1	Neighborhood Business District	Retail outlets, personal service establishments, medical, dental, assisted living facilities, boarding	Limited retail and personal service needs for a limited surrounding residential area

		home, etc.	
B-2	Limited Business District	B-1 uses, Hotel and Motel, Health care facilities, retail establishments	Provide retail and service needs for several neighborhoods or a substantial territory
B-3	Business District	Any B-1 or B-2 use, commercial sports and recreation activities, light assembly, wholesale warehouse, repair shops, etc.	to apply to general business, retail and wholesale, warehouse storage and other services of a general character
B-4	Business District	Same as B-1, B-2 and B-3, dairy suppliers, heavy machinery, feed and fertilizer, shipping and packing, miscellaneous utility uses	intended to apply to general business, retail and wholesale, warehouse storage and other services of a general character
O	Office District	Accounting, Artist's studios, Banks, Engineering, Health Care, Law Firms, Marketing, Photographic studios, Security offices, Real Estate Agencies, Travel and touring agencies	to provide for the establishment of small-scale office activities at strategic locations where the transition between nonresidential and residential land uses may be problematic or where nonretail-oriented services may be conveniently provided to adjoining neighborhoods as a means to reduce highway travel
BC-1	Business Campus, Research and Light Manufacturing Park District	Office Warehouses, Data Processing Centers, Medical Laboratories, Storage, Research and Testing, Radio or TV Stations, Parcel Distribution, Wastewater Treatment Facilities	to locate uses within integrated and structurally designed developments which would have similar or less intensive impacts than the I-1 Industrial district uses and are amenable to the development of highly specialized and technological industries, industrial support facilities, research and experimental institutions and administrative facilities that would create

			more diversity of uses within the site than allowable in a single zoning district
BC-2	Business Campus, Research and Light Manufacturing Park District	Same as BC-1 and Aircraft Engine, parts and rebuilding, Motor vehicle parts and accessories, Bakery products, manufacturing, Boat building and repairing, Medical equipment manufacturing	Same as BC-1
I-1	Industrial District	Any use in B-3 and B-4 which is not permitted in a more restrictive district, Processing and/or Manufacture	to locate certain industrial occupancies which, though they may be large in area, will not require the use of equipment, processes or machinery which will, by the emission of noise, vibration, odor, water or other pollution create conditions detrimental to the value or existing use of adjacent properties, or in any way be incompatible with nearby residential districts
I-2	Industrial District	Any I-1 use except those allowed in B-3 and B-4, Meat processing, construction, disinfectants and insect ides, asphalt storage, sandblasting and other miscellaneous activities	to locate industrial and manufacturing occupancies which, due to employment of heavy equipment and machinery, may create noise and vibration objectionable to residential or business neighborhoods
TND	Traditional Neighborhood Development District	Mixed use residential areas, commercial services, public or institutional uses, open space	to create an implementing district that will allow the optional development and redevelopment of land within the unincorporated areas of Highlands County

P	Public and Quasi-Public Lands District	Public uses, Churches, Lodges, Public Cemeteries, Libraries, Wastewater treatment facilities	the district allows lands, uses and structures in public ownership, or owned by not for profit organizations
PW	Public Water Supply District	Only uses functionally related to the water supply system, open space, parks, playgrounds, playing courts, open air shelters, and other similar recreation facilities are allowed.	intended to include all potable water facilities
CM	Conservation Management Lands District	Conservation and recreation lands, water management, open space, state parks and monuments, etc.	to apply to all lands in public ownership for the purpose of preserving sensitive vegetative communities and wildlife habitats, watershed and riverine resources, receiving areas for off-site environmental mitigation banking and areas being reclaimed from river realignment and floodplain restoration
A-1	Airport District	Any I-2, B-3, BC-2, CG-1, Airports and Aviation related uses, Automobile Raceways, Car Rental, Food and Beverage, Public Transportation and utility Services	to accommodate airport uses which involve certain influences and hazards, but which are essential for the economic viability of the area
PD	Planned Development District	Any use permitted in the underlying zoning district may be permitted	To promote more efficient and economic use of land
FUD	Flexible Development District	Can include any type of development	

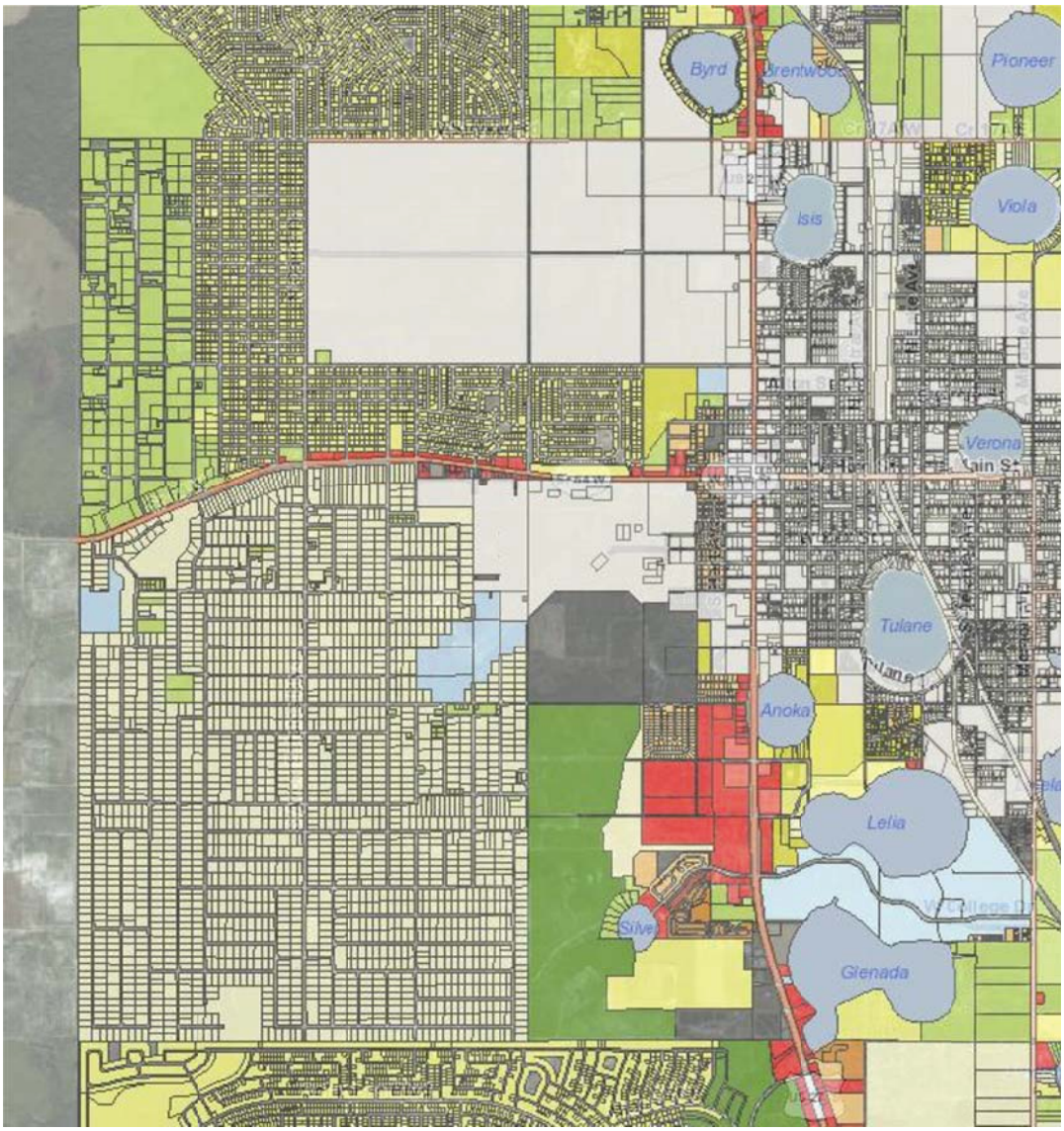
Source: Highlands County Municipal Code.

AVO falls under the A-1 Airport Zoning District as outlined in the Highlands County Municipal Code. The A-1 district is intended to accommodate airport uses which involve certain influences and hazards, but which are essential for the economic viability of the area. In addition, the district

protects adjacent residential areas while at the same time ensuring adequate areas for airport and economic development activities. The A-1 district is designed to provide adequate space in appropriate locations for uses that serve economic development and the needs of the motoring and aviation related public. According to the Highlands County Municipal Code, the A-1, airport district, should serve the major transportation interchanges of vehicle, rail and air transportation.

The primary land uses surrounding the airport are residential, industrial, commercial, agricultural and City use. Highlands County recently adopted the 2030 Comprehensive Plan which included new land uses around AVO. The notable change is that roughly 215 acres generally located immediately south of the AVO will change from agriculture to industrial. **Figure 2-7** illustrates the overall land use surrounding AVO, including the newly designated industrial located south of the airport. **Figure 2-8** illustrates the zoning map for the City of Avon Park.

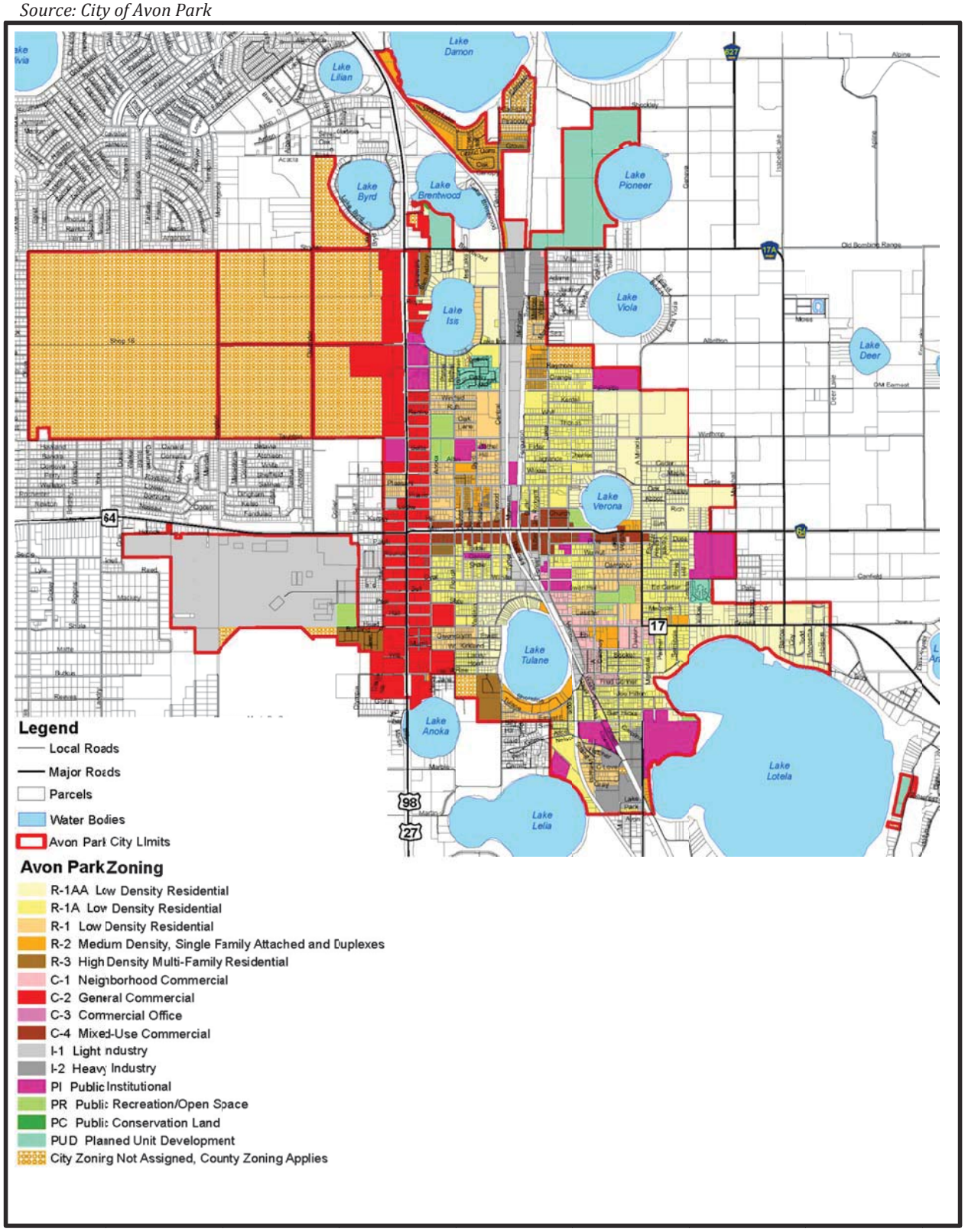
Figure 2-7 Highlands County Land Use



Source: Highlands County

Figure 2-8 Avon Park Zoning

Source: City of Avon Park



2.9 Airspace Structure

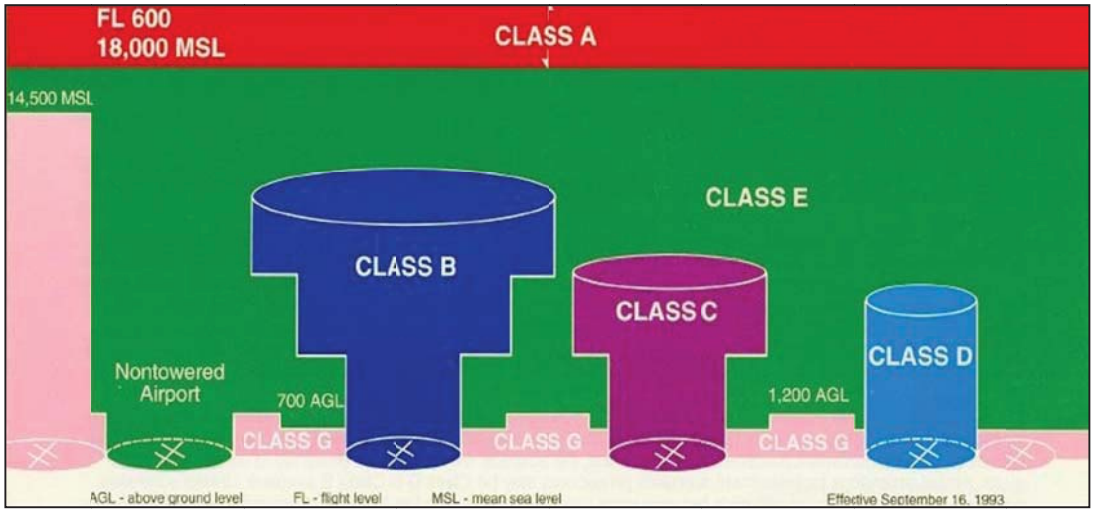
Airspace is classified as controlled or uncontrolled. Controlled airspace is supported by ground-to-air communications, NAVAIDS, and air traffic services. In September 1993, the FAA reclassified major airspace.

Types of controlled airspace include:

- Class A airspace, which includes all airspace between 18,000 ft MSL and 60,000 ft MSL (as well as waters within 12 nautical miles [nm] of the coast of the 48 contiguous states).
- Class B Airspace (formerly referred to as the terminal control area), which includes all airspace from the airport's established elevation up to 10,000 ft MSL, and consists of four airspace layers.
- Class C airspace (formerly referred to as the airport radar service area), which includes all airspace from that airport's established elevation up to 4,000 ft MSL, and consists of two airspace layers.
- Class D airspace (formerly referred to as the airport traffic area) for airports with ATCTs, which normally extends from the surface to 2,500 ft above an airport's established elevation (charted in MSL), and includes control zones and airport traffic areas.
- Class E airspace, which includes all controlled airspace other than Class A, B, C, or D. Class E airspace extends upward from either the surface of the designated altitude to overlying or adjacent controlled airspace. Class E airspace includes transition areas and control zones for airports without ATCTs.
- Class G airspace, which is uncontrolled airspace, begins at the surface and rises to the base of the overlying airspace.

AVO does not have an Air Traffic Control Tower (ATCT) and the airspace immediately surrounding the airport is classified as Class E airspace, which does not require any radio contact with a controlling agency for flight in or out of the area. **Figure 2-9** depicts an example of standard Class E airspace in relation to all other airspace.

Figure 2-9 Airspace Classes



Source, FAA

Only those areas that pertain to AVO (Class E, Restricted Airspace and Military Operating Areas) are described further. The Miami Air Route Traffic Control Center (ARTCC) is responsible for en route control of all aircraft operating in an IFR flight into the Avon Park area. Controlled airspace directly associated with AVO is depicted on the Miami Sectional Aeronautical Chart, February 2012, by a graduated magenta band surrounding the Airport, and Special Use Airspace (SUA), which includes warning areas and MOAs and is depicted by blue and red outlines. The Class E Airspace surrounding AVO has a floor 700 feet above the surface. Class E Airspace allows aircraft to transition to or from the MOA into the airport control zone.

2.9.1 Special Use Airspace

Special use airspace is used to confine certain flight activities and to place limitations on aircraft operations which are not part of these activities. Special use airspace is divided into alert areas, military operation areas, warning areas, restricted areas, prohibited areas, controlled firing areas, and national security areas. Several special use airspaces are located within a 25 nautical mile (nm) radius of AVO.

Within warning areas, while multiple use of the airspace is not prohibited, avoidance is advised during time of military training use. Joint use of MOAs is also allowed. Pilots flying in MOAs are responsible to employ "see and avoid" standards of flight safety. Both warning areas and MOAs are plotted on aeronautical charts so all pilots are aware of their location and the potential for military flight training in the airspace.

MOAs associated with AVO are the Avon Park Bombing Range and MacDill AFB Auxiliary Airport (AGR) operations limit AVO's airspace operations. The restricted areas, as indicated in **Figure 2-10**, indicate those areas that are continuously in effect and limit where aircraft can operate. As indicated, most of the areas restrict civilian aircraft to fly below 14,000 ft MSL. The MOA is considerably larger than the restricted areas and is in effect intermittently during daylight hours Monday through Friday, and occasionally on weekends, but does allow aircraft to fly lower than 7,000 ft on a limited basis. (*Miami Aeronautical Sectional Chart*, February 2015)

Restricted airspace (RA) to the east of AVO, though not entirely prohibited to flight activity, are areas in which unauthorized incursion is not only illegal, but also extremely dangerous. Restricted areas are identified on aeronautical Sectional Charts by a defined area marked with the letter "R," followed by a number. Altitudes and times differ for each restricted area. These areas generally contain operations that do not mix well with aircraft such as artillery firing, guided missiles, or aerial gunnery. Permission to fly in restricted areas can be given by ATCT. **Table 2-6** lists specific RAs and MOAs in the region surrounding AVO. **Figure 2-10** also illustrates the airspace in the vicinity of AVO.

2.9.2 Approach and Departure Procedures

Currently, there are two published non-precision approaches at AVO; one is the non-precision GPS approach to Runway 05 and the other is the non-precision GPS approach to Runway 10. The published precision approaches can be found in **Figures 2-11 and 2-12.**

Table 2-6 AVO Special Use Airspace

RESTRICTED AREAS			
Number	**Usage Altitude**	**Usage Time**	**Controlling Agency**
R-2901 A,C	To 13,999	Intermittent 0600-2400 M-F 0800-1800 S-S +6 Hrs in advance	MIA CNTR
R-2901 B	14,000' to FL 180	Same as Above	MIA CNTR
R-2901 D	500' to 4,000' E of 81 21' 00" W; 1,000' AGL to 4,000' W of 81 21' 00" W	Same as Above	MIA CNTR
R-2901 E,H	1,000" to 3,999'	Same as Above	MIA CNTR
R-2901 F	4,000' to 4,999	Same as Above	MIA CNTR
R-2901 G	To 4,999	Same as Above	MIA CNTR
R-2901 I	1,500' to 3,999	Same as Above	MIA CNTR
R-2901 M	4,000 to 13,999	Same as Above	MIA CNTR
R-2901 N	5,000 to 13,999 N of 27°24'46"N 81°10'59"W to 27°29'31'"N 81°05'29"W to 4,000 to 13,999 S	Same as Above	MIA CNTR

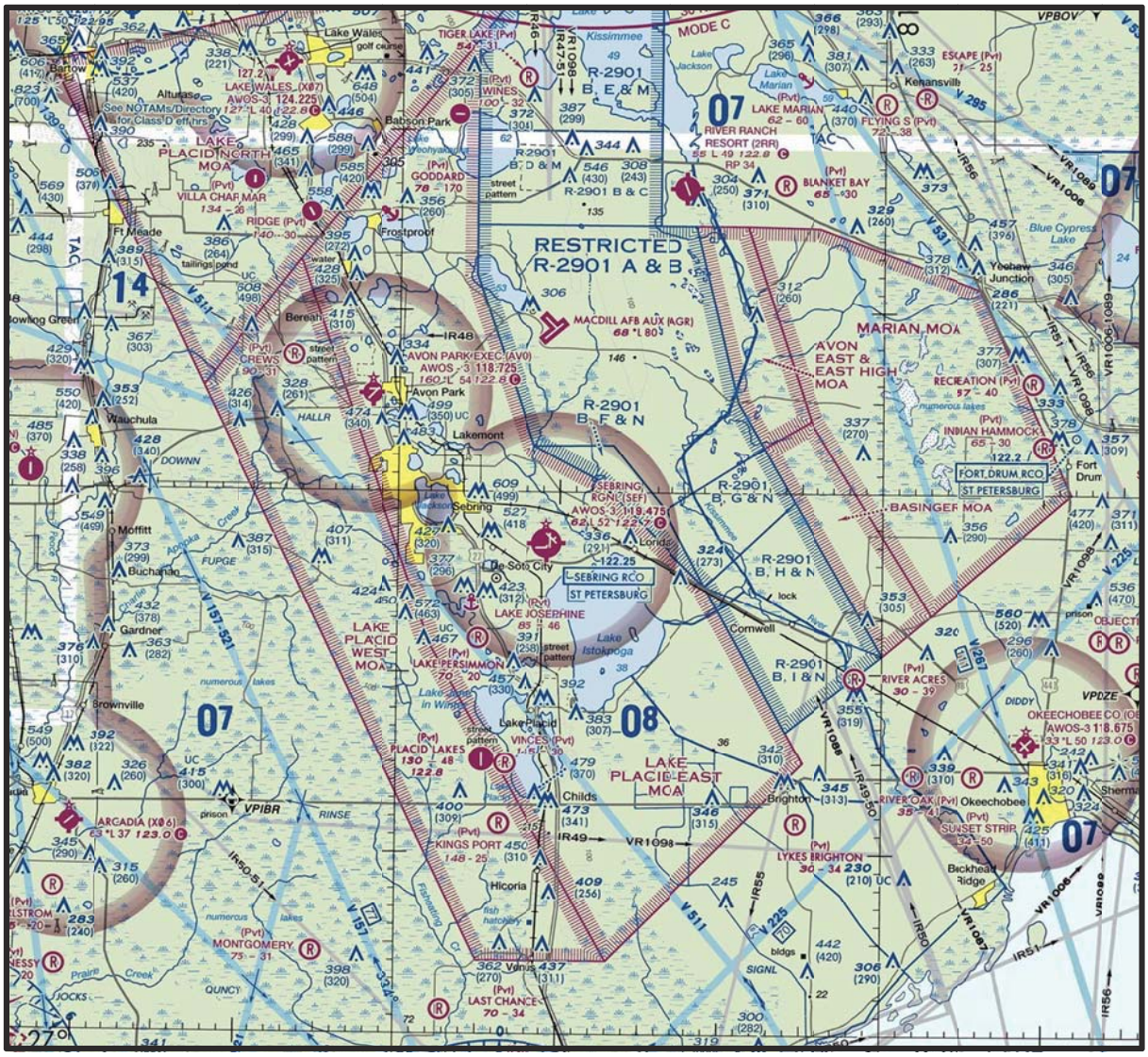
Source: Department of Transportation, U.S. Terminal Procedures Southeast, Volume 3 of 4, February, 2015

Table 2-6 AVO Special Use Airspace (cont'd)

MILITARY OPERATIONS AREAS			
Name	**Usage Altitude**	**Usage Time**	**Controlling Agency**
Avon East	500' AGL to But not including 14,000'	Intermittent daylight hours SR-SS Mon-Fri	MIA CNTR
Avon East High	14,000'	Intermittent, normally daylight hours M-F	MIA CNTR
Basinger	500' AGL to 5,000'	Intermittent daylight hours Mon-Fri occasionally Sat & Sun	MIA CNTR
Lake Placid East, North, West	7,000	Intermittent daylight hours Mon-Fri occasionally Sat & Sun	MIA CNTR
Marian	500' AGL to 5,000'	Intermittent daylight hours Mon-Fri occasionally Sat & Sun	MIA CNTR

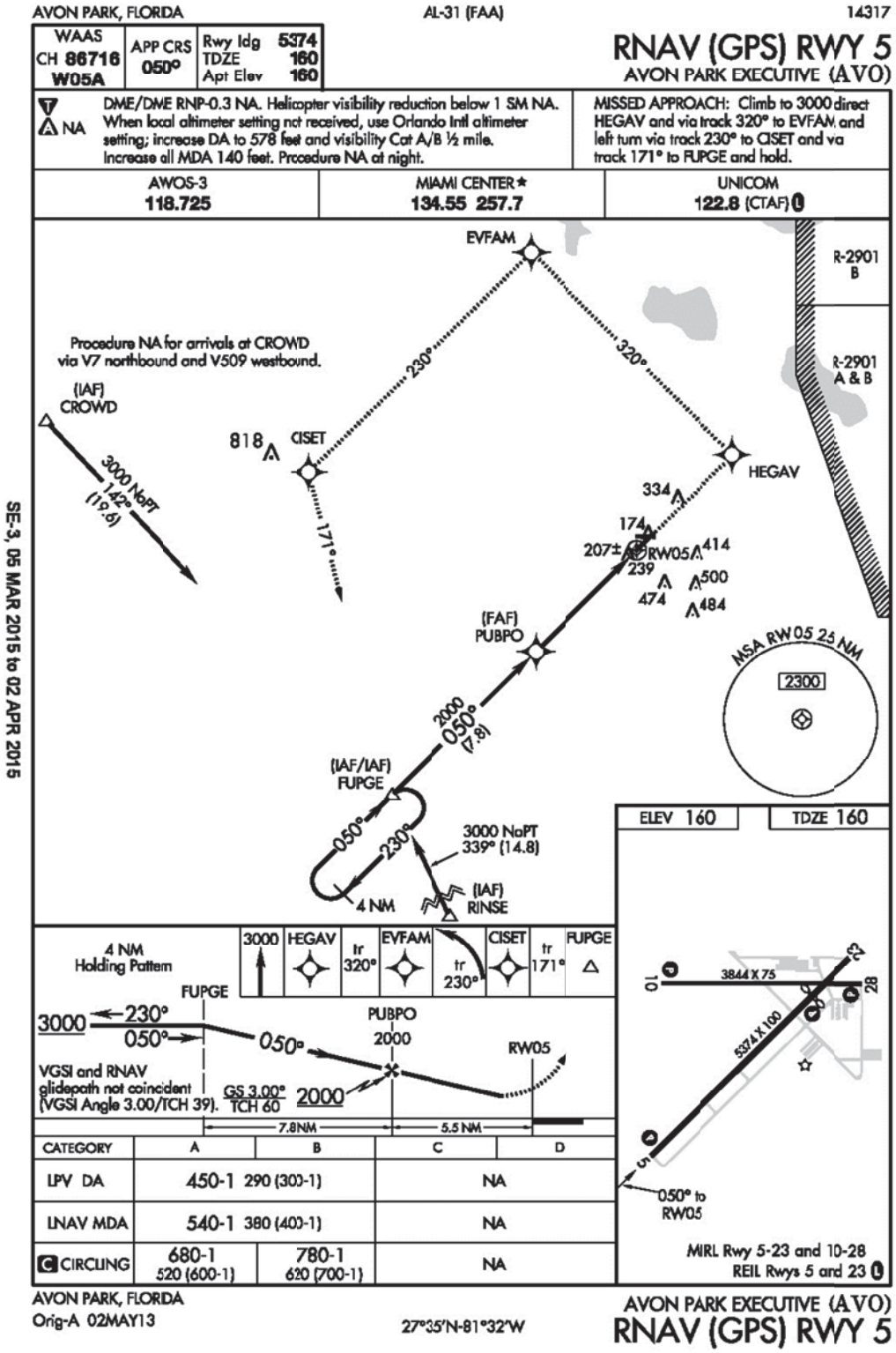
Source: Department of Transportation, U.S. Terminal Procedures Southeast, Volume 3 of 4, February, 2015

Figure 2-10 Restricted Airspace Around AVO (Miami Sectional Chart)



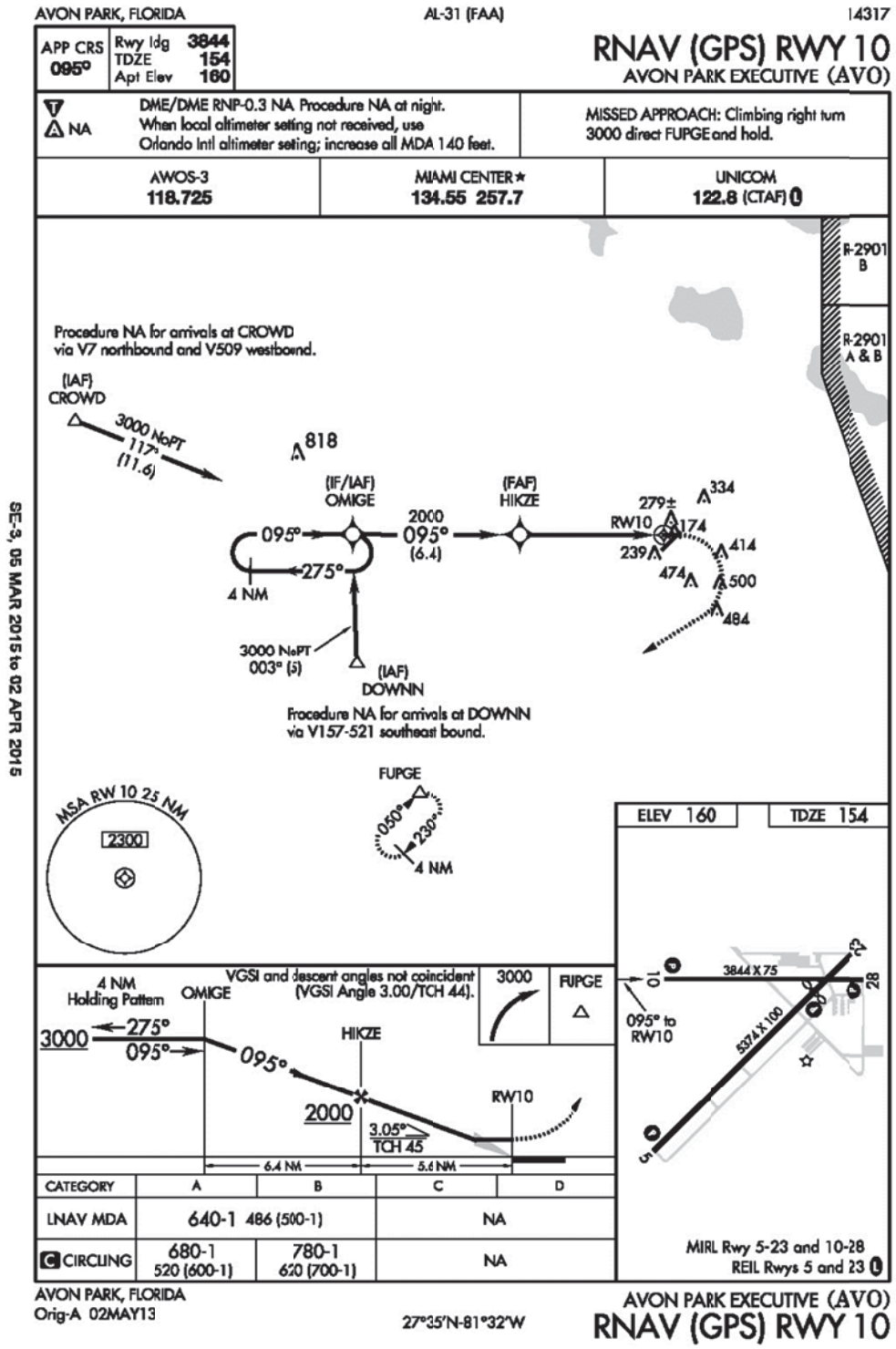
Source: FAA, Miami Aeronautical Sectional Chart, February 2015

Figure 2-11 Published GPS Non-precision Approach to Runway 5



Source: FAA March 2015

Figure 2-12 Published GPS Non-precision Approach to Runway 10



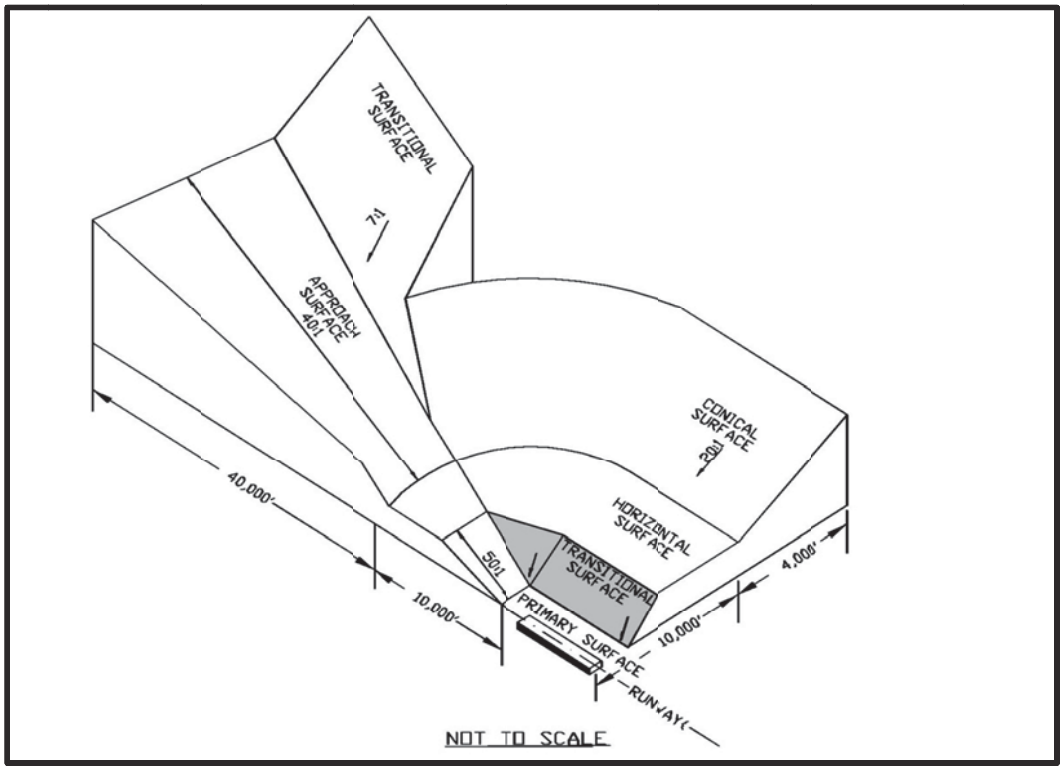
Source: FAA March 2015

2.9.3 Part 77 Obstructions to Navigable Airspace

Federal Aviation Regulations (FAR) Part 77 Obstructions to Navigable Airspace establishes standards for determining obstructions in navigable airspace. An obstruction is defined as any object of natural growth, terrain, or permanent or temporary construction and/or alteration, including related equipment and materials used therein, which penetrates any portion of the "imaginary surfaces." FAR Part 77 establishes imaginary surfaces to govern the vertical height of obstacles within the vicinity of airports. These surfaces will vary in size and slope depending on the aircraft operating along with the available approaches at each runway end.

By superimposing these imaginary surfaces over the Airport, it is possible to determine the severity of existing obstructions. FAR Part 77 surfaces also provide vertical boundaries for existing construction alterations, in addition to new construction. Once objects have been identified, the FAA must review them to determine if they pose a hazard to air navigation. If determined to be a hazard, the obstacle must be removed or altered to eliminate the penetration. If the obstruction remains, dramatic changes to the airfield and/or approach procedures may be required. Examples of such changes could be displacing a runway threshold or increasing approach minimums to provide obstruction clearance. Existing obstructions to air navigation at AVO, if any, will be discussed in the Airport Layout Plans chapter. **Figure 2-13** illustrates typical FAR Part 77 surfaces for a precision approach.

Figure 2-13 Typical Part 77 Surfaces



Source:www.faa.gov

2.10 AIRPORTS IN THE VICINITY

Airports located in the surrounding region are of considerable importance when evaluating sources of competition for airspace and aviation services. AVO has many neighboring aviation facilities consisting of public, private, and military facilities. A number of airports within a 25 nm radius of AVO have been examined and are discussed in this section. All airports in the vicinity of AVO can be seen in **Figure 2-14**.

2.10.1 Private Use

There are 14 private airports in the area. The private use GA airports within the region are listed in **Table 2-7**.

Table 2-7 Private Use GA Airports in the Region

Crews (FL01) David Wines Airstrip (62FL) Villa Char Mar (1FA9) Lake Clinch (52FL) Goddard Seadrome (FD46)	Ridge Landing ((4FL5) Lake Josephine Seaplane (9FL3) Lake Persimmon (03FA) Griffins Peace (FL00) Tiger Lake (2FL8)	Gardner (FD40) Sage Seadrome (9FD0) Vinces (FA60) Placid Lakes (09FA)

2.10.2 Public Use

There are 6 public-use GA facilities that lie within the 25 nm radius of AVO. The public use airports are listed in Table 2-7 and discussed briefly in this section. The public use GA airports within the region are listed in **Table 2-8**.

Table 2-8 Public Use GA Airports in the Region

Lake Wales Municipal (X07) Sebring Regional (SEF) Wauchula Municipal (CHN) Bartow Municipal (BOW) River Ranch Resort (K2RR) Chalet Suzanne Airstrip (X25)

2.10.2.1 Lake Wales Municipal (X07)

Lake Wales Municipal is owned by the City of Lake Wales and operated by the Lake Wales Airport Authority appointed by the City Commission. Lake Wales Municipal is designated as a general aviation airport and is located approximately 18 nautical miles north northwest of AVO. X07 serves the needs of regional, corporate, and private aircraft. In addition, localized recreational glider activity and skydiving activities are conducted at the airport. X07 has two asphalt runways; Runway 17-35 and Runway 6-24. Runway 17-35 is approximately 3,999 feet long and 75 feet wide. Runway 6-24 is approximately 3,999 feet long and 100 feet wide.

Fuel, aircraft parking, a pilot lounge, restrooms, and other services are offered by the FBO on the field. The airport master record reports annual operations at X07 totaled approximately 20,000 in 2010, with 800 air taxi ops, 13,989 local ops, 5,094 GA itinerant ops; and 120 military ops. X07 has 30 based aircraft consisting of 11 single-engine aircraft, 2 multi-engine aircraft, 1 helicopter, 11 gliders and 5 ultra-light aircraft.

2.10.2.2 Sebring Regional Airport (SEF)

SEF is owned and operated by the Sebring Airport Authority. SEF is located approximately 12 nm southeast of AVO. SEF is a designated as a general aviation airport, serving both piston-engine and jet aircraft. SEF has two asphalt runways. Runway 14-32 is 4,999 feet long by 100 feet wide and has a maximum weight limit of 85,000 pounds double dual tandem wheel load. Runway 18-36 is 5,234 feet long by 150 feet wide and has a maximum weight limit of 85,000 pounds double dual tandem wheel load.

SEF is a full service airport with a restaurant, flight school, fuel, aircraft parking and repairs, pilot lounge and restrooms. The airport master record reports annual operations at SEF totaled approximately 103,087 in 2009, with 44,137 GA local ops, 58,550 GA itinerant ops; and 400 military ops. SEF has 46 based aircraft consisting of 34 single-engine aircraft, 4 multi-engine aircraft, 1 jet, 1 helicopter and 9 ultra-light aircraft.

2.10.2.3 Wauchula Municipal Airport (CHN)

CHN is owned by the City of Wauchula and is operated by the Wauchula Municipal Airport Authority as an agency of the city. CHN is a designated as a general aviation airport and is located approximately 19 nm west southwest of AVO. CHN serves the needs of regional, corporate, and private aircraft. CHN has one asphalt runway. Runway 18-36 is 4,005 feet long by 75 feet.

CHN services include; flight training, aircraft repair, aircraft storage, fueling, car rental and a pilots lounge. In addition to recreational aircraft operators, the airport serves many local businesses, including spraying operators for the local agricultural industry. The airport master record reports annual operations at CHN totaled approximately 8,200 in 2010, with 3,360 GA local ops; and 4,840 GA itinerant ops. CHN has 43 based aircraft consisting of 31 single-engine aircraft, 6 multi-engine aircraft, 5 helicopters and 1 ultra-light aircraft.

2.10.2.4 Bartow Municipal Airport (BOW)

BOW is owned by the City of Bartow and is operated by the Bartow Municipal Airport Development Authority as an agency of the city. BOW is a designated as a general aviation airport

and is located approximately 25 nm north northwest of AVO. BOW serves the needs of regional, corporate, and private aircraft. BOW has three asphalt runways. Runway 05-23 is 5,000 feet long by 100 feet and has a maximum weight limit of 110,000 pounds double dual tandem wheel load. Runway 09L-27R is 5,000 feet long by 150 feet and Runway 09R-27L is 4,400 feet long by 150 feet.

Air traffic control, fuel, flight training, aircraft rental, aircraft service and maintenance, pilot lounge, car rental, flight planning room and other services are offered by the FBO on the field. The airport master record reports annual operations at BOW totaled approximately 49,368 in 2010, with 20,622GA local ops, 28,594 GA itinerant ops; and 152 military ops. BOW has 101 based aircraft consisting of 79 single-engine aircraft, 14 multi-engine aircraft, 2 jet aircraft and 6 helicopters.

2.10.2.5 River Ranch Resort Airport (2RR)

2RR is a privately owned public use airport which is owned and operated by Westgate Resorts Central Florida Invest. 2RR is a public use airport that is not listed in the NPIAS. 2RR is located approximately 20 nm northeast of AVO. 2RR serves the needs of private aircraft. 2RR has one asphalt runway; Runway 16-34 is 5,950 feet long by 75 feet.

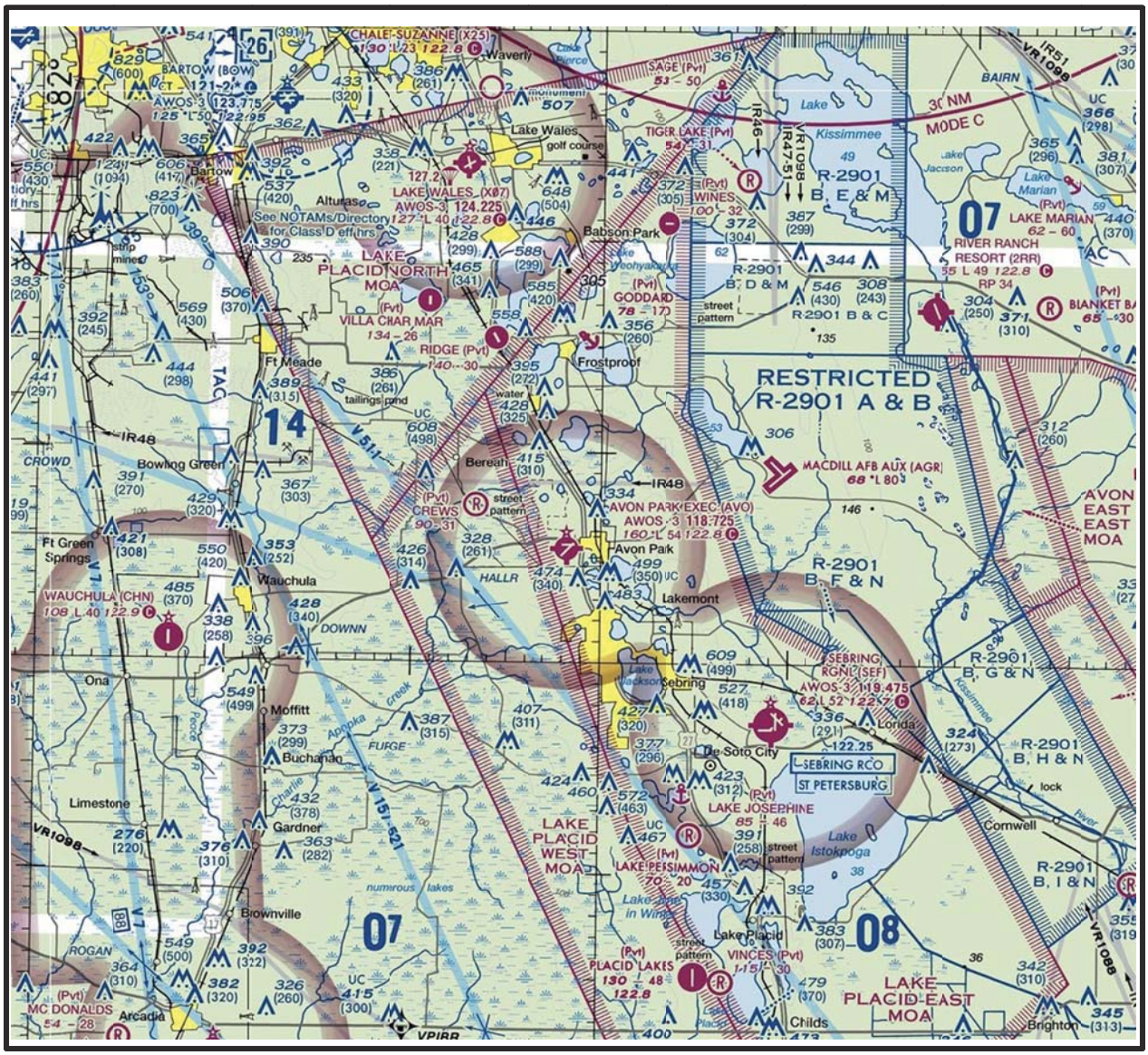
Services at the airport include 100 LL fuel and aircraft tie-downs. The airport is closed to night time operations. The airport master record for 2RR does not reports annual operations or based aircraft.

2.10.2.6 Chalet Suzanne Air Strip (X25)

X25 is a privately owned public use airport which is owned and operated by Chalet Suzanne Properties, Inc. 2RR is a licensed public use airport that is not listed in the NPIAS. X25 is located approximately 22 nm north of AVO. X25 serves the needs of private aircraft. X25 has one turf runway; Runway 18-36 is 2,313 feet long by 50 feet and is equipped with low intensity runway lights.

Services at the airport include turf tie-downs and a hotel/restaurant. The airport is closed to night time operations. The airport master record reports annual operations at X25 totaled approximately 2,472 in 2010, with 400 GA local ops, 2,000 GA itinerant ops, 60 air taxi ops; and 12 military ops. X25 has 7 based aircraft consisting of 4 single-engine aircraft, 1 multi-engine aircraft, 1 helicopter and 1 glider.

Figure 2-14 Airports in the Vicinity of AVO (Miami Sectional Chart)



Source: FAA, Miami Aeronautical Sectional Chart, February 2015

2.11 Socio-Economic Data

The socio-economic condition of the surrounding community is a key factor in forecasting the levels of aviation activity at GA airports and evaluating the overall opportunity for future development. Often, population is a primary driver in the demand for aviation services and the types of aviation services necessary. Population demographics, in addition to employment and earnings statistics provide further indications to the community's ability to support aviation activities. The statistical link between these social and economic indicators provides a gauge of the community's demand for aviation services. This link is often used as a basis for forecasting aviation activity and planning airport development to meet the needs of the surrounding communities.

Information about the socio-economic influences of an area can be derived from a variety of resources. For the purposes of this study, data from Woods & Poole Economics, Inc. served as the primary source for population, employment, and income information. For the purpose of this master plan update, socio-economic factors for Highlands County and the State of Florida will be discussed.

The purpose of this section is to identify major social and economic characteristics and to establish the socio-economic influences and trends that will be incorporated into the aviation activity forecasts and development alternatives analyses presented in the following chapters.

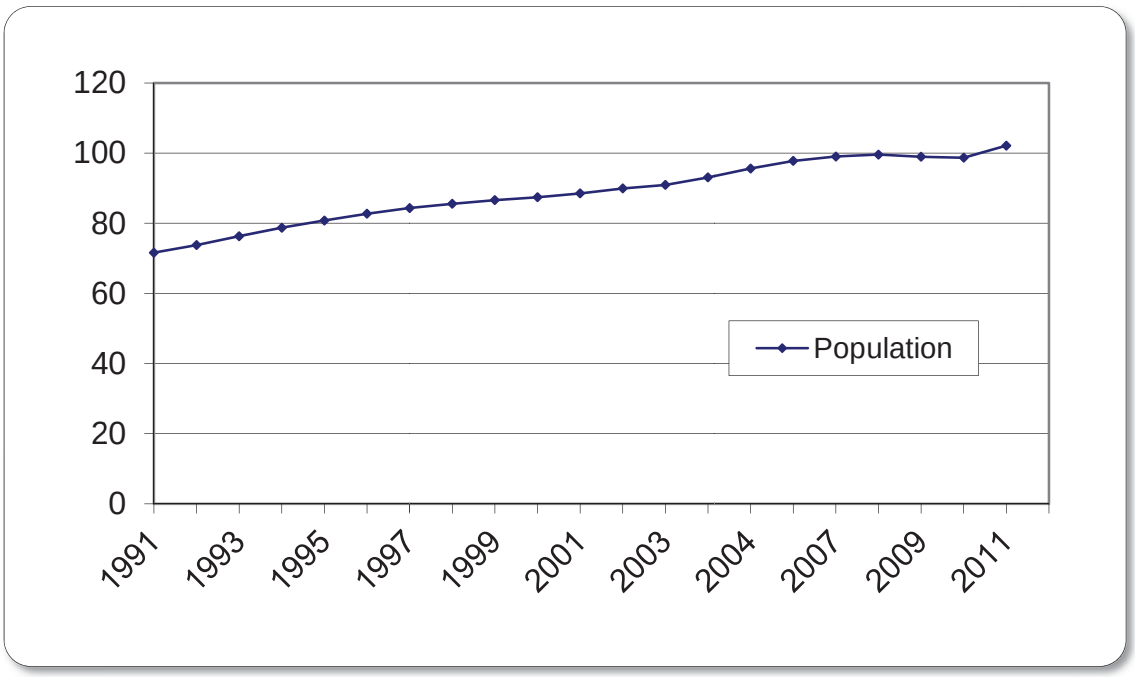
2.11.1 Highlands County

2.11.1.1 Population

Highlands County has experienced steady growth in population over the past 20 years. The population in 1991 was approximately 72,000 people and increased by approximately 20 percent to 88,500 thousand people in 2001. From 2001 to 2011, the population increased approximately 12 percent to 102,100 thousand people. **Figure 2-15** illustrates the historical population growth for Highlands County.

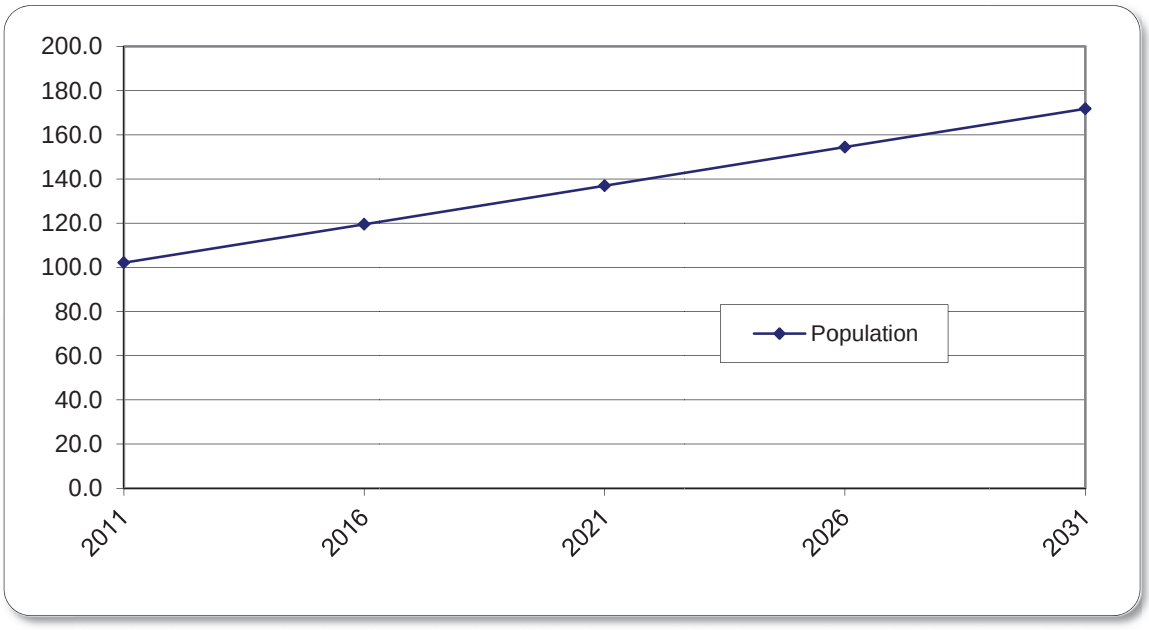
Population projections for Highlands County show a continued steady increase in population through 2031. Forecasts show a 68 percent cumulative growth in population over the next twenty years with approximately 102,000 people in 2011 increasing to approximately 172,000 people by 2031. Thus, it is anticipated that these increases in population could impact the level of aviation activity and associated development at the airports in and/or near Highlands County. **Figure 2-16** illustrates the projected population growth in Highlands County through 2031.

Figure 2-15 Highlands County Historical Population



Source: Woods & Poole Economics, Inc, 2014
Note: Population represents demographic permanent resident population (thousands)

Figure 2-16 Highlands County Projected Population

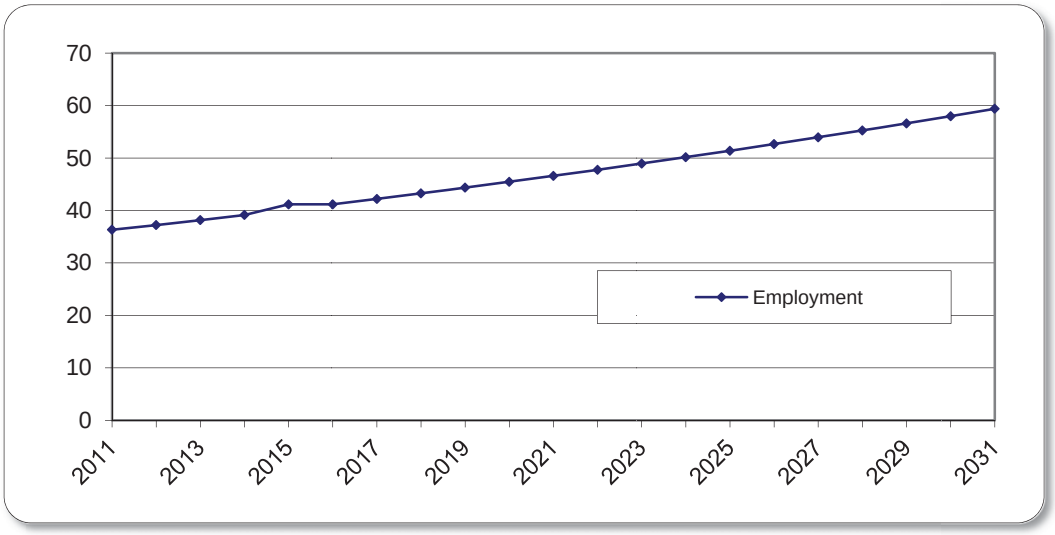


Source: Woods & Poole Economics, Inc, 2014
Note: Population represents demographic permanent resident population (thousands)

2.11.1.2 Employment

Employment in Highlands County has also experienced steady growth throughout the past several years. Total employment in 1991 was 28,117 people, increasing approximately 16 percent to 32,598 people by 2001. By 2011, employment increased to 36,332 people. The trends in historical employment for Highlands County are shown in **Figure 2-17**.

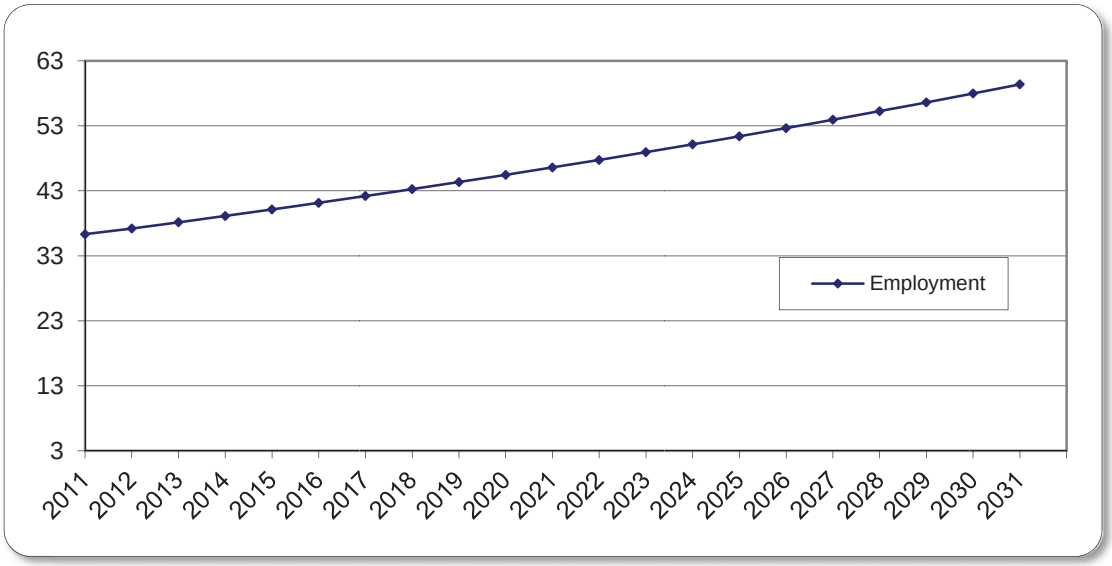
Figure 2-17 Highlands County Historical Employment



Source: Woods & Poole Economics, Inc, 2014
Note: Employment represents demographic permanent resident population (thousands)

Employment projections for Highlands County show a steady increase in the number of people employed. According to the Woods & Poole data; there is a projected 27 percent cumulative increase in the number of people employed, up to 59,389 people, in 2031. **Figure 2-18** illustrates the projected employment growth in Highlands County through 2031.

Figure 2-18 Highlands County Projected Employment



Source: Woods & Poole Economics, Inc, 2014
Note: Employment represents demographic permanent resident population (thousands)

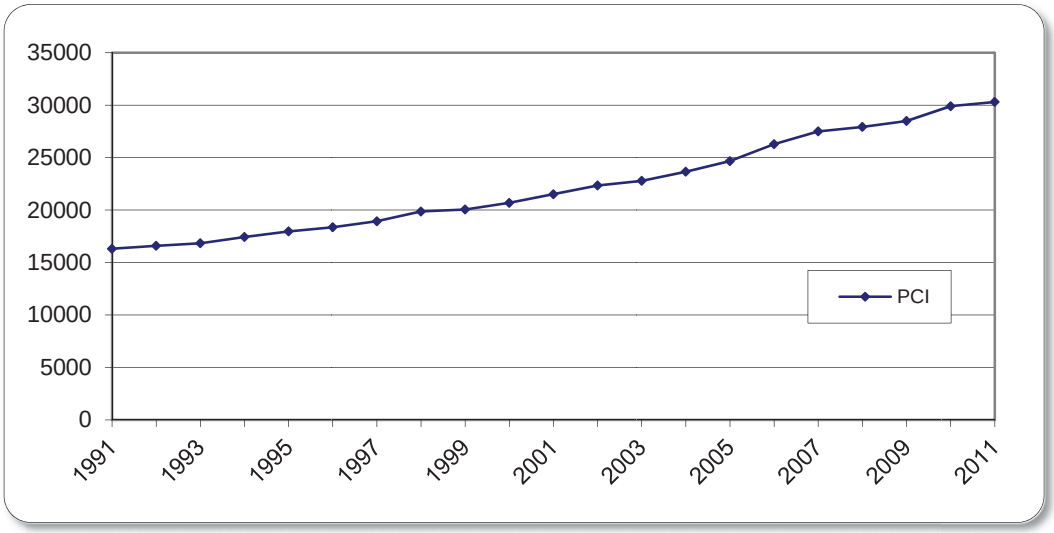
2.11.1.3 Income

Per capita income (PCI) is the estimated average amount per person of total income received during the calendar year for all persons residing in a given area. The basic assumption surrounds the idea that as income increases the potential for a portion of that income to be spent on GA aircraft or services increases accordingly. For example, aircraft ownership and charter services can be significantly affected by the level of income available to pay for these and other services.

Historically, Highlands County PCI has increased since 1991. The reported PCI in 1991 was $16,311, increasing approximately 31 percent to $21,514 by 2001. The reported PCI in 2011 was $30,309, increasing approximately 41 percent from 2001. The trends in historical PCI for Highlands County are shown in **Figure 2-19**.

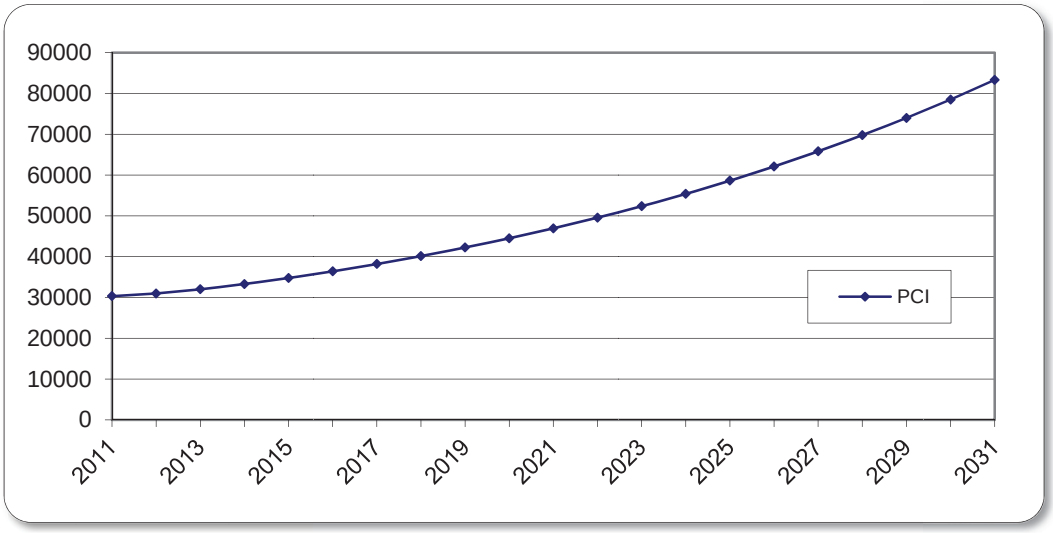
According to the Woods and Poole data projections, the County's PCI will increase 175 percent by 2031. **Figure 2-20** illustrates the projected income growth in Highlands County through 2031.

Figure 2-19 Highlands County Historical PCI



Source: Woods & Poole Economics, Inc, 2014
Note: Total Personal Income Per Capita in Current Dollars

Figure 2-20 Highlands County Projected PCI



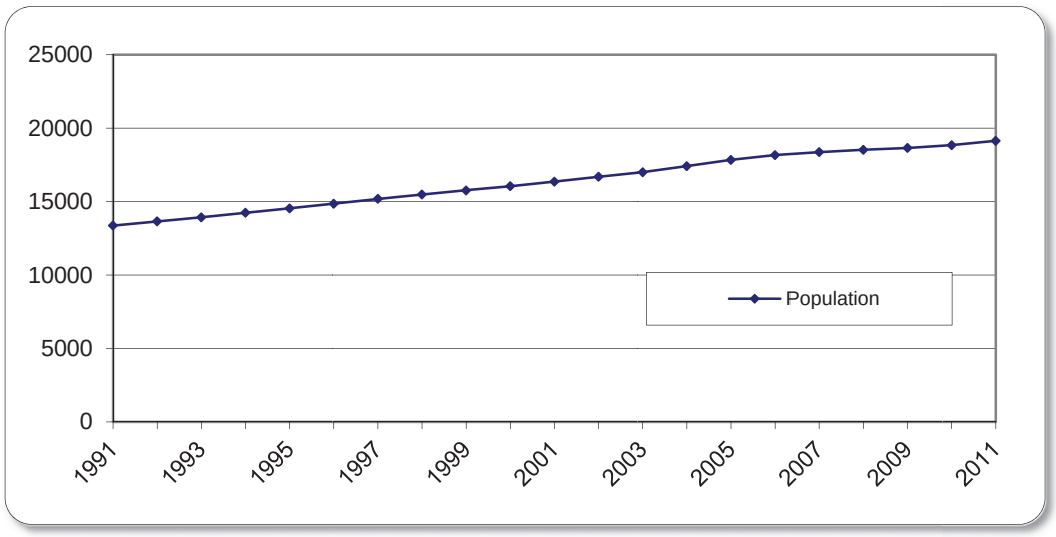
Source: Woods & Poole Economics, Inc, 2014
Note: Total Personal Income Per Capita in Current Dollars

2.11.2 Florida

2.11.2.1 Population

Florida has experienced steady growth in population in recent years. The population of Florida in 1991 was approximately 13.3 million people and increased by approximately 43 percent to 19.1 million people in 2011. **Figure 2-21** illustrates the historical population growth in Florida.

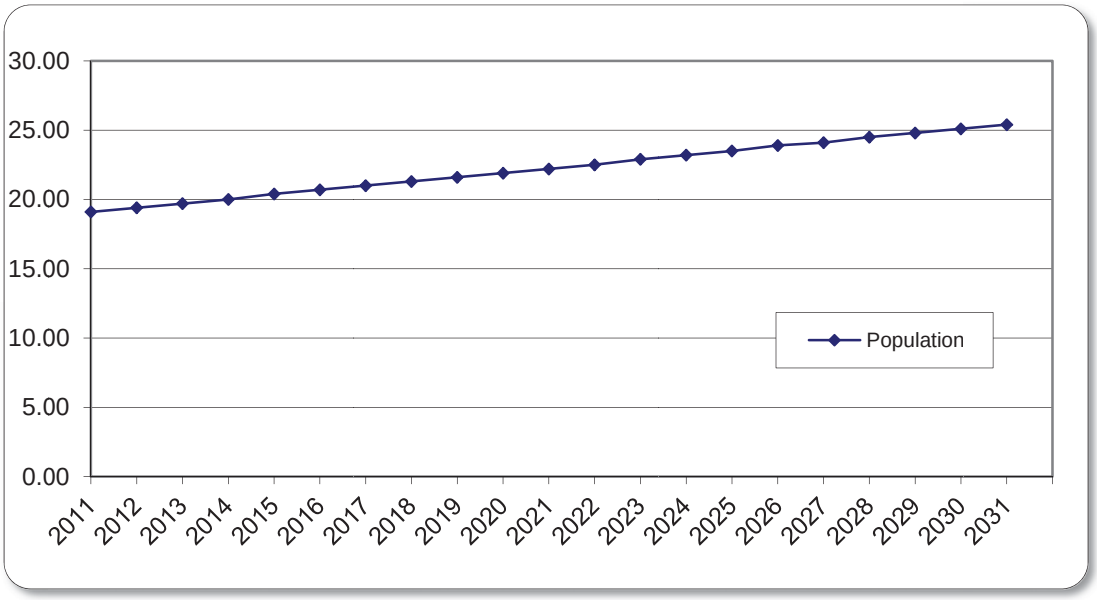
Figure 2-21 Florida Historical Population



Source: Woods & Poole Economics, Inc, 2014
Note: Population represents demographic permanent resident population (millions)

Population projections for the state of Florida show a continued steady increase through 2031. Forecasts show a 33 percent cumulative population growth in population over the next 20 years with approximately 19.1 million people in 2011 increasing to approximately 25.4 million people by 2031. **Figure 2-22** illustrates the projected population growth in Florida through 2031.

Figure 2-22 Florida Projected Population

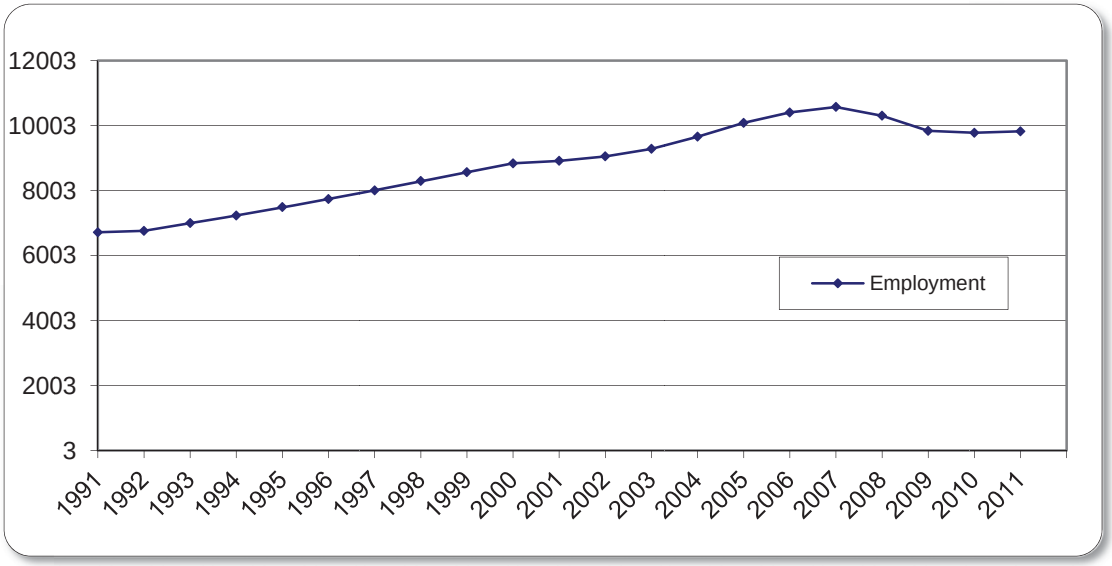


Source: Woods & Poole Economics, Inc, 2014
Note: Population represents demographic permanent resident population (millions)

2.11.2.2 Employment

Employment in Florida has also experienced growth in recent years. Total employment in 1991 was 6.7 million people, increasing approximately 50 percent to 10.1 million people by 2005. Total employment in Florida in 2011 was 98.3 million, a decrease of 2.6 percent from the year 2005. The trends in historical employment for Florida are shown in **Figure 2-23**.

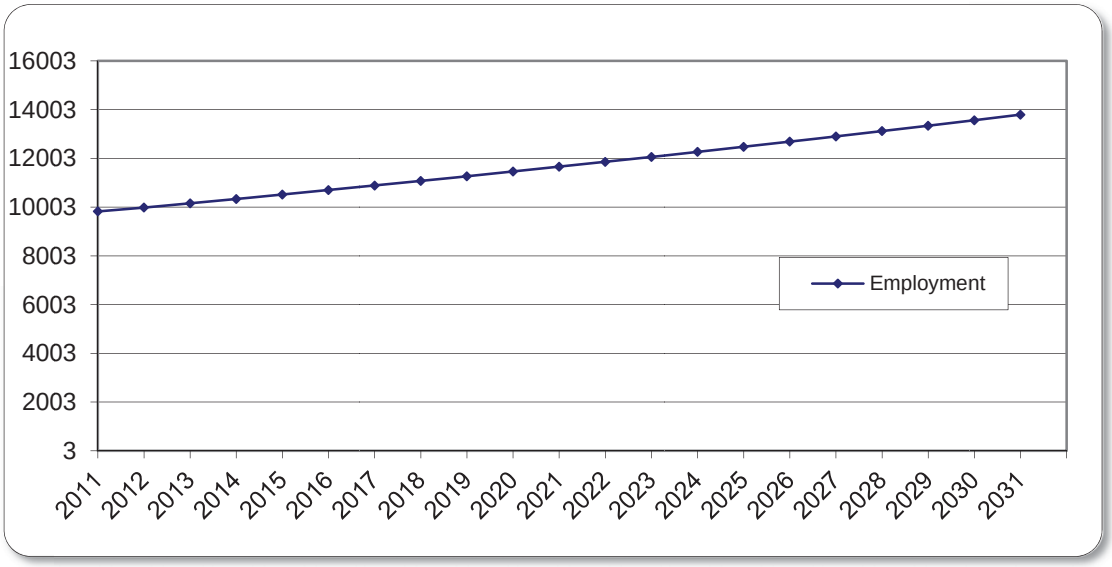
Figure 2-23 Florida Historical Employment



Source: Woods & Poole Economics, Inc, 2014
Note: Employment represents demographic permanent resident population (thousands)

Employment projections for Florida also show a steady increase. Projections show a 40 percent increase by 2031. Employment projections for Florida are shown in **Figure 2-24**.

Figure 2-24 Florida Projected Employment

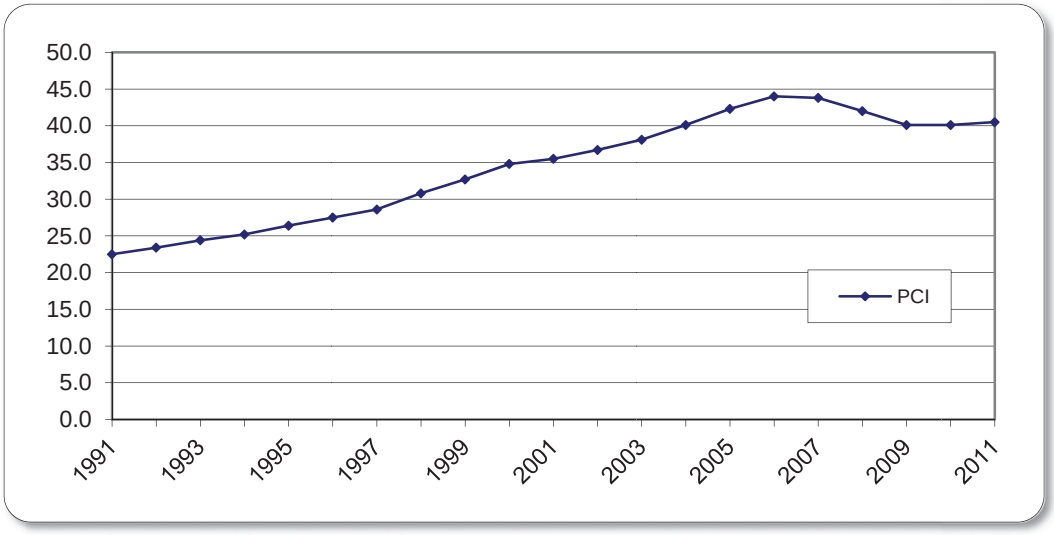


Source: Woods & Poole Economics, Inc, 2014
Note: Employment represents demographic permanent resident population (thousands)

2.11.2.3 Income

Historically, per capita income in the state of Florida has increased. Reported PCI in 1991 was $22,500 increasing approximately 30 percent to $40,500 by 2011. As with employment, the State did see a drop in PCI between 2007 and 2010. The trends in historical PCI for Florida are shown in **Figure 2-25**.

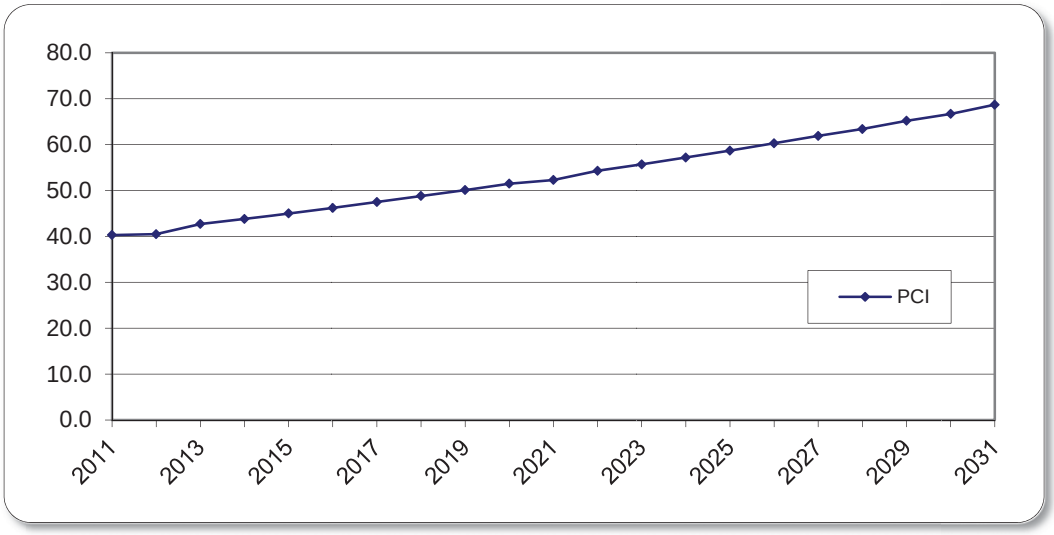
Figure 2-25 Florida Historical PCI



Source: Woods & Poole Economics, Inc, 2014
Note: Total Personal Income Per Capita in 2005 Dollars

According to the projections for Florida, PCI will continue to show a steady increase throughout the planning period. PCI projections for Florida can be found in **Figure 2-26**.

Figure 2-26 Florida Projected PCI



Source: Woods & Poole Economics, Inc, 2014
Note: Total Personal Income Per Capita in 2005 Dollars

2.11.3 Socio-Economic Summary

Based upon the foregoing information, and comparisons of socioeconomic activity throughout the state of Florida and Highlands County, it can be seen that the population growth in the Highlands County area is higher than that of the overall state. In general, such population growth could lead to greater demands for aviation services.

Additionally, growth in income for Highlands County is comparable to that of the State of Florida. Typically there is a correlation between increased consumer income and spending and aviation demand. The increased growth in consumer income in Highlands County is expected to continue throughout the planning period.

SECTION 3
HISTORIC AND FORECAST AVIATION ACTIVITY

3.1 Introduction

Airport facility planning begins with an estimate of the demand that may reasonably be expected to occur over the 20-year planning period. This involves demand forecasting using aviation activity indicators that estimate the projected level of aviation demand. Existing forecasts of general aviation (GA) activity and associated data is used as the basis for facility planning, financial projections, and environmental analysis.

The purpose of the forecast analysis is to provide a basis for understanding the role of GA operations, both historically as well as in the future, at Avon Park Executive Airport (AVO or Airport).

The primary function of the forecast element of this master plan is to serve as a tool in identifying projected aviation demand, supplement state and federal programming decisions with accurate data, and provide additional planning measures for the airport sponsor (Avon Park) and other local jurisdictions.

3.2 Background

Airports recognize the importance of providing access to the air transportation system through facility preservation and system planning, which is needed to facilitate future decision-making. Preserving access to airports requires an understanding of the current and projected demands for GA operations. In addition, preservation of the airport system is dependent on an understanding of the contributions of aviation to the overall economy.

During the master planning process, CDM Smith's consultant team performed a comprehensive data search for airport information, including reviews of such information as existing master plans, state aviation system plans, airport management records, Federal Aviation Administration (FAA) Airport Facility Directory (AFD) information, and FAA Form 5010 data.

Aviation activity forecast development for public-use airports requires a broad understanding of past, current, and future trends in the aviation industry and socioeconomic statistics. Due to the fact that aviation industry trends can have varying impacts on airports, an evaluation of national, state, and regional trends is insightful while developing aviation activity projections for airports in the region.

This chapter assesses these trends and their effects on the anticipated GA activity expected at AVO. The following sections discuss recent and ongoing aviation industry and socioeconomic trends, the projections of aviation demand, and the effects of these trends on the projection of aviation demand for AVO.

3.3 GA Industry and Economic Trends

Trends in the GA industry and national economy can, and typically do, substantially impact aviation activity at regional public-use airports, particularly as they relate to how the demand for GA service will be accommodated in the future. Since AVO supports only GA aircraft operations, having an understanding of the GA trends, as impacted by the national, state and local economy, is important to considering future GA demand. Included in this examination of GA trends will be a discussion of changing patterns in the business and recreational use of GA aircraft and the overall impacts that have occurred due to the global recession of 2008 and 2009.

3.3.1 Overview of General Aviation Activity

GA serves diverse needs and its primary demand components are business/corporate aviation, recreation, and pilot training. GA business travel has witnessed significant growth over the past decade, largely due to industry changes and impacts resulting from the events of September 11, 2001 and the subsequent dramatic decline in airline service, quality, reduced flight schedules, destinations, and overall services. GA has responded by broadening services made available by charter aviation companies and fractional aircraft ownership firms to expedite point-to-point services. While commercial airline passengers and flights are becoming increasingly susceptible to security, airport delays, and en route delays, GA offers users a convenient and efficient alternative form of air transportation. GA provides corporate fliers with more options to permit flexible, economical, and efficient business and personal travel. GA users have the flexibility to fly in and out of nearly 5,500 of the nation's airports. New aircraft ownership options through financing and leasing are becoming increasingly popular, especially with fractional ownership companies providing business and corporate fliers affordable use of aircraft for business purposes. While the demand for corporate GA has been and will continue to be linked with the business economic cycle, the impact of airport delays and declines in airline services will ultimately increase demand for corporate and charter services.

Specific trends related to GA activity, as identified in the FAA Aerospace Forecasts, Fiscal Years 2012-2032, developed by the U.S. Department of Transportation (DOT), are identified in following sections. It should be noted that this information factors in the significant impact the events of September 11, 2001 and the recent national recession and economic collapse have had on the aviation industry as a whole.

3.3.1.1 Business Use of General Aviation Aircraft

Many businesses throughout the U.S. depend on GA aircraft to add to their productivity and efficiency. Air transportation makes possible the quick movement of millions of people and billions of dollars' worth of goods to markets around the world. Florida and the southeast region must be able to compete in the global marketplace, and there is often no practical alternative to air transportation. Similarly, the growth of a competitive domestic economy depends more and more on the ability to move by air. Many of the nation's leading employers use GA aircraft as a

business tool and are members of the National Business Aircraft Association (NBAA), which represents over 8,000 companies of all sizes throughout the world.

Business use of GA aircraft can range from the rental of small, single-engine aircraft to corporate aircraft fleets that are supported by dedicated flight crews and mechanics. The use of GA aircraft allows employers to efficiently transport executive personnel and time-critical cargo. Businesses use GA aircraft to link multiple office locations and to reach existing and potential customers. The use of business aircraft by smaller companies has significantly increased as various chartering, leasing, and time-sharing, and management contract options have emerged. One such option, fractional ownership, has experienced increased growth and continues to expand the market for jet aircraft. Fractional ownership offers an innovative financial interest for parties to lower the cost of the fractional ownership jet while still providing the benefits of charter service. Parties can purchase fractional shares by which they are able to reduce up-front costs and eliminate the responsibilities that go with operating an expensive aircraft.

Of all the benefits GA provides to businesses, flexibility is likely the most valued. Using business aircraft increases the flexibility of scheduling and provides rapid, safe, and efficient access to meeting locations. These factors allow employees using GA aircraft to travel to and from their destination in less time than would be required in a traditional commercial service airline schedule that includes layovers, delays, and other time-consuming factors. The positive effect that minimizing non-business time away from home has on employee morale and productivity is impossible to measure, and growing in importance.

3.3.1.2 Downturn of the National Economy

After seeing moderate growth during most of 2007, the U.S. economy slowed significantly in 2008 and 2009. Unemployment steadily rose throughout those years and there was little doubt that the US economy had entered a recession, together with partner economies from around the world. Further confirmation was provided when the Bureau of Economic Analysis reported that U.S. real gross domestic product (GDP) fell at an annual rate of 3.8 percent in the fourth quarter of 2008, which was the second consecutive quarterly decline in GDP. This was effectively the textbook definition of a recession and made the US economic crisis official. The National Bureau of Economic Research announced that the US economy actually entered into recession in December 2007. Job losses from the beginning of the recession in December 2007 to January 2009 totaled 3.8 million and accelerated in the second and third quarter of 2009. Further contraction in specific segments of the economy was also seen in late 2009 and into 2010.

The economic recession has been one of the most severe downturns since the end of World War II. There is a great deal of uncertainty as to the future direction of the US economy, largely due to significant structural changes in the housing and banking sectors. In any case, the historic downturn in the national economy, especially the impact of volatile oil and fuel prices, has had a significant impact on GA demand over the past few years. General aviation activity at FAA air traffic facilities fell sharply between 2008 and 2010. Operations at combined FAA and contract towers declined 5.6 percent in 2008 alone, the steepest decline in activity since 2003. General aviation activity at consolidated traffic facilities (TRACONs) fell 6.3 percent, while the number of general aviation aircraft handled at FAA en route centers decreased by 7.6 percent.

Developing forecasts of aviation demand and activity levels is extremely challenging in times of national and global economic turmoil such as the conditions witnessed between 2007 and to the present. The decline in GA activity outlined in this section is expected to slow but still continue beyond 2014 and may extend deeper into the short term forecast period. A return to positive growth will only follow a strong and steady recovery of the national economy, which experts expect will continue into and beyond 2015.

3.4 Forecast Overview

The demand for aviation facilities is typically expressed in terms of based aircraft and aircraft operations. Preparation of aviation activity forecasts is essential in assessing the needs and requirements for future aviation development. AVO's aviation activity forecasts serve as an overall planning guide for identifying airport capacity needs and form the basis of preparing future airport alternatives. A number of aviation forecasts were reviewed in the process of preparing the aviation forecasts. The various forecasts depicted in this chapter differ in terms of the level of analysis, the regional area, and the forecasting methods utilized.

It is difficult to predict with a great deal of certainty year-to-year trend changes in a dynamic industry and troubled global economy while forecasting aviation activity 20 years into the future. The forecasts prepared in this chapter use 2011 as the baseline year, with projections extending to 2031, the end of the 20-year planning period. The methodologies and underlying assumptions that are used to prepare aviation demand projections for AVO included in the forecast analysis are discussed in the following sections.

The forecast analysis examines historical data, current developments, and recent aviation trends to provide updated GA forecasts for the following aviation activity:

Based aircraft and fleet mix

Total annual operations

Local and itinerant operations

Instrument approach operations

Peak Hour Airport operations

3.5 Forecast Process

The intent of the forecast chapter is to provide AVO with aviation demand forecasts to assess current and future capacities of the Airport. The forecast analysis comprises a bottom-up approach and applicable methodologies to predict forecasts at the airport level. A detailed explanation of the bottom-up approach and the forecast methodologies are provided in the following section.

3.5.1 Bottom-Up Forecast Approach

A bottom-up approach is used to prepare forecasts of GA aviation activity at AVO. Using this approach, forecasts are compiled on an individual basis and the aggregate results reflect the overall activity level of the airport. This approach involves analyzing historic activity and projecting activity levels that conform to the growth pattern established by each activity type. The resulting sum of the aviation activity is indicative of the future estimates of activity at the airport level.

A number of projection methodologies are applicable to the preparation of aviation forecasts using the bottom-up approach. AVO's forecasts are prepared using the results of four FAA recommended methodologies for master plan forecasting. To ensure that the forecasts prepared using this approach are stable, reasonable, and predictable, the methodologies are subject to multiple levels of consolidation. The average of these levels then forms the selected or preferred aviation forecast for the Airport.

The most reliable approach to estimating future aviation demand is through the utilization of one or more analytical techniques. Forecast methodologies used in preparing the AVO forecasts include:

- Trend line analysis
- Single and Multi-factor regression analysis
- Market share analysis
- Operations per based aircraft (OPBA) methodology

In some cases, additional forecast modifications were applied to the results of these methodologies based on short-term economic indicators for regional, state and national trends.

3.6 Existing Based Aircraft Data

The number of aircraft based at an airport is a primary forecast element and an indicator of all measurements of GA activity. The historic and forecast data from existing published forecasts are reviewed to prepare a consolidated set of based aircraft data. The reconciled data forms the basis from which AVO based aircraft forecasts are prepared. Three forecast methodologies were deployed to forecast based aircraft at AVO: Trend Line, Market Share, and Regression Analysis. The projections of based aircraft were later distributed into different classes of aircraft type to compile the mix of the aircraft fleet based at AVO. In this analysis, the anticipated fleet growth could be further stratified into classes to provide an introspective comparison of rates of increase in certain types of aircraft categories.

Historic and forecast based aircraft data evolved from an examination of historical airport records from AVO FBO/staff and a review of the following:

- FAA Terminal Area Forecast (TAF), 2011
- Florida Aviation System Plan (FASP), 2011
- AVO FBO and Staff Data, 2012
- FAA Airport Master Records (FAA Form 5010), 2011
- FAA Aerospace Forecasts, Fiscal Years 2012-2032

These documents were prepared at different time periods, making the baseline year data variable, and emphasizing the need for establishing a defined and documented set of base data from which future aviation activity trends could be projected. Before forecasting based aircraft, historical information was gathered and verified through the use of FAA TAF, FAA Form 5010 documentation and other aviation sources. These documents represent existing based aircraft numbers at AVO, as reported to the FAA from 2001 to 2011. To assist in establishing a historical trend and analysis comparison, historical based aircraft on a national, state, and regional basis were also collected from the FAA Aerospace Forecasts and the Florida Aviation System Plan (FASP).

In preparing accurate forecasts, consistency in data is important, and analyzing the historical trend is needed to check the accuracy of the data collected. Data discrepancies across sources for based aircraft are managed through screening of the data used, and all historic records of based aircraft data are reconciled for any apparent anomalies or missing records in the data. This is achieved by investigating any forecast errors that may be embedded in the data as potential outliers that are corrected to present a more realistic perspective of the historic based aircraft at each airport.

Table 3-1 shows the existing based aircraft forecasts for AVO, state of Florida, FAA southern region and the nation as a whole. As can be seen, there are a number of variations in the historical accounts of based aircraft at AVO, which result in diverging forecasts. Therefore, the FAA TAF, which is based upon reported airport data, with input from FBO and Airport staff is used to compile the reconciled historic data, thereby, establishing the reconciled historical baseline for all based aircraft forecast analyses for AVO as shown in **Table 3-2**.

Table 3-2 outlines the historic total based aircraft at the national, state, and FAA southern region levels. This integration builds in the aspect of historic growth trend of the market perspective; a relationship between based aircraft at the airport level and national, state, and regional levels respectively. The data is analyzed through factors driving and restraining the growth of based aircraft, with the historic growth trend and market perspective as guidelines. As can be noted from the reconciled based aircraft data in Table 3-2, AVO decreased from 61 to 48 based aircraft, a -2.37 percent average annual growth (AAG) from 2001 to 2011. However, it should be noted that based aircraft held stable at 61 from 2001 through 2007. The decrease between 2007 and 2009, when based aircraft stabilized at 48, is largely attributed to the severe recession of the US and global economy.

Based aircraft increased by an almost flat 0.23 percent AAG from 217,533 in 2001 to 222,520 in 2011 at the national level. Decreases in based aircraft were witnessed at the State and regional level, with a -1.48 percent AAG from 12,854 in 2001 to 11,071 in 2011 at the state level, and by -0.76 percent AAG from 33,557 in 2001 to 31,101 in 2011 in the FAA southern region.

3.6.1 FAA Terminal Area Forecast (TAF)

The 2011 TAF contains historical aviation activity data and FAA's forecasts for more than 460 airports receiving FAA contract tower and radar service. This database also includes projections for more than 3,000 other airports in the National Plan of Integrated Airport Systems (NPIAS). The forecasts, covering fiscal years 2011-2031, project activity of the four major users of the air traffic system: air carriers, air taxi and commuters, GA, and MIL. GA activity data is used for analysis purposes.

Since the forecasts provide an intermediate projection of various aviation activities, they play an integral role in the development of master plan forecasts. The FAA TAF (see Table 3-1) depicts historical data from 2001 through 2011 and estimates of based aircraft forecasts through the year 2031. According to the TAF, 61 aircraft were based at AVO in 2001. This number decreased to 48 aircraft in 2011. According to the TAF, historic based aircraft increased -1.33 percent AAG, -1.48 percent AAG and -0.76 percent AAG in the national, state and FAA southern region respectively. However, these negative growth rates are not expected to continue at the national and regional levels as the national economy continue to recover. The TAF predicts increases of 1.70 percent AAG and 1.55 percent AAG in national and FAA southern region based aircraft totals from 2011 to 2031. The TAF projects increases of 2.14 percent AAG in state based aircraft totals for the same period.

Since the TAF forecast shows no growth in based aircraft at AVO after 2011, it is used only as a reference in compiling historic airport data and a baseline guide for future forecasts. The TAF provides complete annual records of national, statewide and FAA southern region aircraft totals from 2001-2031 and is therefore selected for comparing national, statewide and regional market share data in the forecast analysis. Alternative data sources such as the Florida aviation system plan, AVO records and FAA Form 5010 have been added to the TAF data to provide indicators of the airport-level historical trends.

3.6.2 Florida Aviation System Plan (FASP), 2011

The FASP incorporates the traditional aviation system planning elements provided for in most state aviation system plans. However, the most recent FASP includes an analysis of the intermodal aspects of the transportation system and a strategic planning element that identifies strategic goals and the approaches, measurements and recommendations to achieve these goals. Activity forecasts for each airport in the state system are also included in the document and provide a general overview of the operating capacity available.

Table 3-1. Existing Based Aircraft Data (Existing Forecasts)

	Airport		National		FAA Southern Region	State
Year	AVO TAF	AVO FASP	FAA Aerospace Forecasts	TAF	TAF	TAF
	1	3	4	5	6	7
2001	61		217,533	187,037	33,557	12,854
2002	61		219,214	189,042	33,840	13,078
2003	61		220,895	190,386	34,135	13,334
2004	61		223,573	193,431	35,314	13,212
2005	61		224,257	197,464	36,028	13,152
2006	61		221,942	197,498	36,549	13,269
2007	61		231,606	200,064	36,312	13,170
2008	55		228,664	176,040	32,504	11,238
2009	48	61	223,876	177,875	32,692	10,624
2010	48	61	223,370	165,860	30,874	10,931
2011	**48**		**222,520**	**167,608**	**31,101**	**11,071**
2012	48		222,690	169,240	31,385	11,241
2013	48		222,985	203,534	36,723	13,418
2014	48	66	223,465	205,096	36,981	13,582
2015	48		224,070	206,079	37,281	13,765
2016	**48**		**224,720**	**208,313**	**37,569**	**13,935**
2017	48		225,490	210,193	37,904	14,140
2018	48		226,340	211,836	38,199	14,326
2019	48	71	227,305	213,551	38,506	14,528
2020	48		228,430	215,287	38,815	14,714
2021	**48**		**229,695**	**217,284**	**39,188**	**14,931**
2022	48		231,145	219,067	39,509	15,128
2023	48		232,740	220,973	39,858	15,336
2024	48		234,510	222,846	40,193	15,544
2025	48		236,435	224,632	40,529	15,765
2026	**48**		**238,430**	**226,722**	**40,914**	**15,994**
2027	48		240,570	228,780	41,298	16,223
2028	48		242,820	230,913	41,703	16,426
2029	48	82	245,200	233,050	42,120	16,716
2030	48		247,720	235,173	42,529	16,966
2031	**48**		**250,380**	**236,252**	**42,666**	**17,050**

Sources:
FAA Terminal Area Forecasts (TAF), 2011
Florida Aviation System Plan (FASP), 2011
FAA Aerospace Forecasts, 2012-2032
Avon Park, 2012

Notes:
Column 1, 2011 FAA Terminal Area Forecast (TAF) 2001-2032
Columns 3, FASP, 2008
Column 4, FAA Aerospace Forecasts 2012-2032
Column 5, FAA TAF National Based Aircraft 2001-2032
Column 6, FAA TAF based aircraft forecasts for Southern Region 2001-2032
Column 7, FAA TAF based aircraft forecasts state of Florida 2001-2032
Bold text represents cardinal forecas: years for this chapter
Dividing line indicates base year and forecast year for the existing forecasts

According to the FASP and as shown in Table 3-1, there were 61 aircraft based at AVO in 2009 and 2010. These are the only years reported and seem to reflect data provided in the FAA TAF in the previous years. Due to this difference with data reported in any other data source, and incomplete information coverage for the historic and forecast years, the FASP is used only as a reference for the development of this master plan's forecasts. Additionally, the FASP forecasts a fairly robust 2.14 percent AAG in based aircraft from 2010, the base year, to 2029, the forecast year. This growth rate appears to be high in comparison to the other existing forecast data sources.

Table 3-2. Historic Based Aircraft Data (Reconciled)

	Airport	National	FAA Southern Region	State
Year	AVO	FAA Aerospace Forecasts	TAF	TAF
	1	2	3	4
2001	61	217,533	33,557	12,854
2002	61	219,214	33,840	13,078
2003	61	220,895	34,135	13,334
2004	61	223,573	35,314	13,212
2005	61	224,257	36,028	13,152
2006	61	221,942	36,549	13,269
2007	61	231,606	36,312	13,170
2008	55	228,664	32,504	11,238
2009	48	223,876	32,692	10,624
2010	48	223,370	30,874	10,931
2011	48	222,520	31,101	11,071
AAG (%) 2001-2011	-2.37%	0.23%	-0.76%	-1.48%
2011 State Market Share	0.43%			

Sources:
Avon Park, 2012
Florida Aviation System Plan (FASP), 2008
FAA Form 5010, 2011
FAA Aerospace Forecasts, 2012-2032
FAA TAF, 2011

Notes:
Column 1, Historic data from Avon Park reports and FAA TAF
Column 2, data FAA Aerospace Forecasts 2012-2032
Column 3, TAF, for Southern Region aircraft data for years 2001-2032
Column 4, TAF, for statewide aircraft data for years 2001-2032

3.6.3 FAA Airport Master Record - FAA Form 5010

FAA Form 5010 data records from G.C.R. & Associates, Inc. was obtained and augmented additional data derived from the National Flight Data Center (NFDC). This data presents based aircraft information by type. The FAA Form 5010 is not always regularly updated and time between updates can vary. The historical Form 5010 data for AVO reported the same number of based aircraft from 2004 to 2011 as the FAA TAF. For this reason the Form 5010 data was used as a historical reference in conjunction with other data sources based aircraft data for AVO.

3.6.4 FAA Aerospace Forecasts, Fiscal Years 2012-2032

FAA Aerospace Forecasts – Fiscal Years 2012-2032 uses the economic performance of the U.S. as an indicator of future aviation industry growth. According to the FAA, the U.S. general aviation industry continued to decline through 2011 and is expected to continue, though less severe, in the near-term. Positive growth of general aviation, largely led by business jet aircraft activity, is expected over the long-term. As with commercial aviation, the general aviation industry has recently experienced significant reductions in business and recreational demand due to the national and global recession and volatile oil prices over the past several years. The U.S. GA fleet increased from approximately 217,533 in 2001 to 222,520 aircraft in the forecast base year of 2011. However, GA activity at FAA facilities decreased 2.3 percent in 2011 as compared to 2010.

According to the FAA forecasts, the active GA fleet is expected see low growth in the near term with a return to moderate positive growth in the intermediate- to long-term range. The largest AAG percentage forecast over this time is in turbine jet aircraft at 4.0 percent AAG. This indicates strong growth in corporate and business activity, which is expected to occur in conjunction with the continued recovery of the national and global economies and continued increases in security and air traffic delays at the nation's commercial service airports.

Since the FAA Aerospace forecasts are updated annually, they best represent the total aircraft in the nation and the overall anticipated impact on aviation from national and global economic conditions. The total national based aircraft forecasts are presented in Table 3-1.

3.7 Based Aircraft Forecast Analyses

The analyses presented in this section represent the initial integration of the three forecast methodologies. The analyses are produced from historical observations based on existing forecasts of based aircraft. These data are merged, compiled, and analyzed to obtain the reconciled based aircraft data for AVO.

3.7.1 Trend Line Analysis

The trend line analysis returns values along the linear trend of historical based aircraft. In this analysis, a line of best fit is estimated by adjusting a straight line (using the method of least squares) to the annual historic based aircraft. The results of adjusting a straight line fit of the data for the historic period is presented in **Table 3-3**. A trend line projection of based aircraft was prepared using historic based aircraft at AVO and the trend line determined for the historical period projects the data over the forecast period.

The historic trend line is projected through the year 2031 for AVO. However, due to the historical trend of decreasing numbers of based aircraft, the trend line forecast naturally continues that trend forward into the forecast period. Thus, based aircraft are projected to decrease from 48 in 2011 to 21 in the year 2031 at -4.04 percent AAG, as shown in **Table 3-3**. This continued and aggressive rate of decrease is not realistic and thus, the trend line analysis for AVO is not deemed a viable forecast for use in determining future growth of based aircraft at the Airport.

3.7.2 Market Share Analysis

As stated previously, this forecast was determined by using the total market share of historical based aircraft at AVO in relation to historical national, state, and regional based aircraft totals. Three different airport projections were developed based on AVO's share of these aircraft fleets. This allowed the future based aircraft for AVO to be estimated through the year 2031. The ratio of the average historic based aircraft is computed at the airport and national, state, and regional market-share percentages. This approach assumes the growth at AVO to be proportionate to the aircraft fleet of the nation, state, and region since 2001. Therefore, as market shares are held constant over the forecast period, the resulting increases in the based aircraft fleet occur based on the growth rates of the FAA Aerospace and TAF forecasts.

As shown in **Table 3-4**, the three-market share forecasts vary depending upon the ratio of based aircraft at the national, state, and regional forecast levels. In 2011, AVO's share of the estimated national, regional, and state based aircraft was 0.022 percent, 0.13 percent, and 0.35 percent respectively.

Using this methodology, AVO based aircraft increase from 48 in 2011 to 65, 76, or 87 aircraft by the end of the planning period for national, regional, and state respectively. This depicts the moderate level of the forecasts. Taking a "middle of the road" outlook, which is achieved by estimating the average, or median value of each projection, closes these differences. According to the average market share forecast, AVO based aircraft are forecast to increase by 2.29 percent AAG, adding 28 aircraft total over the planning period. In 2031, AVO is forecast to host 76 based aircraft. Using the average market share forecast, AVO's share of national, regional, and state based aircraft is 0.030 percent, 0.173 percent, and 0.43 percent respectively, in 2031.

Table 3-3. Based Aircraft Trend Line Analysis

		Airport	
	Year	AVO	FAA TAF
		1	2
Historic	2001	61	61
	2002	61	61
	2003	61	61
	2004	61	61
	2005	61	61
	2006	61	61
	2007	61	61
	2008	55	55
	2009	48	48
	2010	48	48
	2011	**48**	**48**
Forecast	2012	48	48
	2013	47	48
	2014	46	48
	2015	44	48
	2016	**43**	**48**
	2017	41	48
	2018	40	48
	2019	38	48
	2020	37	48
	2021	**35**	**48**
	2022	34	48
	2023	33	48
	2024	31	48
	2025	30	48
	2026	**28**	**48**
	2027	27	48
	2028	25	48
	2029	24	48
	2030	22	48
	2031	**21**	**48**
	AAG (%) 2001-2011	-2.37%	-2.37%
	AAG (%) 2011-2031	-4.04%	0.00%

Source:
Avon Park, 2012
FAA Aerospace Forecasts, 2012-2032
FAA Form 5010, 2011
FAA TAF, 2011
CDM Smith Analyss, 2012

Notes:
Column 1, Forecast data from CDM Smith trend line analysis using 2001-2011 data.
Column 2, Forecast based aircraft for AVO using currert FAA TAF to 2031
Dividing line indicales base year and forecast year for the existing forecasts

Table 3-4. Based Aircraft Market Share Analysis

		National Market Share		FAA Southern Region Market Share		State Market Share		Average Market Share
	Year	AVO	FAA Aerospace Forecasts	AVO	FAA TAF	AVO	FAA TAF	AVO
		1	2	3	4	5	6	7
Historic	2001	61	217,533	61	36,028	61	13,152	61
	2002	61	219,214	61	36,549	61	13,269	61
	2003	61	220,895	61	36,312	61	13,170	61
	2004	61	223,573	61	32,504	61	11,238	61
	2005	61	224,257	61	32,692	61	10,624	61
	2006	61	221,942	61	30,874	61	10,931	61
	2007	61	231,606	61	31,101	61	11,071	61
	2008	55	228,664	55	31,385	55	11,241	55
	2009	48	223,876	48	36,723	48	13,418	48
	2010	48	223,370	48	36,981	48	13,582	48
	2011	**48**	**222,520**	**48**	**37,281**	**48**	**13,765**	**48**
Forecast	2012	58	222,690	65	37,569	68	13,935	64
	2013	58	222,985	66	37,904	69	14,140	64
	2014	58	223,465	66	38,199	70	14,326	65
	2015	59	224,070	67	38,506	71	14,528	66
	2016	**59**	**224,720**	**67**	**38,815**	**72**	**14,714**	**66**
	2017	59	225,490	68	39,188	73	14,931	67
	2018	59	226,340	68	39,509	74	15,128	67
	2019	59	227,305	69	39,858	75	15,336	68
	2020	60	228,430	70	40,193	76	15,544	69
	2021	**60**	**229,695**	**70**	**40,529**	**77**	**15,765**	**69**
	2022	60	231,145	71	40,914	78	15,994	70
	2023	61	232,740	71	41,298	79	16,223	70
	2024	61	234,510	72	41,703	80	16,426	71
	2025	62	236,435	73	42,120	81	16,716	72
	2026	**62**	**238,430**	**74**	**42,529**	**83**	**16,966**	**73**
	2027	63	240,570	74	42,666	83	17,050	73
	2028	63	242,820	74	43,006	84	17,258	74
	2029	64	245,200	75	43,346	85	17,465	75
	2030	65	247,720	76	43,686	86	17,673	75
	2031	**65**	**250,380**	**76**	**44,026**	**87**	**17,880**	**76**
	AAG (%) 2001-2011	-2.37%	0.23%	-2.37%	0.34%	-2.37%	0.46%	-2.37%
	AAG (%) 2011-2031	1.53%	0.59%	2.32%	0.83%	3.02%	1.32%	2.29%

Source:
Avon Park, 2012
Florida Aviation System Plan (FASP), 2011
FAA Form 5010, 2011
FAA Aerospace Forecasts, 2012-2032
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, National market share forecast for AVO
Column 2, FAA Aerospace Forecasts 2012-2032
Column 3, Regional market share forecast for AVO
Column 4, FAA TAF for Southern Region based aircraft totals
Column 5, State market share forecast for AVO
Column 6, FAA TAF for State of Florida based aircraft totals
Column 7, Selected market share forecast for AVO based on national, regional and state market share analyses
Dividing line indicates base year and forecast year for the existing forecasts

3.7.3 Regression Analysis

Based aircraft are also projected using single and multi-factor regression analyses, which refer to a group of techniques for studying the relationships among variables over time. Multiple regression analysis is used to estimate models to describe the distribution of a response variable, in this case based aircraft, with the help of a number of predictors such as socio-economic data. A function of the analysis is to search for predictor variables that help to explain significant variation in the response variable. The relationship is stated as the correlation between such factors as growth in population and growth in the number of based aircraft. For this method of forecasting fleet change, three socio-economic indicators including; population, per capita income, and employment, for the national, state, and local county levels were ascertained through accredited sources that publish this type of data as well as forecast the indicators over the long term.

Presented in **Table 3-5,** these independent variables are selected to show the closest relationship to the dependent variable or based aircraft. The Airport's historic data is subject to a thorough analysis of the historical relationship of the variables against the independent variables and tested to select the indicators with the highest measure of forecast reliability. The measure for the reliability of forecasts obtained through regression analysis is (R-Squared - R^2), or the coefficient of correlation. The closer the value of this coefficient is to one (or 100 percent), the more reliable the forecast. The coefficient is a measure of the activity to be forecasted (such as based aircraft or aircraft operations) and other variables known or believed to influence the activity. Conducting a meaningful analysis of the relationship between aviation activity and social or economic indicators requires consistent and reliable historical data for all variables.

A regression analysis using this forecasting method resulted in a forecast with a high growth rate similar to that seen in the socioeconomic data for per capita income levels. Using this forecast method, AVO based aircraft increased at a rate of 5.01 percent AAG, resulting in an increase in aircraft from 61 in 2011 to 128 by 2031. The growth in based aircraft is explained by growth in the socio-economic indicators and the forecasts can be considered fairly reliable since the (R^2) values are in the upper quartile, which suggests a strong correlation between local socioeconomic data and based aircraft at AVO.

Table 3-5. Based Aircraft Regression Analysis

		Airport	Population			Per Capita Income ($)			Total Employment		
	Year	AVO	United States	Florida	County	United States	Florida	County	United States	Florida	County
		1	2	3	4	5	6	7	8	9	10
Historic	2001	61	284,968,955	16,356,970	88,510	$31,157	$29,804	$21,514	165,510,200	8,917,154	32,598
	2002	61	287,625,200	16,689,370	89,939	$31,481	$30,463	$22,347	165,063,100	9,055,999	34,011
	2003	61	290,107,900	17,004,090	90,943	$32,295	$31,241	$22,784	166,019,500	9,286,029	36,188
	2004	61	292,805,300	17,415,320	93,079	$33,909	$33,463	$23,658	169,026,700	9,661,601	36,573
	2005	61	295,526,600	17,842,040	95,614	$35,452	$35,489	$24,675	172,551,400	10,087,920	37,559
	2006	61	298,379,900	18,166,990	97,788	$37,726	$37,996	$26,284	176,124,600	10,407,350	39,182
	2007	61	301,231,200	18,367,840	99,023	$39,506	$39,256	$27,498	179,899,600	10,577,330	39,548
	2008	55	304,094,000	18,527,310	99,568	$40,712	$39,909	$27,935	179,610,100	10,304,800	38,672
	2009	48	306,771,500	18,652,640	98,956	$39,665	$38,725	$28,491	173,809,200	9,840,251	37,137
	2010	48	309,349,700	18,843,330	98,700	$40,778	$39,579	$29,901	172,936,000	9,780,200	37,023
	2011	**48**	**312,308,200**	**19,139,010**	**102,133**	**$42,702**	**$41,022**	**$30,309**	**173,400,700**	**9,825,554**	**36,332**
Forecast	2012	49	315,387,600	19,441,900	105,597	$43,881	$41,903	$30,963	175,736,300	9,983,574	37,210
	2013	52	318,515,700	19,747,640	109,070	$45,408	$43,245	$31,998	178,104,400	10,159,290	38,166
	2014	55	321,672,200	20,055,040	112,547	$47,184	$44,888	$33,281	180,504,600	10,337,530	39,143
	2015	57	324,847,000	20,363,490	116,024	$49,161	$46,764	$34,758	182,936,800	10,518,380	40,139
	2016	**61**	**328,038,800**	**20,672,930**	**119,502**	**$51,316**	**$48,834**	**$36,401**	**185,401,700**	**10,701,880**	**41,160**
	2017	64	331,274,200	20,985,070	122,992	$53,634	$51,078	$38,195	187,899,700	10,888,010	42,199
	2018	67	334,525,100	21,298,150	126,484	$56,119	$53,495	$40,140	190,431,700	11,076,990	43,264
	2019	71	337,787,900	21,611,970	129,977	$58,774	$56,088	$42,240	192,997,600	11,268,500	44,355
	2020	75	341,069,500	21,926,980	133,474	$61,607	$58,861	$44,501	195,598,100	11,462,850	45,463
	2021	**79**	**344,345,100**	**22,241,600**	**136,965**	**$64,631**	**$61,828**	**$46,935**	**198,233,500**	**11,660,040**	**46,601**
	2022	83	347,639,500	22,557,420	140,462	$67,854	$64,997	$49,550	200,904,700	11,860,070	47,756
	2023	88	350,936,600	22,873,440	143,958	$71,292	$68,385	$52,362	203,611,600	12,062,960	48,945
	2024	93	354,237,600	23,189,710	147,453	$74,960	$72,008	$55,385	206,355,100	12,268,800	50,155
	2025	98	357,547,500	23,506,570	150,949	$78,873	$75,880	$58,636	209,135,600	12,477,530	51,391
	2026	**103**	**360,842,200**	**23,822,430**	**154,438**	**$83,019**	**$79,993**	**$62,108**	**211,935,600**	**12,689,340**	**52,656**
	2027	109	364,127,100	24,137,650	157,920	$87,412	$84,358	$65,816	214,809,400	12,904,110	53,946
	2028	115	367,391,100	24,451,480	161,391	$92,066	$88,992	$69,775	217,703,800	13,121,970	55,263
	2029	115	370,658,400	24,765,510	164,862	$96,992	$93,907	$74,000	220,637,200	13,342,970	56,608
	2030	121	373,924,300	25,079,440	168,330	$102,208	$99,121	$78,507	223,610,100	13,567,100	57,982
	2031	**128**	**377,175,500**	**25,392,370**	**171,789**	**$107,734**	**$104,656**	**$83,320**	**226,622,900**	**13,794,450**	**59,389**
	AAG (%) 2001-2011	-2.37%	0.92%	1.58%	1.44%	3.20%	3.25%	3.49%	0.47%	0.97%	1.09%
	AAG (%) 2011-2031	5.01%	0.95%	1.42%	2.63%	4.74%	4.79%	5.19%	1.35%	1.71%	2.49%

Source:
Avon Park, 2012
Woods and Poole Economics, Inc., 2012
FAA Form 5010, 2011
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Dividing line indicates base year and forecast year for the existing forecasts
Column 1, Multiple regression analysis for AVO
Columns 2 - 4, Population data
Columns 5 - 7, Per capita income data
Columns 8 - 10, Employment data

3.7.4 Selected Based Aircraft Forecast

The short-term outlook for AVO indicates that weaker than normal demand in based aircraft will continue with the slow recovery of the national economy. Recent growth in the economy will be slow to impact the GA industry as a short lag is anticipated before a full rebound to positive growth can be realistically expected.

Table 3-6 depicts the results of each of the three forecast methodologies discussed previously, as well as an average and market adjusted forecast that was developed from the previous forecast results. The average forecast was developed by averaging the results of the market share and regression analysis forecasts to develop a "middle of the road" projection of based aircraft. The market adjusted forecast utilized an average of the published FAA TAF growth rates for the state and southeast region and projected based aircraft for AVO over the forecast period. Since two forecast models show unrealistic growth, either very low or very high, the market forecast was utilized and "adjusted" to depict no change in actual based aircraft for 2012 while the local, state and national economies continue to recover. This market adjusted forecast represents a more realistic forecast based on actual market conditions and local and regional growth rates. Positive growth was then maintained for the remainder of the forecast period at an AAG of 1.41 percent. The end result is a forecast that projects an increase in based aircraft from 48 in 2011 to 63 in 2031.

The four positive growth forecasts presented in Table 3-6 are based on the expectation that modest growth in the number of based aircraft will occur regardless of hangar development. The results of the different projections developed yielded different average annual growth rates for AVO. These percentages were -4.04 percent AAG based on the trend-line forecast, 2.32 percent AAG based on the forecast of GA market share, 5.01 percent AAG based on the regression analysis, 1.00 percent based on the average of all viable forecasts and 1.41 percent AAG based on the market adjusted forecast discussed previously. Of these, the market adjusted forecast appears to provide the most realistic projection of growth based on a continually weaker than normal demand in the short-term followed by modest growth in the long-term, largely guided by a stabilization and recovery of the local, state and national economies.

The selected based aircraft forecast for AVO is shown in **Table 3-7**. Based on this forecast, based aircraft at AVO are expected to increase at 1.41 percent, which represents the level of growth that is reasonable and could be expected over the planning period given current economic conditions. Further, this forecast is in line with FAA guidance relative to forecast development, review and approval. At this level of growth, the Airport can be expected to add an additional 15 aircraft to the existing 48 based aircraft, increasing the fleet total to 63 based aircraft by the end of the planning period.

Table 3-6. Based Aircraft Forecast Distribution

	Year	Trend Line Analysis	Market Share Analysis	Regression Analysis	Forecast Average	Market Adjusted
		1	2	3	4	5
Historic	2001	61	61	61	61	61
	2002	61	61	61	61	61
	2003	61	61	61	61	61
	2004	61	61	61	61	61
	2005	61	61	61	61	61
	2006	61	61	61	61	61
	2007	61	61	61	61	61
	2008	55	55	55	55	55
	2009	48	48	48	48	48
	2010	48	48	48	48	48
	2011	**48**	**48**	**48**	**48**	**48**
Forecast	2012	48	64	49	49	48
	2013	47	64	52	49	49
	2014	46	65	55	49	49
	2015	44	66	57	49	50
	2016	**43**	**66**	**61**	**50**	**51**
	2017	41	67	64	50	51
	2018	40	67	67	51	52
	2019	38	68	71	51	53
	2020	37	69	75	52	54
	2021	**35**	**69**	**79**	**53**	**54**
	2022	34	70	83	53	55
	2023	33	70	88	54	56
	2024	31	71	93	54	57
	2025	30	72	98	55	58
	2026	28	73	103	56	58
	2027	27	73	109	56	59
	2028	25	74	115	57	60
	2029	24	75	115	57	61
	2030	22	75	121	58	62
	2031	**21**	**76**	**128**	**59**	**63**
	AAG (%) 2001-2011	-2.37%	-2.37%	-2.37%	-2.37%	-2.37%
	AAG (%) 2011-2031	-4.04%	2.32%	5.01%	1.00%	1.41%

Source:
Avon Park, 2012
Woods and Poole Economics, Inc., 2012
FAA Form 5010, 2011
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Columns 1, Trend line analysis forecast
Columns 2, Market share analysis forecast
Columns 3, Regression analysis forecast
Column 4, Average forecast of columns 1 through 3
Column 5, Market adjusted forecast based on market and FAA TAF forecast growth rates
Bold text represents cardinal forecast years for this chapter
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-7. Selected Based Aircraft Forecasts

		Selected Forecast	TAF	
	Year	AVO	TAF	Percent Difference
		1	2	3
Historic	2001	61	61	0.00%
	2002	61	61	0.00%
	2003	61	61	0.00%
	2004	61	61	0.00%
	2005	61	61	0.00%
	2006	61	61	0.00%
	2007	61	61	0.00%
	2008	55	55	0.00%
	2009	48	48	0.00%
	2010	48	48	0.00%
	2011	**48**	**48**	**0.00%**
Forecast	**2016**	**51**	**48**	**5.76%**
	2021	**54**	**48**	**13.44%**
	2026	**58**	**48**	**21.67%**
	2031	**63**	**48**	**30.49%**
	AAG (%) 2001-2011	-2.37%	-2.37%	
	AAG (%) 2011-2031	1.41%	0.00%	

Source:
Avon Park, 2012
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Selected forecast
Column 2, FAA TAF data for AVO
Column 3, Percentile difference between selected forecasts and FAA TAF
Dividing line indicates base year and forecast year for the existing forecasts

3.7.5 Based Aircraft Fleet Mix Forecast

The FAA divides based aircraft into the following categories: single-engine piston, multi-engine piston, turbo prop, jet, rotorcraft, and other. Aircraft by type and forecast year are presented in **Table 3-8**. Overall, aircraft by type are expected to increase or remain consistent at AVO during the forecast period. The projected growth in single-engine and multi-engine piston aircraft is in-line with the anticipated growth of this segment nationwide, as forecast by the FAA. The percentage of multi-engine (including turboprops), and helicopters is expected to increase as a part of the total based aircraft population at the Airport. The percentage of business jets is expected to see the largest growth over the forecast period, which is supported by the anticipated nationwide growth in demand for corporate aviation services and reflects the target market segment for AVO.

AVO's fleet of single-engine piston aircraft and multi-engine piston aircraft is expected to increase by 1.24 percent and 1.39 percent respectively. AVO's fleet of turbo prop aircraft and jet aircraft is expected to increase by 2.90 percent and 4.00 percent respectively. AVO's fleet of helicopters is expected to increase by 2.10 percent, and other aircraft are expected to remain the same over the forecast period as presented in Table 3-8.

By 2031, single-engine aircraft are anticipated to comprise approximately 75.2 percent of the total based aircraft at AVO, with approximately 15.8 percent multi-engine piston, 5.8 percent turbo-prop aircraft, approximately 1.5 percent jet aircraft and 1.6 percent helicopters.

Table 3-8. Based Aircraft Fleet Mix Using Selected Forecast

		Piston		Turbine		Other		
	Year	SE	ME	TP	JE	HE	OT	TOTAL
Historic	2001	46	10	4	1	1	0	61
	2002	46	10	4	1	1	0	61
	2003	46	10	4	1	1	0	61
	2004	46	10	4	1	1	0	61
	2005	46	10	4	1	1	0	61
	2006	46	10	4	1	1	0	61
	2007	46	10	4	1	1	0	61
	2008	41	9	3	1	1	0	55
	2009	36	8	2	1	1	0	48
	2010	36	8	2	1	1	0	48
	2011	36	8	2	1	1	0	48
Forecast	2012	36	8	2	1	1	0	48
	2013	37	8	2	1	1	0	49
	2014	37	8	2	1	1	0	49
	2015	38	8	2	1	1	0	50
	2016	38	**9**	**2**	**1**	**1**	**0**	51
	2017	38	9	2	1	1	0	51
	2018	39	9	3	1	1	0	52
	2019	39	9	3	1	1	0	53
	2020	40	9	3	1	1	0	54
	2021	41	**9**	**3**	**1**	**1**	**0**	54
	2022	41	9	3	1	1	0	55
	2023	42	9	3	1	1	0	56
	2024	43	9	3	1	1	0	57
	2025	42	10	3	1	1	0	58
	2026	43	**10**	**3**	**1**	1	**0**	58
	2027	44	10	3	1	1	0	59
	2028	44	10	3	1	1	0	60
	2029	45	10	3	2	1	0	61
	2030	46	10	4	2	1	0	62
	2031	46	**10**	**4**	**2**	**1**	**0**	63
	Mix (%)	75.22%	15.80%	5.84%	1.55%	1.59%	0.00%	**100.00%**
	AAG (%) 2001-2011	-2.37%	-2.37%	-5.31%	-2.37%	-2.37%	0.00%	-2.37%
	AAG (%) 2011-2031	1.24%	1.39%	2.90%	4.00%	2.10%	0.00%	1.41%

Source:
Avon Park, 2012
FAA Aerospace Forecasts, 2012-2032
FAA Form 5010, 2011
FAA TAF, 2011
CDM Smith Analysis, 2012

Legend:
SE, Single-engine aircraft
ME, Multi-engine aircraft
TP, Turboprop aircraft
JE, Jet aircraft
HE, Helicopter
OT, Other aircraft

3.8 Existing Aircraft Operations Data

A comprehensive analysis of the historic and forecast aircraft data is established from historical Airport records, airport/FBO staff, online government data warehouses, and a review of the following:

- TAF, 2011
- FASP, 2011
- FAA Form 5010, 2011
- FAA Aerospace Forecasts, Fiscal Years 2012-2032
- FAA Air Traffic Activity Data System (ATADS) 2001 - 2011

In order to maintain continuity in the historic data and to develop reasonable aviation forecasts, historic data for the missing years is reconciled by comparing datasets from multiple sources and assuming a linear trend between adjacent years. Data consolidation across multiple resources was used for reconciling differences, and this progression is charted to reach a preferred forecast of the demand that may be expected during the planning period. **Table 3-9** presents existing GA operations data and **Table 3-10** presents the reconciled historic GA operations data.

Table 3-9 shows the existing GA operations data and forecasts for AVO. As depicted, historical data for AVO is either missing or has largely been held constant over the entire 10 year historical period. Therefore, the FAA TAF, FAA Form 5010 and FAA ATADS data with confirmation of the 2011 base year by Airport/FBO staff was used to reconcile historic data and assign the historical baseline for the GA operations forecast analyses for AVO.

Table 3-10 represents the reconciled historic GA operations data for AVO and FAA historic GA operations at the national, FAA southern region and state levels. The historic data was compared with various sources and integrated in the preparation of the forecasts of GA activity for AVO. From the reconciled data in Table 3-10, GA operations at AVO decreased from 42,121 in 2001 to 36,250 in 2004 but then saw a slight increase to 37,000 in 2005. Operations then decreased to a low of 32,400 in 2011. In 2011, AVO had 0.41 percent of all GA operations in the state. The state lost an estimated 1,739,675 total GA operations for an AAG of -1.99 percent over the historic period from 2001 to 2011.

Table 3-9. Existing Annual Operations Data

	Airport		National		FAA Southern Region	State
Year	AVO TAF	AVO FASP	FAA Aerospace Forecasts	TAF	TAF	TAF
	1	2	3	4	5	6
2001	32,400		53,527,000	100,313,225	25,895,985	9,572,985
2002	32,400		52,535,500	99,791,457	25,698,721	9,439,630
2003	32,400		51,544,000	98,536,910	25,108,174	8,989,951
2004	32,400		50,552,500	98,645,064	25,258,831	8,929,456
2005	32,400		49,561,000	96,778,455	25,460,822	9,086,918
2006	32,400		47,815,800	95,078,100	24,790,771	8,843,550
2007	32,400		47,518,800	94,891,794	24,924,809	9,012,524
2008	32,400		45,136,500	91,955,405	24,651,669	8,819,242
2009	32,400	32,400	40,125,300	86,091,048	23,032,003	8,162,548
2010	32,400		38,597,400	83,586,972	22,443,234	7,662,194
2011	**32,400**		**37,873,800**	**82,810,828**	**22,475,871**	**7,833,310**
2012	32,400		37,238,700	82,414,104	22,486,859	7,870,181
2013	32,400		37,479,100	82,839,177	22,645,040	7,948,091
2014	32,400	32,400	37,790,300	83,337,712	22,828,845	8,033,064
2015	32,400		38,096,500	83,832,200	23,019,605	8,122,884
2016	**32,400**		**38,397,400**	**84,321,055**	**23,207,370**	**8,212,864**
2017	32,400		38,661,700	84,776,380	23,374,154	8,298,452
2018	32,400		38,930,500	85,239,538	23,545,117	8,385,853
2019	32,400	33,550	39,200,400	85,706,997	23,714,138	8,475,083
2020	32,400		44,350,600	86,182,658	23,886,654	8,566,203
2021	**32,400**		**39,753,000**	**86,664,930**	**24,062,743**	**8,659,260**
2022	32,400		40,036,000	87,155,828	24,242,511	8,754,307
2023	32,400		40,323,600	87,655,064	24,426,017	8,851,386
2024	32,400	34,741	40,616,000	88,162,888	24,613,349	8,950,552
2025	32,400		40,913,100	88,679,586	24,804,609	9,051,862
2026	**32,400**		**41,215,100**	**89,205,837**	**24,999,917**	**9,155,374**
2027	32,400		41,522,200	89,741,592	25,199,352	9,261,136
2028	32,400		41,834,600	90,287,095	25,402,983	9,369,198
2029	32,400		42,152,100	90,842,496	25,610,949	9,479,634
2030	32,400		42,474,700	91,407,625	25,823,339	9,592,504
2031	**32,400**		**42,803,400**	**91,983,191**	**26,040,252**	**9,707,857**

Sources:
FAA Terminal Area Forecasts (TAF), 2011
Florida Aviation System Plan (FASP), 2011
FAA Aerospace Forecasts, 2012-2032
Avon Park, 2012

Notes:
Column 1, 2011 FAA Terminal Area Forecast (TAF) 2001-2031
Column 2, FASP, 2011
Column 3, FAA Aerospace Forecasts, National GA activity at towered airports 2012-2032
Column 4, FAA TAF National GA Activity, 2001-2031
Column 5, FAA TAF GA Activity for Southern Region 2001-2031
Column 6, FAA TAF GA Activity for state of Florida 2001-2031
GA Operations include air taxi and military operations
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-10. Historic Annual Operations Data (Reconciled)

	Airport	National	FAA Southern Region	State
Year	AVO	FAA Aerospace Forecasts	TAF	TAF
	1	2	3	4
2001	42,121	53,527,000	25,895,985	9,572,985
2002	40,414	52,535,500	25,698,721	9,439,630
2003	38,707	51,544,000	25,108,174	8,989,951
2004	36,250	50,552,500	25,258,831	8,929,456
2005	37,000	49,561,000	25,460,822	9,086,918
2006	36,680	47,815,800	24,790,771	8,843,550
2007	35,760	47,518,800	24,924,809	9,012,524
2008	34,840	45,136,500	24,651,669	8,819,242
2009	34,168	40,125,300	23,032,003	8,162,548
2010	32,400	38,597,400	22,443,234	7,662,194
2011	32,400	37,873,800	22,828,845	7,833,310
AAG (%) 2001-2011	-2.59%	-3.40%	-1.25%	-1.99%
2011 State Market Share	0.41%			

Source:
Avon Park, 2012
FAA Aerospace Forecasts, 2012-2032
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Historic annual operatons data reconciled to include operations estimate from FBO
Column 2, FAA Aerospace Forecasts 2012-2032
Column 3, FAA TAF for Southern Region GA operations
Column 4, FAA TAF for statewide GA operations
Operations include Air Taxi and Military activity

3.8.1 2011 FAA Terminal Area Forecast (TAF)

TAFs are prepared by the FAA to meet planning needs of their offices that are concerned with future traffic levels at the nation's airport facilities. FAA TAF (see Table 3-9) depicts GA operations data from 2001 to 2031.

As shown in Table 3-9, FAA TAF data shows no increase in AVO operations for the entire historical period. Further, the FAA TAF holds operations at a constant 32,400 operations for the forecast period to 2031. Based on this the FAA TAF for AVO is not considered a viable option when determining forecast growth at AVO. However, the FAA TAF also presents historical and forecast data on the national, regional and state levels. The data sets for these areas present complete data sets and indicate a generally declining number of operations between 2001 and 2011 in all areas. GA operations generally experienced a -1.90, -1.41 and -1.99 percent AAG for the nation, southern region and state.

3.8.2 Florida Aviation System Plan (FASP)

The 2008 FASP is a comprehensive review of the state's airport system. Data from the FASP provides a broad blueprint for GA activity for select years. The latest FASP was based on the GA operations data in 2009. GA operations data at AVO for every year prior to 2009 is not published in the report.

The forecast growth rates associated with this version of the system plan appear to be low for AVO. Annual GA operations forecasted for 2024 are 34,741, as shown in Table 3-9, which represents a 0.5 percent AAG over the period. Still, historic and forecast data contained in the system plans exceed the levels reported by the TAF. Since the FASP provides a strategic perspective on the overall trend of GA activity at airports in the state, it is therefore used as a barometer for evaluating the reasonableness of the GA aircraft operations historic and future growth rates and trends at AVO only.

3.8.3 FAA Form 5010

FAA Form 5010 is created by the FAA to document basic information about airports and is updated as state officials inspect the airports. Under a contractual agreement with the FAA through the National Association of State Aviation Officials (NASAO), state officials perform annual updates of the FAA Form 5010 survey. Under this contract, FAA Form 5010 data is collected and updated. This activity promotes aviation safety through timely reporting of information and current conditions at the state's public-use landing facilities. The records contain information on individual airports, including data on annual based aircraft and operations.

The historical data for AVO recorded on the FAA Master Record, Form 5010, presented the same operational data from 2006 to 2011, reporting 32,400 total annual operations for each year. Since the FAA Form 5010 operational data appears not to have been regularly updated and merely mirrors the TAF data, the overall usefulness of this source is diminished.

3.8.4 FAA Aerospace Forecasts

In March 2012, the FAA's Office of Aviation Policy and Plans released their fiscal year 2012-2032 Aerospace Forecasts. The forecasts predict a slight decline in most aviation activity for 2012 followed by stabilization and a small rebound to positive growth by fiscal year 2013. On a broad level, the plan anticipates that aviation activity across the nation can be expected to return to positive growth by the end of the short-term period (0-5 years), following recovery of the economy from the national and global downturn. However, as a result of the events of the severe economic recession, this year's forecast predicts conservative growth over the planning period as economic recovery is expected to be slow (see Table 3-9).

According to the FAA forecasts, historic U.S. aircraft operations decreased at -3.40 percent AAG from 53,527,000 operations in 2001 to 37,873,800 operations in 2011. These forecasts provide an important benchmark at the national level, which is particularly important in the preparation of the market share analysis of GA operations at AVO. A history of national GA operations from 2001-2011 using the FAA Aerospace Forecasts is included in the reconciled dataset depicted in Table 3-10.

3.8.5 Air Traffic Activity Data System (ATADS)

ATADS provides highly-detailed, query-based access to air traffic activity for airports and states, 1990-present. ATADS is the official source of historical air traffic operations for center, airport, instrument, and approach counts. Daily, monthly, and annual counts are available for airports grouped nationally, statewide, and regionally. This database system is the official source of historical air traffic activity for FAA Air Route Traffic Control Centers (ARTCCs) and FAA and contract towered airports, as well as counts of services provided by FAA flight service stations (FSSs). Since the ATADS reports are presumed to be accurate, the GA operations data for the airport, in conjunction with base year information provided by airport/FBO staff, were used in the preparation of the historic reconciled information, as shown in Table 3-10.

GA operations data from ATADS was verified against other data records to create a historical record of activity. According to the ATADS and other data sources, operations at AVO decreased from 42,121 in 2001 to 36,250 in 2004 but then saw an increase to 37,000 in 2005. Operations then decreased further to 32,400 in 2011.

3.9 Aircraft Operations Forecast Analyses

As with GA based aircraft, the aircraft operations analyses represent the initial state for the integration of the forecast methodologies. The analyses are produced from historical observations based on existing published forecasts of annual GA operations and, in some cases, forecast based aircraft. These data are merged, compiled, and analyzed to obtain the reconciled operations data for AVO.

3.9.1 Trend Line Analysis

The trend line analysis is similar to that methodology used in the based aircraft forecast. A trend pattern exists when there is an increase or decrease in the historical data. Aviation activities such as GA operations tend to follow a trend pattern in their time series of historic data. Aviation data

tends to be cyclical and its historic trend can be used as a method to predict activity at an airport. For example, an airport with a linear increasing trend can equate to an airport with increasing GA operations, or to an airport in an expanding market retaining its share of the overall market.

GA operations at AVO have had a period of continual decline over much of the historic period, with only one brief period of increases in operations. Further, the overall trend at AVO, when considering the AAG growth over the historic record, has been one of modest decline. Though, this trend is not expected to continue throughout the planning period, it does have a direct and significant impact on the trend line analysis. As shown in **Table 3-11**, the results of this methodology indicate operations at AVO are anticipated to decrease at roughly -4.36 percent AAG, from 32,400 in 2011 to 13,291 by the end of the planning period. These results are not realistic and are a direct result of the methodologies' inability to account for anomalies and significant outside market impacts on growth and adjust for such changes. Thus, the forecast resulting from the trend line analysis is not a feasible forecast for use in determining the projected future activity at AVO.

3.9.2 Market Share Analysis

Another method of forecasting demand for GA operations is a market share analysis. In addition to predicting demand change, this method gauges AVO's market share potential. The market share analysis is similar to that methodology used in the based aircraft forecast and assists in the understanding of how large the potential GA market is nationally, regionally and statewide, and how much of it AVO currently possesses. AVO currently comprises 0.084, 0.114, and 0.423 percent of the national, regional and state GA operations, respectively. These percentages are determined by taking ratios of the Airport's GA operations to existing FAA National Aerospace forecasts, regional FAA TAF, and state FAA TAF totals.

In order to forecast future annual GA operations, national, regional and state GA operations data were divided by historical aircraft operations at AVO in order to determine the share of the total GA operations attributed to AVO. This share of national, regional and state activity for the airport was then compared to that of the forecast activity for the national, regional and state levels to determine the respective percentage of the overall forecast GA activity for which AVO accounted. The market share forecast analysis is outlined in **Table 3-12**.

Using this methodology, AVO's GA operations are forecast to increase from 32,400 in 2011 to 32,805, 38,910, or 39,629 operations in 2031 based on the national, regional and state markets share, respectively. This depicts low growth levels at AVO with AAG ranging from 0.06 percent AAG, to 0.92 percent AAG and 1.01 percent AAG over the planning period for the national, regional and state based market share forecasts respectively.

Taking a "middle of the road" outlook, which is achieved by estimating the average, or median value of each projection, closes these differences. According to the selected market share forecast, AVO's operations are forecast to increase by 0.68 percent AAG, adding 4,715 annual operations over the 20-plus year planning period. In 2031, AVO is forecast to host 37,115 annual operations based on the average market share. Using the average market share forecast, AVO's share of national, region, and state GA operations is 0.087 percent, 0.143 percent, and 0.382 percent respectively, by 2031.

Table 3-11. Annual Operations Trend Line Analysis

	Year	Airport AVO	National FAA Aerospace Forecasts	FAA Southern Region TAF	State TAF
		1	2	3	4
Historic	2001	42,121	53,527,000	25,895,985	9,572,985
	2002	40,414	52,535,500	25,698,721	9,439,630
	2003	38,707	51,544,000	25,108,174	8,989,951
	2004	36,250	50,552,500	25,258,831	8,929,456
	2005	37,000	49,561,000	25,460,822	9,086,918
	2006	36,680	47,815,800	24,790,771	8,843,550
	2007	35,760	47,518,800	24,924,809	9,012,524
	2008	34,840	45,136,500	24,651,669	8,819,242
	2009	34,168	40,125,300	23,032,003	8,162,548
	2010	32,400	38,597,400	22,443,234	7,662,194
	2011	**32,400**	**37,873,800**	**22,475,871**	**7,833,310**
Forecast	2012	30,833	37,238,700	22,486,859	7,870,181
	2013	29,910	37,479,100	22,645,040	7,948,091
	2014	28,986	37,790,300	22,828,845	8,033,064
	2015	28,063	38,096,500	23,019,605	8,122,884
	2016	**27,140**	**38,397,400**	**23,207,370**	**8,212,864**
	2017	26,217	38,661,700	23,374,154	8,298,452
	2018	25,293	38,930,500	23,545,117	8,385,853
	2019	24,370	39,200,400	23,714,138	8,475,083
	2020	23,447	44,350,600	23,886,654	8,566,203
	2021	**22,523**	**39,753,000**	**24,062,743**	**8,659,260**
	2022	21,600	40,036,000	24,242,511	8,754,307
	2023	20,677	40,323,600	24,426,017	8,851,386
	2024	19,754	40,616,000	24,613,349	8,950,552
	2025	18,830	40,913,100	24,804,609	9,051,862
	2026	**17,907**	**41,215,100**	**24,999,917**	**9,155,374**
	2027	16,984	41,522,200	25,199,352	9,261,136
	2028	16,061	41,834,600	25,402,983	9,369,198
	2029	15,137	42,152,100	25,610,949	9,479,634
	2030	14,214	42,474,700	25,823,339	9,592,504
	2031	**13,291**	**42,803,400**	**26,040,252**	**9,707,857**
	AAG (%) 2001-2011	-2.59%	-3.40%	-1.41%	-1.99%
	AAG (%) 2011-2031	-4.36%	0.61%	0.74%	1.08%

Source:
Avon Park, 2012
FAA Aerospace Forecasts, 2012-2032
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Forecast data from CDM Smith trend line analysis
Column 2, FAA Aerospace Forecasts 20012-2032
Column 3, 2011 FAA Southern Region Terminal Area Forecast (TAF) 2001-2031
Column 4, FAA TAF aircraft operations forecasts State of Florida 2001-2031
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-12. Annual Operations Market Share Analysis

		National Market Share		Regional Market Share		State Market Share		Selected Market Share
	Year	AVO	FAA Aerospace Forecasts	AVO	TAF	AVO	TAF	AVO
		1	2	3	4	5	6	7
Historic	2001	42,121	53,527,000	42,121	25,895,985	42,121	9,572,985	42,121
	2002	40,414	52,535,500	40,414	25,698,721	40,414	9,439,630	40,414
	2003	38,707	51,544,000	38,707	25,108,174	38,707	8,989,951	38,707
	2004	36,250	50,552,500	36,250	25,258,831	36,250	8,929,456	36,250
	2005	37,000	49,561,000	37,000	25,460,822	37,000	9,086,918	37,000
	2006	36,680	47,815,800	36,680	24,790,771	36,680	8,843,550	36,680
	2007	35,760	47,518,800	35,760	24,924,809	35,760	9,012,524	35,760
	2008	34,840	45,136,500	34,840	24,651,669	34,840	8,819,242	34,840
	2009	34,168	40,125,300	34,168	23,032,003	34,168	8,162,548	34,168
	2010	32,400	38,597,400	32,400	22,443,234	32,400	7,662,194	32,400
	2011	**32,400**	**37,873,800**	**32,400**	**22,475,871**	**32,400**	**7,833,310**	**32,400**
Forecast	2012	28,540	37,238,700	33,601	22,486,859	32,698	7,870,181	31,613
	2013	28,725	37,479,100	33,837	22,645,040	33,022	7,948,091	31,861
	2014	28,963	37,790,300	34,112	22,828,845	33,375	8,033,064	32,150
	2015	29,198	38,096,500	34,397	23,019,605	33,748	8,122,884	32,448
	2016	**29,429**	**38,397,400**	**34,677**	**23,207,370**	**34,122**	**8,212,864**	**32,743**
	2017	29,631	38,661,700	34,926	23,374,154	34,478	8,298,452	33,012
	2018	29,837	38,930,500	35,182	23,545,117	34,841	8,385,853	33,287
	2019	30,044	39,200,400	35,434	23,714,138	35,211	8,475,083	33,563
	2020	33,991	44,350,600	35,692	23,886,654	35,590	8,566,203	35,091
	2021	**30,468**	**39,753,000**	**35,955**	**24,062,743**	**35,977**	**8,659,260**	**34,133**
	2022	30,684	40,036,000	36,224	24,242,511	36,372	8,754,307	34,427
	2023	30,905	40,323,600	36,498	24,426,017	36,775	8,851,386	34,726
	2024	31,129	40,616,000	36,778	24,613,349	37,187	8,950,552	35,031
	2025	31,357	40,913,100	37,064	24,804,609	37,608	9,051,862	35,343
	2026	**31,588**	**41,215,100**	**37,356**	**24,999,917**	**38,038**	**9,155,374**	**35,661**
	2027	31,823	41,522,200	37,654	25,199,352	38,477	9,261,136	35,985
	2028	32,063	41,834,600	37,958	25,402,983	38,926	9,369,198	36,316
	2029	32,306	42,152,100	38,269	25,610,949	39,385	9,479,634	36,653
	2030	32,554	42,474,700	38,586	25,823,339	39,854	9,592,504	36,998
	2031	**32,805**	**42,803,400**	**38,910**	**26,040,252**	**39,629**	**9,707,857**	**37,115**
	AAG (%) 2001-2011	-2.59%	-3.40%	-2.59%	-1.41%	-2.59%	-1.99%	-2.59%
	AAG (%) 2011-2031	0.06%	0.61%	0.92%	0.74%	1.01%	1.08%	0.68%

Source:
Avon Park, 2012
FAA Aerospace Forecasts, 2012-2032
FAA TAF, 2011
CDM Smith Analysis, 2011

Notes:
Column 1, National market share forecast for AVO
Column 2, FAA Aerospace Forecasts 2012-2032
Column 3, Regional market share forecast for AVO
Column 4, 2011 FAA TAF for Southern Region annual GA operations
Column 5, State market share forecast for AVO
Column 6, 2011 FAA TAF for State of Florida annual GA operations
Column 7, Selected market share forecast for AVO based on national, regional and state market share analyses
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

3.9.3 Regression Analysis

Regression analysis assumes that operations at an airport are directly affected by socioeconomic factors. Regression analysis is a method of forecasting that assumes a cause-and-effect relationship exists between one or more socioeconomic factors and the activity being forecasted. Socio-economic variables are important because they describe the overall "social and economic climate" that shapes area demographics, propensity of persons to spend income, and the level of employment. Using this methodology, these socio-economic variables are the independent variables that are used to explain the overall propensity of individuals to use aviation goods and services. The forecasts are based on econometric equations, which specify a relationship between GA operations and the socio-economic variables, which determine them, using data from the 2001 to 2011. The key variables determining GA operations were found to be population, income, and employment figures at the national, state, and local county levels. This is consistent with the results of other research conducted by the FAA in predicting demand and is also what would be expected from economic theory. Due to this strong link between socio-economic variables and the aviation system, this is a widely used method of relating multiple economic factors to the changes in historic and forecast GA operations at airports.

This forecast is especially useful if over five years of historical data are available, and there are no significant data variances in any of the factors. For AVO the population, income, and employment figures at the national, state, and county levels were used. Data was not limited to a certain region; however, a broad spectrum of information assisted in establishing strong relationships between the socio economic data and the GA operations. For example, using the socio-economic data at different levels allowed for a better correlation between operations and the socio-economic data. Further, multiple variations of regression analysis methodology were developed to provide various activity projections. This allowed for a range of GA operations forecast for AVO based on various socio-economic factors and varying levels of statistical correlation. The following regression analyses, utilizing socio-economic factors that produced the highest levels of correlation, were completed for this forecast methodology:

- Single Regression (County Income)
- Dual Regression (County Income & State Employment)
- Multi-Factor Regression

Utilizing these regression techniques, 138,259, 94,222 and 76,142 operations are projected for the year 2031 based on the single, dual and multi-regression analyses, respectively. This results in an estimated increase of 7.52, 5.48 or 4.36 percent AAG between 2011 and 2031 for the single, dual and multi-regression forecasts, respectively. Based upon the measure for the reliability of forecasts through regression, these forecasts represent significantly robust growth. Thus, a "middle of the road" forecast was developed using the median of the three methodologies and produced an increase in operations of 5.95 percent AAG between 2011 and 2031. This forecast also presents a robust projection of activity based on the growth rates for the socio-economic factors utilized in the analysis and does not present a sustainable growth rate.

Based on current market conditions all three regression analysis forecasts and the average or median forecast produced an unrealistically high forecast of activity for the planning period. Thus, a fifth forecast, a "market adjusted" forecast, was developed to reflect the anticipated annual operations activity at AVO from the existing baseline activity in 2011 and based on known local, state and national market conditions in the aviation industry. This forecast anticipates a stabilization of activity and return to slow positive growth in 2012 with the recovery of the national, state and local economies. The market adjusted forecasts predicts an increase in annual operations at AVO from 32,400 in 2011 to 52,466 in 2031, which represents a 2.44 percent AAG between 2011 and the end of the planning period in 2031. **Table 3-13** outlines the regression analyses and forecast results.

3.9.4 Operations per Based Aircraft Ratio

In general, a ratio is a way of concisely showing the relationship between two defined entities or quantities. A ratio is used to compare based aircraft and operations, one value divided by another. The result is representative of the value of one quantity in terms of the other. The ratio of two numbers is their relationship in which one number is a multiple of the other, a part of it, or parts of it. Therefore, operations per based aircraft (OPBA) is the relative size of two quantities, GA operations and based aircraft, expressed as the quotient of GA operations divided by the total based aircraft. It is used as a forecast measure because it directly links the aircraft to their average level of annual utilization at the Airport. This number is particularly useful in facility planning and is an important indicator in the aviation forecasting process.

One of the methodologies approved by the FAA is that total aircraft operations are tied to the number of based aircraft at an airport. These forecasts assume a constant number of annual operations per based aircraft over the forecast period using historical OPBA figures for AVO. As presented in **Table 3-14**, the 2011 OPBA for AVO is 675. Taking an average of the OPBA for the historical period from 2001 to 2011, an OPBA of 658 is determined. It should be noted that an OPBA of 658 for long-term forecasts is slightly higher than FAA guidance presented in Advisory Circular (AC) 150/15300-13, *Airport Design*, which states an OPBA ranging from 492 to 637 is standard for GA airports similar to AVO. Applying the average OPBA estimate to projections of future based aircraft yields a forecast of total aircraft operations. Using these factors as well as the forecast for based aircraft at AVO, it was estimated that 38,563 annual GA operations are forecast to occur in the year 2031. This results in a rate of growth of 0.87 percent AAG over the planning period.

Table 3-13. Annual Operations Regression Analysis

		AVO					Population			Per Capita Income ($)			Total Employment		
	Year	Single Regression	Dual Regression	Multiple Regression	Average	Market Adjusted	United States	Florida	County	United States	Florida	County	United States	Florida	County
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Historical	2001	42,121					284,968,955	16,356,970	88,510	$31,157	$29,804	$21,514	165,810,200	8,917,154	32,598
	2002	40,414					287,625,200	16,689,370	89,939	$31,481	$30,463	$22,347	165,063,100	9,055,999	34,011
	2003	38,707					290,107,900	17,004,090	90,943	$32,295	$31,241	$22,784	166,019,500	9,286,029	36,188
	2004	36,250					292,805,300	17,415,320	93,079	$33,909	$33,463	$23,658	169,026,700	9,661,601	36,573
	2005	37,000					295,526,600	17,842,040	95,614	$35,452	$35,489	$24,675	172,551,400	10,087,920	37,559
	2006	36,680					298,379,900	18,166,990	97,788	$37,726	$37,996	$26,284	176,124,600	10,407,350	39,182
	2007	35,760					301,231,200	18,367,840	99,023	$39,506	$39,256	$27,498	179,899,600	10,577,330	39,548
	2008	34,840					304,094,000	18,527,310	99,568	$40,712	$39,909	$27,935	179,610,100	10,304,800	38,672
	2009	34,168					306,771,500	18,652,640	98,956	$39,665	$38,725	$28,491	173,809,200	9,840,251	37,137
	2010	32,400					309,349,700	18,843,330	98,700	$40,778	$39,579	$29,901	172,536,000	9,780,200	37,023
	2011	32,400	32,400	32,400	32,400	32,400	**312,308,200**	**19,139,010**	**102,133**	**$42,702**	**$41,022**	**$30,309**	**173,400,700**	**9,825,554**	**36,332**
Forecast	2012	**89,466**	**57,594**	**48,076**	**65,045**	**33,173**	315,387,600	19,441,900	105,597	$43,881	$41,903	$30,963	175,736,300	9,983,574	37,210
	2013	90,430	57,998	47,762	65,397	33,352	318,515,700	19,747,640	109,070	$45,408	$43,245	$31,998	178,104,400	10,159,290	38,166
	2014	91,626	58,625	47,697	65,982	33,651	321,672,200	20,055,040	112,547	$47,184	$44,888	$33,281	180,504,600	10,337,530	39,143
	2015	93,002	59,424	47,829	66,752	34,043	324,847,000	20,363,490	116,024	$49,161	$46,764	$34,758	182,936,800	10,518,380	40,139
	2016	**94,534**	**60,369**	**48,139**	67,681	34,517	**328,038,800**	**20,672,930**	**119,502**	**$51,316**	**$48,834**	**$36,401**	**185,401,700**	**10,701,880**	**41,160**
	2017	96,206	61,447	48,598	**68,750**	**35,063**	331,274,200	20,985,070	122,992	$53,634	$51,078	$38,195	187,899,700	10,888,010	42,199
	2018	98,018	62,656	49,221	69,965	35,682	334,525,100	21,298,150	126,484	$56,119	$53,495	$40,140	190,431,700	11,076,990	43,264
	2019	99,975	64,002	50,012	71,330	36,378	337,787,900	21,611,970	129,977	$58,774	$56,088	$42,240	192,997,600	11,268,500	44,355
	2020	102,082	65,488	50,965	72,845	37,151	341,069,500	21,926,980	133,474	$61,607	$58,861	$44,501	195,598,100	11,462,850	45,463
	2021	**104,351**	**67,127**	**52,111**	74,530	38,010	**344,345,100**	**22,241,600**	**136,965**	**$64,631**	**$61,828**	**$46,935**	**198,233,500**	**11,660,040**	**46,601**
	2022	106,788	68,926	53,438	**76,384**	**38,956**	347,639,500	22,557,420	140,462	$67,854	$64,997	$49,550	200,904,700	11,860,070	47,756
	2023	109,408	70,899	54,980	78,429	39,999	350,936,600	22,873,440	143,958	$71,292	$68,385	$52,362	203,611,600	12,062,960	48,945
	2024	112,226	73,059	56,739	80,674	41,144	354,237,600	23,189,710	147,453	$74,960	$72,008	$55,385	206,355,100	12,268,800	50,155
	2025	115,255	75,422	58,733	83,137	42,400	357,547,500	23,506,570	150,949	$78,873	$75,880	$58,636	209,135,600	12,477,530	51,391
	2026	**118,491**	**77,982**	**60,964**	85,812	43,764	**360,842,200**	**23,822,430**	**154,438**	**$83,019**	**$79,993**	**$62,108**	**211,935,600**	**12,689,340**	**52,656**
	2027	121,947	80,752	63,442	**88,714**	**45,244**	364,127,100	24,137,650	157,920	$87,412	$84,358	$65,816	214,809,400	12,904,110	53,946
	2028	125,636	83,746	66,186	91,856	46,847	367,391,100	24,451,480	161,391	$92,066	$88,992	$69,775	217,703,800	13,121,970	55,263
	2029	129,574	86,978	69,204	95,252	48,578	370,658,400	24,765,510	164,862	$96,992	$93,907	$74,000	220,637,200	13,342,970	56,608
	2030	133,774	90,462	72,512	98,916	50,447	373,924,300	25,079,440	168,330	$102,208	$99,121	$78,507	223,610,100	13,567,100	57,982
	2031	**138,259**	**94,222**	**76,142**	**102,874**	**52,466**	**377,175,500**	**25,392,370**	**171,789**	**$107,734**	**$104,656**	**$83,320**	**226,622,900**	**13,794,450**	**59,389**
	AAG (%) 2001-2011	-2.59%					0.92%	1.58%	1.44%	3.20%	3.25%	3.49%	0.47%	0.97%	1.09%
	AAG (%) 2011-2031	7.52%	5.48%	4.36%	5.95%	2.44%	0.95%	1.42%	2.63%	4.74%	4.79%	5.19%	1.35%	1.71%	2.49%

Source:
Avon Park, 2012
Woods and Poole Economics, Inc., 2012
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Single regression analysis based on County per capita income
Column 2, Dual regression analysis based on County per capita income and Florida employment
Column 3, Dual regression analysis based on County per capita income, Florida employment and national population
Column 4, Forecast based on average of regression analyses in columns 1-3
Column 5, Market adjusted forecast based on average forecast growth rate and base year activity
Columns 6-8, Population Data
Columns 9-11, Per capita income Data
Columns 12-14, Employment Data
Equations presented in the notes section are truncated for simplicity, actual analyses are at highest accuracy
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-14. Operations Per Based Aircraft (OPBA) Analysis

	Year	Historical Annual Operations	Historical Based Aircraft	Operations / Based Aircraft Ratio	Selected Based Aircraft Forecast	Forecast Annual Operations
		1	2	3	4	5
Historic	2001	42,121	61	691		
	2002	40,414	61	663		
	2003	38,707	61	635		
	2004	36,250	61	594		
	2205	37,000	61	607		
	2006	36,680	61	601		
	2007	35,760	61	586		
	2008	34,840	55	633		
	2009	34,168	48	712		
	2010	32,400	48	675		
	2011	32,400	48	675	**48**	**32,400**
Forecast	2012				49	32,234
	2013				49	32,234
	2014				49	32,029
	2015				49	32,381
	2016				**50**	**32,737**
	2017				50	33,096
	2018				51	33,459
	2019				51	33,827
	2020				52	34,198
	2021			658	**53**	**34,574**
	2022				53	34,953
	2023				54	35,337
	2024				54	35,725
	2025				55	36,117
	2026				**56**	**36,514**
	2027				56	36,915
	2028				57	37,320
	2029				57	37,730
	2030				58	38,144
	2031				**59**	**38,563**
	AAG (%) 2001-2011	-2.87%	-2.63%			
	AAG (%) 2011-2031				1.00%	0.87%

Source:
Avon Park, 2012
CDM Smith Analysis, 2012

Notes:
Column 1, Historical annual operations
Column 2, Historical based aircraft
Column 3, Historical operations per based aircarft ratio and forecast average operations per based aircraft
Column 4, Selected based aircraft forecast
Column 5, Forecast annual operations based on average operations per based aircraft ratio and selected based aircraft fo
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

3.9.5 Selected Operations Forecast

In identifying a selected operations forecast a distribution of the previous forecast results was developed. In addition to these forecasts, three new forecasts were added to the distribution and included forecasts utilizing; the growth rate from the state 2011 TAF, the growth rate from AVO's 2011 TAF and a market adjusted average of the four resulting viable forecasts. The forecast based on the state TAF used the AAG growth rate of 1.08 percent and applied that to the existing 2011 operations data for AVO, predicting a total of 40,165 total annual operations in 2031. Likewise, the forecast based on AVO's existing TAF maintained the TAF growth rate of 0.00 percent, resulting in an unrealistic flat forecast over the planning period. Finally, the market adjusted average growth forecast took the median growth rate, or "middle of the road", of the four viable forecasts and applied that to the existing 2011 operations data for AVO. This forecast predicts stabilization and a slight rebound in operations in 2012. This forecast predicts a total of 42,619 annual GA operations at AVO in 2031. **Table 3-15** outlines the forecast distribution using the trend line, market share, regression analysis, OPBA, State TAF growth rate, AVO TAF growth rate and market adjusted average growth rate forecasts and subsequent results of each.

The selected aircraft operations forecast for AVO is based upon the market adjusted average growth forecast of the four viable forecast methodologies, which include the market share, regression analysis, OPBA, and State TAF growth rate forecast analyses. Since each analysis produces varying results with respect to the future growth potential for AVO, using the average values adjusted for current market conditions minimizes the potential for excessive inflation or deflation of the levels of aviation activity and incorporates known current localized factors that impact demand, resulting in a more sustainable prediction of GA activity for AVO.

In 2031, AVO is forecasted to host 42,619 annual GA aircraft operations (including AT and military operations) based on the increase in operations by 1.38 percent AAG, which equals an overall increase of 20,219 GA operations over the 20-plus year planning period. According to the selected GA operations forecasts, AVO is expected to host approximately 0.439 percent of the state GA airport operations. Additionally, AVO's level of growth is expected to be slightly above the FAA forecast average annual growth of 1.08 percent for GA operations in the state.

Table 3-15. Operations Forecast Distribution

	Year	Trend Line Analysis	Market Share Analysis	Regression Analysis	OPBA Analysis	FAA State TAF Growth Rate	AVO FAA TAF Growth Rate	Average Growth of Viable Forecasts
		1	2	3	4	5	6	7
Historic	2001	42,121	42,121	42,121	42,121	42,121	42,121	42,121
	2002	40,414	40,414	40,414	40,414	40,414	40,414	40,414
	2003	38,707	38,707	38,707	38,707	38,707	38,707	38,707
	2004	36,250	36,250	36,250	36,250	36,250	36,250	36,250
	2005	37,000	37,000	37,000	37,000	37,000	37,000	37,000
	2006	36,680	36,680	36,680	36,680	36,680	36,680	36,680
	2006	35,760	35,760	35,760	35,760	35,760	35,760	35,760
	2007	34,840	34,840	34,840	34,840	34,840	34,840	34,840
	2008	34,168	34,168	34,168	34,168	34,168	34,168	34,168
	2010	32,400	32,400	32,400	32,400	32,400	32,400	32,400
	2011	**32,400**	**32,400**	**32,400**	**32,400**	**32,400**	**32,400**	**32,400**
Forecast	2012	30,833	31,613	33,173	32,234	32,750	32,400	32,847
	2013	29,910	31,861	33,352	32,234	33,104	32,400	33,300
	2014	28,986	32,150	33,651	32,029	33,461	32,400	33,760
	2015	28,063	32,448	34,043	32,381	33,823	32,400	34,226
	2016	**27,140**	**32,743**	**34,517**	**32,737**	**34,188**	**32,400**	**34,698**
	2017	26,217	33,012	35,063	33,096	34,557	32,400	35,177
	2018	25,293	33,287	35,682	33,459	34,930	32,400	35,662
	2019	24,370	33,563	36,378	33,827	35,307	32,400	36,155
	2020	23,447	35,091	37,151	34,198	35,689	32,400	36,654
	2021	**22,523**	**34,133**	**38,010**	**34,574**	**36,074**	**32,400**	**37,159**
	2022	21,600	34,427	38,956	34,953	36,464	32,400	37,672
	2023	20,677	34,726	39,999	35,337	36,858	32,400	38,192
	2024	19,754	35,031	41,144	35,725	37,256	32,400	38,719
	2025	18,830	35,343	42,400	36,117	37,658	32,400	39,253
	2026	**17,907**	**35,661**	**43,764**	**36,514**	**38,065**	**32,400**	**39,795**
	2027	16,984	35,985	45,244	36,915	38,476	32,400	40,344
	2028	16,061	36,316	46,847	37,320	38,891	32,400	40,901
	2029	15,137	36,653	48,578	37,730	39,311	32,400	41,465
	2030	14,214	36,998	50,447	38,144	39,736	32,400	42,038
	2031	**13,291**	**37,115**	**52,466**	**38,563**	**40,165**	**32,400**	**42,619**
	AAG (%) 2001-2011	-2.59%	-2.59%	-2.59%	-2.59%	-2.87%	-2.87%	-2.87%
	AAG (%) 2011-2031	-4.36%	0.68%	2.44%	0.87%	1.08%	0.00%	1.38%

Source:
Avon Park, 2012
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Trend line analysis forecast
Column 2, Selected market share analysis forecast
Column 3, Selected regression analysis forecasts
Column 4, Selected operations per based aircraft analysis forecasts
Column 5, Forecast annual operations using forecast FAA TAF growth rate for the State of Florida
Column 6, Forecast annual operations using forecast FAA TAF growth rate for AVO
Column 7, Forecast annual operations using an average of forecasts in columns 2-5
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast years for the existing forecasts

3.10 Summary of Selected Operations Forecast

Forecasting involves building reasonable predictions of activity levels from reliable data sources. More than one methodology is used to forecast activity over the long-term, which allows for the development of reasonable forecasts.

Table 3-16 presents the selected total annual operations forecast for AVO, which are predicted to grow at a positive rate over the long term, in comparison to the existing FAA TAF forecast for the Airport. With an overall optimistic long-term economic outlook for the region, AVO is forecast to see an increase in the number of total operations at 1.38 percent AAG in the long term. AVO's total operations data are expected to increase from 32,400 operations in 2011 to 42,619 operations by 2031. AVO is expected to see stabilization of activity and return to growth in 2012 or 2013. Fluctuations in the timeline for the return to positive growth may be witnessed as a rebound in activity at AVO is largely dependent on the recovery of the global, national and state economies and a more long-term stabilization of fuel prices. AVO is forecast to control less than approximately ½ percent (0.439) of the state market for GA operations in 2031.

3.11 Existing and Forecast Local and Itinerant GA Operations

For the purposes of planning, total annual GA operations are classified in two categories, local and itinerant. Local operations, as defined by the FAA, are performed by aircraft that:

- Operate in the local traffic pattern or within sight of the Airport
- Are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the Airport
- Are executing simulated or actual instrument or visual approaches or low passes at the Airport (touch-and-go operations)

Itinerant operations include all non-local operations. GA activity includes itinerant operations consisting of business and personal travel and recreational flying, and local operations consisting primarily of flight training activities. The 2011 local-itinerant GA split at AVO was established, and the split between local GA and itinerant GA operations is directly correlated to the characteristics of the airport. Thus, the historic local-itinerant GA split was rounded to accommodate overall growth and is considered reasonable to project local and itinerant GA operations through 2031.

As presented in **Table 3-17**, AVO's GA operations were made up of 15,098 local operations (46.6 percent) and 17,302 itinerant operations (53.4 percent) in 2011. Using this percentage split, AVO is expected to witness 19,860 local operations and 22,758 itinerant operations in 2031.

Table 3-16. Selected Annual Operations Forecast

	Year	Selected Operations Forecast	AVO FAA TAF	Percent Difference
		1	2	3
Historic	2001	42,121	32,400	30.00%
	2002	40,414	32,400	24.73%
	2003	38,707	32,400	19.47%
	2004	36,250	32,400	11.88%
	2005	37,000	32,400	14.20%
	2006	36,680	32,400	13.21%
	2007	35,760	32,400	10.37%
	2008	34,840	32,400	7.53%
	2009	34,168	32,400	5.46%
	2010	32,400	32,400	0.00%
	2011	**32,400**	**32,400**	**0.00%**
Forecast	**2016**	**34,698**	**32,400**	**7.09%**
	2021	**37,159**	**32,400**	**14.69%**
	2026	**39,795**	**32,400**	**22.82%**
	2031	**42,619**	**32,400**	**31.54%**
	AAG (%) 2001-2011	-2.87%	0.00%	---
	AAG (%) 2011-2031	1.38%	0.00%	---

Source:
Avon Park, 2012
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Selected Airport Forecast
Column 2, 2011 AVO TAF data
Column 3, Percentile difference between selected Airport forecast and FAA AVO TAF data
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-17. Local and Itinerant Operations Forecast

	Year	Local Operations	Itinerant Operations	Total Operations
Historic	2001	19,628	22,493	42,121
	2002	18,833	21,581	40,414
	2003	18,037	20,670	38,707
	2004	16,893	19,358	36,250
	2005	17,242	19,758	37,000
	2006	17,093	19,587	36,680
	2007	16,664	19,096	35,760
	2008	16,235	18,605	34,840
	2009	15,922	18,246	34,168
	2010	15,098	17,302	32,400
	2011	**15,098**	**17,302**	32,400
Forecast	2012	15,307	17,540	32,847
	2013	15,518	17,782	33,300
	2014	15,732	18,028	33,760
	2015	15,949	18,277	34,226
	2016	**16,169**	**18,529**	**34,698**
	2017	16,392	18,785	35,177
	2018	16,619	19,044	35,662
	2019	16,848	19,307	36,155
	2020	17,081	19,573	36,654
	2021	**17,316**	**19,843**	**37,159**
	2022	17,555	20,117	37,672
	2023	17,797	20,395	38,192
	2024	18,043	20,676	38,719
	2025	18,292	20,961	39,253
	2026	**18,545**	**21,251**	**39,795**
	2027	18,800	21,544	40,344
	2028	19,060	21,841	40,901
	2029	19,323	22,143	41,465
	2029	19,590	22,448	42,038
	2030	**19,860**	**22,758**	**42,619**
	2011 % Mix	46.60%	53.40%	100.00%
	AAG (%) 2001-2011	-2.87%	-2.87%	-2.87%
	AAG (%) 2011-2031	1.38%	1.38%	1.38%

Source:
Avon Park, 2012
FAA TAF, 2011
Airport Master Record, Form 5010, 2011
CDM Smith Analysis, 2012

Notes:
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

3.12 Forecast of Instrument Approach Operations

A terminal navigational aids needs assessment must consider elements such as instrument operations and annual instrument approaches. Since AVO does not have an Air Traffic Control Tower (ATCT), instrument approach operations data for the Airport was obtained from FAA ATADS and NOAA weather observations data. Instrument approach operations differ from instrument operations. An instrument approach is an approach made to an airport by an aircraft on an instrument flight rules (IFR) flight plan, when the visibility is less than three miles or the ceiling is at or below the minimum control approach altitude (MCA). This definition has three elements:

1. An instrument approach is limited to approaches in which aircraft pilots file an IFR flight plan.
2. The IFR arrival meets the requirements of an instrument approach if certain weather conditions are met.
3. Instrument approaches are associated with destination airports with appropriate landing aids.

The forecasts of instrument operations and is presented in **Table 3-18**. Total instrument operations for AVO are expected to increase at a rate of 1.14 percent AAG from 2011 to 2031. AVO's instrument operations level in 2011 was 389 and is expected to reach 488 operations by the end of the planning period.

3.13 Activity Forecast Summary

The aviation activity forecasts presented in this chapter provide the short-, medium-, and long-term outlook for AVO. The period of aviation activity covers 2011, the base year, to 2031, the end of the planning period. Information presented throughout the chapter outlines the historic data for each aviation activity indicator, which is then projected to the end of the planning period using trend line, market share, regression, OPBA and market adjusted forecasting analyses. The selected forecasts are consolidated to represent the 20-year projections in a tabulated and summarized format specified by the FAA. The data used in preparing the forecasts was reconciled using a variety of recognized government and private agencies such as the FAA, FDOT, airport/FBO staff and records, Avon Park, and Woods and Poole Economics Inc. Projections by aviation activity indicator are provided in this report. A comparison of AVO's aviation activity forecasts and FAA TAF forecasts are presented in **Table 3-19**.

Historically, AVO's aviation activity saw declines in the early and late 2000's, with a small increase between 2004 and 2005. The selected forecasts anticipate a return to conservative positive growth. This return of positive growth will largely be driven by the speed and aggressiveness of the recovery of the national, state and local economies. For AVO, average annual growth rates of 1.41 percent and 1.38 percent are determined for based aircraft and operations, respectively. Given the historic and forecast socio-economic conditions in the nation, state, and region, this level of growth is considered reasonable and attainable by the Airport over the long-term planning period.

Table 3-20 presents FAA forecast summary templates for AVO using the forecasts of the aviation activity developed in this chapter. These forecasts will be used in later sections to develop the demand/capacity analysis and facility requirements for AVO from 2011 to 2031.

Table 3-18. Instrument Operations Forecasts

	Year	Forecast Total Annual Operations	Forecast Instrument Operations
		1	2
Historic	2001	42,121	505
	2002	40,414	485
	2003	38,707	464
	2004	36,250	435
	2005	37,000	444
	2006	36,680	440
	2007	35,760	429
	2008	34,840	418
	2009	34,168	410
	2010	32,400	389
	2011	32,400	389
Forecast	**2016**	**34,698**	**413**
	2021	**37,159**	**438**
	2026	**39,795**	**465**
	2031	**42,619**	**488**
	AAG (%) 2001-2011	-2.59%	-2.59%
	AAG (%) 2011-2031	1.38%	1.14%

Source:
Avon Park, 2012
FAA ATADS instrument operations data, 2011
CDM Smith Wind Analysis, 2012

Notes:
Column 1, Forecast total annual operations
Column 2, Total instrument operations
Operations include Air Taxi and Military activity
Dividing line indicates base year and forecast year for the existing forecasts

Table 3-19. Comparison of Airport Planning and TAF Forecast

		Airport: AVO			Airport Forecast vs. TAF
		Year	Forecast	TAF	(% Difference)
Passenger Enplanements					
	Base yr.	2011	0	0	0.00%
	Base yr. + 5yrs.	2016	0	0	0.00%
	Base yr. + 10yrs.	2021	0	0	0.00%
	Base yr. + 15yrs.	2026	0	0	0.00%
	Base yr. + 20yrs	2031	0	0	0.00%
Commercial Operations					
	Base yr.	2011	0	0	0.00%
	Base yr. + 5yrs.	2016	0	0	0.00%
	Base yr. + 10yrs.	2021	0	0	0.00%
	Base yr. + 15yrs.	2026	0	0	0.00%
	Base yr. + 20yrs	2031	0	0	0.00%
Total GA & MIL Operations					
	Base yr. *	2011	32,400	32,400	0.00%
	Base yr. + 5yrs.	2016	34,698	32,400	7.09%
	Base yr. + 10yrs.	2021	37,159	32,400	14.69%
	Base yr. + 15yrs.	2026	39,795	32,400	22.82%
	Base yr. + 20yrs	2031	42,619	32,400	31.54%

Source:
FAA TAF, 2011
CDM Smith Analysis, 2012

Note: Percent difference value is determined by the dividend of the difference between the Airport Forecast and TAF data.

Table 3-20. Summary of Airport Planning Forecasts

AIRPORT NAME:	AVO	Specify base year:	2011								
							Average Annual Compound Growth Rates				
Activity Indicator	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base Yr. + 20yrs.	Base Yr. to +1yr.	Base Yr. to +5yrs.	Base Yr. to +10yrs.	Base Yr. to +15yrs.	Base Yr. + 20yrs.
Air Carrier	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Commuter	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Operations											
Itinerant											
Air Carrier	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Commuter	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Commercial Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
General Aviation	17,302	17,540	18,306	19,604	20,995	22,758	1.38%	1.13%	1.26%	1.30%	1.38%
Air Taxi	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Military	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Local											
General Aviation	15,098	15,307	16,392	17,555	18,800	19,860	1.38%	1.66%	1.52%	1.47%	1.38%
Military	0	0	0	0	0	0					
TOTAL OPERATIONS	32,400	32,847	34,698	37,159	39,795	42,619	1.38%	1.38%	1.38%	1.38%	1.38%
Instrument Approaches	389	393	418	443	471	488	1.20%	1.44%	1.32%	1.28%	1.14%
Peak Hour Operations	25	25	27	29	31	33	0.00%	1.38%	1.38%	1.38%	1.38%
Cargo/Mail (Enplaned + Deplaned Tons)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Based Aircraft											
Single Engine (Non-jet)	36	36	38	41	43	46	0.60%	0.83%	1.20%	1.15%	1.24%
Multi Engine (Non-jet)	8	8	9	9	10	10	5.49%	3.48%	1.73%	1.86%	1.39%
Turbine (Turboprop+Jet)	3	3	3	4	5	5	3.19%	3.20%	3.20%	3.21%	3.21%
Helicopter	1	1	1	1	1	1	2.10%	2.10%	2.10%	2.10%	2.10%
Other	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	48	48	51	54	58	63	0.00%	1.13%	1.27%	1.32%	1.34%
				B. Operational Factors							
	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 6yrs.	Base Yr. + 11yrs.	Base Yr. + 16yrs.	Base Yr. + 21yrs.					
Average Aircraft Size (Seats)											
Air Carrier	0	0	0	0	0	0					
Commuter	0	0	0	0	0	0					
Average Enplaning Load Factor											
Air Carrier	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
Commuter	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
Local GA Operations per Based Aircraft (Based on selected forecasts)	675	684	683	682	681	680	1.38%	0.25%	0.11%	0.06%	0.04%

3.14 Facility Design Forecasts

3.14.1 Introduction

This section presents additional forecast analyses that will be used for airport-specific facility planning. All forecast information presented in this section is based on the selected forecasts of aviation activity presented in the previous sections.

3.14.2 Existing and Forecast Peak Activity

Many airport facility needs are related to the levels of activity during peak periods. Peaking characteristics are usually defined as peak month, average day, and peak hour activity. When projecting future activity levels at an airport, it is important to identify and project peak period activity levels. These projections are important for various facility planning purposes. Peak hour activity tests an airport's ability to accommodate demand represented by an increased level of activity that occurs with predictable frequency. The determination of peak activity will aid in the development and sizing of airport facilities to meet heightened demand. Thus, peak month activity has only been determined for AVO to aid in determining future facility needs.

The FAA defines the theoretical "peak-hour operations" as the total number of aircraft operations expected to occur at an airport, averaged for two adjacent peak hours of a typical peak time or busiest hour on record. Peaking characteristics are determined from peak monthly activity, peak daily activity, and then estimating the peak hourly activity. The most common method of converting the forecasts to an hourly demand baseline is Average Day/Peak Month (AD/PM). To determine the AD/PM, the peak month must first be identified. Since AVO must be designed to accommodate peak demand in some categories, these projections are important to subsequent facilities planning.

3.14.2.1 Peak Month

The peak month is the calendar month when peak aircraft operations occur. The analysis of existing demand/capacity conditions relative to forecast levels of activity helps determine the extent of GA facility improvements. The calculations for determining capacity planning criteria are discussed in the following chapter of this report.

AVO's fuel flowage records were evaluated and the peak month was identified. The peak month accounted for 13.9 percent of AVO's total annual operations, on average, according to the airport fuel sales data. Fuel sales data is correlated with aviation activity at an airport, and used as a proxy indicator of peak activity. Peak monthly activity at AVO for 2011 is 5,152 and is expected to increase to 6,776 by 2031.

3.14.2.2 Average Day

The average day refers to the average day in the peak month. Typically, dividing the peak month operations by the average number of days per month per year easily derives this indicator. Since the number of days in a month is variable throughout the year, an average of the number of days is considered for planning purposes and is presented in the following equation:

Average Day = (Peak month/30.42 days)

AVO's average daily operations were approximately 169 in 2011 and are expected to reach 223 by 2031.

3.14.2.3 Peak Hour

The peak hour refers to the highest hour during the average day. This descriptor is used particularly in airfield demand/capacity analysis, as well as in activity at AVO. Peak hourly operations typically range from 10 to 20 percent of the average day/peak month for GA airports without control towers or part-time control towers in operation. For the purposes of this study, the peak hour operations were determined by using the following formula.

Peak Hour = (Average Day x 15%)

Based on this calculation, peak hour operations at AVO are expected to increase by 8 operations from an estimated 25 operations in 2011 to 33 operations in 2031 as depicted in **Table 3-21.**

Table 3-21. Peak Hourly Operations

	Year	Total Annual Operations	Peak Monthly Operations	Average Daily Operations	Peak Hourly Operations
		1	2	3	4
Historic	2001	42,121	6,697	220	33
	2002	40,414	6,426	211	32
	2003	38,707	6,154	202	30
	2004	36,250	5,764	189	28
	2005	37,000	5,883	193	29
	2006	36,680	5,832	192	29
	2007	35,760	5,686	187	28
	2008	34,840	5,540	182	27
	2009	34,168	5,433	179	27
	2010	32,400	5,152	169	25
	2011	**32,400**	**5,152**	**169**	**25**
Forecast	2012	32,847	5,223	172	26
	2013	33,300	5,295	174	26
	2014	33,760	5,368	176	26
	2015	34,226	5,442	179	27
	2016	**34,698**	**5,517**	**181**	**27**
	2017	35,177	5,593	184	28
	2018	35,662	5,670	186	28
	2019	36,155	5,749	189	28
	2020	36,654	5,828	192	29
	2021	**37,159**	**5,908**	**194**	**29**
	2022	37,672	5,990	197	30
	2023	38,192	6,073	200	30
	2024	38,719	6,156	202	30
	2025	39,253	6,241	205	31
	2026	**39,795**	**6,327**	**208**	**31**
	2027	40,344	6,415	211	32
	2028	40,901	6,503	214	32
	2029	41,465	6,593	217	33
	2030	42,038	6,684	220	33
	2031	**42,619**	**6,776**	**223**	**33**
	AAG (%) 2001-2011	-2.59%	-2.59%	-2.59%	-2.59%
	AAG (%) 2011-2031	1.38%	1.38%	1.38%	1.38%

Source:
Avon Park, 2012
FAA TAF, 2011
CDM Smith Analysis, 2012

Notes:
Column 1, Total annual operations
Column 2, Peak monthly operations based on peak month of fuel sales (October)
Column 3, Average daily operations = peak month divided by 30.42 days per month
Column 4, Peak hour operations = 15% of peak daily operations
Dividing line indicates base year and forecast year for the existing forecasts

3.14.3 GA Passengers and Automobile Parking

3.14.3.1 GA Passengers

Passenger forecasts are typically used to determine the required capacity and improvements for facilities such as terminal buildings. GA passengers (including air taxi) were forecast using a formula of 0.9 passengers per local operation and three passengers per itinerant operation, as indicated by the FAA's *Estimating the Economic Impact of Airports*. Thus, by multiplying the number of operations (based on the selected GA operations forecast) by the correct passenger coefficient, the number of GA passengers per cardinal forecast year was determined and is represented in **Table 3-22**.

Table 3-22. Forecast of GA Passengers

	2011	2016	2021	2026	2031
GA Passengers	65,494	70,139	75,113	80,443	86,148

Source: CDM Smith, 2012

3.14.3.2 Automobile Parking

Automobile parking forecasts have been developed using a factor of 1.5 parking spaces per busy-hour passenger, as suggested in the Transportation Research Board publication, *Measuring Airport Landside Capacity*. Using this ratio, it is estimated that a total of 89 automobile parking spaces will be required by 2031.

The results of this forecasts will be used later to determine facility requirements and the extent of any necessary improvements to the parking areas. **Table 3-23** presents the forecasted parking spaces according to cardinal year, based on the selected GA operations forecast.

Table 3-23. Forecast of Automobile Parking

Year	Total Passengers	Peak-Hour Passengers	Parking Spaces
2011	65,494	45	68
2016	70,139	48	72
2021	75,113	52	78
2026	80,443	55	83
2031	86,148	59	89

Source: CDM Smith, 2012

SECTION 4
AIRPORT DESIGN CRITERIA

This chapter presents the design criteria to be used as the basis of the demand/capacity and facility requirements analysis for Avon Park Executive Airport (AVO or Airport). All design standards presented in this section are established by the Federal Aviation Administration (FAA) for developing airport facilities to meet existing and forecast levels of activity.

4.1 Airport Reference Code & Critical Aircraft

As discussed in Chapter 2, the airport reference code (ARC) is an airport specific operational and physical design-criteria coding system that is based on aircraft operating characteristics. Runway design standards are based on aircraft approach speeds, while taxiways, taxilanes, and aprons are typically based on the airplane's wingspan. Typically, the critical aircraft (aircraft with the longest wingspan and the highest approach speeds), that consistently makes substantial use of the airport, determines the ARC. FAA Order 5090.3, *Field Formation of the NPIAS*, latest edition, defines substantial use as 500 or more annual aircraft operations or scheduled commercial service. Currently, AVO is designated as an aircraft category "C", design group "II" (C-II) airport and is projected to remain as such in the future. Runway 5-23 is a C-II runway while Runway 10-28 is designated as an ARC B-II.

4.1.1 Critical Aircraft

The current critical aircraft for AVO is based on a mix of aircraft operating at the airport, as no single aircraft meets or exceeds the 500 annual operations threshold necessary to be classified as the critical aircraft. The critical aircraft mix is largely made up of moderate sized business jet aircraft within the C-II classification that are predominantly operated by the current FBOs and other transient operators. Based on a review of the aircraft operations and type data available, as well as from discussion with airport and FBO staff, the following aircraft constitute the most demanding aircraft currently operating at AVO and the basis of the critical aircraft mix:

- Citation X
- Lear 55
- Challenger 300
- Gulfstream 150
- Gulfstream 250

A review of the projected aircraft activity, as presented in Chapter 3, was completed to determine the most appropriate ARC determination to accommodate the anticipated aircraft activity. Based on the forecast of aviation activity it is anticipated that the future critical aircraft designation will remain a C-II, though it is likely that future demand may result from a smaller mix of aircraft or a single business jet aircraft such as the Gulfstream 250 and/or Citation X. Discussions with the previous FBO management, airport staff and other Airport tenants during the master plan process revealed current activity this type of aircraft had increased somewhat in 2012-2014.

4.2 Facility Design Criteria

Airfield improvements are planned and developed according to the established ARC for the airport, and then for each particular runway. **Tables 4-1 and 4-2** depict the design criteria required for ARC B-II and C-II, while **Table 4-3** depicts the runway protection zone (RPZ) dimensions required for ARC B-II and C-II.

Table 4-1. Geometrical Design Standards

Geometrical Design Standards	ARC B-II	ARC C-II
Runway width	75 feet [1]	100 feet
Runway shoulder width	10 feet	10 feet
Runway blast pad width	95 feet [2]	120 feet
Runway blast pad length	150 feet	150 feet
Runway safety area width	150 feet [3]	500 feet
Runway safety area length beyond runway end	300 feet [4]	1,000 feet
Runway safety area length prior to landing threshold	300 feet [4]	600 feet
Obstacle free zone width	400 feet	400 feet
Obstacle free zone length beyond runway end	200 feet	200 feet
Runway Object free area width	500 feet [5]	800 feet
Object free area length beyond runway end	300 feet [5]	1,000 feet
Taxiway width	35 feet	35 feet
Taxiway shoulder width	10 feet	10 feet
Taxiway safety area width	79 feet	79 feet
Taxiway object free area width	131 feet	131 feet

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

1 *Runway width of 75feet is for runways with not lower than ¾ mile approach visibility minimums. A width of 100feet is required for runways with visibility minimums below ¾ mile.*

2 *Blast pad width of 95feet is for runways with not lower than ¾ mile approach visibility minimums. A width of 120feet is required for runways with visibility minimums below ¾ mile.*

3 *Safety area width of 150feet is for runways with not lower than ¾ mile approach visibility minimums. A width of 300feet is required for runways with visibility minimums below ¾ mile.*

4 *Safety area distance prior to threshold and beyond runway end of 300feet is for runways with not lower than ¾ mile visibility minimums. Runways with lower than ¾ mile minimums require 600feet prior to threshold and beyond runway end.*

5 *The OFA width and length beyond runway presented are for runways with not lower than ¾ mile visibility minimums. Runways with lower than ¾ mile visibility minimums require a OFA width of 800feet and a length beyond runway end of 600feet.*

Table 4-2. Separation Standards

Separation Standards	ARC B-II	ARC C-II
Runway centerline to holdline	200 feet [1]	250 feet
Runway centerline to parallel taxiway/taxilane centerline	240 feet [2]	300 feet [5]
Runway centerline to aircraft parking area	250 feet [3]	400 feet [6]
Runway centerline to helicopter touchdown pad	700 feet [4]	700 feet [4]
Taxiway centerline to parallel taxiway/taxilane centerline	105 feet	105 feet
Taxiway centerline to fixed or moveable object	65.5 feet	65.5 feet
Taxilane centerline to parallel taxilane centerline	97 feet	97 feet
Taxilane to fixed or moveable object	57.5 feet	57.5 feet

Source: FAA AC 150/5300-13, Airport Design, latest edition; FAA AC 150/5390-2, Heliport Design

1 *Runway centerline to holdline distance of 250feet is required for B-II runways with visibility minimums below ¾ mile.*
2 *Runway centerline to parallel taxiway/taxilane distance of 300feet is required for B-II runways with visibility minimums below ¾ mile.*
3 *Runway centerline to aircraft parking area distance of 400feet is required for B-II runways with visibility minimums below ¾ mile.*
4 *500 feet for small and medium helicopters, 700 feet for heavy helicopters (over 12,500 lbs)*
5 *Runway centerline to parallel taxiway/taxilane distance of 400feet is required for C-II runways with visibility minimums below ¾ mile.*
6 *Runway centerline to aircraft parking area distance of 500feet is required for C-II runways with visibility minimums below ¾ mile.*

Table 4-3. Runway Protection Zone (RPZ) Dimensions

RPZ Dimensions	ARC B-II	ARC C-II
Runways with visual approaches and not lower than 1 mile visibility minimums:		
Inner width	500 feet	500 feet
Outer width	700 feet	1,010 feet
Length	1,000 feet	1,700 feet
Runways with approach visibilities ≥ ¾ mile:		
Inner width	1,000 feet	1,000 feet
Outer width	1,510 feet	1,510 feet
Length	1,700 feet	1,700 feet

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

4.2.1 Existing Airfield Facilities and Current Design Standards

The previous airport layout plan (ALP) update completed in 2005 by Wilbur Smith & Associates specifies a mix of aircraft meeting the ARC C-II as the design aircraft for AVO. Runway 5-23 is designated as a C-II runway while Runway 10-28 is designated as a B-II runway. The existing facility meets FAA guidelines for this type of aircraft and ARC designations. Since the Airport has seen growth in these types of aircraft operations and future growth in this category is anticipated to continue based upon the forecasts presented in Chapter 3, information pertaining to approach categories and design groups for ARC designations of B-II and C-II will be presented in the following sections.

4.2.1.1 Runways

Runway 5-23 is 5,374 feet long and 100 feet wide with a 1,044-foot displaced threshold on Runway 23. Runway 10-28 is 3,844 feet long and 75 feet wide. The dimensions of Runway 5-23 meet the requirements for the current C-II ARC designation while Runway 10-28 meets the requirements for an ARC B-II designation. The load bearing capacities for each runway are listed below and meet the current C-II and B-II ARC designations:

	Runway 5-23	Runway 10-28
SWL (lbs)	26,000	90,000

Based on the forecast of activity and anticipated future critical aircraft remaining a C-II, no physical runway improvements are necessary in order to maintain the C-II ARC designation on Runway 5-23 and the B-II designation on Runway 10-28. **Table 4-1** and **Table 4-2** depict the runway design criteria for ARC designations B-II and C-II.

4.2.1.2 Taxiways and Taxilanes

The existing taxiway system at AVO is mostly 35 feet wide and is in compliance with FAA standards for Group II aircraft with the exception of Taxiway 'F' and a portion of Taxiway 'B' north of Runway 10-28, which are both only 25 feet wide. Additionally, the runway centerline to taxiway centerline separations currently range from a low of 300 feet between Runway 10-28 and Taxiway 'H' to a high of 310 feet between Runway 5-23 and Taxiway 'E'. Both runway separation distances meet the minimum 300-foot requirement for Group II aircraft.

The main FBO and tenant parking apron at AVO is accessed from Taxiway 'G' via Taxiway 'B' and have a painted taxilane line for aircraft movements through the apron and tie-down area. Airplane Design Group II requires taxiway and taxilane separations of 65.5 feet and 57.5 feet, respectively, from centerline to fixed or moveable object. The existing taxiway and taxilane safety and object free areas at AVO comply with the separation guidelines for Group II aircraft. However, future development should be reviewed in order to ensure adequate separation between taxiways and/or taxilanes and the existing and future aircraft storage and tiedown areas is maintained. **Table 4-1** and **Table 4-2** depict the taxiway and taxilane design criteria for ARC designations B-II and C-II.

4.2.1.3 Aprons

The positioning of the existing aircraft parking aprons at AVO meets the required FAA separation standards for the Group II aircraft. The current separation from the Runway 10-28 centerline to

the existing aircraft parking apron meets the minimum 250-foot FAA requirement for Group II aircraft. Thus, no changes to the existing apron due to separation requirements appear to be necessary.

4.2.2 Runway Safety Area (RSA) Dimensions

The runway safety area (RSA) is an area of land surrounding the runway that is prepared and/or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations. Additionally, the RSA must be drained by grading or storm sewers to prevent the accumulation of water, and be capable under dry conditions of supporting snow removal equipment, firefighting and rescue equipment, and the occasional passage of aircraft without causing structural damage.

The existing RSAs at AVO are not the same for both runways. Runway 5-23 requires a RSA width of 500 feet, a length prior to landing threshold of 600 feet and a length beyond the runway end of 1,000 feet. The Runway 23 threshold is currently displaced 1,044 feet, some of which is required to meet the minimum RSA length required prior to the landing threshold.

Runway 10-28 requires a RSA width of 150 feet and a length prior to landing threshold and beyond the runway end of 300 feet. The existing RSAs at AVO currently meet these FAA requirements for standard RSA dimensions based on the applicable ARC designation for each runway. **Table 4-3** outlines the RSA requirements for ARC designations B-II and C-II.

4.2.3 Runway Protection Zone (RPZ) Dimensions

The RPZ is an area of land that begins 200 feet from the runway end, maintained for departing and arriving aircraft, that must be evenly graded and remain clear of objects. The size of the RPZ can be affected by changes in the ARC code. The RPZ for an ARC B-II runway is smaller than that of a C-II runway when instrument approach visibility minimums are not lower than 1 mile. However, the RPZ dimensions for ARC B-II and C-II runways are the same when the instrument approach minimums are greater than or equal to three-quarters of a mile. Assuming approach visibilities at AVO remain at 1 mile or greater, a change from B-II to C-II on Runway 10-28 would require an increase in the outer width of the RPZ by 310 feet and an increase in length of the RPZ by 700 feet. If such an upgrade to the ARC on Runway 10-28 was considered, impacts from the increased RPZ dimensions should be evaluated to ensure the clearing requirements can be met. All RPZs at AVO currently meet requirements based on FAA guidelines. **Table 4-3** illustrates the RPZ requirements for ARC designations B-II and C-II.

4.3 Pavement Design Aircraft Determination

Aircraft weight characteristics also affect the design of an airport. Pavement design of the runways, taxiways, and aprons is based on a design aircraft. The design aircraft is different from the critical aircraft described previously. The design aircraft is determined by landing gear configuration (i.e., single wheel, dual wheels, etc.), and the known or forecast number of operations of aircraft with the heaviest maximum gross takeoff weights. A mix of the dual wheel Citation X (35,700 pounds), Lear 55 (21,500 pounds), Challenger 300 (38,850 pounds) and Gulfstream 250 (39,600 pounds) are estimated to be the anticipated design aircraft mix at AVO.

As mentioned previously in section 4.2.1.1, the published runway pavement strength for the runways at AVO is 26,000 pounds SWL for Runway 5-23 and 10,000 Pounds SWL for Runway 10-28. Though dual wheel load bearing information is not currently available for Runway 5-23, a load bearing rating of 26,000 pounds SWL suggests that the runway has adequate dual wheel load bearing capacity for the anticipated design aircraft mix. Future improvements to the runway, taxiways and aprons should confirm the dual wheel load bearing capacity and strengthen any weak pavement, as necessary, to accommodate the proposed design aircraft.

4.4 FAR Part 77 Surfaces

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, defines standards for determining obstructions to navigable airspace. These imaginary surfaces are used to protect operations around airports from high structures that can pose a threat to aircraft landing or departing the airport facility. Obstructions are primarily determined by superimposing the Part 77 "imaginary surfaces" over the airport and surrounding areas. An analysis is performed to determine the elevations of various objects (structures, terrain, towers, etc.). The object's elevation is then compared to the elevation of the associated Part 77 Surface. Objects that are found to be higher than the Part 77 surfaces are considered obstructions. Within the ALP set developed in conjunction with this Master Plan Update, an airport airspace drawing will illustrate the various obstructions and objects located within the Part 77 areas. A reduced version of this set is located in Chapter 10 of this report.

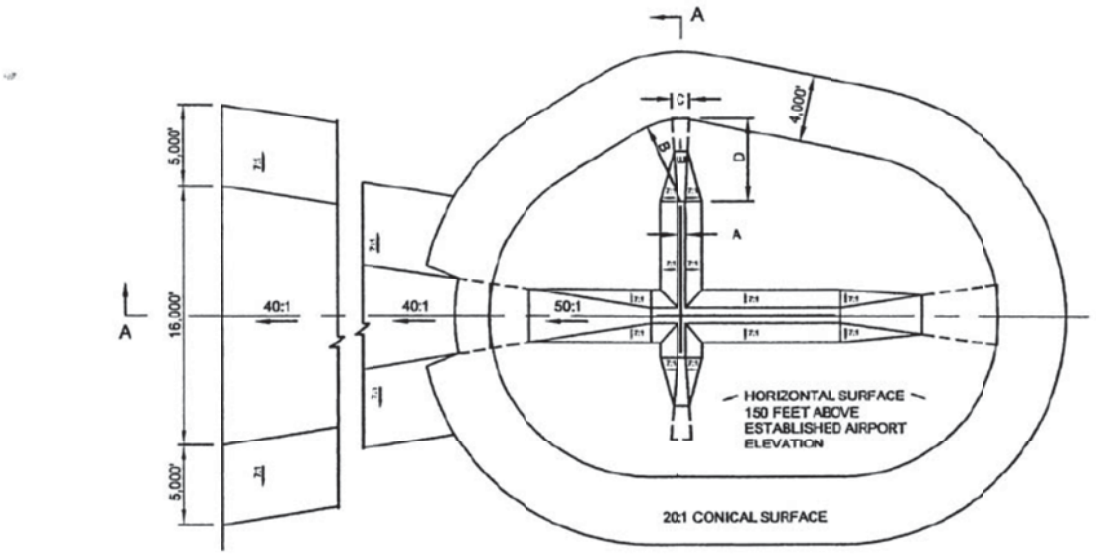
Dimensions of the "imaginary surfaces" are derived from the type of approach and aircraft operating at the Airport. Federal regulations require that the primary and horizontal surfaces, identified within the Part 77 imaginary surfaces guidance, of the most demanding approach be applied to the entire runway. The configuration and dimensions of the Part 77 surfaces at AVO are presented in **Table 4-4**. The typical Part 77 surfaces for various approach types are illustrated in **Figure 4-1**.

Table 4-4. FAR Part 77 Surfaces

Part 77 Imaginary Surface	Runways 5 and 10 Dimensions (1 mile non-precision approach)	Runways 23 and 28 Dimensions (visual approach)
Primary Surface:		
Width	500 feet	500 feet
Length beyond runway end	200 feet	200 feet
Approach Surface:		
Inner width	500 feet	500 feet
Outer width	3,500 feet	1,500 feet
Length	10,000 feet	5,000 feet
Approach Slope	34 : 1	20 : 1

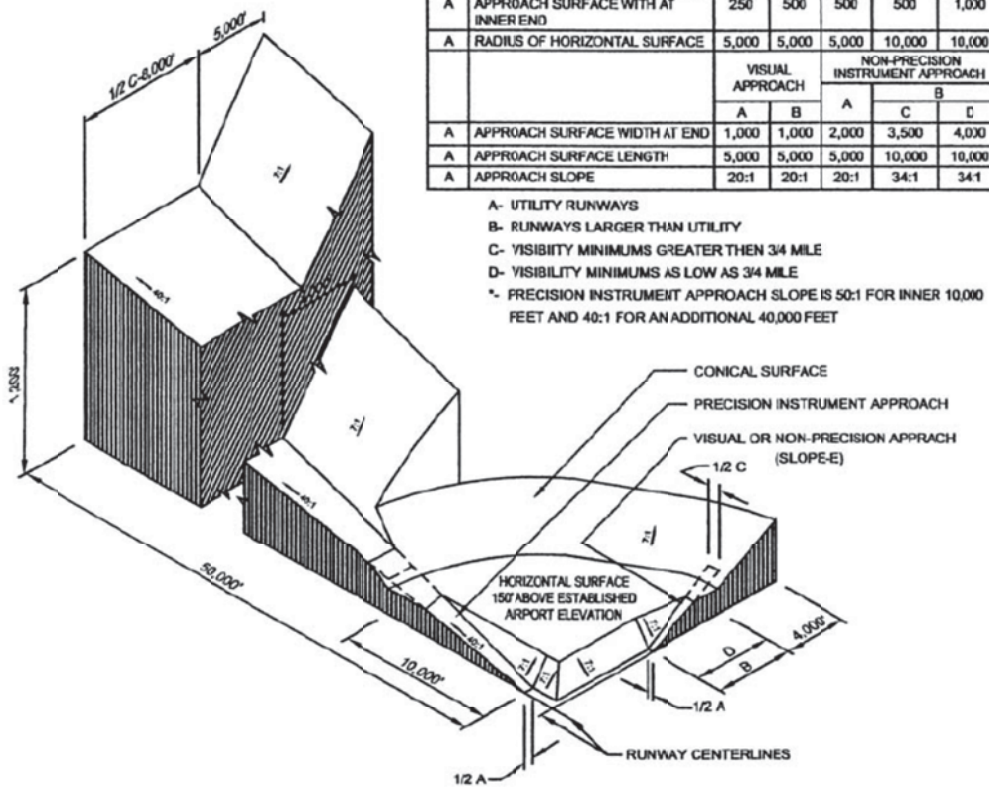
Source: Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace

Figure 4-1. Typical Part 77 Surfaces



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WITH AT INNER END	250	500	500	500	1,000	1,000
A	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
A	APPROACH SURFACE WIDTH AT END	1,000	1,000	2,000	3,500	4,000	16,000
A	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
A	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A- UTILITY RUNWAYS
B- RUNWAYS LARGER THAN UTILITY
C- VISIBILITY MINIMUMS GREATER THEN 3/4 MILE
D- VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
*- PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



ISOMETRIC VIEW OF SECTION A-A

Source: FAA, 2011

SECTION 5
DEMAND/CAPACITY ANALYSIS & FACILITY REQUIREMENTS

A key step in the master plan process is developing requirements of airport facilities, which will allow for airside and landside evolution over the term of the planning period. By comparing the existing conditions of the airport to predicted growth projections based upon both existing and future aircraft usage, the airport can define requirements for runways, taxiways, aprons, terminal, and other related facilities to accommodate growth over the short-, intermediate-, and long-term planning periods. Demand-capacity analyses aid in the identification of airport deficiencies, surpluses, and opportunities for future development.

This chapter of the master plan will analyze the ability of the current facilities at the Avon Park Executive Airport (AVO or Airport) to meet the forecast planning activity levels shown in Chapter 3, *Historic and Forecast Aviation Activity*. Using Federal Aviation Administration (FAA) methodologies and typical sizing factors, the aviation projections are converted into facility requirements over the 20+-year planning period.

5.1 General

An essential step in the process of estimating airport needs is the determination of an airport's current capacity to accommodate anticipated demand. Demand-capacity analyses yield information that is used to design the airport layout plan and stage facility development. This chapter will identify the capacity of AVO to accommodate anticipated aviation demand and outline specific facility requirements necessary to address any deficiencies in the existing airport system.

Operational airport capacity is determined through an analysis of the Annual Service Volume (ASV). The ASV determines an airport's annual capacity based upon historic and forecast operations and fleet mix. ASV accounts for deficiencies in runway configuration and use, aircraft fleet mix, weather conditions and taxiway access that may be encountered based upon the existing aircraft group category and usage. Three separate facility groups, each with the potential to constrain growth, were investigated as part of the demand/capacity and facility requirements analysis for AVO. The maximum obtainable airport capacity could be dependent upon the limitations of any one of the following:

- Airspace Capacity
- Airfield Capacity
- Landside Capacity

5.2 Airspace Capacity

Airspace capacity at an airport can be impacted when the flight paths of air traffic at nearby airports or local navigational aids (NAVAIDS) interact to affect operations at the study airport. A review of the airports, special use airspace and associated approach procedures that surround AVO was completed to determine the overall airspace capacity. **Figure 5-1** illustrates the airspace surrounding AVO, as depicted in FAA Miami Sectional Aeronautical Chart, effective February, 2015.

As discussed in Chapter 2, the Miami Air Route Traffic Control Center (ARTCC) controls the en route airspace surrounding AVO and is responsible for en route control of all aircraft operating under instrument flight rules (IFR) in the Avon Park area. The airspace surrounding AVO is classified as Class E. The airspace surrounding AVO is occupied by six public-use general aviation (GA) airports. Specifically, the public-use GA airports that are located within 25 nautical miles of AVO include: Lake Wales Municipal (X07), Sebring Regional (SEF), Wachula Municipal (WHC), Bartow Municipal (BOW), River Ranch Resort (K2RR) and Chalet Susanne Airstrip (X25).

Special use airspace is used to confine certain flight activities and to place limitations on aircraft operations which are not part of these activities. Special use airspace can significantly restrict airspace capacity and is divided into alert areas, military operation areas, warning areas, restricted areas, prohibited areas, controlled firing areas, and national security areas. Several special use airspaces are located within a 25 nautical mile (nm) radius of AVO. MOAs associated with AVO are the Avon Park Bombing Range and MacDill AFB Auxiliary Airport (AGR) operations limit AVO's airspace operations. The restricted areas indicate those areas that are continuously in effect and limit where aircraft can operate. Most of these areas restrict civilian aircraft to fly below 14,000 ft MSL.

Restricted airspace (RA) areas to the east of AVO, though not entirely prohibited to flight activity, are areas in which unauthorized incursion is not only illegal, but also extremely dangerous. These areas generally contain operations that do not mix well with civilian aircraft activity such as artillery firing, guided missiles, or aerial gunnery. Permission to fly in restricted areas can be given by ATCT. The impact of these special use and restricted airspace areas on the airspace surround ding AVO must be considered as restricted airspace and MOAs are located in almost every direction surrounding AVO.

The overall airspace surrounding AVO is congested with military and/or special use airspace, and several small GA airports. Some limitations on the airspace and general use of instrument approach procedures exist at AVO due to its proximity to these special use airspace areas and the surrounding airports. Significant adverse impacts by these factors however, are somewhat moderated due to the limited number of overall civilian operations that traverse the area. Still, the airspace limitations must be considered when evaluating the Airport's overall capacity during visual meteorological conditions (VMC) / visual flight rules (VFR) and/or instrument meteorological conditions (IMC) / instrument flight rules (IFR). Currently, only non-precision global positioning system (GPS) instrument approach procedures exist at AVO. These instrument approaches are to Runways 5 and 10 only.

Figure 5-1. Surrounding Airspace

5.3 Airside Capacity and Facility Requirements

The major components of the airfield system to be considered when determining capacity include runway orientation and configuration, runway length, and runway exit locations. Additionally, the capacity of a given system is affected by operational characteristics such as fleet mix, climatology, and air traffic control (ATC) procedures. Each of these components has been examined as part of the airside capacity analysis. Upon completion of this capacity analysis a review of existing facilities is performed and any additional requirements necessary to meet the forecast demand are identified.

5.3.1 Airfield Capacity

Airfield capacity is defined as the number of aircraft operations that can be safely accommodated on the runway-taxiway system at a given point in time. Delay is the difference between "constrained" and "unconstrained" aircraft operating time, usually expressed in minutes. As demand approaches capacity, individual aircraft delay is increased. Successive hourly demands exceeding the hourly capacity will ultimately result in unacceptable delays. Aircraft delays can still occur even when the total hourly demand is less than hourly capacity if the demand during a portion of that hour exceeds the available capacity at that time.

Operational capacity analyses of airfield or airside systems and facilities, such as the airport's runways and taxiways, results in calculated hourly capacities for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions. Additionally, an annual service volume (ASV) is calculated and identifies the total number of aircraft operations that may reasonably be accommodated at the airport without excessive delay. Since the magnitude and scheduling of user demand is relatively uncontrollable, especially at general aviation (GA) airports, reductions in aircraft delay can best be achieved by improving airfield facilities to increase overall capacity. Airfield capacity is quantified by two factors:

- Weighted hourly capacity (Cw) is the theoretical number of aircraft that can be accommodated by the airport in an hour, considering all runway use configurations.
- ASV or the Airport's theoretical annual operational capacity.

To determine Cw and ASV and conduct the capacity analysis, a number of prime determinates specific to AVO must be identified. These include:

- Predominant meteorological conditions
- Runway use configuration
- Aircraft mix (based upon existing aircraft demand)
- Percentage of arrival operations
- Touch and Go operations
- Number and location of exit taxiways

The FAA defines operational capacity as a reasonable estimate of the Airport's annual capacity that would be encountered over a year's time. The parameters, assumptions, and calculations required for this analysis are included in the following subsections.

5.3.1.1 Runway Orientation, Utilization, and Wind Coverage

Ideally, the active runway should match the predominant wind direction as closely as possible. To a lesser extent, runway use is also determined by proximity to the terminal area, available runway length, and instrumentation. Runway 5-23 which is aligned to the northeast and southwest, is the primary runway in use at AVO. Runway 10-28 is used as a crosswind runway. The use and orientation of both runways was evaluated to determine the capacity of the airfield, which is the sum of capacities determined for each operation (takeoff and landing). Each operation is defined by its direction, which is often influenced by wind, available instrument approaches, noise abatement procedures, airspace restrictions, and/or other operating parameters. The runway use configurations used for capacity calculations considered runway orientations of 5-23 and 10-28 in various combinations.

Runway use was determined based on wind data, FAA air traffic and instrument flight data and airport and FBO staff information. This information was analyzed to determine the estimated percent of operations that typically utilize each runway, based on the type of aircraft, wind direction, and overall weather conditions. The resulting runway utilizations will later be factored into the capacity calculations for the airfield. **Table 5-1** presents runway utilization for VFR and IFR conditions at AVO.

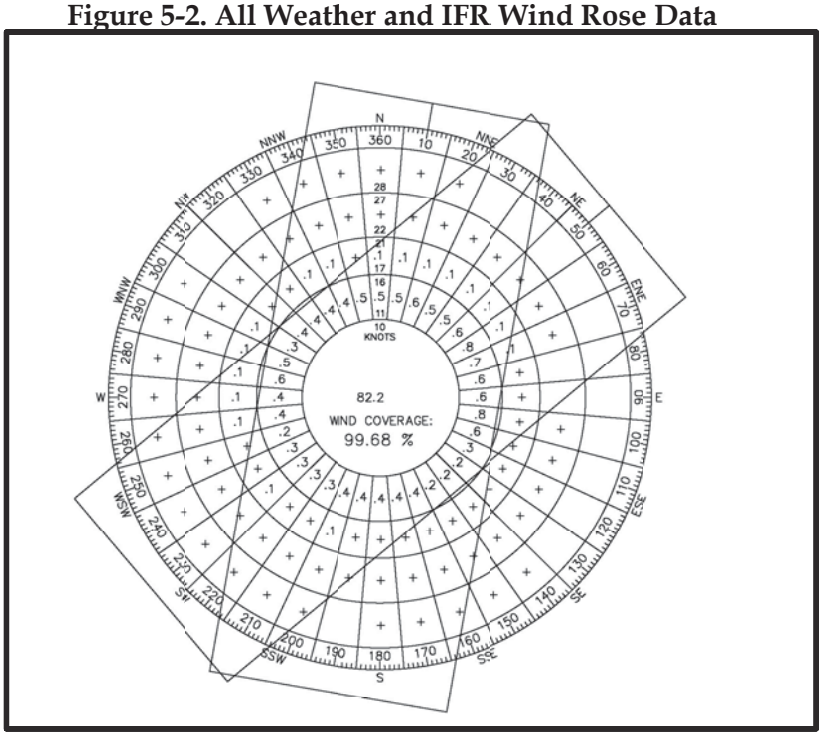
Table 5-1. Runway Utilization (Percent)

Runway	VFR Conditions	IFR Conditions
5	48.7%	2.7%
23	31.0%	0.0%
10	10.8%	1.0%
28	4.7%	0.0%
Closed	----	1.1%

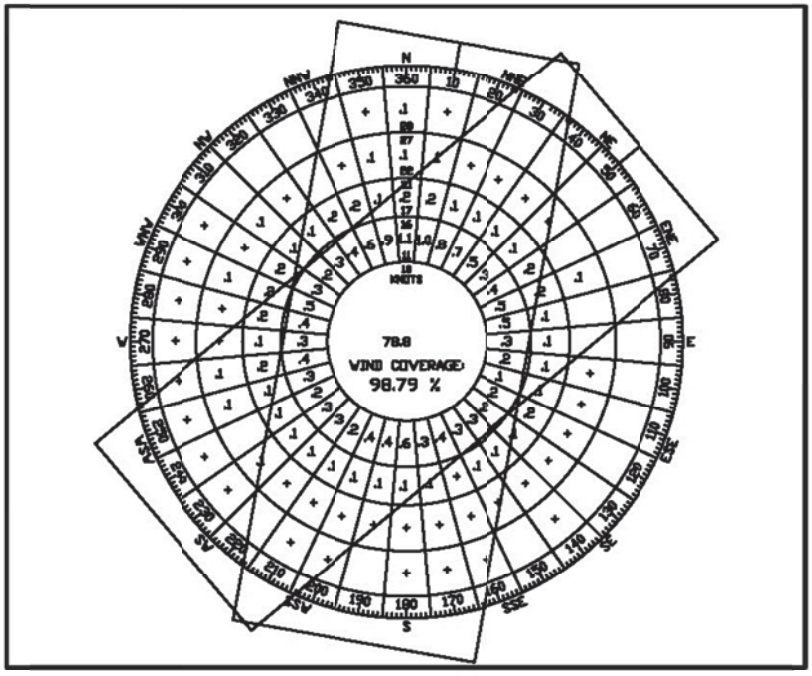
Source: NOAA Meteorological data, FAA ATADS data and Airport/FBO staff

The single most important criterion for runway orientation is wind coverage. The runways should provide the maximum opportunity for takeoff and landing into the wind. The FAA requires the crosswind coverage of the runway systems to be at least 95 percent. To determine the wind coverage at AVO, a wind analysis was completed using Version 4.2D of the FAA's computer program, *Airport Design for Microcomputers*. Crosswind components of 10.5, 13, and 16 knots were applied. **Figure 5-2** illustrates the all weather wind rose for AVO.

Figure 5-2. All Weather and IFR Wind Rose Data



Source: https://airports-gis.faa.gov/airportsgis/publicToolbox/windroseForm.jsp



Source: https://airports-gis.faa.gov/airportsgis/publicToolbox/windroseForm.jsp

Crosswind coverage and maximum crosswind components are applied to runways based on the overall size of the aircraft utilizing the runway, and the FAA design group (A, B, C, or D) applied. Therefore, crosswind components of 10.5, 13, and 16 knots were applied to the runways based on the existing and anticipated aircraft design group. The wind analysis yielded 97.6 percent coverage for 10.5 knots and 99.3 percent coverage for 13 knots in all weather conditions. These percentages were the result of utilizing Runways 5-23 and 10-28 for all weather conditions.

5.3.1.2 Airfield Operational Capacity Parameters and Assumptions

Calculated airfield operational capacity is developed by methods, parameters, and assumptions described in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. The calculations are based on the runway utilizations that produce the highest sustainable capacity consistent with existing air traffic rules, practices, and guidelines. The criteria and values used in the AC 150/5060-5 are typical of U.S. airports with similar runway configurations, and are designed to enable calculation of airport capacity as accurately as possible. The parameters and assumptions identified in this section were used to calculate the airfield capacity for AVO.

Aircraft Mix Index

The FAA has developed a classification system for aircraft, based on size, weight, and performance. **Table 5-2** illustrates this classification as it is presented in FAA AC 150/5060-5. This classification is used to develop an aircraft mix, which is the relative percentage of operations conducted by each of the four classes of aircraft (A, B, C, and D). The aircraft mix is used to calculate a "mix index", which is used in airfield capacity studies. The FAA defines the mix index as a mathematical expression, %(C+3D), which represents the percent of Class C aircraft, plus three times the percent of Class D aircraft. The following is a list of the mix indices that may be used in capacity calculations.

- 0 to 20
- 21 to 50
- 51 to 80
- 81 to 120
- 121 to 180

The current facilities at AVO can accommodate aircraft classes A through C. A review of base year operations by each class of aircraft at AVO determined that operations were divided across the four classes (A-D) of aircraft at approximately 75, 16.7, 8.3, and 0 percent, respectively. Utilizing this information, the base year mix index at AVO, for purposes of airfield capacity calculations, is 8.3 percent. Additionally, based upon the forecasts presented in Chapter 3, the mix index was estimated for cardinal forecast years of 2016, 2021, 2026, and 2031, resulting in 8.4, 8.8, 9.4, and 9.9 percent, respectively. The mix index for these years will be used to determine the ratio of demand to total capacity at each cardinal year. This analysis will be discussed in the capacity calculations section of this chapter.

Table 5-2. FAA Aircraft Classifications

Aircraft Class	Max. Cert. Takeoff Weight (lb)	Number of Engines	Wake Turbulence Classification
A	12,500 or less	Single	Small (S)
B		Multi	
C	12,500 – 300,000	Multi	Large (L)
D	Over 300,000	Multi	Heavy (H)

Source: FAA AC 150/5060-5, Airport Capacity and Delay, latest edition

Percent Arrivals

The percent of arrivals is the ratio of arrivals to total operations. It is typically safe to assume that the total annual arrivals will equal total departures, and that average daily arrivals will equal average daily departures. Interviews with airport and FBO staff confirmed that arrivals generally equal departures on an average annual basis. Therefore, an arrival percentage of 50 percent was used for the airfield capacity calculations.

Percent Touch and Go (T&G)

The T&G percentage is the ratio of landings with an immediate takeoff, to total operations. This type of operation is typically associated with flight training. The number of T&G operations normally decreases as the number of air carrier operations increases, demand for service and number of total operations approach runway capacity, and/or weather conditions deteriorate. Typically, T&G operations are assumed to be between zero and 50 percent of total operations. Based on interviews and discussions with airport and FBO staff, T&G operations account for approximately 15 percent of the total operations at AVO.

Taxiway Factors

Taxiway entrance and exit locations are an important factor in determining the capacity of an airport's runway system. Runway capacities are highest when full-length, parallel taxiways, and ample runway entrance and exit taxiways are available and no active runway crossings exist. FAA Advisory Circular 150/5060-5 identifies the criteria for determining taxiway exit factors at an airport. The criteria for exit factors are generally based on the mix index and the distance the taxiways are from the threshold and each other. Because the mix index for AVO was calculated to be 8.3 for the base year, and forecast to be 9.9 by 2031, only exit taxiways that are between 2,000 and 4,000 feet from the threshold, spaced at least 750 feet apart, were considered and contributed to the taxiway exit factor. Taxiways that met these parameters were considered in completing the capacity calculations for all directions and all conditions.

Taxiway exits were evaluated considering bidirectional flow for each runway during VFR and IFR conditions. The presence of a full-length parallel taxiway and the number of exit taxiways available for each runway impacts the runway capacity. A full length parallel taxiway was identified for Runway 5-23 but not Runway 10-28. Based on the location of the taxiways, Runway 5-23 has two exit taxiways that met the requirements contributing to the taxiway exit factor. Thus, using the applicable runway diagram and associated figures from AC 150/5060-5, the taxiway exit factor identified for AVO was 0.79 for VFR operations and 0.95 for IFR operations. These taxiway exit factors will be used in the capacity calculations later in this chapter.

Runway Instrumentation

The capacity calculations for AVO include one primary runway and one crosswind runway. The primary runway, Runway 5-23, has GPS approach capabilities in one direction on Runway 5. Likewise, the crosswind runway, Runway 10-28, also has GPS approach capabilities in one direction on Runway 10. Additionally, air traffic control (ATC) facilities, equipment, and services within the region are adequate to carry out operations in a radar environment.

Weather Influences

Weather data obtained from the NCDC identified that IFR conditions (ceiling greater than or equal to 250 feet but less than 1,000 feet, and/or visibility greater than or equal to 1 mile but less than 3 miles) occur approximately 4.8 percent of the time. The Airport is considered closed to landing aircraft in IFR conditions when cloud ceilings or visibility is below 450 feet and 1 mile, respectively. Based on the NCDC weather data, this condition occurs approximately 1.1-percent of the time.

5.3.1.3 Airfield Capacity Calculations

The airfield operational capacity calculations in this section were performed using the parameters and assumptions discussed above. These calculations also utilize data from the preferred aviation demand forecast, as presented in Chapter 3, for portions of the capacity calculations. The following sections outline the hourly capacities in VFR and IFR conditions, as well as the annual service volume for AVO. The capacity of AVO to accommodate projected increases in aircraft operations was conducted in accordance with procedures contained in FAA AC 150/5060-5, *Airport Capacity and Delay*.

Hourly VFR Capacity

The hourly VFR capacity was calculated to be 92 operations per hour. The following equation and calculations present the step-by-step method that was utilized to calculate the hourly VFR capacities, based on the guidance provided in FAA AC 150/5060-5.

Hourly VFR Equation (All Runways)

Hourly Capacity Base (C*) x Touch & Go Factor (T) x Exit Factor (E) = Hourly Capacity

C* x T x E = C

110 x 1.05 x 0.79 = 92

Hourly IFR Capacity

The hourly IFR capacity for AVO was calculated using Runway 5-23 as the sole runway available for use since it is the primary runway and has the lowest instrument approach minimums. Using the applicable runway diagram and associated figures from FAA AC 150/5060-5, it was determined that the hourly capacity for AVO was calculated to be 57 operations per hour in IFR conditions. The hourly IFR capacity equation and calculations are shown below.

Hourly IFR Equation (Runway 5-23)

Hourly Capacity Base (C*) x Touch & Go Factor (T) x Exit Factor (E) = Hourly Capacity

C* x T x E = C

60 x 1.0 x 0.95 = 57

Annual Service Volume (ASV)

The ASV is the maximum number of annual operations that can occur at the Airport before an assumed maximum operational delay value is encountered. The ASV is calculated based on the existing runway configuration, aircraft mix, and the parameters and assumptions identified herein, and incorporates the hourly VFR and IFR capacities calculated previously. Utilizing this information and the guidance provided in FAA AC 150/5060-5, the ASV for existing conditions at AVO was calculated to be 211,548 operations. It should be noted that the ASV represents the existing airfield capacity in its present configuration, with one northeast-southwest primary runway and one crosswind runway. The equation and calculations used to obtain the ASV were taken from FAA AC 150/5060-5, and are presented below.

ASV Equation

Weighted Hourly Capacity (Cw) x Annual/Daily Demand (D) x Daily/Hourly Dem. (H) = Annual Service Volume (ASV)

ASV Calculation

Cw x D x H = ASV

94.44 x 280 x 8 = 211,548

The ASV calculations are based on the previously mentioned parameters and assumptions, and are directly derived from the guidance provided in FAA AC 150/5060-5, *Airport Capacity and Delay*. The results of the airfield capacity calculations represent an airport specific analysis and have been deemed appropriate and necessary for this level of airport master planning effort.

The current aviation demand in number of aircraft operations at the Airport, as presented in Chapter 3 of this document, is 32,400 operations. This equals approximately 15.3 percent of the present ASV. Additionally, according to the FAA, the following guidelines should be used to determine necessary steps as demand reaches designated levels.

- 60 percent of ASV: Threshold at which planning for capacity improvements should begin.
- 80 percent of ASV: Threshold at which planning for improvements should be complete and construction should begin.
- 100 percent of ASV: Airport has reached the total number of annual operations (demand) the airport can accommodate, and capacity-enhancing improvements should be made to avoid extensive delays.

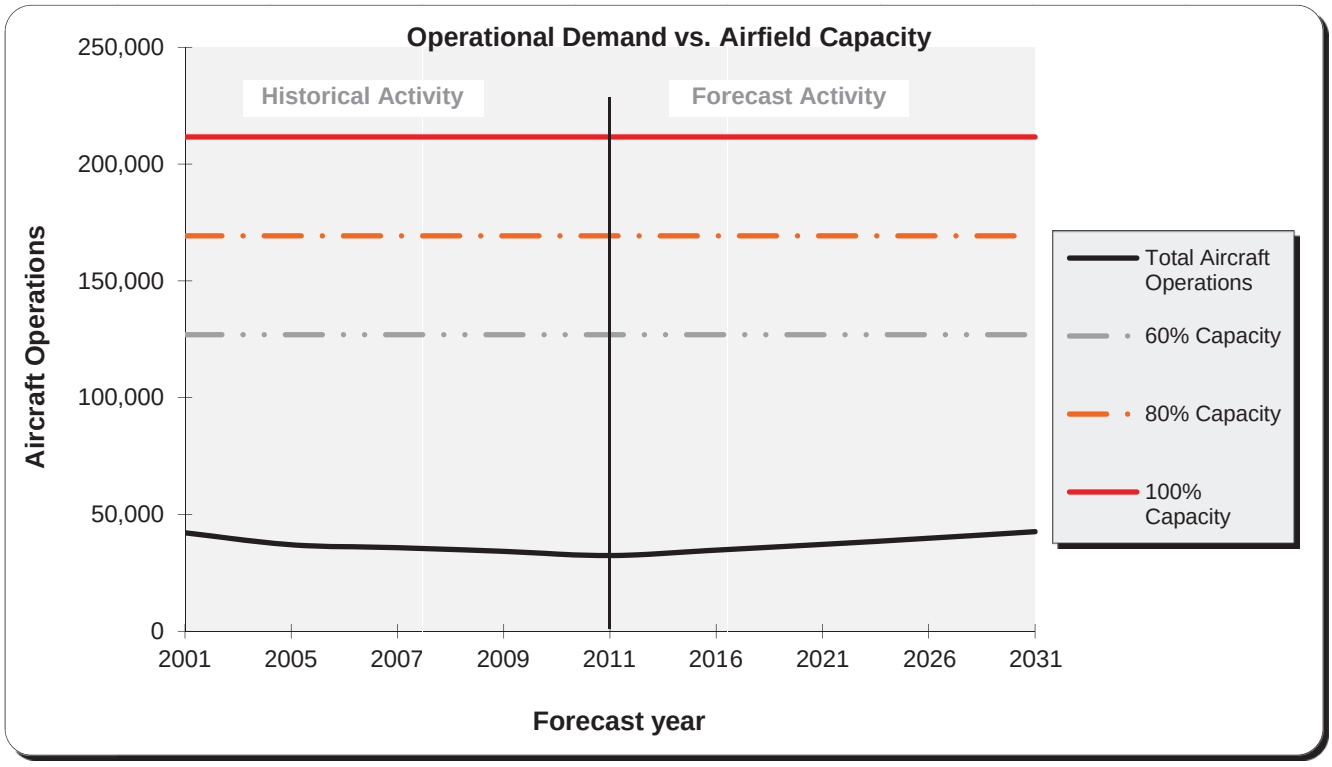
Table 5-3 and **Figure 5-3** illustrate the preferred aviation demand forecast for AVO, based upon the Chapter 3 forecasts, and its relation to the Airport's ASV under VFR and IFR conditions. Based upon existing demand criteria, no additional capacity enhancing projects for the runway system will be needed during the planning period.

Table 5-3. Annual Service Volume vs. Demand

Year	Aircraft Mix Index	Annual Operations	Annual Service Volume (ASV)	Percent of ASV
2011	8.3%	32,400	211,548	15.3%
2016	8.4%	34,698	211,548	16.4%
2021	8.8%	37,159	211,548	17.6%
2026	9.4%	39,795	211,548	18.8%
2031	9.9%	42,619	211,548	20.1%

Source: FAA AC 150/5060-5, Airport Capacity and Delay and CDM Smith, 2012

Figure 5-3. Annual Service Volume vs. Demand



Source: FAA AC 150/5060-5, Airport Capacity and Delay and CDM Smith, 2014

5.3.2 Runway and Taxiway System Requirements

As discussed in Chapter 4, the current critical aircraft for the Airport has been determined by a mix of C-II aircraft and is anticipated to become a mix of the Citation X and Gulfstream 350 in the future. Use of these types of corporate aircraft at AVO has increased over the past few years and has steadily increased nationwide since the terrorist attacks of September 11, 2001 as corporate aircraft became a more viable alternative to commercial airlines for business travel. These aircraft will typically support the travel needs of local businesses and affluent travelers as a way to reduce the delays and increased costs associated with travel on commercial airlines. Increased operations of this type have been witnessed at AVO and are forecast to increase over the planning period. Thus, a review of the runway and taxiway system at AVO must be completed to identify any improvements necessary to accommodate the projected aircraft fleet.

5.3.2.1 Runway Requirements

The aircraft previously mentioned will primarily operate on Runway 5-23 at AVO since it is primary runway and has instrument approach capabilities available. Runway 10-28 will provide additional crosswind coverage for smaller aircraft but will likely see limited use by the larger business jet category. According to FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design* and

FAA Guidance Letter RGL 01-2, "*Runway Length and Strength Requirements for Business Jet Aircraft*," dated August 10, 2001; the recommended runway length for an airport is based on the airplanes forecast to use the runway on a regular basis (500 annual operations or 250 annual takeoffs).

A review of the runway length requirements of the Citation X and Gulfstream 350 and other similar C-II aircraft shows that a runway length of 4,600 to 5,500 feet is typically required for takeoff with 90 percent usable load. Increases in temperature on hot summer days, a negative runway gradient or wet and slippery runways can push the takeoff distance required to near 6,000 feet in some configurations. Based on these requirements, the existing usable takeoff length of Runway 5-23 at 5,374 feet will meet the forecast aircraft demand for AVO. It should be noted however, the reduced available landing distance of 4,340 feet could limit operations by some of the larger forecast C-II aircraft in specific configurations (i.e. wet or slippery runway, increased landing weight, etc.). Additionally, the takeoff distance of Runways 10-28 at only 3,844 will provide limited backup capacity for the larger aircraft currently and forecast to operate at AVO.

A review of the load bearing capacities for each of the three runways at AVO, as identified previously in Chapter 4, against the requirements of the Citation X, Gulfstream 250 and overall C-II critical/design aircraft mix was completed to identify any necessary increases in runway strength that may be required. The primary runway at AVO, Runway 5-23, is estimated to currently have load bearing weight capacities that meet the forecast critical/design aircraft and C-II fleet mix. However, this is based on current single wheel load bearing ratings and specific dual wheel load ratings are not known. Testing to confirm the dual wheel load bearing capacity of the runway should be completed. No increases to the load bearing strength are anticipated unless it is found through other project work that the actual runway strength is less than reported. Efforts to repair and or maintain the reported load bearing strength of each runway should be completed as necessary.

5.3.2.2 Runway Safety Areas

Consideration of runway length requirements must also factor in other design criteria established by the FAA. FAA design criteria regarding runway object free a rea (OFA), runway safety area (RSA), and height clearances must be considered. The runway OFA is defined in FAA Advisory Circular 150/5300-13, **Airport Design**, latest edition, as an area centered on the runway extending out in accordance to the critical aircraft design category utilizing the runway. The OFA must provide clearance of all ground based objects protruding above the runway safety area (RSA) edge elevation, unless the object is fixed by function serving air or ground navigation.

The RSA is also centered on the runway reaching out in accordance to the approach speed of the critical aircraft using the runway. FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

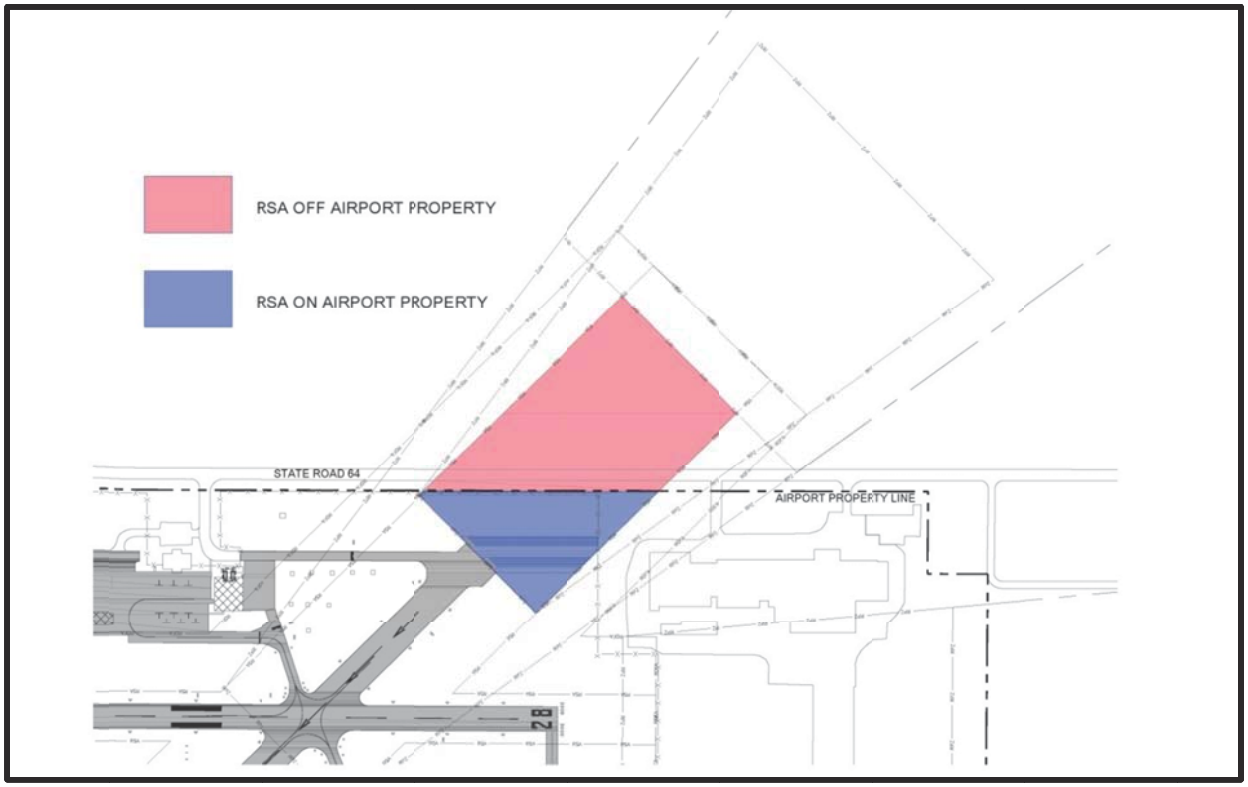
Analysis in the Forecasts chapter indicated that Runway 5-23 should be planned to accommodate aircraft in airport reference code (ARC) C-II. In order to meet design criteria for ARC C-II aircraft , the cleared and graded RSA would need to be 500 feet wide (centered on the runway) and extend 1,000 feet beyond each runway end. The OFA would require a cleared area 400 feet on each side of the runway center line, extending 1,000 feet beyond each runway end.

Runway 10-28 should, at a minimum, accommodate all aircraft in Category A and B. In order to meet design criteria for ARC A-II and B-II aircraft for a runway with navigational approach aids providing visual or not lower than one mile visibility, the FAA criteria for a cleared and graded RSA is 150 feet wide (centered on the runway) and extend 300 feet beyond each runway end. The OFA would require a cleared area 250 feet on each side of the runway center line, extending 300 feet beyond each runway end.

It appears that the RSA for the south end of Runway 23 and both Runway 10 and 28 comply with FAA standards. However, based on the current declared distance of 5,374' the north end of Runway 5 does not meet the required ARC C-II OFA and RSA standards primarily due to the location of the airport property line and Florida State Road 64. The location of the property line and road limits the RSA and OFA beyond the end of the runway to approximately one-fourth of that necessary to meet FAA standards as depicted in Figure 5-4 below.

Alternatives for addressing the Runway 5 non-standard RSA and OFA are discussed in Chapter 6, Development Concepts, paragraph 6.3.2, Runway Safety Areas

Figure 5-4. Runway 5 Non-Standard RSA



Source: CDM Smith

5.3.2.3 Taxiway Requirements

Taxiway 'E' is the parallel taxiway to Runway 5-23, and has five entrance/exist taxiways between the runway and the taxiway. Taxiways 'A', 'B', 'C' and "D' are exit/entrance taxiways between Taxiway 'E' and Runway 5-23. Taxiway 'B' provides access to the apron areas from Taxiway 'E' and both runways. All existing taxiways are currently 35 feet wide, with the exception of Taxiway 'F'

and a portion of Taxiway 'B', north of Runway 10-28. Taxiway 'F' and this portion of Taxiway 'B' are 25 feet wide. All existing taxiway widths, with the exception of Taxiway 'F' and the north portion of Taxiway 'B', meet Group II design standards. Additionally, all existing taxiway to runway centerline separations meet the FAA Group II requirements.

The addition of a full length parallel taxiway to Runway 10-28 with adequate entrance/exit taxiways, which are currently identified on the current Airport layout Plan (ALP), should be completed. The current lack of a parallel taxiway to this runway is a limiting factor that reduces the safety and efficiency of the overall airfield system. A new parallel taxiway with entrance/exit taxiways placed in locations to maximize their use for landing aircraft would alleviate this limitation.

All future taxiways should be designed to meet FAA Group II standards and meet the load bearing weight capacities of the critical/design aircraft discussed previously. It is assumed the current taxiways meet the load bearing capacities as reported for the runway pavement however, efforts to repair and or maintain the reported load bearing strength of each taxiway should be completed as necessary.

5.4 Approach and Navigational Aids

As discussed in Chapter 2, AVO has limited navigational and approach aids. These consist mainly of GPS non-precision approaches for Runways 5 and 10 and precision approach path indicators (PAPIs) in both directions on Runways 5-23 and 10-28. Additionally, the airport is equipped with medium intensity runway lighting (MIRL) on both runways, runway end identifier lights (REIL) on Runway 5-23 and medium intensity taxiway lighting (MITL) on Taxiways 'A', 'B', 'C', 'D' and 'E'. The lighting systems at AVO are pilot activated by keying the microphone with the radio set to the local Common Traffic Advisory Frequency (CTAF) of 122.8. Additionally, a rotating beacon, lighted wind sock and segmented circle are also located at the airport.

Future navigational aids (NAVAIDS) that may be considered in order to increase operational efficiency and ensure safety during IFR and night operations include the installation of REILs on Runway 10-28 as well as a non-precision GPS approach to Runway 23.

5.5 Airfield Lighting, Signage and Pavement Markings

5.5.1 Airfield Lighting

Runways 5-23 and 10-28 currently have MIRL, while Taxiways 'A', 'B', 'C', 'D' and 'E' have MITL systems. The MITL system should be expanded to all existing taxiways currently not lighted as well as in conjunction with any taxiway construction, such as new parallel and entrance/exit taxiways associated with Runway 10-28. Additionally, LED lighting should be installed on all lighted runways once the technology has received FAA approval and is available in the market. LED lighting has a much longer operating life over the current runway lighting at AVO and would require much less power to operate, which would significantly reduce operating and maintenance costs to the City.

5.5.2 Airfield Signage

A portion of the existing airfield signage panels at AVO have recently been replaced and overall signage is adequate for the current facilities. Some remaining signage is of considerable age and is beginning to see more frequent failures. Replacement of the failing existing signage should be completed in the short-term period of the planning study. Additionally, signage improvements should be completed in conjunction with airfield projects. Projects identified in this study that would require signage updates include; taxiway extensions and/or construction and apron improvements and/or construction. Additionally, signage that identifies the preferred noise abatement procedures and clearly designates the FBO terminal locations may be helpful for arriving and departing transient aircraft.

5.5.3 Pavement Markings

Pavement markings should be appropriately relocated to coincide with the completion of any runway (pavement rehabilitation) and/or taxiway improvements or construction of additional apron area. Specifically, new pavement markings and modifications to existing ones should be completed as part of any construction of a new parallel taxiway to Runway 10-28, including all associated entrance/exit taxiways and connections to existing taxiway and apron areas.

5.6 Aircraft Parking Apron

Approximately ten to 15 percent of based aircraft at every airport will not require hangar space. These non-hangared aircraft will require tie-down positions on available apron. Sizing criteria for tie-down positions vary according to aircraft size, including space for circulation and fueling. In addition, itinerant traffic typically does not utilize hangar space. Therefore, tie-down/apron space should be planned to accommodate the estimated non-hangared based aircraft and one-half of the busy-day itinerant aircraft.

There is one main existing aircraft apron area at AVO that total approximately 44,500 square feet (4,945 sq yd) of paved apron surface used for aircraft parking and tie-down, circulation and aircraft movement, and frontage for the FBO terminal and hangars. All of the existing apron and tie-down space is located on the north side of the airfield, north of Runway 10-28. The apron area is typically used for both based and transient aircraft parking. The apron area appears to be in overall good condition with minimal cracking.

Additional apron area utilized in conjunction with two larger conventional hangars is located north of Runway 10-28 adjacent taxiway 'F' and south of Taxiway 'H' near the T-hangar buildings. However, this apron is not available for public use and is restricted to the tenants that lease these facilities.

Based on previous studies and information from airport and FBO management, it has been estimated that 20 percent of single-engine piston based aircraft and 5 percent of multi-engine piston based aircraft at AVO are not hangared and will require apron space. In addition, it is estimated that one-half of the busy day itinerant aircraft will require parking/tie-down space. FAA

AC 150/5300-13 indicates that planning for 300 square yards for each based aircraft and 360 square yards per each busy day itinerant aircraft will provide sufficient space for a mix of aircraft. Additionally, it was estimated 50 percent of the busy day itinerant aircraft will require apron space simultaneously. These calculations result in an occupied apron area for 2011 of approximately 5,160 square yards (46,440 sq ft) or approximately 104 percent of the current apron capacity.

By applying this methodology to the projected demand for aircraft parking, it is estimated that a total of 6,780 square yards (61,020 sq ft) of apron will be required for parking by based and itinerant aircraft in 2031. The existing apron area at AVO is only 44,500 sq ft (4,945 sq yd) in size and will not meet the forecast demand over the planning period. Thus, additional apron space should be considered in the short- to intermediate-term of the planning period. **Table 5-4** illustrates the apron requirements over the planning period.

It should be noted that additional aircraft parking space over that which is projected may be necessary if existing tie-down space is utilized for the construction of aircraft storage hangars. Any space lost to the construction of new hangars should be replaced in kind in addition to the forecast requirements presented in Table 5-4. Also, a review of the level and type of itinerant aircraft parking being used should be completed periodically. If the growth of based or itinerant business jet aircraft exceeds that currently projected additional apron space may be necessary. Reviewing activity and apron needs regularly will allow the airport to gauge the need for additional tie-down apron to accommodate any additional increases in activity.

Table 5-4. Aircraft Tie-Down/Parking Apron Requirements (sq yd)

Year	Based Aircraft Space	Itinerant Aircraft Space	Total
2011	3,000	2,160	5,160
2016	3,300	2,520	5,820
2021	3,300	2,520	5,820
2026	3,600	2,880	6,480
2031	3,900	2,880	6,780

Source: FAA AC 150/5300-13; CDM Smith, 2012

5.7 Aircraft Storage Hangars

Buildings used to store aircraft can generally be categorized as:

- T-hangars: Normally sized for single class A or B aircraft. Structure consists of multiple units.
- Corporate/conventional hangars: Normally sized for single class C or D and turboprop aircraft.
- Service hangars: Normally used by multiple class A and B aircraft and in some instances turboprop and class C and D types.

Service hangars (and in some instances corporate and larger T-hangars) are used to store more than one aircraft depending upon the hangar owner's arrangement with the aircraft owner. In some instances, service hangars house maintenance operations and do not have the capability to store aircraft.

Three types of aircraft storage buildings are currently available at the airport and include; T-hangars, corporate/conventional hangars and large maintenance/service hangars. There is a strong demand for hangar space by based aircraft owners and other aircraft owners who wish to locate their aircraft to AVO. AVO currently has a total of 58 T-hangar units and 64,430 square feet of common hangar (corporate/conventional or maintenance/service hangars) space in a total of six hangar facilities.

Demand for storage space of GA aircraft typically reflects the local climatic conditions and the type of aircraft. Generally, multi-engine, turboprop, and jet aircraft require hangar facilities. In Florida, a general rule of thumb is that 80 to 85 percent of based aircraft owners will desire hangar space for aircraft storage, primarily for protection from weather and for lower maintenance costs. Currently, approximately 90 percent of based aircraft at AVO are stored in hangar facilities, with a growing demand from owner's of based aircraft for additional hangar space. Based on this information, **Table 5-5** shows the demand for aircraft storage space, in total number of aircraft, based on the forecast growth over the planning period.

Table 5-5. Aircraft Storage Requirements

	2011	2016	2021	2026	2031
Forecast Based Aircraft	48	51	54	58	63
Total Aircraft Storage Required	44	46	49	53	57

Source: CDM Smith, 2012

Note: Approximately 85% of aircraft at AVO will require hangar storage throughout planning period

5.8 Aircraft Fuel Storage

Fuel storage at AVO is located north of Runway 10-28 and the maintenance hangar and is provided by the City of Avon Park. The previous FBO operator owned the fuel tanks and recently removed the system. The City entered into a Joint Participation Agreement (JPA) with the Florida Department of Transportation to install one new 12,000 gallon Jet-A tank and one new 12,000 gallon Avgas tank. It is anticipated that the system will be installed and operational by the summer of 2015.

Fuel flowage information for AVO was provided by the previous FBO and airport staff, and was used to forecast the estimated fuel flowage/sales over the planning period (as presented in Chapter 3). Based on fuel flowage data provided by the previous FBO and subsequent projections of aviation demand and fuel flowage, it is estimated that approximately 72,452 gallons of total fuel (51,441 Avgas and 21,011 Jet-A) will be sold annually by 2031. The required capacity necessary to accommodate this demand is presented in **Table 5-6** and has been determined based upon the facilities required to store the average one-month demand of fuel.

It should be noted that as operations requiring Jet-A fuel increase at AVO, fuel storage requirements may need to be reviewed to ensure an adequate level of Jet-A capacity is provided. Additionally, the actual amount of fuel stored to meet demand is subject to the operational policy and business decision of the individual fuel provider (i.e. FBO) and can typically range from one week to one month. Storage for the average monthly demand, as presented in this section, represents the most demanding scenario from a facility requirements standpoint. Less fuel storage than that identified in this section would be required at storage levels necessary to meet a two or one week demand.

In addition to increases in storage capacity, the level at which fuel is required to be delivered is expected to increase. This is mainly due to the forecast increase in activity and the larger fuel requirements of jet aircraft. To meet this demand, additional fuel trucks may be required. **Table 5-6** illustrates the fuel storage requirements for AVO, which include additional storage tanks and fuel trucks.

Table 5-6. Fuel Storage Requirements

Year	Avg. Month Demand (Gal.)		Capacity (Gallons) (1)		Fuel Tank Requirement (2)		Fuel Trucks Required		Total Fuel Farm Area (sq./ft.) (3)
	Avgas	Jet-A	Avgas	Jet-A	Avgas	Jet-A	Avgas	Jet-A	
2011	2,826	1,154	3,109	1,266	1	1	1	1	3,200
2016	3,490	1,426	3,839	1,569	1	1	1	1	3,200
2021	3,738	1,527	4,112	1,680	1	1	1	1	3,200
2026	4,003	1,635	4,403	1,799	1	1	1	1	3,200
2031	4,287	1,751	4,716	1,926	2	1	2	1	4,800

Source: CDM Smith, 2014

Note: (1) Based on 110% capacity of forecast demand

(2) Based on 5,000 gallon Avgas and 10,000 gallon Jet-A storage tanks

(3) Based on average area of 1,600 square feet per tank for safety and operational areas

5.9 FBO/GA Terminal Building

The demand for terminal space at a GA airport relates to the need for facilities that can accommodate both pilots and passengers at an airport. Normally, these facilities are provided by the airport FBO(s) or the airport operator and typically include a lounge for pilots and passengers, a flight planning room, rest rooms, and administration offices. The primary consideration for GA terminal design under federal guidelines is that the facility be capable of handling the amount of passengers, pilots, and visitors associated with peak hour operations. This consideration is presented in Appendix 5 of AC 150/5300-13 *Airport Design*, latest edition, which provides guidelines for small airport buildings, including GA terminals. Additional guidelines are found in AC 150/5040-2, *Aviation Demand and Airport Facility Design Forecasts*, Appendix 2, "General Aviation Terminal Buildings". By assessing peak demand, minimum square footage allotments are assigned to the facility to derive terminal space requirements.

Currently, there is one FBO terminal building at AVO with approximately 4,000 square feet of total space, which consists of lobby and office space, FBO, pilot lounges, conference rooms, a small kitchen facility, and a flight planning room. GA facility sizing can vary from 50 to 100 square feet per peak hour passenger. Future needs at AVO will depend upon air traffic, FBO services, corporate business use, and the amount of charter operations. Considering the level of operations forecast over the planning period, for planning purposes a 50 square foot per peak hour pilot/passenger factor was used to estimate gross GA terminal area requirements.

Utilizing the above referenced sizing criteria and based on the current and forecast level of demand, 4,425 square feet of FBO/GA terminal space will be required by 2031. **Table 5-7** shows the FBO/GA terminal building requirements over the planning period.

Table 5-7. FBO/GA Terminal Building Requirements

Year	Total GA Passengers	Peak-Hour Passengers	Forecast Terminal Demand (sq ft)	Terminal Space Requirements (sq ft)
2011	65,494	45	2,250	3,375
2016	70,139	48	2,400	3,600
2021	75,113	52	2,600	3,900
2026	80,443	55	2,750	4,125
2031	86,148	59	2,950	4,425

Source: CDM Smith, 2012

The previous analysis assumes 1.9 persons, including one pilot and .9 passengers, for every peak hour local operation and three persons, one pilot and two passengers, per every itinerant peak hour operation. The long-term planning requirement applies a 50 percent factor to demand to allow for ample time for the next stage of improvements.

5.10 Public Automobile Parking

There are no exact parameters, which can be applied to determine automobile parking requirements at GA airports. During development, areas should be reserved for parking with adequate room for expansion. Using the guidelines noted in FAA AC 150/5360-13, *Planning and Design Guidelines for Airline Terminal Facilities*, a realistic forecast of demand can be determined. Historically, at an origin and destination airport, 40 to 85 percent of the originating passengers arrive in private automobiles. Consequently, adequate public parking facilities are a valuable part of good terminal design. Automobile parking facilities are not only intended to provide space for passengers, but also for employees and visitors.

Automobile parking at AVO is located in various areas of the airport. The sole public parking area is restricted to the parking area associated with the airport administration building, which contains approximately 19 parking spaces. Additional parking lots associated with the maintenance facility and other tenants at AVO are located in conjunction with their individual facilities and are used strictly for employees and customers of those facilities.

It is important to note that parking at GA airports is usually spread around the airport. Historically, GA operators with aircraft storage facilities on airports typically use these hangars to store their

vehicle when they are out of town. The FAA suggests using a planning factor of 1.3 parking spaces per peak-hour GA passenger. When developing plans for an automobile parking lot, a planner must reserve approximately 400 square feet per parking space, which accounts for parking and circulation. Based on these planning factors, approximately 89 parking spaces and 35,600 square feet of pavement area will be required by 2031. The forecast requirements for the public automobile parking areas over the planning period are listed in **Table 5-8**. The space requirements identified are anticipated to accommodate the forecast levels of GA pilot, passenger, customer and visitor parking demand.

Table 5-8. Automobile Parking Requirements

Year	Peak-Hour Passengers	Required Parking Spaces	Required Parking Area (sq ft)
2011	45	68	27,200
2016	48	72	28,800
2021	52	78	31,200
2026	55	83	33,200
2031	59	89	35,600

Source: CDM Smith, 2012

5.11 Ground Access

Ground access and terminal roadways serve passengers, employees, visitors, and anyone who travels to and from the airport. Circulation systems within the airport boundaries should minimize congestion and support efficient access to the airfield and associated facilities. Additionally, it is important to ensure that the access roadways are well planned, and provide adequate capacity to meet the projected demand imposed by vehicular traffic. The roadway system must be able to accommodate peak levels of activity without creating excessive or unwarranted delay.

Currently access to the GA terminal building is provided by State Road 64, which connects to U.S 27 approximately .7 miles to the east of the airport. In addition, the T-hangars and maintenance hangar can be accessed via Bell Street which connects to U.S. 27 approximately one-half mile from the airport. **Figure 5-4** illustrates the location of the airport access roads.

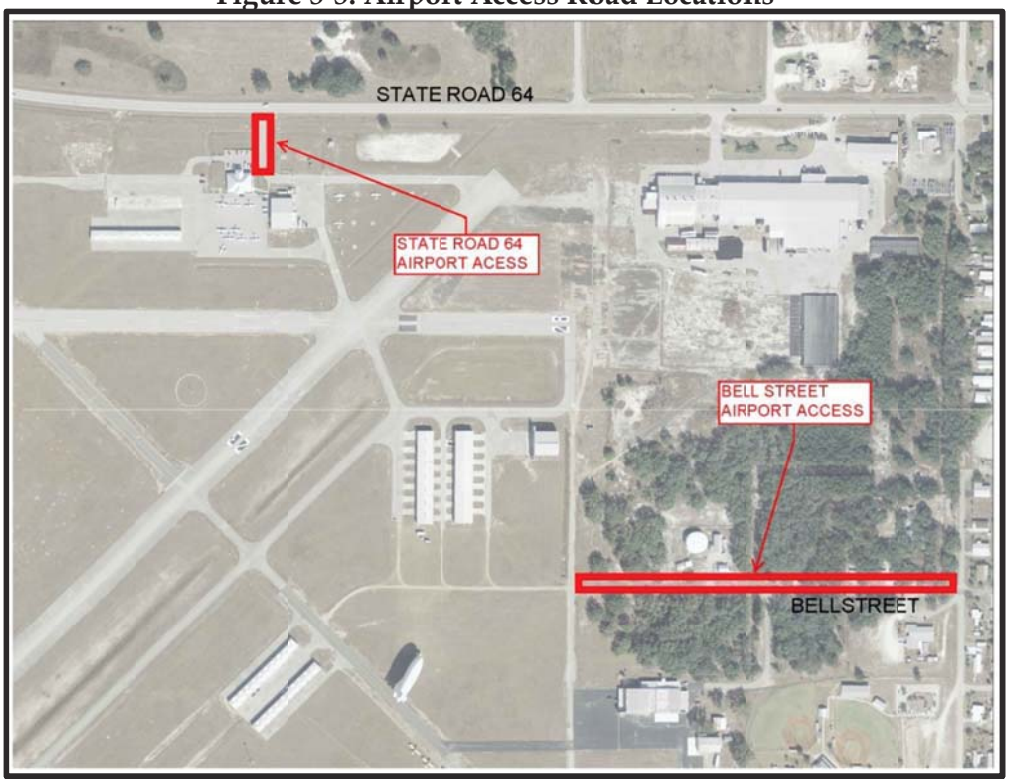
Regional access to and from AVO is provided by State Road 64, which connects to US Highways 27 and 98 east of the Airport. US Highway 27 runs north and south and connects the area to State Road 60 and Interstate 4 to the north, and State Road 70 (Okeechobee Road) and Interstate 75 to the south. These roads are the limited access regional transportation arteries providing access to Florida's east and west coasts and to the Miami/Dade County and central Florida/Orlando areas. State Road 64 also provides access to Interstate 75 west of Avon Park near Bradenton on the west coast of Florida.

Based on the forecast of aviation demand presented in Chapter 3, the only additional roadway expansion projects anticipated during the planning period include continued maintenance and roadway expansion projects associated with future development. Such projects may include; repaving or rehabilitation of existing roadway surfaces, widening to accommodate increased development, new roadway construction as part of a large parcel development, and/or installation of curb and gutter type improvements as part of an enhanced development project.

5.12 Airport Security and Fencing

Currently, AVO has a network of security gates with key card access along the airport perimeter fencing to secure the airport property. Additionally, AVO completed and adopted an airport security plan in December 2011. Not all the security fencing at the airport meets federal guidelines to include 10-foot high security fence with 2-feet of buried fencing to secure the property from burrowing animals. An upgrade to this level of security fencing should be completed as necessary to so that the entire airport perimeter fence and meets federal requirements. Further, all security fencing and access gates/key pads should be maintained and adjusted, as necessary, in conjunction with airfield and facility development. In addition, appropriate clearing of foliage should be maintained within the runway visual zone (RVZ), runway protection zones (RPZ) and runway object free areas (ROFA) in order to provide adequate visibility across the area and maintain safe air navigation to and from the airport. As additional safety measures, any additional buildings or parking areas constructed on airport property should have adequate security lighting. Also, the use of security cameras at key locations should be considered.

Figure 5-5. Airport Access Road Locations



Source: CDM Smith, 2015

5.13 Airport Rescue and Firefighting (ARFF)

The City of Avon Park currently provides Emergency Medical Treatment (EMT) and Airport Rescue and Firefighting (ARFF) services for AVO. The City also provides firefighting support to the airport from the Avon Park Fire Station located on Delaney Avenue, approximately 1.5 miles from the airport. Law Enforcement is provided by the Highlands County Sheriff's Office.

Since AVO is a GA facility that does not have commercial service and/or a Part 139 certification, ARFF services are not required to be located on the airport. Therefore, the ARFF services provided by the City may be considered adequate for the existing level of operations. However, as corporate operations and the airport's fire safety needs increase, a review of the airport's overall fire protection and rescue needs should be completed and any necessary improvements identified to ensure the safety of the airport.

5.14 Non-Aviation Use

The airport currently has land assets for development, the majority of which are suitable for aviation uses. However, some areas of airport property may be suitable for development of non-aviation uses based on their location and/or sensitivity to surrounding communities. One of these areas is located to the north of airport property along State Road 64. A portion of this land may be more suitable for commercial or industrial development due to its proximity to the highway and distance from direct runway access. Another area of airport property that could have non-aviation development potential is located on the east side of the airfield, near the existing baseball fields.

Other non-aviation uses exist on airport and are largely developed out of leases of existing buildings that do not have airside access. It is anticipated that these opportunities will continue. Such opportunities to lease non-aviation use facilities should be sought whenever possible in order to diversify revenue sources and maximize the benefit of airport facilities to the City and local community.

5.15 Summary

This section has identified the general airport capacity and facility requirements necessary to meet the 20+ year forecast of aviation demand. Prior to the actual physical layout of these facilities, specific refinements must be accomplished to enable the airport to develop in a coherent and logical manner. The facility requirements are based upon the forecast of aviation activity. A summary of the general facility requirements is outlined by planning phase in **Table 5-9**.

Capacity and demand requirements have been determined for essentially all aspects of AVO's operations. These calculations, which are based on various components, should be regarded as generalized planning tools, which assume attainment of forecast levels as described in Chapter 3. Should the forecasts prove conservative, proposed developments that will be recommended as a result of the demand/capacity analysis and facility requirements should be advanced in schedule.

Likewise, if traffic growth materializes at a slower rate than forecast, deferral of expansion would be prudent.

Table 5-9. Summary of Facility Requirements

Item	2011 (existing)	Planning Stage Requirements		
		Phase 1 (0 – 5 yrs)	Phase 2 (6 – 10 yrs)	Phase 3 (11 – 20 yrs)
Airside Facilities				
Runway 5-23:				
- ARC	C-II	N/C	N/C	N/C
- length / width	5,374' x 100'	N/C	N/C	N/C
- pavement condition / strength	26,000 SW	N/C	Maintenance - Overlay	N/C
- Safety Area (Runway 5)	1,000 x 500 (L x W)	N/C	N/C	N/C
- Safety Area (Runway 23)	1,000 x 500 (L x W)	N/C	N/C	N/C
- approach aids	GPS, PAPI, MIRL, REIL	N/C	N/C	N/C
Runway 10-28:				
- ARC	B-II	N/C	N/C	N/C
- length / width	3,844 x 75'	N/C	N/C	N/C
- pavement condition / strength	10,000 SW	N/C	N/C	Maintenance - Overlay
- Safety Area (Runway 10)	300 x 150 (L x W)	N/C	N/C	N/C
- Safety Area (Runway 28)	300 x 150 (L x W)	N/C	N/C	N/C
- approach aids	GPS, MIRL, PAPI	N/C	GPS, MIRL, PAPI, REIL	N/C
Taxiway System				
- Runway 5-23	Full-length parallel	N/C	N/C	Entrance/exit taxiway to Runway 10-28 & apron area
- Runway 10-28	No parallel	N/C	Full-length parallel (north side)	N/C
Airfield Lighting / electrical	----	Taxiway lighting (LED)	Runway 10-28 REILs / Taxiway lighting (LED)	Taxiway lighting (LED)
Airfield Signage	----	Signage replacement	N/C	N/C
Landside Facilities				
Aircraft Parking Apron Area:	4,945 sq/yds	5,820 sq/yds	N/C	6,780 sq/yds
Aircraft Storage (Required Units)	----	N/C	N/C	14

Fuel Facilities (tanks / trucks):	2 / 2	N/C	N/C	3/ 3
GA/FBO Terminal Space:	4,000 sq/ft	N/C	N/C	5,000 sq/ft
Public Automobile Parking:	19 spaces	72 spaces	78 spaces	89 spaces
ARFF	----	N/C	N/C	N/C
Ground Access / Roadways	----	N/C	N/C	N/C
Security Fencing	Partial 10-foot perimeter	Complete 10-foot perimeter and add security cameras	N/C	N/C
Airport Property	321 acres	N/C	N/C	N/C

Note: N/C - No Change, N/A - Not Applicab

SECTION 6
DEVELOPMENT CONCEPTS

The primary objective of this chapter is to identify a preferred development concept for Avon Park Executive Airport (AVO) that will meet the airport's long-term aviation needs and the City's strategic visions for the future of the airport. Airside and landside facilities necessary to satisfy the various elements of the aviation demand forecast for the 20-year planning period drive the analysis. In general, three major functional areas were considered in identifying the development alternatives. These include the airside (runways, taxiways, and aprons), landside (hangars, terminal buildings, and parking), and general airport requirements (ground access and non-aviation land uses).

6.1 Master Land Use Plan

The intent of this section is to build upon the information presented in the previous chapters and evaluate the existing on-airport land uses to identify ways to improve and/or maximize operational efficiency, diversify and increase revenue sources for the airport, and ensure compatibility and a certain level of "synergy" between adjacent uses within the total airport system. Achieving this can sometimes be challenging where available vacant developable parcels are limited and large tracts are currently leased by tenants. It is often best to look for the single best land use solution that maximizes the use of airport property, its economic benefit to the community and builds flexibility for future redevelopment if changes in lease area and/or use occur.

The land use planning process completed in this section identified and confirmed the areas having aeronautical, and non-aeronautical driven development opportunities for AVO. These development areas have been evaluated and programmed to establish a master land use plan for long-term development. The land uses identified in the master land use plan seek to meet general land use planning assumptions identified to help guide the consideration of viable development opportunities. These general land use planning assumptions include:

- Aeronautical aviation related businesses are considered by federal law and regulations to be the highest and best use for all suitable parcels when runway access is available.
- Non-aeronautical aviation related businesses are considered the highest and best use for all suitable parcels when runway access is not available.
- Proposed land uses must consider existing adjacent land uses and seek to ensure land use compatibility and enhanced flexibility.
- Proposed development must comply with federal law and regulations regarding use of airport lands and the terms and conditions under which such land is made available for development.

- Necessary access and infrastructure to support the proposed land use must be available and readily accessible or expanded.

- Environmental concerns should be considered relative to the type and location of the proposed land use.

- Opportunities to enhance revenue diversification and increase overall revenue sources should be incorporated whenever feasible.

These assumptions have been used as the basis for consideration in evaluating various aeronautical and non-aeronautical land uses and development areas. Ultimately, the master land use plan must present a cohesive flexible plan that accommodates existing uses and plans for future development that will maximize the flexibility and economic impact of the Airport. The master land use plan for AVO is illustrated in the **Land Use Plan (sheet 13) of the Airport Layout Plan** set.

6.2 Development Considerations

To meet current and future aviation demand, various airside, landside, and general airport requirements were identified in Chapters 4 and 5, Demand/Capacity Analysis and Facility Requirements. Prior to identifying a development plan, these aviation-specific requirements are evaluated. In general, similar criteria are used to measure the effectiveness and the feasibility of various development options and are grouped into four general categories. These include:

- Operational – The final development plan should be capable of meeting the Airport's facility needs as they have been identified for the planning period. Preferred options should resolve any existing or anticipated deficiencies as indicated by Federal Aviation Administration (FAA) design and safety criteria.

- Environmental – Airport growth and expansion have the potential to impact the Airport's environs; therefore, the selected plan should seek to minimize impacts in the areas outside the Airport's boundaries. Alternatives should also seek to obtain a reasonable balance between development needs and off-site acquisition and relocation needs, while being sensitive to environmental features that may be impacted.

- Cost – Some alternatives may result in excessive costs as a result of expansive construction, acquisition, or other development requirements. In order for a preferred alternative to best serve the airport and the community, it must satisfy development needs at reasonable costs.

- Feasibility – The alternatives must be acceptable to the City, the FAA, the Florida Department of Transportation (FDOT) and the overall community served by the Airport, and should be economically feasible while meeting diversified objectives. The development concept should augment local government efforts to enhance existing business activity and stimulate growth in new industry sectors. The Airport development plan should provide a lucrative asset for the City in marketing the area to prospective business operations. Finally, the development concept must provide the Airport/City with a master strategic development plan that will guide the growth of the Airport for the foreseeable future and provide the tools to ensure its financial stability.

These evaluation criteria addresses economic, operational, environmental, and other important issues that are crucial to making strategic long-range planning decisions. The following sections will use these evaluation criteria to identify potential development options that best meet the airport's long-term planning goals and development needs. Proposed airport development discussed in this chapter is presented in the following separate but interrelated functional areas of the Airport:

- Airfield Facilities
- Aviation Development Areas
- Non-Aviation Development Areas

It should be noted that any evaluation of potential future development could also include a "no action" alternative. However, a "no action" alternative may not meet the forecast requirements of the airport or the long-term strategic goals of the Airport/City and must be fully evaluated if deemed to be a viable alternative for consideration.

6.3 Airfield Configuration

The runways and taxiways are the focal point of the airport complex, and airfield facility requirements are often the most critical factor in the determination of viable development alternatives. In particular, the runway system often has the greatest influence on the location and overall development of other airport facilities, both airside and landside. The potential for physical expansion of the airport to accommodate airfield development is a primary factor that determines long-term expansion. The runway and taxiway system directly affects the efficiency of aircraft movements both on the ground and in the surrounding airspace. Thus, the overall capacity of an airport to accommodate aviation activity is directly related to the efficiency and capabilities of the airfield system. Additionally, the runway and taxiway system can limit the ability of the Airport to handle certain aircraft, which can directly affect the types of aircraft the Airport can accommodate. The airfield's existing configuration of two runways accommodates the fleet mix and air traffic levels over the planning period.

Figure 6-1 below illustrates the existing runway/taxiway configuration at the Airport. The following sections outline the improvements that have been considered to each individual component within the airfield system to include addressing non-compliant FAA standards such as runway safety areas and runway object free areas.

Figure 6-1 Runway/Taxiway Configuration

Source: Google Earth, 2015

6.3.1 Runway Improvements

As discussed in Chapter 5, no change in runway width and/or strength is anticipated to be necessary for Runway 5-23. However, addressing an existing non-compliant runway safety area (RSA) and runway object free area (ROFA) associated with the departure end of Runway 5 may require the extension of the departure end of Runway 23. Any extension of Runway 5-23 to address the non-compliant RSA/OFA would most likely be dependent upon FAA concurrence as well as the availability of funding for a federal grant. The following section (Runway Safety Areas) examines in more detail the non-compliant RSA/OFA at the departure end of Runway 5 and provides possible solutions with the pros and cons of each.

No change in runway length, width or strength is projected for Runway 10-28 in order to meet the forecasted critical aircraft demand.

Continued maintenance of the exiting pavement surfaces, including regular pavement overlays, should be completed to ensure the existing runway system remains in good useable condition and to avoid any unsafe operating conditions that may result from degradation of the runway pavement surfaces. Thus, the following runway pavement improvements/maintenance are anticipated over the planning period:

- Runway 5-23 – Pavement rehabilitation in short-term period
- Runway 10-28 – Pavement rehabilitation in long-term period

No other improvements to the existing runway pavements are anticipated over the planning period.

6.3.2 Runway Safety Areas

The design of airfield facilities includes both the pavement areas to accommodate landing and ground operations of aircraft as well as imaginary safety areas to protect aircraft operational areas and keep them free of obstructions could affect the safe operation of aircraft at the airport. The imaginary safety areas include the: runway safety area (RSA) and object free area (OFA).

As identified in Chapter 5, Demand/Capacity Analysis & Facility Requirements, paragraph 5.3.2.2, Runway Safety Areas, based on the current utilized runway length of 5,374 feet, the north end of Runway 5 does not meet the required ARC C-II OFA and RSA standards primarily due to the location of the airport property line and Florida State Road 64.

Figures 6-2 and 6-3, located at the end of Section 6, identify the existing conditions of the Runway 5-23 RSA/OFA. The stop end of Runway 5 is currently configured to be the end of the pavement available for takeoff. As such, the RSA and OFA extend 1,000 feet beyond the end of pavement and off of the airport property. Florida State Road 64 falls within the RSA and OFA boundaries.

Currently, there is a 175 foot communications tower approximately 4,800 feet from the departure end of Runway 5 at a heading of 39.3 degrees. The tower penetrates the 40:1 departure surface by 53.2 feet. The tower is lighted and has been in place since 1990. An airspace study was completed on the tower under ASN 1990-ASO-1062-OE. Additionally, for obstacle clearance purposes, the FAA considers roads as vertical solid objects with a clearance requirement of 15 feet. With the current configuration, State Road 64 penetrates the 40:1 departure surface by 6.2 feet.

Under the current configuration the Runway 5-23 distances available for the Takeoff Roll Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) are listed in **Table 6-1**.

Table 6-1 Existing Runway 5-23 Declared Distances

RUNWAY	TORA	TODA	ASDA	LDA	RSA LENGTH (BEYOND RUNWAY END)
5	5,374'	5374'	5,374'	5,374'	266'
23	5,374'	5,374'	5,374'	4,330'	1,000'

Source: CDM Smith, 2015

Primary aviation related businesses on the airport, such as Highlands Aviation, market high end business class jets by providing aircraft paint and refurbishing services. In order to meet the typical requirements levied by most insurance carriers in order to receive underwriting, the runway length available for take-offs must be at least 5,000 feet. Anything less could severely damage some businesses on the airport due to those demanding insurance requirements. Also, with the hot and humid summers experienced in Florida, even 5,000 feet of runway length can be reduced by the effects of temperature and humidity and its negative impact upon aircraft take-off flight characteristics.

Under the existing configuration the airport businesses are not impacted by the distances associated with the TORA, TODA, ASDA and LDA, and their relationship to jet aircraft flight characteristics.

The challenge of addressing the non-standard RSA/OFA at Avon Park Executive Airport is achieving a realistic balance between safety, avoiding negative economic impacts to businesses on the airport, a realistic timeline, and an economically feasible solution for all funding participants.

Through coordination with the City of Avon Park and the FAA, it has been discussed that short-term, mid-term, and long-term solutions should be examined, and pursued to the extent practicable. The short-term solution would be the implementation of declared distances. The mid-term solution would provide for a 211 foot extension of Runway 5-23 in conjunction with a non-standard 600-foot RSA. The long-term solution would extend Runway 5-23 721 feet to the southwest to provide the full 1,000 feet of RSA at the takeoff end of Runway 5. An examination of each is presented below.

6.3.2.1 Short-Term RSA Solution: Declared Distances

Figures 6-4 and 6-5, located at the end of Section 6, shows the short-term solution by implementing declared distances to provide a fully compliant RSA at both takeoff ends of Runway 5-23 within the airport property. With this solution, the displaced Runway 23 threshold would remain at its existing location.

Regarding the 175 foot communications tower addressed above, in accordance with AC 150/5300-13 the 40:1 departure surface will begin at the end of the TORA/TODA. This will reduce the tower

penetration of the departure surface from 53.2 feet to approximately 33.3 feet and eliminate the State Road 64 penetration completely.

Under the **short-term** configuration the Runway 5-23 declared distances available for the Takeoff Roll Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) are listed in **Table 6-2**.

Table 6-2 Short-Term Runway 5-23 RSA Solution

RUNWAY	TORA	TODA	ASDA	LDA	RSA LENGTH (BEYOND RUNWAY END)
5	4,330'	4,330'	4,330'	4,330'	1,000'
23	5,374'	5,374'	5,374'	4,330'	1,000'

Source: CDM Smith, 2015

This scenario does not provide for a minimum of 5,000 feet for takeoffs on Runway 5. Runway 5 is also the longest runway on the airport with a non-precision GPS approach. Based on discussions with one of the primary business beneficiaries of jet traffic, Highlands Aviation, placing these particular declared distances into effect will contribute heavily to the eventual closure of their business due to the reduction of jet traffic capable of utilizing the airport, both from an insurance requirement, as well as the flight characteristics of the aircraft.

NOTE: Per FAA studies, the takeoff distance required for many Category C business jets at sea level, standard temperature, and maximum takeoff weight is typically between 3,200 and 5,700 feet. The landing distance required in dry conditions at sea level, standard temperature, and maximum landing weight typically ranges from 2,400 to 5,900 feet. The mean maximum temperature for Avon Park Executive Airport is 90.5 degrees which could result in an even greater takeoff distance required due to the effects of high temperature and high humidity.

6.3.2.2 Mid-Term RSA Solution: Extend Runway 5-23 211' to Southwest

Figures 6-6 and 6-7, located at the end of Section 6, show the mid-term solution. It would provide a minimum of 5,000 feet for both take-offs and landings on Runway 5-23. Under this solution, the existing displaced Runway 23 threshold would be relocated 450 feet northeast of its current location. The result would be a 600 foot runway end safety area at the Runway 5 departure end. The Runway 23 departure end would be extended approximately 211 feet to the southwest.

Under the **mid-term** configuration the Runway 5-23 declared distances available for the Takeoff Roll Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) are listed in **Table 6-3**.

Table 6-3 Mid-Term Runway 5-23 RSA Solution

RUNWAY	TORA	TODA	ASDA	LDA	RSA LENGTH (BEYOND RUNWAY END)
5	5,000'	5,000'	5,000'	5,000'	600'
23	5,585'	5,585'	5,585'	5,000'	1,000'

Source: CDM Smith, 2015

Under this scenario the businesses on the airport would not be impacted in that it does provide for a minimum of 5,000 feet for takeoffs on Runways 5 and 23. Although the RSA/OFA at the departure end of Runway 5 would be increased from 266 feet to 600 feet it would still be non-compliant. Acquisition of additional off-airport property in order to accommodate the RSA/OFA at the take-off end of Runway 23 would NOT be required.

6.3.2.3 Long-Term RSA Solution: Extend Runway 5-23 671' to Southwest

Figures 6-8 and 6-9, located at the end of Section 6, show the long-term solution to providing a fully compliant RSA at the takeoff end of Runway 5 within the airport property. It would also provide a minimum of 5,000 feet for both take-offs and landings on Runway 5-23. Under this solution, the displaced Runway 23 threshold would remain at its current location so as to provide a 1,000 foot runway end safety area clear of the fence line and State Road 64. The Runway 23 end would be extended approximately 721 feet to the southwest. It would be necessary to acquire additional off-airport property in order to accommodate the RSA at the take-off end of Runway 23.

Under the **long-term** configuration the Runway 5-23 declared distances available for the Takeoff Roll Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) are listed in **Table 6-4**.

Table 6-4 Long-Term Runway 5-23 RSA Solution

RUNWAY	TORA	TODA	ASDA	LDA	RSA LENGTH (BEYOND RUNWAY END)
5	5,000'	5,000'	5,000'	5,000'	1,000'
23	6,044'	6,044'	6,044'	5,000'	1,000'

Source: CDM Smith, 2015

This solution would require the following major steps:

a. Environmental Assessment.
b. Environmental Mitigation.
c. Land Acquisition.
    1. Acquire 4.5 acres of non-compatible land use for RSA/OFA
    2. Acquire 18.1 acres of non-compatible land use for RPZ
d. Design.
e. Bidding.
f. Construction.
    1. Extend Runway 23 departure end and parallel taxiway.
    2. Relocate Runway 5 PAPI.

The process associated with the steps listed above would likely take several years to complete. ***Also, based upon an estimated cost of approximately $7,000,000 - $9,000,000 the long-term RSA/OFA solution is most likely cost prohibitive and not economically feasible.***

6.3.2.4 Recommendations

The scenarios which would not incur costs include the existing configuration and the short-term solution. The existing configuration includes a very short non-compliant RSA/OFA at the departure end of Runway 5 which is only 266 feet at the extended runway centerline. However, the distances available for takeoffs on Runways 5 and 23 are at least 5,000 feet and would not have an economic impact upon those airfield businesses which rely upon jet traffic to support them.

The short-term solution would only implement declared distances and not involve construction. This scenario would provide for a fully compliant RSA/OFA at both ends of the runway. Runway 23 (visual) would have over 5,000 feet available for takeoff; however, the distance available for takeoff on Runway 5 (non-precision GPS approach) is only 4,330 feet. As stated previously this scenario would negatively impact Highlands Aviation to the degree that given time, closure would probably occur due to its effect upon the volume of jet traffic.

The mid-term solution implements declared distances and includes construction. It increases the non-compliant RSA/OFA from 266 feet to a still non-compliant 600 feet. Additionally, the departure end of Runway 23and Taxiway E would be extended 211 feet. Runways 5 and 23 would have at least 5,000 feet available for takeoffs, and would not have an economic impact upon those airfield businesses which rely upon jet traffic to support them. For what is currently known about that area of the airport there would not be any environmental impacts associated with the runway/taxiway extension nor the RSA/OFA.

The long-term solution will be the most costly and time consuming. It would implement declared distances and construct a 651 foot extension to the departure end of Runway 23. It would provide for fully compliant RSA/OFAs at the Runway 5-23 departure ends and provide the minimum 5,000 feet of runway length (5 and 23) necessary for those airport businesses dependent upon jet traffic. Due to the estimated cost of $7,000,000 to $9,000,000 to accomplish all aspects of this solution, the City's potential funding share would most likely be too costly a burden. The area required for the additional RSA/OFA is known to contain some protected species of animals and habitat, and has the potential for significant mitigation costs above what is currently estimated.

It is recommended that the City pursue the mid-term solution. Due to the almost prohibitive high costs associated with the long-term solution the mid-term solution could very well take on the role as the long-term solution.

6.3.3 Taxiway Improvements

The following sections outline the taxiway improvements that have been considered within the development concept process. The concepts presented in the following sections will incorporate taxiway improvements from these sections to meet the development needs of each area.

Parallel Taxiways

Full length parallel taxiways provide additional operational safety and efficiency to arriving and departing aircraft when entering and exiting the runway system. Currently, AVO only has one full

length parallel taxiway and it serves Runway 5-23. In order to increase operational safety and capacity to the airfield system an additional parallel taxiway should be provided. Thus, the following parallel taxiway improvements should be considered:

- Construct parallel taxiway on the north side of Runway 10-28 from Taxiway B to the approach end of Runway 10 to complete a full-length parallel taxiway on the north side of RW 10-28.

- Extend Taxiway F from the Runway 23 threshold to the Runway 28 threshold

No other improvements to the existing parallel taxiway configuration are anticipated over the planning period.

Other Taxiways

As with parallel taxiways, adequate entrance and exit taxiways are instrumental in allowing aircraft to exit the runway, reducing delays and helping increase overall efficiency. Guidance provided in the FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, recommends a minimum of four entrance/exit taxiways, spaced at least 750 feet apart and located 2,000 and 4,000 feet from the landing threshold.

Currently, adequate entrance/exit taxiways are located at AVO and meet these requirements to. However, the addition of new entrance/exit taxiways with new parallel taxiway construction and the rehabilitation of existing taxiways, including Taxiway A and taxiway E, should be completed. No other improvements to the existing taxiway configuration are anticipated over the planning period.

6.3.4 Airfield Development Concept

Based on the runway and taxiway considerations discussed previously, a recommended airfield concept was identified. This concept outlines a program that most effectively meets the overall short-, medium-, and long-range goals at the airport while enhancing operational safety, increasing airfield efficiency and meeting forecast demand at AVO.

Items 1 through 17 of the Future Airport Development contained in the Airport Layout Plan (sheet 3 of the Airport Layout Plan set), illustrates the proposed airfield improvements, including the necessary pavement maintenance as part of the selected airfield concept.

6.4 Aviation Development Areas

The purpose of this section is to evaluate potential aviation development areas, considering the airfield concept identified previously, in order to develop an aviation development concept that will support the long-term strategic development goals of the Airport and meet the anticipated needs of existing and forecast demand. Aviation development concepts should be created in balance with the airfield and surrounding airspace and consider the impact that such development areas will have on non-aviation landside development and the adjacent community.

Opportunities for expansion of the following aviation development types have been identified:

- Light GA facilities and storage hangars

- Corporate GA facilities and related aeronautical development areas (FBOs, maintenance, avionics, etc.)

- Aviation support facilities

Potential development types were evaluated within available vacant development areas, as well as potential areas of redevelopment on the airport. The ultimate goal is for the aviation development concept to exhibit the following characteristics:

- **Flexibility**: A plan that is demand-responsive, and can adjust over time to changes in quantifiable demands as well as changes in the nature of demands.

- **Vision**: A plan that addresses probable future aviation trends and technologies, as well as trends in other transportation arenas.

- **Definition**: A plan that sets a sure course of action, and is clearly supported and realistic.

- **Convenience**: A plan that enables the Airport to achieve a high level of public service.

- **Stability**: A plan that properly guides small increments of growth and modification as needed over time.

- **Economic Soundness**: A plan that enables the Airport to prosper over the years and help enhance the local economy.

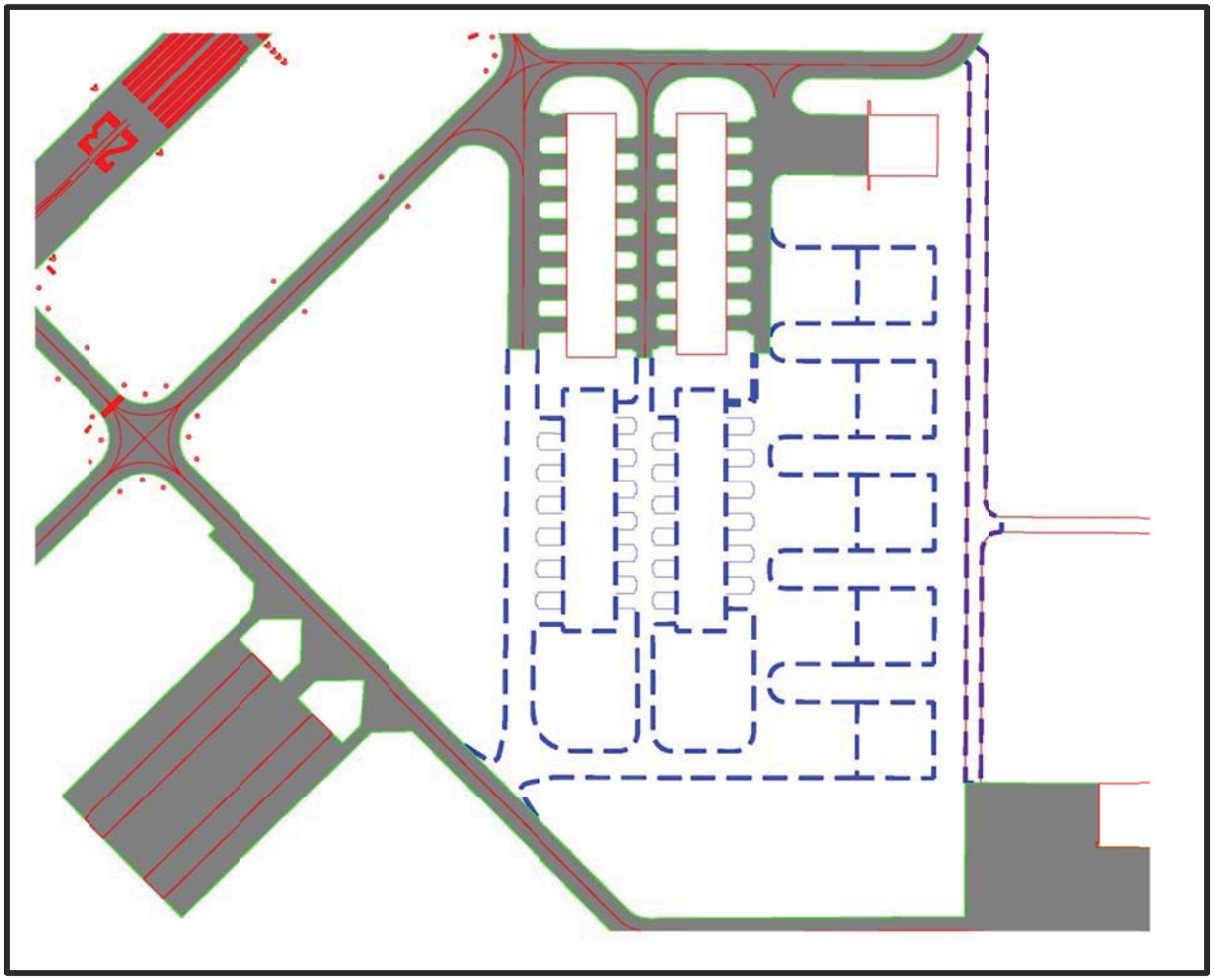
The previously mentioned development types and criteria were evaluated in areas of undeveloped land and areas where redevelopment may be warranted. Considering the seemingly endless range of possibilities for development alternatives and ultimate build-outs, only broad preliminary bubble concepts were developed and restricted to largely identifying the type of development while leaving the facility layout and details to future design based on specific tenant needs. The development types and concepts evaluated for these areas are discussed in the following sections.

Light General Aviation Development

Light general aviation (GA) development and associated facilities are a specific market sector currently growing and one that has significant demand for such facilities and services at the Airport.

Light GA expansion and development could be completed at various locations within the airport property. These areas provide excellent opportunities for development of additional light GA storage facilities, such as T-hangars or small box hangars and are viable options for the airport that would help create additional revenue and provide capacity for a growing market. **Figure 6-2** illustrates the proposed light GA development for AVO.

Figure 6-2 Proposed Light General Aviation Development



Source: CDM Smith, 2015

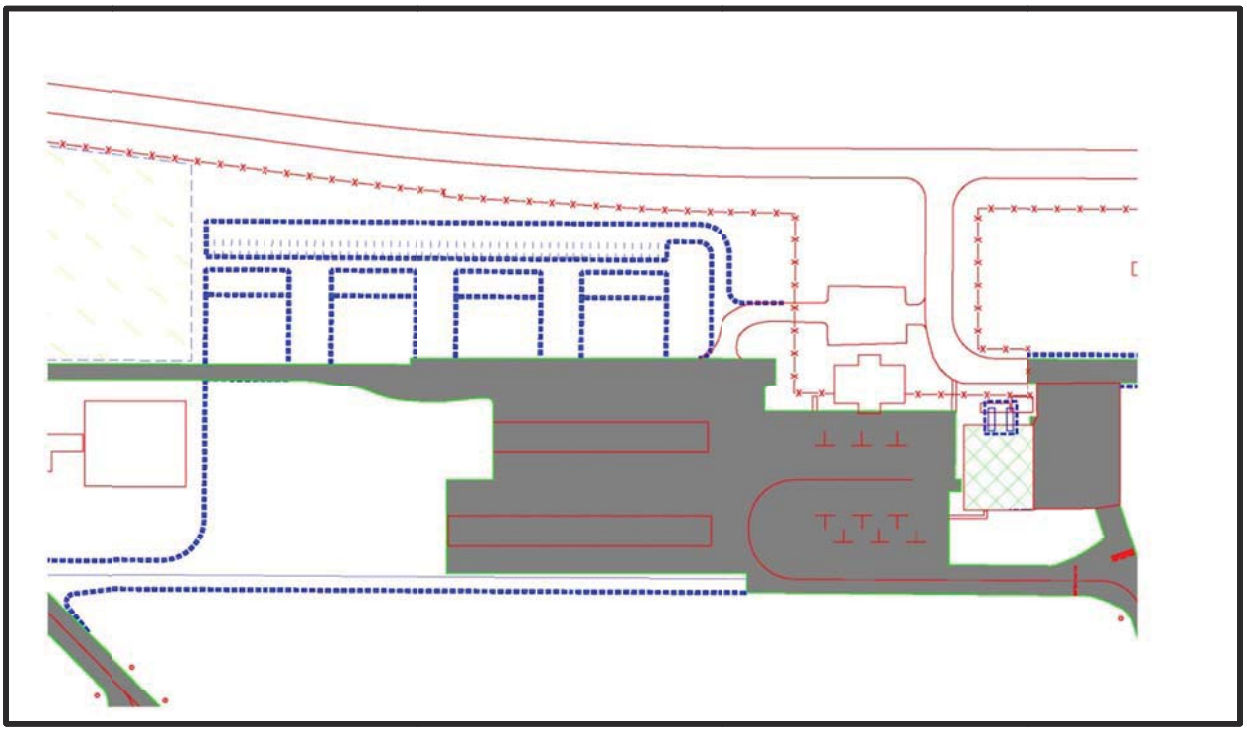
Corporate Aviation Development

As with light GA development, corporate aviation facilities and services is a market sector currently served at AVO and one that is forecast to see growth over the planning period. Corporate aviation facilities and services are currently largely provided by the FBO located on the north side of the aircraft parking apron, with some additional facilities on the east side of the airfield.

Based on a review of the potential development areas at AVO, it is anticipated that initial phases of future corporate aviation facilities and services forecast for AVO will be accommodated in the existing FBO area, adjacent existing development and redevelopment areas on the north side of the airfield. Development of corporate aviation facilities could be made on the east side of the airport between Taxiways A and H if necessary to meet demand. This will provided flexibility to the overall plan to accommodate market growth within the available existing Airport development areas based on the most demanding market sector.

Figure 6-3 illustrates the potential corporate aviation development areas (dashed blue).

Figure 6-3 Proposed Corporate Aviation Development



Source: CDM Smith, 2015

Aviation Support Facilities

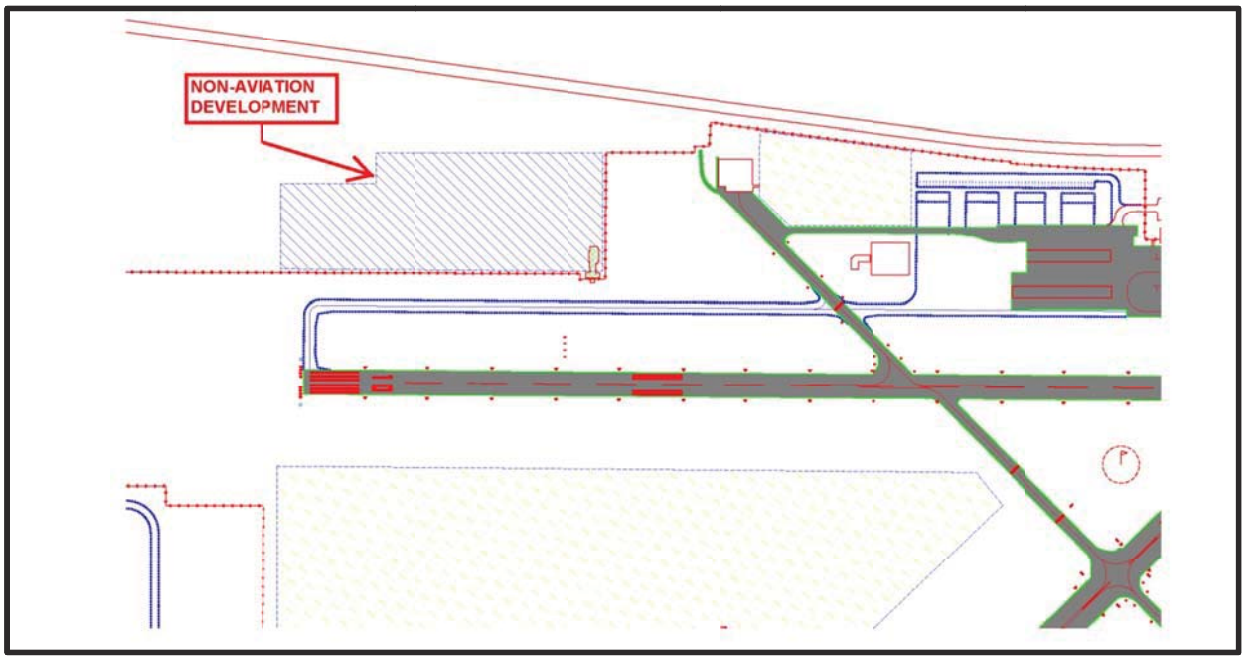
Aviation support facilities are typically services and facilities that are provided by the airport owner/operator for the use of all airport tenants and visitors and to ensure the safety of operations at the airport. Examples of such facilities may include; airport terminal building, airport maintenance, aircraft rescue and fire-fighting (ARFF), and/or customs and border patrol. AVO currently has an airport maintenance building that houses all of the existing equipment necessary for maintenance of the airport facilities. The current terminal building is primarily being used by the City to support its staff and is available for lease by an FBO.

As discussed previously in Chapter 5, ARFF services are not currently required to be located on the airport and are provided by the City of Avon Park Fire Station located on Delaney Avenue, approximately 1.5 miles from the airport. Sheriff patrols and Emergency Medical Treatment (EMT) are also provided. However, improvements of other aviation support facilities including; the airport fuel farm, backup generator, and access road are included in the development concept. The proposed locations for the aviation support facility improvements within the development plan are illustrated as items 3, 6, and 13 in the **Airport Layout Plan (sheet 3) of the Airport Layout Plan** set.

6.5 Non-Aviation Development Areas

Non-aviation development on Airports is typically reserved for areas of land that cannot feasibly gain access to the airfield and airside facilities due to location or some other physical constraint. These areas are subsequently often treated as secondary development areas and do not receive the same attention as the airfield and associated facilities do during the master planning process. However, when these areas are of considerable size and opportunity they should be considered for development that would enhance the economic position of the airport. Limited areas of potential non-aviation development exist at AVO and are generally located in northwest area of the airport. **Figure 6-4** illustrates the proposed non-aviation use development areas at AVO.

Figure 6-4 Proposed Non-Aviation Development



Source: CDM Smith, 2015

6.6 Airport Development Plan

The airport development plan represents the proposed improvements and development types considered necessary to meet forecast demand and the overall strategic goals for revenue enhancement and positive economic impact at AVO. The airport development plan was evaluated in the context of the previously discussed development criteria as follows:

2. Operational – The selected development plan will meet a majority of the identified Airport needs through 2032. Further, the development plan will enhance operational efficiency and safety at AVO greater than that of the other development concepts considered.

3. Environmental – The potential environmental impacts of the selected development plan are considered minimal due to the Airport's environs and the limitation of any proposed

property acquisition. Further evaluation of possible environmental impacts and mitigation methods are discussed in Chapter 7.

4. Cost – The costs associated with the selected development plan may be offset through proper phasing, grants, and tenant agreements. This development plan will increase the Airport's overall revenue over its current levels and more than that offered by the other alternatives. This will prove beneficial to the Airport's economic position and help to further attract new business into the local community.

5. Feasibility – The selected development plan supports the overall goal of the City, FDOT, and the FAA to promote aviation and economic growth. Full implementation of the development program is feasible with proper phasing and financial planning.

The airport development plan gives the Airport/City long-term planning flexibility to meet the anticipated market demand over the planning period while increasing the overall safety of aircraft operations at AVO. The full airport development plan is illustrated in the **Airport Layout Plan (sheet 3) of the Airport Layout Plan set.**

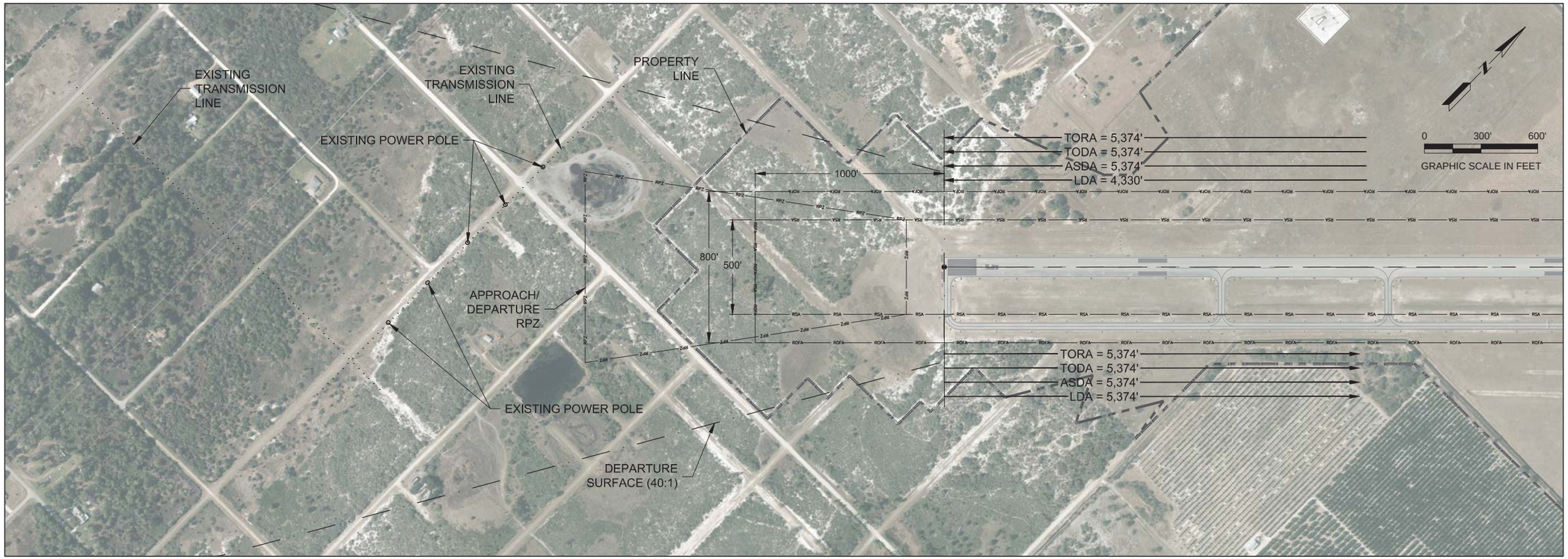
6.7 Summary

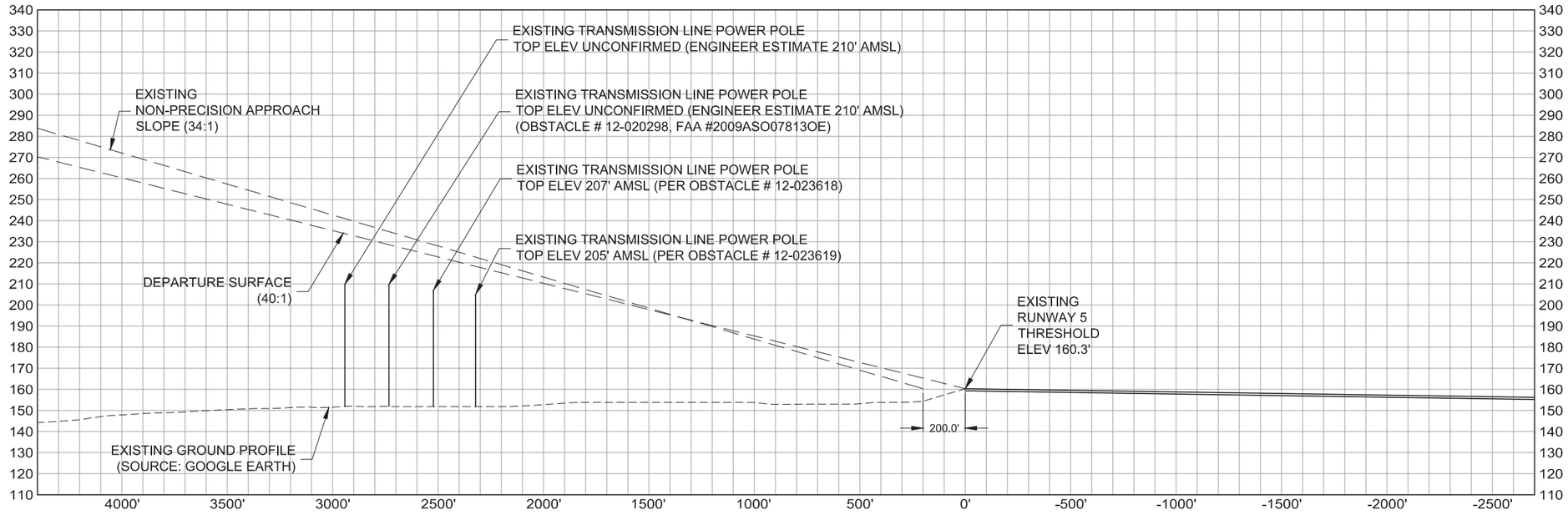
The Airport development plan described previously outlines the necessary development and facility improvements to meet the forecast demand over the short- intermediate- and long-term phases of the planning period, as presented in Chapter 3. In order to ultimately ensure competitiveness and financial viability for the Airport, and provide the Airport and surrounding community with the greatest overall benefit, enhancements to the Airport development plan during the long-term years may be necessary.

The process utilized in assessing airside and landside development options involved an analysis of overall facility requirements and growth potential. Current Airport design standards were included in the analysis of runway and taxiway needs, with consideration given to the safety areas required by the FAA. As design standards are further modified in the future, revisions may need to be made in the plan, which could affect future development options.

As any good long-range planning tool, the final master-planning concept should remain flexible to accommodate unique opportunities that may be presented to the Airport. It should also be kept in mind that changes in market conditions, such as operational demand, critical aircraft activity, or increases in light GA or corporate aviation services may require the acceleration, delay and/or modification of projects.

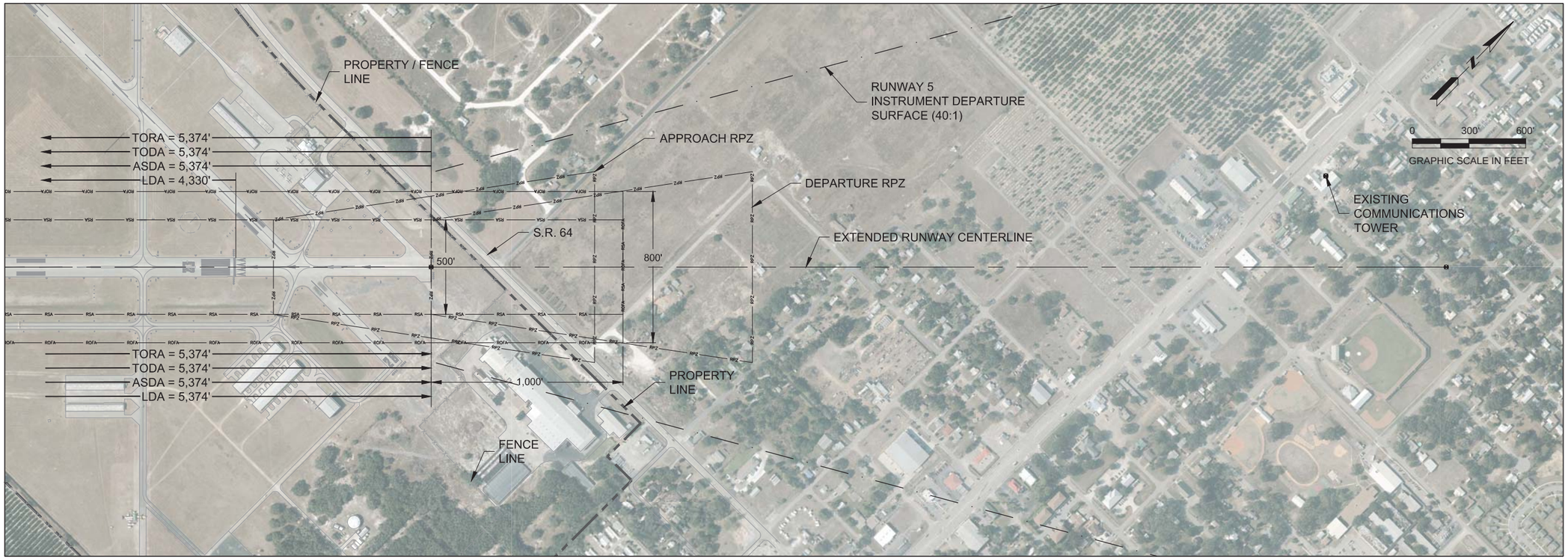
The remaining portions of the master plan will be directed towards the review of potential environmental considerations associated with the development plan, preparation of a capital improvement program and financial analysis. A review of order of magnitude costs, project phasing and financial implementation is discussed in Chapters 8 and 9.





Runway 5-23 Existing Conditions - RSA/OFA

FIGURE 6-5



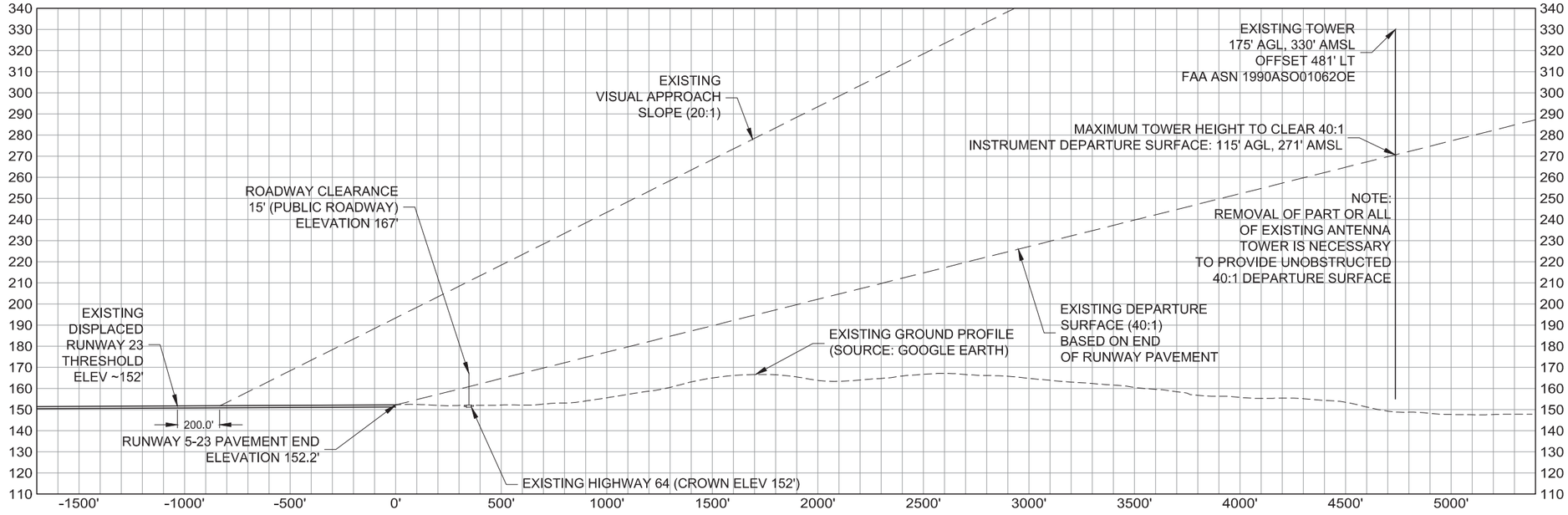
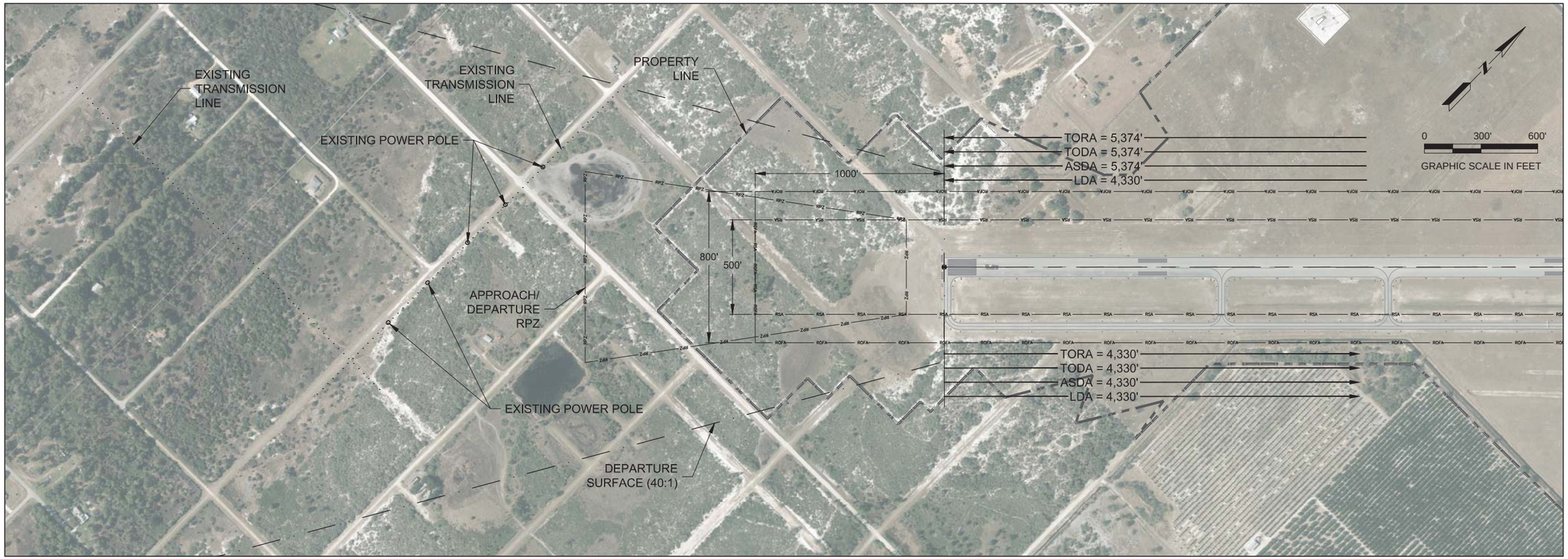


FIGURE 6-6

Runway 5-23 Existing Conditions - RSA/OFA



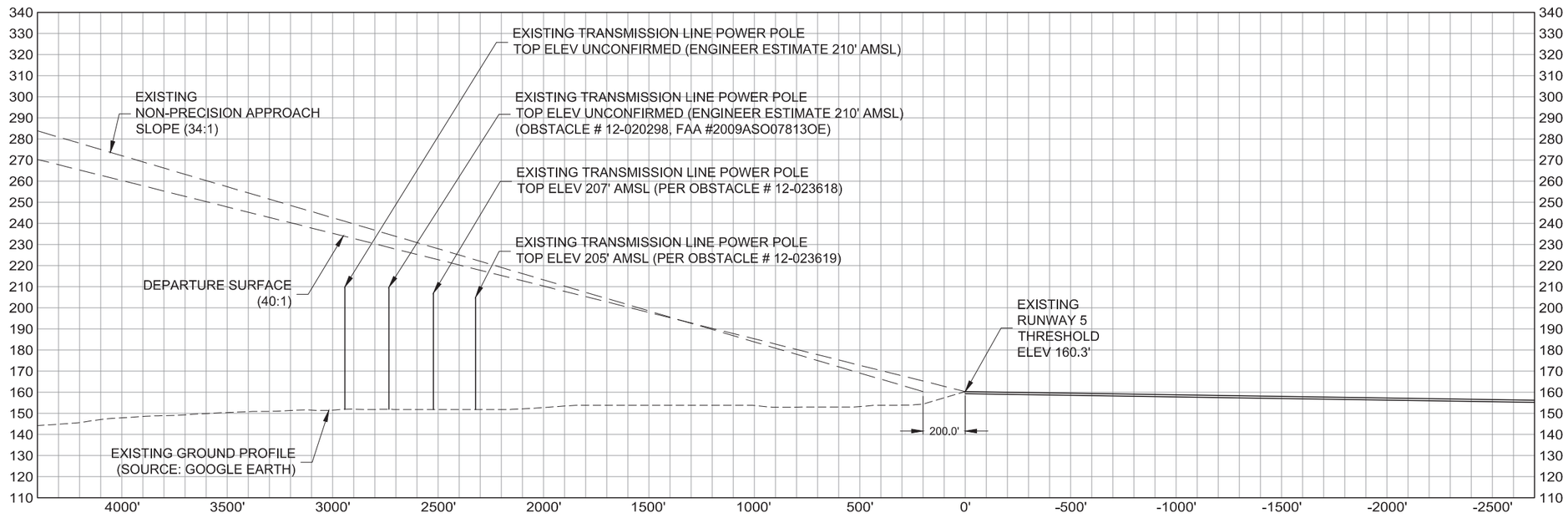
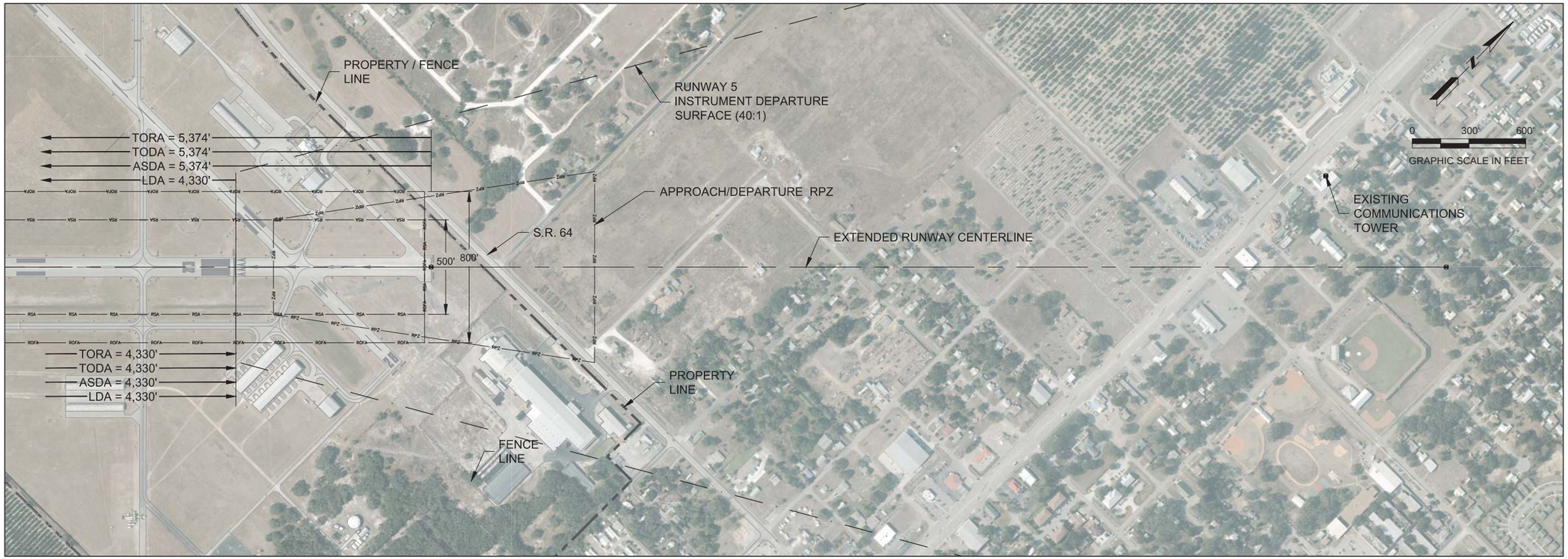


FIGURE 6-7

Short-Term RSA/OFA Solution



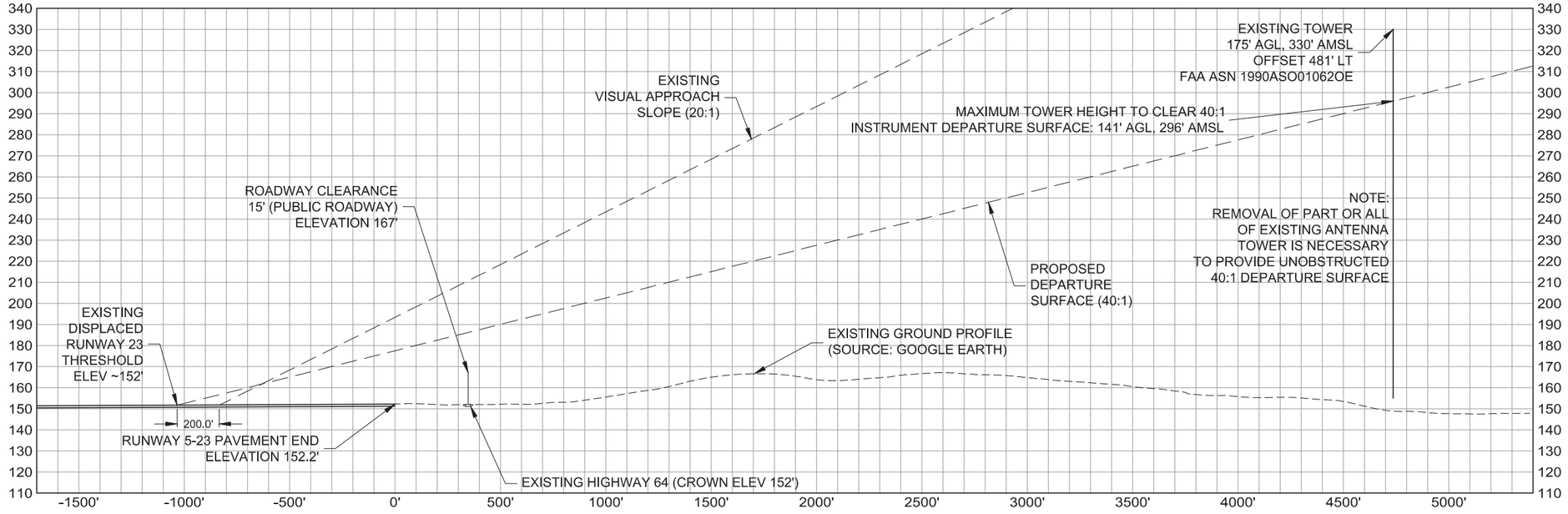
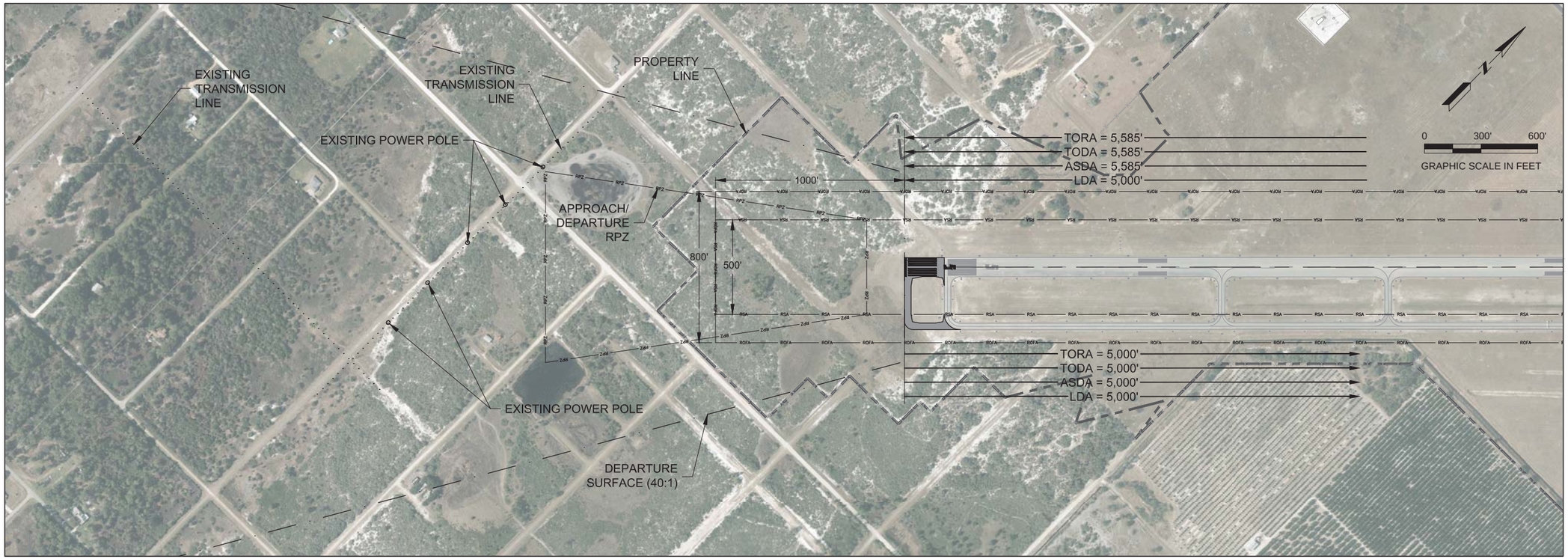


FIGURE 6-8

Short-Term RSA/OFA Solution



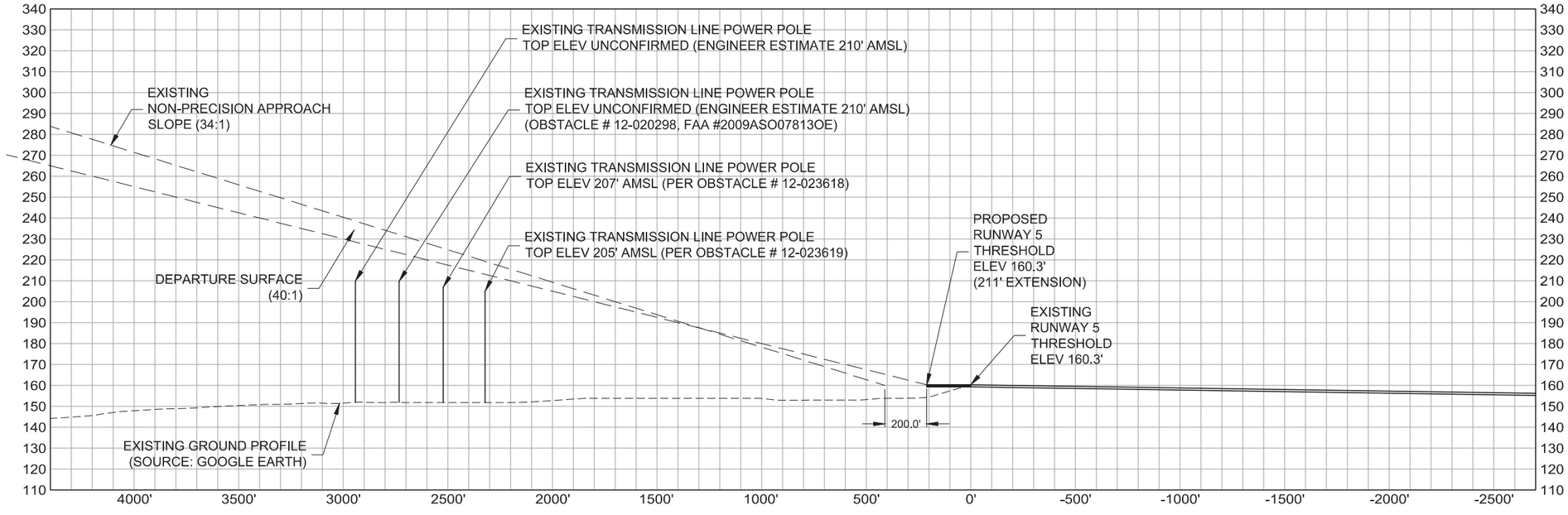
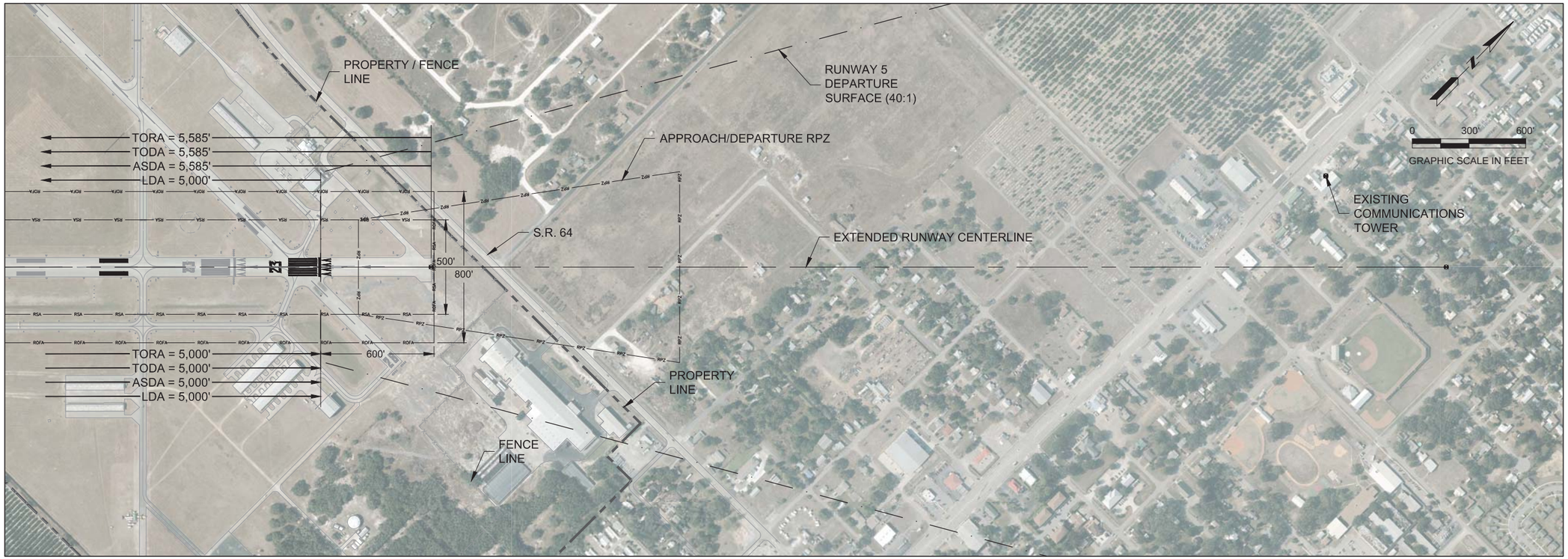


FIGURE 6-9

Mid-Term RSA/OFA Solution



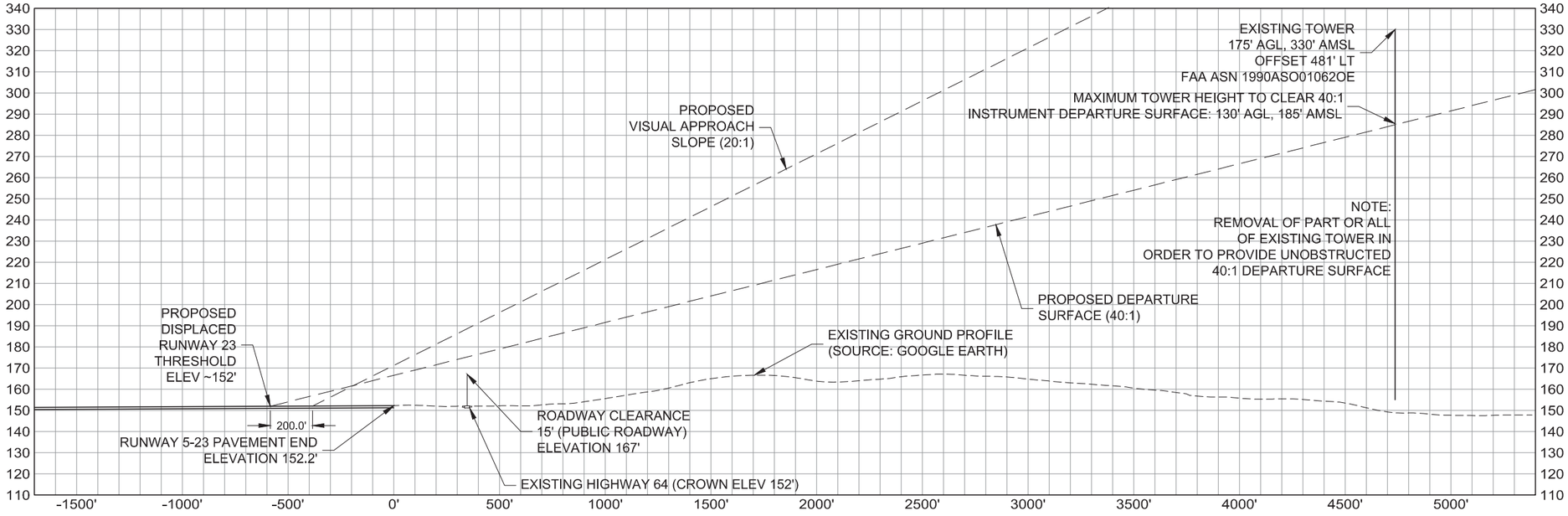
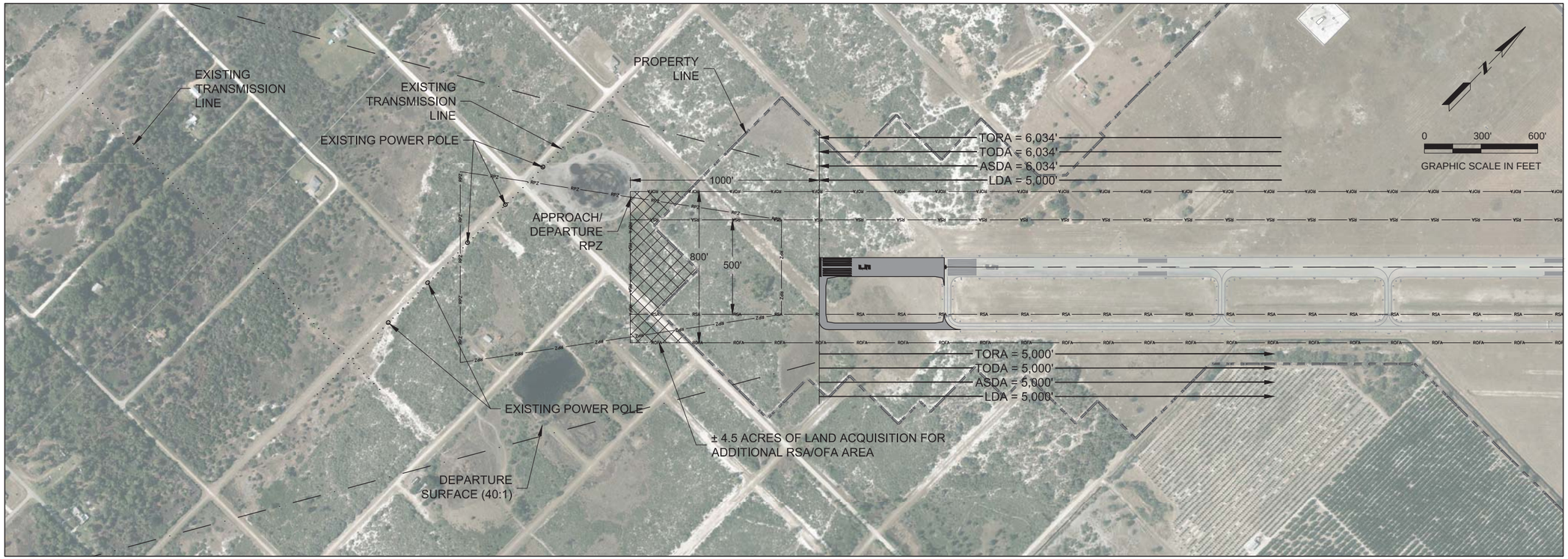


FIGURE 6-10

Mid-Term RSA/OFA Solution



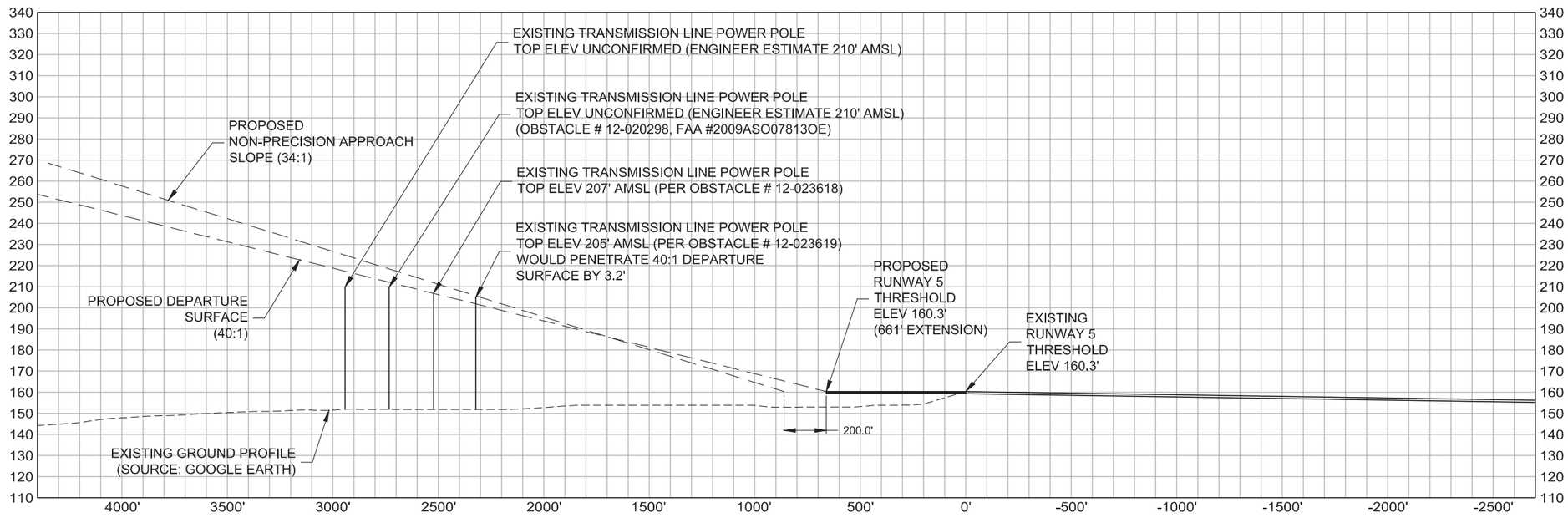
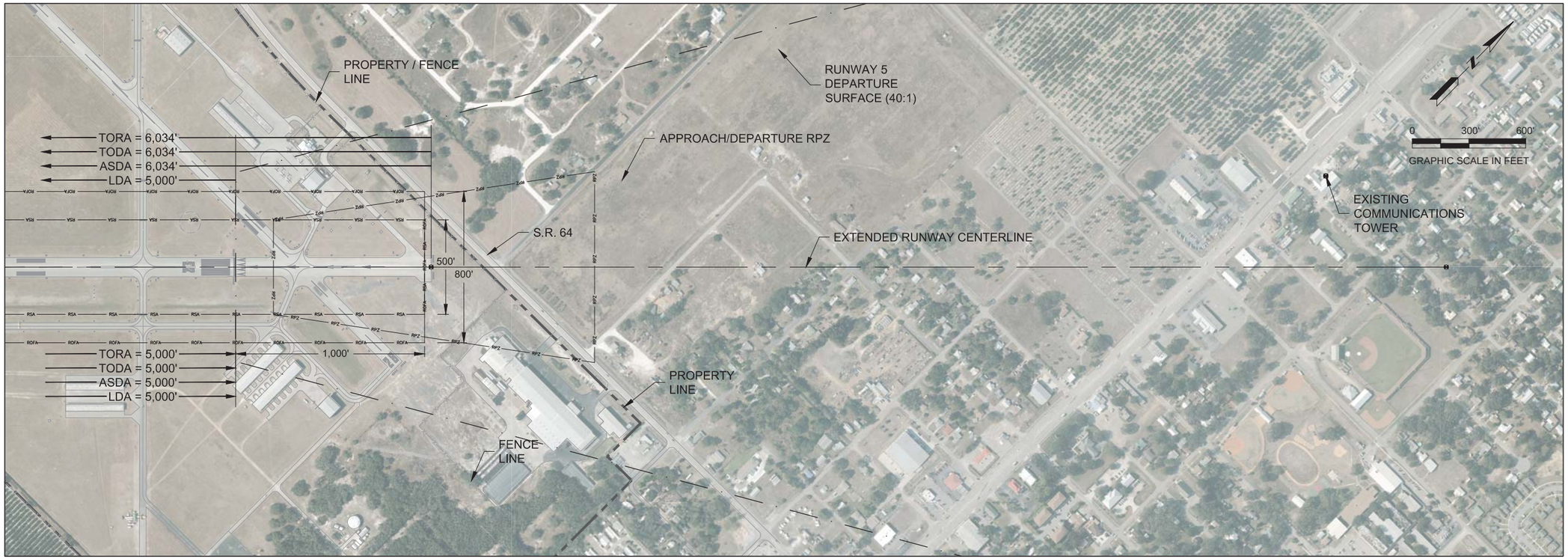


FIGURE 6-11

Long-Term RSA/OFA Solution



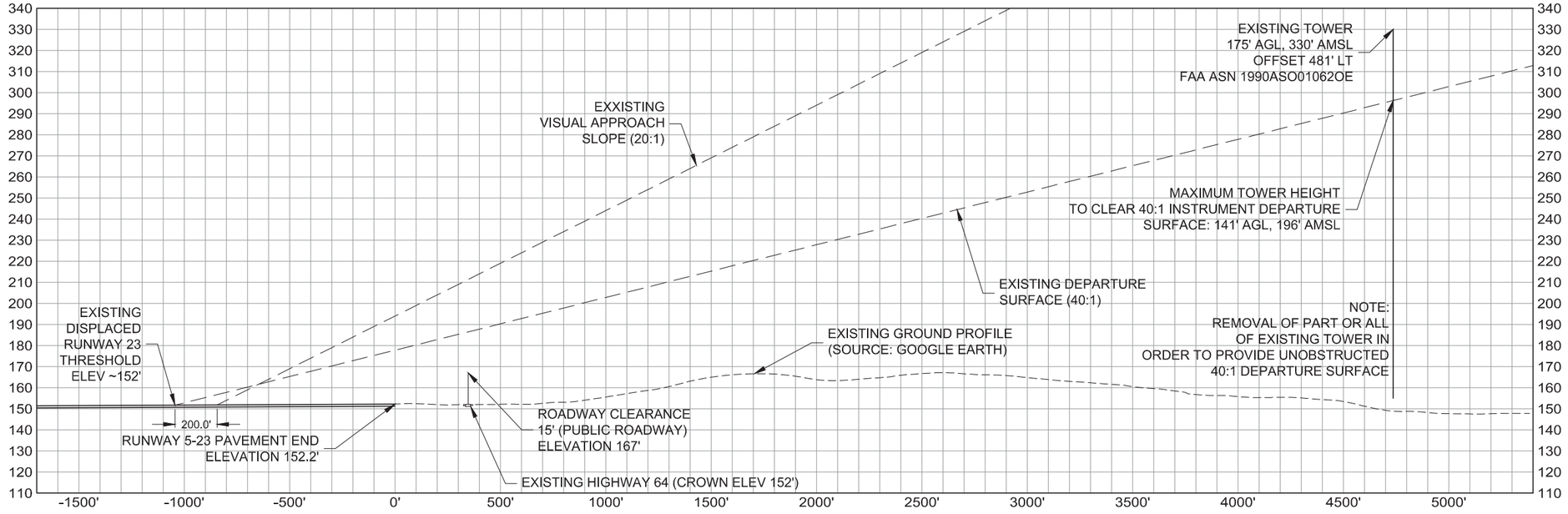


FIGURE 6-12

Long-Term RSA/OFA Solution

SECTION 7
ENVIRONMENTAL OVERVIEW

In addition to identifying airport projects that are financially and technically sound, an important part of the master planning process is to ensure that future airport developments minimize impacts to the environment. Council on Environmental Quality (CEQ) 1501.2 states, "Agencies shall integrate the National Environmental Policy Act (NEPA) process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts." Accordingly, identifying potential environmental impacts of proposed airport projects has become an integral part of the master planning process.

This environmental overview has been prepared to identify known potential environmental issues at the Avon Park Executive Airport (AVO) and the surrounding area to assist in the avoidance and minimization of environmental effects of future airport projects during the master planning process. This environmental overview discusses potential environmental impacts of the proposed airside improvements, as well as proposed landside developments identified in Chapter 6, "Development Concepts." These improvements were identified on Figure 6-8**,** Development Plan.

7.1 Environmental Impact Categories

While this environmental overview is not intended to satisfy environmental clearance requirements outlined in Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures,* or to fulfill the requirements of the National Environmental Policy Act (NEPA), it does consider each of the potential environmental impact categories included in FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects,"* and FAA Order 1050.1E, which would enable follow-on environmental review (i.e., NEPA) and/or implementation of the required permitting processes.

These impact categories are:

- Air Quality
- Biotic Resources/Federally-listed Endangered and Threatened Species
- Coastal Barriers/Coastal Zone Resources
- Compatible Land Use
- Construction Impacts
- Section 4(f)
- Energy Supplies, Natural Resources, and Sustainable Design
- Farmlands

- Floodplains
- Hazardous Materials
- Historical and Archaeological Resources
- Light Emissions and Visual Impacts
- Noise
- Social Impacts/Environmental Justice and Children's Environmental Health and Safety Risks
- Solid Waste
- Water Quality
- Wetlands
- Wild and Scenic Rivers
- Induced Socioeconomic/Cumulative Impacts

7.2 Air Quality

The National Environmental Policy Act of 1969 (NEPA), the Clean Air Act (CAA), as amended, and Title 49 U.S.C. 47106 (c) (1) (B), as amended (formerly sections 509 (B) (5) and (B) (7) of the Airport and Airway Improvement Act of 1982, as amended; PL 97-248) are the primary laws that apply to air quality. NEPA requires Federal agencies to prepare an environmental document (i.e., environmental impact statement (EIS) or environmental assessment (EA) for major Federal actions that have the potential to affect the quality of the environment, including air quality.

The Clean Air Act (CAA) established National Ambient Air Quality Standards (NAAQS) for six pollutants, termed "criteria pollutants." The six pollutants are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulates (PM10 and PM2.5), and sulfur dioxide (SO2). The CAA requires each state to adopt a State Implementation Plan (SIP) to achieve the NAAQS for each pollutant within time frames established under CAA. Avon Park Executive Airport is located in Highlands County, Florida, which is currently in attainment for all criteria pollutants.

In addition to NEPA, the Clean Air Act of 1990 Amendments required the Environmental Protection Agency (EPA) to issue rules that would ensure that Federal actions conform to the appropriate SIP. The General Conformity Rule establishes the procedures and criteria for determining whether certain Federal actions conform to State or EPA (Federal) air quality implementation plans. To determine whether conformity requirements apply to a proposed Federal action, the following must be considered: the non-attainment or maintenance status of the area; type of pollutant or emissions; exemptions from conformity and presumptions to conform; the project's emission levels; and the regional significance of the project's emissions. FAA actions are subject to the General Conformity Rule. Because Avon Park Executive Airport is located in an area that is attainment for all criteria pollutants, the proposed actions would not be subject to General Conformity requirements.

7.3 Biotic Resources / Federally Listed Endangered and Threatened Species

Section 7 of the Endangered Species Act (ESA), as amended, applies to Federal agency actions and requires each agency to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat. In addition, the Fish and Wildlife Coordination Act requires that agencies consult with the state wildlife agencies and the US Fish and Wildlife Service (USFWS) concerning the conservation of wildlife resources where the water or any stream or other water body is proposed to be controlled or modified by a Federal agency or any public or private agency operating under a Federal permit.

Table 7-1 identifies the birds, mammals, reptiles, and plants that are Federally- listed threatened or endangered species which are known to occur in Highlands County, Florida. **Tables 7-2, 7-3, and 7-4** identify the birds, plants, reptiles and mammals, respectively, that are listed by the State of Florida as threatened, endangered, or species of special concern that are located within Volusia County. As part of the NEPA documentation required prior to the implementation of the proposed airport projects, an on-site biotic survey would be conducted to identify the presence of any of the Federally-listed species listed in Table 5-1 or their habitats within the project area. If any of the Federally-listed species are located within the project area, Section 7 coordination with the USFWS would be required. Any state-listed threatened or endangered species, or species of special concern should also be identified as part of the NEPA process and coordination conducted with the Florida Fish and Wildlife Conservation Commission (FWC) to determine the potential impacts of the proposed project on these species.

Table 7-1: Federally-Listed Threatened, and Endangered Species
Highlands County, Florida

Common Name	Scientific Name	Federal Status	State Status
Birds			
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	E	
Piping Plover	*Charadrius melodus*	T	
Florida Scrub-Jay	*Aphelocoma coeruluscens*	T	
Wood Stork	*Mycteria americana*	E	
Red-cockaded Woodpecker	*Picoides borealis*	E	
Mammals			
West Indian (Florida)	*Trichechus manatus latirostris*	E/CH	

Manatee			
Reptiles			
Gopher Tortoise	*Gopherus polyphemus*	C	
Eastern Indigo Snake	*Dymarchon corais couperi*	T	
Green Sea Turtle	*Chelonia mydas*	E	
Hawksbill Sea Turtle	*Eremochelys impricata*	E	
Leatherback Sea Turtle	*Dermochelys coriacea*	E	
Kemp's ridley Sea Turtle	*Lepidochelys kempii*	E	
Atlantic Salt Marsh Snake	*Nerodia clarkia taeniata*	T	
Plants			
Rugel's Pawpaw	*Deeringohamus rugelii*	E	
Okeechobee gourd	*Cucurbita okeechobeensis* *Ssp.okeechobeensis*	E	

KEY:

E – Endangered

T – Federally Listed Threatened

CH– Critical Habitat Designated

C - Cadidate

Source: U.S. Fish and Wildlife Service

Table 7-2: State-Listed Threatened, Endangered, and Species of Special Concern-Birds Highlands County, Florida

Common Name	Scientific Name	State Status	Species of Special Concern
American Oystercatcher	*Haematopus palliatus*		Yes
Black Skimmer	*Rynchops niger*		Yes
Brown Pelican	*Pelecanus occidentalis*		Yes
Florida Sandhill Crane	*Grus canadensis pratensis*	ST	
Least Tern	*Sternula antillarum*	ST	
Limpkin	*Aramus quarauna*		Yes
Little Blue Heron	*Egretta caerulea*		Yes
Osprey	*Pandion haliaetus*		Yes
Reddish Egret	*Egretta rufescens*		Yes
Roseate Spoonbill	*Platalea ajaja*		Yes
Snowy Egret	*Egretta thula*		Yes
Southeastern American Kestrel	*Falco sparverius paulus*	ST	
Tricolored Heron	*Egretta tricolor*		Yes
White Ibis	*Eudocimus albus*		Yes

KEY: Source: Florida Natural Areas Inventory

LT - Threatened

ST – State population listed as Threatened by FFWCC

Table 7-3: State-Listed Threatened, Endangered, and Species of Special Concern-Plants Highlands County, Florida

Common Name	Scientific Name	State Status	Species of Special Concern
American Toothed Spleenwort	*Asplenium dentatum*	LE	
Atlantic Coast Florida Lantana	*Lantana depressa var. floiridana*	LE	
Auricled Spleenwort	*Asplenium erosum*	LE	
Buckthorn	*Sideroxylon lycioides*	LE	
Celestial Lily	*Nemastylis floridana*	LE	
Coastal Hoary-pea	*Tephrosia angustissima var. curtissii*	LE	
Coastal Vervain	*Glandularia maritima*	LE	
Florida Beargrass	*Nolina atopocarpa*	LT	
Fragrant Prickly Apple	*Harrisia fragrans*	LE	
Giant Orchid	*Pteroglossaspis ecristata*	LT	
Golden Leather Fern	*Acrostichum aureum*	LT	
Hand Fern	*Ophioglossum palmatum*	LE	
Lake-side Sunflower	*Helianthus carnosus*	LE	
Large-flowered Rosemary	*Conradina grandiflora*	LT	
Nodding Pinweed	*Lechea cernua*	LT	
Okeechobee Gourd	*Curcurbita okeechobeensis*	LE	
Plume Polypody	*Pecluma ptilodon*	LE	
Rugel's Pawpaw	*Deeringothamnus rugelii*	LE	
Simpson's Prickly Apple	*Harrisia simpsonii*	LE	
Star Anise	*Illicium parviflorum*	LE	
Swamp Plume Polypody	*Pecluma ptilodon*	LE	

KEY: Source: Florida Natural Areas Inventory

LT - Threatened

LE –Endangered

Table 7-4 State-Listed Threatened, Endangered, and Species of Special Concern-Reptiles and Mammals Highlands County, Florida

Common Name	Scientific Name	State Status	Species of Special Concern
Reptiles			
Florida Pine Snake	*Pituophis melanoleucus mugitus*		Yes
Gopher Tortoise	*Gopherus polyphemus*	ST	
Mammals			
Florida Mouse	*Podomys floridanus*		Yes
Sherman's Fox Squirrel	*Sciurus niger shermani*		Yes

Source: Florida Natural Areas Inventory

KEY: LT - Threatened

LE –Endangered

7.4 Coastal Barriers / Coastal Zone Resources

The Coastal Barriers Resources Act and the Coastal Zone Management Act govern federal activities involving or affecting coastal resources. Highlands County is not within the Florida Coastal Zone Management Program. Therefore, the airport improvements identified for Avon Park Executive Airport do not have to consider the Coastal Zone Management Program.

7.5 Compatible Land Use

FAA Order 5050.4B states that the compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport and its impact upon sensitive land uses. Sensitive land uses include: residential areas, parks, hospitals, churches, amphitheaters, and libraries. FAA Advisory Circular 150/5020-1, Noise Control and Compatibility Planning for Airports, has identified land use compatibility guidelines that relate types of land uses to airport noise levels. Based on these guidelines, all land uses are considered to be compatible with yearly day-night sound levels below 65 DNL.

Compatible land use impacts also can occur it the proposed airport projects result in other impacts exceeding thresholds of significance which have land use ramifications such as disruption of communities; residential and business relocations; and induced socioeconomic impacts (FAA Order 1050.1E). The proposed improvements to the Airport do not result in any community disruptions,

residential or business relocations, or induced socioeconomic impacts, therefore, there would be no incompatible land use impacts resulting from the proposed airport projects.

7.6 Construction Impacts

Specific impacts that would occur as a result of construction activities include noise from construction equipment on the site, noise and dust from the delivery of materials through local streets, disposal of soil, air pollution from construction equipment exhaust and dust, and water pollution from erosion. To the extent necessary, mitigation of construction impacts would be accomplished by incorporating in the project specifications from the provisions of FAA Advisory Circular 150/5370-10, *Standards for Specifying Construction of Airports,* and FAA Advisory Circular 150/5370-10, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control.* Potential construction-related water quality impacts would be minimized through the implementation of a sediment and erosion control plan.

Construction would require workers and machinery in and about the operations of the Airport. In some cases, runway or taxiway closures may be required for short periods of time. FAA guidelines provided in FAA Advisory Circular 150/5370/2C, *Operation Safety on Airports During Construction,* would be enforced where applicable. Runway or taxiway closure conditions would be kept to a minimum in an effort to minimize inconvenience to airport users.

7.7 Department of Transportation Act, Section 4(f)

The Department of Transportation Act of 1966, Section 4(f), recodified at 49 USC, Subtitle I, Section 303, prohibits the taking of public parkland, recreation areas, wildlife and waterfowl refuges, or historic sites unless there is "no feasible and prudent alternative." According to correspondence received from the State Historic Preservation Office (SHPO) for Florida, there are no known historic or archaeological properties within the Area of Potential Effect for the proposed airport projects that would require Section 4(f) evaluations.

7.8 Energy Supplies, Natural Resources and Sustainable Design

7.8.1 Energy Supply

In accordance with 40 Code of Federal Regulations (CFR) 1502.16(3) and (f) and Executive Order 13123, *Greening the Government Through Efficient Energy Management* (64 Federal Register 30851, dated June 8, 1999), Federal agencies must assess each alternative's energy requirements, energy conservation, and the use of natural or consumable resources in reviewing the environmental effects of a proposed action. Also, each Federal agency is encouraged to expand the use of renewable energy in its facilities and its actions.

FAA Order 1053.1, *Policies and Procedures for Energy Planning and Conservation,* provides for assessing energy demands related to airport improvement projects. The effects of airport development on energy supply typically related to the amount of energy required for:

- Stationary facilities (such as terminal building heating and cooling and airfield lighting)
- Movement of air and ground materials

It is anticipated that the local power company would have no difficulty in meeting the energy demands of the increased energy required by the hangars, maintenance and equipment storage building, museum, and security cameras. In addition, energy consumption by aircraft and ground vehicles is not expected to significantly increase as a result of the proposed airport development.

7.8.2 Natural Resources

The impacts of airport development on natural resources are primarily related to the use of materials such as gravel, fill dirt, etc. that are required for construction. It is anticipated that the natural resources required for the construction of the runway extension, taxiways, hangars, and apron areas are available in sufficient quantities locally.

7.9 Farmlands

The Farmland Protection Policy Act (FPPA) regulates Federal actions with the potential to convert farmland to nonagricultural uses. The proposed airport development projects will primarily occur on airport property, which is dedicated to airport use. There are no prime farmland soils on the airport property. Therefore, there would be no impacts to farmlands as a result of the proposed projects.

7.10 Floodplains

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. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on 100-year floodplains (7 CFR Section 650.250).

Flood Insurance Rate Maps were obtained from FEMA. Review of these maps indicates that the Airport is situated in an area with a "Zone C (not shaded)" designation with additional small areas of "Zone A" sparsely located around the property. The following is a brief description of each designation:

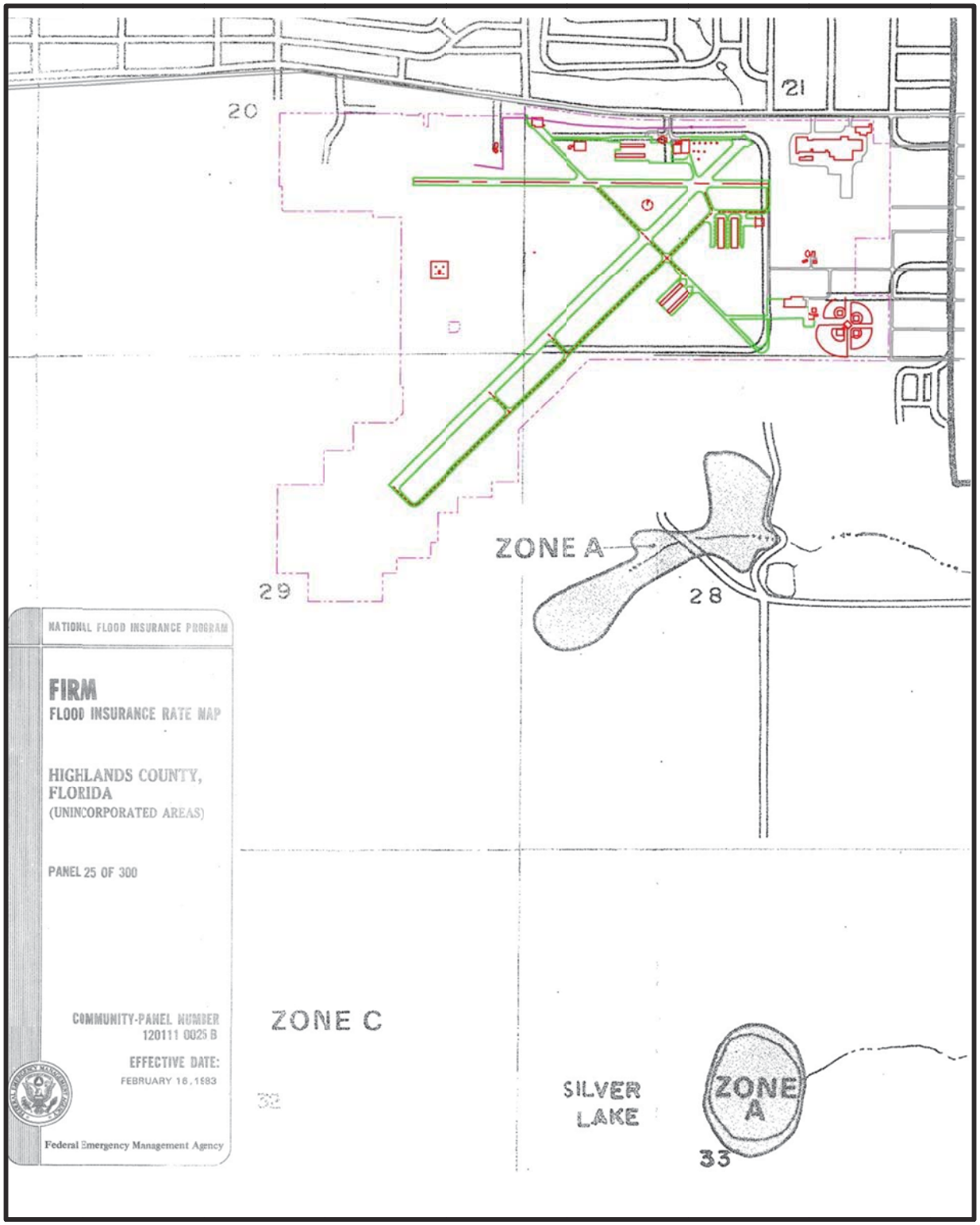
- **Zone C (not shaded)** is the flood insurance zone that corresponds with areas outside the 500 year floodplain.

- **Zone A** is the flood insurance zone that corresponds to areas within the 100 year floodplain however, no base flood elevations have been determined in these areas.

Based on the location of the site and it's the majority of the property outside the location of the 100-year floodplain, it is unlikely that the proposed improvements will impact the floodplains. In the

event that improvements extend into adjacent areas of floodplain, it may be necessary to evaluate whether such expansions will impact the 100-year floodplain. The FEMA Flood Insurance Rate Map is depicted below in **Figure 7-1.**

Figure 7-1 Flood Insurance Rate Map



7.11 Hazardous Materials

The two statutes of most importance in ensuring that the construction and operation of airport facilities and navigational aids do not impact hazardous materials are the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facilities Compliance Act of 1992, and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended (also known as Superfund). RCRA governs the generation, treatment, storage, and disposal of hazardous waste and CERCLA provides for the cleanup of any releases of a hazardous substance (excluding petroleum) into the environment. FAA actions to fund, approve, or conduct an activity require consideration of hazardous material and solid waste impacts.

To identify the presence of known hazardous waste sites within the airport property that could be impacted by the construction of the proposed improvement projects, the EPA databases for hazardous waste information were searched. These databases provide information on hazardous waste generators, as well as hazardous waste sites. There were no hazardous waste generators or hazardous waste disposal sites on the airport property or on the adjacent properties that would be impacted by the proposed airport projects.

7.12 Historical and Archeological Resources

The National Historic Preservation Act of 1966 (NHPA), as amended, provides for the preservation of properties that are eligible for inclusion in the National Register of Historic Places (NRHP). In addition, Section 106 of the NHPA directs the heads of federal agencies, federal departments, or independent agencies that have direct or indirect jurisdiction over a federal or federally assisted undertaking to "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register."

The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistorical, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project. A review of the National Register of Historic Places and National Historic Landmarks indicates that the no known or listed historic sites are located on or adjacent the airport. Other listed structures, sites, and/or objects are located within the City of Avon Park but are not in the vicinity of the airport. The proposed improvements are not expected to impact historical, architectural, and cultural resources.

7.13 Light Emissions and Visual Impacts

Light emissions caused by airport-related lighting can create an annoyance to residents in the vicinity of the Airport. In general, however, light emissions created by general aviation airports are minimal. As indicated in FAA Order 1050.1E, light emissions are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities and other airport development actions.

None of the proposed airport projects involve significant changes in runway lighting or other airport lighting; therefore, there would be no light impacts as a result of the proposed airport development projects.

7.14 Noise

The standard practice for evaluating the noise impacts at airports involves the use of the FAA-approved Integrated Noise Model (INM). ***Due to budget restrictions imposed by the FAA, FDOT and the City, an INM was not included in the scope of work for completing this Master Plan.*** However, the process of evaluating noise impacts through the use of the INM is explained below.

7.14.1 Methodology

The INM works by defining a network of grid points at ground level around the airport site. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation by aircraft type and engine thrust level, and by time of day/night along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location to provide a day-night level (DNL), which is the 24-hour average sound level expressed in decibels, including an additional 10-decibel penalty for night-time operations (those occurring between the hours of 10 p.m. and 7 a.m.). The cumulative noise exposure levels at all grid points are then used to plot noise exposure contours for selected values to illustrate the noise impacts in the area.

The decibel scale from zero to 110 includes most of the range of typical daily sound levels, and is shown in **Table 7-5.**

Table 7-5: Common Sound Levels

Decibels	Common Aircraft Sound Level	Common Daily Sound Level
110	B-747 takeoff at 2 miles	Rock Band
100	DC-10 takeoff at 2 miles	Gas Lawn Mower at 3 feet
90	B-727 takeoff at 2 miles	Garbage Disposal at 3 feet
80	Learjet 25 takeoff at 2 miles	Shouting at 3 feet
70		Normal Speech at 3 feet
60		Large business office
50	Piper Twin Comanche takeoff at 2 miles	Dishwasher in next room

7.14.2 Noise Contour Mapping

DNL noise levels are indicated by a series of modeled contour lines superimposed on the airport site map. These levels are calculated for designated points on the ground from the weighted summation of the effects of all aircraft operations. Some operations are far enough away from a location that their effect is minimal, while other operations may dominate noise exposure at that location. For example, a location just east of the Airport may be affected by an aircraft departure to the east but unaffected by an arrival to the west.

7.14.3 Operational Activity

Modeling airport noise in INM requires data from parameters such as aircraft operations, fleet mix, runway utilization, operational profiles, and flight tracks. The following is a summary of the operational data that would typically be used in the noise modeling analysis.

- Aircraft Operations
- Aircraft Fleet Mix – The fleet mix consists of various categories of aircraft operating at AVO.
- Runway Utilization – shows how frequently operations at the airport use each runway during the day, at night, and in total. Runway 5-23 is used the vast majority of the time. Runway 10/28, is used less frequently.
- Approach and Departure Profiles – Approach and departure profiles illustrate an aircraft's altitude along its flight path. INM's vast database includes information regarding standard approach and departure profiles for the aircraft used in this analysis.
- Flight Tracks – Flight tracks project an aircraft's flight path as if shown on the surface. Due to meteorological conditions, aircraft type, stage length, air traffic control instructions, and pilot judgment, flight tracks are unique to each operation.

7.14.4 Noise Exposure Impacts

When included as part of the scope of work for any master planning process, noise contours are developed for existing and future airport conditions in accordance with FAA Order 1050.1E.

7.15 Social Impacts / Environmental Justice and Children's Environmental Health and Safety Risks

7.15.1 Social Impacts

The purpose of a social impact analysis is to determine the effect of airport development on the human environment. The types of social impacts typically evaluated include the following:

- Relocation of residences and/or businesses

- Alterations in traffic patterns that may permanently or temporarily restrict traditional community access
- Division or disruption of established communities
- Disruption of orderly, planned development
- Creation of appreciable change in employment.

The proposed airport development projects will occur on airport property and there will be no relocation of residences and/or businesses or disruption of established communities as a result of these projects. In addition, while there may be some short-term employment created from the construction of the proposed airport projects, there would be no long-term changes in employment.

7.15.2 Environmental Justice

Executive Order 129898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires the Department of Transportation (DOT) to identify and address disproportionately high and adverse human health or environmental effects of their policies or programs on minorities or low-income populations. Environmental Justice must be considered in all phases of planning. It is essential that any potential impacts to minority and low-income populations be identified early in the planning process so that they can be considered during the evaluation of project alternatives.

The proposed airport development projects would not result in any disproportionate adverse impacts to minority and low-income populations because there would be no significant impacts off airport property to adjacent residential areas.

7.15.3 Children's Environmental Health and Safety Risks

The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency believes could disproportionately affect children, including risks associated with contaminated air, food, drinking water, recreational waters, soil, or products that children might use or be exposed to.

The proposed airport projects would not result in any disproportionate health and safety risks to children.

7.16 Solid Waste

Solid waste impacts must be evaluated in conjunction with airport development. These impacts include the following:

- Impacts on solid waste generation
- Location of existing solid waste disposal facilities in the vicinity of proposed runways.

Significant increases in solid waste generation are not anticipated as a result of the proposed airport improvements. The only additional waste anticipated is that which would be associated with the construction of the aviation facilities. Existing waste collection and disposal facilities would be adequate to handle the waste associated with the construction of the airport facilities.

FAA Order 5200.5, *FAA Guidance Concerning Sanitary Landfills On or Near Airports*, states that "sanitary landfills will be considered as incompatible use" if located within 1,500 meters (approximately 4,921 feet) of all runways planned to be used by piston type aircraft and within

3,000 meters (approximately 9,843 feet) of all runways planned to be used by turbine aircraft. Airports located closer than these distances to sanitary landfills have an increased risk of bird hazards. No sanitary landfills are located within five miles of AVO. Therefore, there would be no potential bird hazards from landfills as a result of the proposed runway improvements.

7.17 Water Quality

The Federal Water Pollution Control Act, as amended (commonly referred to as the Clean Water Act), provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, establish location with regard to an aquifer or sensitive ecological area such as a wetlands area, and regulate other issues concerning water quality.

If the proposed federal action would impound, divert, drain, control, or modify the waters of any stream or other body of water, the Fish and Wildlife Coordination Act applies unless the project is for the impoundment of water covering an area of less than 10 acres. The Fish and Wildlife Coordination Act requires the responsible federal official to consult with the US Fish and Wildlife Service (USFWS) and the applicable state agency to identify ways to prevent loss or damage to wildlife resources resulting from the proposed project.

If there is potential for contamination of an aquifer designated by the EPA as a principal drinking water resource for the area, the project needs to be coordinated with the EPA, as required by Section 1424 (e) of the Safe Drinking Water Act, as amended.

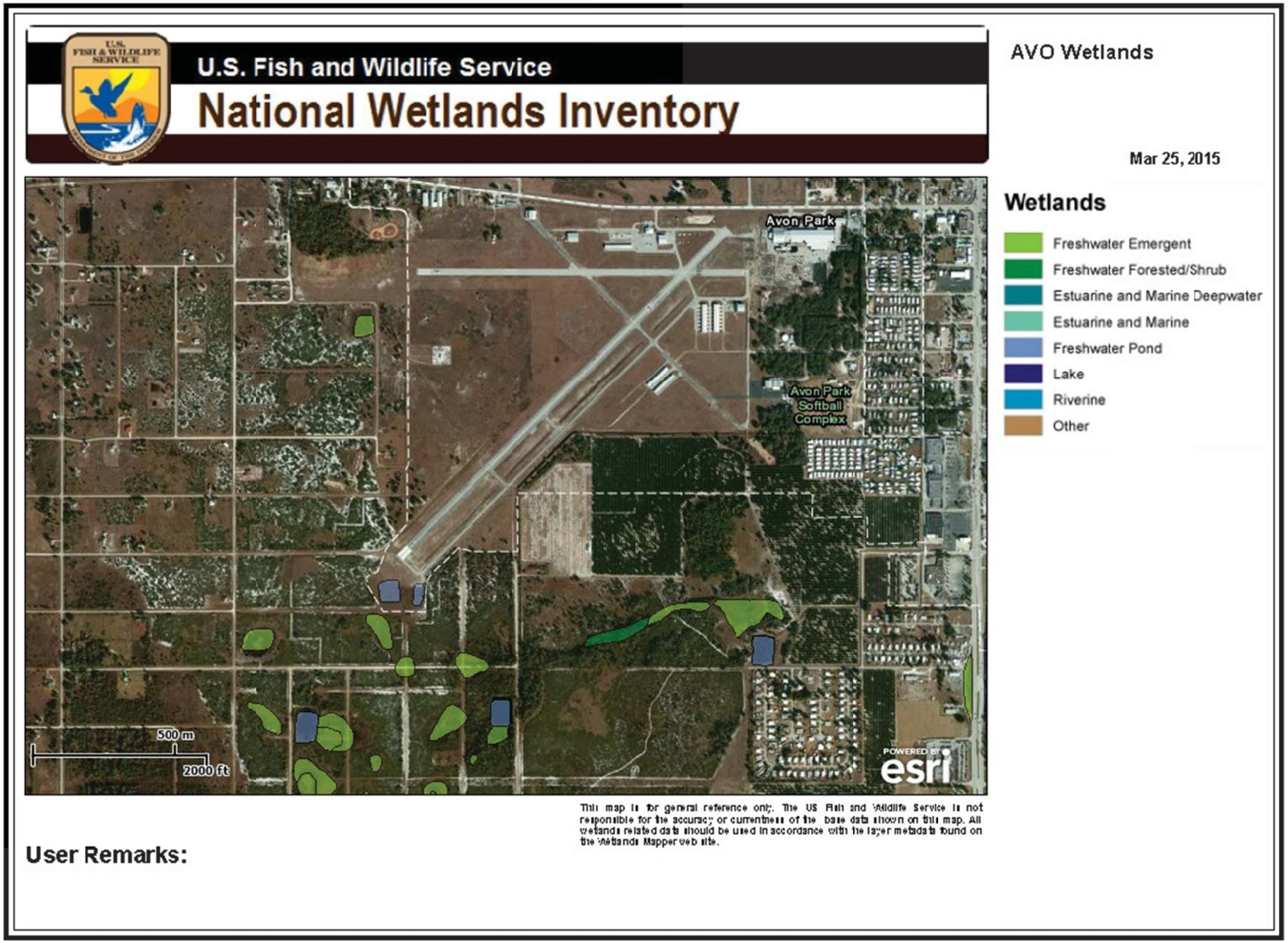
The proposed airport development would not significantly impact ground water, surface water bodies, any public water supply systems, or Federal, state, or Tribal water quality standards. Environmental Resource Permit (ERP) applications would be required by the Southwest Florida Water Management District (SWFWMD) and U.S. Army Corps of Engineers (USACE). Additionally, future development would be required to be in compliance with the requirements of the FDEP NPDES Generic Permit. Before construction activities are initiated, a Stormwater Management Pollution Prevention Plan (SWPPP) for Construction Activities must be implemented with this permit.

7.18 Wetlands

Executive Order (E.O.) 11990, "Protection of Wetlands," DOT Order 5660.1A, the Rivers and Harbors Act of 1899, and the Clean Water Act, Section 404, address activities in wetlands. E.O. 11990 requires federal agencies to ensure that their actions minimize the destruction, loss, or degradation of wetlands. It also ensures the protection, preservation, and enhancement of the Nation's wetlands to the fullest extent practicable during the planning, construction, funding, and operation of transportation facilities and projects (7 CFR Part 650.26, August 6, 1982). DOT Order 5660.1A sets forth DOT policy that transportation facilities should be planned, constructed, and operated to ensure protection and enhancement of wetlands.

Based on a review of the National Wetlands Inventory (NWI) map for the Airport, there are areas of jurisdictional wetland on Airport property. Therefore, further coordination with the U.S. Army Corps of Engineers and Southwest Florida Water Management District may be required prior to project construction.

Figure 7-2 National Wetlands Inventory



7.19 Wild and Scenic Rivers

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) protects rivers that are listed on the National Inventory of Wild and Scenic Rivers. There are no rivers listed on the U.S. Department of Interior's Inventory of National Wild and Scenic Rivers in the vicinity of the Airport. Therefore, there would be no impacts to designated wild and scenic rivers as a result of the implementation of the proposed airport projects.

7.20 Induced Socioeconomic / Cumulative Impacts

Certain airport development projects could impact the socioeconomic characteristics of the surrounding communities. Induced socioeconomic impacts occur when significant impacts in resource categories result in socioeconomic impacts. For example, airport projects that result in noise impacts or resulting in additional land could cause local land use changes. Cumulative impacts occur if the proposed airport development projects, combined with other local development projects, such as road improvements or local development, create significant socioeconomic impacts for the surrounding area. These impacts are assessed by evaluating the following factors:

- Shifts in patterns of population movement and growth;
- Increases in public service demands
- Changes in business and economic activities; or
- Other factors identified by the public.

The proposed airport development projects would not result in shifts in patterns of population movement or growth. Most of the proposed projects would occur on airport-owned land and would not require any re-zoning of adjacent land. The proposed projects would not require increases in utilities; the existing electrical, sewer, and water systems are adequate to meet the needs of the proposed projects.

In addition, the proposed airport development would not result in significant economic changes. There would be come construction-related employment generated by the projects that would result in minor short-term economic benefits to Highlands County. However, these economic impacts, while beneficial to the local economy, are not anticipated to be significant enough to result in shifts in population or changes in local land use.

7.21 Summary

There are no major environmental issues identified at AVO that would impede the implementation of the proposed airport development projects. As identified in this Environmental Overview, further coordination would be required with the US Army Corps of Engineers and appropriate State of Florida agencies during the environmental permitting process if the proposed construction of any runway and taxiway extensions impact wetland areas or threatened and/or endangered species.

SECTION 8
CAPITAL IMPROVEMENT PROGRAM

The preceding chapters have identified the projects necessary for the Avon Park Executive Airport (AVO) to accommodate the forecast level of demand. As discussed in Chapter 6, the potential development areas were evaluated and an Airport development plan identified. The Airport development plan meets the projected aviation demand and overall development goals of the AVO and the City. The projects included in the selected development plan form the basis of the Airport's capital improvement program (CIP) for the 20-year (2014-2033) planning period.

The CIP includes projects that represent the Airport's needs, such as continuing maintenance, improvement of certain facilities to comply with federal and State aviation regulations, and additional facilities to keep pace with increasing demand for aviation services. Additionally, the proposed facilities reflect strategic business development initiatives as well as the Airport's/City's goal of promoting the Airport as an economic generator for the City of Avon Park and the surrounding area. As part of the development process, project phasing and cost estimates are developed and included in the CIP in order to manage and plan for the implementation requirements associated with these development projects.

8.1 Phasing

This section applies a general schedule to the proposed Airport development projects. The schedule represents a prioritized Airport development plan to meet regulatory issues, forecast increases in aviation demand, and/or economic development initiatives. Projects that appear in the first phase are of greatest importance and have the least tolerance for delay. Additionally, some projects included in an early phase may be a prerequisite for other planned improvements in a later phase. The development phasing for AVO has been divided into three planning phases as follows:

- Phase 1: Short-Term (0 to 5 years) – 2014 – 2018
- Phase 2: Mid-Term (6 to 10 years) – 2019-2023
- Phase 3: Long-term (11 to 20 years) – 2024-2033

The phasing of individual projects should undergo an annual review to determine the need for changes based upon variations in forecast demand, available funding, economic conditions, and/or other factors that influence airport development. It should be noted that other projects not foreseen in this report may be identified in the future and would, therefore, likely necessitate changes in the phasing of projects and the overall CIP. Further, the projects and overall development identified in the CIP, though tied to a timetable, will only occur once the threshold of demand and/or need is demonstrated for each project. Phasing for the projects included in the development plan is illustrated in **Sheet 3 (Airport Layout Plan)** of the Airport Layout Plan set.

8.2 Capital Improvement Program and Order of Magnitude Estimates

This section outlines the schedule of work for the proposed CIP and the order of magnitude estimates for each project included in the CIP for AVO over the next 20 years. A brief description of the projects has been included and special attention has been placed upon the first five years of the CIP. These projects have been identified as the most critical to the Airport in terms of correcting any substandard facilities, enhancing airport facilities and revenues, economic development and meeting forecast demand.

Additionally, the order of magnitude estimates are based upon unadjusted 2015 dollars and are calculated for order-of-magnitude purposes only. Actual construction costs will vary based upon inflation, variations in labor and changes in the type or cost of materials used, as well as other unforeseeable economic factors. Furthermore, federal and state grant assistance and eligibility may also vary from year to year. Therefore, a review of the development costs and overall CIP should be undertaken annually and/or as conditions warrant. Based on the Facility Requirements identified in Chapter 5 and the Airport Development Plan outlined in Chapter 6 and depicted on the Airport Layout Plan (ALP), the estimated costs in current dollars (2015) are summarized in **Table 8-1**. This table is based upon current federal and state eligibility criteria only, and does not represent a commitment for funding by the respective funding sources. The local column depicts the Airport/City share of the costs, which may be shared with other entities (i.e., current and future tenants, third party developers, etc.) depending on the development and/or funding approach applied to each project. The full CIP and order of magnitude estimates for each project are presented in **Tables 8-2** through **8-4**.

Table 8-1: Summary of Cost Estimates (2015 Dollars)

Development Period	Total	Federal	State (FDOT)	Local (City)
Phase 1 - Short- Term (2014– 2018)	$ 5,463,000	$ 3,833,000	$ 1,380,000	$ 250,000
Phase 2 – Mid- Term (2019 – 2023)	$ 6,200,000	$ 3,040,000	$ 3,160,000	**$0
Phase 3 – Long-Term (2024 – 2033)	$ 6,200,000	$ 1,575,000	$ 4,625,000	**$0
Total Estimated Development Costs	***$ 17,863,000***	***$ 8,448,000***	***$ 9,165,000***	***$ 250,000***

Source: CDM Smith, 2015

*Note: The funding amounts and project eligibility presented are based on 2014 FAA and FDOT guidelines but do not constitute approval, acceptance or a commitment of funding by the FAA or FDOT and should only be used for planning and budgeting purposes. **Under the State of Florida Rural Economic Development Initiative, Avon Park is eligible to request a waiver or reduction of project match requirements for funding. This is assumed for each FDOT project.*

Table 8-2: Capital Improvement Program Phase I (2014-2018)

Year	Project Description and Title	Order of Magnitude Cost
2014	FEMA Master Drainage Pond Includes the construction of a large regional drainage pond designed and permitted based on FEMA requirements.	$ 1,000,000
2015	Fuel Farm Improvements The existing fuel farm was old, privately owned, and has been removed. A replacement is required.	$ 530,000
2015	Rehabilitate Runway 5-23 (Design & Construction) Includes the rehabilitation of Runway 5-23 as part of pavement maintenance program.	$ 1,677,000
2016	Extend Runway 5-23 Includes the design and construction to extend the 5 approach end of Runway 5-23 approximately 211'.	$ 656,000
2016	Install Emergency Backup Generator Includes the purchase and installation of an emergency backup generator for critical airport functions during disaster recovery.	$ 100,000
2017	Extend Taxiway 'F' Includes design and construction of an extension to Taxiway 'F' from the Runway 23 threshold to the Runway 28 threshold.	$ 750,000
2018	Construct T-Hangars Includes the design and construction of a new 14-unit T-hangar on the east side of the airfield.	$ 750,000
	Phase 1 Total:	**$ 5,463,000**

Table 8-3: Capital Improvement Program Phase 2 (2019-2023)

Year	Project Description and Title	Order of Magnitude
2019	Apron Expansion Includes the design and construction of the airport terminal/FBO apron to support new hangar construction.	$ 600,000
2020	New Parallel Taxiway & REILs For Runway 10-28 This project will design and construct a parallel taxiway to Runway 10-28 and install REILs on Runway 10-28.	$ 1,810,000
2021	Construct Corporate Hangar – North Side This project will construct a 100-foot by 100-foot corporate aircraft hangar on the north side of the airfield adjacent to State Road 64.	$ 750,000
2022	Rehabilitate Runway 10-28 This project will rehabilitate the asphalt pavement on Runway 10-28.	$ 2,000,000
2023	Rehabilitate Taxiway A This project will rehabilitate the asphalt pavement on Taxiway A.	$ 1,500,000
	Phase 2 Total:	**$ 6,200,000**

Table 8-4: Capital Improvement Program Phase 3 (2024-2033)

Year	Project Description and Title	Order of Magnitude
2024	Airport Service Road Rehabilitation Includes the design and construction for the rehabilitation of the existing airport service road on the east side of the airport	$ 450,000
2025	Rehabilitate Taxiway E This project will rehabilitate approximately 5,000 linear feet (35 foot wide) of Taxiway E asphalt pavement.	$ 1,750,000
2026	Construct Corporate Hangar – East Side This project will construct a 100-foot by 100-foot corporate aircraft hangar on the east side of the airfield.	$ 750,000
2027	Construct New T-Hangars and Taxilanes - East Side Includes the overlay/rehabilitation of Taxiway A as part of pavement maintenance program.	$ 750,000
2028	Construct Airport West Access Road This project will construct a 3,500 linear foot access road from State Road 64 to the airport property on the west side of the airport, to include sewer and water.	$ 2,500,000
	Phase 3 Total:	**$ 6,200,000**

SECTION 9
FINANCIAL EVALUATION

This section includes a review of historical revenue and expenses and a projection of revenues and expenses over the next five years for Avon Park Executive Airport (AVO) to determine the financial viability of implementing the capital improvement program (CIP) included in the AVO Master Plan Update as presented. The actual implementation schedule of the CIP will be defined by actual demand, development triggers, facility conditions, and funding availability rather than by specific years. However, the financial analysis completed in this chapter assumes the short-term projects identified in Chapter 8 will be implemented.

9.1 Funding Sources

There are various funding sources and mechanisms available to an airport depending on the location and type of airport, management structure and policies of the airport/owner, type and magnitude of a project, and general operating characteristics of the airport and local community. Funding improvements at publicly-owned general aviation airports traditionally relies on FAA and FDOT grant programs to provide significant federal and/or state funding for airport improvements. These grant funds are typically combined with local funds generated by airport revenues and/or provided from other sources from the airport owner/sponsor. Private funding for development is also used, primarily to develop and/or upgrade tenant facilities. Such tenant facilities may include T-hangars, traditional hangars, FBOs, and corporate facilities. The primary funding sources for operating expenses and capital improvements at AVO and GA airports in general include:

- Local/Airport sources (Airport fund contributions and operating revenue from fees, lease income, etc.)
- State and federal grants (FDOT, FAA, CDBG and EDA)
- Public-private partnerships and/or third-party financing
- Bonding and/or commercial paper mechanisms

The following sections discuss these funding sources in greater detail and review when each source may be appropriate for use at AVO.

9.1.1 Local / Airport Funding

Of the sources listed previously, local Airport funds and airport operating revenues are typically the funding source that is used for the day-to-day operation and maintenance of the Airport and to meet certain requirements for any capital improvement projects. The remaining three sources listed are typically only associated with capital projects

and expenditures for improvement or expansion of an airport, including pavement maintenance projects such as runway and taxiway overlays or rehabilitations. However, Airport funds are also used for the local "match", or share, of state and federal grants for capital projects.

The airport operating revenues at AVO have typically been collected through land/ground leases and building and T-hangar leases. These revenue sources are typical instruments that many GA airports utilize to generate operating revenue. Additional sources of operating revenue that are often implemented at GA airports include; fuel flowage fees, percentage of gross receipts, landing or user fees, and lease and sublease provisions to gain revenue from additional business activities.

Of these additional sources of local airport revenue, a few sources of operating revenue that AVO could implement is the implementation and use of additional lease provisions to ensure that revenue is collected from fuel flowage/sales and/or a percentage of gross commercial sales. Though these lease provisions may be difficult to implement in the short-term due to the term on existing leases, implementation of such provisions for new tenants when possible or through renegotiation of existing lease agreements upon renewal should be considered by the airport.

It needs to be noted that under the State of Florida Rural Economic Development Initiative (REDI), Avon Park is eligible to request a waiver or reduction of project match requirements for funding. A request for a waiver or reduction of project match should be submitted for each capital improvement project. As part of the REDI program Avon Park could potentially realize improvements at the airport without having to provide a financial share.

9.1.2 State and Federal Funding

Common funding sources that are typically used to fund capital expenditures at an Airport include state and federal grant programs. Though the state and federal grants are typically tied to specific project eligibility and often come with specific assurances for the continued operation of an airport, these funding sources are the primary mechanism for funding airport improvements at GA airports nationwide. This is largely due to the limited local funding requirements associated with state and federal grants. FAA funding through the Airport Improvement Program (AIP) can typically be obtained at airports like AVO for up to 90 percent of the project cost, with FDOT and the airport/owner sharing the remaining cost at 5 percent each.

FDOT aviation grants for projects that may not be eligible under the FAA AIP will fund eligible security projects up to 100 percent of the project cost and up to 80 percent of the total cost for other non-security non-revenue generating projects. Projects that are non-aviation related or revenue generating in nature (i.e. t-hangars, leasable development, etc.) are typically eligible for 50 percent of the total project cost. This allows airports in Florida to address critical safety, maintenance and development needs for often as little as 5 to 20 cents for each total project dollar spent on eligible projects. Because of this overall benefit to airports and limited requirement for local investment, FDOT and FAA grants are typically the most favorable mechanism to fund capital projects for the maintenance and improvement of airport facilities.

Other state and federal grants that can be used to fund specific airport projects include; community development block grants (CDBG) and economic development administration (EDA) grants. The CDBG is a federal program that provides funding for housing and community development. The

objectives of the program are to benefit low- and moderate-income persons, prevent or eliminate slum or blight, and address urgent community development needs. The program consists of an Entitlement component (provides funds directly to urban areas) and a Small Cities component (provides funds to the states for distribution to rural areas). The program is an excellent opportunity for communities to obtain funds for projects that the community cannot otherwise afford and it provides a means to implement projects that local governments may not have staff to complete. Popular examples of community projects include:

- Rehabilitation and Preservation of Housing
- Water and Sewer Improvements
- Street Improvements
- Economic Development Activities
- Creating Jobs for Low and Moderate Income People
- Downtown Revitalization
- Parks and Recreation Projects
- Drainage Improvements

The EDA grants are a competitive federal grant process where "all projects are evaluated to determine if they advance global competitiveness, create jobs, leverage public and private resources, can demonstrate readiness and ability to use funds quickly and effectively and link to specific and measureable outcomes." Part of the EDA's mission is to promote innovation and competitiveness and prepare American regions for growth and success in the worldwide economy. EDA grants are given to state and local government, Indian tribes, Economic Development Districts, public and private non-profits, universities and other institutions of higher education to support the development and implementation of economic development strategies. The EDA has seven investment programs that include:

- Public Works & Economic Development
- Economic Adjustment Assistance
- Planning
- Technical Assistance
- Research & Evaluation
- Trade Adjustment Assistance for Firms
- Global Climate Change Mitigation Incentive Fund

EDA grant funding priority is generally given to projects that support:

- Long-term, coordinated, and collaborative regional economic development approaches
- Innovation and competitiveness
- Entrepreneurship
- Strategies and investments that connect regional economies with the worldwide marketplace

Though the FDOT and FAA AIP grants are the typical and most commonly used state and federal funding sources for airports like AVO, consideration should be given to CDBG and EDA grants as a possible source for funding airport projects. The CDBG and EDA grants should especially be considered for projects that support regional collaboration and economic development.

9.1.3 Other Funding Sources

The remaining funding sources identified previously that can be used to fund capital projects at airports include the use of public-private partnerships, third party financing and bonding or commercial paper mechanisms. These funding sources are typically more complex and involve various considerations that may or may not make them appropriate for various airports and/or projects. Public-private partnerships and/or third party financing instruments are often used for specific projects when the airport would like to have increased control over a project/development but does not have, or is not willing to commit, the funds necessary to construct the project. The arrangements are often used for hangar and other similar projects that create a final product (e.g. building/facility) that the airport can then lease to the developer to manage as a whole or can be leased directly to individual tenants. In either case, such arrangements can often provide a viable tool for limiting the financial burden to the airport for development of a project while still increasing the potential lease revenue of the completed facility over that of a standard ground/land lease.

In addition to public-private partnerships and third party financing, airports sometimes use standard open market financing mechanisms such as bonding and/or commercial paper. These types of financing mechanisms are typically used on large airport projects and often by large reliever GA airports and commercial service airports. Since the level of risk and cost on these mechanisms is typically greater than that associated with the funding sources discussed previously, especially considering the financial markets we have witnessed in recent years, the anticipated return from or overall demand for the subject project must justify the use of these funding sources to the airport owner. Example projects that have been associated with such funding mechanisms include;

- Large scale strategic master plans for commercial service airports
- Development of large (300-500 acre) airport business/commerce parks

- Construction of new commercial terminal and/or cargo facilities
- Construction of new airports

Additionally, these funding sources are typically combined with many of the previously discussed sources and are often not the sole funding mechanism employed. This allows airport owners to manage the overall risk and cost of the subject development in order to maintain a reasonable anticipated return on investment and ensure future debt service costs associated with the development are manageable.

9.2 Historical Revenue and Expenses

Operating revenue sources at AVO currently include a variety of sources. These sources include:

- Aviation related ground and hangar/building leases (rents)
- Non- Aviation related office and building leases (rents)
- Miscellaneous income (permits, special event fees and interest income)

These income sources have been categorized into three general income categories; permits and fees, rents and royalties and other miscellaneous revenues. The largest operating revenue source for AVO is the income generated from rent, which was approximately 73 percent of total revenue in Fiscal Year (FY) 2013. The next largest source of revenue is from miscellaneous revenues, which represented approximately 25 percent of total operating revenue in FY 2013.

General operating expenses at AVO fall into four categories based on the type of expense. The four categories include; general operating expenses, charges and obligations, debt service, and contingency. Of these expenses, the largest expense category is general operating expenses, which represent approximately 47 percent of total operating expenses for FY 2013. Charges and obligations and debt service were the next highest expenses at 30 percent and 18 percent, respectively of total operating expenses in FY 2013.

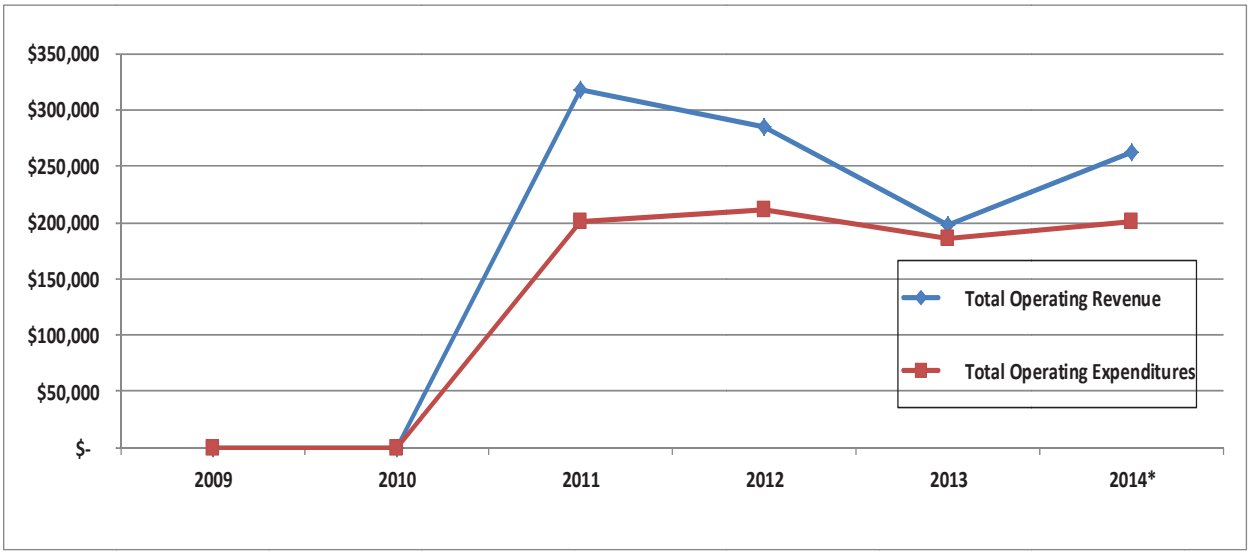
As shown in **Table 9-1**, total operating revenues generated by the Airport have exceeded total operating expenses since FY 2008. The expense figures presented do not include the local share of capital improvement costs however those funds are also not included in available operating income presented for the Airport. A review of available operating income against projected capital improvement costs at the local level will be completed as part of the projection of revenues and expenses in Section 9.3. **Figure 9-1** illustrates the historical operating revenues and expenses for AVO.

Table 9-1 Historical Airport Revenues and Expenses

	Historical					
	2009	2010	2011	2012	2013	2014*
Operating Revenues						
Rents and Royalties			208,507	234,883	162,984	240,132
Permits and Fees					4,470	2,000
Miscellaneous Revenues (Interest, Transfers, Insurance, etc.)			109,860	50,704	30,463	20,000
Total Operating Revenue	$ -	$ -	$ 318,367	$ 285,587	$ 197,917	$ 262,132
Operating Expenditures (before depreciation)						
General Operating Expenses			117,845	115,906	61,107	93,538
Charges and Obligations			63,259	75,000	76,845	60,000
Debt Service			20,099	20,099	37,922	36,773
Contingency			0	0	10,420	10,420
Total Operating Expenditures	$ -	$ -	$ 201,203	$ 211,005	$ 186,294	$ 200,731
Total Annual Operating Income	$ -	$ -	$ 117,164	$ 74,582	$ 11,623	$ 61,401

Source: Airport Staff, Avon Park Airport Budget Worksheet FY 2011 - 2014
** Based on 2014/2015 Budget.*

Figure 9-1 Historical Airport Revenues and Expenses



CDM Smith, 2014

9.3 Projected Revenues and Expenses

Revenues the Airport generates in the future will largely be derived primarily from the same sources it generates now, including: land leases and building leases. Additional revenue could be generated if provisions for FBO royalties and fuel flowage fees were implemented in future lease contracts and negotiations. However, the greatest opportunity to generate significant revenues is associated with the use of undeveloped and underutilized land areas within the existing Airport

property. This can be accomplished though clear and defined development and leasing policies and strategies, adherence to minimum standards, and a pro-active Airport development plan for AVO.

The baseline projection of airport revenues and expenses over the next five years is based on forecast activity, utilizing standard funding mechanisms and obtaining revenue from the primary historical sources of existing land or facility leases. State and federal grant funds have been included as budgeted for anticipated capital improvement projects.

Several underlying assumptions were included in this analysis and the resulting financial model. These assumptions include:

- Financing for airport operations, maintenance and improvements is on a "pay as you go" basis.
- No financing mechanisms, such as commercial paper or bonds, are to be employed to finance the capital program.
- In all instances of estimated future revenues and expenses, all estimations are trended to be conservative (revenues were not over-stated and expenses were not under-stated).
- Baseline and incremental calculations were made for both revenues and expenses. Baseline costs and revenues are those that come from existing facilities continuing to function and exist in their current state, while incremental refers to the "new" costs and revenues that are added to the calculations as development is initiated and completed.
- A general rate of inflation of 2.01 percent annually, based on the average rate of inflation in the U.S. between 2004 and 2014, was used to escalate operating expenses beyond the FY 2014 adopted budget.
- Baseline operating revenues were escalated beyond the FY 2014 adopted budget based on the historical trend from FY 2011 through FY 2013, approximately 3.03 percent average annual growth.
- Existing capital project expenses and anticipated state and federal grant revenues were included as projected based on project eligibility only. Capital projects will not be undertaken unless adequate local match funding is available.

Based on budget accounting the airport is self-sufficient from an operating standpoint, as annual operating revenues are projected to continue to exceed annual operating expenses. The Airport should maintain a net profit after capital costs assuming the airport does not fund any capital improvement costs beyond the income available to fund the local share. Since funding sources may vary due to grant and source programs, the local share for the five year CIP may increase. However, early and careful coordination with the JACIP should help AVO to plan future projects and time capital expenditures. Realistically, the capital outlay will continue to be governed by the cash flow required to support the projects implemented. The projected total revenues and expenses are presented in **Table 9-2,** while projected annual total airport expenses and total airport revenues is

illustrated in **Figure 9-2**. **Figure 9-3** shows projected total annual airport income compared to total annual cumulative income.

Table 9-2 Projected Airport Revenues and Expenses

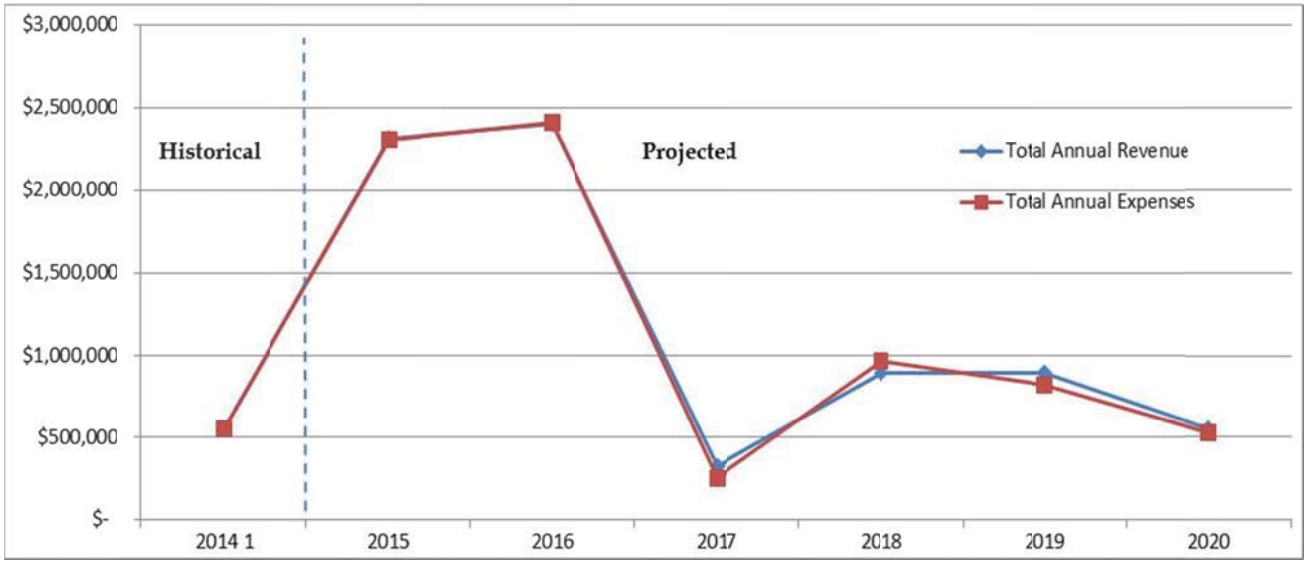
	Historical	Projected					
	2014 [1]	2015	2016	2017	2018	2019	2020
Operating Revenues							
Rents and Royalties	240,132	247,408	254,904	262,628	270,586	278,784	287,232
Permits and Fees	2,000	2,061	2,123	2,187	2,254	2,322	2,392
Miscellaneous Revenues (Interest, Transfers, Insurance, etc	20,000	20,606	21,230	21,874	22,536	23,219	23,923
Total Operating Revenue	$ 262,132	$ 270,075	$ 278,258	$ 286,689	$ 295,376	$ 304,326	$ 313,547
Operating Expenditures (before depreciation)							
General Operating Expenses	93,538	95,418	97,336	99,292	101,288	103,324	105,401
Charges and Obligations	60,000	61,206	62,436	63,691	64,971	66,277	67,610
Debt Service	36,773	37,512	38,266	39,035	39,820	40,620	41,437
Contingency	10,420	10,629	10,843	11,061	11,283	11,510	11,742
Total Operating Expenditures	200,731	204,766	208,881	213,080	217,363	221,732	226,189
Total Operating Income	$ 61,401	$ 65,309	$ 69,376	$ 73,609	$ 78,013	$ 82,594	$ 87,358
Non-Operating Revenues							
State Grants	207,010	517,500	1,460,000	3,200	600,000	15,000	240,000
Federal Grants	87,300	1,525,000	660,000	36,000	0	570,000	0
Total Non-Operating Revenue	$ 294,310	$ 2,042,500	$ 2,120,000	$ 39,200	$ 600,000	$ 585,000	$ 240,000
Non-Operating Expenditures (CIP / Prof. Services)							
Capital Outlay (inc. professional services)	350,370	2,100,000	2,200,000	40,000	750,000	600,000	300,000
New Debt Service	0	---	---	---	---	---	---
Total Non-Operating Expenditures	$ 350,370	$ 2,100,000	$ 2,200,000	$ 40,000	$ 750,000	$ 600,000	$ 300,000
Total Non-Operating Income	$ (56,060)	$ (57,500)	$ (80,000)	$ (800)	$ (150,000)	$ (15,000)	$ (60,000)
Total Annual Income (loss)	**$ 5,341**	**$ 7,809**	**$ (10,624)**	**$ 72,809**	**$ (71,987)**	**$ 67,594**	**$ 27,358**
Cumulative Income (loss)	**$ 5,341**	**$ 13,150**	**$ 2,526**	**$ 75,335**	**$ 3,348**	**$ 70,942**	**$ 98,300**

Source: Airport Staff, AVO 2014/2015 Adopted Budget, AVO Capital Improvement Program (CIP) FY 2013/2014, and CDM Smith, 2014.

Notes

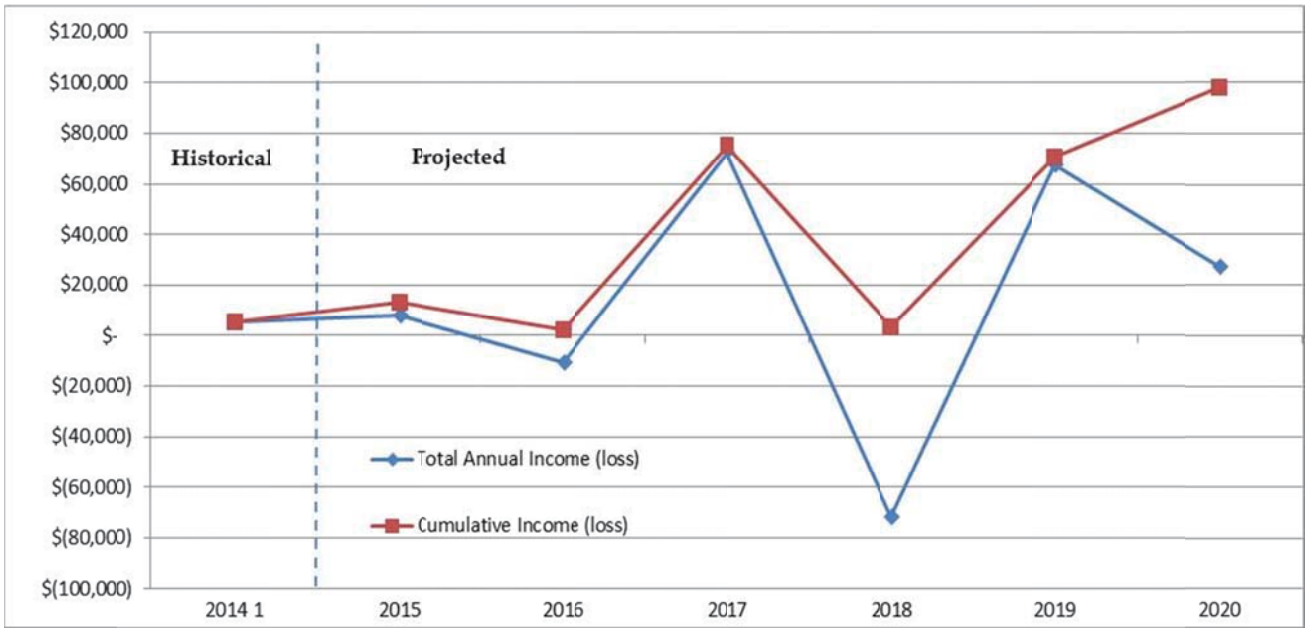
[1] Data from adopted FY 2014/2015 budget and CIP

Figure 9-2 Projected Airport Revenues and Expenses



CDM Smith, 2014

Figure 9-3 Projected Total Annual Income and Cumulative Income



CDM Smith, 2014

9.4 Summary

Overall, AVO has operated in a generally positive financial condition but have not had the ability to create adequate reserve accounts. Revenues the Airport generates now and in the future will come primarily from hangar and building rental fees and land leases. Additional revenues could be realized through a more "revenue enhanced" approach to operation and development where the Airport receives a percentage of fuel flowage and/or aviation related commercial sales. Further, the undeveloped and underutilizes land areas on the Airport represent the greatest opportunity to generate significant revenues through ground leases and/or the construction and leasing of hangars and other airport facilities. The success of the Airport to implement and capitalize on aviation and non-aviation development opportunities will determine its ability to increase reserve and contingency accounts and maximize the overall positive economic impact of the Airport to the community.

SECTION 10
AIRPORT LAYOUT PLAN DRAWINGS

The Airport Layout Plan sets consist of several drawings that graphically depict the locations of existing and planned airfield and landside facilities in addition to pertinent ancillary information such as property lines, set-back lines, and approach slopes with obstructions denoted. The airport layout plan set for Avon Park Executive Airport (AVO) presents, in graphic format, the proposed development of the Airport to meet forecast aviation demand and the overall goals of AVO and the City of Avon Park (City). The complete set of plans includes the following:

- Title Sheet
- Existing Facilities
- Airport Layout Plan (ALP)
- Airport Data Sheet
- Terminal Area Plan
- Airport Airspace Drawing
- Inner Portion of the Approach Surface – Runway 5
- Inner Portion of the Approach Surface – Runway 23
- Inner Portion of the Approach Surface – Runway 10-28
- Runway Departure Surface – Runway 5
- Runway Departure Surface – Runway 23
- Runway Departure Surface – Runway 10-28
- Land Use Map
- Property Map

This chapter will present the drawings with a brief discussion of each. The ALP set is provided in conjunction with this report document and has been prepared according to the design requirements set forth in this document, the Federal Aviation Administration (FAA) Advisory Circulars (AC) 150/5300-13, *Airport Design,* latest edition, and 150/5070-6, *Airport Master Plans*, latest edition, as well as FAR Part 77, *Obstructions to*

Air Navigation), and Florida Department of Transportation (FDOT) *Guidebook for Airport Master Planning*.

10.1 Title Sheet

The title sheet serves as an introduction to the ALP set. It includes the name of the Airport, location map, vicinity map, and an index of drawings.

10.2 Existing Facilities

Included in the AVO plan set is the existing facilities drawing, which is a graphic representation, to scale, of the Airport in its current configuration (year 2015). The drawing shows all existing Airport facilities, their location, pertinent dimensions and clearance information, and the runway and taxiway infrastructure.

10.3 Airport Layout Plan (ALP)

The ALP drawing for AVO is a graphic representation of the recommended infrastructure development proposed through the year ending 2033. The ALP is the primary planning document for the Airport and is a graphic representation, to scale, of existing and proposed Airport facilities, their location, dimensional and clearance data, and the overall infrastructure of the Airport, including runways, taxiways, and aprons. It also includes information on the Airport's location, runways, meteorological conditions, and other pertinent data. FAA and FDOT officials refer to the Data Sheet and ALP when considering grant applications for development assistance and off-airport development within the vicinity of the Airport.

The ALP was developed in accordance with the design criteria and guidelines contained in FAA AC 150/5300-13, "Airport Design", 150/5070-6, *Airport Master Plans*, FAR Part 77, *Obstructions to Air Navigation*, and Florida Department of Transportation (FDOT) *Guidebook for Airport Master Planning.* The information and analysis presented in the previous chapters of this report discuss the design requirements that pertain to the Airport and that have been incorporated into the ALP.

10.4 Airport Data Sheet

The Airport Data Sheet is typically used when space is not available on the ALP for the necessary tabular information regarding the Airport and its facilities. In this case, a separate sheet that includes information typically found on the ALP is included.

10.5 Terminal Area Plan

The Terminal Area Plan presents an enlarged area of the ALP. The terminal area plan highlights the respective terminal facilities, including the FBO terminal buildings, aircraft parking apron, automobile parking and any other facilities located in and around the existing or proposed terminal areas.

10.6 Airport Airspace Drawing

Federal Aviation Regulations (FAR) Part 77, "Objects Affecting Navigable Airspace," prescribes airspace standards, which establish criteria for evaluating navigable airspace. Airport imaginary surfaces are established relative to the Airport and runways. The size of each imaginary surface is based on the runway category with respect to the existing and proposed visual, non-precision, or precision approaches for that runway. The slope and dimensions of the respective approach surfaces are determined by the most demanding, existing or proposed, approach for each runway. The imaginary surfaces definitions include:

- **Primary Surface** – A rectangular area symmetrically located about the runway centerline and extending a distance of 200 feet beyond each runway threshold. Its elevation is the same as that of the runway.
- **Horizontal Surface** – An oval shaped, flat area situated 150 feet above the published Airport elevation. Using a 10,000-foot arc, which is centered 200 feet beyond each runway end, then connecting the arcs with a line tangent to those arcs determines its dimensions.
- **Conical Surface** – A sloping area whose inner perimeter conforms to the shape of the horizontal surface. It extends outward for a distance of 4,000 feet measured horizontally, and slopes upward at 20:1.
- **Transitional Surface** – There are three different transitional surfaces. The first is off the sides of the primary surface, the second is off the sides of the approach surface, and the last is outside the conical surface and pertains to precision runways only. All transitional surfaces have slopes of 7:1 that are measured perpendicular to the runway centerline.
- **Approach Surface** – This surface begins at the ends of the primary surface and slopes upward at a predetermined ratio while at the same time flaring out horizontally. The width and elevation of the inner ends conform to that of the primary surface, while the slope, length, and outer width are determined by the runway service category and existing or proposed instrument approach procedures.

Existing objects, which penetrate above Part 77 surfaces, are tabulated on the drawings. The table contains data on the object elevation, elevation of the imaginary surface, and any action necessary to mitigate the penetration.

10.7 Inner Portion of the Approach Surface – Runways 5-23 and 10-28

The Inner Portion of the Approach Surface drawings show both plan and profile views for each runway protection zone (RPZ) and associated approaches as shown on the ALP. The purpose of these plans is to locate and document existing objects, which represent obstructions to navigable airspace, as well as the existing and proposed approach slopes for each runway. Additionally, the drawing shows the proposed runway extensions and the ground profile along the extended centerline beyond each runway end.

10.8 Runway Departure Surface – Runways 5-23 and 10-28

The Runway Departure Surface drawing depicts a large scale plan and profile view of the departure surfaces for runway ends designated primarily for instrument departures.

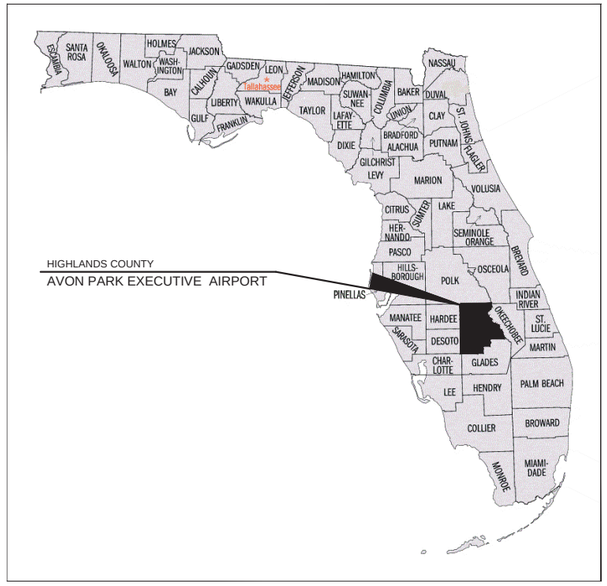
10.9 Land Use Map

Land Use depicts existing land use. This drawing will help provide local authorities guidance and help ensure aviation compatible zoning is maintained in the future.

10.10 Property Map

The Property Map presents the Airport property line with bearings and approximate distances from cardinal points, which define the surveyed property line. Aviation easements are also indicated.

AIRPORT LAYOUT PLAN



LOCATION MAP

INDEX OF DRAWINGS	
SHEET NUMBER	TITLE
1	TITLE SHEET
2	EXISTING FACILITIES
3	AIRPORT LAYOUT PLAN
4	AIRPORT DATA SHEET
5	TERMINAL AREA PLAN
6	AIRPORT AIRSPACE
7	INNER PORTION OF THE APPROACH SURFACE (RUNWAY 5)
8	INNER PORTION OF THE APPROACH SURFACE (RUNWAY 23)
9	INNER PORTION OF THE APPROACH SURFACE (RUNWAY 10–28)
10	RUNWAY DEPARTURE SURFACE (RUNWAY 5)
11	RUNWAY DEPARTURE SURFACE (RUNWAY 23)
12	RUNWAY DEPARTURE SURFACE (RUNWAY 10–28)
13	LAND USE MAP
14	PROPERTY MAP

(AVO)
AVON PARK, FLORIDA

FAA AIP 3-12-0004-017-2011

PREPARED FOR THE
CITY OF AVON PARK

VICINITY MAP

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

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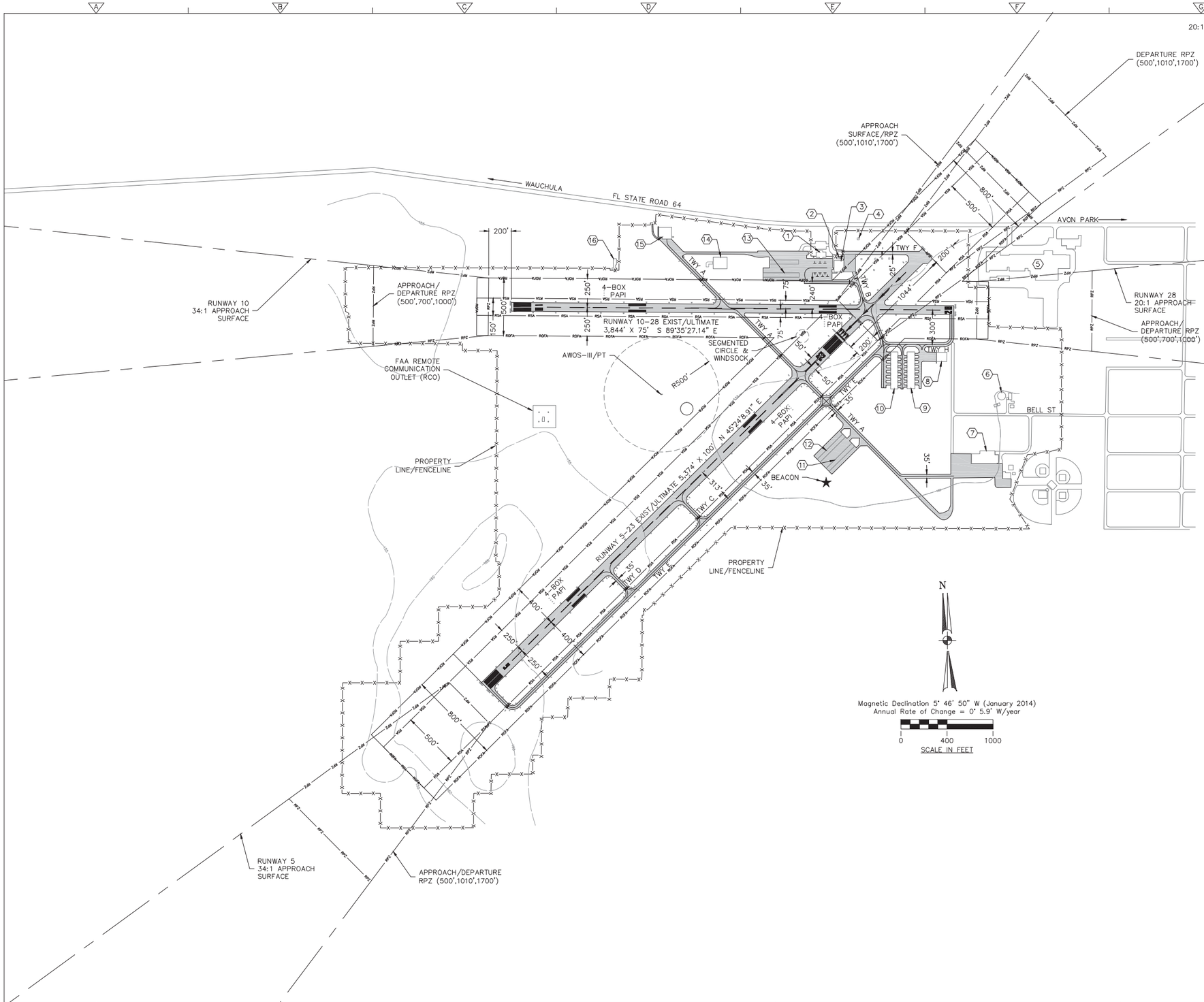
AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

TITLE SHEET

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
1

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION



LEGEND	
EXISTING	ITEM
	Airport Property Line
	Airport Security Fence
BRL	35' Building Restriction Line (BRL)
RVZ	Runway Visibility Zone Line (RVZ)
ROFA	Runway Object Free Area Line (OFA)
RSA	Runway Safety Area Line (RSA)
RPZ	Runway Protection Zone Line (RPZ)
	Airfield Pavement
	Buildings
	Windcone
	Airport Reference Point (ARP)
	Rotating Beacon
	NAVAIDS
	Water Features
114	Topographic Contours

⟨X⟩	BUILDING DATA TABLE	
NO.	FACILITY DESCRIPTION	FUTURE REMOVAL
⟨1⟩	TERMINAL BUILDING/FBO	
⟨2⟩	FUEL FARM	
⟨3⟩	FLORIDA AIRCRAFT SERVICES – MAINTENANCE HANGAR	YES
⟨4⟩	ELECTRICAL VAULT	
⟨5⟩	CLASSIC CALADIUMS	
⟨6⟩	CITY WATER TREATMENT FACILITY	
⟨7⟩	HIGHLANDS AVIATION – HANGAR	
⟨8⟩	CORPORATE HANGAR	
⟨9⟩	T-HANGAR	
⟨10⟩	T-HANGAR	
⟨11⟩	T-HANGAR	
⟨12⟩	T-HANGAR	
⟨13⟩	T-HANGAR	YES
⟨14⟩	DUMONT AIRCRAFT ENGINES – MAINTENANCE FACILITY	
⟨15⟩	BEN HILL GRIFFIN – HANGAR	
⟨16⟩	RESIDENTIAL BUILDING – CITY OWNED	YES

REV. NO.	DATE	DRWN	CHKD	REMARKS

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AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

EXISTING FACILITIES

PROJECT NO. 118223-88065
FILE NAME:
SHEET NO. 2

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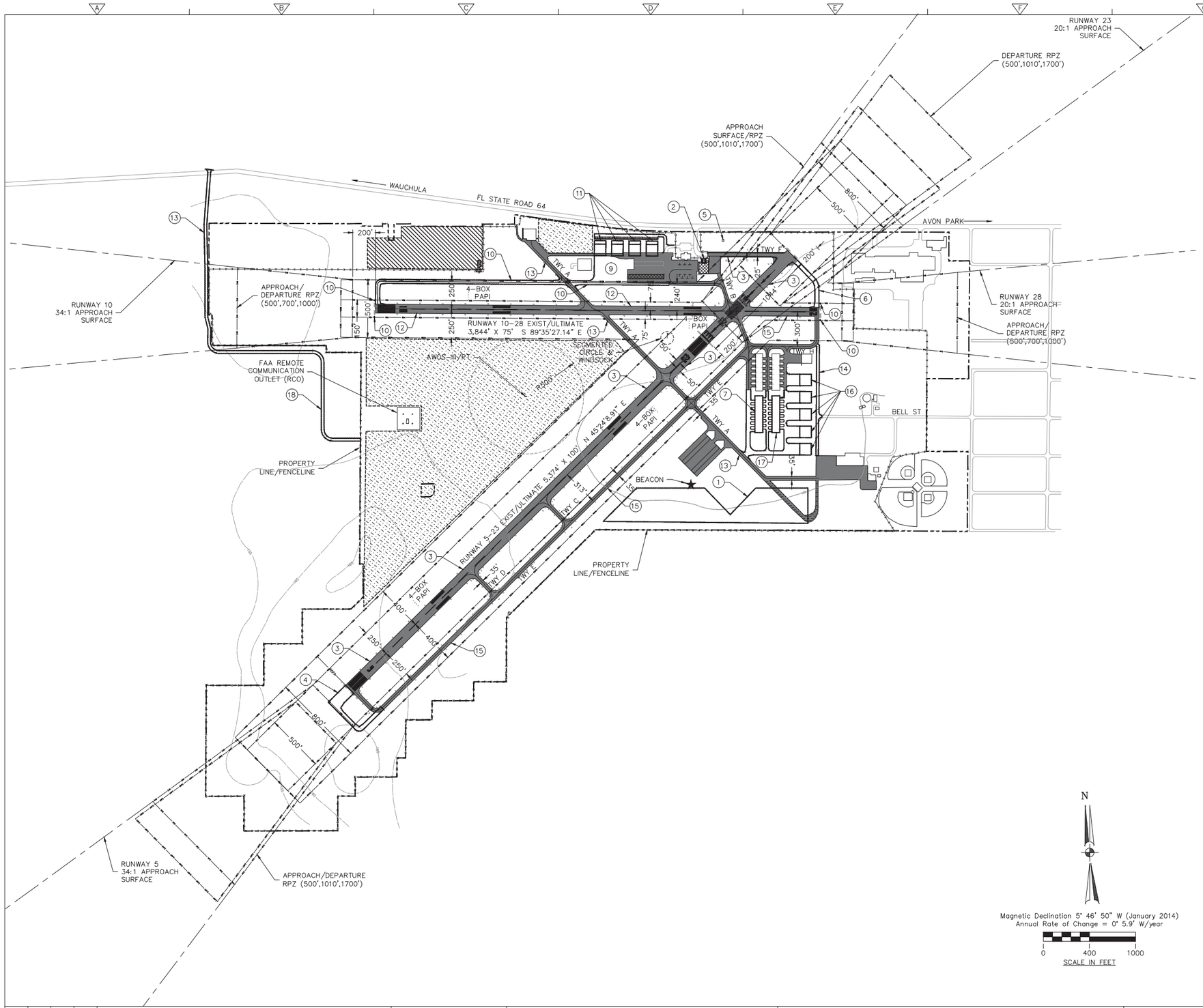

LEGEND		
EXISTING	FUTURE	ITEM
	N/A	Airport Property Line
		Airport Security Fence
	N/A	Off-Airport Fence
BRL	N/A	35' Building Restriction Line (BRL)
RVZ	RVZ	Runway Visibility Zone Line (RVZ)
ROFA	ROFA	Runway Object Free Area Line (OFA)
RSA	RSA	Runway Safety Area Line (RSA)
RPZ	RPZ	Runway Protection Zone Line (RPZ)
		Airfield Pavement
N/A		Airfield Pavement to be Removed
		Buildings
N/A		Buildings to be Demolished
	N/A	Conservation Easement
N/A		Future Aviation Use
		Windcone
	N/A	Airport Reference Point (ARP)
		Rotating Beacon
		NAVAIDS
N/A		Land To Be Acquired
		Water Features
	N/A	Topographic Contours

FUTURE AIRPORT DEVELOPMENT LEGEND	
NEAR TERM / 0-5 YEARS	
(1)	CONSTRUCT FEMA STORMWATER POND
(2)	FUEL FARM IMPROVEMENTS
(3)	REHABILITATE RUNWAY 5-23 & ASSOCIATED WORK
(4)	EXTEND RUNWAY 5-23
(5)	INSTALL EMERGENCY BACK-UP GENERATOR
(6)	EXTEND TAXIWAY F
(7)	CONSTRUCT T-HANGARS
MID TERM / 6-10 YEARS	
(9)	APRON EXPANSION
(10)	NEW PARALLEL TAXIWAY & REILS FOR RUNWAY 10-28
(11)	CONSTRUCT CORPORATE HANGARS - NORTH SIDE
(12)	REHABILITATE RUNWAY 10-28
(13)	REHABILITATE TAXIWAY A
LONG TERM / 11-20 YEARS	
(14)	AIRPORT SERVICE ROAD REHABILITATION
(15)	REHABILITATE TAXIWAY E
(16)	CONSTRUCT CORPORATE HANGAR - EAST SIDE
(17)	CONSTRUCT NEW T-HANGARS AND TAXILANES - EAST SIDE
(18)	CONSTRUCT AIRPORT WEST ACCESS ROAD

SPONSOR APPROVAL

AUTHORIZED REPRESENTATIVE

PRINTED NAME AND TITLE

FAA APPROVAL

AUTHORIZED REPRESENTATIVE

PRINTED NAME AND TITLE

CONSTRUCTION NOTICE REQUIREMENT

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

N

Magnetic Declination 5° 46' 50" W (January 2014)
Annual Rate of Change = 0° 5.9' W/year

0 400 1000

SCALE IN FEET

NOTES

1. ALL NORTHING AND EASTING COORDINATES REPORTED ARE RELATIVE TO NAD 83, GEODETIC REFERENCE SYSTEM, INTERNATIONAL FOOT DATUM.
2. ALL ELEVATIONS REPORTED ARE RELATIVE TO 0.00' MSL (NAVD '88 DATUM).
3. SEE SHEET 3 (DATA TABLE SHEET) FOR AIRPORT, RUNWAY, APRON AND WIND ROSE DATA.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
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AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

AIRPORT LAYOUT PLAN

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
3

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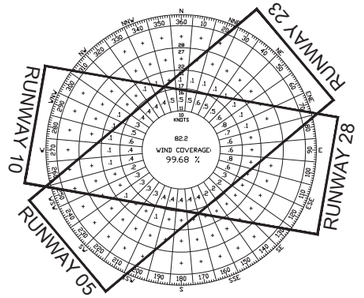
ALL WEATHER WIND ROSE



ALL WEATHER 16.0

WIND DATA SUMMARY*

Crosswind Component (Knots)	R 10–28	R 5–23	Combined
10.5	93.3%	92.6%	96.0%
13.0	95.5%	96.7%	98.5%
16.0	99.6%	99.7%	99.7%

*Period of Observation: January 2005 – December 2014
*Observations: 117,721
*Station: Orlando International Airport
*Source: National Climatic Data Center/National Oceanic and Atmospheric Administration (March 2015)

NOTES

1. ALL ELEVATIONS REPORTED ARE RELATIVE TO 0.00' MSL (NAVD '88 DATUM).
2. FOR APPROACH PENETRATIONS SEE THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS.
3. APPROACH END OF RUNWAYS 5 AND 10 ACCOMMODATE INSTRUMENT APPROACHES HAVING VISIBILITY MINIMUMS < 1 STATUTE MILE DAY OR NIGHT.

DECLARED DISTANCES

RUNWAY END		EXISTING	ULTIMATE
10	TORA	3,844'	3,844'
	TODA	3,844'	3,844'
	ASDA	3,844'	3,844'
	LDA	3,844'	3,844'
28	TORA	3,844'	3,844'
	TODA	3,844'	3,844'
	ASDA	3,844'	3,844'
	LDA	3,844'	3,844'
5	TORA	5,374'	5,000'
	TODA	5,374'	5,000'
	ASDA	5,374'	5,000'
	LDA	5,374'	5,000'
23	TORA	5,374	5,585'
	TODA	5,374'	5,585'
	ASDA	5,374'	5,585'
	LDA	4,330'	5,000'

AIRPORT DATA TABLE

DESCRIPTION	EXISTING		FUTURE	
AIRPORT REFERENCE CODE (ARC)	C–II		C–II	
MEAN MAX. TEMP., HOTTEST MONTH	90.5°F, JULY		SAME	
AIRPORT ELEVATION	156.0'		SAME	
AIRPORT NAVIGATIONAL AIDS	GPS, PAPI, BEACON		SAME	
AIRPORT REFERENCE POINT COORDINATES	LAT 27°35'28.66" LONG 81°31'44.32"		LAT 27°35'28.11" LONG 81°31'47.19"	
MISCELLANEOUS FACILITIES	MIRL, MITL, WIND CONE, AWOS, SEGMENTED CIRCLE		SAME	
CRITICAL AIRCRAFT	FAMILY GROUPING C–II GREATER THAN 12,000 LBS LESS THAN 60,000 LBS		SAME	
AIRPORT MAGNETIC VARIATION	5°46'50" W (JAN 2014) ANNUAL RATE OF CHANGE = 0°5.9' W PER YEAR		SAME	
AIRPORT ACREAGE	385		SAME	
NPIAS SERVICE LEVEL	GENERAL AVIATION		SAME	
RUNWAY END COORDINATES/ELEVATIONS	COORDINATES	ELEV.	COORDINATES	ELEV.
RUNWAY 10	LAT 27°35'36.81" LONG 81°32'04.18"	154.2'	SAME	SAME
RUNWAY 28	LAT 27°35'36.71" LONG 81°31'21.47"	153.2'	SAME	SAME
RUNWAY 5	LAT 27°35'04.14" LONG 81°32'06.50"	155.8'	LAT 27°35'02.66" LONG 81°32'08.16"	156.0'
RUNWAY 23 (PHYSICAL)	LAT 27°35'41.65" LONG 81°31'24.17"	152.2'	SAME	SAME
RUNWAY 23 (DISPLACED)	LAT 27°35'34.46" LONG 81°31'32.24"	152.6'	LAT 27°35'37.57" LONG 81°31'28.76"	152.4'

RUNWAY DATA TABLE

ITEM	RUNWAY 10–28		RUNWAY 5–23	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
RUNWAY DESIGN CODE (RDC)	B–II	SAME	C–II	SAME
RUNWAY REFERENCE CODE (RRC)	B–II	SAME	C–II	SAME
PAVEMENT STRENGTH (lbs)	DWG = 60,000	SAME	SWG = 26,000	SAME
PAVEMENT TYPE	ASPHALT	SAME	ASPHALT	SAME
EFFECTIVE GRADIENT (%)	0.1%	SAME	0.09%	SAME
MAXIMUM ELEVATION (AMSL)	154.1'	SAME	160.2'	SAME
MAXIMUM GRADE CHANGE	0.1%	SAME	0.09%	SAME
% WIND COVERAGE (13 KNOTS)	X%	SAME	X%	SAME
% WIND COVERAGE (16 KNOTS)	X%	SAME	X%	SAME
RUNWAY DIMENSIONS (LENGTH & WIDTH)	3,844' X 75'	SAME	5,374' X 100'	SAME
RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	NON–PRECISION/VISUAL	NON–PRECISION	NON–PRECISION	SAME

	RW 10	RW 28	RW 10	RW 28	RW 5	RW 23	RW 5	RW 23
NAVIGATIONAL AIDS	GPS	N/A	SAME	SAME	GPS	N/A	SAME	SAME
VISUAL AIDS	PAPI–4	PAPI–4	PAPI–4/REILS	PAPI–4/REILS	PAPI–4/REILS	PAPI–4/REILS	SAME	SAME
APPROACH SLOPE	34 : 1	20 : 1	SAME	SAME	34 : 1	20 : 1	SAME	SAME
RUNWAY DEPARTURE SURFACE	40 : 1	40 : 1	SAME	SAME	40 : 1	40 : 1	SAME	SAME
APPROACH TYPE	NPI	VISUAL	SAME	SAME	NPI	VISUAL	SAME	SAME
RSA LENGTH BEYOND RWY END	300'	300'	SAME	SAME	1000'	1000'	SAME	SAME
RSA LENGTH PRIOR TO THRESHOLD	300'	300'	SAME	SAME	600'	600'	SAME	SAME
RUNWAY SAFETY AREA WIDTH	150'	150'	SAME	SAME	500'	500'	SAME	SAME
RUNWAY OBJECT FREE AREA LENGTH BEYOND RWY END	300'	300'	SAME	SAME	1000'	1000'	SAME	SAME
RUNWAY OBJECT FREE AREA LENGTH PRIOR TO THRESHOLD	300'	300'	SAME	SAME	600'	600'	SAME	SAME
RUNWAY OBJECT FREE AREA WIDTH	500'	500'	SAME	SAME	800'	800'	SAME	SAME
RUNWAY OBSTACLE FREE ZONE WIDTH	250'	250'	SAME	SAME	250'	250'	SAME	SAME
RUNWAY PROTECTION ZONE DIMENSIONS	500' X 1000' X 700'	500' X 1000' X 700'	SAME	SAME	500' X 1010 X 1700''	500' X 1010 X 1700''	SAME	SAME
TOUCHDOWN ZONE ELEVATION	153.7'	153.1'	SAME	SAME	160.2'	154.5'	SAME	SAME
TAXIWAY DESIGN GROUP (TDG)	2	2	SAME	SAME	2	2	SAME	SAME
TAXIWAY WIDTH	35'	35'	SAME	SAME	35'	35'	SAME	SAME
TAXIWAY SAFETY AREA WIDTH	79'	79'	SAME	SAME	79'	79'	SAME	SAME
TAXIWAY OBJECT FREE AREA WIDTH	131'	131'	SAME	SAME	131'	131'	SAME	SAME
TAXIWAY CENTERLINE TO FIX OR MOVABLE OBJECT	65.5'	65.5'	SAME	SAME	65.5'	65.5'	SAME	SAME
TAXIWAY LIGHTING	MITL	MITL	SAME	SAME	MITL	MITL	SAME	SAME
TAXILANE OBJECT FREE AREA WIDTH	115'	115'	SAME	SAME	115'	115'	SAME	SAME
TAXILANE CENTERLINE TO FIX OR MOVABLE OBJECT	57.5'	57.5'	SAME	SAME	57.5'	57.5'	SAME	SAME

APRON DATA TABLE

APRON LOCATION	DIMENSIONS	NUMBER OF TIEDOWNS
TERMINAL RAMP	244' X 175'	10

DISPLACED THRESHOLD COORDINATES (NAD 83)

RUNWAY END		EXISTING			ULTIMATE		
		DEG.	MIN.	SEC.	DEG.	MIN.	SEC.
5	LATITUDE		NONE			NONE	
	LONGITUDE		NONE			NONE	
23	LATITUDE	27°	35'	34.46"	27°	35'	37.57"
	LONGITUDE	81°	31'	32.24"	81°	31'	28.76"
10	LATITUDE		NONE			NONE	
	LONGITUDE		NONE			NONE	
28	LATITUDE		NONE			NONE	
	LONGITUDE		NONE			NONE	

MODIFICATION TO FAA DESIGN STANDARDS

DESCRIPTION	DESIGN STANDARD	AERONAUTICAL STUDY NUMBER	FAA APPROVAL
	NONE		

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

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Maitland, FL 32751 Tel. (407) 660-2552

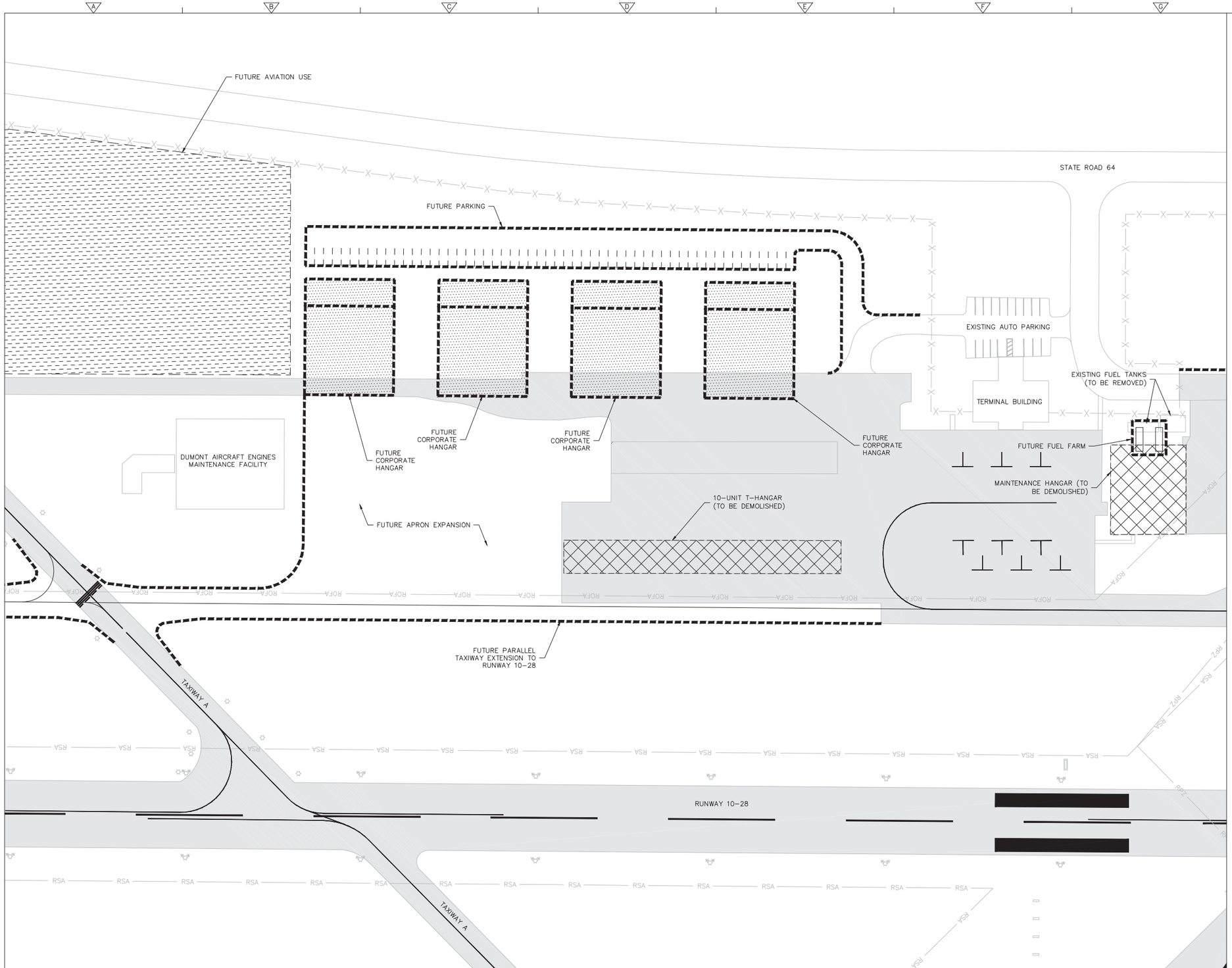
AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

DATA SHEET

PROJECT NO. 118223–88065
FILE NAME:

SHEET NO.
4

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION



LEGEND		
EXISTING	FUTURE	ITEM
	N/A	Airport Property Line
	N/A	Airport Security Fence
	N/A	Off-Airport Fence
BRL	N/A	35' Building Restriction Line (BRL)
RVZ	RVZ	Runway Visibility Zone Line (RVZ)
ROFA	ROFA	Runway Object Free Area Line (OFA)
RSA	RSA	Runway Safety Area Line (RSA)
RPZ	RPZ	Runway Protection Zone Line (RPZ)
		Airfield Pavement
N/A		Airfield Pavement to be Removed
		Buildings
N/A		Buildings to be Demolished
	N/A	Conservation Easement
N/A		Future Aviation Use
		Windcone
	N/A	Airport Reference Point (ARP)
		Rotating Beacon
		NAVAIDS
		Water Features
14	N/A	Topographic Contours

N

5.433°

Magnetic Declination 6°10' W (September 2013)
Annual Rate of Change = 0° 5' W/year

0 50 100

SCALE IN FEET

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
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SHEET CHK'D BY: CDMS
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AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

TERMINAL AREA PLAN

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
5

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

OBSTRUCTION TABLE

NO.	DESCRIPTION	OBSTACLE ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	PENETRATION (FEET)	RECOMMENDED ACTION	LIGHTED
①	RADIO/CELL TOWER	330.0'	RWY 05 DEPARTURE SURFACE	54.0'	TO REMAIN LIGHTED	YES

HIGHLANDS COUNTY CODE OF ORDINANCES, CHAPTER 2.1, ARTICLE II, GOVERNS THE DEVELOPMENT OF LAND USES ON AND IN THE VICINITY OF AVON PARK EXECUTIVE AIRPORT AND RESTRICTS THE HEIGHT OF POTENTIAL DEVELOPMENT TO PROTECT THE AIRSPACE REQUIREMENTS ASSOCIATED WITH AIRCRAFT OPERATIONS AT THE AIRPORT.

GENERAL NOTES:
1. HORIZONTAL DATUM: NAD 83; VERTICAL DATUM NAVD88.
2. THE FOLLOWING USGS QUAD MAPS WERE USED AS REFERENCE: FL AVON PARK, FL FROSTPROOF, FL LAKE ARBUCKLE, AND FL LAKE ARBUCKLE SW.
3. REFER TO THE INNER PORTION OF THE APPROACH SURFACE PLAN VIEW DETAILS FOR CLOSE-IN OBSTRUCTIONS.

20:1 CONICAL SURFACE

HORIZONTAL SURFACE

34:1 APPROACH SURFACE

7:1 TRANSITIONAL SURFACE

HORIZONTAL SURFACE EL. 306'
AIRPORT ELEVATION - 156'

MSL 506' MSL 481' MSL 456' MSL 431' MSL 406' MSL 381' MSL 356' MSL 331' MSL 306'

Magnetic Declination 6°10' W (September 2013)
Annual Rate of Change = 0° 5' W/year

0 2000 4000
SCALE IN FEET

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
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AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

AIRPORT AIRSPACE

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
6

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

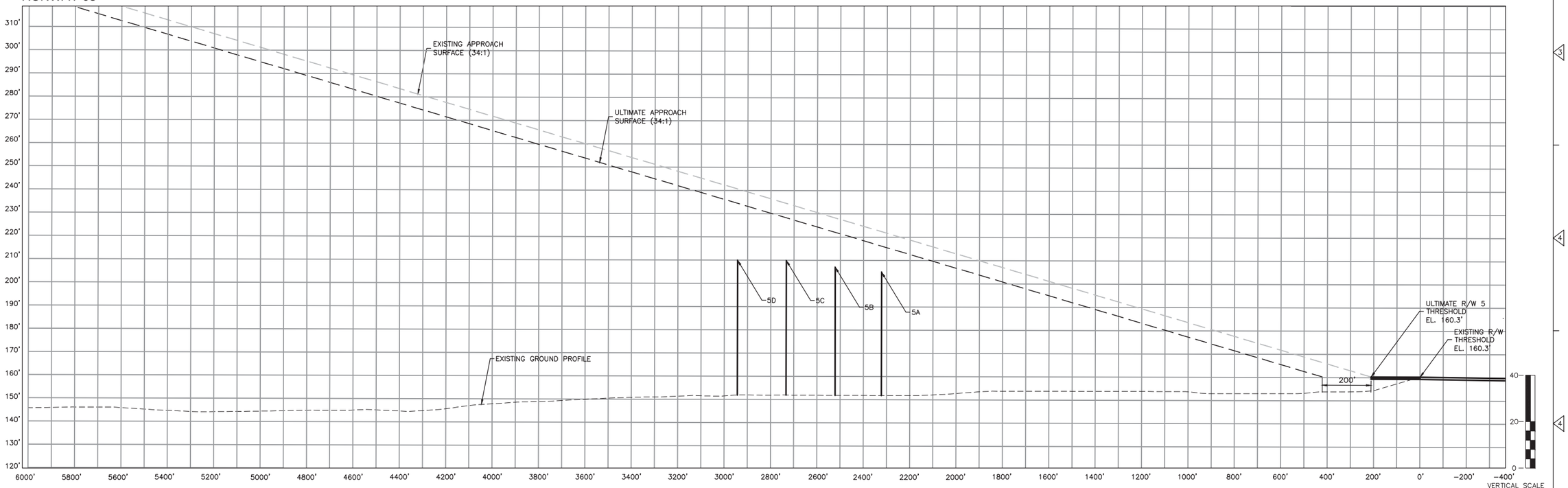
OBSTRUCTION DATA TABLE - RUNWAY 05

REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 05 C/L	PART 77 SURFACE	MITIGATION
5A	ELECTRICAL TRANSMISSION LINE & POLE	205.0'	213.1'	207.8'	−8.0'	NO	−2.8'	NO	330.4' RIGHT	40:1 DEPARTURE	NONE; LIGHTED
5B	ELECTRICAL TRANSMISSION LINE & POLE	207.0'	218.1'	212.8'	−11.1'	NO	−5.8'	NO	134.4' RIGHT	40:1 DEPARTURE	NONE; LIGHTED
5C	ELECTRICAL TRANSMISSION LINE & POLE	210.0'	223.3'	218.1'	−13.3'	NO	−8.1'	NO	77.6' LEFT	40:1 DEPARTURE	NONE; LIGHTED
5D	ELECTRICAL TRANSMISSION LINE & POLE	210.0'	228.6'	223.3'	−18.6'	NO	−13.3'	NO	286.5' LEFT	40:1 DEPARTURE	NONE; LIGHTED

*NOTE: (−) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

RUNWAY 05

RUNWAY 05



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
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AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

INNER APPROACH SURFACE RUNWAY 05

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
7

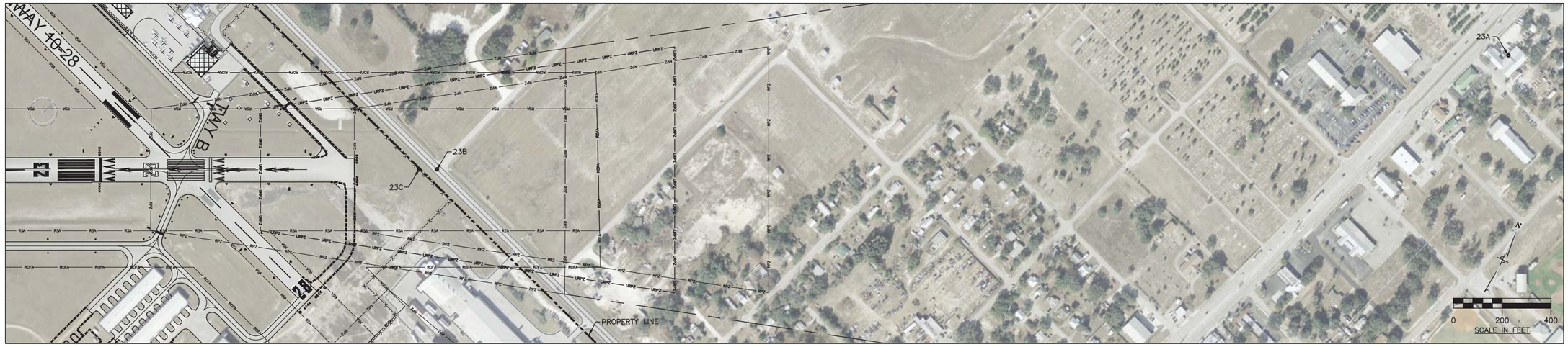
PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

OBSTRUCTION DATA TABLE - RUNWAY 23

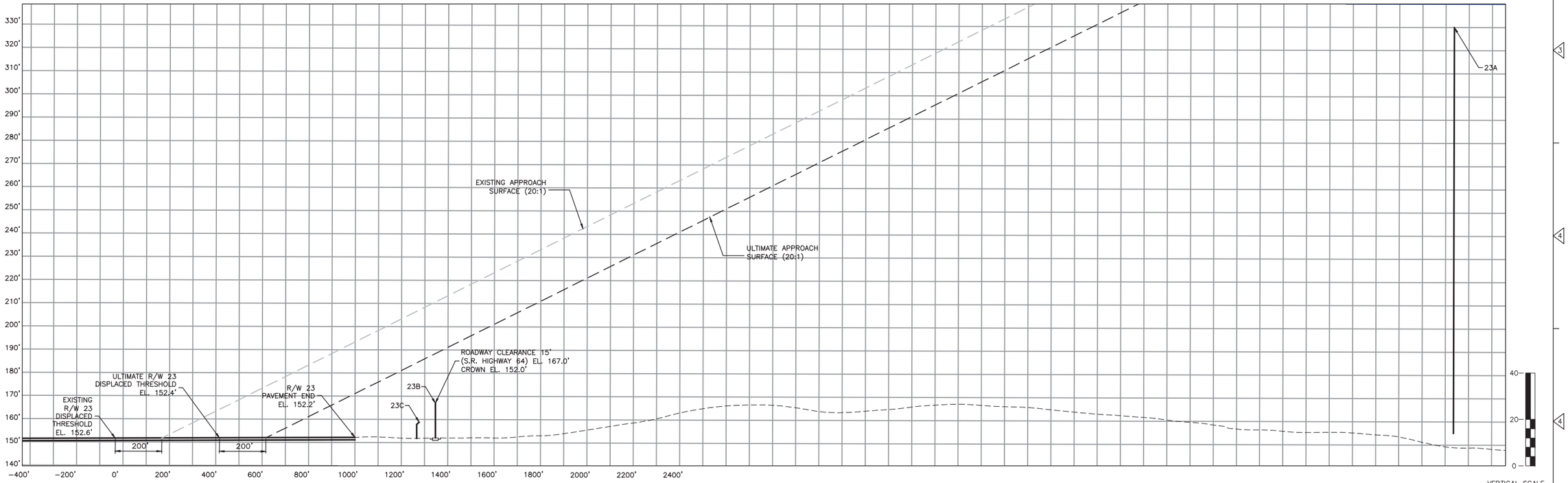
REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. FUTURE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE FUTURE		OFFSET FROM RUNWAY 05 C/L	PART 77 SURFACE	MITIGATION
23A	RADIO/CELL TOWER	330.0'	269.0'	276.0'	+61.0'	YES	+54.0'	YES	481.0' LEFT	40:1 DEPARTURE	REMAIN LIGHTED
23B	C/L STATE ROAD 64	166.7'	160.6'	166.7'	+6.1'	YES	0.0'	NO	C/L	40:1 DEPARTURE	NONE
23C	SECURITY FENCE	158.8'	159.1'	166.7'	−0.3'	NO	−8.9'	NO	C/L	40:1 DEPARTURE	NONE

*NOTE: (−) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

RUNWAY 23



RUNWAY 23



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

CDM Smith
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

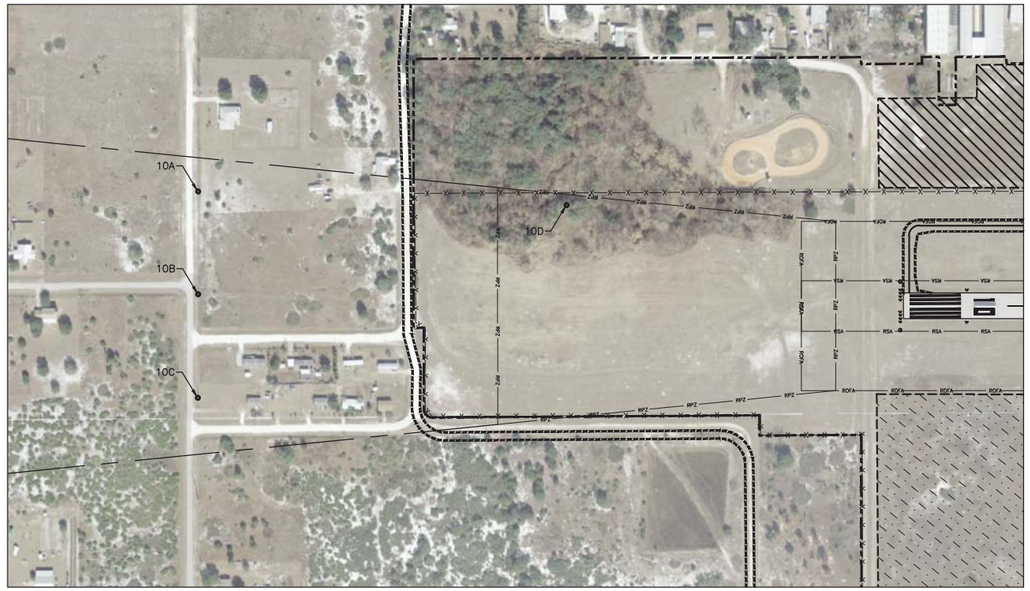
INNER APPROACH SURFACE RUNWAY 23

PROJECT NO. 118223-88065
FILE NAME:

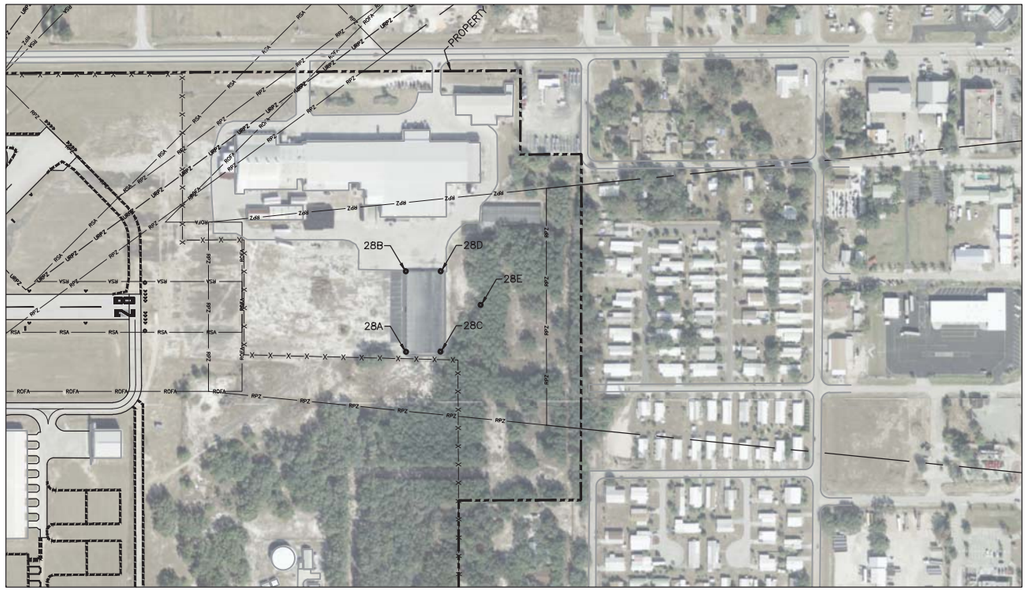
SHEET NO.
8

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

RUNWAY 10



RUNWAY 28



OBSTRUCTION DATA TABLE - RUNWAY 10

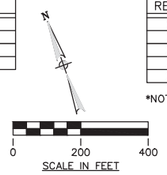
REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 10 C/L	PART 77 SURFACE	MITIGATION
10A	ELECTRICAL TRANSMISSION LINE & POLE	195.5'	209.9'	209.9'	-14.4'	NO	-14.4'	NO	337.5' LEFT	34:1 APPROACH	NONE; LIGHTED
10B	ELECTRICAL TRANSMISSION LINE & POLE	195.2'	209.9'	209.9'	-14.7'	NO	-14.7'	NO	33.6' LEFT	34:1 APPROACH	NONE; LIGHTED
10C	ELECTRICAL TRANSMISSION LINE & POLE	194.9'	209.9'	209.9'	-15.0'	NO	-15.0'	NO	272.3' RIGHT	34:1 APPROACH	NONE; LIGHTED
10D	TREES	175.5'	181.4'	181.4'	-5.9'	NO	-5.9'	NO	297.3' LEFT	34:1 APPROACH	NONE; MAINTAIN

*NOTE: (-) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

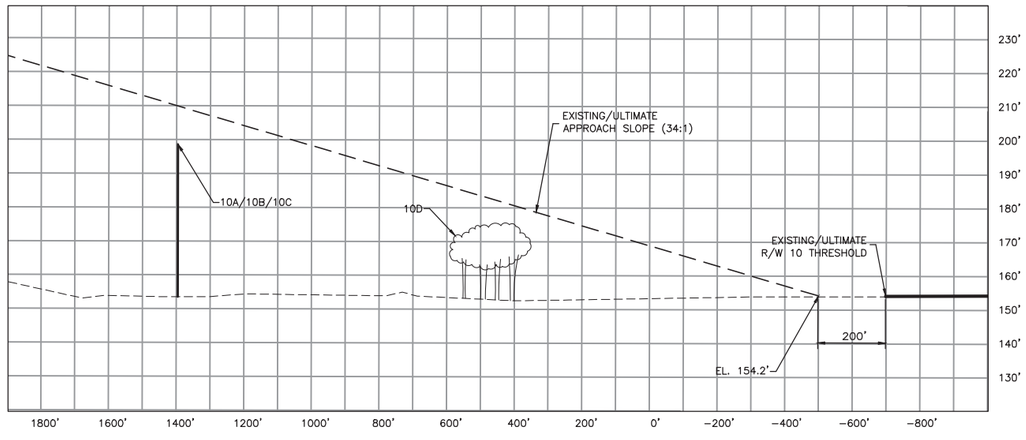
OBSTRUCTION DATA TABLE - RUNWAY 28

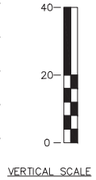
REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 28 C/L	PART 77 SURFACE	MITIGATION
28A	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	133.6' LEFT	20:1 APPROACH	NONE
28B	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	104.9' RIGHT	20:1 APPROACH	NONE
28C	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	133.6' LEFT	20:1 APPROACH	NONE
28D	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	104.9' RIGHT	20:1 APPROACH	NONE
28E	TREES	181.4'	197.2'	197.2'	-15.8'	NO	-15.8'	NO	5.1' RIGHT	20:1 APPROACH	NONE

*NOTE: (-) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

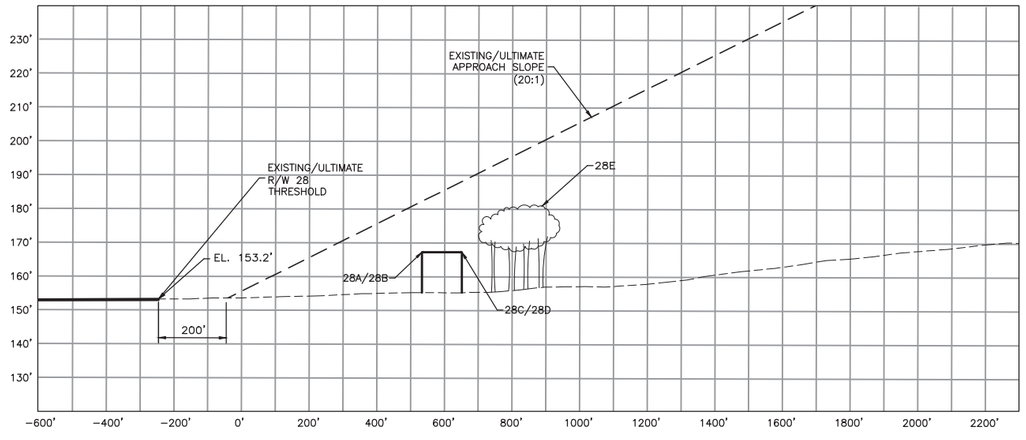


RUNWAY 10





RUNWAY 28



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

CDM Smith
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

INNER APPROACH SURFACE RUNWAY 10-28

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
9

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

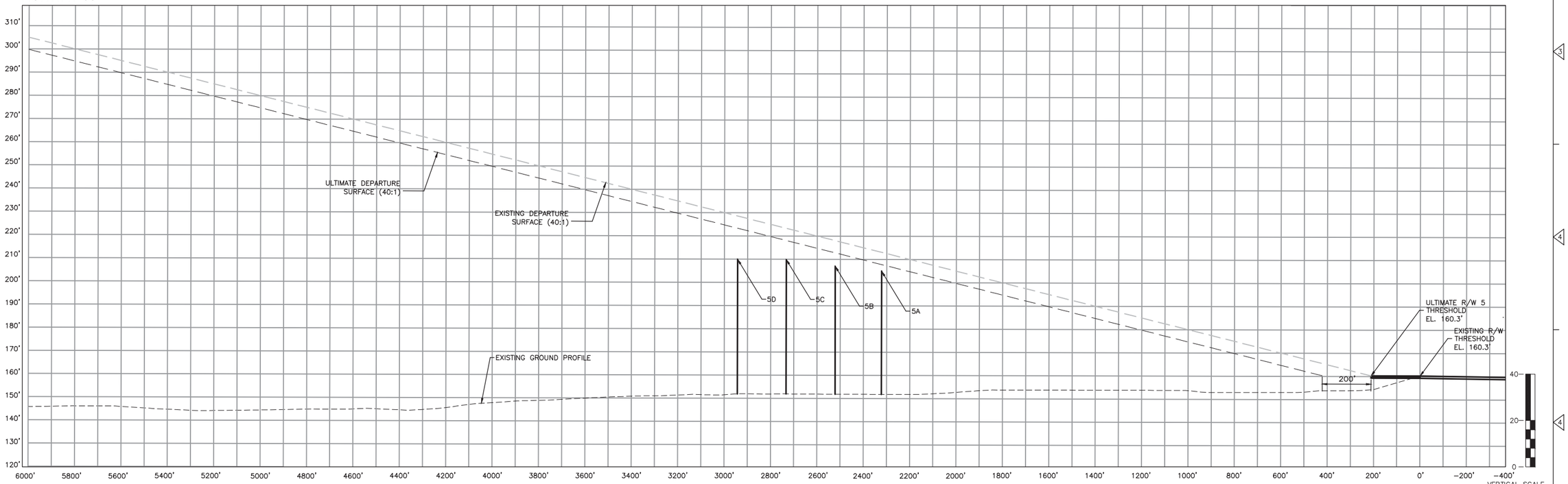
OBSTRUCTION DATA TABLE - RUNWAY 05

REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 05 C/L	PART 77 SURFACE	MITIGATION
5A	ELECTRICAL TRANSMISSION LINE & POLE	205.0'	213.1'	207.8'	−8.0'	NO	−2.8'	NO	330.4' RIGHT	40:1 DEPARTURE	NONE; LIGHTED
5B	ELECTRICAL TRANSMISSION LINE & POLE	207.0'	218.1'	212.8'	−11.1'	NO	−5.8'	NO	134.4' RIGHT	40:1 DEPARTURE	NONE; LIGHTED
5C	ELECTRICAL TRANSMISSION LINE & POLE	210.0'	223.3'	218.1'	−13.3'	NO	−8.1'	NO	77.6' LEFT	40:1 DEPARTURE	NONE; LIGHTED
5D	ELECTRICAL TRANSMISSION LINE & POLE	210.0'	228.6'	223.3'	−18.6'	NO	−13.3'	NO	286.5' LEFT	40:1 DEPARTURE	NONE; LIGHTED

*NOTE: (−) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

RUNWAY 05

RUNWAY 05



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

CDM Smith
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

DEPARTURE SURFACE RUNWAY 05

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
10

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

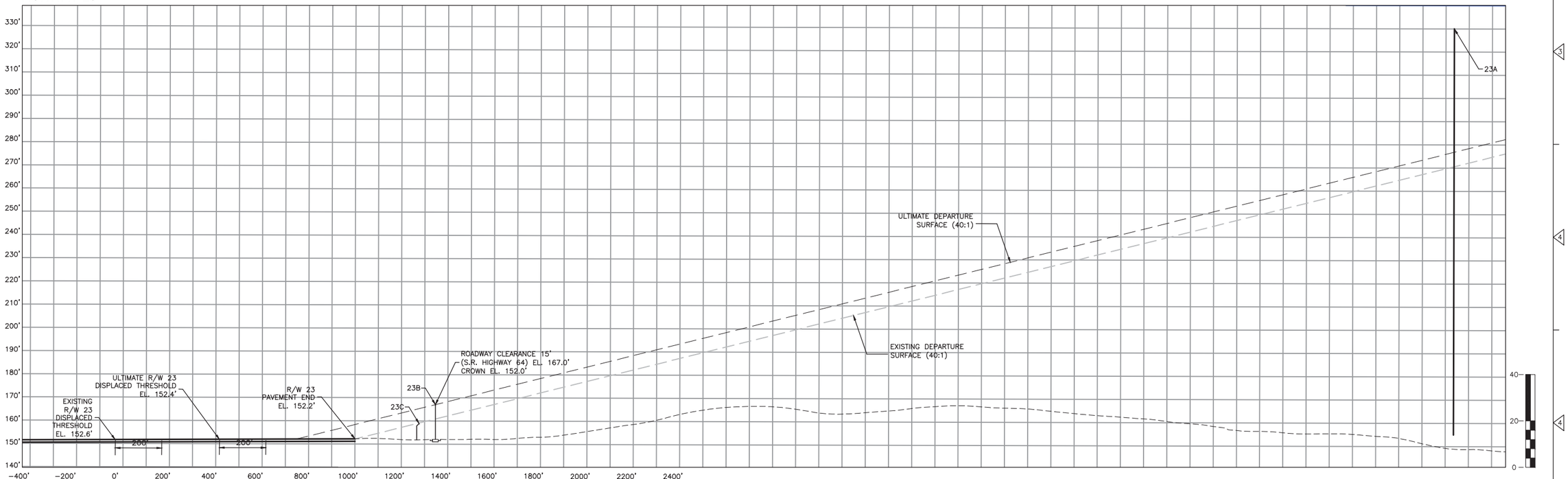
OBSTRUCTION DATA TABLE - RUNWAY 23

REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. FUTURE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE FUTURE		OFFSET FROM RUNWAY 05 C/L	PART 77 SURFACE	MITIGATION
23A	RADIO/CELL TOWER	330.0'	269.0'	276.0'	+61.0'	YES	+54.0'	YES	481.0' LEFT	40:1 DEPARTURE	REMAIN LIGHTED
23B	C/L STATE ROAD 64	166.7'	160.6'	166.7'	+6.1'	YES	0.0'	NO	C/L	40:1 DEPARTURE	NONE
23C	SECURITY FENCE	158.8'	159.1'	166.7'	−0.3'	NO	−8.9'	NO	C/L	40:1 DEPARTURE	NONE

*NOTE: (−) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

RUNWAY 23

RUNWAY 23



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

CDM Smith
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Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

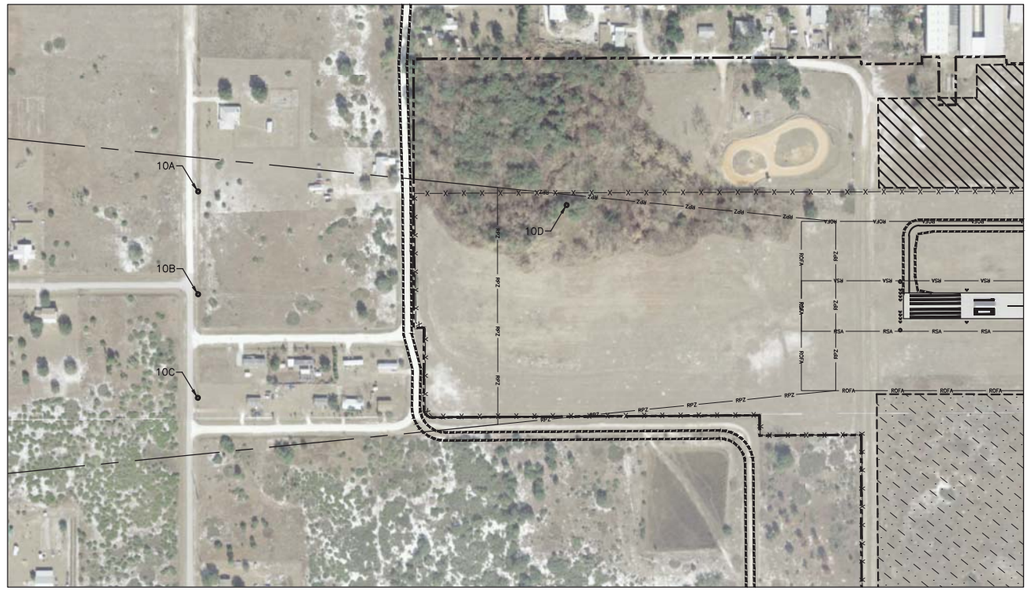
DEPARTURE SURFACE RUNWAY 23

PROJECT NO. 118223-88065
FILE NAME:

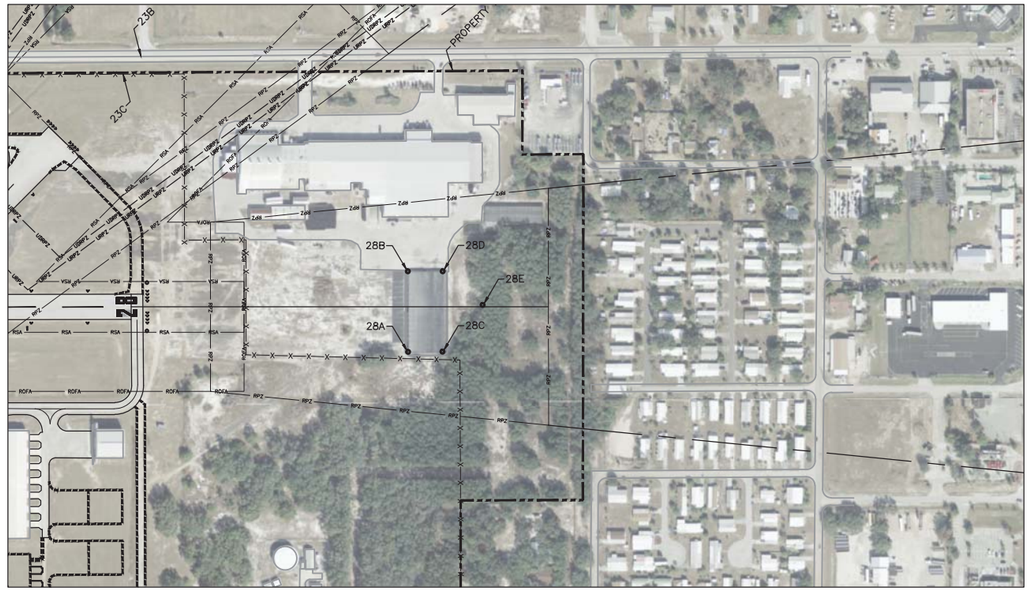
SHEET NO.
11

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION

RUNWAY 10



RUNWAY 28



OBSTRUCTION DATA TABLE - RUNWAY 10

REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 10 C/L	PART 77 SURFACE	MITIGATION
10A	ELECTRICAL TRANSMISSION LINE & POLE	195.5'	209.9'	209.9'	-14.4'	NO	-14.4'	NO	337.5' LEFT	34:1 APPROACH	NONE; LIGHTED
10B	ELECTRICAL TRANSMISSION LINE & POLE	195.2'	209.9'	209.9'	-14.7'	NO	-14.7'	NO	33.6' LEFT	34:1 APPROACH	NONE; LIGHTED
10C	ELECTRICAL TRANSMISSION LINE & POLE	194.9'	209.9'	209.9'	-15.0'	NO	-15.0'	NO	272.3' RIGHT	34:1 APPROACH	NONE; LIGHTED
10D	TREES	175.5'	181.4'	181.4'	-5.9'	NO	-5.9'	NO	297.3' LEFT	34:1 APPROACH	NONE; MAINTAIN

*NOTE: (-) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

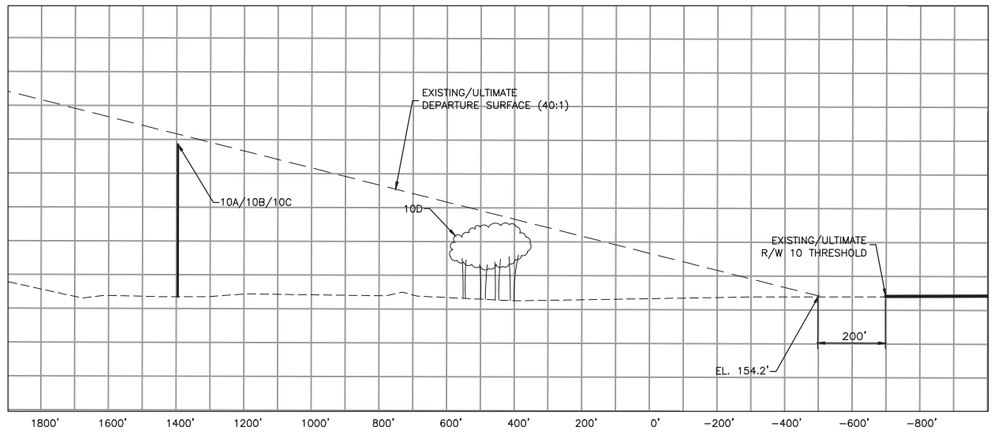
OBSTRUCTION DATA TABLE - RUNWAY 28

REF#	DESCRIPTION	TOP ELEV. (AMSL)	MAX. ALLOWABLE PART 77 ELEV. EXISTING	MAX. ALLOWABLE PART 77 ELEV. ULTIMATE	PART 77 PENETRATION (YES/NO) *SEE NOTE EXISTING		PART 77 PENETRATION (YES/NO) *SEE NOTE ULTIMATE		OFFSET FROM RUNWAY 28 C/L	PART 77 SURFACE	MITIGATION
28A	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	133.6' LEFT	20:1 APPROACH	NONE
28B	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	104.9' RIGHT	20:1 APPROACH	NONE
28C	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	133.6' LEFT	20:1 APPROACH	NONE
28D	GREENHOUSE	167.3'	182.3'	182.3'	-15.0'	NO	-15.0'	NO	104.9' RIGHT	20:1 APPROACH	NONE
28E	TREES	181.4'	197.2'	197.2'	-15.8'	NO	-15.8'	NO	5.1' RIGHT	20:1 APPROACH	NONE

*NOTE: (-) INDICATES FEET BELOW PART 77 SURFACE
(+) INDICATES FEET ABOVE PART 77 SURFACE

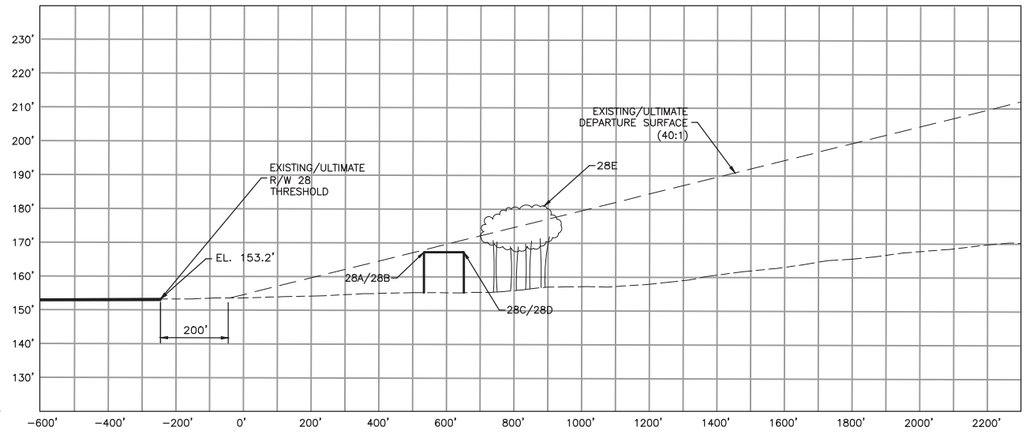
0 200 400
SCALE IN FEET

RUNWAY 10



40
20
0
VERTICAL SCALE

RUNWAY 28



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

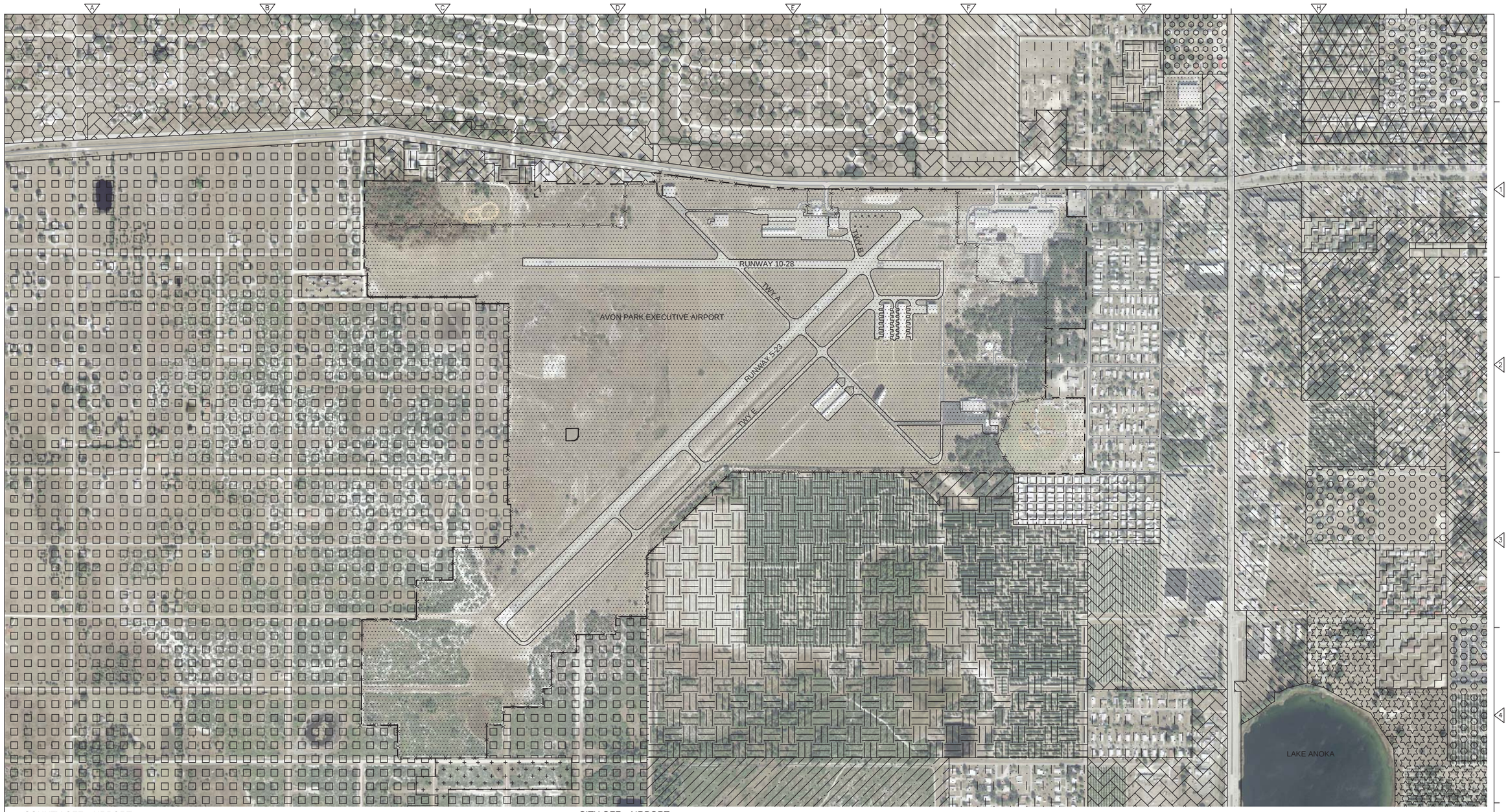
CDM Smith
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

DEPARTURE SURFACE RUNWAY 10-28

PROJECT NO. 118223-88065
FILE NAME:
SHEET NO.
12

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION



COUNTY OFF - AIRPORT PROPERTY LAND USE

- AGRICULTURE
- COMMERCIAL
- CONSERVATION
- COMM / IND MIX
- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- RESIDENTIAL / OFFICE
- MIXED USE

CITY OFF - AIRPORT PROPERTY LAND USE

- R-1AA LOW DENSITY RESIDENTIAL
- R-1A LOW DENSITY RESIDENTIAL
- R-1 LOW DENSITY RESIDENTIAL
- R-2 MEDIUM DENSITY, SINGLE FAMILY
- R-3, HIGH DENSITY MULTI-FAM RESIDENTIAL
- C-2 GENERAL COMMERCIAL
- C-3 COMMERCIAL OFFICE
- C-4 MIXED USE COMMERCIAL
- L-1 LIGHT INDUSTRY
- L-2 HEAVY INDUSTRY
- PI PUBLIC INSTITUTIONAL
- PR PUBLIC RECREATION/OPEN SPACE

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

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2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

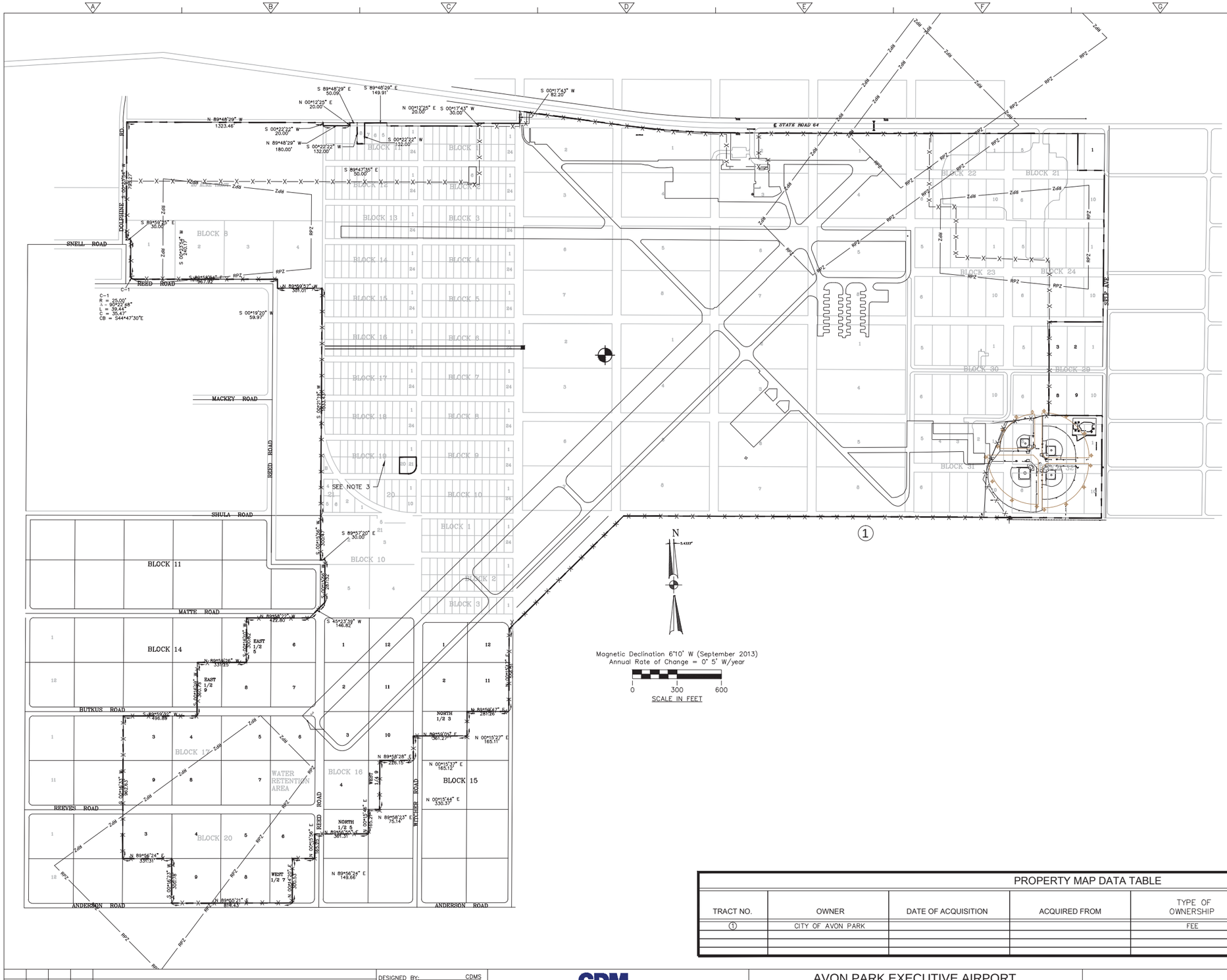
AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

LAND USE

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO.
13

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION



LEGEND:

- Set Concrete Marker (SCM)
- Found Concrete Marker (FCM)
- Iron Pipe (IP)
- Iron Rod & Cap (IR&C)
- Railroad Spike (RRS)
- Nail & Flasher (N&F)
- Nail & Disk (N&D)
- Drill Hole (DH)
- Pole
- Fence
- Recovered
- (F) Field Measurement
- (D) Described (Deed) Measurement
- (P) Platted Measurement
- (C) Calculated
- Water Meter (WM)
- Δ Delta (Central Angle)
- R Radius
- L Length of Arc
- CD Chord Distance
- CB Chord Bearing
- D Degree of Curve
- MH Manhole
- N North
- S South
- E East
- W West
- ° Degrees
- ' Minutes
- " Seconds
- Handicap Parking Space
- D & U E Drainage & Utility Easement
- (CS) Chastain Skillman
- Fire Hydrant
- Light Pole
- Centerline
- Property Line
- BLL Boundary Line
- POB Point of Beginning
- R/W Right-of-Way
- EOP Edge of Pavement
- BOC Back of Curb
- TOC Top of Curb
- TOB Top of Bank
- BOB Bottom of Bank
- GRD Ground
- CB Catch Basin
- Power Pole (PP)
- CONCRETE
- Guy Anchor (GA)
- Telephone Pole (TP)
- Water Valve (WV)
- Fire Hydrant (FH)
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- BM Bench Mark
- CMP Corrugated Metal Pipe
- RCP Reinforced Concrete Pipe
- O.R. Official Records
- P.B. Plat Book
- D.B. Deed Book
- Base Line
- INV. Invert
- A/C Air Conditioning
- Electric Meter
- Monitoring Well
- FENCE
- LOT LINE
- POWER LINE
- EDGE OF PAVT.
- RIGHT OF WAY
- PROPERTY LINE
- BUILDING OUTLINE
- CENTER LINE
- SECTION LINE

BOUNDARY SURVEY

SCALE: 1"=250'

GRAPHIC SCALE

250 125 0 250

(IN FEET)

REPORT

1. THIS SURVEY PERFORMED WITHOUT THE BENEFIT OF AN ABSTRACT OR TITLE OPINION SEARCH, THEREFORE, EASEMENTS OR OTHER ENCUMBRANCES MAY EXIST THAT ARE NOT SHOWN HEREON. THIS IS NOT A CERTIFICATE OF TITLE
2. UNDERGROUND IMPROVEMENTS, IF ANY, HAVE NOT BEEN LOCATED.
3. BEARINGS BASED ON STATE PLAIN FLORIDA (EAST ZONE).

LEGAL DESCRIPTION: (PROVIDED)

Legal Description

ALL OF BLOCKS 21, 22, 23, 24, 29, 30, 31, 32, 35, 37, 38, 39, 40 lying South of STATE ROAD NO. 64, LESS Lot 1 and the East * of Lot 2, Block 21, LESS Lots 1, 2, 3, 8, 9, 10, Block 29, LESS the West 30 feet of the South * of Lot 1, LESS Lot 2, LESS the North 110 feet of Lots 3 and 4, Block 31, TOWN OF AVON PARK in Section 21, Township 33 South, Range 28 East, as shown on the plat thereof as recorded in Plat Book 1, Page 58 of the Public Records of DeSoto County, Florida (of which Highlands County was formerly a part).

Together With

Blocks 1 to 21 inclusive and that portion of closed road contiguous of Lots 5, 6, 7, LESS Lot 8, Block 11, LESS Lot 6, Block 2, LESS lots 20, 21, Block 19, OAK PARK SUBDIVISION according to the plat thereof as recorded in Plat Book 1, Page 106 of the Public Records of Highlands County, Florida.

Together With

Block 1, 2 and Lots 1 to 12 inclusive, Block 3, SECTION A OAK RIDGE SUBDIVISION according to the plat thereof as recorded in Plat Book 1, Page 107 of the Public Records of Highlands County, Florida.

Together With

The N * of the NW * of the SE * of Section 20, Township 33 South, Range 28 East, Highlands County, Florida.

Together With

Beginning at a point at the northwest corner of Section 28, Township 33 South, Range 28 East, then running in an easterly direction along the north line of Section 28 a distance of 490 feet on a compass course of S89°20'00"E, thence in a southwesterly direction 690 feet on a compass course of S44°40'00"W to a point intersecting the dividing line of Sections 28 and 29, thence running in a northerly direction 490 feet on a compass course of no degrees 40 minutes east to Point of Beginning.

Together With

A portion of Avon Park Estates, Unit II, according to the Plat thereof recorded in Plat Book 10, Page 22 of the Public Records of Highlands County, Florida, being more particularly described as follows:

Lots 1, 2, 3, 4, Block 8

Together with Lots 2, 3, 4 and 5, Block 10

Together with Lots 6, 7, 8 and the East * of lot 5 and the East 1/3 of Lot 9, Block 14

Together with Lots 3, 4, 5, 6, 7, 8, 9 and the Water Retention Area, Block 17

Together with Lots 3, 4, 5, 6, 8, 9 and the West * of Lot 7, Block 20

Together with Lots 1, 2, 3, 4, 10, 11, 12 and the North * of Lot 5, the West * of Lot 9, Block 16

Together with Lots 1, 2, 11, 12 and the North * of Lot 3, Block 15

Together with Lots 5, Block 21, Section A of Oak Ridge Subdivision, according to the plat thereof recorded in Plat Book 1, Page 107 of the Public Records of Highlands County, Florida

Together with the following described parcel: A parcel of land in Tarct 4, According to the Replat of Section 28, Township 33 South, Range 28 East, as recorded in Plat Book 3, Page 63 of the Public Records of Highlands County, Florida, being more particularly described as follows:

Commencing at the Northwest corner of said Section 28; proceed North 89°57'47" East a distance of 614.47 feet along said North line of Section 28 to the POINT OF BEGINNING; thence continue North 89°57'47" East a distance of 103.68 feet along said North line of Section 28; thence South 45°06'43" West a distance of 1013.24 feet; thence North 00°01'38" West a distance of 96.02 feet along the West line of said Section 28, thence North 44°46'45" East a distance of 872.02 feet to the POINT OF BEGINNING.

Together with the following:

A portion of Reeves Road, Bulkus Road, Matte Road, Reed Road, Witcher Road and Carr Road as shown on the plat of Avon Park Estates Unit I according to the plat thereof recorded in Plat Book 10, Page 22 of the Public Records of Highlands County, Florida and recorded in ORB 1269, Page 1942 of the Public Records of Highlands County, Florida.

PROPERTY MAP DATA TABLE

TRACT NO.	OWNER	DATE OF ACQUISITION	ACQUIRED FROM	TYPE OF OWNERSHIP	PARCEL ACREAGE	FEDERAL AID PROJECT NUMBER
1	CITY OF AVON PARK			FEE	1311	

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: CDMS
DRAWN BY: CDMS
SHEET CHK'D BY: CDMS
CROSS CHK'D BY: CDMS
APPROVED BY: CDMS
DATE: FEBRUARY 2015

CDM Smith
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751 Tel: (407) 660-2552

AVON PARK EXECUTIVE AIRPORT
AVON PARK, FLORIDA

PROPERTY MAP

PROJECT NO. 118223-88065
FILE NAME:

SHEET NO. 14

PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION