LAKELAND LINDER REGIONAL AIRPORT

Master Plan Update

Prepared For:

City of LAKELAND

Prepared By:

AHC

AMHERST CONSULTING

January 2012

DISCLAIMER STATEMENT

Lakeland Linder Regional Airport
2011 Master Plan Update
Lakeland, Florida

The Preparation of this document was financed in part through a grant from the Federal Aviation Administration (FAA) as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987. The contents of this report reflect the views of Page One Consultants, Inc., which is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with public laws.

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INVENTORY

The Master Plan process begins with the collection of data related to all current Lakeland Linder Regional Airport (LAL) resources. This data is accumulated through a combination of on-site inspections, review of historical data, interviews with airport management and airport tenants, in addition to reviewing the previous airport master plan. Coordinating data was also collected from the Federal, State, and Local Government.

1.11 AIRPORT SETTING

Lakeland Linder Regional Airport is a publicly owned, public use airport located on a 1,710 acre site in the west central area of Florida within Polk County. Geographically, as shown in **Figure 1.11A**

the airport is located at 27° 59’ 20.092”N and 82° 01’ 06.803”W, which is approximately 4 miles southwest of the Lakeland Business District. A current Depiction of the LAL facilities is shown in **Figures 1.11B** and **1.11C**.

1.12 AERONAUTICAL ROLE & SERVICE LEVEL

LAL is classified by the FAA in the National Plan of Integrated Airport

Systems (NPIAS) as a reliever airport (Site No. 03283.*A). The Continuing Florida Aviation Systems Planning Process organization (CFASPP) lists Lakeland as being a reliever airport for both Tampa International Airport and Orlando International. The purpose of a reliever airport is to reduce congestion caused by general aviation (GA) and military traffic at the larger commercial service airports. LAL also serves the aviation needs of the Polk County area.

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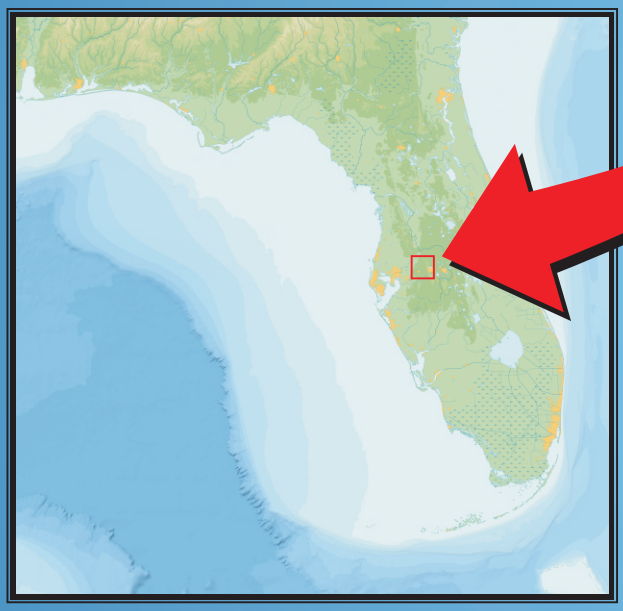

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City of LAKELAND

LAKELAND LINDER REGIONAL AIRPORT

Figure 1.11A
AIRPORT LOCATION MAP

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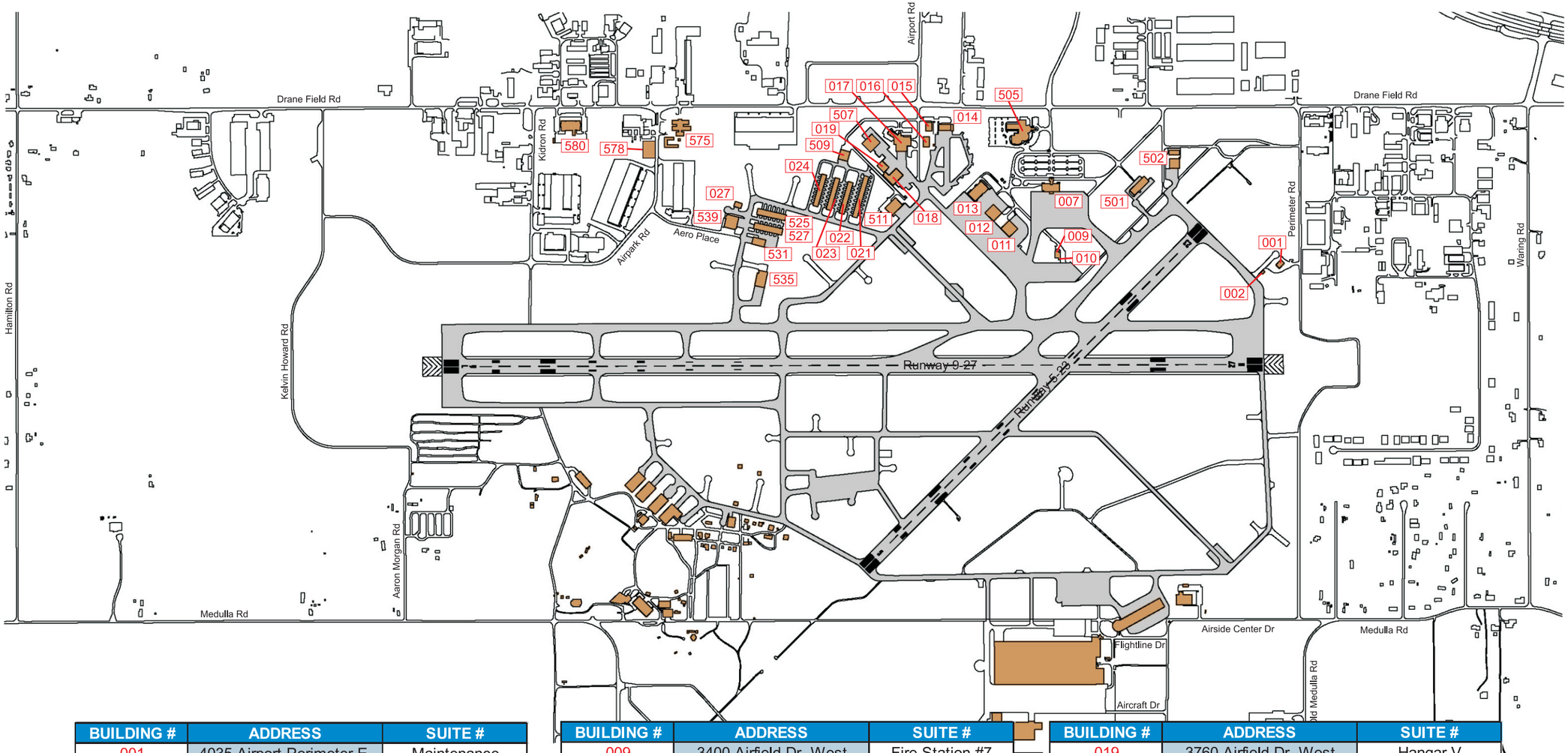
LAKELAND LINDER REGIONAL AIRPORT



BUILDING #	ADDRESS	SUITE #
001	4035 Airport Perimeter E.	Maintenance
002	4049 Airport Perimeter E.	Electrical Vault
014	3600 Drane Field Rd.	Hangar/Office
015	3610 Drane Field Rd	Office
016	3830 Airfield Ct. West	Warehouse/Office
017	3650 Drane Field Rd.	Hangar/Office
007	3900 Don Emerson Dr.	101
		110
		201
		210
501	3240 Airfield Dr. East	Land Lease
502	3840 Airfield Ct. East	Land Lease

BUILDING #	ADDRESS	SUITE #
009	3400 Airfield Dr. West	Fire Station #7
010	3402 Airfield Dr. West	Tower
011	3434 Airfield Dr. West	Hangar I
012	3454 Airfield Dr. West	Hangar II
013	3480 Airfield Dr. West	Hangar III
507	3700 Airfield Dr. West	Land Lease
509	3701 Airfield Dr. West	Land Lease
021	3745 Airfield Dr. West	T-Hangar 36-55
		Pilot's Lounge
022	3747 Airfield Dr. West	T-Hangar 56-70
023	3749 Airfield Dr. West	T-Hangar 71-85
024	3751 Airfield Dr, West	T-Hangar 86-100

BUILDING #	ADDRESS	SUITE #
019	3760 Airfield Dr. West	Hangar V
018	3770 Airfield Dr. West	Hangar IV
511	3795 Airfield Dr. West	Land Lease
535	3900 Aero Place	Land Lease
525/527	3905 Aero Place	Exec. T-Hangars
531	3907 Aero Place	Land Lease
027	3925 Aero Place	Hangar/Office
539	3929 Aero Place	Land Lease
575	3900 Drane Field Rd.	Land Lease
578	4000 Drane Field Rd.	Land Lease
580	4140 Drane Field Rd.	Land Lease

City of LAKELAND

Figure 1.11B
EXISTING AIRPORT PROPERTY AND FACILITIES NORTH

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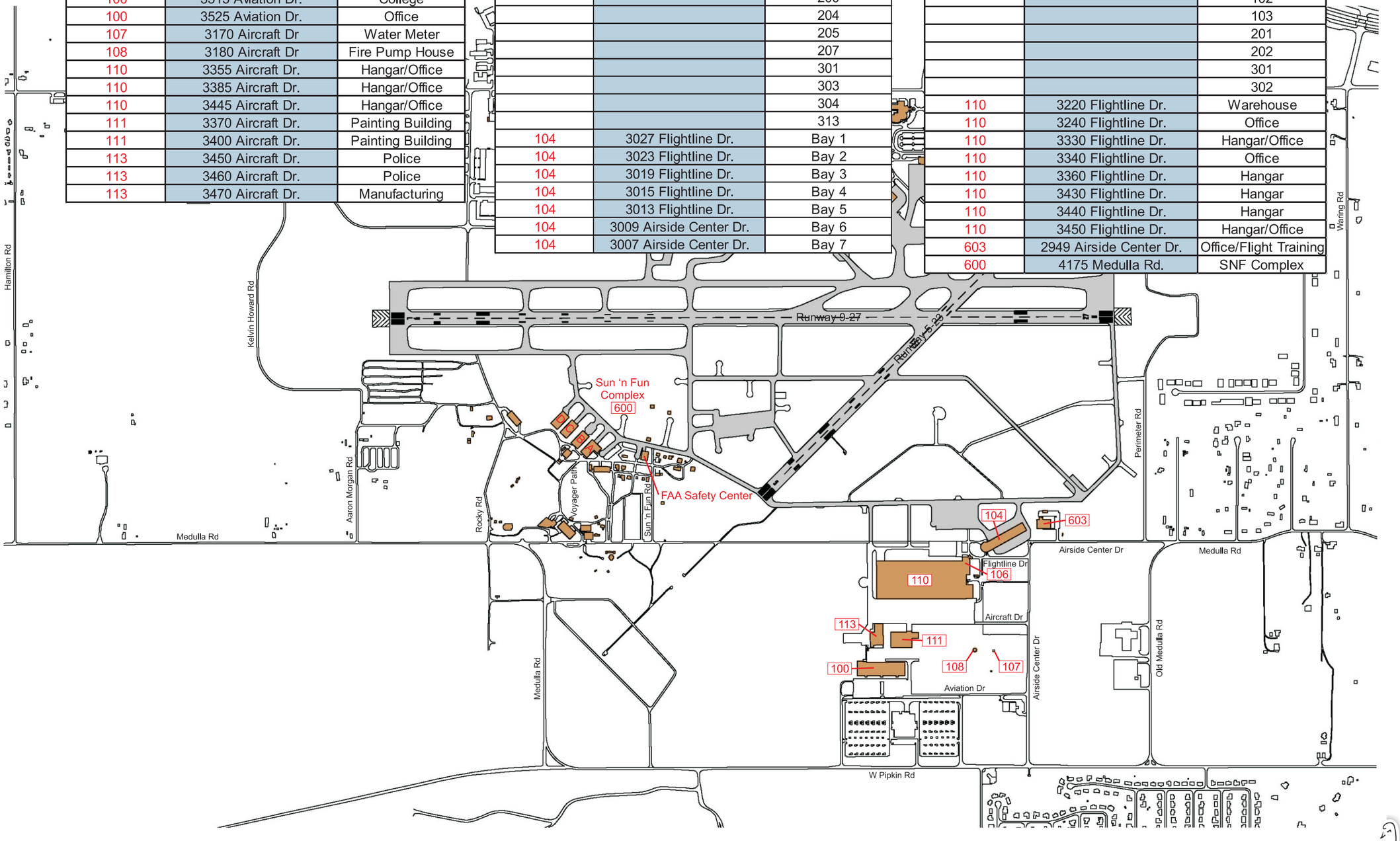
LAKELAND LINDER REGIONAL AIRPORT

BUILDING #	ADDRESS	SUITE #
100	3505 Aviation Dr.	Office
100	3515 Aviation Dr.	College
100	3525 Aviation Dr.	Office
107	3170 Aircraft Dr	Water Meter
108	3180 Aircraft Dr	Fire Pump House
110	3355 Aircraft Dr.	Hangar/Office
110	3385 Aircraft Dr.	Hangar/Office
110	3445 Aircraft Dr.	Hangar/Office
111	3370 Aircraft Dr.	Painting Building
111	3400 Aircraft Dr.	Painting Building
113	3450 Aircraft Dr.	Police
113	3460 Aircraft Dr.	Police
113	3470 Aircraft Dr.	Manufacturing

BUILDING #	ADDRESS	SUITE #
104	3131 Flightline Dr.	101
		200
		204
		205
		207
		301
		303
		304
		313
104	3027 Flightline Dr.	Bay 1
104	3023 Flightline Dr.	Bay 2
104	3019 Flightline Dr.	Bay 3
104	3015 Flightline Dr.	Bay 4
104	3013 Flightline Dr.	Bay 5
104	3009 Airside Center Dr.	Bay 6
104	3007 Airside Center Dr.	Bay 7

BUILDING #	ADDRESS	SUITE #
106	3200 Flightline Dr.	101
		102
		103
		201
		202
		301
		302
110	3220 Flightline Dr.	Warehouse
110	3240 Flightline Dr.	Office
110	3330 Flightline Dr.	Hangar/Office
110	3340 Flightline Dr.	Office
110	3360 Flightline Dr.	Hangar
110	3430 Flightline Dr.	Hangar
110	3440 Flightline Dr.	Hangar
110	3450 Flightline Dr.	Hangar/Office
603	2949 Airside Center Dr.	Office/Flight Training
600	4175 Medulla Rd.	SNF Complex



City of LAKELAND

Figure 1.11C
EXISTING AIRPORT PROPERTY AND FACILITIES SOUTH

1.13 AIRPORT DEVELOPMENT HISTORY

Just Prior to World War II, the City of Lakeland acquired the original 640 acre site for the airport. The intent was to replace the Lodwick Airport, also known as Municipal Airport No. 1, which was located on the west bank of Lake Parker. The new facility was originally called “Drane Field”. During its early years the airport was used primarily by National Airlines which served Lakeland and the surrounding areas until 1962. In 1942, the Federal Government took over control and used the airport as a training facility for aviation cadets. During this time they completed construction of the runways and acquired additional land. After WWII ended the Federal Government relinquished control back to the City.

The airport was operated on a contract basis and was used for flight training by Garner Aviation and later Truman Miller Aviation.

The City employed its first airport manager in 1958. Through the coordinated efforts of airport management and the Civil Aviation Administration, the airport was converted to a full-time municipal airport. During the next decade the airport underwent several construction projects including the addition of several new buildings, new pavement, and new airfield lighting. Additional property was also purchased during this time.

In October of 1972, Piper Aircraft Corporation began manufacturing general GA aircraft at the airport. They continued production until November 1985 when the plant closed. The Experimental Aircraft Association (EAA) held its first annual Sun ‘n Fun fly-in event in 1975, and it has continued to grow in popularity every year. Most of the current airfield lighting and navigation equipment was installed sometime in the 1980’s. The airport also rehabilitated the pavement and facilities during this time. In May of 1989, the Lakeland Municipal Airport was renamed, Lakeland Regional Airport. It was renamed again in January 1991, when it became Lakeland Linder Regional Airport.

In the time since the last Master Plan update in 2004, LAL has completed several Federal and State funded improvement projects. These projects are shown in **Figure 1.13A** and include:

- *AIP 3-12-0041-022 (FY 2000) - Acquire Land for Approaches*
    - This project included the reimbursement for 26.11 AC of land identified as Area 110 acquired in

1990 under FDOT WPI No. 1827924.

- *AIP 3-12-0041-023 (FY 2002) – Modify Service Road; Rehabilitate Taxiway*

  - This project included the design of the Realignment and Overlay of the East Perimeter Road, the design and construction of the Relocation and Widening of Taxiway B from Taxiway A to Runway 23 and the Partial Rehabilitation of Taxiways F, G and L.

- *AIP 3-12-0041-024 (FY 2002) – Improve Runway Safety Area*

  - This project included the construction portion of the Realignment and Overlay of the East Perimeter Road.

- *AIP 3-12-0041-025 (FY 2003) – Rehabilitate Taxiway; Install Perimeter Fencing*

  - This project included the design and bidding phases of the Rehabilitation and Widening of Taxiway C from Runway 23 to Taxiway A.

- *AIP 3-12-0041-026 (FY 2004) – Rehabilitate Taxiway*

  - This project included the construction phase of the Rehabilitation and Widening of Taxiway C from Runway 23 to Taxiway A.

- *AIP 3-12-0041-027 (FY 2005) – Rehabilitate Runway*

  - This project included the design and construction of the Rehabilitation of Runway 5-23 and Associated Improvements.

- *AIP 3-12-0041-028 (FY 2008) – Conduct Master Plan Study*

  - This current project includes the development of the Airport Master Plan.

- *AIP 3-12-0041-029 (FY 2009) – Construct Taxiway*

  - This project included the design and bidding phases of the Realignment of Taxiway A4 (renamed Taxiway H) to correct what was identified as a ‘hot spot’.

- *AIP 3-12-0041-030 (FY 2009) – Acquire Equipment*

  - This project included the purchase of an Airport Sweeper Truck for the purposes of airfield pavement maintenance.

- *AIP 3-12-0041-031 (FY 2010) – Construct Taxiway*

  - This project includes the construction phase of the Realignments of Taxiway A4 (renamed Taxiway H) and Taxiway J to correct what was identified as ‘hot spots’, or potential incursion points.

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
KIDRON ROAD
AIRPARK ROAD
AIRPORT ROAD
HAMILTON ROAD
MAINTENANCE ACCESS ROAD
TAXIWAY A
TAXIWAY B
TAXIWAY C
TAXIWAY D
TAXIWAY E
TAXIWAY F
TAXIWAY G
TAXIWAY H
TAXIWAY L
TAXIWAY P
TAXIWAY S
T/W A1
T/W A2
T/W A3
T/W A4
T/W A5
T/W P1
T/W P2
TAXIWAY P5
TAXIWAY B2
APRON
RUNWAY 9-27 (8,500 X 150') 89°51'18.008" TRUE
RUNWAY 5-23 (5,000 X 150') 44°59'04.036" TRUE
9
27
5
23
AARON MORGAN ROAD
MEDULLA ROAD
PIPKIN ROAD

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LEGEND

- AIP 3-12-0041-022 (FY 2000) - ACQUIRE LAND FOR APPROACHES
- AIP 3-12-0041-023 (FY 2002) - MODIFY SERVICE ROAD: REHABILITATE TAXIWAY
- AIP 3-12-0041-024 (FY 2002) - IMPROVE RUNWAY SAFETY AREA
- AIP 3-12-0041-026 (FY 2004) - REHABILITATE TAXIWAY
- AIP 3-12-0041-027 (FY 2005) - REHABILITATE RUNWAY
- AIP 3-12-0041-029 (FY 2009) - CONSTRUCT TAXIWAY

PROJECTS NOT SHOWN ON MAP

AIP 3-12-0041-025 (FY 2003) - REHABILITATE TAXIWAY; INSTALL PERIMETER FENCING
THIS PROJECT INCLUDED THE DESIGN AND BIDDING PHASES OF THE REHABILITATION AND WIDENING OF TAXIWAY C FROM RUNWAY 23 TO TAXIWAY A

AIP 3-12-0041-028 (FY 2008) - CONDUCT MASTER PLAN STUDY
THIS CURRENT PROJECT INCLUDES THE DEVELOPMENT OF THE AIRPORT MASTER PLAN

AIP 3-12-0041-030 (FY 2009) - ACQUIRE EQUIPMENT
THIS PROJECT INCLUDED THE PURCHASE OF AN AIRPORT SWEEPER TRUCK

GRAPHIC SCALE IN FEET
500 0 500 1000

City of LAKELAND

FIGURE 1.13A
RECENT AIRPORT IMPROVEMENT PROJECTS

1.14 ACCESS ROADS

1.14A External Access Roads

As shown on **Figure 1.14A** the central business district of Lakeland is located 4 miles northeast of the airport. Don Emerson Drive provides access to the airport terminal building from Drane Field Road (SR 572), located on the north side of the airport. Drane Field Road also provides access via Florida Avenue (SR 37) and Harden Boulevard to the City of Lakeland. Medulla and West Pipkin Roads, located on the south side of the airport, provide access to the central and southern portions of Polk County. I-4, accessed via County Line Road, provides access to Tampa and Orlando.

The Polk County Parkway (SR 570) provides additional surface access to the airport. This limited access facility forms a partial loop to the west, south, and east of the City of Lakeland. Interchanges providing access to the airport are provided at Airport Road and Waring Road.

The City of Lakeland's public bus transportation, the Citrus Connection, provides a low-cost means of transportation around the city. The Airport and Airside Center are served by the Blue Transit Bus 57 which also provides access to Central Park Plaza, Lakeside Village Mall, VA Clinic, and Lakeland Christian School.

Mass transit service to the airport is currently unavailable. The completion of an Amtrak Station in late 1998 has brought upgraded rail service to Lakeland. This station operates daily routes to Miami and Jacksonville. In addition, the CSX Railroad system provides access to the vast network of rail within the county. CSX offers multi-modal service for freight and distribution including train, truck, barge, and container services. In addition, several switching yards are available, and the north-south and east-west mainlines extend from the center of Polk County. Several rail spurs are located north of Drane Field Road, in the Winston Railroad Yard.

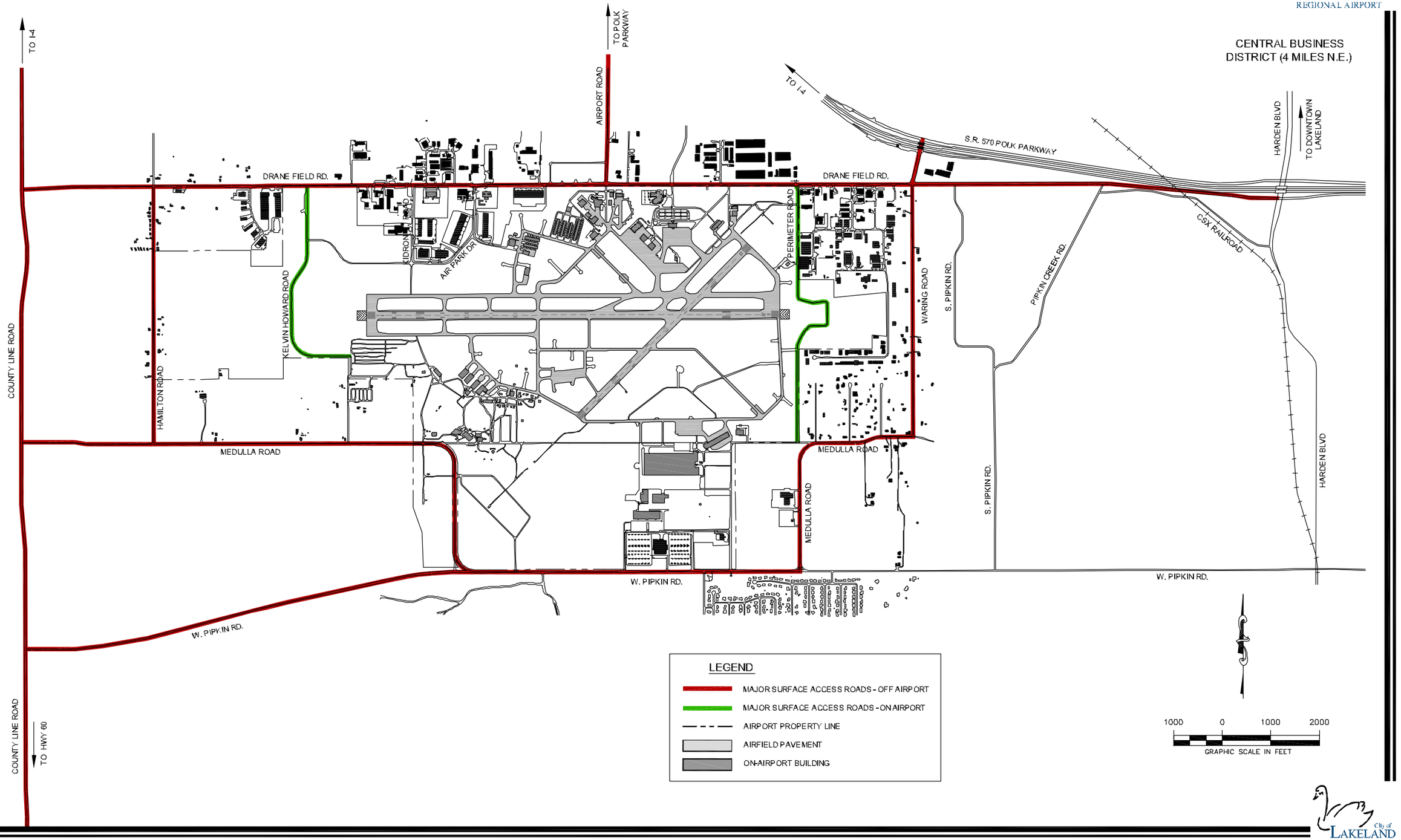
1.14B Internal Access Roads

There are two main internal roads which provide access from one side of the airfield to the other, East and West Perimeter Roads. From the main terminal building there is a zipper road which parallels Taxiway B heading northeast where it connects with East Perimeter Road. East Perimeter Road follows the airports property line on the east side of

the airfield and provides direct access to the airfield maintenance facility and electrical vault. On the south side of the airfield East Perimeter Road provides access to the LAL VORTAC. A gate at the end of East Perimeter Road provides off airfield access to the south side via Medulla Road, Airside Center Drive, and West Pipkin Road.

On the west side of the airfield is West Perimeter Road, also called Kevin Howard Road, which provides north/south access. On the south side of the airfield, West Perimeter Road connects to Poberezny Road and Aaron Morgan Road which provide access to the Sun ‘n Fun campground area and the main Sun ‘n Fun campus.

LAKELAND LINDER REGIONAL AIRPORT



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City of LAKELAND

FIGURE 1.14A
EXISTING AIRPORT SURFACE TRANSPORTATION ACCESS ROADS

1.2 EXISTING AIRFIELD FACILITIES & PAVEMENT

1.21 BUILDINGS

1.21A Terminal Building & Automobile Parking

The LAL Terminal is a 27,260 SqFt building located on a 13 acre tract of land fronting Drane Field Road. The building features office space for airport administration, one large and one small conference room, a restaurant, Fixed Base Operator (FBO) facilities, car rental area, and space designed for commercial services, future offices or a variety of other lease options. The parking area is located on the north side of the terminal building and consists of approximately 275 parking spaces with 10 reserved for handicapped parking. Both the terminal building and parking area are accented with lush tropical landscaping. The terminal building also features a 185 Ft section of curbside area with an access loop that transitions through a 30 Ft wide covered walkway, providing a convenient drop off or pick up area.

1.21A1 Terminal Building

Of the 27,360 SqFt inside the terminal building 6,260 SqFt on the first floor and 1,200 SqFt on the second floor is currently designated as common area. This area includes lobby/seating, terminal ramp overlook, restrooms, mail box facility, and locker rooms.

1.21A2 FBO Operations In-Terminal

3,200 SqFt of the terminal building has been developed for FBO operations. This area is located on the first floor on the southwest side of the lobby area. The area includes office space, display cabinet, shower/locker room, kitchen/catering area, and counter space overlooking the lobby. An additional 800 SqFt of space serves as a pilots' lounge and includes an adjacent space designated as a planning/pilot ready area.

1.21A3 Administrative Offices

The airport administrative offices and conference rooms are located on the east side of the second floor. They consist of 6,200 SqFt which is divided between general office space, a small conference room, and a large conference room.

1.21A4 Restaurant

On the southwest side of the second floor is a 6,000 SqFt area which is currently home to Earhart's Runway Grill. The area includes expanded kitchen facilities, a private bathroom, manager's office, custodial closet, and service elevator.

1.21A5 Future Offices/Charter Operations

The southeast side of the first floor consists of a 2,400 SqFt area that is reserved for future commercial services, office space, or charter operations.

1.21A6 Air Charter Offices

There is a 300 SqFt area in the northeast side of the first floor that is designated for Air Charter operations.

1.21A7 Mechanical/Electrical

There are two areas consisting of 900 SqFt which are used to house the buildings mechanical and electrical equipment.

1.21B Hangars

1.21B1 T-Hangars

The airport has a total of 6 T-Hangar buildings. Four of the T-Hangar buildings are designated as the City T-Hangars which identifies them as airport owned while the other two are designated as the Executive T-Hangars which identifies them as privately owned Hangars on airport leased land. The City T-Hangars have two different sized units 938 SqFt and 1050 SqFt, they also share a community pilots lounge that is approximately 500 SqFt. There are a total of 65 units in the City T-Hangar Buildings equaling approximately 64,800 SqFt.

1.21B2 Conventional Hangars

The airport has 26 conventional hangars on site, some of which are airport owned and some of which are privately owned. The airport owned hangars vary in size from approximately 3,000 SqFt up to approximately 40,000 SqFt. The hangars are leased to both aviation and non-aviation related businesses and individuals.

1.21C Aircraft Rescue & Fire Fighting (ARFF) Facilities

In 2007 LAL entered into a letter of agreement with the Lakeland Fire Department (LFD) to offer Aircraft Rescue & Firefighting (ARFF) services at the airport. LFD currently operates out of the building at the base of the Air Traffic Control (ATC) tower. According to the criteria listed in FAR part 139.315 LAL is

listed as having Index A ARFF services. LFD currently operates an Oshkosh Striker 1500 emergency vehicle as its primary response vehicle for airport emergencies.

1.21D Air Traffic Control Tower (ATCT)

The airports Air Traffic Control Tower is located on the north side of the airfield next to the ARFF station which is immediately south of the main terminal ramp area. The tower operates daily from 6:00 AM to 10:00PM and is staffed by six full-time Robinson Aviation, Inc. (RVA) controllers under the Federal Contract Tower Program.

1.21E Maintenance Facilities

Maintenance Facilities for the airport are located on the eastern side of the airfield. The building is approximately 3,750 SqFt and is used for maintenance office space and to house equipment needed to maintain the airfield. A second maintenance facility is located on the south side of the airport. This facility houses additional equipment and provides an overflow storage area.

1.21F Fixed Base Operators (FBO)

1.21F1 Columbia Air Services

Columbia Air Services is the only FBO currently operating at the Lakeland Airport. They now have office space in the main terminal building. Their services include: full-service aircraft fueling, a 24 hour self-serve AvGas pump, aircraft tie-downs, GPU, lavatory services, courtesy car, rental car services, taxi/limo services, concierge services, catering services, pilot and passenger lounge, and they have a flight planning room with WSI weather information.

1.21G Fuel Storage Facilities

Columbia Air Services, operates and maintains two fuel storage areas. One is located just west of the main terminal building and the other is by their hangar further to the west which includes a self-serve tank. The FBO offers fueling services daily during the hours of 6:00AM – 10:00PM. 24 hour service is available on a call-out basis for an additional fee, prior arrangements must be made. The FBO has two 100LL AvGas tanks, one 12,000 gallon and one 15,000. They have a total of three Jet A tanks, one 12,000 gallon, and two 15,000 gallon.

1.21H Education Facilities

Central Florida Aerospace Academy of Kathleen High School is a full-time high school program located on the southwest side of the airfield on the Sun ‘n Fun

campus. Students are challenged to reach high levels of achievement in science, technology, engineering and mathematics in preparation for high-tech careers in the fields of aviation and aerospace. The academy responds to the needs of industry by placing emphasis on teamwork, individual achievement, skill development, creativity, and innovation, as well as critical thinking. Students who attend the academy participate in coursework in Aerospace Engineering, Avionics, Aerospace Technologies, and Air Force JROTC as well as their general high school curriculum.

1.21I Flight Schools

Flight Safety International occupies a 18,306 SqFt building situated on the southeast side of the airfield. Their primary focus is the training of pilots and maintenance technicians for proficiency in the safe and effective operation of all types of aircraft. The company's training involves the use of advanced simulators that replicate with certified accuracy the experience of flying an aircraft.

1.21J Sun 'n Fun Fly-In, Inc.

1.21J1 History of Sun 'n Fun

In 1974, the Lakeland, Florida chapter of the Experimental Aircraft Association (EAA) decided to hold a fly-in for sport aviation enthusiasts at the Lakeland Airport. EAA is a growing and diverse organization of members with a wide range of aviation interests and backgrounds and was founded by a group of individuals interested in building their own airplanes. The Southeastern Sport Aviation Council (SESAC), an organization of 60 EAA chapters in the Southeast, and the Florida Sport Antique Classic Aircraft Association (FSAACA), an association of pre-1936 antique, 1936-1942 classic, and World War II military aircraft restorers joined the effort.

The first weekend fly-in, called Mid-Winter Sun ‘n Fun was held in January of 1975 at the Lakeland Municipal Airport and was limited to pilots, EAA, SESAC, and FSAACA members. In 1978, Sun ‘n Fun became the second largest EAA fly-in in the United States topped only by the EAA convention in Oshkosh, Wisconsin. In 1980, the month the fly-in was held changed from January to March. In 1988 the convention was moved from March to April. The annual Spring Celebration of Flight brings together those from all over the world, and from all segments of the aviation community. Sun ‘n Fun leases an area in the south west quadrant of the airfield which is also home to the Florida Air Museum.

1.21J2 Economic Impact

In 2003 the University of South Florida conducted an economic impact study to determine an estimate of the financial impact to the community related to the Sun ‘n Fun Fly-In. For 2003, the last year of data available, it is estimated that the fly-in contributed to an economic impact of $27,390,000 for the entire Central Florida area. Yearly attendance has increased from 1,980 people during the fly-in’s inaugural year to over 160,000 people in 2008.

1.21J3 Airport Operations During Sun ‘n Fun

Due to the large number of aircraft operating to and from LAL during the Sun ‘n Fun Fly-In, revised air navigational procedures in the vicinity of LAL are used to enhance safety and minimize air traffic delays. These procedures are issued by Notice to Airmen (NOTAM) and are highlighted below. During the event, the FAA provides ATC services.

- No Radio (NORDO) aircraft are NOT AUTHORIZED (except Paradise City Ultralight/LSA).

- Airport closures occur daily during Aerobatic demonstrations as indicated by a predetermined schedule. No arrivals or departures are permitted during this period without prior authorization from the Airport Director, Sun ‘n Fun Manager, and ATC.

- Runway 5/23 (ILS and NDB/GPS Runway 5) and several taxiways are closed during the event.

- VFR arrival procedures include aircraft holding at Lake Parker and Lake Hancock.

- Taxiway A is designated as Runway 9L/27R during the Sun ‘n Fun Fly-In.

Only left traffic for Runway 9L or right traffic for 27 R is used with downwind leg entry close to the airport over Airport Road.

- Displaced thresholds are in place on Runways 9L and 9R.

- VFR departure procedures include proceeding straight out for three miles before proceeding on course.

Event specific Air Traffic Control and radio communication procedures are in effect to expedite the orderly arrival and departure of certain aircraft.

1.21J4 Florida Air Museum

The Florida Air Museum displays a variety of historic aircraft and artifacts covering the first 100 years of flight. Displays include tributes to aviation greats and pioneers such as Howard Hughes, the Tuskeegee Airmen, early air racers, and countless Floridians that have influenced the world of aviation. The Museum offers year-round educational programs, tours, workshops and lectures that bring aviation to life.

1.21K Airport Utilities

1.21K1 Electrical

Lakeland Electric & Water provides electricity to the airport via city owned lines that pass through a substation located in the Winston Railroad Yard. The airport electrical vault houses a 150kW emergency generator, the ATC tower has a 100kW emergency generator, and the airport terminal building has its own 35kW emergency generator.

1.21K2 Telephone

In 2008 the City of Lakeland and the airport converted the phone service over to a Voice Over Internet Protocal (VOIP) system. Supplemental service is provided to the airport and surrounding area by Verizon.

1.21K3 Sewage

Wastewater service and treatment is provided by Lakeland Electric & Water. Four wastewater pump stations are located on the airport. One unit is located on the northeast side of the old airport terminal, one is on the west side of the main terminal near what is currently the Publix hangar, the third is located in the airpark, and the last is located in the Sun ‘N Fun area.

These pump stations feed sewage into a 24 inch force main that runs along Drane Field Road. This force main is capable of handling up to 3 million gallons per day (MGD) of wastewater. After entering the force main the sewage then travels a distance of approximately five miles to the Glendale Street Treatment Plant, located southeast of the city. The current capacity of this plant is 13.7 MGD. The current daily flow rate average is about 8.48 MGD. A gravity system has been constructed in the northeast quadrant (new terminal building) of the airport to serve commercial users who are currently hooked up to septic tanks and for future users.

1.21K4 Water

Lakeland Electric & Water provides water to the airport via a twenty-four inch water main which is located along the south side of Drane Field Road. A twelve inch water main comes off of the Drane Field Road water main and follows Medulla Road to serve the south side of the airport. The terminal building is served by a six inch water line and the Airpark is served by an eight inch water line. Both lines are connected with the Drane Field Road water main. Sun 'n Fun is served by an eight inch water main which connects to the twenty-four inch water main along Drane Field Road and the twelve inch water main along Medulla Road. Another six inch line connected to the Medulla Road water main serves the southeastern corner of the airport. Additionally a water storage tank is located south of the airport near the intersection of East Perimeter and Medulla Roads.

1.21K5 Drainage

The established airport elevation is 142 Ft. The terrain of the airport is relatively flat, ranging from 140 Ft on the east side to about 134 Ft on the west side. Airport drainage is provided by a system of storm sewers, culverts, swales, and ditches.

Storm water runoff collects in retention ponds and channels into either the English Creek or Poley Creek. These creeks flow into the Alafia River which ultimately discharges into Tampa Bay. The City of Lakeland completed an airport drainage master plan (early 2001 approval), which was a priority recommendation of the 1995 airport master plan update.

1.22 RUNWAYS

Runway weight capacity data for 9/27 and 5/23 can be found in Appendix A.

1.22A Runway 9/27

Runway 9/27 is 8,500 Ft long and 150 Ft wide. The runway has a magnetic heading of 095°/275° with a true bearing of 89° 52' 13.792" and 269° 52' 13.792".

The runway is constructed of grooved asphalt and is in good to excellent condition. The effective gradient is negligible at 0.012 percent. The traffic pattern consists of all left-hand turns. All airfield pavements, including Runway 9/27, are depicted on **Figure 1.22A**.

1.22A1 Runway 9/27 Markings/Lighting/Signage

Airfield markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. Runway 9 has precision instrument runway markings that identify the runway centerline, threshold, and designation. Runway 27 is marked for non-precision approaches.

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. Runway 9/27 and its parallel taxiway are both lighted with medium intensity lights. The runway is equipped with medium intensity runway lights (MIRL) located 2-10 Ft from the edge of pavement.

Airfield signs are installed at all taxiway and runway intersections. Airfield identification signs assist pilots in identifying their locations on the airfield and direct them to their desired locations.

Surface Painted Holding Position Signs (SPHPS), are located on all Taxiways that connect to Runway 9/27.

1.22A2 Runway 9/27 Geometric Setbacks

Runway 9/27 has a 500 Ft wide runway safety area (RSA) that extends for 1,000 Ft beyond the runway end, and an 800 Ft wide runway obstacle free area (ROFA). Runway 9/27 safety setbacks are presented on **Figure 1.22B**.

1.22B Runway 5/23

Runway 5/23 is 5,000 Ft long and 150 Ft wide. The runway has a magnetic heading of 050°/230° with a true bearing of 44° 51' 46.614" and 224° 51' 46.614".

The runway is constructed of grooved asphalt and is in good to excellent condition. The effective gradient is negligible at 0.022 percent. The traffic pattern consists of all left-hand turns. All airfield pavements, including Runway 5/23, are depicted on **Figure 1.22A**.

1.22B1 Runway 5/23 Markings/Lighting/Signage

Runway 5 is marked for precision instrument approaches and Runway 23 is marked for non-precision instrument approaches.

Runway 5/23 is equipped with high intensity runway lights (HIRL). Runway 5 is equipped with a Medium Intensity Approach Lighting System (MALSR) with Runway Alignment Indicator Lights (RAIL).

Airfield signs are installed at all taxiway and runway intersections. Airfield identification signs assist pilots in identifying their locations on the airfield and direct them to their desired locations.

Surface Painted Holding Position Signs (SPHPS), are located on all Taxiways that connect to Runway 5/23.

1.22B2 Runway 5/23 Geometric Setbacks

Runway 5/23 has a 500 Ft wide RSA that extends for 1,000 Ft beyond the runway end, and an 800 Ft wide ROFA. Runway 5/23 safety setbacks are presented on **Figure 1.22B**.

1.23 TAXIWAYS & TAXILANES

As depicted previously on **Figure 1.22A**, a taxiway system provides access from the terminal area and the north and south operations areas to the runways. Enhanced taxiway centerline markings and apron markings are provided to assist aircraft using these airport surfaces. Aircraft hold positions are marked on all taxiway surfaces. Surface Painted Holding Positions Signs (SPHPS) are provided on all taxiways that connect to a runway. Taxiways and taxiway connectors are lighted. Taxiways/Taxilanes A, B, C, E, F, G, H, J, and K are equipped with medium intensity taxiway lighting (MITL). Taxiways A, B, C, and K have a Taxiway Safety Area (TSA) of 171 Ft and a Taxiway Object Free Area (TOFA) of 259 Ft. All other taxiways have a TSA of 118 Ft and a TOFA of 186 Ft. Taxiway safety setbacks are presented on **Figure 1.22B**.

1.23A Taxiway A (Alpha)

Taxiway A is a full-length 75 Ft wide parallel taxiway having a runway centerline-to-taxiway centerline separation of 400 Ft. Taxiway A is situated on the north side of Runway 9/27. There are five taxiways (A1-A5) connecting the parallel taxiway to the runway. There are also taxiways that connect Taxiway A to aircraft parking aprons.

1.23B Taxiway B (Bravo)

Taxiway B connects Taxiway A and Runway 23 to the terminal apron area. Taxiway B is 75 Ft wide.

1.23C Taxiway B2 (Bravo Two)

Taxiway B2 connects the Main Aircraft Parking Ramp area on the south side of the airfield to Taxiway D and Runway 5. Taxiway B2 is 40 Ft wide.

1.23D Taxiway C (Charlie)

Taxiway C extends from the end of Runway 23 to the end of Runway 27 and connects to Taxiway A. Taxiway C also serves as an access point for the airfield maintenance facility. Taxiway C is 75 Ft wide.

1.23E Taxiway D (Delta)

Taxiway D is located in the midfield area and is parallel to and south of Runway 9/27. Taxiway D is 50 Ft wide and extends from Taxiway F to Taxiway L crossing Runway 5/23. Taxiway D connects with Runway 9/27 via Taxiway P5.

1.23F Taxiway E (Echo)

Taxiway E is located on the south and east side of the airfield. Taxiway E begins at Runway 5, extends east, then north, terminating at the end of Runway 27. It connects the Airside Center Hangar Complex to Runway 5/23 and Runway 9/27. Taxiway E is 50 Ft wide.

1.23G Taxiway F (Foxtrot)

Taxiway F extends south from Runway 9/27 to the end of Runway 5. Taxiway F is 50 Ft wide.

1.23H Taxiway G (Gulf)

Taxiway G is located north of Runway 9/27 and connects to Taxiways A, H and L. Taxiway G is 50 Ft wide.

1.23I Taxiway H (Hotel)

Taxiway H is located north of Runway 9/27 and provides access to the T-Hangars and Corporate Hangars located on the northwest side of the airfield from Taxiways A and G. Taxiway H is 50 Ft wide and is designated non-movement.

1.23J Taxiway J (Juliet)

Taxiway J provides access to the terminal apron area from Taxiways A. Taxiway J is 75 Ft wide.

1.23K Taxiway K (Kilo)

Taxiway K, formerly Taxiway B1, provides access to the terminal apron area from Taxiway B. Taxiway K is 75 Ft wide.

1.23L Taxiway L (Lima)

Taxiway L (previously Runway 13/31) connects Taxiways E and D on the southeast side of the airfield and Taxiways G and H to Taxiway A on the north side of the airfield. Taxiway L is 50 Ft wide north of Runway 9/27 and 40 Ft wide to the south.

1.23M Taxiway P (Papa)

Taxiway P is a partial parallel taxiway situated on the south side of Runway 9/27. Taxiway P is 50 Ft wide and has a runway centerline to taxiway centerline separation of 400 Ft. Taxiway P has two connecting taxiways (P1 and P2) to Runway 9/27.

1.23N Taxiway P5 (Papa Five)

Taxiway P5 is located on the south side of Runway 9/27 approximately mid-field and it connects Runway 9/27 to Taxiway D. Taxiway P5 is 40 Ft wide.

1.23O Taxiway R (Romeo)

This is no longer a taxiway. It has been converted to an internal service road.

1.23P Taxiway S (Sierra)

Taxiway S is situated within the Sun ‘n Fun Convention area on the southwest side of the airfield. Taxiway S is 50 Ft wide and provides a connection from Taxiway P to Taxiway F.

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
KIDRON ROAD
AIRPARK ROAD
AIRPORT ROAD
HAMILTON ROAD
MAINTENANCE ACCESS ROAD
AARON MORGAN ROAD
MEDULLA ROAD
PIPKIN ROAD
TAXIWAY A
TAXIWAY B
TAXIWAY C
TAXIWAY D
TAXIWAY E
TAXIWAY F
TAXIWAY G
TAXIWAY H
TAXIWAY J
TAXIWAY L
TAXIWAY P
TAXIWAY P5
TAXIWAY S
T/W A1
T/W A2
T/W A3
T/W A4
T/W A5
T/W K
T/W P1
T/W P2
APRON
RUNWAY 9-27 (8,500 X 150') 89°51'18.008" TRUE
RUNWAY 5-23 (5,000 X 150') 44°5'54.036" TRUE

LEGEND
- RUNWAYS
- TAXIWAYS/TAXILANES
- APRONS
- AIRPORT PROPERTY LINE

GRAPHIC SCALE IN FEET
500 0 500 1000

City of LAKELAND

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FIGURE 1.22A
EXISTING AIRFIELD PAVEMENTS

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
HAMILTON ROAD
KIDRON ROAD
AIRPARK ROAD
AIRPORT ROAD
MAINTENANCE ACCESS ROAD
AARON MORGAN ROAD
MEDULLA ROAD
PIPKIN ROAD

RUNWAY 9-27 (8,500 X 150') 89°51'16.00" TRUE
RUNWAY 5-23 (5,000 X 150') 144°51'16.00" TRUE

TAXIWAYA
TAXIWAYB
TAXIWAYC
TAXIWAYD
TAXIWAYE
TAXIWAYF
TAXIWAYG
TAXIWAYH
TAXIWAYP
TAXIWAYR
TAXIWAYS
TWY A1
TWY A2
TWY A3
TWY A4
TWY P1
TWY P2
APRON

1000'
400'
800' ROFA
500' RSA
129.5' TOFA
171' TSA
259' TOFA
118' TSA
186' TOFA
93' TOFA

LEGEND

- RUNWAY/TAXIWAY SAFETY AREA
- RUNWAY/TAXIWAY OBJECT FREE AREA
- ON-AIRPORT BUILDING
- OFF-AIRPORT BUILDING

500 0 500 1000
GRAPHIC SCALE IN FEET

City of LAKELAND

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FIGURE 1.22B
EXISTING RUNWAY & TAXIWAY SAFETY SETBACKS

1.24 AIRCRAFT PARKING APRONS

The primary airport apron areas designated for aircraft parking are located in various places around the airfield. These locations include the terminal building ramp (approximately 23,400 SY), tower ramp (approximately 11,700 SY), hangar 1, 2, & 3 ramp (approximately 31,700 SY), hangar 6 ramp (approximately 14,900 SY), Main Aircraft Parking ramp (approximately 23,280 SY), Airside Center ramp (approximately 11,900 SY), LPD ramp (approximately 2,500 SY), and the south ramp (approximately 17,900 SY). Each apron area is depicted on **Figure 1.24A**.

1.25 AIRFIELD NON-MOVEMENT AREAS

A non-movement area is any taxiway and apron (Ramp) areas not controlled under Air Traffic Control (ATC). Movement of aircraft and vehicles within these non-movement areas is the responsibility of the pilot/operators. Two-way radio communication with the Airport Traffic Control Tower (ATCT) is required prior to moving outside these ramps, parking areas and non-movement areas. Non-movement areas at LAL are depicted on **Figure 1.24A**.

1.26 NAVIGATIONAL AIDS (NAVAIDS)

1.26A Electronic

1.26A1 VOR/TACAN/DME

A Very High Frequency (VHF) Omni-directional Range and collocated Tactical Aircraft Control and Navigational (TACAN) equipment comprise a “VORTAC” navigational facility. As depicted on **Figure 1.26A**, the VORTAC is located southeast of Runway 5/23 and broadcasts electronic navigational signals, 360 degrees in azimuth, oriented from magnetic north and provides VOR azimuth, TACAN azimuth, and TACAN Distance Measuring Equipment (DME) at one site. Each VOR is part of a nation-wide system of navigation facilities. Through the broadcast of discrete VHF radio frequencies, point-to-point air navigation to airborne aircraft is provided.

1.26A2 ADS-B

Lakeland also has an Automatic Dependent Surveillance Broadcast (ADS-B) system which provides pilots with up to the second updated information on weather and other aircraft in the vicinity. This system enables pilots to identify potential flight and incursion hazards well in advance. The system also receives aeronautical flight information regarding

temporary flight restrictions and special use airspace.

1.26A3 ILS

An Instrument Landing System (ILS) is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. It is comprised of two highly directional transmitting systems (known as the localizer and glide slope transmitters) and, along the approach, three (or fewer) marker beacons. Lakeland has an ILS (110.1) to Runway 5 that includes a Locator Outer Marker (LOM).

1.26A4 NDB

NDBs are general purpose low- or medium-frequency radio beacons that an aircraft equipped with a Automatic Direction Finder (ADF) can home in on or determine its bearing relative to the sending facility. Lakeland Linder utilizes its LOM (227 WIREY) as an NDB for the Airport.

1.26B Visual

Runway 5 and Runway 23 are equipped with Precision Approach Path Indicators (PAPIs) that use a single row of four lights arranged to provide visual 3-dregree descent guidance while on approach to the runway threshold. The Threshold Crossing Height (TCH) for Runway 5 is 56 Ft and the TCH for Runway 23 is 50 Ft. Runway 9 and Runway 27 are also equipped with PAPIs which provide visual 3-degree descent guidance while on approach to the runway threshold. The TCH for both Runway 9 and 27 is 45 Ft. PAPIs are used to provide positive guidance along a prescribed path to the landing threshold. The PAPI lights are visible from 3 to 5 miles during the day and up to 20 miles or more at night. The PAPI systems as well as other lighted airfield facilities are depicted on **Figure 1.26A**.

1.26C Rotating Beacon

A rotating beacon that is operated from dusk to dawn is located on top of the ATCT. The beacon is in good condition.

1.26D Windsock/Segmented Circle

LAL airport management maintains four lighted windsocks and one segmented circle. The airport's windsock and segmented circle are located to the south of Runway 9/27 at midfield. All of the windsocks are in good condition.

1.27 LIMITED WEATHER REPORTING STATION

LAL utilizes a Limited Aviation Weather Reporting Station (LAWRS) as a weather source for airport users. Using LAWRS, observers report cloud height, weather, obstructions to vision, temperature and dew point, surface wind, altimeter and pertinent remarks.

1.28 ELECTRICAL VAULT

The electrical vault that serves the entire airfield is located adjacent to the airport maintenance facility on the east side of the airfield. The vault consists of an 818 SqFt building that houses nine regulators, an emergency generator, and ancillary electrical equipment. There is ample room for expansion within the electrical vault. The electrical vault is in excellent condition.

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
KIDRON ROAD
AIRPARK ROAD
AIRPORT ROAD
HAMILTON ROAD
MAINTENANCE ACCESS ROAD
TAXIWAY H
TAXIWAY G
TAXIWAY L
TAXIWAY J
TAXIWAY B
TAXIWAY C
TAXIWAY A
APRON
T/W K
T/W A1
T/W A2
T/W A3
T/W A4
T/W A5
T/W P1
T/W P2
RUNWAY 9-27 (8,500 X 150') 89°51'18.008" TRUE
09
27
TAXIWAY P
TAXIWAY P5
TAXIWAY D
RUNWAY 5-23 (5,000 X 150') 44°57'04.036" TRUE
05
23
TAXIWAY E
TAXIWAY S
TAXIWAY F
TAXIWAY B2
AARON MORGAN ROAD
MEDULLA ROAD
PIPKIN ROAD

LEGEND

NON-MOVEMENT AREAS

GROUND CONTROL CONTACT POINTS

AIRPORT PROPERTY LINE

GRAPHIC SCALE IN FEET
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City of LAKELAND

FIGURE 1.24A
NON-MOVEMENT AREAS & AIRCRAFT APRONS

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
HAMILTON ROAD
KIDRON ROAD
AIRPARK ROAD
AIRPORT ROAD
MAINTENANCE ACCESS ROAD
AARON MORGAN ROAD
MEDULLA ROAD
PIPKIN ROAD

MEDIUM INTENSITY RUNWAY EDGE LIGHTS (MIRL)
HIGH INTENSITY RUNWAY EDGE LIGHTS (HIRL)

RUNWAY 9-27 (8,500 X 150') 89°51'18.008" TRUE
RUNWAY 5-23 (5,000 X 150') 44°51'04.036" TRUE
RUNWAY 14-32 (5,000 X 150')

TAXIWAY A
TAXIWAY B
TAXIWAY C
TAXIWAY D
TAXIWAY E
TAXIWAY F
TAXIWAY G
TAXIWAY H
TAXIWAY J
TAXIWAY L
TAXIWAY P
TAXIWAY P5
TAXIWAY S
T/W A1
T/W A2
T/W A3
T/W A4
T/W A5
T/W P1
T/W P2
T/W K
TAXIWAY B2

APRON

PAPI
VORTAC
MALSR

LEGEND

- AIRPORT PROPERTY LINE
- LIGHTED RUNWAYS
- LIGHTED TAXIWAYS
- ON-AIRPORT BUILDING
- OFF-AIRPORT BUILDING
- LIGHTED WINDSOCK
- LIGHTED WINDSOCK & SEGMENTED CIRCLE
- AIR TRAFFIC CONTROL TOWER WITH COLLOCATED ROTATING BEACON
- PAPI
- MALSR
- VORTAC

500 0 500 1000
GRAPHIC SCALE IN FEET

City of LAKELAND

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FIGURE 1.26A
EXISTING VISUAL NAVAIDS/AIRFIELD LIGHTING

1.3 AREA AIRSPACE & AIR TRAFFIC CONTROL

On an average day in the United States, approximately 80,000 general aviation and commercial aircraft depart an airport en-route to another destination. As the volume of air traffic has progressively grown over the history of aviation, there has been an increasing need to regulate the efficient use of airspace. The Federal Aviation Act of 1958 established the Federal Aviation Administration (FAA) as the responsible agency for the control and use of navigable airspace within the U.S. Administratively, control of air traffic at Lakeland Linder Regional Airport (LAL) is assigned to the FAA's Southern Region located in Atlanta, GA. The tower at Lakeland Linder is an FAA contract tower.

On a broader scale, the FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. The system also includes components shared jointly with the military.

A fundamental component of the infrastructure of any airport is that of "airspace," generally defined in an aviation context to be a specific three-dimensional portion of the atmosphere which is available for aeronautical transportation purposes. Within the United States, the NAS has been defined and is controlled by the FAA. From an airspace structure perspective, the NAS has been broken down into a series of airspace classifications, each of which has its own purposes, control, and operational requirements. From an airspace control perspective, the NAS consists of a network of navigational aids (NAVAIDS) and air traffic control (ATC) facilities, whose primary purpose is to prevent collisions between aircraft operating in the system and to organize and expedite the flow of traffic within the NAS. These controls ultimately support and are supported by navigational infrastructure elements at the local or airport level, such as instrument approaches.

This section of the inventory chapter provides an overview of the airspace structure, air traffic control services,

supporting NAVAIDS, and instrument approaches that currently exist at LAL.

1.31 AREA AIRSPACE

1.31A Airspace Structure

Within the regulatory airspace elements of the NAS (that which is non-military and not restricted), there are four types of airspace: controlled, uncontrolled, special use, and other. The manner in which airspace is broken down into these four types is a function of the complexity or density of aircraft movements; the nature of the operations conducted within the airspace; the level of safety required; and the national and public interest. For the purposes of this study, this discussion will be limited to controlled airspace.

“Controlled” airspace is a generic term that encompasses the different classifications of airspace (Class A, Class B, Class C, Class D, and Class E airspace) within which varying levels of ATC service is provided in accordance with the airspace classification. Among other requirements, controlled airspace requires that a pilot insure that ATC clearance or radio communication requirements are met prior to entry into controlled airspace. The pilot retains this responsibility when receiving ATC radar advisories.

Since the controlled airspace within the vicinity of Lakeland Linder Regional Airport is comprised of airspace classifications Class B, Class D, and Class E, this discussion will focus primarily on these three. (Note that Class C will also be included for reference.) **Figure 1.31A** shows an idealized generic profile of all airspace classifications. Note that this diagram does not represent the actual configuration of these classes of airspace in the Lakeland area but does provide a basis upon which these airspace jurisdictions can be compared. As shown in the figure, Class B airspace extends higher than Class C and Class D airspace, with Class E effectively filling in the airspace in between these classes. The figure also shows how the various airspace jurisdictions are centered on the airports with which they are associated.

1.31A1 Class B Airspace

Class B Airspace is generally defined as the airspace from the ground to 10,000 Ft mean sea level (MSL) surrounding the nation's busiest airports in terms of aircraft operations or passenger enplanements.

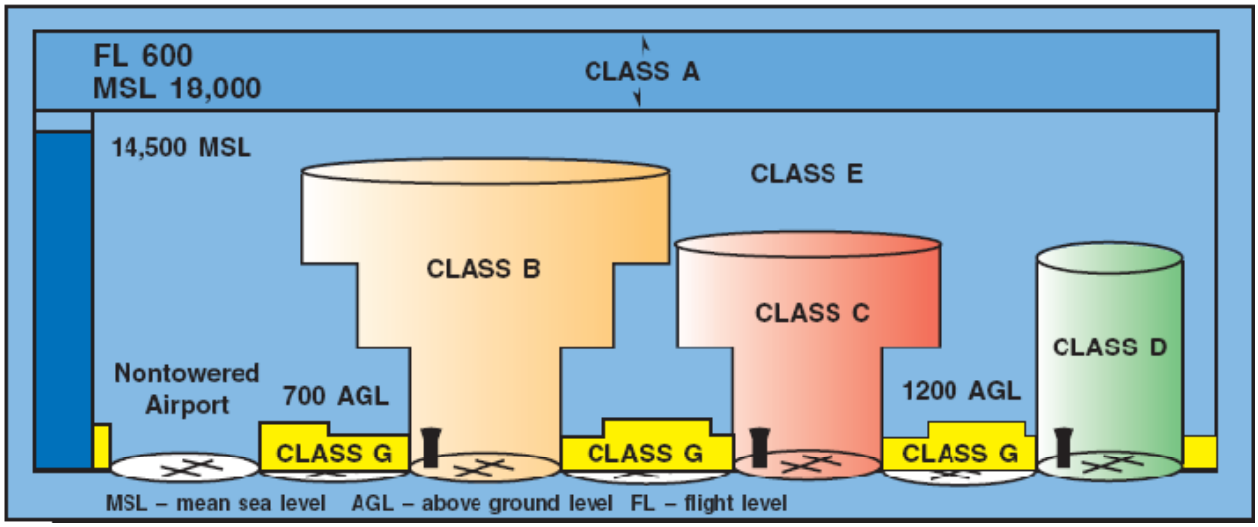

Figure 1.31A Airspace Profile
Source: Pilot's Handbook of Aeronautical Knowledge, Federal Aviation Administration, 2003, p. 13-2

The configuration of Class B airspace is individually tailored, but generally consists of a surface layer and two or more additional layers designed to contain all published instrument procedures associated with an airport. All aircraft that operate within Class B airspace must obtain ATC clearances and receive separation services within the airspace. In addition, all aircraft operating within Class B airspace are required to carry certain communications equipment to ensure they can be monitored by air traffic controllers. Within the immediate area surrounding Lakeland Linder Regional Airport, there are two Class B airspace areas that accommodate Tampa International Airport (TPA) to the west, and Orlando International Airport (MCO) to the northeast, both of which extend up to 10,000' MSL.

1.31A2 Class C Airspace

Class C Airspace generally extends from the ground to 4,000 Ft above the airport elevation and surrounds airports that have an operational airport traffic control tower (ATCT), are serviced by radar approach control, and accommodate minimum levels of aviation activity as specified by the FAA. Like Class B airspace, Class C airspace is individually tailored to the airports that they serve, and generally consist of a surface area with an additional layer above it, resembling an upside-down wedding cake. Pilots are required to establish two-way radio communications with the ATC facility providing air traffic services prior to

entering Class C airspace and must maintain those communications while in the airspace. Within Class C airspace, air traffic controllers are required to separate aircraft operating under visual flight rules (VFR) from aircraft operating under instrument flight rules (IFR), but are not required to separate VFR operations from one another. Sarasota Bradenton International Airport (to the southwest) is the closest Class C airspace to the Airport.

1.31A3 Class D Airspace

Class D Airspace consists of the airspace surrounding airports that have an operational ATCT, but do not meet the other requirements necessary to be designated as Class C airspace. Class D airspace is individually tailored to each airport, but generally consists of a single layer that extends from the ground to an altitude of 2,500 Ft above the airport's elevation. Air traffic controllers are not required to provide separation services to VFR flights within Class D airspace. The nearest airports to Lakeland with a Class D airspace designation are Bartow Municipal Airport (BOW), Kissimmee Gateway Airport (ISM), Albert Whitted Airport (SPG), and St. Petersburg Clearwater International Airport (PIE).

The Class D airspace reserved for LAL is a circle centered on the Airport with a radius of five nautical miles that extends from the surface up to 2,600 Ft MSL when the ATCT is operational. It should be noted that there is a small “cut out” of its Class D airspace that lies to the southwest of the Airport in order for South Lakeland Airport to remain in Class E airspace.

1.31A4 Class E Airspace

Class E Airspace includes all of those areas of controlled airspace that are not designated A, B, C, or D. Except for 18,000 Ft MSL, Class E airspace has no defined vertical limit, but rather it extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Class E airspace can serve a variety of purposes, including the following:

Surface Area Designated for an Airport

When designated as a surface area for an airport, Class E airspace is configured to contain all instrument procedures.

Extension to a Surface Area

There are Class E airspace areas that serve as extensions to Class B, Class C, and Class D surface areas designated for an airport. Such airspace provides controlled airspace to contain standard

instrument approach procedures without imposing a communications requirement on pilots operating under VFR.

Airspace used for transition

There are Class E airspace areas beginning at either 700 or 1,200 Ft above ground level (AGL) used to transition to/from the terminal or en-route environment.

En-Route Domestic Areas

There are Class E airspace areas that extend upward from a specified altitude and are en-route domestic airspace areas that provide controlled airspace in those areas where there is a requirement to provide IFR en-route ATC services but the Federal airway system is inadequate.

Federal Airways

The Federal airways are Class E airspace areas and, unless otherwise specified, extend upward from 1,200 Ft to, but not including, 18,000 Ft MSL.

Note that the airspace reverts to a Class E with a floor of 700’ AGL when it’s ATCT is closed (from 10:00 PM to 6:00 AM). Additionally, to the northeast of the Airport, there is a Class E extension to the Class D that extends to the ground in order to protect for approaches to and departures from LAL.

Figure 1.31B shows a sectional that defines the boundaries of Class B, Class D, and Class E airspace in the area described above.

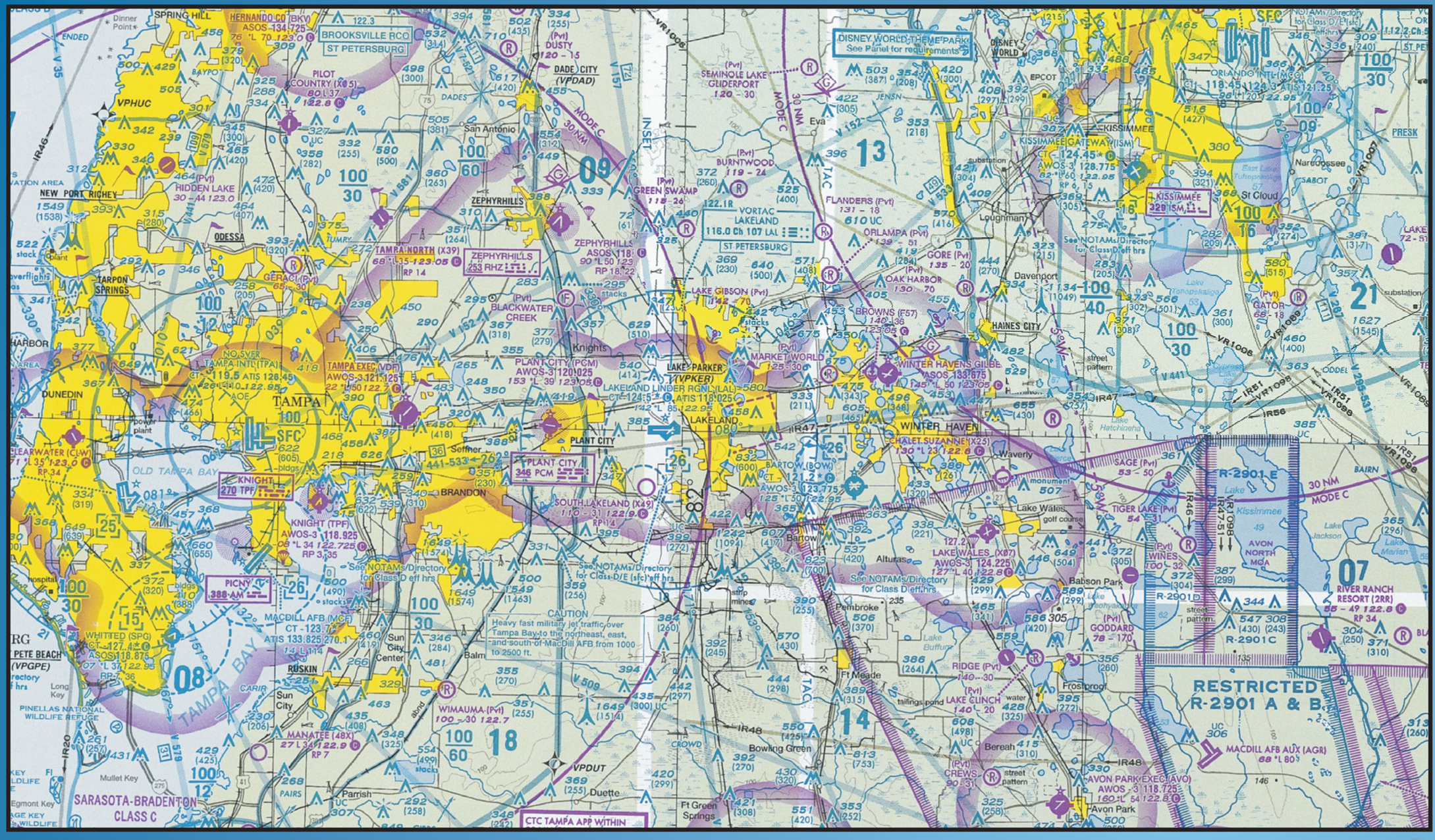

Figure 1.31B
FAA MIAMI SECTIONAL AERONAUTICAL CHART, FEBRUARY 11, 2010
Source: www.SkyVector.com

1.32 AREA AIRPORTS

As referenced above and reflected in the previous figure, there are several other general aviation airports surrounding LAL that also impact the area airspace by serving the region. These nearby paved public use airports and their relative characteristics are summarized in **Table 1.32A**.

In addition to airports listed in **Table 1.32A**, the following grass strips and/or private use airports are located within a 10 nautical mile radius of Lakeland Linder Regional Airport: South Lakeland Airport (X49), Market World Airport (PVT), Blackwater Creek Ultralight Flightpark (PVT), and Lake Gibson Seaplane Base (8FAO). The locations of these and other general aviation airports can be seen in the previously referenced **Figure 1.31B**.

Airport	Airport Identifier	Distance to LAL	Max. Runway Length	Approach Type	Best Approach Minimums (DH – Vis)	Based Aircraft
Lakeland Linder	LAL	N/A	8,500’	ILS	200 AGL – ½ mi	165
Plant City	PCM	8 miles	3,948’	GPS	500 AGL – 1 mi	65
Bartow Municipal	BOW	13 miles	5,000’	RNAV	400 AGL – 1 mi	94
Winter Haven’s Gilbert	GIF	15 miles	5,006’	RNAV	300 AGL – 1 mi	169
Zephyrhills Municipal	ZPH	16 miles	4,999’	GPS	600 AGL – 1 mi	48
Tampa Executive	VDF	17 miles	5,000’	ILS	300 AGL – ¾ mi	148
Lake Wales Municipal	X07	25 miles	3,999’	GPS	700 AGL – 1 mi	16

Table 1.32A General Aviation Airports – LAL Vicinity
Source: www.AirNav.com

1.33 MILITARY AIRPORTS & MILITARY OPERATIONS AREAS (MOAS)

Military airports, military operations areas, and restricted areas can likewise impact airspace use in the vicinity of a civil airport.

There two military airports/facilities within a 40-nautical mile (NM) radius of LAL. MacDill Air Force Base (AFB) is located approximately 33 NM to the southwest of Lakeland, while MacDill AFB Auxiliary Field Airport, also known as Avon Park

Auxiliary Field, is located approximately 40 NM to the southeast. Aeronautical charts provide cautionary notes that “Heavy fast military jet traffic over Tampa Bay to the northeast, east, and south of MacDill AFB from 1000 to 2500 ft.”

Military Operations Areas (MOAs) in the vicinity of Lakeland Linder include the Lake Placid MOA located approximately 11 NM southeast of the airport, the Avon North MOA located approximately 36 NM east of the airport, and the Avon East, Marian, and Basinger MOAs all located approximately 45 NM southeast of the airport. The Lake Placid MOA has an altitude of use between 7,000’ and 18,000’ Ft above mean sea level (MSL) with intermittent times of use of sunrise to sunset Monday through Friday and issued by NOTAM on Saturday and Sunday. The Avon North MOA has an altitude of use between 5,000’ and 18,000’ Ft MSL with intermittent times of use of sunrise to sunset Monday through Friday, while the Avon East MOA has an altitude of use between 500’ and 14,000’ Ft MSL with intermittent times of use of sunrise to sunset Monday through Friday.

Both the Marian and Basinger MOAs have an altitude of use between 500’ and 5,000’ Ft MSL with intermittent times of use of sunrise to sunset Monday through Friday and issued by NOTAM on Saturday and Sunday.

In addition to the MOA’s, there are nine Restricted Areas within the vicinity of the airport: R-2901A, R-2901B, R-2901C, R-2901D, R-2901E, R-2901F, R-2901G, R-2901H, and R-2901I. All restricted airspaces surround MacDill AFB Auxilliary Field Airport and are adjacent to all previously noted MOAs.

1.34 AIR TRAFFIC CONTROL (ATC)

Air traffic control (ATC) is a service provided by an appropriate authority (primarily by the FAA) to assure safety and to promote the orderly, expeditious flow of air traffic. Generally, ATC services are provided by ground-based controllers whose primary task is to maintain separation between all aircraft within their control by preventing them from coming too close to each other horizontally or vertically. Secondary tasks include ensuring orderly and expeditious flow of traffic and providing relevant information to pilots, such as radar traffic advisories, weather advisories, flight following, and navigation information. The ability to provide these additional services can be limited by many factors, such as the volume of traffic, frequency congestion,

quality of radar, controller workload, higher priority duties, and the pure physical inability to scan and detect those situations that fall in this category.

ATC services can be divided into two major subspecialties: terminal or airport control, and en-route or area control. Terminal or airport control includes the control of traffic (aircraft and vehicles) on the airport surface and airborne aircraft within the immediate airport environment as dictated and described in the previous airspace definitions. Terminal controllers work in air traffic control towers (ATCT) and terminal control centers, otherwise known as Terminal Radar Approach Control facilities or TRACONs. Generally, ATCTs are responsible for the airspace within 1 to 10 nautical miles of their host airport, and provide air traffic control services for aircraft operating in the immediate vicinity of and on the airport. Controllers at ATCTs are responsible for ensuring that safe separations are maintained between arrivals during their final approaches; establishing a sequence of departing aircraft on the ground; providing approach and departure clearances; monitoring flight training activity (i.e., touch-and-go operations); and providing ground control services.

Related to ATCTs, a TRACON has an additional primary responsibility of sequencing arrivals and departures to and from airports within their airspace. TRACON controllers also provide separation services to aircraft that transit its airspace, including establishing arrival and departure sequences in order to maximize the efficient use of TRACON airspace while ensuring that safe separations are maintained among aircraft operations.

En-route controllers work at facilities called area control centers or Air Route Traffic Control Centers (ARTCCs), and generally control the traffic between the terminal areas. They can also control traffic in and out of airports where the traffic volume does not warrant the establishment of a terminal ATC operation or during periods when a terminal ATCT is closed. One of the primary duties of ARTCC controllers is to ensure that safe separations are maintained among aircraft before arrivals enter and after departures leave TRACON airspace. As such, ARTCC controllers are responsible for the initial sequencing and metering of arrivals into TRACON airspace.

ATC facilities serving air traffic in the Lakeland area include the following: the

Jacksonville ARTCC to the north, the Miami ARTCC to the south; the Tampa TRACON located at Tampa International, the Orlando TRACON located at Orlando International; and ATCTs located at various area airports, including Bartow Municipal Airport (BOW), Kissimmee Gateway Airport (ISM), Albert Whitted Airport (SPG), and St. Petersburg Clearwater International Airport (PIE).

LAL is currently served by a contract ATCT operated by Robinson Aviation, Inc. (RVA), having six full-time operators (with two to three operators in the cab at any one time) as well as an ATCT manager. Constructed in 1980, the ATCT controls the Class D airspace during its operational hours of 6:00 AM to 10:00 PM. After 10:00 PM, the Tampa TRACON assumes responsibility of the airspace for flights on an instrument flight plan. For all other flights, it is the pilot's responsibility to see, avoid and communicate with other aircraft in the area.

1.35 NAVIGATIONAL AIDS (NAVAIDS)

A navigational aid (or NAVAID) is generally defined as any facility used by an aircraft for navigation. Various types of NAVAIDS are in use today, each serving a special purpose, and having a wide variety of owners and operators, including the Federal Aviation Administration (FAA), the military services, private organizations, individual states and foreign governments. The FAA has the statutory authority to establish, operate, and maintain air navigation facilities, as well as to prescribe standards for the operation of any of these aids which are used for instrument flight in federally controlled airspace. These aids are tabulated in the Airport/Facility Directory (A/FD).

In the vicinity of an Airport, the NAVAIDS available for use by pilots include VORTAC facilities, Instrument Landing System (ILS), Global Positioning System (GPS) Non-Directional radio Beacon (NDB) facilities, and an Automatic Dependent Surveillance Broadcast (ADS-B) system. A VORTAC (VHF Omnidirectional Range/Tactical Air Navigation) is a navigational aid providing VOR azimuth, TACAN Azimuth, and TACAN distance measuring equipment (DME) at a single site. An ILS is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. It is comprised of two highly directional transmitting systems (known as the localizer and glide slope transmitters) and, along the approach, three (or fewer) marker beacons.

GPS is a satellite-based radio navigation system that broadcasts a signal used by receivers to determine precise position anywhere in the world. GPS forms the basis of all new air navigational systems.

NDBs are general purpose low- or medium-frequency radio beacons that an aircraft equipped with a loop antenna can home in on or determine its bearing relative to the sending facility.

The Automatic Dependent Surveillance Broadcast (ADS-B) system provides pilots with up to the second updated information on weather and other aircraft in the vicinity. This system enables pilots to identify potential flight and incursion hazards well in advance. The system also receives aeronautical flight information regarding temporary flight restrictions and special use airspace.

The Lakeland VORTAC (116.0 LAL) is located on LAL and the St. Petersburg VORTAC (116.4 PIE) is located approximately 36 NM west of the Airport. LAL has an ILS (110.1) to Runway 5 that includes a Locator Outer Marker (LOM). In terms of GPS, there are several key airspace fixes surrounding the Airport, including PLUMY, IPUNE, SANOY, ZUXON, OBTOQ, JAKEN, ECADE, CAMIV, PICDO, FAPES, NANTE, MIREE, BIYAT, LEZTI, JOVMU, EHAGU, RETME, GILDE, and KONDE. Regarding NDBs, Lakeland Linder utilizes its LOM (227 WIREY) as an NDB for the Airport. Additionally, there are numerous other NDBs within the area, including Plant City (346 PCM), 8 NM west of the Airport; Zephyrhills (253 RHZ), Knight (270 TPF), 24 NM west of the Airport; 16 NM northwest of the Airport, and Kissimmee (329 ISM), 36 NM northeast of the Airport.

A network of low-altitude published airways (victor airways) in the vicinity of the Airport also traverses the area, which span between the regional ground-based VOR/DME and VORTAC equipment. Victor airways include the airspace within parallel lines located 4 NM on either side of the airway and extend 1,200 Ft AMSL to, but not including, 18,000 Ft AMSL. The ADS-B requires a Universal Access Transceiver (UAT) in order to receive the 978 MHz signal. Unlike current GPS, the ADS-B is available for free to anyone with the equipment to receive it.

1.36 INSTRUMENT APPROACH & DEPARTURE PROCEDURES

Instrument approach and departure procedures are established for airports to facilitate the safe operation of aircraft landing at or departing from a given airport

during periods of inclement weather and/or as required by operational requirements. When visibility and cloud ceilings near an airport deteriorate to a point where visual flight can no longer be conducted safely, aircraft must either follow published instrument approach procedures to locate and land at that airport, or divert to another airport. Additionally, some aircraft operate under instrument flight rules (IFR) regardless of weather conditions, requiring the possible use of predetermined instrument arrival and departure routes.

Specifically, Instrument Approach Procedures (IAPs) are navigational procedures designed to align an aircraft with a runway end for landing during periods of reduced cloud ceiling height and visibility. All IAPs in the United States are based on joint civil and military criteria contained in the U.S. Standard for Terminal Instrument Procedures (TERPS). The design of IAPs based on criteria contained in TERPS takes into account the interrelationship between airports, facilities, the surrounding environment, terrain, obstacles, noise sensitivity, etc. Appropriate altitudes, courses, headings, distances, and other limitations are specified and, once approved, the procedures are published and distributed by government and commercial cartographers as instrument approach charts.

There are two general categories of IAPs, precision or non-precision. A precision IAP provides both horizontal and vertical navigation guidance, as well as range (distance) information. A non-precision approach provides only horizontal guidance and some may provide range information.

The Airport is currently served by eight published instrument approach procedures established that utilize both ground-based and satellite-based navigational aids. Collectively, these procedures provide electronic navigation to each runway end when locally reported meteorological conditions are at or above pre-established landing minima reported as cloud ceiling height measured in Ft above the runway end elevation level and horizontal visibility measured in miles. Those current approaches are listed and summarized in **Table 1.36A**, and are shown in **Figure 1.36A** through **Figure 1.36H**.

Due to periods of airspace congestion, the FAA has established two Standard Terminal Arrival (STAR) procedures.

A STAR is a pre-planned air traffic control arrival procedure designed to provide for

the transition from the enroute phase of flight to an outer fix or an instrument approach fix in the terminal area. The two published STARs for the Airport are titled Blonde One and Dades One; they are shown in **Figure 1.36I** and **Figure 1.36J**.

Type of Approach	Runway Designation	Lowest Ceiling Minimums	Lowest Visibility Minimums
ILS OR LOC	05	200' (AGL)	½ mile
RNAV (GPS) - LPV	05	200' (AGL)	½ mile
RNAV (GPS) - LPV	09	400' (AGL)	1 mile
RNAV (GPS) - LPV	23	300' (AGL)	1 mile
RNAV (GPS) - LPV	27	400' (AGL)	1 mile
VOR	09	600' (AGL)	1 mile
VOR	27	500' (AGL)	1 mile
NDB	05	500' (AGL)	¾ mile

Table 1.36A LAL Instrument Approach Procedures
Source: U.S. Terminal Procedures, SE-3, 11 February 2010

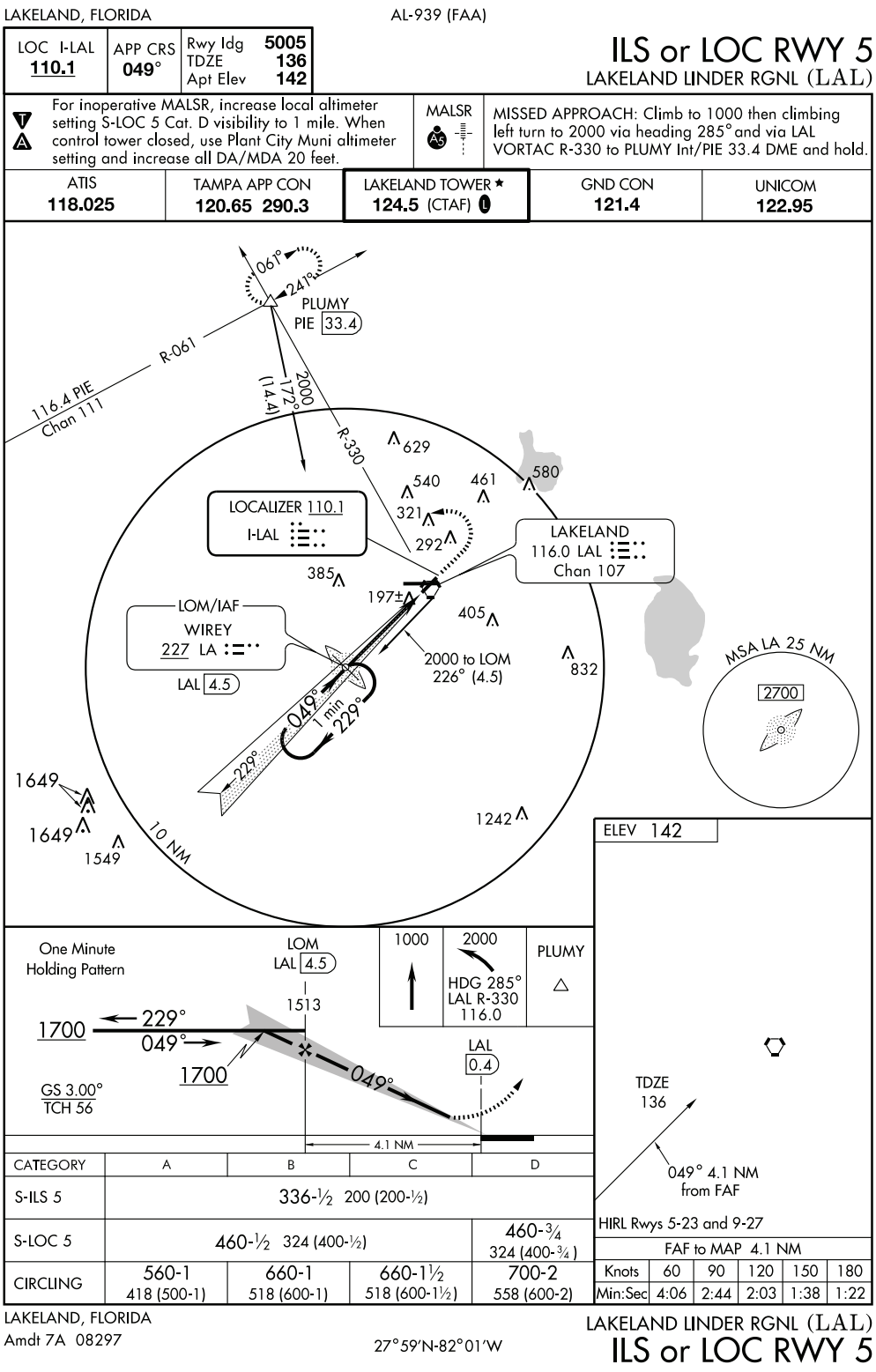

Figure 1.36A
ILS OR LOC RUNWAY 5 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

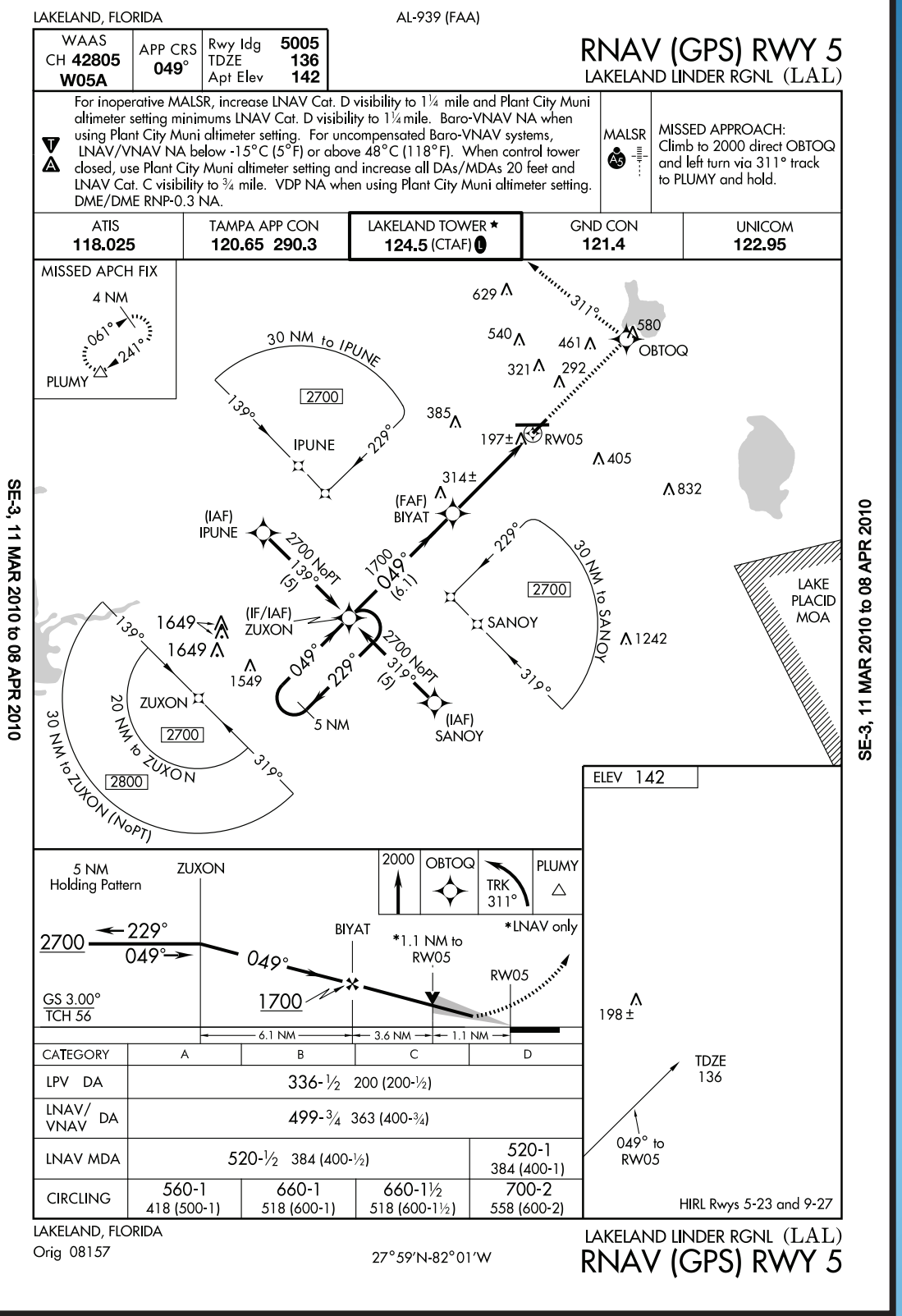

Figure 1.36B
GPS RUNWAY 5 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

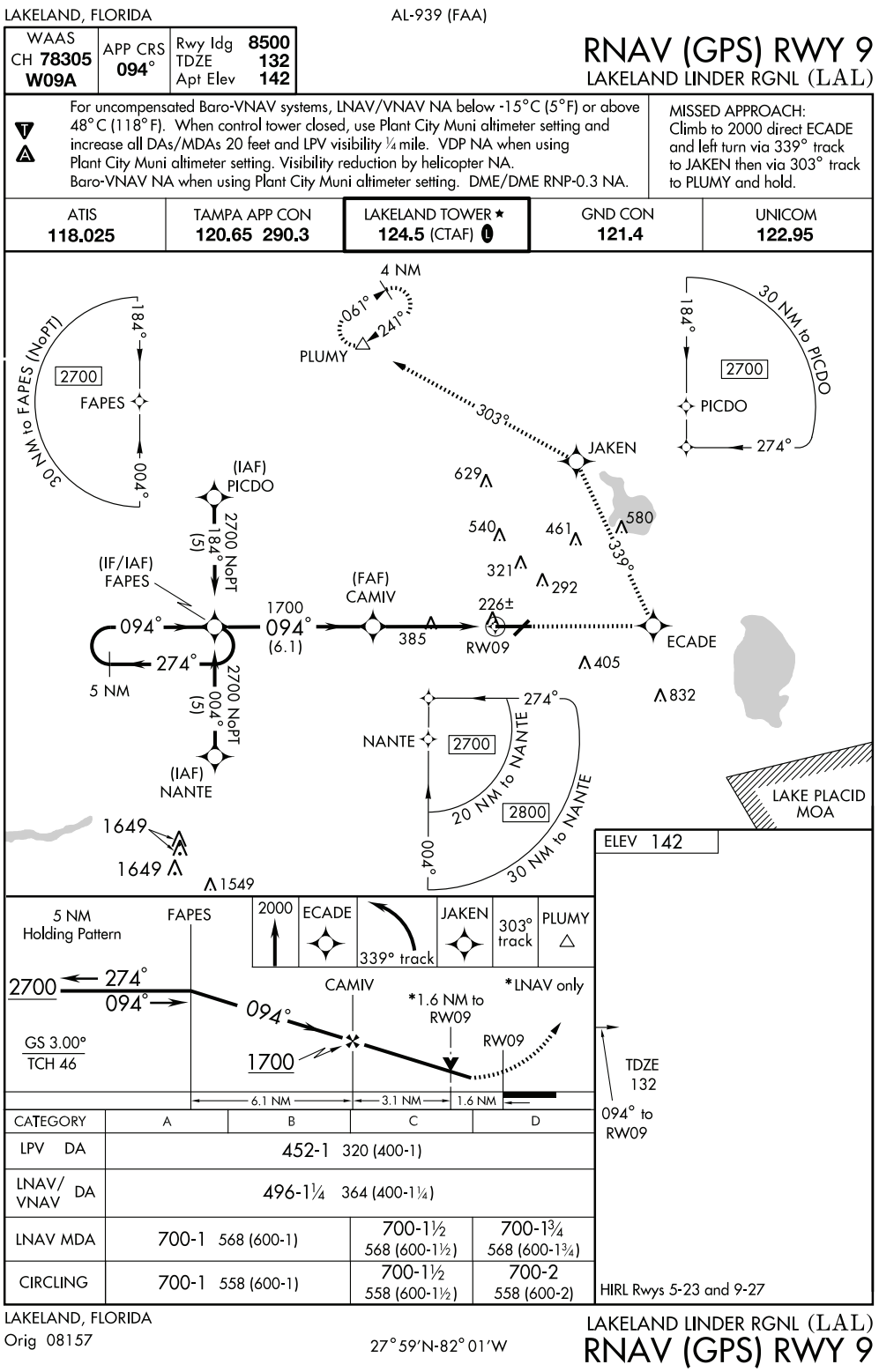

Figure 1.36C
GPS RUNWAY 9 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

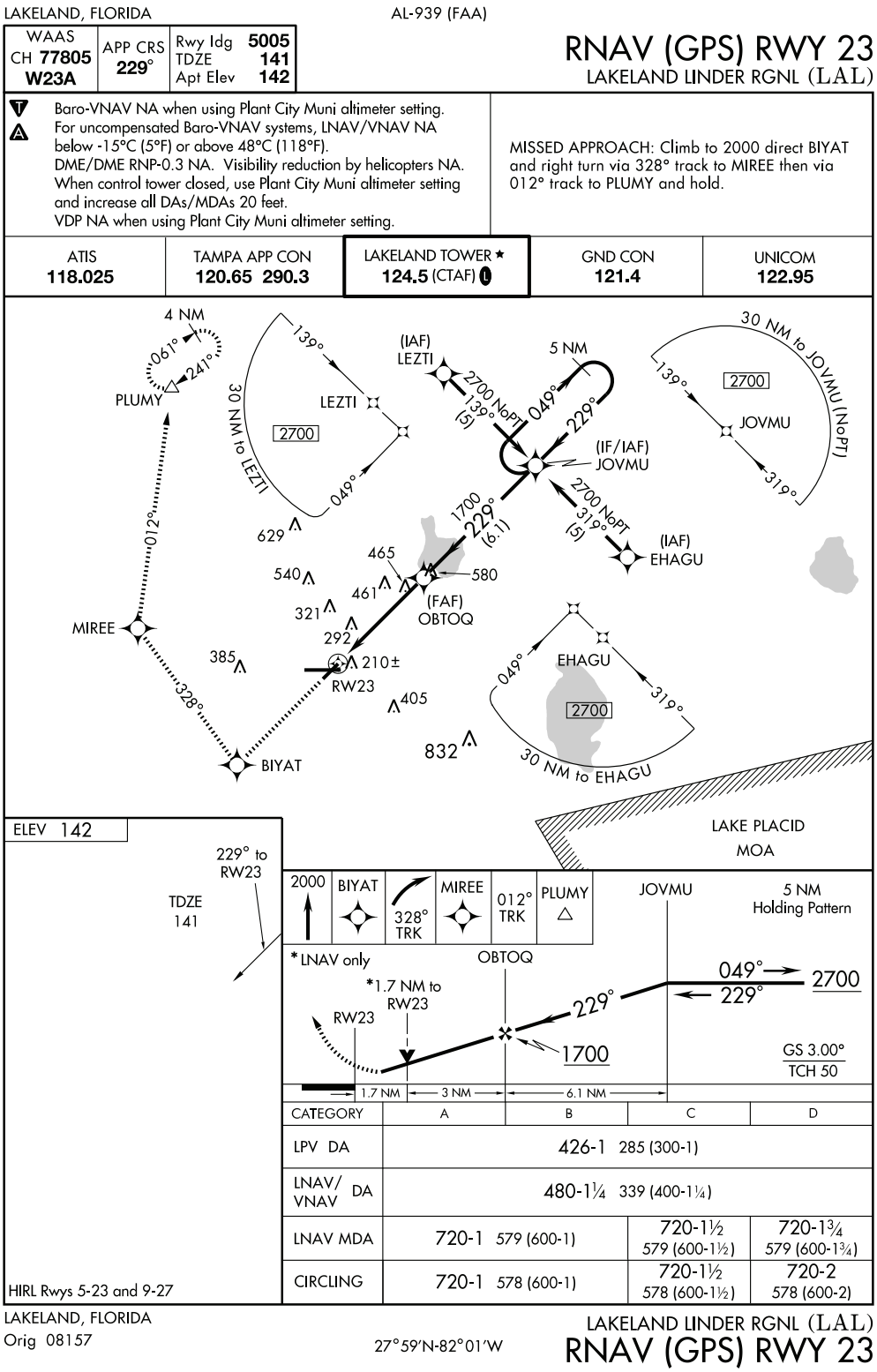

Figure 1.36D
GPS RUNWAY 23 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

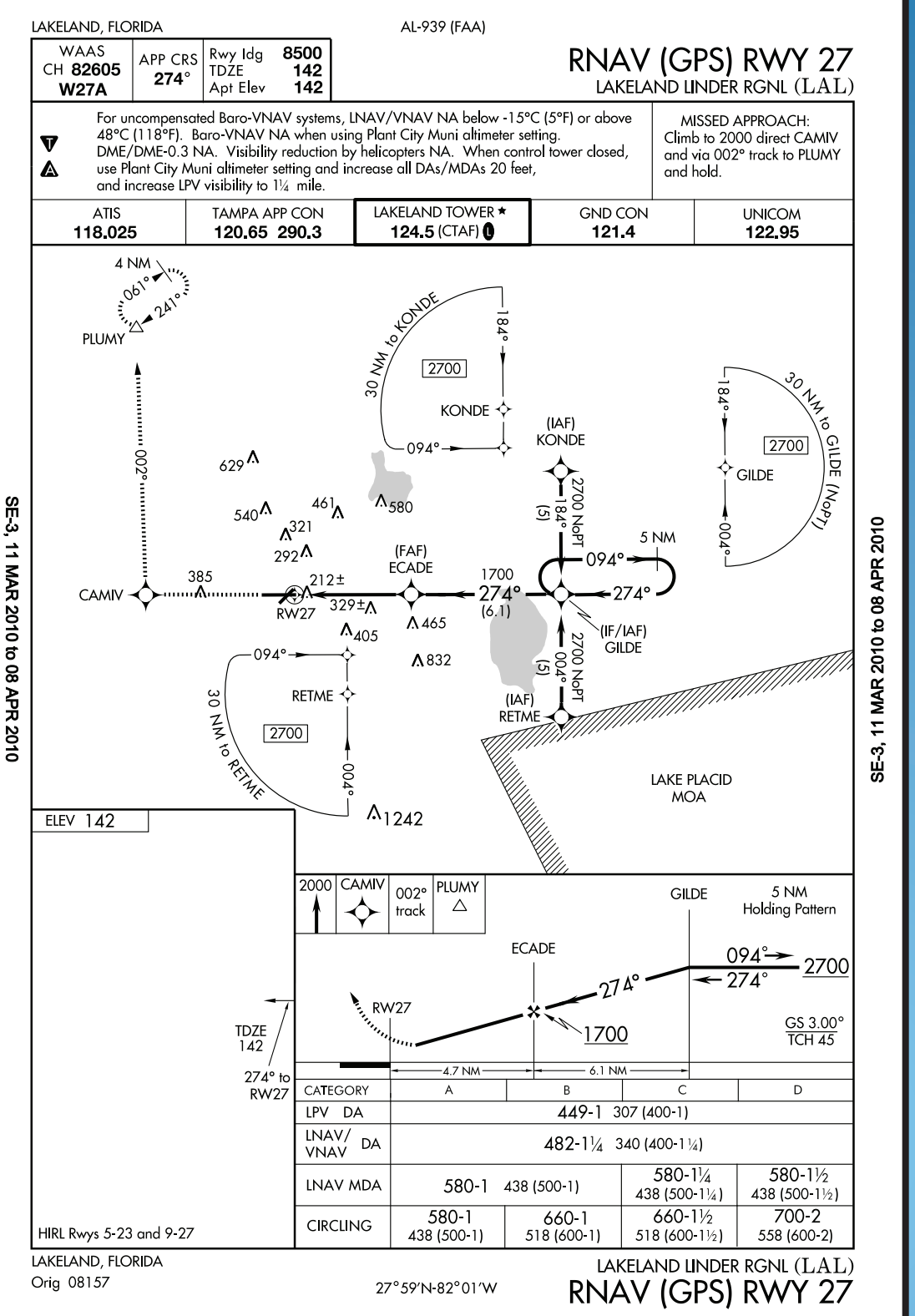

Figure 1.36E
GPS RUNWAY 27 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

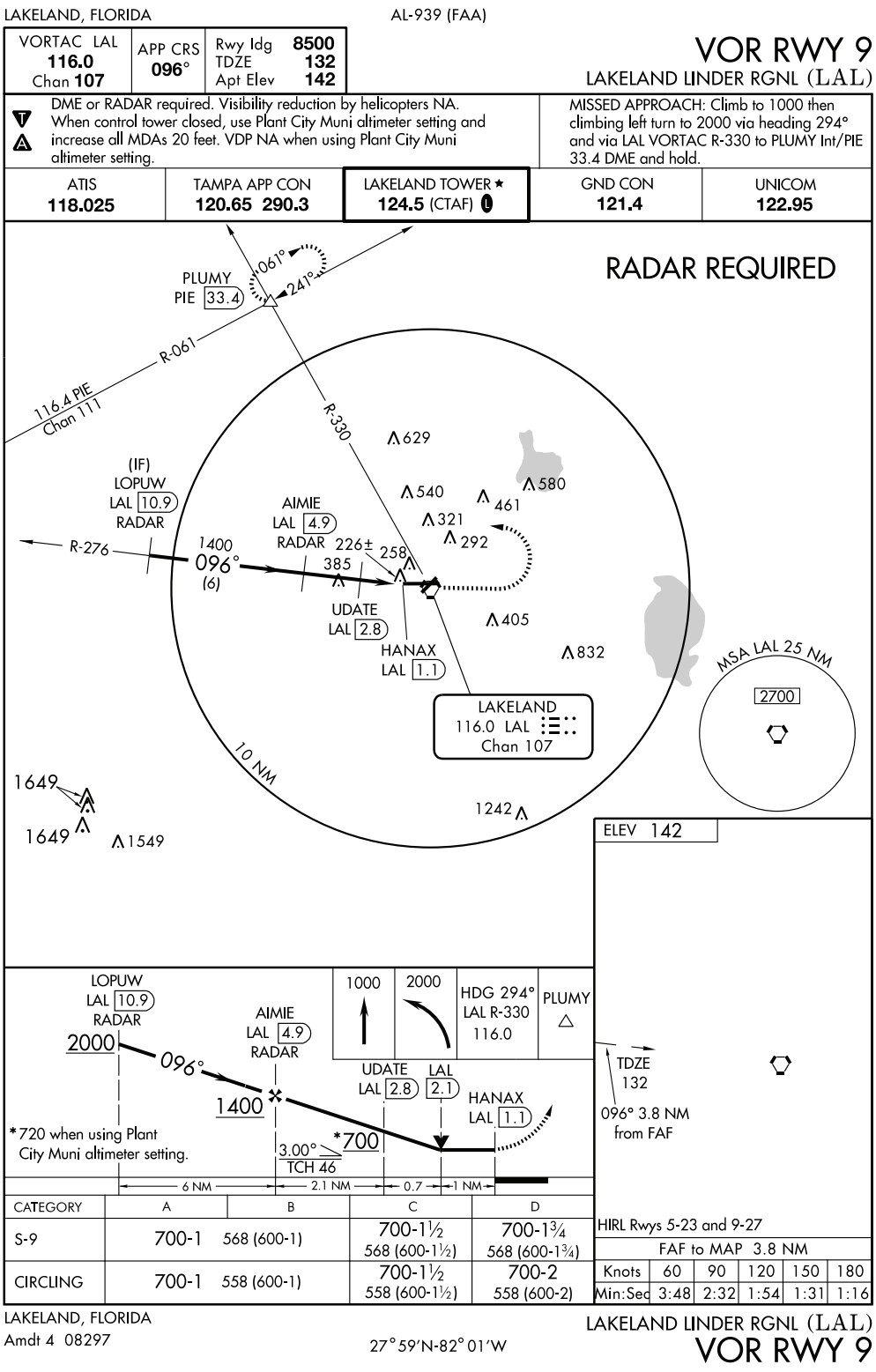

Figure 1.36F
VOR RUNWAY 9 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

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LAKELAND, FLORIDA

AL-939 (FAA)

VOR RWY 27

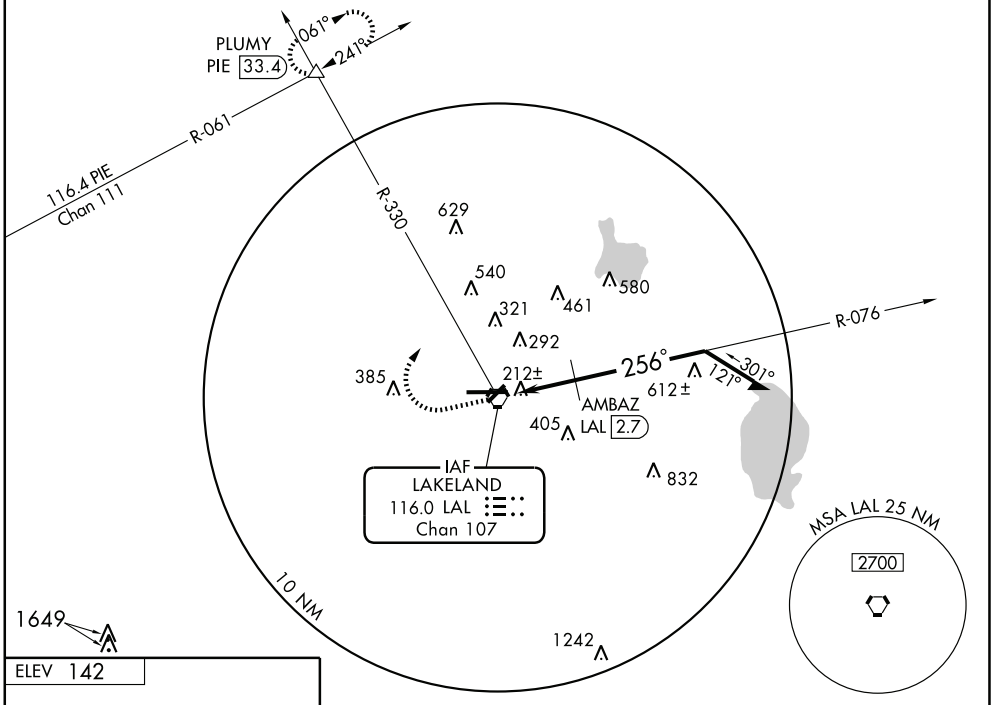
LAKELAND LINDER RGNL (LAL)

VORTAC LAL	APP CRS	Rwy Idg	8500
116.0	256°	TDZE	142
Chan 107		Apt Elev	142

When control tower closed, use Plant City Muni altimeter setting and increase all MDAs 20 feet and increase AMBAZ Fix minimums S-27 Cat. D visibility to 1¼ mile. Visibility reduction by helicopters NA.

MISSED APPROACH: Climb to 1000 then climbing right turn to 2000 via heading 017° and LAL VORTAC R-330 to PLUMY Int/PIE 33.4 DME and hold.

ATIS	TAMPA APP CON	LAKELAND TOWER ★	GND CON	UNICOM
118.025	120.65 290.3	124.5 (CTAF) L	121.4	122.95



SE-3, 11 MAR 2010 to 08 APR 2010

SE-3, 11 MAR 2010 to 08 APR 2010

ELEV 142

TDZE 142

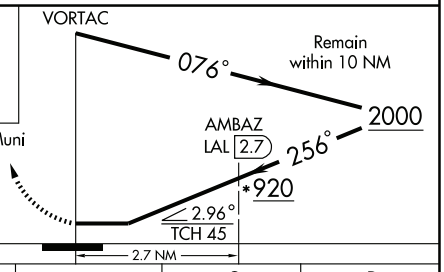
256° to VORTAC

HIRL Rwys 5-23 and 9-27

Knots	60	90	120	150	180
Min:Sec					

1000	2000	PLUMY
↑	HDG 017° LAL R-330 116.0	△

*940 when using Plant City Muni altimeter setting.



CATEGORY	A	B	C	D
S-27	920-1 778 (800-1)	920-1¼ 778 (800-1¼)	920-2¼ 778 (800-2¼)	920-2½ 778 (800-2½)
CIRCLING	920-1 778 (800-1)	920-1¼ 778 (800-1¼)	920-2¼ 778 (800-2¼)	920-2½ 778 (800-2½)
AMBAZ FIX MINIMUMS				
S-27	480-1 338 (400-1)			
CIRCLING	560-1 418 (500-1)	660-1 518 (600-1)	660-1½ 518 (600-1½)	700-2 558 (600-2)

LAKELAND, FLORIDA
Amdt 7A 08157

27°59'N-82°01'W

LAKELAND LINDER RGNL (LAL)

VOR RWY 27

City of LAKELAND

LAKELAND LINDER REGIONAL AIRPORT

Figure 1.36G
VOR RUNWAY 27 APPROACH
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

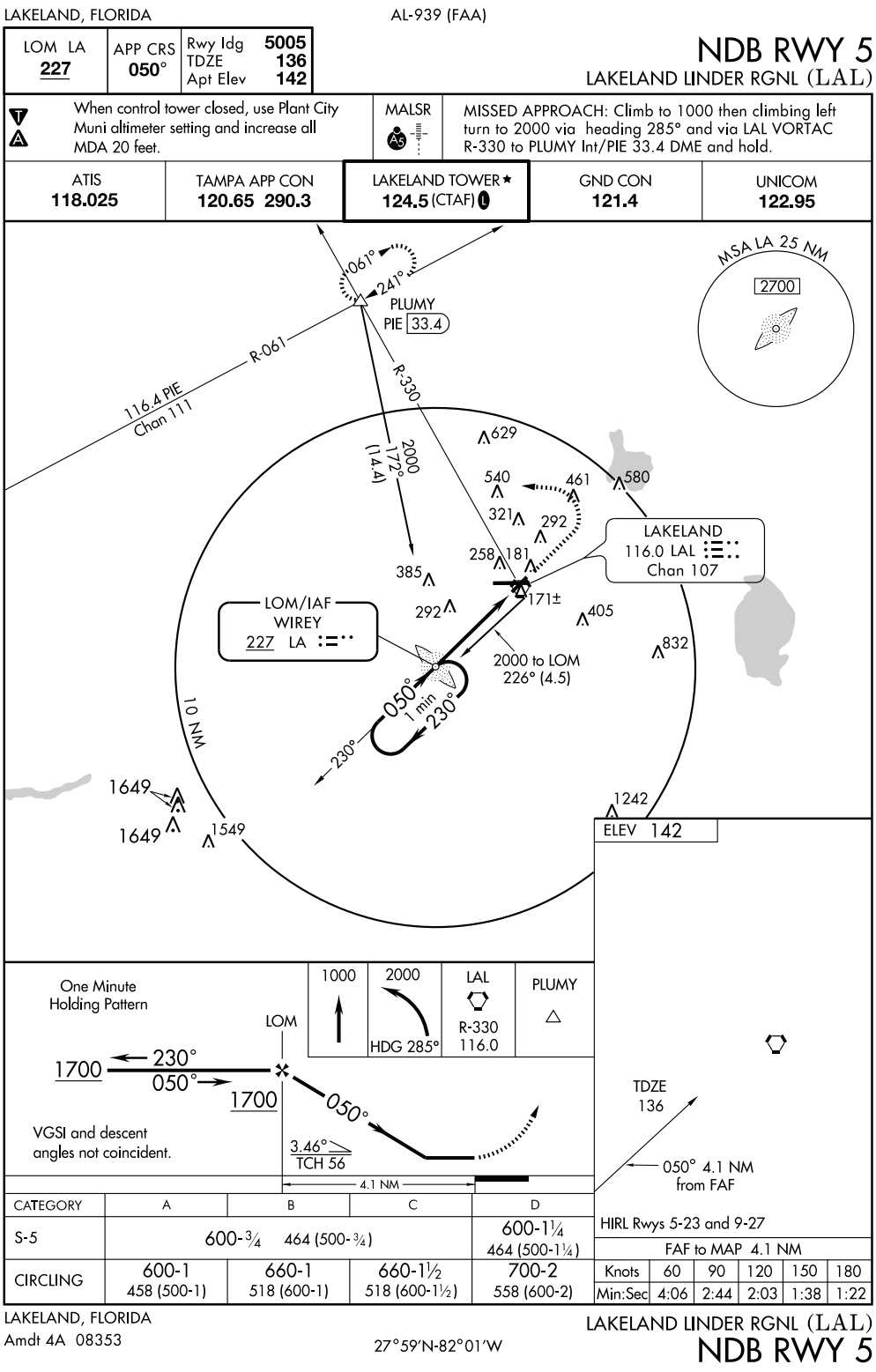


Figure 1.36H
NDB RUNWAY 5
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

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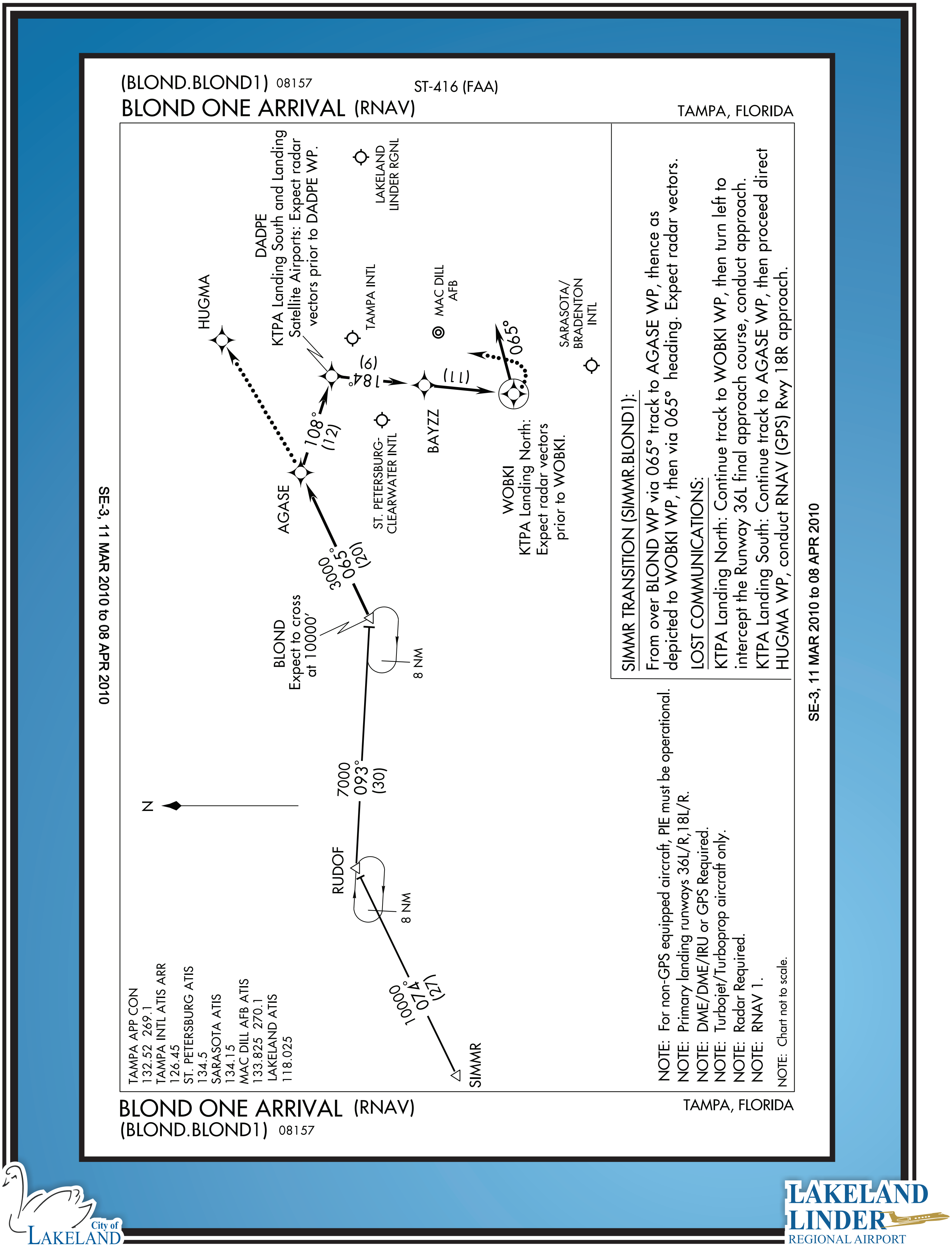
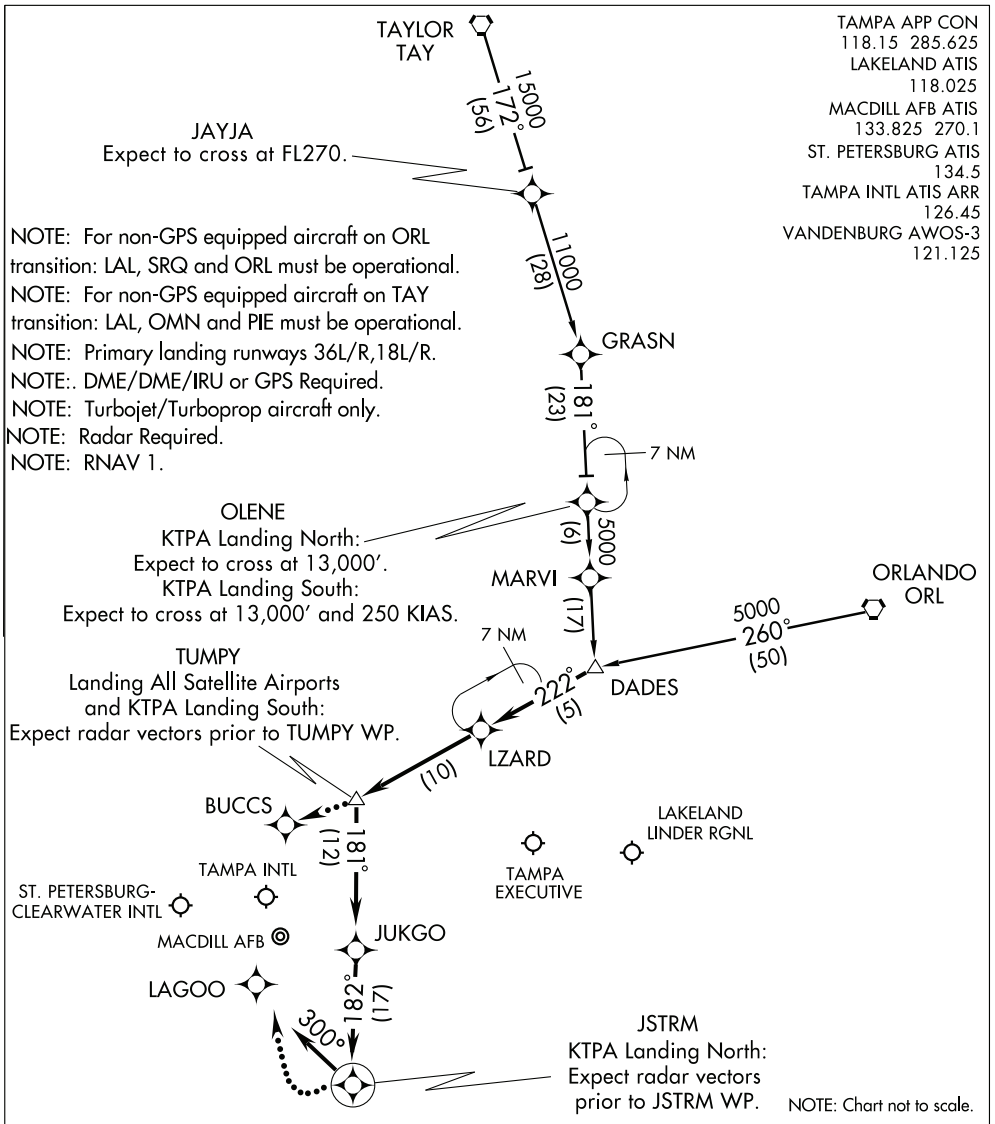


Figure 1.36I
BLOND ONE ARRIVAL
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

(DADES.DADES1) 09183 ST-416 (FAA)

DADES ONE ARRIVAL (RNAV)

TAMPA, FLORIDA



SE-3, 11 MAR 2010 to 08 APR 2010

SE-3, 11 MAR 2010 to 08 APR 2010

ORLANDO TRANSITION (ORL.DADES1):

TAYLOR TRANSITION (TAY.DADES1):

From DADES WP via 222° track to LZARD WP, thence as depicted to JSTRM WP, then via 300° heading. Expect radar vectors.

LOST COMMUNICATIONS:

KTPA Landing North: Continue track to JSTRM WP, then turn right to intercept the Runway 36L final approach course, conduct approach.

KTPA Landing South: Continue track to TUMPY WP, proceed direct BUCCS WP, then intercept the Runway 18L final approach course, conduct approach.

DADES ONE ARRIVAL (RNAV)

TAMPA, FLORIDA

(DADES.DADES1) 09183

City of LAKELAND

LAKELAND LINDER REGIONAL AIRPORT

Figure 1.36J
DADES ONE ARRIVAL
Source: U.S. Terminal Procedures, SE-3, 11 March 2010

1.4 AIRSPACE SURFACES & RUNWAY PROTECTION ZONES

1.41 FAR PART 77, OBJECTS AFFECTING NAVIGABLE AIRSPACE

As a standard practice, the FAA establishes regulations for the protection of airspace for a variety of purposes, including for the protection of operating aircraft, the protection of facilities and people on the ground, and for ensuring maximum operational effectiveness of aviation-related facilities. These regulations are expressed through a variety of different airspace imaginary surfaces, penetration of which would trigger a violation of that representative regulation.

For the purposes of this Master Plan, the review of these airspace surfaces will include Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), *Objects Affecting Navigable,* which establishes standards regarding objects that may affect navigable airspace. The standards included within Part 77 apply to the use of navigable airspace by aircraft and to existing air navigation facilities, such as an air navigation aid, airport, Federal airway, instrument approach or departure procedure, or approved off airway route. Additionally, they apply to a planned facility or use, or a change in an existing facility or use. Specifically, 14 CFR Part 77 provides guidance on the following elements:

Establishes standards for determining obstructions in navigable airspace; sets forth the requirements for notice to the Administrator of certain proposed construction or alteration; provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace; provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and provides for establishing antenna farm areas.

Furthermore, 14 CFR Part 77 applies to the following type of obstructions and actions:

Any object of natural growth, terrain, or permanent or temporary construction or alteration, including equipment or materials used therein, and apparatus of a permanent or temporary character; and alteration of any permanent or temporary existing structure by a change in its height (including appurtenances), or lateral dimensions, including equipment or materials used therein.

14 CFR Part 77 requires that notice be given to the FAA prior to construction or alteration

of certain structures. Upon notice, the FAA will initiate an aeronautical study to determine the safety impact of the potential obstruction. This determination is made, in part, after evaluating the potential obstruction's relationship to imaginary surfaces defined in 14 CFR Part 77. At the completion of the FAA's initial evaluation, a FAA determination on the effect of a potential obstruction on navigable airspace may result in one of the following findings:

- The proposed structure or alteration would not exceed any standard of 14 CFR Part 77 and would not be a hazard to air navigation;

- The proposed structure or alteration would exceed a standard of 14 CFR Part 77 but would not be a hazard to air navigation; or

- The proposed structure or alteration would exceed a standard of 14 CFR Part 77 and further aeronautical study is necessary to determine whether it would be a hazard to air navigation, that the sponsor may request within 30 days that further study, and that, pending completion of any further study, it is presumed the construction or alteration would be a hazard to air navigation.

- The imaginary surfaces, defined in 14 CFR Part 77, are described below and depicted on **Figure 1.41A**.

1.41A Primary Surface

A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 Ft beyond each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The primary surface width corresponds to the following guidance:

- 250 Ft for utility runways having only visual approaches.

- 500 Ft for utility runways having non-precision instrument approaches.

For other than utility runways the width is:

- 500 Ft for visual runways having only visual approaches.

- 500 Ft for non-precision instrument runways having visibility minimums greater than three-fourths statute mile.

- 1,000 Ft for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as three-fourths of a

statute mile, and for precision instrument runways.

Note that the width of the primary surface of an entire runway will be that which is required for the most precise existing or planned approach for either end of the runway.

1.41B Approach Surface

A surface that is longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

- 1,250 Ft for that end of a utility runway with only visual approaches;
- 1,500 Ft for that end of a runway other than a utility runway with only visual approaches;
- 2,000 Ft for that end of a utility runway with a non-precision instrument approach;
- 3,500 Ft for that end of a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile;
- 4,000 Ft for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as three-fourths statute mile; and
- 16,000 Ft for precision instrument runways.

The approach surface extends for a horizontal distance of:

- 5,000 Ft at a slope of 20 to 1 for all utility and visual runways;
- 10,000 Ft at a slope of 34 to 1 for all non-precision instrument runways other than utility; and,
- 10,000 Ft at a slope of 50 to 1 with an additional 40,000 Ft at a slope of 40 to 1 for all precision instrument runways.

The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

1.41C Transitional Surfaces

These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface that project through and beyond the limits of the conical surface extend a distance of 5,000 Ft measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

1.41D Horizontal Surface

The Horizontal Surface is a horizontal plane 150 Ft above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.

- The radius of each arc corresponds to the following:

- 5,000 Ft for all runways designated as utility or visual;

- 10,000 Ft for all other runways. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000 Ft arc is encompassed by tangents connecting two adjacent 10,000 Ft arcs, the 5,000 Ft arc shall be disregarded on the construction of the perimeter of the horizontal surface.

1.41E Conical Surface

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

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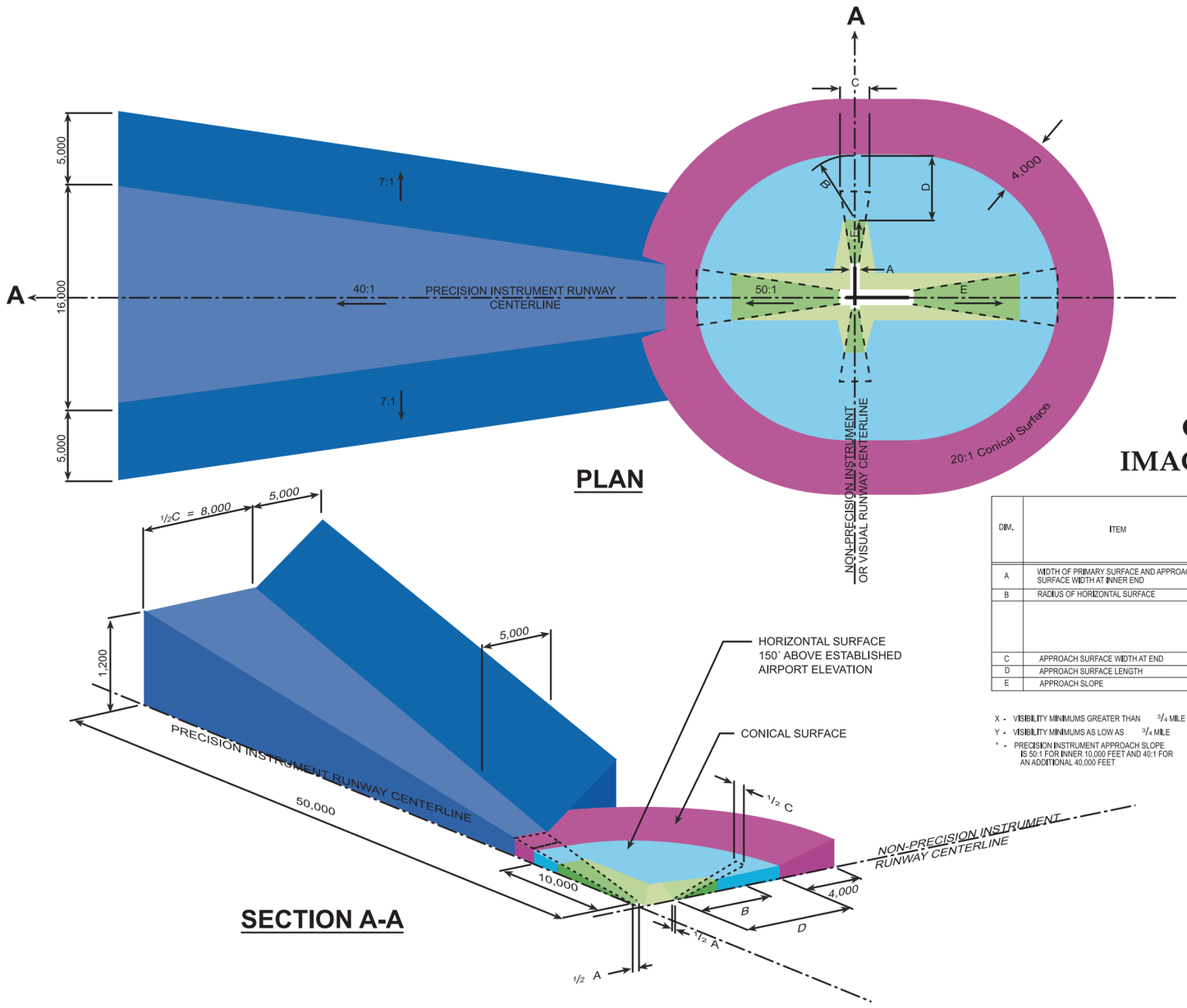
LAKELAND LINDER REGIONAL AIRPORT



SURFACE SLOPE KEY

- HORIZONTAL SURFACE
- 20:1
- 7:1
- 7:1
- VARIES (SEE "E" VALUE IN TABLE BELOW)
- 40:1 (PRECISION INSTRUMENT RUNWAY ONLY)

CIVIL AIRPORT IMAGINARY SURFACES

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

X - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
Y - 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

City of LAKELAND

Figure 1.41A
FAA - FAR PART 77 IMAGINARY SURFACES
Source: http://www.wsdot.wa.gov/aviation/Planning/CivAPImagSurf.htm

1.41F Part 77 Surfaces for Lakeland Linder Regional Airport

For purposes of defining the Part 77 surfaces, both Runway 9 and Runway 27 have been classified as non-precision instrument runways with approach visibility minimums greater than ¾ mile. **Table 1.41A** presents the appropriate Part 77 airspace surface specifications for Runway 9-27.

Runway 5 has been classified as a precision instrument runway with approach visibility minimums less than ¾ mile, while Runway 23 has been classified as a non-precision instrument runway with approach visibility minimums greater than ¾ mile. **Table 1.41B** presents the appropriate airspace surface specifications for Runway 5-23.

Table 1.41A LAL FAR Part 77 Surfaces – Runway 9/27

Part 77 Surface	Runway 9	Runway 27
Primary Surface	500 wide; extends 200' beyond each RW end; surface elevation = nearest runway centerline elevation	
Approach Surfaces	34:1 for 10,000' 500' wide at primary surface 3,500' wide at surface extents	34:1 for 10,000' 500' wide at primary surface 3,500' wide at surface extents
Transitional Surfaces	7:1	
Horizontal Surface	Arc radius = 10,000', 150' AGL (292' MSL)	
Conical Surface	20:1 slope for horizontal distance of 4,000' (Starts as 292' MSL and climbs to 492' MSL)	

Note: Assumes airport elevation of 142' MSL

Table 1.41B LAL FAR Part 77 Surfaces – Runway 5/23

Part 77 Surface	Runway 5	Runway 23
Primary Surface	1000 wide; extends 200' beyond each RW end; surface elevation = nearest runway centerline elevation	
Approach Surfaces	50:1 for 10,000' 40:1 for 40,000' 1,000' wide at primary surface 16,000' wide at surface extents	34:1 for 10,000' 1,000' wide at primary surface 3,500' wide at surface extents
Transitional Surfaces	7:1	
Horizontal Surface	Arc radius = 10,000', 150' AGL (292' MSL)	
Conical Surface	20:1 slope for horizontal distance of 4,000' (Starts as 292' MSL and climbs to 492' MSL)	

Note: Assumes airport elevation of 142' MSL

1.41G Current Conditions of Runway Approaches

Based on current instrument approaches, as well as current field inspection reports of those approaches (via airport 5010 inspections), the current conditions of the runway approaches are as follows:

- *Runway 9 Approach* – Non-precision approach with a Touchdown Crossing Height (TCH) of 46 Ft. Reported as having trees 423 Ft from departure end of runway, 53 Ft right of centerline, up to 68 Ft AGL / 212 Ft MSL. Trees 590 Ft from departure end of runway, 185 Ft left of centerline, up to 66 Ft AGL / 210 Ft MSL.

- *Runway 27 Approach* – Non-precision approach with a TCH of 45 Ft Reported as having trees 70 Ft from departure end of runway, 75 Ft left of centerline, up to 78 Ft AGL / 207 Ft MSL. Pole 383 Ft from departure end of runway, 476 Ft left of centerline, 16 Ft AGL / 155 Ft MSL. Trees 1795 Ft from departure end of runway, 116 Ft right of centerline, up to 76 Ft AGL / 205 Ft MSL.

- *Runway 5 Approach* – Precision approach without any TCH. Reported as having trees 720 Ft from departure end of runway, 49 Ft right of centerline, up to 47 Ft AGL / 191 Ft MSL. Trees 869 Ft from departure end of runway, 219 Ft left of centerline, up to 39 Ft AGL / 183 Ft MSL.

- *Runway 23 Approach* – Non-precision approach with a TCH of 50 Ft (See Runway 5 departure conditions).

1.41H Known and Chartered Objects/Obstructions

Referencing the most recent (March 1993) National Ocean Service (NOS) Obstruction Data Sheet (No. 309) prepared for the Lakeland Linder Regional Airport, a total of 23 objects were surveyed as potential obstructions to air navigation. Those objects were identified as follows:

Lighted Objects:

- Antennas
- 1 VORTAC
- 1 Airport Rotating Beacon
- 1 Hangar
- 1 Water tank

Non-Lighted Objects:

- 16 Trees
- 1 Pole

The current Airport Certification Manual for LAL also lists several additional lighted obstructions which include the following:

- 4 Windsocks
- 4 Airport Terminal Ramp Lights
- 1 Wastewater lift station antenna
- 1 Self service fuel sign
- Airport Maintenance Vault
- Glide Slope Antenna RWY 5
- Localizer Antenna RWY 5
- ADS-B Antenna

1.42 Runway Protection Zones

A Runway Protection Zone (RPZ) is a predefined area of land, trapezoidal in shape and centered about the extended runway centerline. As described in FAA AC 150/5300-13, *Airport Design*, the function of the RPZ is to enhance the protection of people and property on the ground by prohibiting or limiting certain land uses, such as residences, places of public assembly, fuel storage facilities, and man-made or natural environs that may serve to attract wildlife hazards. Ideally, this prohibition would be achieved through airport ownership or control of the RPZ.

Such control includes clearing (and maintaining them clear) RPZ areas of incompatible objects and activities, and is critical to ensuring that inappropriate development does not take place in the runway approaches.

An RPZ begins 200 Ft beyond the end of the runway pavement that is usable for takeoffs and landings. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end. Generally, as the aircraft size increases and the approach minimums become more precise, the dimensions of the RPZ increase. Note that displacing the landing or takeoff threshold does not change the beginning point of the RPZ, unless declared distances are applied. Based on the design assumptions noted previously, **Table 1.42A** describes LAL's current RPZ dimensions, acreage and controlling interests.

Runway	Category	Dimensions / Details
Runway 9	Inner Width	500’
	Outer Width	1,010
	Length	1,700’
	Acreage	29.465 acres
	Control	All Airport Owned
Runway 27	Inner Width	500’
	Outer Width	1,010
	Length	1,700’
	Acreage	29.465 acres
	Control	All Airport Owned
Runway 5	Inner Width	1,000’
	Outer Width	1,750’
	Length	2,500’
	Acreage	78.914 acres
	Control	All Airport Owned
Runway 23	Inner Width	500’
	Outer Width	1,010
	Length	1,700’
	Acreage	29.465 acres
	Control	All Airport Controlled 17.65 acres (Airport Owned) 11.79 acres (via Easement)

Table 1.42A LAL RPZ Dimensions
Note: RPZ dimensions based on existing instrument approaches (March 2010)

1.5 ENVIRONMENTAL SETTING

Based on the local environs, the potential for impacting wetlands, floodplains, threatened or endangered species is minimal.

1.5A Wetlands

Executive Order 11990 entitled “Protection of Wetlands” defines those lands considered to be wetlands and indicates appropriate measures that should be taken for their protection. On the west side of the airport there are some man-made drainage canals dating back to when the airport was originally built, and some natural wetlands north and south of the west end of Runway 9/27.

1.5B Floodplains

No designated floodplain areas are located on the airport property or in its immediate vicinity.

1.51 METEOROLOGICAL CONDITIONS

Climatological conditions specific to the location of an airport not only influence the layout of the airfield, but also impact the use of the runway system. Variations in the weather resulting in limited cloud ceilings and reduced visibility typically lower airfield capacity, while changes in

wind direction and velocity typically dictate runway usage and also influence runway capacity. Additionally, variations within temperature and precipitation can impact airport operations.

In order to establish the historical pattern of these conditions at LAL, as well as temperature and precipitation, appropriate weather station data was obtained from the National Climactic Data Center (NCDC) of the National Oceanic Atmospheric Administration (NOAA) for the area.

1.51A Temperature

NOAA compiles data relating to temperature at various stations around the United States. This temperature data is presented in the Climatology of the United States, No. 81 for the State of Florida. The annual median temperature in the Lakeland region is 74.3º Fahrenheit, with the maximum mean temperature being in July (94.6º F) and the lowest mean temperature being in January (51.1º F).

1.51B Precipitation

NOAA compiles data relating to precipitation at various stations around the United States. This precipitation data is presented in the Climatology of the United States, No. 81 for the State of Florida. Within the Lakeland area, there is an average annual rainfall total of approximately 49.13 inches, with July being the wettest month (7.51 average inches) and April being the driest month (2.04 average inches). Note that more than 56 percent (28.17 inches) of the annual rainfall occurs during the four-month “wet season” of June through September.

1.51C Occurrences of Meteorological Conditions

The NCDC serves as a national resource for the tracking, collecting, administering, and dissemination of climate information, including that data generated by the nation’s extensive network of weather stations. In fact, Lakeland Linder Regional Airport has such a station (Weather Station 72211) located on its property. Data from this station was broken down and analyzed with respect to the standard meteorological condition categories utilized by the FAA. These are described in the following:

- Visual Flight Rules (VFR) or Visual Meteorological Conditions (VMC) occur whenever the cloud ceiling is at least 1,000 feet above ground level (AGL) and the visibility is at least three (3) statute miles. These conditions occur

at the Airport approximately 95.5% of the time annually.

- Instrument Flight Rules (IFR) or Instrument Meteorological Conditions (IMC) occur when the reported cloud ceiling is at least 500 feet AGL, but less than 1,000 feet and/or visibility is at least one (1) statute mile, but less than three (3) statute miles. These conditions occur at the Airport approximately 4.5% of the time annually.

- Poor Visibility and Ceiling (PVC) conditions exist whenever the cloud ceiling is less than 500 feet AGL and/or the visibility less than one (1) statute mile. These conditions occur at the Airport less than 0.05% of the time annually.

1.51C1 Wind Analysis

The direction and speed of the wind affects the direction in which traffic at an airport operates. Surface wind conditions have a direct effect on the operation of an airport. Runways not oriented to take the fullest advantage of prevailing winds will restrict the capacity of the airport to varying degrees. When landing and taking off, aircraft are able to properly operate on a runway as long as the wind component perpendicular to the direction of travel (defined as a crosswind) is not excessive.

The FAA has established the desirable wind coverage for an airport's runway system to be 95%, meaning that the runway orientation and configuration should be developed so that the maximum crosswind component is not exceeded more than 5% of the time annually. For the purpose of runway wind analyses, a crosswind component can be defined as the wind that occurs at a right angle to the runway centerline. Crosswind components of 10.5, 13, 16 and 20 knots were used for

analyzing the combined runway system at LAL per the requirements of FAA AC 150/5300-13, *Airport Design*, Change 15, par 203.

The following table (**Table 1.51A**) quantifies the wind coverage offered by the airport's existing runway system for all weather conditions, including the coverage for each runway end. **Figure 1.51A** shows the Airport’s All Weather Wind Rose. (It should be noted that wind data is recorded relative to “true” North and are analyzed as such with respect to the “true” runway headings. Runway naming conventions are based on magnetic headings.

Table 1.51A: LAL All Weather Runway Wind Coverage

Runway	10.5 Knot Crosswind	13 Knot Crosswind	16 Knot Crosswind	20 Knot Crosswind
Runway 09/27	96.53%	98.33%	99.70%	99.94%
Runway 09	82.22%	83.51%	84.58%	84.77%
Runway 27	74.90%	76.08 %	77.14%	77.36%
Runway 05/23	96.02%	98.20%	99.69%	99.95%
Runway 05	83.69%	84.97%	85.97%	86.11%
Runway 23	74.31%	75.90%	77.19%	77.43%
Combined 05/23 & 09/27	98.84%	99.62%	99.95%	99.99%

Note: Allows for standard 5-knot tailwind component
Source Station: Weather Station 72211 (Lakeland)
Observation Period: 2000 through 2009 (53.855 observations)

The following table (**Table 1.51B**) quantifies the wind coverage offered by the airport's existing runway system for VFR weather conditions, including the coverage for each runway end. **Figure 1.51A** shows the LAL VFR Weather Wind Rose.

Table 1.51B: LAL VFR Weather Runway Wind Coverage

Runway	10.5 Knot Crosswind	13 Knot Crosswind	16 Knot Crosswind	20 Knot Crosswind
Runway 09/27	96.63%	98.39%	99.71%	99.95%
Runway 09	81.94%	83.19%	84.22%	84.40%
Runway 27	74.40%	75.55%	76.58%	76.78%
Runway 05/23	96.02%	98.22%	99.71%	99.96%
Runway 05	83.61%	84.91%	85.90%	86.03%
Runway 23	74.09%	75.69%	76.98%	77.22%
Combined 05/23 & 09/27	98.89%	99.65%	99.96%	100.00%

Note: Allows for standard 5-knot tailwind component
Source Station: Weather Station 72211 (Lakeland)
Observation Period: 2000 through 2009 (50.894 observations)

Table 1.51C below quantifies the wind coverage offered by the airport's existing runway system for IFR weather conditions, including the coverage for each runway end. **Figure 1.51A** shows the Airport's IFR Weather Wind Rose.

Table 1.51C: LAL IFR Weather Runway Wind Coverage

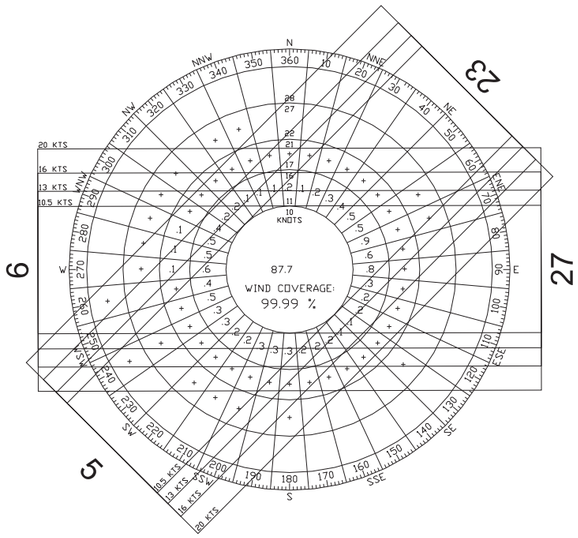
Runway	10.5 Knot Crosswind	13 Knot Crosswind	16 Knot Crosswind	20 Knot Crosswind
Runway 09/27	94.05%	96.80%	99.39%	99.86%
Runway 09	85.17%	87.36%	89.56%	89.93%
Runway 27	81.65%	83.53%	85.55%	86.01%
Runway 05/23	95.42%	97.64%	99.32%	99.81%
Runway 05	83.08%	84.43%	85.65%	86.07%
Runway 23	75.57%	77.23%	78.61%	78.97%
Combined 05/23 & 09/27	97.65%	99.14%	99.81%	99.93%

Note: Allows for standard 5-knot tailwind component
Source Station: Weather Station 72211 (Lakeland)
Observation Period: 2000 through 2009 (2,496 observations)

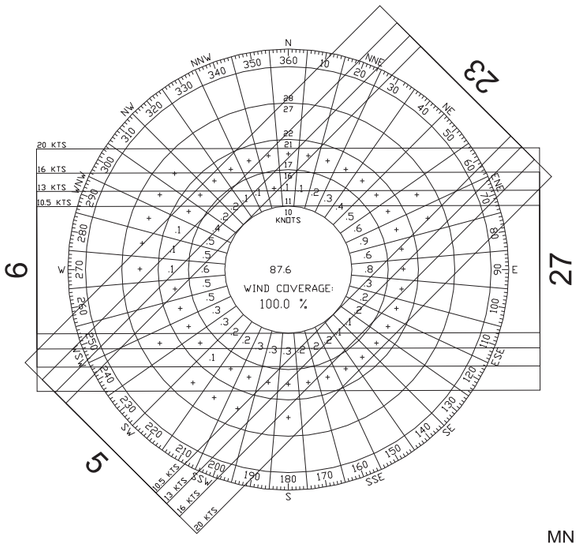
LAKELAND LINDER REGIONAL AIRPORT

Wind Rose

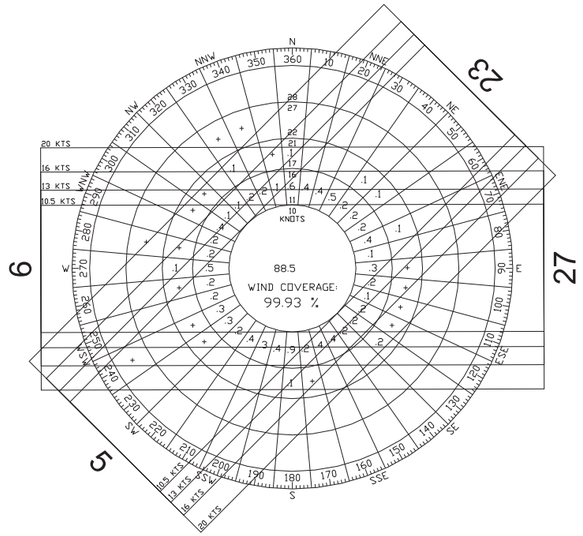
All Weather



Visual Meteorological Conditions



Instrument Meteorological Conditions



MN TN

4.0°W

TN = True North
MN = Magnetic North

Wind Tabulation Data

Source: NOAA National Climatic Data Center, Ashville, N.C.
Station : 72211 Lakeland, Florida
Period of Record: 2000-2009

Wind Rose depicted relative to true north (NAD83)
Magnetic Variation: estimated 4.0° W
(2000 EPOCH)

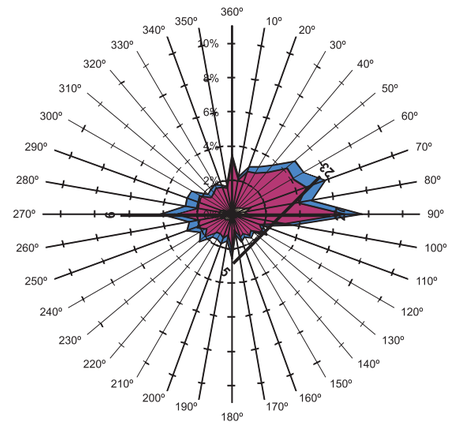
Notes:

1. This chart plots, for the data period, the recorded occurrences (in percent) of wind by direction and speed while the rectangular boxes represent the maximum acceptable crosswind component for each runway. The wind coverage capability of the airfield is thus determined by totaling all occurrences falling within the rectangles.

2. Runways are numbered based on magnetic bearing direction while wind data is presented using true bearing direction. Therefore, at Station 72211, there is a 4.0 degree direction difference between the actual runway headings and the depicted wind rose runway headings.

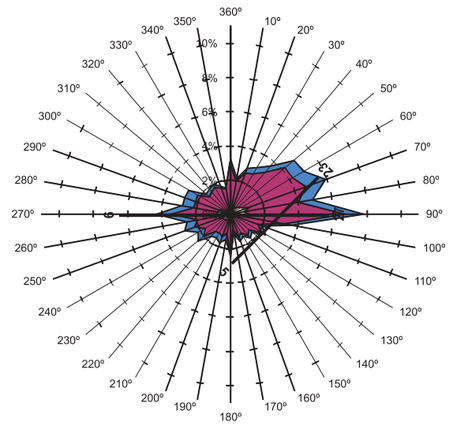
Wind Persistency Chart

All Weather



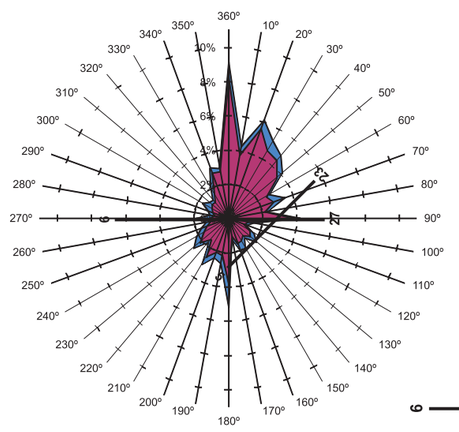
Total Observation: 53,855 (100%)

Visual Meteorological Conditions



Total Observation: 50,894 (94.5%)

Instrument Meteorological Conditions



Total Observation: 2,496 (4.6%)

All Wind Velocities
0-10 Knots
11 Knots or greater

Existing Runway Configuration

Notes:

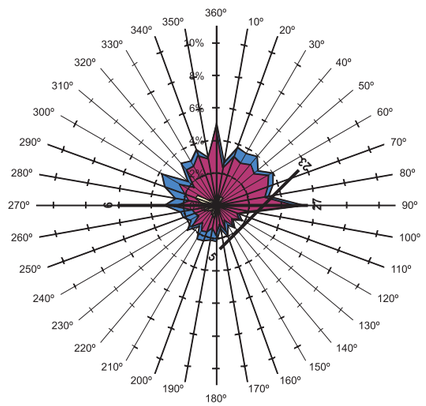
This chart graphically depicts the relative percent of recorded wind occurrence by 10-degree direction of origin (relative to true north) and velocity (excluding calm conditions) as recorded at Station 72211, Lakeland, Florida.

City of LAKELAND

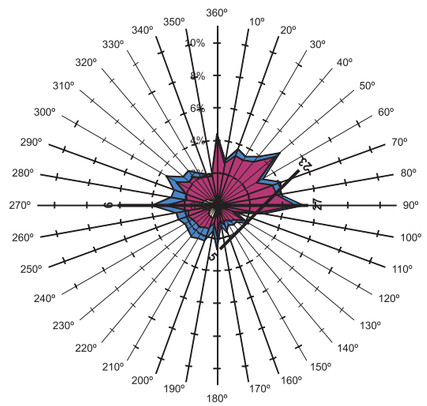
Figure 1.51A
WIND ANALYSIS CHART

LAKELAND LINDER REGIONAL AIRPORT

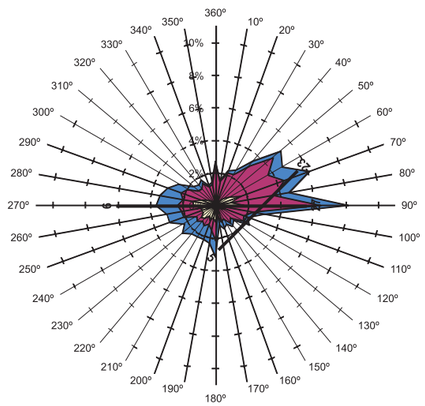
January



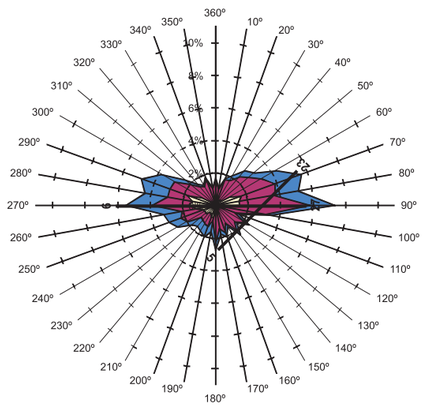
February



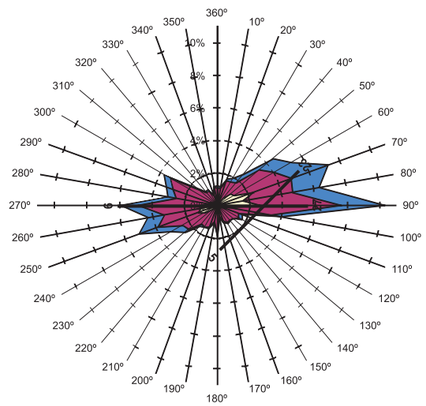
March



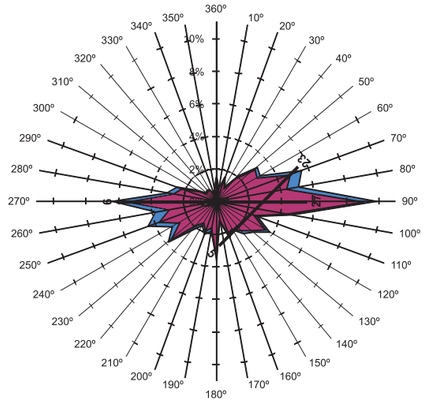
April



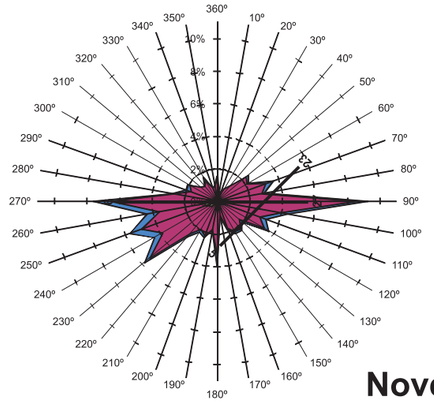
May



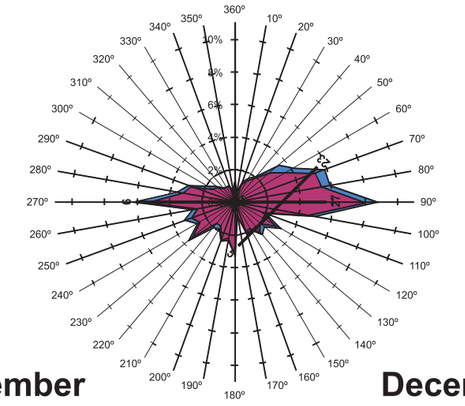
June



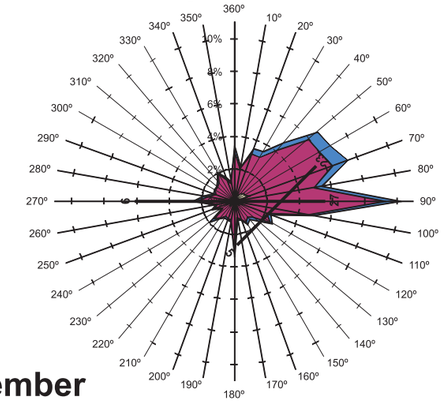
July



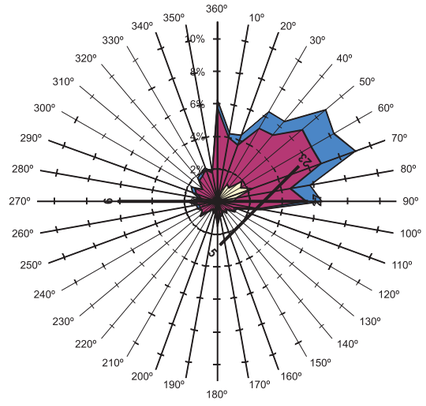
August



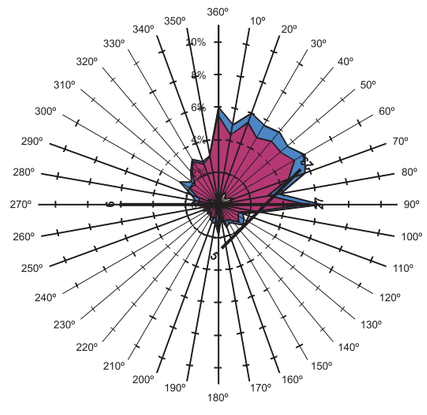
September



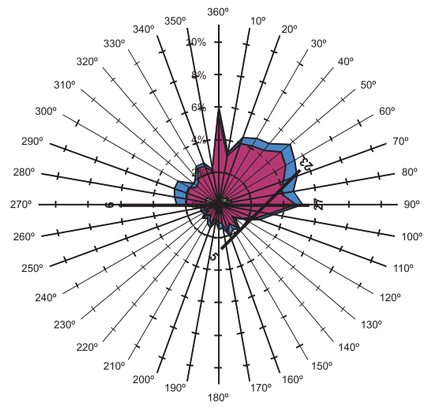
October

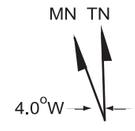


November



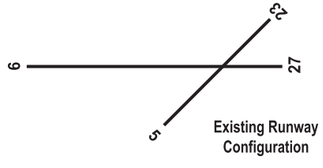
December





TN = True North
MN = Magnetic North

All Wind Velocities
0-10 Knots
11 Knots or greater



Notes:

This chart graphically depicts the relative percent of recorded wind occurrence by 10-degree direction of origin (relative to true north) and velocity (excluding calm conditions) as recorded at Station 72211, Lakeland, Florida.

Wind Tabulation Data

Source: NOAA National Climatic Data Center, Ashville, N.C.
Station : 72211 Lakeland, Florida
Period of Record: 2000-2009

Wind Rose depicted relative to true north (NAD83)
Magnetic Variation: estimated 4.0° W
(2000 EPOCH)

City of LAKELAND

Figure 1.51B
MONTHLY ALL WEATHER WIND PERSISTENCY CHART

Winds in the vicinity of LAL are predominantly from the north/northeast during the fall season and from the east/west the remainder of the year. **Figure 1.51A** also illustrates the annual wind persistency trends at LAL that were examined based on all weather, VFR, and IFR weather conditions. **Figure 1.51B** provides an illustration of all-weather wind persistency by month.

1.52 SOCIOECONOMIC SETTINGS

1.52A Population

Official data collected from the U.S Census and the Central Florida Development Council indicates that Polk County ranked as the nineth most populated county in Florida with 569,861 people. This is an increase of over 17 percent from 2000 and represents a little over three percent of the state's entire population. The U.S Census Bureau estimated that as of July 1, 2009, Polk County had 569,681 people, which represents a 1.7 percent decrease since 2008. Total population for 2009 in the City of Lakeland increased approximately 19 percent from 2000 to 93,508. Statewide Florida's 2009 population has increased approximately 18 percent from 2000 to 18,879,636.

The median age of Polk's population in 2008, was estimated to be 38.2 years old. There were 87,689 students enrolled in Polk County's public schools (kindergarten through 12th grade) for the 2007-2008 school year. Another 10,949 students attend private schools. Approximately 75.8 percent of Polk County's total population is 18 years old or older and 17.4 percent is 65 years old or older.

1.52B Income

The U.S Census Bureau regularly updates demographic information for the State of Florida and its counties. In 2007, median household income for the State of Florida and Polk County was $46,602 and $42,534, respectively. In 2008, median household income for the State of Florida and Polk County increased nearly 4.4 percent to $48,637 and 4.9 percent to $44,633, respectively.

1.52C Employment

The U.S Census Bureau also provides demographic information relating to employment statistics for the State of Florida and its counties. The Retail Trade and Services industries comprise the majority of employment in the county. In 2007, the labor force was 256,717 and the unemployment rate was 5.6 percent. By

2008, the labor force increased to 264,404 and the unemployment rate increased to 6.4 percent.

The top non-government employers in Polk County include Publix Supermarkets, Wal-Mart, Lakeland Regional Medical Center, MOSAIC, Winter Haven Hospital, State Farm Insurance, GEICO Insurance, Watson Clinic, GC Services, and Florida Natural Growers.

1.52D Local Economy

Polk County's economy has been historically based on three primary industries: tourism, phosphate mining and agriculture.

Due to the numerous attractions in the Polk County and in central Florida, tourism is a strong economic force in the county. Polk County is home to Lego Land formerly Cypress Gardens, Bok Tower Gardens, Fantasy of Flight, and host to the annual Sun 'n Fun Fly-in. Polk County is also within an hour drive of the Walt Disney World resort area, Universal Studios, Sea World, and Busch Gardens. In addition to these attractions, Polk is the spring training headquarters for the Detroit Tigers baseball team. The county had an estimated total of 11,500 hotel, motel, and condominium rental units in 2004.

Polk County has one of the world's largest phosphate deposits which has resulted in mining on approximately 200,000 acres or 15.3 percent of the County. In addition to the phosphate mining industry, a number of allied industries, including chemical manufacturing plants producing agricultural and other industrial chemicals, have located in Polk County.

According to the Polk County Farm Bureau, Polk County has the largest amount of farmland in the state of Florida with an estimated 626,634 acres in 2009. This farmland acreage includes approximately 95,050 acres of citrus groves. Polk County has long been recognized as the top citrus-producing county in Florida and continues to lead the state with about 42.2 million boxes of fruit picked for the 2008-09 season. In addition to citrus, Polk County was ranked fourth in the state in 2009 in number of beef cattle with an estimated 100,000 cows.

1.6 NATIONAL & FLORIDA AIRPORT SYSTEM

According to the National Plan of Integrated Airport System (NPIAS), the FAA has designated Lakeland Linder Regional Airport a Reliever Airport to Tampa International Airport. A Reliever Airport is defined as a public use airport

that relieves airport congestion at a commercial service airport and provides general aviation access to the overall community.

For state system planning purposes, Lakeland Linder Regional Airport is located in the Central Florida CFASPP region. The Florida Department of Transportation has designated LAL as a Community Airport due to extensive flight training, corporate, recreational-sport, and business-recreational services.

1.7 AIRPORT SERVICES

Lakeland Linder Regional Airport offers a variety of services. A listing of businesses on the Airport is presented below by services category:

Aircraft Painting and Refurbishing

- Duncan Interiors - Design and retrofit aircraft interiors
- Foster's Aircraft Refinishing - Strip and paint all aircraft types
- National Flight Services, Inc. - Interior and strip and paint service
- Wing Waxers of Florida Inc. - Aircraft detailing

Aircraft Repairs, Parts, and Sales

- Aeromech, Inc. - Aircraft parts, service, and support
- Aircraft Parts Express, Inc. (APEX) - General aviation aircraft parts and pilot supplies
- Dixie Jet & Rotor Service LLC – Corporate jet and turbine helicopter maintenance
- Florida Aero Services Inc. – Cessna, Piper, and Beechcraft maintenance and modifications
- National Flight Services, Inc.- Engine service, airframe, and avionics maintenance

Avionics Sales and Service

- Gulf Coast Avionics Corp. – Avionics distributor and avionics maintenance
- MAC Avionics – Avionics service provider

Airlines and charter Service

- Atlantic Airlines, Inc. – Currently provides charter service, but plans to offer "Florida Air Shuttle" based at LAL pending FAA certification, expected in May 2010.

- Elite Business Aircraft LLC – Charter and pilot services to the U.S. and the Bahamas

Fixed Based Operators

- Columbia Air Services – provides fuel, ground service, and ramp, tie-down, and hangar parking

Flight Training

- FlightSafety International – Pilot and maintenance simulator training

Educational Facilities

- Central Florida Aerospace Academy- full time high school program
- FAA National Resource Center – Base of the FAA Safety Team and the FAA Production Studios
- Polk State College – Local campus provides AA and BAS degree programs

Pilot Supplies

- Gulf Coast Avionics Corp. – Pilot supplies distributor
- PilotMall.com – Full service pilot shop

Hotels

- Hilton Garden Inn- 105 room hotel located on airport property

1.8 AIRPORT CONSTRUCTION & DEVELOPMENT PROJECTS

There are several large construction projects that are recently completed, currently underway, or scheduled to start shortly at LAL. There are also several things under development and will begin in the near-term. These projects may impact the needs of the facility in the longer term. The projects are detailed below:

- An Air Traffic Control Tower Site Selection Study is currently underway and will be completed in 2010.
- AWOS- Installation of new AWOS will occur in 2010 - 2011.

The design of the following projects has been completed and construction will begin in the summer of 2010:

- Regional Pond Design
- Realignment of Taxiway “H”
- Realignment of Taxiway “J”
- Terminal Ramp Expansion

Security upgrades

- Several upgrades will be completed at in 2010 - 2011, including access control.

NAVAIDS

- ILS on RW9 (including a MALSR) - Design to be completed in 2010 and installation planned for 2012. This project will also include the decommissioning of the ILS/MALSR on RW5.

Lighting

- Taxiway lighting upgrade- This project has been funded for 2010 by FDOT.

Water

- Surge Basin Redesign- As part of the Regional Pond Design, the surge basin located south of taxiway "P" will be eliminated/redesigned.

Energy

- Silver Project- This planned project, sponsored by the City of Lakeland, will provide five megawatts of power from ground-based silver antenna rays. This project is scheduled for completion in 2010 – 2011. It will provide an estimated $250,000 in additional revenue to the Airport.

Road Access

- Access Improvements- West Pipkin Road will be widened to four lanes to improve airport access to vehicle traffic. This project includes increased force main water capacity.

Airport Property Development

- Central Florida Aerospace Academy will build permanent facilities on the Airport campus, with help from a recent private donation of $7.5 million.

- The Civil Air Patrol has also been discussing the development of permanent facilities on the Sun 'N Fun campus.

- The FAA has also expressed interest in expansion, possibly in conjunction with the Civil Air Patrol.

- New air traffic control tower construction- Although this project is still being studied, the Airport hopes that construction of a new tower will be forthcoming in conjunction with an FAA building.

1.9 REGULATORY FRAMEWORK & SURROUNDING LAND USES

1.91 REGULATORY FRAMEWORK

The Polk County Airport Zoning Board has established a set of zoning regulations to provide both airspace protection and land use compatibility in relation to the normal operation of the eight airports licensed for public-use by the State of Florida Department of Transportation (FDOT) in Polk County, Florida. This includes Lakeland Linder Regional Airport. Specifically, these regulations limit the uses of land located around airports relative to the:

- height of structures and objects of natural growth to prevent obstacles within areas aircraft routinely climb from or descend to runways;
- uses of land sensitive to airport noise to minimize impacts and potential nuisance litigation;
- uses of land in areas subject to aircraft overflight potential to limit severity of crashes for the safety of people in aircraft and on the ground;
- establishment of educational facilities;
- uses of land which result in the generation of in-flight visual or electronic interference,
- such as smoke, steam and electronic interference; and
- uses of land which result in aircraft bird strike hazard such as landfills or organic processing facilities.

Specifically, the Polk County Airport Zoning Regulations establishes three (3) Zones of Influence and three (3) Special Requirements... Any application for land development within these airport zones of influence must comply with detailed regulations and requirements, any applicable state or federal regulations, and any applicable requirements of the land development regulations of the local governments represented on the Polk County Joint Airport Zoning Board. The airport zones of influence include the following:

- the Airport Height Notification Zone
- the Airport Overflight Zone
- the Airport Noise Zone

1.91A Airport Height Notification Zone

This zone is established to regulate the height of structures and objects of natural growth in areas around each public-use airport in Polk County. Each Airport Height Notification Zone consists of two subzones, defined as follows:

- *Airport Height Notification Subzone 1*: For each public-use airport in Polk County (except Brown Seaplane Base and Chalet Suzanne Airport,) Airport Height Notification Subzone 1 includes that area which lies within 20,000 feet of its runway(s).

- *Airport Height Notification Subzone 2*: For each public-use airport in Polk County, Airport Height Subzone 2 includes all areas that both lie within the territorial limits over which the local governments represented on the Polk County Joint Airport Zoning Board have jurisdiction, and do not lie within Airport Height Notification Subzone 1. For any development proposal over 200 feet in height (a building of approximately 5 to 6 stories), a "Notice of Potential Airport Obstruction" is required.

1.91B Airport Overflight Zone

The Airport Overflight Zone was established to regulate the uses of land lying in specified areas above which aircraft must routinely operate at low altitudes (less than 50 feet above the ground), such as during arrival and/or departure operations, at or near Polk County's public-use airports. Within an Airport Overflight Zone, certain land uses are restricted or prohibited, including residential, educational facilities, healthcare facilities, places of worship, hotels/motels, uses by their nature that attract gatherings of people, and sales or distribution of gasoline/propane.

The Airport Overflight Zone is that portion of the Approach Surface, as defined by 14 CFR Part 77.25(d), which extends outward from, and perpendicular to, its common boundary with the Primary Surface, as defined in 14 CFR Part 77.25(a), for a horizontal distance of:

- 1,000 feet for utility runways,

- 1,700 feet for non-precision instrument/other-than-utility runways,

- 2,500 feet for precision instrument runways.

1.91C Airport Noise Zone

The Airport Noise Zone is established around each publicly owned, public-use airport in Polk County to regulate land uses sensitive to sound levels generated by the routine operation of each such airport. Within the Airport Noise Zone, land uses restrictions and special construction standards are established to minimize the impacts of airport-generated noise. Specifically, development including the construction, expansion, alteration, moving, repair, replacement, and occupancy changes are regulated within the noise zones. However, the following exceptions apply:

- Structures for which the cost of such additions alterations, or repairs are made within any five (5) year period does not exceed fifty (50) percent of the total value of such structures.

- Nonstructural alterations or repairs of such structures for which the cost of such alterations or repairs does not exceed fifty (50) percent of the total value of such structures may be made with the materials of which such structures are constructed, if otherwise allowed.

- Structures for which no more than fifty (50) percent of the roof covering of such structures is replaced within any three (3) year period.

Each Airport Noise Zone consists of three subzones, defined as follows:

- *Airport Noise Subzone A*: The area commencing at the airport reference point and extending outward from there to that boundary which approximates to a day/night average sound level of 75 Ldn.

- *Airport Noise Subzone B*: The area commencing at the airport reference point and extending outward from there to that boundary which approximates to a day/night average sound level of 70 Ldn, excluding Subzone A.

- *Airport Noise Subzone C*: The area commencing at the airport reference point and extending outward from there to that boundary which approximates to a day/night average sound level of 65 Ldn, excluding subzones A and B.

For each publicly-owned, public-use airport in Polk County, the boundary of the Airport Noise Zone established in the regulations is based on the forecast of day/night average sound levels

documented in its approved airport master plan or airport layout plan, or both.

1.91D Special Requirements

In addition to the airport zones of influence, the Polk County Airport Zoning Board has established three (3) special requirements that would prohibit any interference with the operation of any airborne aircraft or aircraft operations at any of the public use airports within Polk County. Specifically, requirements include the following:

1. *In-flight Visual or Electronic Interference* – Land uses within three (3) miles of any runway of any airport shall not produce smoke, steam, glare, or any other visual impairments. In addition, no land use shall produce electronic interference or utilize high energy beam devices.

2. *Aircraft Bird Strike Hazard* - Uses of land that, store, handle or process organic material that foster or harbor the growth of insects, rodents, amphibians, or other similar organisms that increases the potential for aircraft bird strike hazards are limited around public airports.

3. *Educational Facilities* – The construction of any educational facility of a public or private school is restricted within an area that extends five (5) miles from either end of a runway, along the extended runway centerline, and which has a width measuring one-half the length of the runway of any publicly-owned airport in Polk County.

1.91E Surrounding Land Uses

Land uses surrounding LAL, as classified by Polk County, are presented in **Figure 1.9A**. Existing land uses surrounding an airport include industrial, residential, business park, and rural/agricultural. Most of the surrounding land use is either industrial or business park use, a compatible land use for an airport. Residential areas are located just south and east of the airport. There is also a large parcel containing residential uses to the north of the airport.

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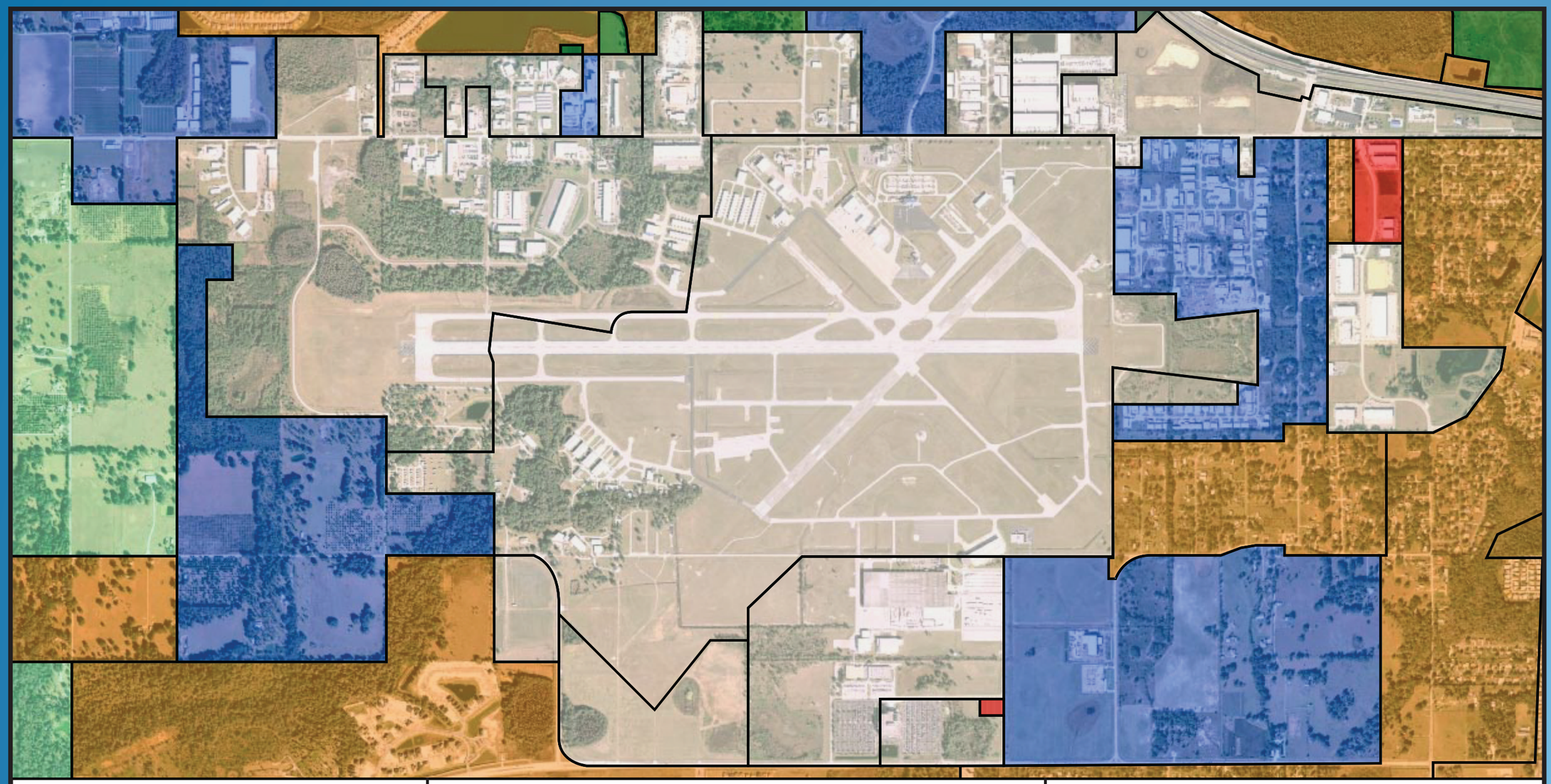
LAKELAND LINDER REGIONAL AIRPORT



City of LAKELAND

Figure 1.9A
AIRPORT AND SURROUNDING LAND USE
Source: City of Lakeland, Polk County, FL

FORECASTS

Projecting future aviation demand is a critical element in the overall master planning process. The activity forecasts developed in this chapter will be used in subsequent tasks to determine the characteristics of future airside and landside facility developments.

This chapter discusses the findings and methodologies used to project aviation demand at Lakeland Linder Regional Airport (LAL). It must be recognized that there are always short-term fluctuations in an airport's activity due to a variety of factors that cannot be anticipated. The forecasts developed in the Master Plan provide a meaningful framework to guide the analysis for future Airport development needs and alternatives.

The projections of aviation demand developed for the Airport are documented in the following sections:

- Historic Aviation Activity
- Trends/Issues Influencing Future Airport Growth
    - Regional Demographics
    - Airport/Local/Regional Outlook
    - National Aviation Trends
- Projections of Aviation Demand
    - Based Aircraft Projections
    - Aircraft Operations Projections

- Critical Aircraft
- Commercial Service Potential and Projections
- Summary

This forecast analysis includes methodologies that consider historical aviation trends at the Airport and throughout the nation. Local historical data were collected from FAA Terminal Area Forecast (TAF) records, Airport and Tower records, and the 2003 Lakeland Linder Regional Airport Master Plan Study. In addition, demographic data for Polk County and the Lakeland-Winter Haven Metropolitan Statistical Area were used to track local trends and conditions that have the ability to impact aviation demand levels.

Projections of aviation activity for the Airport were prepared for the near-term (2014), mid-term (2019), and long-term (2024 and 2029) timeframes. These projections are generally unconstrained and assume the Airport will be able to develop the various facilities necessary to accommodate based aircraft and future operations.

2.11 HISTORIC AIRPORT ACTIVITY

Historic based aircraft and operations data for the Airport provides the baseline from which future activity at the Airport can be projected. While historic trends are not always reflective of future periods, historic data does provide insight into how local, regional, and national demographic and aviation-related trends may be tied to the Airport.

A based aircraft is generally defined as an aircraft that is permanently stored at an airport. An aircraft operation represents either a landing or departure conducted by an aircraft. A takeoff and a landing, for example, would count as two operations.

Table 2.11A presents the historic based aircraft by aircraft type.

The number of aircraft based at the Airport has fluctuated over the past 20 years. The number peaked in 1997 and 1998 at 251. In 2009, there were about one-third fewer aircraft based at LAL than 1998 levels. The majority of the aircraft (74 percent) are single-engine aircraft. Multi-engine aircraft account for 14 percent of the based aircraft fleet while seven percent are jet aircraft and five percent are helicopters. Until 2003, several military aircraft were also based at LAL.

Historic Based Aircraft
Lakeland Linder Regional Airport

Year	Single Engine	Multi-Engine	Jet	Helicopter	Other	Total
1989	122	46	2	4	16	190
1990	122	46	2	4	16	190
1991	127	46	4	4	16	197
1992	127	46	7	6	15	201
1993	127	46	7	6	15	201
1994	121	22	9	10	15	177
1995	171	21	9	9	24	234
1996	171	21	9	9	24	234
1997	185	33	12	13	8	251
1998	185	33	12	13	8	251
1999	146	29	5	15	10	205
2000	146	39	5	15	10	215
2001	157	32	6	17	12	224
2002	157	32	6	17	12	212
2003	157	32	6	17	12	212
2004	121	30	7	5	0	163
2005	121	30	7	5	0	163
2006	121	30	7	5	0	163
2007	132	24	13	10	0	179
2008	132	24	13	10	0	179
2009	122	23	12	8	0	165
CAGR						
1989 – 2009	0.00%	-3.40%	9.40%	3.50%	-100.00%	-0.70%
1999 – 2009	-1.80%	-2.30%	9.10%	-6.10%	-100.00%	-2.10%
2004 - –2009	0.20%	-5.20%	11.40%	9.90%	-100.00%	0.20%

Note: CAGR = Compound Annual Growth Rate

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LAKELAND LINDER REGIONAL AIRPORT

TABLE 2.11A
Source: 1989 – 2002 Previous master plan; 2003 – 2009 Airport Records

Annual operations represent the number of aircraft takeoffs and landings occurring at the Airport during the FAA's fiscal year (October through September). The historic operations data includes operations conducted by both based aircraft as well as operations conducted by itinerant aircraft from other airports that arrive and depart from LAL for a variety of reasons including business, recreation, or flight training purposes. Historic aircraft operations data, as reported by the FAA air traffic control tower for LAL, are summarized in **Table 2.11B.**

Over the past 19 years, activity at the Airport has fluctuated, peaking at 221,000 annual operations 10 years ago in 1999. The current level of nearly 102,000 operations is about the same level as reported in 1990. 2009 total operations are down 19 percent from 2008 levels. General aviation local and itinerant operations were hard hit due in part to the recent closing of a helicopter school and the national recession. In the last 10 years, the level of activity has decreased, on average, approximately 7.5 percent per year.

Fourteen percent of the 2009 operations are associated with Sun N' Fun, a six-day aviation tradeshow/convention, airshow, and fly-in that occurs in April each year. In April 2009, the Airport reported over 14,500 operations associated with Sun n'Fun.

Itinerant traffic represents almost 58 percent of the aviation activity at LAL. The Airport's location and services makes it very convenient for itinerant aircraft to land, be serviced, or fueled. The Airport provides an air traffic control tower, precision approach, long/wide runway and avgas and jet fuel; thus attracting aircraft passing through the area.

Local operations at the Airport represent 42 percent of activity at LAL. Local operations are performed by aircraft staying close to the facility or those performing touch and go operations. Touch and go operations consist of an approach, touchdown, high speed taxi down the runway, and take off – all without stopping the aircraft. The touch and go may not involve a touchdown on the runway, in which case the procedure is commonly called a low pass.

LAKELAND LINDER REGIONAL AIRPORT

Historic Operations
Lakeland Linder Regional Airport

Year	General Aviation Itinerant	General Aviation Local	Military Itinerant	Military Local	Air Taxi[1]	Air Carrier	**Total**	Sun n' Fun Only[2]
1990	43,332	53,321	1,530	1,467	224	0	**99,874**	28,152
1991	55,474	49,586	1,307	1,468	177	0	**108,012**	30,117
1992	74,566	64,940	1,671	2,119	166	0	**143,462**	36,081
1993	72,979	76,330	1,469	2,630	126	6	**153,540**	37,698
1994	70,252	81,302	1,780	3,855	178	4	**157,371**	42,848
1995	85,472	84,106	1,751	2,069	186	0	**173,584**	48,505
1996	94,673	82,170	1,489	2,137	422	2	**180,893**	42,211
1997	100,460	94,639	1,100	1,828	842	0	**198,869**	42,345
1998	98,591	89,908	1,360	2,226	758	4	**192,847**	45,710
1999	107,580	108,986	1,505	2,058	930	0	**221,059**	57,336
2000	99,370	97,774	1,704	2,922	977	6	**202,753**	45,371
2001	99,940	98,581	1,198	1,946	1,339	2	**203,006**	47,563
2002	83,837	56,978	1,741	3,982	1,573	7	**148,118**	32,686
2003	79,711	52,844	1,008	2,018	1,133	4	**136,718**	23,554
2004	84,063	45,718	1,204	1,719	1,042	6	**133,752**	16,426
2005	66,732	37,247	1,337	1,586	791	0	**107,693**	16,284
2006	72,646	33,130	1,177	1,417	839	0	**109,209**	17,200
2007	71,991	65,798	1,151	1,555	1,259	0	**141,754**	18,243
2008	66,754	55,032	980	1,405	1,459	38	**125,668**	14,214
2009	56,351	40,482	1,625	2,539	953	16	**101,966**	14,513
CAGR								
1990 - 2009	1.39%	-1.44%	0.32%	2.93%	7.92%	NA	**0.11%**	-2.00%
1999 - 2009	-6.26%	-9.43%	0.77%	2.12%	0.24%	NA	**-7.45%**	-12.80%

Notes:

[1] Air Taxi category represents non-scheduled or for-hire service on aircraft with 60 seats or fewer

[2] Operations occurring during Sun n' Fun are included in the General Aviation Itinerant and Local categories. Airport management noted the method of counting operations during Sun n'Fun has changed in the last six years and therefore is considered to be more accurate in recent years. It appears in previous years that these operations may have been overstated.

City of LAKELAND

Table 2.11B
Source: FAA Tower Records, fiscal year

Touch and go operations are performed primarily as pilot training exercises and a single aircraft may make multiple touch and go operations as part of an annual pilot proficiency training requirement for both commercial and military pilots. Touch and go operations are also conducted by students at flight schools located at LAL. Aircraft conducting these types of operations range from small single-engine aircraft like the Cessna 152 to military training aircraft such as the Air Force's KC-135 to Orion P-3. The Airport recently signed an agreement with Patrick Air Force Base for performing HC-130 rescue aircraft training activities at the Airport. For the same reasons itinerant aircraft may find LAL attractive, local aircraft also find the uncongested airspace, tower, precision approach, and wide runways a valuable asset for training.

Although operations at LAL have shown a decline in recent years, the Airport is well positioned for future growth. There are several potentials that could lead to increased operations in 2010. They include:

- Several flight schools have shown interest in operating at the Airport in 2010 to support the growth anticipated by the Central Florida Aerospace Academy (CFAA). CFAA enrollment doubled in 2009 and anticipates 250 students in 2010.

- The Airport signed a letter of agreement in August 2009 with Patrick Air Force Base's rescue squadron to conduct military flight training for a three year period.

- There are two tenants on the Airport that have applied for FAA Part 135 certificates to provide scheduled charter service in 2010. One carrier, Elite Aviation, hopes to start offering scheduled charter service to Key West and the Bahamas in 2010 using King Air C-90 aircraft. Another carrier, Atlantic Air also expects its certification in 2010 and hopes to begin intrastate shuttle service utilizing Cessna 172 aircraft. This type of service will help grow the air taxi operations at the Airport.

- A restaurant, Earhart's Runway Grill, opened on Airport property in April 2010. Airport management estimates that this should bring in about 3,000 to 4,000 annual general aviation itinerant operations, based on previous restaurant success.

- LAL recently completed airport marketing and business plans. These plans outline the aggressive campaign to increase operations at the Airport through actively seeking and promoting

charter operations like those that utilized the Airport during the 2009 Super Bowl. In addition, the Airport is working closely with the on-site Hilton Garden Inn and Sun n' Fun Inc., to promote events and improve event-based traffic for things such as Pilot Proficiency Programs, Civil Air Patrol training, workshops and Young Eagle programs.

- In April 2010 LAL entered into a formal agreement with Sky King for use of a 50,000 Sq Ft hangar which will be the air carrier's new base of operations. Sky King operates a fleet of Boeing 737's and 767's for a variety of services including: tour operators, sports organizations, corporations, and the U.S. and foreign governments.

- Unscheduled charter service by commercial airlines will continue to occur at LAL to support baseball spring training activities and other occasional trips.

2.12 TRENDS/ISSUES IMPACTING FUTURE AIRPORT GROWTH

There are several factors that may influence aviation activity which are independent of Airport activity. It is worthwhile to review outside influences to determine how they may impact future growth. These factors include:

- Regional Demographics

- Airport/Local/Regional Outlook

- National Aviation Trends

The purpose of this section is to provide an overview of what might alter demand and associated needs of LAL. The current reality is, with the downturn in the economy, there are few major employers moving into Central Florida today, no surge of small business upstarts, and no boom in real estate. This will impact demand for aviation at many airports throughout the U.S. as well as LAL during the next few years. However, the Airport should be poised and prepared for future growth in activity as new opportunities arise.

2.13 REGIONAL DEMOGRAPHICS

For an airport master plan, socioeconomic characteristics are often collected and examined to derive an understanding of the dynamics of historic and projected growth within the geographic area served by the airport. This information is then typically used as one tool to forecast aviation demand. The types of socioeconomic data that are presented include population, employment and per capita personal income.

Lakeland is the most populous city in the Lakeland-Winter Haven, FL (MSA). Other cities and towns in the MSA include: Bartow, Winter Haven, Lake Wales and Haines City. As a whole, Lakeland and its surrounding cities and towns have experienced growth over the past 30 years. With close proximity to both the Tampa and Orlando areas, there are approximately 8.6 million people within a 100-mile radius of Lakeland.

This analysis examines the historical trends and future projections of the region's population, employment, and earnings. Several reliable data sources were utilized. Historic and projected future population data was obtained from the U.S. Census and the Central Florida Development Council. Employment and income data was compiled from Woods & Poole Economics, Inc. as well as the U.S. Bureaus of Labor Statistics and Economic Analysis.

Table 2.13A summarizes population growth trends experienced between 1980 and 2009 for Lakeland, Lakeland-Winter Haven, FL MSA, and Florida. The Lakeland MSA was included in this analysis based on the assumption that the Air Trade Area of LAL expands beyond the borders of the City of Lakeland and into portions of Polk and Hillsborough counties. Trends impacting all the cities and towns within the region are anticipated to impact LAL.

Historical population growth in City of Lakeland has been consistent with growth in the rest of the United States, averaging 3.6 percent compound annual growth rate (CAGR) from 1980 to 2009. Population growth in City of Lakeland has slightly outpaced that of the entire state of Florida since 1980. Growth has slowed between 2008 and 2009 due to the current economic recession. Overall population in the Lakeland MSA has declined 1.7 percent from 2008 levels.

The most recent projections developed for Lakeland, the MSA, and the state as a whole were based on census data. According to the City of Lakeland population estimates, the population of the area should outpace that of the county and the U.S. as a whole, growing at an average annual rate of 1.9 percent per year between 2000 and 2020.

There are a number of demographic factors that impact, to varying degrees, the demand for general aviation in any particular region. In addition to population trends, regional economic trends also can significantly impact aviation demand.

Population

Year	City of Lakeland	Lakeland MSA	Florida
1980	47,406	321,652	9,746,961
1990	70,576	405,382	12,938,071
2000	78,452	483,924	15,982,378
2002	87,167	504,984	16,650,114
2003	88,741	513,754	16,959,416
2004	89,731	523,502	17,260,294
2005	90,851	528,389	17,510,550
2006	91,623	564,868	18,349,132
2007	91,623	565,049	18,360,271
2008	93,427	579,879	18,599,579
2009	93,508	569,861	18,879,636
Forecast[1]			
2005	90,697	535,800	17,700,000
2010	100,000	572,600	18,866,700
2015	106,577	613,900	21,000,000
2020	115,050	655,300	22,600,000
CAGR[2]			
1980-2009	3.60%	3.10%	3.50%
2000-2009	2.00%	1.80%	1.90%
2000-2020	1.90%	1.50%	1.70%

Statistical Abstract (BEBR): City of Lakeland, Community Development, 2008; 2009 is April 2009 estimate.
1 Projections were based on actual 2000 census data.
2 CAGR = Compound Annual Growth Rate

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LAKELAND LINDER REGIONAL AIRPORT

TABLE 2.13A
Source: 1980-2000 data from U.S. Census, 2008 Florida

Regional Economic Trends

Year	Lakeland MSA Employment	Lakeland MSA Per Capita Personal Income
1998	195,658	$22,213
1999	199,263	$23,140
2000	221,751	$23,721
2001	224,293	$24,850
2002	224,320	$24,998
2003	226,442	$25,679
2004	235,368	$27,696
2005	243,996	$29,625
2006	251,090	$31,018
2007	254,555	$31,418
2008	254,530	NA
2009	238,300	NA
Lakeland MSA CAGR		
1998-2008	2.70%	3.9%[1]
2003-2008	2.40%	5.2%[1]
Florida CAGR		
1998-2008	1.80%	4.20%
2003-2008	1.60%	3.70%
U.S. CAGR		
1998-2008	1.20%	4.00%
2003-2008	1.10%	4.70%

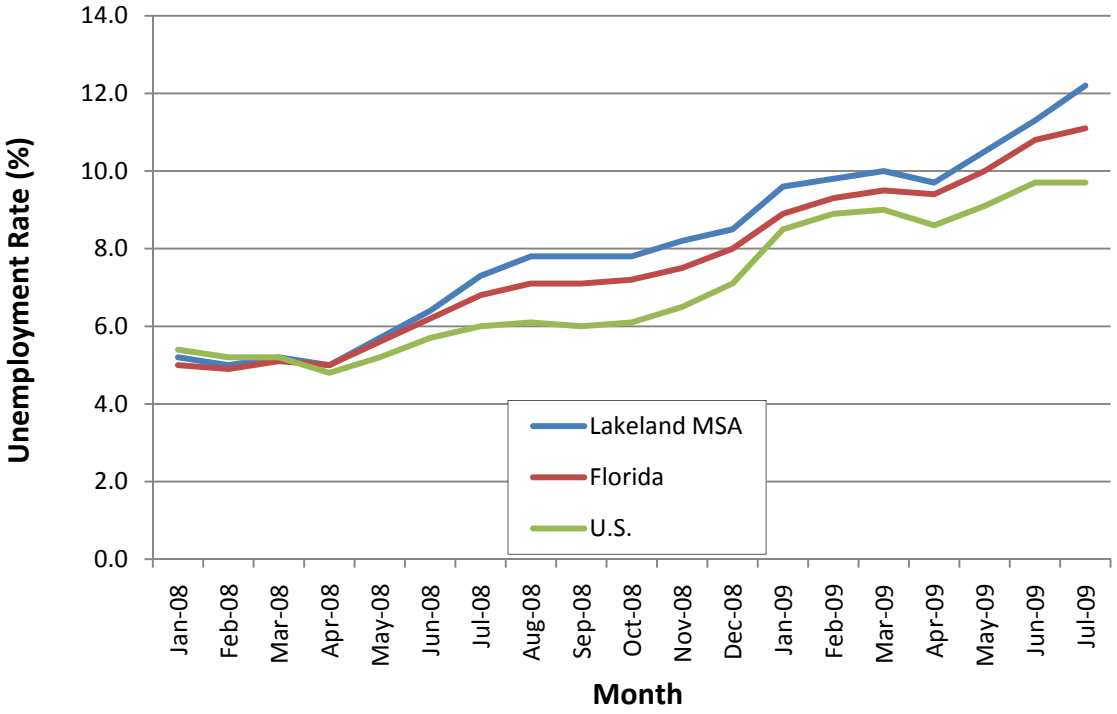
Sources: Employment - Florida Research and Economic Database, Labor Market Statistics, Local Area Unemployment Statistics Program.
Earnings – U.S. Bureau of Economic Analysis
Notes: 1The CAGR calculation for the Lakeland MSA per capita personal income is a nine year average from 1998 to 2007.
NA=not available, CAGR=compound annual growth rate.

Regional economic trends are summarized in this analysis through an examination of employment and earnings data. **Table 2.13B** presents historic employment and earnings data for the Lakeland MSA.

The data presented in **Table 2.13B** indicates that in the Lakeland MSA, compound growth in employment averaged 2.7 percent annually from 1998 to 2008. This growth was well above the state average and more than doubles the national average.

Employment growth in the Lakeland MSA slowed in 2008 and by July 2009 dropped 5.5 percent from 2008 levels. **Figure 2.13A** shows the rise in unemployment in the Lakeland MSA, Florida, and the entire U.S. between January 2008 and July 2009. Lakeland MSA has been hit hard by the current economic recession. Unemployment in the Lakeland MSA was 12.3 percent in July 2009 exceeding that experienced by all of Florida (11.0 percent) and the U.S. (9.7 percent).

Figure 2.13A: Monthly Unemployment Rate Comparison



Source: Florida Research and Economic Database, Labor Market Statistics, Local Area Unemployment Statistics Program

There are several sources of employment projections for the Lakeland MSA and Polk County. The State of Florida Agency for Workforce Innovation projects that the total employment in Polk County (or State Workforce Region 17) will grow at an average annual rate of 1.4 percent between 2009 and 2017. This is lower than historic

growth and reflects a stabilization of regional growth over the projection period.

Regional personal income can be one of the most important demographic factors influencing aviation demand, illustrating an underlying assumption that as personal income, and consequently discretionary income grows; regional residents have more to spend on all goods and services, including aviation-related goods and services. As shown in **Table 2.13B**, per capita personal income in the Lakeland MSA is estimated to have grown at an average annual compound growth rate of 3.9 percent between 1998 and 2007. This growth is just below the growth experienced by the state (4.2 percent) and the nation (4.0 percent).

Although the annual growth rates of personal income in the Lakeland MSA are on par with national and state levels, actual per capita personal income are higher than that found in the Lakeland MSA. On the state level, large cities such as Miami, Tampa, and Orlando influence much of the economic growth in Florida. In 2007, Lakeland's average per capita income is estimated to be about $31,400 or about 81.7 percent of the state average.

Figure 2.13B shows that despite steady growth, income per capita in Lakeland has failed to keep pace with the state and national averages. Lakeland continues to face the challenge of competition from other areas of the country and state as they seek to achieve some of the economies that are driving metro areas toward higher rates of growth in per capita income.

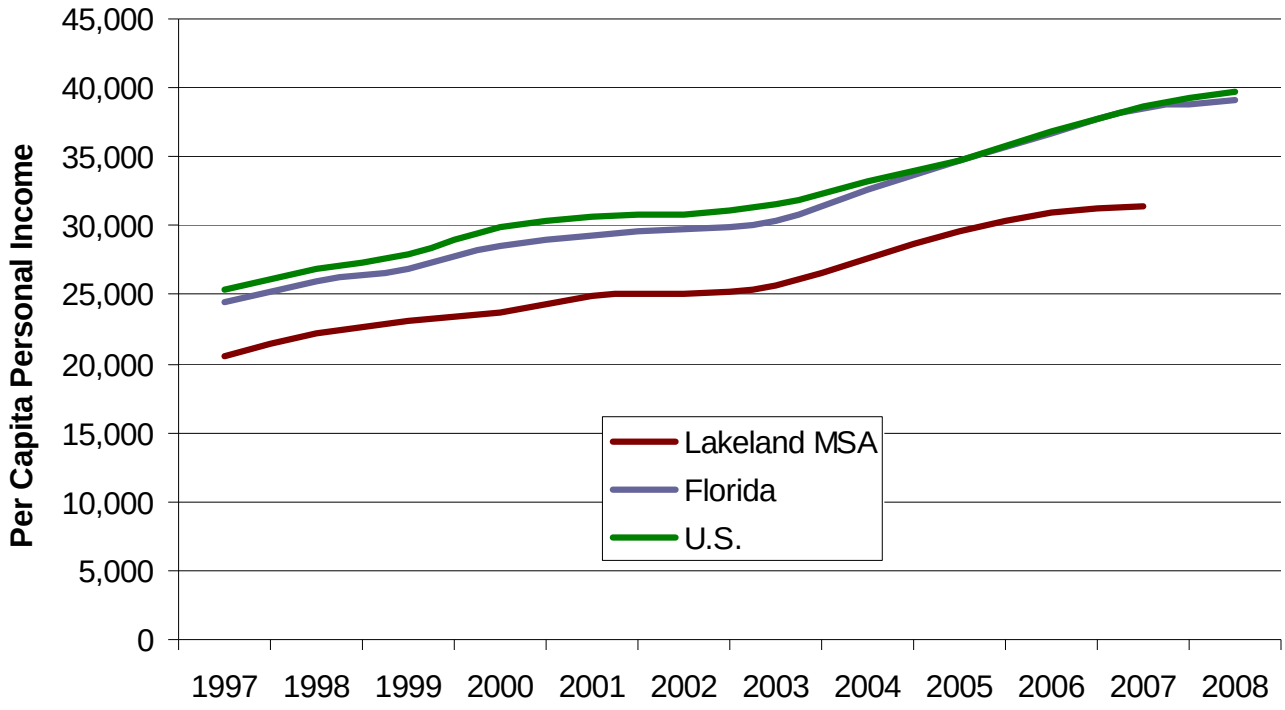
Projections of per capita personal income developed for Lakeland MSA using Woods and Poole data illustrate continued growth. Per capita personal income (in current dollars) is expected to grow at an average annual rate of 4.9 percent, which is near the historical trend.

The outlook for aviation and the economy remains uncertain. The world economy has experienced an upheaval unprecedented in modern history. Its unwinding presents a contracted world economy; but how much and for how long remains to be seen.

All of regions of the country are currently being impacted by the economic recession and Lakeland has been hard hit with large declines in housing prices and home values as well. This has led to an oversupplied housing market. According to Moody's Economy.com, Lakeland's economic contraction will continue well into 2010 as job losses have accelerated and unemployment has soared. However, Lakeland's long-term economic growth will

be well supported due to a strong healthcare industry and a large number of individuals facing retirement age. Lakeland has had consistently above average population and employment growth and this is projected to continue as the economy recovers. As indicated in this section, population, employment, and per capital personal income projections show positive compound annual growth rates, indicating the potential for growth in aviation activity.

Figure 2.13B: Per Capita Personal Income



Source: U.S. Bureau of Economic Analysis

2.14 AIRPORT/LOCAL/REGIONAL OUTLOOK IMPACTING PROJECTIONS

While socioeconomic factors often are a large influence on aviation forecasts, LAL also has several unique characteristics that have the potential to impact the forecasts developed in this chapter. The Airport does not have a defined market area since 8.6 million people and a workforce of 3.4 million reside within a 100-mile radius. Lakeland is located on Florida's primary east-west corridor, Interstate 4, providing convenient access to the region.

There are also many other general aviation and commercial service airports located near LAL. Each of the airports has its own market niche. A few of the things that define

LAL's niche in the Central Florida airport system include:

- LAL hosts the Sun N' Fun Fly-In each year, drawing nearly 150,000 visitors annually and accommodates 15,000 aircraft operations within the six day period. In addition, the Airport hosts many EAA and CAP activities, Pilot Proficiency Programs, and other special events throughout the year.

- LAL is designated by the FAA and FDOT as a Reliever Airport for Tampa International. LAL helps to relieve congested airspace in the Tampa area by accommodating general aviation and military aircraft.

- Due to LAL's uncongested airspace and top notch facilities, including long runways and sophisticated approaches, LAL is an ideal airport for training activities by both military and civil aircraft. The Air Force signed a letter of intent to utilize the airport more often for training in 2009. Also, the Central Florida Flight Academy has committed to the airport and has large expansion plans over the next few years.

2.14A Tourism

Lakeland's proximity to Tampa and Orlando means it is just minutes away from many legendary attractions and theme parks and approximately an hour away from some of Florida's best beaches. This proximity makes Lakeland an ideal base for visitors exploring the region.

Lakeland is home to the Detroit Tigers Spring Training and is an hour drive from six other baseball team spring facilities. Polk County has also become a preferred venue for recreational and competitive sports on all levels. Each year Polk County hosts hundreds of sporting events that pump in excess of $84 million into the local economy. This is in addition to $72 million generated by the Spring Training operation of the Detroit Tigers.

Other nearby tourist attractions include: Bok Tower Gardens, Fantasy of Flight, and the Sun n' Fun Annual Fly-In. The Sun n' Fun Fly-In is the annual fly-in, airshow, and convention hosted by Lakeland Linder Airport each April. The Fly-In has been attracting visitors from all over the world since 1975. Sun 'n Fun's annual attendance during the six-day event averages approximately 140,000. The economic impact to Lakeland and Polk County is estimated at more than $27 million annually

based on a University of South Florida economic impact study.

In January 2010, it was announced that a second U.S. location of Legoland Park will be located in nearby Winter Haven on the current site of Cypress Gardens. Merlin Entertainment estimates that Legoland will have a $459 million economic impact on Polk County, expecting 1.5 to 2 million visitors annually. The park is scheduled to be complete by the end of 2011. Legoland will likely bring additional hotels, retail, and other services to Polk County. This park will also draw more visitors and activity to LAL. The Airport's proximity to Legoland should be of interest to commercial airlines looking to serve the Central Florida region as well.

2.15 NATIONAL AVIATION TRENDS

The aviation industry and general aviation activity have experienced significant changes over the last 30 years. At the national level, fluctuating trends regarding general aviation usage and economic upturns/downturns resulting from the nation's business cycle have all impacted general aviation demand. This section will examine general aviation trends, and the numerous factors that have influenced those trends, in the U.S. and the State of Florida.

Recent trends, both national and local, will be important considerations in the development of projections of aviation demand for LAL. National trends can provide insight into the potential future of aviation activity and anticipated facility needs. Data sources that were examined and used to support this analysis of national general aviation trends included the following:

- Federal Aviation Administration, FAA Aerospace Forecasts, 2009-2025
- General Aviation Manufacturers Association (GAMA), 2008 General Aviation Statistical Databook & Industry Outlook
- No Plane No Gain, business aviation advocacy campaign by NBAA and GAMA
- Honeywell Corporation, 16th Annual Business Aviation Outlook, 2007

Data from these sources regarding historic and anticipated trends in general aviation and commercial service summarized in the following sections of this report:

- General Aviation Overview
- General Aviation Industry Trends
- Commercial Service Trends
- FAA Aerospace Forecast of Activity

Historic and anticipated trends related to general aviation and commercial service will be important considerations in developing regional forecasts of demand for LAL.

2.15A General Aviation Overview

General aviation aircraft are defined as all aircraft not flown by commercial airlines or the military. General aviation activity is divided into six use categories, as defined by the FAA. There are more than 18,300 public and private airports located throughout the United States, as reported by the FAA. More than 3,300 of these airports are included in the National Airport System, indicating their eligibility for federal funding assistance.

2.15B General Aviation Industry Trends

A pronounced decline in the general aviation industry began in 1978, and lasted throughout most of the 1980s and into the mid-1990s. After a decade and a half of declines in general aviation, enactment of the General Aviation Revitalization Act (GARA) of 1994 provided significant relief. GARA spurred manufacturers including Cessna and Piper Aircraft to resume production of single-engine piston general aviation aircraft. Since 1994, statistics indicated an increase in general aviation activity, an increase in the active general aviation aircraft fleet, and an increase in shipments of fixed-wing general aviation aircraft.

While enactment of GARA stimulated production of single-engine piston aircraft, the cost of these aircraft has continued to increase. The relatively high cost of new general aviation aircraft has contributed to significantly lower levels of aircraft production from those experienced during the 1960's and 1970's when the annual numbers of aircraft manufactured were commonly between 10,000 and 18,000 new aircraft per year.

Business aviation has been one of the fastest growing facets of general aviation. Companies and individuals use aircraft as a tool to improve their businesses efficiency and productivity. The business/corporate component of general aviation use is one that has experienced significant recent growth. Increased personnel productivity is one of the most important benefits of using business aircraft. Companies flying general aviation aircraft for business have control of their travel. Itineraries can be changed as needed, and the aircraft can fly into destinations not served by scheduled airlines.

The NBAA's Business Aviation Fact Book indicates that approximately 75 percent of all Fortune 500 businesses operate general

aviation aircraft and 92 of the Fortune 100 companies operate general aviation aircraft. Business use of general aviation aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. General aviation aircraft use allows employers to transport personnel and air cargo efficiently. Businesses often use general aviation aircraft to link multiple office locations and reach existing and potential customers. Business aircraft use by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged. Businesses and corporations have increasingly employed business aircraft in their operations.

Fractional ownership arrangements also experienced rapid growth. NBAA estimated that 2,600 companies used fractional ownership arrangements in 1999; by 2004 that number had grown to 6,200 companies, more than doubling over the five year period. Growth continued through 2007 but at a more sustainable four percent annually. The principal players in the fractional jet ownership market include CitationShares, NetJets, Bombardier Flexjet and the Flight Options/Travel Air operations. NetJets, the industry leader in fractional aircraft ownership, has purchased aircraft totaling more than $19 billion in value in the last six years alone. It should be noted that these types of operators are common at LAL.

As late as last year there was continuing optimism about the prospects of very light jets (VLJs) entering the fleet for business flying. However, certifications for these new aircraft took longer than expected and capitalization of aircraft development programs delayed or suspended a few promising ventures. DayJet was the first per seat, on-demand jet service and provided service throughout Florida including at LAL.

The recent recessionary national economy has had a dampening impact on these positive general aviation industry trends. General and business aviation has been subject to downward pressures sustained by high fuel prices, limited credit, and softening demand. On demand VLJ operator DayJet ceased operations in September 2008 due to a shortage of investment funding which has resulted from a weak economy and credit market.

The Aircraft Owners and Pilots Association (AOPA) reports reductions by 14 percent in gallons of aviation gasoline (avgas) sold between the fourth quarters of 2007 and 2008. Also, general aviation activity reported at centers is down 19 percent and at towers;

down 45 percent. Operations numbers were the lowest in 10 years.

The extreme volatility of late 2008 has continued into 2009 and the fast growing business aviation segment has all but dropped off. Recent negative media coverage regarding the corporate aircraft has also hurt the sector. Fractional aircraft operators such as NetJets have announced layoffs and deferred shipments. General aviation aircraft makers have been hit hard recently due largely to disappearing disposable income by small-business owners and wealthy plane enthusiasts, by falling corporate profits, and by the current credit crunch.

The General Aviation Manufacturers Association (GAMA) reported that shipments of aircraft were down drastically (45.9 percent) in the first six months of 2009.

- For the largest sector, piston aircraft, representing the bulk of personal flying, shipments were down 58 percent from 1,034 shipped in the first six months of 2008 compared with 434 aircraft shipped during the same period in 2009.

- Turboprop sales declined 13.6 percent with a drop from 221 to 191 aircraft shipped in the first half of 2009.

- Business jet sales also fell by 37.9 percent to 412 aircraft shipped in 2009 versus 663 in the first half of 2008.

Declining activity at airports around the country is occurring. LAL has also been impacted by this trend as operations in the first six months of 2009 declined nearly 14 percent from the same period of 2008. It is interesting to point out that the level of operations for the month of April 2009 (when Sun n' Fun occurred) remained unchanged from 2008.

In the summer of 2009, industry experts have noted that that the overall economic picture is showing some signs of improvement, which is a crucial condition for recovery in the general aviation market. Flight hours are stabilizing, used aircraft inventories are beginning to shrink, and manufacturers are seeing signs of renewed interest in airplane purchases. However, for 2010, general aviation airports are likely to continue to experience reduced demand for flying. As for the business jet market, Bombardier still projects 11,500 planes delivered between 2009 and 2018 (compared to just 6,500 between 1999 and 2008).

The anticipated changes in the nation's active general aviation fleet, including growth in the number of active jet aircraft

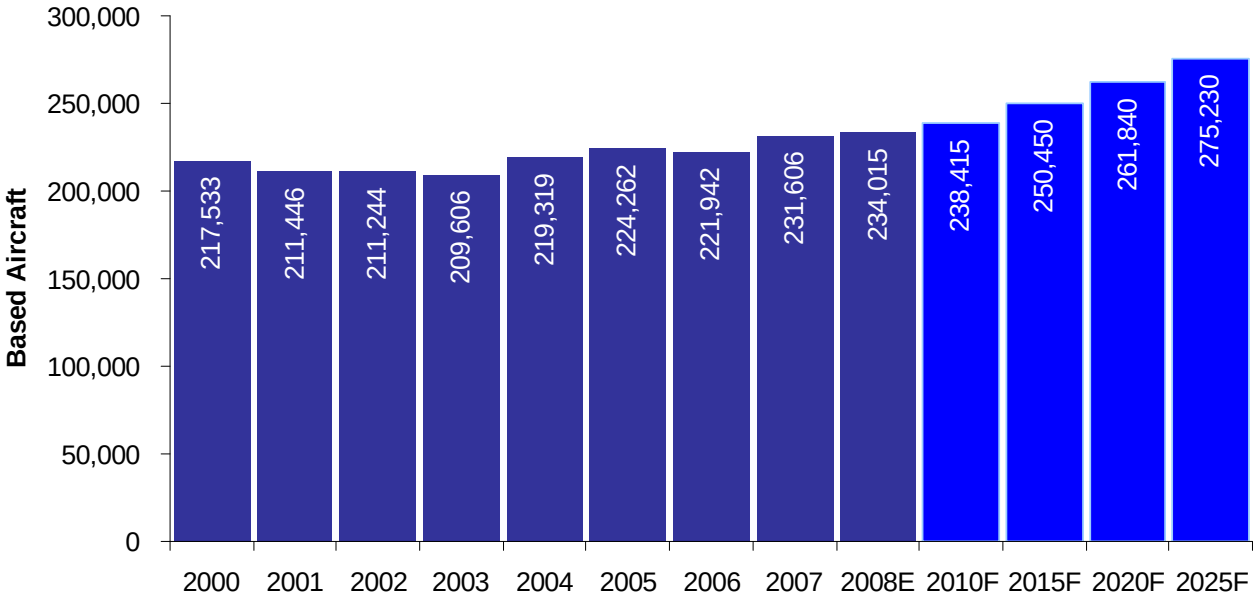
and use of fractional ownership arrangements, are likely to impact aviation activity at LAL over the 20-year study period of the master plan. Recent general aviation trends and projected changes to the nation's active general aviation fleet may be reflected in the projections of aviation demand developed for the Airport.

2.15C FAA Aerospace Forecast of Activity

As part of its forecasting effort, the FAA prepares national forecasts of active general aviation aircraft, fleet mix and general aircraft operations. The FAA's active aircraft forecast is presented in **Figure 2.15A,** and the fleet mix forecast is presented in **Table 2.15A**. It should be noted that the FAA has expressed the challenge of forecasting during the current volatile economic times, especially as it relates to near-term projections.

Overall, general aviation aircraft are projected to nationally grow at an average annual rate of 1.0 percent for the next 17 years. However, there is quite a lot of variation both with respect to the mix of aircraft and the growth rates within each category. Starting in 2005, the FAA added "light sport" aircraft as a registration category. FAA is expecting registration of nearly 16,000 aircraft in this category in the next 17 years. Other growth areas are the twin-engine micro jets and helicopters. Single-engine piston aircraft are expected to grow relatively slowly at average annual rates of 0.1 percent while twin engine piston aircraft are expected to decline at 1.0 percent annually.

Figure 2.15A: Active General Aviation and Air Taxi Aircraft



Source: *FAA Aerospace Forecasts, Fiscal Years 2009-2025*

U.S. Active General Aviation Aircraft
Actual and Forecast

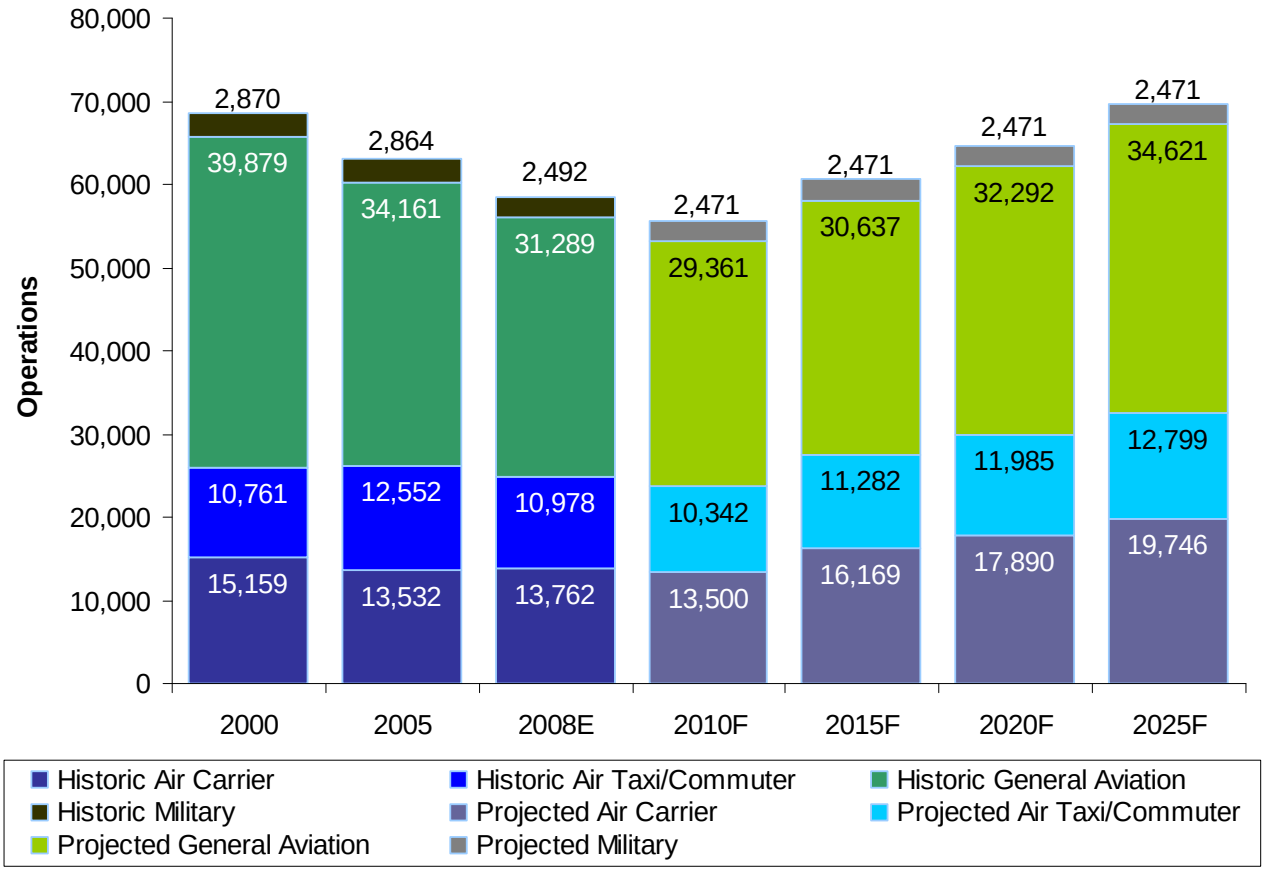
	Fixed Wing									
	Piston		Turbine		Rotorcraft					
Year	Single-Engine	Multi-Engine	Turbo Prop	Turbo Jet	Piston	Turbine	Experimental	Sport	Other	Total Fleet
Historic										
2000	149,422	21,091	5,762	7,001	2,680	4,470	20,407	NA	6,700	217,533
2005	148,101	19,412	7,942	9,823	3,039	5,689	23,627	170	6,459	224,262
2008E	146,590	19,130	9,600	11,400	3,070	7,145	24,100	6,965	6,015	234,015
Projection										
2010	144,960	18,795	9,740	13,155	3,565	7,735	25,615	8,765	6,085	238,415
2015	143,530	17,910	10,540	17,100	4,550	8,970	29,125	12,665	6,060	250,450
2020	144,880	16,965	11,480	20,945	5,250	9,920	32,025	14,365	6,010	261,840
2025	148,545	16,005	12,245	25,165	5,925	10,870	34,625	15,865	5,985	275,230
CAGR										
2000-2008	-0.20%	-1.20%	6.60%	6.30%	1.70%	6.00%	2.10%	NA	-1.30%	0.90%
2008-2025	0.10%	-1.00%	1.40%	4.80%	3.90%	2.50%	2.20%	5.00%	0.00%	1.00%

Note: E=estimate, CAGR=Compound Average Growth Rate

Table 2.15A
Source: FAA Aerospace Forecasts, Fiscal Years 2009-2025

Figure 2.15B shows operations by all segments declined over the last eight years. **Figure 2.15B** also presents forecasted operations at airports with either an FAA or contract air traffic control tower. Commercial and air taxi/commuter operations are projected to grow 2.1 and 0.9 percent annually, respectively.

Figure 2.15B: Commercial and General Aviation Operations at Airports with FAA or Contract Towers, Actual and Forecast



Source: *FAA Aerospace Forecasts, Fiscal Years 2009-2025*

General aviation operations are projected to grow 0.6% per year and military operations are expected to stay flat. FAA projected that aviation activity will be below 2008 levels until 2013 and will not return to the level experienced in 2000 until the 2025 forecast year.

The FAA projects that mainline air carrier capacity will be down 6.7 percent in 2009 and regional carrier capacity will fall by 5.5 percent. Enplanement declines for 2009 follow suit, with declines around 7.3 percent from 2008 levels.

The most recent FAA commercial service forecasts reflect the following average annual growth rates for the period 2008 to 2025:

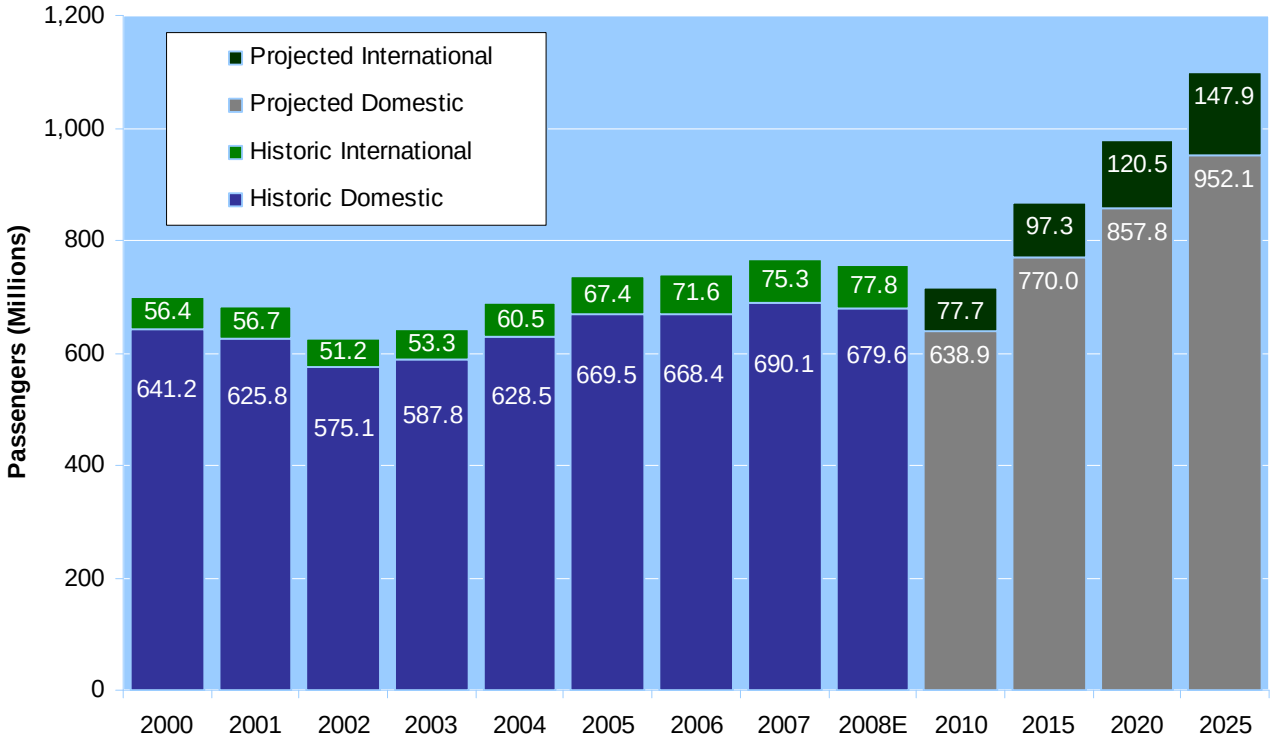
- Domestic enplanements – 2.0 percent per year
- International enplanements – 3.9 percent per year
- Available Seat Miles (ASMs) – 3.1 percent per year
- Revenue Passenger Miles (RPMs) – 3.1 percent per year

The FAA anticipates that international travel will be the fastest growing segment of scheduled air service. In 2008, international ASMs represented approximately 28 percent of the system. By 2025, international ASMs are expected to represent 34 percent of total ASMs. Regional carrier passenger growth will slow to 3.0 percent per year after historical annual increases in the nine percent range between 2000 and 2008. **Figure 2.15C** shows the most recent FAA forecasts for both domestic and international passengers.

The nature of general aviation and commercial service activity as illustrated in the data presented in this section can be characterized as undergoing significant change. Historically, general aviation activity and active aircraft experienced steady growth in all areas, however, the terrorist attacks of 2001 and the economic downturn dampened activity over the last several years. These events happened to coincide with shifts in the active general aviation fleet that are showing signs of increased jet aircraft use.

These factors are reflected in FAA projections that show varied growth over the next several years, and most components of general aviation activity are projected to soon surpass previous activity levels.

Figure 2.15C: U.S. Commercial Air Carriers, Historical and Forecast Domestic and International Passengers (2000-2025)



Source: *FAA Aerospace Forecasts, Fiscal Years 2009-2025*

2.2 PROJECTIONS OF AVIATION DEMAND

Projections of aviation demand at Lakeland Linder Regional Airport for the 20-year planning period are presented in the following sections:

- Based Aircraft Projections
- Aircraft Operations Projections

Various methodologies were examined and used to develop projections of based aircraft and aircraft operations at LAL. The results of these different methodologies are compared and a preferred projection of each is selected.

The following assumptions were made in developing the projections of aviation demand at LAL:

- The national and local economies will begin to recover in 2010 and continue to grow through the overall forecast period.
- Economic disturbances that may cause year-to-year traffic variations, but the long term projections will likely be realized.
- Aviation at LAL will generally reflect the national aviation industry. The FAA projects growth in all aspects of aviation.
- Sun n' Fun and other EAA-sponsored events will continue throughout the forecast period.
- The military will continue to use LAL for training activity through the forecast period.

2.21 BASED AIRCRAFT PROJECTIONS

Based aircraft are those aircraft that are permanently stored at an airport. Estimating the number and types of aircraft expected to be based LAL over the 20-year study period will impact the planning for future Airport facility and infrastructure requirements. As the number of aircraft based at an airport increases, so too does the aircraft storage required at the facility. Based aircraft at the Airport was projected using several different methodologies. Each methodology is summarized in the following sections and the results presented. These results are then compared and a preferred based aircraft projection for the Airport selected. The preferred based aircraft projection for LAL will be carried forward in the master planning process and will be used to examine future Airport facility needs.

2.21A Population Growth Methodology

Changes in area population are often a key factor that can affect aviation demand in a study area. In many instances there tends to

be a direct correlation between an area's population and number of based aircraft in that area. Furthermore, as that area's population grows, corresponding growth is experienced in based aircraft numbers. A based aircraft projection was developed for LAL that reflects that anticipated population growth for the Airport's general market area. The results of the population growth methodology are summarized in **Table 2.21A**.

Using this methodology and continuing the growth rate through the forecast period allows us to project the number of based aircraft. As the Lakeland area's total population increases from approximately 93,400 in 2005 to 139,000 in 2029, total based aircraft at LAL are projected to increase from 165 in 2009 to 245 in 2029, representing a compound annual growth rate (CAGR) of 2.0 percent.

2.21B Employment Growth Methodology

The growth in the number of people employed in an area is another demographic factor that can be tied to the growth of based aircraft in an area. The predicted annual growth of employment for the Lakeland MSA is 1.4 percent. This factor was applied to the number of existing based aircraft to develop a forecast number of based aircraft through the planning period. Using this methodology predicts that based aircraft will reach a count of 218 by the end of the planning period.

2.21C Market Share Growth Methodology

For this methodology, LAL's share of total U.S. active general aviation aircraft in 2008 was assumed to remain constant throughout the forecast period. Based on this assumption and using the *FAA Aerospace Forecasts Fiscal Years 2009-2025*, national forecast of general aviation aircraft, an airport projection of based aircraft for LAL was developed. Using this approach, based aircraft are projected to increase from 165 in 2009 to 200 in 2029, an average annual growth rate of 1.0 percent.

2.21D Summary of Based Aircraft Projection Scenarios

The results of the population growth, employment growth, and market share methodologies represent high-, mid-, and low-growth forecasts of total based aircraft at LAL.

Table 2.21A summarizes the results of the three based aircraft projection scenarios utilized in this analysis.

Comparison of Based Aircraft Projections
Lakeland Linder Regional Airport

Year	Historic	Population Growth 1/	Employment Growth	Market Share	FASP	FAA TAF*
1999	205					
2000	205					
2001	224					
2002	165					
2003	161					
2004	163					
2005	163					
2006	177					
2007	177					
2008	179					179
2009	165	165	165	165	165	181
Forecast						
2014		185	177	173	187	189
2019		203	190	181	211	197
2024		223	204	190	239	207
2029		245	218	200	270	218*
2009-2029 CAGR		2.00%	1.40%	1.00%	2.50%	0.90%

Source: Wilbur Smith Associates, Airport records, FDOT,
FAA Terminal Area Forecasts
Note: FAA TAF forecast base year was 2008
*Extrapolated 1/ Preferred methodology

As shown, the projection methodologies resulted in based aircraft forecasts ranging from 200 total based aircraft in the market share scenario to 245 total based aircraft in the population growth scenario for the out-year of the planning period, 2029. Based aircraft growth rates represented by these forecasts ranged from a CAGR of 1.0 percent to a CAGR of 2.0 percent. The range of these growth rates shown in these scenarios represent the most realistic growth patterns considering the Airport's history and predicted regional and local growth estimates. For comparative purposes, the most current TAF and Florida Airport System Plan projections are also depicted.

The preferred based aircraft projection for LAL is based on the population methodology. Several parallels can be drawn between this methodology and other demographic and economic indicators discussed earlier in this chapter. These comparisons are presented below:

2.21E Comparison to Other Forecasts

The Florida DOT develops annual projections of aircraft and operations at all airports in Florida for state planning purposes. FDOT used a base year of 2009 and projected based aircraft to reach 187 by 2014, 211 by 2019, and 270 by 2029. This represents an average annual growth rate of 2.5 percent through the master plan forecast period. This rate of growth was higher than any of the based aircraft scenarios developed for the plan.

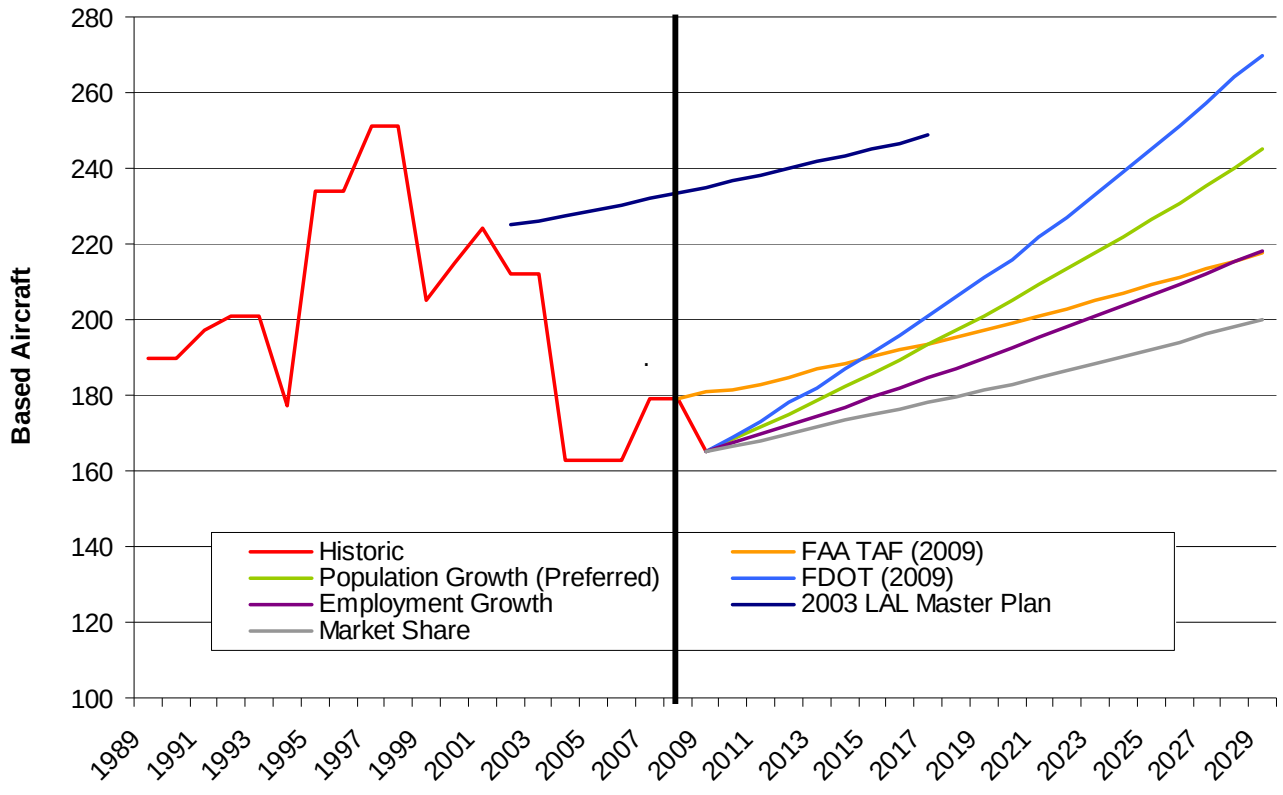
The FAA Terminal Area Forecast (TAF), is the FAA's most current projection of LAL activity. The base year used in the TAF forecast is the year ended September 30, 2008 or the federal fiscal year, with 179 based aircraft. The FAA projected that based aircraft will reach 218 by 2029. Based aircraft at LAL are projected to grow at 0.9 percent per year on average over the period. The LAL preferred projections of based aircraft are within the 10 percent variance of the TAF during the five-year projection period (2.2 percent variance), 10-year TAF projection (3.0 percent variance), and the 15-year projection (7.8 percent variance).

The previous master plan update for LAL was completed in 2003. This plan projected that based aircraft would increase at an average annual rate of 0.68 percent. There were 60 additional aircraft that were based at LAL in 2002, compared to 2009. Based aircraft at LAL were projected to grow from 225 in 2002 to 249 in 2017 in the 2003 master plan update.

The preferred based aircraft projection for LAL is compared to the results of the other methodologies as well as other projections developed by the FAA, the FDOT, and the previous master plan update in **Figure 2.21A**.

As illustrated in **Figure 2.21A**, the population growth projection methodology, the preferred projection of based aircraft, resulted in a forecast of 245 total based aircraft at the Airport when compared to other forecasts of based aircraft. Although this projection represents the upper range of based aircraft projections for LAL, the growth rate is below that expected by FDOT and the total based aircraft in 2029 are still projected to be below historic levels when the number of based aircraft peaked in the late 1990s. The market share methodology represents lower range forecasts of future based aircraft at the Airport.

Figure 2.21A: Comparison of Based Aircraft Projections



Sources: Airport records, Wilbur Smith Associates, FAA TAF, FDOT, 2003 LAL Master Plan Update

Although the actual number of total based aircraft at the Airport in the future will be determined by a number of factors, the forecast methodologies and scenarios presented in this analysis present a range within which the likely number of aircraft based at LAL will fall. From the methodologies and scenarios examined in this master plan, the population growth scenario is selected as the preferred based aircraft projection for use in following analyses.

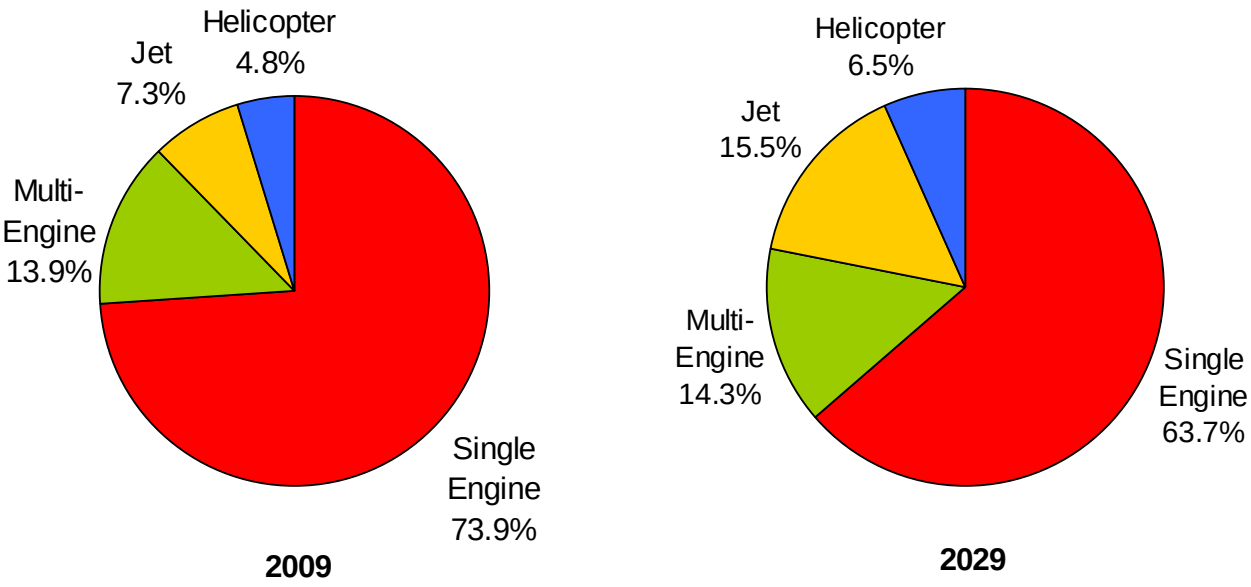
2.21F Based Aircraft Fleet Mix Projections

Total based aircraft projected for LAL over the projection period in the preferred based aircraft projection were allocated to two aircraft categories – single engine, multi-engine, jet, and helicopter. The fleet mix projections were developed based on the fleet mix percentages exhibited at the Airport in 2009. However, the growth of business jet aircraft in the state and nation as discussed earlier in this chapter explains why it may be likely that additional jet aircraft may be based at LAL in the future. The existing based aircraft fleet mix at LAL is summarized as follows:

- *Single engine piston aircraft* –74 percent of total based aircraft
- *Multi-engine piston*- 14 percent of total based aircraft
- *Small jet aircraft* –7 percent of total based aircraft
- *Helicopter*- 5 percent of total based aircraft

The current and projected aircraft fleet mix is presented in **Figure 2.21B**. Jet aircraft are projected to comprise nearly 16 percent of the fleet by 2029.The percent of single engine aircraft based at Lakeland Linder Regional Airport is projected to decline to 64 percent.

Figure 2.21B: Current and Projected Aircraft Fleet Mix
Lakeland Linder Regional Airport



Sources: FAA 5010, Wilbur Smith Associates
Note: Using the percentages above, the preferred based aircraft fleet mix projections are presented in **Table 2.21B**.

Table 2.21B: Preferred Based Aircraft Fleet Mix Projection
Lakeland Linder Regional Airport

Year	Single Engine	Multi-Engine	Jet	Helicopter	Total Based Aircraft
Historic					
2009	122	23	12	8	165
Projected					
2014	132	26	17	10	185
2019	140	29	22	12	203
2024	148	32	29	14	223
2029	156	36	36	17	245

Sources: Wilbur Smith Associates and airport records

2.22 AIRCRAFT OPERATIONS PROJECTIONS

Many different factors impact the number of aircraft operations at the Airport, including but not limited to, total based aircraft, area demographics, activity and policies at neighboring airports, the local and national economy, and numerous other national aviation trends.

Projections of future operations at LAL are discussed in the following sections:

- General Aviation Operations Projections
  - Operations Per Based Aircraft Methodologies
  - Market Share Methodology
- Commercial Service/Commuter/Air Taxi Operations Projections
- Military Operations Projections
- Comparison of Aircraft Operations Projections
- Preferred Aircraft Operations Projections
- Projected Local/Itinerant Split
- Projected Category Mix

The result of each projection methodology is compared and a preferred projection scenario is selected. Following the selection of the preferred operations projection for the Airport, the local/itinerant split at the Airport is also identified. The preferred aircraft operations projection for LAL will be used to conduct a demand/capacity analysis in which the adequacy of existing airfield facilities will be evaluated to determine if capacity enhancing projects may be required to support future levels of aircraft operations at the Airport.

2.23 GENERAL AVIATION OPERATIONS PROJECTIONS

Several methodologies are used to develop projections of future general aviation aircraft operations at LAL through the projection period.

2.23A Operations Per Based Aircraft Methodologies

The operation per based aircraft (OPBA) methodology is recognized by the FAA as an accepted means for relating the total number of aircraft operations to a known variable; in this case, based aircraft. OPBA is calculated by dividing the number of total general aviation operations that occur at an airport by the number of aircraft based at the airport. Total general aviation operations at LAL are projected by applying the Airport's OPBA ratio to the preferred projection of based aircraft.

The Airport's OPBA ratio for 2009 was calculated at 587 general aviation operations per based aircraft. Two OPBA projections were used to develop projections of general aviation operations. In the first

methodology, LAL's 2009 OPBA is held constant throughout the projection period and applied to the Airport's preferred projection of based aircraft. Under this projection, total general aviation operations are anticipated to increase from 96,800 in 2009 to 143,900 in 2029, representing an average annual growth rate of 2.0 percent.

The second OPBA methodology uses an increasing OPBA to project general aviation operations. Under the increasing OPBA methodology, general aviation operations are projected to reach 155,800 by 2029, growing at average annual rate of 2.4 over the 20-year forecast period. This information is summarized in **Table 2.23A**

Table 2.23A: Aircraft Operation Projections
Based on Operations per Based Aircraft
Lakeland Linder Regional Airport

Year	Based Aircraft	Constant OPBA	Constant OPBA Operations	Increasing OPBA	Increasing OPBA Operations
Historic					
2009	165	587	96,833	587	96,833
Projected					
2014	185	587	107,000	599	109,100
2019	203	587	118,100	611	122,900
2024	223	587	130,300	623	138,400
2029	245	587	143,900	636	155,800
CAGR	2.0%	0.0%	2.0%	0.4%	2.4%

Source: Airport records and Wilbur Smith Associates
Note: Projected operations are rounded

2.23B U.S. Market Share Methodology

In the *FAA Aerospace Forecasts FY2009-2025*, the FAA projects general aviation operations at airports with FAA or contract air traffic control towers will grow at an average annual rate of 1.0 percent throughout their 20-year forecast period. Based on the anticipated growth at LAL in 2010 discussed above, it is estimated that LAL will be able to capture a slightly increasing share of the FAA's projected U.S. general aviation operations over the next ten years. In 2009, LAL's share of the total U.S. general aviation operations as reported by the FAA was 0.33 percent. It is estimated that LAL's share of U.S. general aviation operations will increase to 0.35 percent by 2019 and 0.36 percent by 2029. Based on this methodology, the Airport's total general aviation operations are projected to reach 134,900 by 2029.

2.23C Comparison of Aircraft Operations Projections

The results of the different general aviation aircraft operations projection scenarios examined in this analysis are summarized in **Table 2.23B**. A comparison of the most recent state and FAA projections are also included.

As shown in **Table 2.23B**, the different methodologies resulted in a CAGR ranging from 1.7 percent in the U.S. Market Share Methodology to 2.4 percent in the Increasing OPBA Methodology. In these projection scenarios general aviation operations at LAL in 2029 are projected to range between 134,900 general aviation operations to 155,800 operations.

The U.S. Market Share Methodology is selected as the preferred projection of aircraft operations for the Airport. This methodology results in a realistic forecast of activity that takes into account an increasing share of the total U.S. general aviation operations. Lakeland's location in central Florida and proximity to key Florida cities, along with relatively lower costs of doing business all point to continued strong growth for general aviation operations at the LAL. The projected activity demonstrated by the U.S. Market Share Methodology attains levels that are slightly higher than previous operations experienced at the Airport and represent a gradual and realistic gain in activity throughout the planning period.

In the preferred projection scenario, general aviation operations at LAL are projected to increase from 96,833 in 2009 to almost 135,000 in 2029, representing a CAGR over the projection period of approximately 1.7 percent.

The preferred projection of general aviation operations identified for the master plan represents a realistic estimate of future activity at LAL when compared to the other projection scenarios.

The projected general aviation operations for 2029 are still well below the operations experience at the Airport in the late 1990s when operations were over 200,000 annually.

Table 2.23B: Summary of Operations Projections
Lakeland Linder Regional Airport

Year	Historic	Constant OPBA	Increasing OPBA	U.S. Market Share	FDOT (2009)	FAA TAF (2009)
1999	216,566					
2000	197,144					
2001	198,521					
2002	140,815					
2003	132,555					
2004	129,781					
2005	103,979					
2006	105,776					
2007	137,789					
2008	121,786				118,175	
2009	96,833	96,833	96,833	96,833	121,129	96,833
Forecast						
2014		107,000	109,100	103,200	137,047	93,952
2019		118,100	122,900	112,700	155,056	99,926
2024		130,300	138,400	121,600	175,431	106,324
2029		143,900	155,800	134,900	198,484	113,181
2010-2029 CAGR		2.0%	2.4%	1.7%	2.5%	0.8%

Sources: Wilbur Smith Associates, airport records, FDOT, FAA TAF
Note: * Extrapolated 1/ Preferred scenario

2.23D Comparison to Other Forecasts

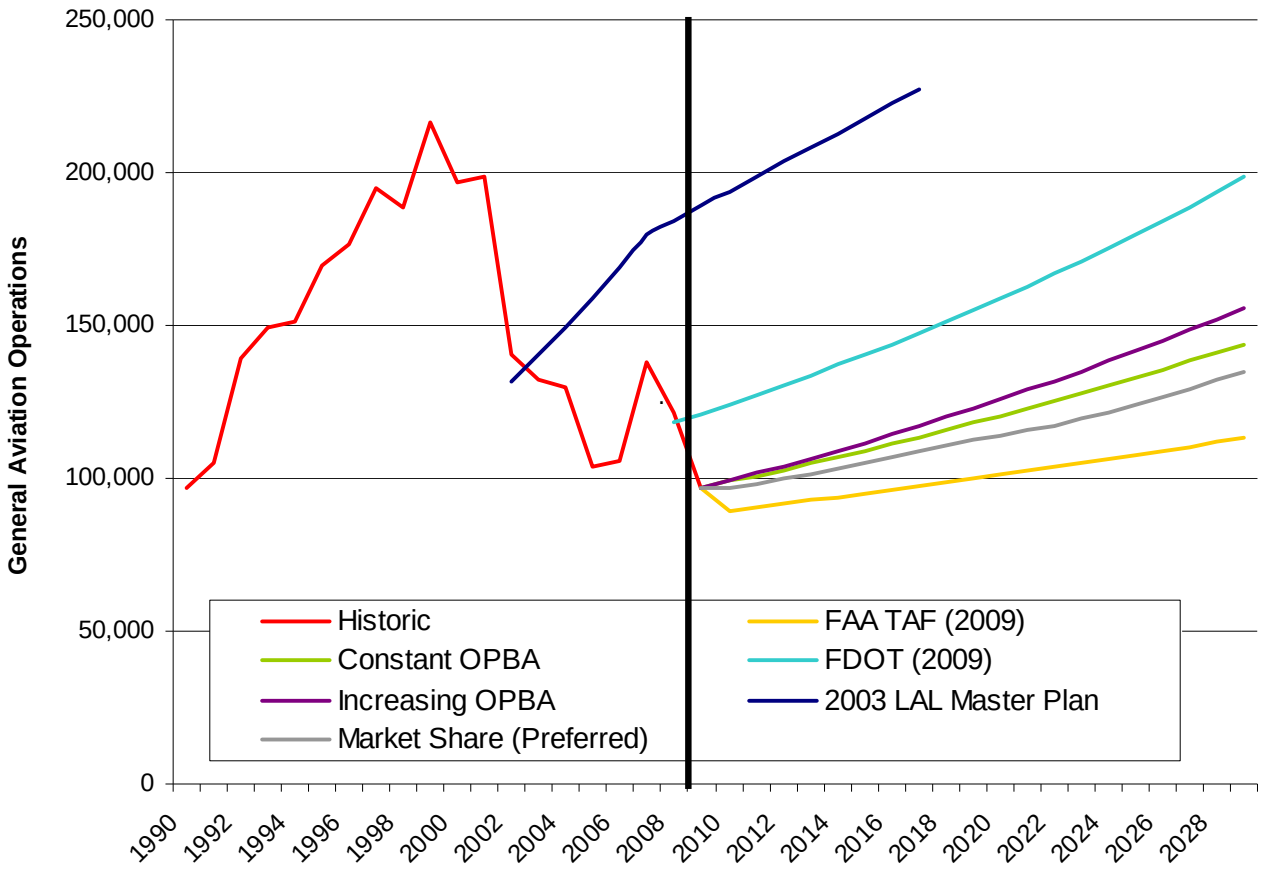
Using 2008's general aviation operations as a baseline, the Florida DOT projects that general aviation operations at LAL will increase 2.5 percent per year on average through 2029. These projections note that LAL will reach nearly 200,000 annual general aviation operations by 2029.

The FAA TAF most recent forecasts were developed in December 2009. The FAA estimates that general aviation operations at LAL will decline nearly eight percent from 2009 to 2010. The FAA projects that based aircraft will reach just 113,000 by 2029, growing at 0.8 percent per year on average over the period from 2009 to 2029.

The LAL preferred projections of general aviation operations are within the 10 percent variance of the TAF during the five-year projection period (9.8 percent variance), 10-year TAF projection (12.8 percent variance), and the 15-year projection (14.4 percent variance).

The master plan's preferred projection of aircraft operations is compared to other projections of aircraft operations at the Airport as developed in this analysis and from other sources in **Figure 2.23A**.

Figure 2.23A: Comparison of General Aviation Projections
Lakeland Linder Regional Airport



Sources: Wilbur Smith Associates, FAA TAF, and FDOT

LAL's previous master plan update, completed in 2003, projected that general aviation operations would increase at an average annual rate of 3.7 percent from 2002 to 2017. General aviation operations at LAL were projected to grow from 132,000 in 2002 to 227,000 in 2017 in the 2003 master plan update. This projected growth was well above the growth realized in the period since the projections were developed.

2.24 PROJECTIONS OF MILITARY ACTIVITY

Various factors enter into the analysis of military aviation activity, including national defense funding, troop activation, training frequency, etc. The military makes no data available regarding official aviation activity, and the FAA offers no forecasting guidance for military activity. Furthermore, federal funding for aviation projects is distributed without regard for military activity. Therefore, historic data is the only guidance for preparing forecasts of military activity and is unreliable as a predictor of future activity. For these reasons, for the purposes of this document, military aviation at LAL will be kept constant at its 2009 level of approximately 4,170 operations per year through the 2029 forecasting period.

2.25 PROJECTIONS OF COMMERCIAL SERVICE/COMMUTER/AIR TAXI OPERATIONS

Sky King is currently the only provider of commercial air service at LAL. However, LAL has the potential for commercial air service by other niche carriers at some point in the forecast period. A discussion of this commercial service potential at LAL is presented in detail in a subsequent portion of this chapter.

There are currently two carriers applying for their Part 135 certification to offer air taxi service at LAL. In 2009, it is estimated that 953 air taxi operations were performed at LAL. It is anticipated that air taxi operations will grow throughout the forecast period based on the recent interest in serving the LAL market. Although the FAA TAF projections for LAL keep the Commuter/Air Taxi operations category constant at 953 operations, the master plan has applied the *FAA Aerospace Forecasts FY2009-2025* growth rate of 1.5 percent to the LAL 2009 base year. Based on this growth rate, air taxi operations at LAL will reach 1,280 by 2029.

2.25A Projected Local/Itinerant Split

An important consideration when examining historic and projected airport operations at an airport is whether they are local or itinerant. Local operations are those

operations conducted by aircraft remaining in the Airport's traffic pattern. It should be noted that almost all local operations are training-related. Itinerant operations are those conducted by aircraft coming from outside the traffic pattern. Changes in the local/itinerant operations split at an airport are an indicator of changes in the nature of activity occurring at the facility.

In the past, operations have averaged 58 percent itinerant and 42 percent local. Historically, these percentages have shifted from year to year based on the level of flight training operations. Based on current and projected activity at the airport, these current percentages will be used in projecting the itinerant/local split of operations in future planning years. **Table 2.25A** shows the projected split of itinerant and local operations for the planning period is expected to remain the same as in past years.

Table 2.25A: Itinerant and Local Split Projections
Lakeland Linder Regional Airport

	Itinerant Operations	Local Operations	Total Operations
Historic			
2009	58,945	43,021	101,966
Projected			
2014	62,580	45,840	108,420
2019	68,160	49,840	118,000
2024	73,440	53,540	126,980
2029	81,230	59,140	140,370
Percentage Split	57.9%	42.1%	

Source: Wilbur Smith Associates, airport records

2.25B Operations Summary

Through additional facility development, based aircraft and operations activity could be higher than predicted in this forecast. The development of additional facilities may attract aircraft owners and businesses from neighboring airports or other parts of the country. Aggressive business development initiatives may attract businesses to the Lakeland region and the implementation of additional airport services could increase the use of LAL as a base of operations. However, despite these high-growth scenario possibilities, without firm interest or commitments from area businesses or individuals, the chosen growth methodologies discussed above appear reasonable considering historical activity, local development, regional and national trends, and the state and predicted growth of the industry.

The mix of general aviation, military, air taxi and air carrier operations from 2009 will remain similar throughout the projection period. **Table 2.25B** shows the projected operations for each category of operation.

Table 2.25B: Operations Mix
Lakeland Linder Regional Airport

Year	General Aviation		Military		Air Taxi	1/ Air Carrier!	Total
	Itinerant	Local	Itinerant	Local			
Historic							
2009	56,351	40,482	1,625	2,539	953	16	101,966
Projected							
2014	59,900	43,300	1,630	2,540	1,030	20	108,420
2019	65,400	47,300	1,630	2,540	1,110	20	118,000
2024	70,600	51,000	1,630	2,540	1,190	20	126,980
2029	78,300	56,600	1,630	2,540	1,280	20	140,370
2009-2029 CAGR	1.7%	1.7%	0.0%	0.0%	1.5%	1.1%	1.6%
2009 % of Total	55.3%	39.7%	1.6%	2.5%	0.9%	0.0%	100.0%
2029 % of Total	55.8%	40.3%	1.2%	1.8%	0.9%	0.0%	100.0%

Source: Wilbur Smith Associates, airport records
Notes: 1 Air Taxi category represents non-scheduled or for-hire service on aircraft with 60 seats or fewer
Totals rounded to the nearest 100 operations 1/Only considers historical activity identified by FAA.
Additional discussion of potential air carrier activity presented later in chapter.
E=estimate, CAGR=compound average growth rate

2.26 CRITICAL AIRCRAFT

The development of airport facilities is impacted by both the demand for those facilities, typically represented by total based aircraft and operations at an airport, as well as the type of aircraft that will make use of those facilities. In general, airport infrastructure components are designed to accommodate the most demanding aircraft, referred to as the critical aircraft, which will utilize the infrastructure on a regular basis. The factors used to determine an airport's critical aircraft are the approach speed and wing span of the most demanding class of aircraft that is anticipated to perform at least 500 annual operations at the airport during the planning period.

The FAA groups aircraft into Aircraft Categories and Airplane Design Groups based on their approach speed and wingspan, respectively. The criteria for these categories are presented in **Table 2.26A**.

Table 2.26A: Aircraft Categories and Design Groups

Aircraft Category	Approach Speed	Example
A	< 91 knots	Cessna 172
B	91 to < 121 knots	King Air 200
C	121 to < 141 knots	B737
D	141 to < 166 knots	B767
E	166 knots or more	SR-71
Airplane Design Group	**Wingspan**	**Example**
I	< 49 feet	Cessna 172
II	49 to < 79 feet	King Air 200
III	79 to < 118 feet	B737
IV	118 to < 171 feet	B767
V	171 to < 197 feet	B747
VI	197 to < 262 feet	A380

Source: FAA

After identifying an airport's critical aircraft it is then possible to determine the facility's Airport Reference Code (ARC). The ARC is a coding system that relates airport design criteria to the operational and physical characteristics of the airplanes that are intended to operate at an airport. An airport's ARC is a composite designation

based on the Aircraft Category and Airplane Design Group of that airport's critical aircraft.

The largest aircraft utilizing LAL is the Air Force's HC-130. The 920th Operations Group of Patrick Air Force Base has a letter of agreement with LAL for the Reserve 39th Rescue Squadron to perform training operations, including night vision goggle training. The HC-130 falls into the C-IV ARC classification. The preferred runway for this military activity is Runway 09/27 to avoid populated areas and help mitigate noise exposure. While some larger military aircraft such as the KC-135 also operates on the airfield, albeit with fewer operations than the HC-130. It is important to note that the HC-130 should not be the only determining factor since the FAA typically does not recognize military use for FAA funded projects.

Airport management noted that the largest civilian aircraft currently utilizing LAL with more than 500 annual operations is the CRJ-200. This aircraft is the Airport's critical civilian aircraft with a C-III ARC. If commercial service operations were be introduced at LAL in the forecast period, it is likely that a niche airline like Allegiant would utilize a Boeing MD-80 or Airbus A320 which have an ARC of C-III as well. This potential is discussed in more detail below.

2.27 COMMERCIAL SERVICE POTENTIAL & PROJECTIONS

Lakeland Linder Regional Airport possesses a Federal Aviation Regulations (FAR) Part 139 operating certificate entitling it to conduct commercial passenger aircraft operations, but there is currently no scheduled commercial airline service at the Airport. During the late 1950s and early 1960s, service was provided by the former National Airlines. During the rest of the 1960s and into the early 1970s, prior to airline deregulation, commercial airline service was provided by Allegheny Commuter and the former Sun Airlines.

As part of the master plan, the potential for Lakeland Linder Regional Airport to again support commercial airline service will be analyzed. This section will discuss the following:

- Current commercial air service operating environment and trends
- Niche carriers serving Florida airports
- Comparison analysis- Charlotte County
- LAL's strategic position for airline service and regional competing airports
- LAL commercial service projection scenario

2.27A Current Commercial Air Service Operating Environment and Trends

An understanding of the current airline operating environment will provide insight into the current opportunities and possibilities of LAL to support commercial airline service. Similar to the general aviation industry, the commercial airline industry has also been turbulent over the last 10 years. After suffering from the aftermath of 9/11 for several years, by 2005, the aviation industry had begun to turnaround. By 2005, most commercial airports exceeded 2000 activity levels. Most network carriers showed operating profits in mid-2007. The structural changes made by Northwest, Delta, US Airways, and United airlines during Chapter 11 bankruptcy made it possible for these carriers to reduce capacity, retire aging and less efficient aircraft, shrink operating costs, restructure debt, and reposition to more effectively compete with other carriers, particularly low cost carriers. A leaner airline industry emerged.

However, at the end of 2007, the price of fuel soared and nearly doubled by July 2008. Fuel represented 12.8 percent of airline operating costs in 2003. By the third quarter of 2008, fuel represented 35.6 percent of total operating costs. The airlines responded to the spike in fuel prices with capacity cuts, some of the largest in 20 years. Jobs were eliminated, aircraft were flown less to minimize fuel burn, and air service was cut significantly. Not all of the airlines made it. Aloha, Frontier, ATA, Skybus and Sun Country, among others, declared bankruptcy or ceased operations.

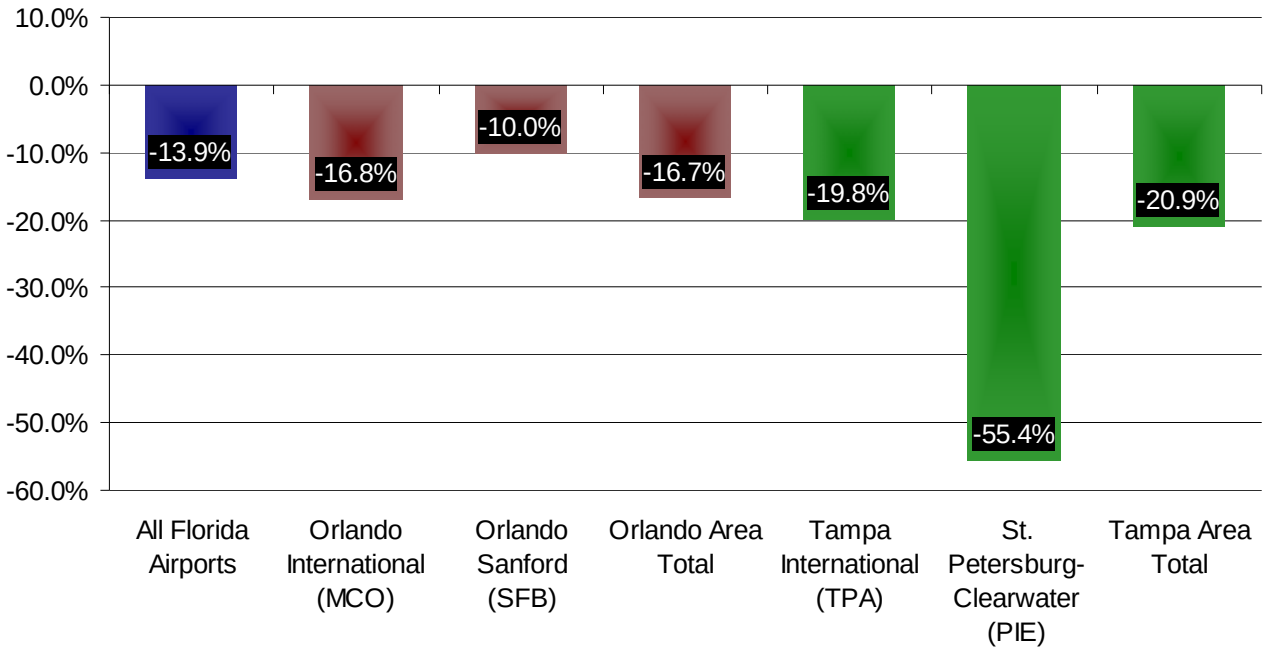
The current global economic crisis coincided with the spike in fuel price and manifested itself first in March 2008. As of the fall of 2009, many U.S. airlines were still operating in survival mode. Airline overhead and staff costs have been pared again and again. Industry revenues per passenger are down about 20 per cent over last year, while domestic capacity is down by 10 percent and still shrinking. Oil prices remain relatively high, albeit, at a much lower level than the summer of 2008. Airlines have been operating at record load factors despite the global recession and the slide in demand because of seat-capacity cuts. Airfares have fallen dramatically as fewer people are traveling overall.

It is not anticipated that the recovery for airlines will be strong in the near term due to the fact that many corporations have changed the way they look at travel, cutting back on trips and expenditures. While there are signs that improvement may be on the horizon, the demand for air travel remains weak. The decrease in airfares appears to be decelerating and may reverse later in

2010 if the economy continues to show signs of recovery.

Nearly all U.S. airports including those located in central Florida areas of Orlando (Orlando International and Orlando Sanford International) and Tampa (Tampa International and St. Petersburg-Clearwater International) metro areas experienced large declines in the last two years. **Figure 2.27A** presents the decline in capacity over the last two years at all Florida airports and the commercial service airports in the Orlando and Tampa regions. As shown, capacity at all Florida airports is down 14 percent from 2007 levels. Airline capacity at the two Orlando area airports was down 17 percent and the Tampa airports experienced declines of nearly 21 percent.

Figure 2.27A: Percent Change in Departing Monthly Seat Capacity September 2007 to September 2009



Source: Official Airline Guide

With the current commercial airline operating environment and economic downturn, airlines have cut capacity drastically in the last year and it is not anticipated that capacity will be quickly replaced as demand for both business and leisure air travel has weakened and there appeared to be too much capacity in certain markets. While it appears that the airlines are beginning to add flights again, including Southwest, who noted additional service at both Tampa and Orlando in March 2010, it is not anticipated that growth to pre-2008 levels will occur in the next few years.

One bright spot is with the low cost carrier (LCC) segment. The LCCs have fared better than their traditional service rivals during this economic downturn and some even continue to add new service. In 1999, the low cost sector had only 10 percent of the domestic U.S. market. Today, just 10 years later, LCCs have 30 percent of market.

Potentially, LAL may be able to work with one or more growing niche LCC to bring service to the Airport. A discussion of niche airlines is below.

2.27B Niche Airlines Serving Florida

Niche carriers are low cost carriers, often providing ultra-low fares. They tend to be less well known than their counterparts who operate at the largest commercial airports in the study area and their route structures are not as extensive. Often times, niche carriers seek less congested commercial airports that are on the fringe of a larger metropolitan area. In some cases, airport fees are also relatively more attractive at the airports that the niche carriers select. In Florida, niche carriers are currently concentrated at St. Petersburg-Clearwater International (Tampa metropolitan area) and Orlando Sanford International (Orlando Metropolitan area). Niche carriers have also recently begun serving Charlotte County Airport in Punta Gorda. A description of the service offered at one of these “niche airports”, Charlotte County, is discussed in a subsequent discussion below.

The airlines at niche airports differ from other more traditional airlines for several reasons. In the case of Allegiant Airlines, the airline follows a low fare business model, with pricing and route structures that differ from legacy carriers. Other carriers are strictly charter operators that offer flights on a set schedule. Other airlines accommodate international charter customers only. Still others serve special destinations, such as gambling resorts or popular beach communities, with some flying to non-domestic locations. In many cases, airlines serving the niche airports blend more than

one of these characteristics to create a unique business model.

In Florida, niche airports tend attract passengers, both residents and visitors, from the metropolitan or larger area's pool of airline travelers. These airports have developed a niche by blending service offerings from a variety of non-traditional domestic and international carriers. These carriers operate with lower fares or to destinations not always served by carriers at the larger airports in the state. In the process, these airports have been able to attract a growing passenger base, even when faced with stiff competition from larger nearby airports. Niche airports tend to have fluctuations in their enplaned passengers. These airports recognize that growth cannot be sustained without new service offerings or without financial stability of the carriers who serve their airports.

The airline industry is continually changing as carriers start up, merge, expand, and often go out of business. The financial situation of smaller niche airlines tends to be impacted greatly by economic downturns and changes in travel patterns. This can be seen as both ATA and Skybus, two larger niche airlines previously serving Florida airports, ceased operations in early 2008 due to their inability to sustain high fuel prices and weak demand. Skybus began service at two Florida airports that did not have commercial airline service at the time - Charlotte County Airport in Punta Gorda and St. Augustine, which is located 40 miles south of Jacksonville and 50 miles north of Daytona Beach. While Charlotte County was able to attract service by other niche carriers, St. Augustine is currently without commercial service once again.

Table 2.27A presents a comparison of service at Florida's niche airports. As shown, Orlando Sanford is the largest niche airport in the state with 67 weekly departures to 48 destinations by seven carriers. Orlando Sanford supports both scheduled domestic niche carriers and international charter flights to Europe. St. Petersburg-Clearwater is served by five carriers to 26 destinations and 24 weekly departures. Charlotte County Airport has service to 10 domestic markets by Allegiant and Direct Air, but just four weekly departures. When you compare the population within a 60-minute drive time (developed utilizing GIS) at the Florida niche airports, LAL has a much larger population base (2.7 million) than Charlotte County (1.1. million) and St. Augustine (1.2 million).

Table 2.27A: Comparison of Service at Niche Airports (October 2009)

	Lakeland Linder LAL	Charlotte County PGD	St. Augustine UST	St. Petersburg-Clearwater PIE	Orlando-Sanford SFB
Carriers/ (No. Destinations)	None	Allegiant (2) Direct Air (8)	None	Allegiant (21) Air Transat (1) Locair (2) Sunwing (1) USA 3000 (3)	Allegiant (31) Direct Air (2) Flyglobalspan (4) Icelandair (2) Monach (3) Thomas Cook (4) Thomson (6)
No. of Domestic Markets	0	10	0	24	33
No. of International Markets	0	0	0	2	15
No. Weekly Flights 10/09	0	4	0	24	67
Distance to Major Metro	33 miles to Tampa 60 miles to Orlando	28 miles to Ft. Myers 57 miles to Sarasota	38 miles to Jacksonville	17 miles to Tampa	30 miles to Orlando
Population w/in 60-minute drive	2.7 million	1.1 million	1.2 million	3.1 million	2.2 million

Sources: *Official Airline Guide*, GIS Analysis, 2005 Census estimates, Airport websites

2.27B1 Allegiant Air

While most competitors cut back, discount carrier Allegiant Air has boosted capacity in the last year and was the most profitable U.S. airline in 2008 in terms of operating revenue. In the third quarter of 2009, Allegiant increased scheduled capacity by 53 percent and passenger enplanements grew by 41 percent over 2008 levels. Allegiant has announced more than 30 new routes in the last year, including a new base at Los Angeles International.

Allegiant's focus is to provide nonstop service between small to medium-sized communities that lack inexpensive service and vacation getaways including Las Vegas,

Phoenix, and Florida airports of Orlando, St. Petersburg, Punta Gorda (Charlotte County), and Ft. Lauderdale.

Allegiant faces competition on only six of its 134 routes. Allegiant operates a fleet of 41 used MD-80s. Since the cost to fuel this plane is so high, the airline must operate at very high load factors, currently near 90 percent. But other than fuel costs, the aircraft is inexpensive to operate so Allegiant can afford to fly to small communities with two to four flights a week to ensure high loads. Allegiant also often adjust its schedule due to seasonality in some markets.

2.27B2 Direct Air

Direct Air is a privately owned carrier providing public charter flights and offering vacation packages. Direct Air leases Airbus A319 and A320s from Virgin America and 150-seat 737 aircraft from XTRA Airways. The company began operations in March 2007 and is headquartered in Myrtle Beach. Direct Air provides nonstop service to Punta Gorda from Worcester MA, Kalamazoo MI, Toledo OH, Springfield IL, Myrtle Beach SC, Rockford IL, and Niagara Falls NY, or to Orlando-Sanford from Kalamazoo MI and Worcester MA. Direct Air also operated a focus city at St. Petersburg for several months.

Differing from Allegiant, the planes fly both coach and business class seats and offers more of the luxuries of newer planes, including plasma televisions. Fares offered by Direct Air are also higher than those offered by Allegiant, starting at $99 each way. However, similar to Allegiant, flights are not offered on a daily basis and in some cases, offered twice a week. Direct Air markets itself as being ideal for vacationers looking for a week-long retreat or for visiting family and/or friends in Florida over a long weekend. According to the airline, its customers prefer the convenience of smaller, secondary airports.

2.27C Comparative Analysis- Charlotte County

Charlotte County Airport provides a good comparison regarding the type of service that LAL could pursue and ultimately capture. Charlotte County Airport, located 28 miles north of Ft. Myers and 57 miles south of Sarasota, was nearly leveled by Hurricane Charley in 2004. A $5.5 million, 16,000-square-foot building with the ability to provide ample room to service passengers with restrooms and tickets counters was included as part of the airport's reconstruction.

Offering low operating costs and a brand new terminal, Skybus began service at Charlotte County in December 2007. It was

an ideal location for Skybus to serve the southwest Florida market. Skybus was the first commercial carrier to serve the airport since 1984. Skybus was an ultra low-cost carrier, passing the nearly all ancillary costs on to the passengers who would pay for everything from early boarding to beverages, food, and gifts during the flights. Skybus provided service between Charlotte County and its base of Columbus, OH as well as Portsmouth, NH and Greensboro, NC. At its peak, Skybus offered six daily non-stop flights to Charlotte County. The service at Charlotte County ended just five months later, with the closure of Skybus.

During its tenure, Skybus had 116,000 passengers flying to three cities. This volume attracted the attention of Direct Air who began serving the market in November 2008 and Allegiant Air who started service to two destinations- Greensville-Spartanburg and Knoxville, TN in March 2009. Both carriers offer two to four flights per week, depending on the season. While Direct Air provided service with 20 flights a week to eight markets (Rockford IL, Myrtle Beach SC, Toledo OH, Niagara Falls NY, Worcester MA, Kalamazoo MI, Allentown PA, and Springfield IL) in November 2009. It should be noted that Direct Air reduced schedule in the summer months and served just two markets with two weekly flights.

2.27D Lakeland's Strategic Position & Competing Airports

There are over a half a million people that live in the Lakeland MSA and 8.6 million people that live within a 100 mile radius of Lakeland. LAL is 32 miles or 40 minutes to downtown Tampa and 52 miles or just over one hour drive to Disney World and other Orlando area tourist attractions. More Orlando and Tampa area employees have made Polk County home in recent years. Lakeland's central location in relation to major metropolitan areas, tourism attractions, and beaches, makes it an opportunity for the appropriate carrier. The Airport also boasts low operating costs and other incentives that could be attractive to a new carrier service as well as excellent access to I-4 via the Polk Parkway.

As noted above, the Lakeland MSA (Polk County) has experienced extensive growth over the last decade, reaching nearly 600,000 residents. In addition, the Central Florida Development Council estimates that 1.5 million tourists visit Polk County each year. There are nearly 2.7 million people living within a 60-minute drive time of Lakeland Linder.

The Orlando and Tampa metro areas are well-served by traditional and low cost carriers. As a result it is unlikely that LAL could attract one of these airlines.

According to the FAA, neither airport will approach operational capacity constraints through the forecast period. However, it is possible that LAL may appeal to a niche low cost airline in the future. It would fit well into the business model of a current niche carrier such as Allegiant or Direct Air. These carriers have found a niche in providing service to smaller or secondary markets to vacation getaways. Besides being a large MSA in its own right, Lakeland's proximity and access to the Tampa and Orlando metro areas, would allow a carrier to serve both markets. The convenience of a smaller airport is appealing to such a carrier. LAL was in discussions with Skybus Airlines to bring the carrier to the Airport until the carrier when out of business in 2008. LAL airport management has again been contacted by several carriers recently that are seriously considering serving at LAL.

2.27E Commercial Service Projections

Although the airline industry is currently experiencing a downturn and most airlines in the U.S. have cut capacity, LCC's have been able to gain market share. LAL is uniquely poised to serve a niche LCC such as Allegiant or Direct Air due to location between two large metropolitan areas and tourism markets.

Table 2.27B presents a possible commercial service projection scenario at LAL by a niche carrier. This scenario is a conservative projection based on the introduction of service by one niche carrier by 2014 and the expansion of that carrier and/or the introduction of an additional niche carrier in the longer term. As shown, the master plan projects sixteen weekly departures to eight nonstop destinations by 2014, utilizing jet aircraft such as the MD-80. It is projected that this carrier would have 1,660 annual operations and 112,100 passenger enplanements annually. By 2029, it is projected that there could be 38 weekly departures to 19 nonstop destinations. This would mean nearly 4,000 annual commercial service operations and over 266,000 annual enplanements.

The projections of commercial service presented here represent a possible scenario for commercial airline service at LAL. If carrier service could be secured, LAL would need additional passenger terminal facilities, including ticketing areas, baggage claim, gate areas, and TSA passenger security to meet these projections. How potential passengers can be accommodated will be discussed in a subsequent chapter of the master plan.

Table 2.27B: Projection Scenario of Commercial Service Activity
Lakeland Linder Regional Airport

	2014	2019	2024	2029
Avg. weekly departures	16	24	32	38
No. of nonstop markets	8	12	16	19
Annual operations	1,660	2,500	3,330	3,950
Annual enplanements	112,100	168,800	224,800	266,600

Source: Wilbur Smith Associates

2.28 SUMMARY

It is anticipated that LAL will see substantial growth during the 20-year planning period. **Table 2.28A** presents a summary of aviation demand for LAL. Included in this projection summary are aircraft operations and based aircraft. As shown, total aircraft operations are projected to increase from 101,966 in 2009 to 140,370 in 2029, growing at 1.7 percent per year on average. Based aircraft are projected to jump from 165 in 2009 to 245 in 2029, representing an average annual rate of growth of 2.0 percent. Following sections of the Master Plan will explore the facility implications of accommodating the projected demand.

In addition to the operations projections presented above, the master plan also analyzed LAL's potential to support commercial airline service. The analysis noted that LAL could play a unique role in the Central Florida commercial air service market. It appears that the Airport can support commercial service by a niche LCC carrier that would want to serve the two large metropolitan centers and nearby tourism areas of Orlando and Tampa with one central destination. Commercial airlines could also reach a large O&D market. It is projected that the Airport could enplane over 266,000 by the end of the 2029 forecast period. Based on the current airline industry and uncertainties with niche carriers, commercial service at LAL is presented in the master plan as a potential growth scenario, not as part of the projections that will drive future facility needs. However, commercial service facility needs should be discussed in a subsequent chapter, should airline service be realized at LAL.

Table 2.28A: Projections of Demand
Lakeland Linder Regional Airport

	Actual 2009/2010	Forecast 2014	Forecast 2019	Forecast 2029	CAGR 2009/2010 2009-2029
Aircraft Operations					
Air Carrier	16	20	20	20	1.1%
Commuter/Air Taxi	953	1,030	1,110	1,280	1.5%
General Aviation	96,833	103,200	112,700	134,900	1.7%
Local	40,482	43,300	47,300	56,600	1.7%
Itinerant	56,351	59,900	65,400	78,300	1.7%
Military	4,164	4,170	4,170	4,170	0.0%
Local	2,539	2,540	2,540	2,540	0.0%
Itinerant	1,625	1,630	1,630	1,630	0.0%
Total	**101,966**	**108,420**	**118,000**	**140,370**	**1.7%**
Based Aircraft	**165**	**185**	**203**	**245**	**2.0%**
Operations per Based	650	651	653	654	**0.0%**

Source: Wilbur Smith Associates

In order for approval of these projections, the FAA requires a comparison of master plan forecasts to their annual Terminal Area Forecasts (TAF), which are completed for each airport in the NPIAS and updated each year. The FAA prefers that airport planning forecasts not vary significantly from the FAA-TAF forecasts.

The FAA requires the forecasts to be within 10 percent of their five-year forecasts and 15 percent of their 10-year forecasts. The forecasts must be submitted to the local FAA office for approval. As shown in **Table 2.28B**, the enplanement, operations, and based aircraft projections for LAL are each within the FAA-required variance of the TAF.

Table 2.28B: Projections Compared to the TAF
Lakeland Linder Regional Airport

	Actual 2009	Forecast 2014	Forecast 2019	Forecast 2024	CAGR 2009-2029
Total Operations					
WSA Forecast	101,966	108,420	118,000	126,980	1.6%
FAA TAF	101,966	99,085	105,059	111,457	0.6%
Percent Variance	*0.0%*	*9.4%*	*12.3%*	*13.9%*	
Based Aircraft (excl. military)					
WSA Forecast	165	185	203	223	2.2%
FAA TAF	181	189	197	207	1.0%
Percent Variance	*-8.8%*	*-2.1%*	*3.0%*	*7.7%*	

Sources WSA Forecast – Wilbur Smith Associates, FAA TAF – Federal Aviation Administration, Terminal Area Forecast, December 2009

DEMAND/CAPACITY FACILITY REQUIREMENTS

The objective of the demand/capacity analysis is to utilize the information quantified by the aviation forecasts developed in Chapter Two, Forecasts, to determine the facilities required to accommodate existing and future aviation demands for Lakeland Linder Regional Airport. Once the demand/capacity analysis is performed, facility requirements can be determined. This section will describe the additional facilities determined to be necessary in order to meet future aviation demands. It will also identify a timeframe in which new facilities need to be implemented. Other facilities recommended based on safety, operating efficiency, or to maintain, restore, and upgrade facilities to current standards will also be described. The Federal Aviation Administration (FAA) standards for the location, construction, and protection of any future or existing facilities are also outlined.

3.11 AIRPORT PLANNING CONTEXT

3.11A National Plan of Integrated Airport Systems

The National Plan of Integrated Airport Systems (NPIAS) is a 10-year plan that is continually updated and published

annually by the FAA. The current 2009-2013 plan identifies 3,356 existing public use airports that are significant to air transportation and includes cost estimates that will be needed over a 5-year period to meet the needs of all segments of civil aviation. This plan estimates that $49.7 billion of infrastructure development that is eligible for Federal aid that will be needed over the next 5 years to meet the needs of all segments of civil aviation.

Estimates of future airport development included within the NPIAS are obtained primarily from airport master plans, regional/metropolitan airport system plans, and statewide airport planning processes. These plans are usually funded in part by the FAA, are consistent with FAA forecasts of aeronautical activity, follow FAA guidelines, and have been reviewed and accepted by FAA planners who are familiar with local conditions.

The 2009-2013 NPIAS identifies the state of Florida as having 19 Primary Commercial Service Airports, 22 Reliever Airports, and 59 General Aviation Airports (GA). The NPIAS recognizes Lakeland Linder Regional Airport (LAL) as a Reliever Airport. A reliever airport is an airport that reduces commercial service airport congestion by providing service for the smaller GA aircraft. The term “general aviation” encompasses the entire spectrum of aircraft and aircraft related businesses and services including the most sophisticated corporate and business jets, aircraft charters, training aircraft, helicopters, aircraft maintenance and refurbishment, and personal aircraft used for business and recreational purposes. The NPIAS anticipates a total of 189 aircraft will be based at LAL by the end of the NPIAS 5-year planning period. The NPIAS further reports that the estimated 5-year airport development cost that is eligible under the FAA’s Airport Improvement Program is approximately $25,795,581.

3.11B Statewide Airport System Planning Process

The Statewide Airport System Planning Process occurs between the FAA’s national planning as documented in the NPIAS and regional intrastate airport system and individual airport master planning. It identifies the general location and characteristics of new airports and general development projects of existing airports to meet statewide air transportation needs and goals. This planning is performed by state transportation or aviation planning agencies and feeds information “up” to the

NPIAS or “down” to the regional or individual airport master plan.

Better known as the Continuing Florida Aviation System Planning Process (CFASPP), the Florida Aviation System Plan (FASP) is Florida’s approach to preparing and maintaining a statewide 20-year plan for aviation facilities. The FASP identifies 128 airports as part of Florida’s aviation system. These airports are classified by the role they perform: Commercial Service (21), Reliever (22), and General Aviation (85).

An important function of the state planning process is to assist in identifying airports that meet national interest criteria but which might not be identified as such by the FAA alone. The state will apply its planning and engineering guidelines and standards. However, if it is anticipated that development items will be included in the NPIAS, FAA planning and design criteria are applicable.

The Aviation Office of the Florida Department of Transportation (FDOT) updates the FASP every 10 years. The plan evaluates the state’s public use airport system and related transportation elements. Additional elements analyzed and documented in the plan include airport inventory, economic impact and analysis, aviation activity projections, air service analysis, air cargo analysis, strategic planning, ground access, and land use.

3.11C Airport Master Planning Process

Airport Master Plans are prepared by operators of individual airports, with the assistance of consultants and detail specific long-range plans for the individual airport within the framework of statewide and regional/metropolitan airport system plans. These Airport Master Plans may be funded by the FAA.

3.11D Role of Lakeland Linder Regional Airport

The history of the airport, formerly called Drane Field, began in 1940 with 640 acres. As part of the Government’s World War II efforts in 1942, the airport was expanded and new paved runways were constructed. After World War II, control over the airport was returned to the City. The City of Lakeland owns and operates LAL which serves as a home to 169 based aircraft, the annual Sun n’ Fun Fly-In and a 27,260 SqFt GA terminal building that includes the administration offices.

LAL is classified by the FAA as a General Aviation Reliever airport. In this role, the airport attracts many GA and military aircraft away from the congested airspace around both Tampa International and

Orlando International Airports. The airport does not currently focus on commercial service operations, but is in the process of implementing some changes that are designed to draw in one or more commercial service operators.

The airport's vision for its future is to provide a first-class airport facility offering charter service, premier corporate aviation facilities/services, and commercial service. Located within the central part of Florida, the airport is ideally situated within one of the state's fastest growing counties.

3.12 BALANCED AIRPORT DEVELOPMENT

In the development of any airport, the balance between the capabilities and inherent capacities of the various functional areas of the airport is critical. The three main components: airside, landside, and airspace must all be comparable in their respective abilities to accommodate existing and projected levels of aviation activity.

The existing airside capability is primarily governed by the airport's 8,500-foot runway (Runway 9/27), and the single ILS precision approach for Runway 5.

Landside and terminal facility considerations also play important roles. Facilities that must be present and of adequate size to support GA activities include Fixed Base Operators (FBOs), a GA terminal and passenger waiting space, aircraft parking aprons, aircraft storage, aircraft maintenance facilities, aircraft fueling services, and automobile parking space.

From an airspace perspective, relative ease of use, required safety aspects and freedom from operational delays must be addressed. Without adequate airspace, full utilization of airside and landside facilities may not be fully realized.

The demand capacity analysis attempts to achieve a full balance among the three aspects of airport development to meet the anticipated future operational role and aeronautical needs of the airport. As airport deficiencies are identified, more specific determinations of sizing and timing of new airport facilities for the short, intermediate, and long-range planning periods are needed. Airport facility requirements identified through the demand/capacity analysis are also presented in the following sections.

3.13 PLANNING AND DESIGN CRITERIA

3.13A Airport Reference Code

For the purposes of airfield and facility planning, the FAA has established a

coding system called an Airport Reference Code (ARC). The ARC represents two components related to the operational demands of aircraft anticipated to utilize the airport over the entire planning period. The first component of the coding system is the Airplane Approach Category, which is a grouping of aircraft that have similar landing approach speed characteristics. Variations in aircraft approach speeds and landing distances affect runway occupancy times, which in turn, affect airfield capacity. The second component is the Airplane Design Group, which groups aircraft by wingspan. An aircraft's wingspan is critical to the development of the airfield geometry, centerline separations, and safety setbacks.

Most often, airport planning considerations are based on pre-established ARCs, which in turn, establish airport design criteria. Both components are described in greater detail as follows:

Aircraft Approach Categories

- A - Approach speeds less than 90 knots
- B - Approach speed 91 knots or more, but less than 121 knots
- C - Approach speed 121 knots or more, but less than 141 knots
- D - Approach speed 141 knots or more, but less than 166 knots
- E - Approach speed 166 knots or more

Airplane Design Groups

- I - Wingspans up to, but not including 49 feet
- II - Wingspans 49 feet up to, but not including 79 feet
- III - Wingspans 79 feet up to, but not including 118 feet
- IV - Wingspans 118 feet up to, but not including 171 feet
- V - Wingspans 171 feet up to, but not including 214 feet
- VI - Wingspans 214 feet up to, but not including 262 feet

Currently, the airport is classified as having an ARC of C-IV which is based on the critical aircraft being a HC-130. Since the HC-130 is a military plane and the FAA does not typically reference them for determining an airports ARC the largest non-military plane currently operating at LAL with at least 500 annual operations is the CRJ-200 which falls into the ARC C-III category. Other representative aircraft having these characteristics would include, but not be limited to, cabin-class business jets such as the Bombadier Global Express, Gulfstream V. Also larger jet aircraft typically used for scheduled or charter air carrier service would include

the Airbus 318, 319, and 320 series; British Aerospace 146 series; Boeing 717, 727, and 737 series; Fokker F-28 series; and McDonnell Douglas (MD) DC9 and MD 80 series of aircraft. Lastly, aircraft typically used for regional commuter service would include the Canadair/Bombardier (CL) and British Aerospace (BAE) series of regional jets.

It is anticipated that as the economic and urban demographic base within the central Florida area expands, natural market demand will require that LAL provide a wider range and breadth of GA facilities and services. Such changes would be required to adequately accommodate a larger and more diverse fleet of GA aircraft, most notably those used for scheduled or charter air transport services. In anticipation of such changes occurring within the 20-year planning period at LAL, future airfield planning within this Airport Master Plan Update reflect the FAA's ARC C-IV design criteria. Representative aircraft having these characteristics would include but are not limited to: the Airbus 300 & 310 series and the Boeing 757 & 767 aircraft series.

The planning and development of needed airport facility improvements necessary to fully accommodate ARC C-IV operations would most likely occur as demand or facility requirements dictate. For example, if the extension of Runway 9/27 is required to accommodate the runway takeoff and landing lengths of aircraft having C-IV characteristics, the extent of additional airport facility improvements may be limited to the development of adjacent taxiways and aprons that would be required to support ARC C-IV operations and safety design requirements.

3.13B Runway Geometric Requirements

In determining airfield requirements, the runway geometric design standards prescribed in FAA's Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1-15 inclusive were referenced and utilized. Currently, LAL meets or exceeds the geometric standards from ARC C-III. All future planning, as part of this Airport Master Plan Update, is predicated on meeting or exceeding current FAA ARC C-IV design standards. The two respective ARC standards are listed in **Table 3.13A**.

3.13B1 Runway Safety Areas

Runway safety areas (RSA) are defined by the FAA as "surfaces surrounding a runway that are prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or

excursion from the runway". RSAs consist of a relatively flat graded area that is free of objects and vegetation that could damage aircraft. According to FAA guidance, the RSA should be capable, under dry conditions, of supporting Airport Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

Based on FAA's inspection records, all but one of the airport's existing RSAs fully satisfy current FAA design standards. A localizer antenna array serving the Category-I ILS for Runway 5 is currently situated within the portion of the Runway 5/23 RSA that extends 1,000 feet beyond the physical end of the Runway 23. The FAA recommends, for safety and design compliance reasons, that the localizer antenna be relocated to an area beyond the limits of the RSA.

3.13B2 Runway Object Free Area

In addition to the RSA, a runway object free area (ROFA) is also defined around a runway in order to enhance the safety of aircraft operations. The ROFA is cleared of all objects except those that are related to navigational aids (NAVAIDs) and aircraft ground maneuvering. However, unlike the RSA, there is no physical component to the object free area. The ROFA for runways serving aircraft in approach categories C and D has a width of 800 feet and a length beyond the runway end of 1,000 feet.

All but one of the airport's existing ROFAs fully satisfy current FAA design standards, this is again inhibited by the location of the Runway 5/23 localizer antenna array.

3.13B3 Runway/Taxiway Centerline Separation Standards

Separation standards indicate the distance that various facilities such as taxiways, aprons, and other operational areas must be located from runways. These standards ensure that aircraft can safely operate on both areas simultaneously without fear of collision. These standards also ensure that no part of an aircraft on a taxiway penetrates the RSA or obstacle free zone (OFZ).

The existing 400-foot runway centerline-to-taxiway centerline separation between Runway 5/23 and Taxiway "B" and Runway 9/27 and Taxiway "A" fully satisfy the FAA ARC C-III/C-IV design requirements.

H:\Departments-allAirports (Des-Plan)\08038\Master Plan\Exhibits\CorelTable 3.13A.cdr

LAKELAND LINDER REGIONAL AIRPORT

Runway Geometric Requirements
Lakeland Linder Regional Airport

Requirements	Existing (Feet)	Future (Feet)
Runways	**ARC C-III**	**ARC C-IV**
Runway Centerline to Parallel Taxiway/Taxilane Centerline Separation	400	400
Runway Centerline to Edge of Aircraft Parking	500	500
Runway Centerline to Hold Line	250	250
Runway Width	100	150
Runway Shoulder Width	20	25
Runway Blast Pad Width	140	200
Runway Blast Pad Length	200	200
Runway Safety Area Width	500	500
Runway Safety Area Length Beyond Each Runway or Stopway End	1,000	1,000
Runway Object Free Area Width	800	800
Runway Object Free Area Length Beyond Each Runway or Stopway End	1,000	1,000
Clearway Width	500	500
Stopway Width	100	150
Obstacle Free Zone		
Runway Obstacle Free Zone Width	400	400
Runway Obstacle Free Zone Length Beyond Each Runway End	200	200
Inner-Approach Obstacle Free Zone Width	400	400
Inner-Approach Obstacle Free Zone Length Beyond Approach Light System	200	200

City of LAKELAND

Table 3.13A
Source: FAA AC 150/5300-13 Changes 1-15

3.13C Taxiway/Taxilane Geometric Design Requirements

The airport is currently served by two runways of varying lengths. It is recommended that each runway be complimented with a full length parallel taxiway, adequate number of connector taxiways that are strategically located to provide efficient entry and exit from the runway, and bypass taxiways where required. Apron–edge taxiways and taxilanes are also highly recommended to facilitate the optimum flow of aircraft to and from the apron areas. Future taxiway placement and design at the airport should meet the following key planning goals:

- Taxiways should be as direct as possible,
- Bypass capability to multiple access points to runway ends should be provided, and
- Taxiway bottlenecks should be minimized.

In determining airfield requirements, the taxiway/taxilane geometric design standards prescribed in AC 150/5300-13 were referenced. Currently, LAL meets or exceeds the geometric standards from ARC C-III. All future planning, as part of this Airport Master Plan Update, is predicated on meeting or exceeding ARC C-IV design standards. The two respective ARC standards are listed in **Table 3.13B**.

LAKELAND LINDER REGIONAL AIRPORT

Taxiway Geometric Requirements
Lakeland Linder Regional Airport

Requirements	Existing (Feet)	Future (Feet)
Taxiways	**ARC C-III**	**ARC C-IV**
Taxiway Width	50	75
Taxiway Shoulder Width	20	25
Taxiway Safety Area Width	118	171
Taxiway Object Free Area Width	186	259
Taxiway Edge Safety Margin	10	15
Taxiway Wingtip Clearance	34	44
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	152	215
Taxiway Centerline to Fixed or Movable Object	93	129.5
Taxiway Fillet Configurations:		
Radius of Turn	100	150
Length of Lead-In	150	250
Radius for Centerline Tracking	55	85
Taxilanes		
Taxilane Width	50	75
Taxilane Obstacle Free Area Width	162	225
Taxilane Wingtip Clearance	22	27
Taxilane Centerline to Parallel Taxilane Centerline	140	198
Taxilane Centerline to Fixed or Movable Object	81	112.5

City of LAKELAND

Table 3.13B
Source: FAA AC 150/5300-13 Changes 1-15

3.14 AIRFIELD DEMAND/CAPACITY ANALYSIS AND IDENTIFICATION OF FACILITY NEEDS

The objective of the demand/capacity analysis (as part of this Airport Master Plan Update) is to determine the capabilities and operational capacities of existing airport airfield facilities and to identify the need and timing for development of additional facilities and supporting infrastructure (which will be required to accommodate this future aviation demand). Where deficiencies are identified, recommendations are presented to provide the timely planning, funding, and development of needed facilities for the continued safe and efficient operation of the airport. The type, location, and extent of recommended airfield facility improvements are based on current airport design standards prescribed in FAA AC 150/5300-13, and Airport Design Changes 1 through 15 inclusive. Determinations of airfield capacity were developed using information and methodologies that are prescribed in FAA's AC 150/5060-5, Change 2 inclusive, Airport Capacity and Delay.

3.14A Airfield Capacity

The determination of existing and future planned levels of airfield capacity is critical to the evaluation of the adequacy of the runway and taxiway (airfield) system to meet existing and future airport activity demand levels. The inherent ability of a system of one or more runways to efficiently accommodate aircraft operations is quantified in both hourly and annualized terms. Hourly capacities for the existing and future runway systems are calculated to determine the airfields ability to accommodate projected peak hour operations. Hourly capacity is defined as the maximum number of aircraft operations that can be accommodated by the airfield system during a one-hour period, while operating in visual meteorological conditions (VMC) and instrument meteorological conditions (IMC).

Airfield capacity is defined as a reasonable estimate of an airport's ability to efficiently accommodate existing or projected levels of total annual aircraft operations (takeoffs and landings) as a percentage of calculated Annual Service Volume (ASV) for a single runway or a system of runways. As the number of annual aircraft operations increases and approaches the airport's calculated ASV, the average level of delay experienced per aircraft operation increases. When annual aircraft operations are equal to the calculated ASV (100 percent) the resultant average delay

for each operation is anticipated to range between one to four minutes depending on the mix aircraft using the airport. When the number of annual operations exceeds the ASV, moderate to severe levels of operational delay will occur.

3.14A1 Capacity Factors

The following factors are fundamental to any airfield capacity analysis and are based on general planning considerations for airports similar in size and aeronautical role to that of LAL:

- *Airfield Characteristics* - The configuration and number of available runways, parallel taxiways, and connector taxiways have a direct influence on an airfield's ability to accommodate various types of aircraft in a given period. The type of navigational aids and other instrumentation is extremely important to runway capacity, particularly during periods of low cloud ceilings and reduced horizontal visibility.

  LAL has two paved intersecting runways having a "Closed V" configuration. Runway 5 is the only runway that can accommodate Category-I Instrument Landing System (ILS) capabilities offering published approach minimums as low as 200 feet above touchdown zone elevation and 1/2 mile horizontal visibility. All other runways are supported by non-precision instrument approach procedures. It is recommended that Runway 9 be equipped with Category-I ILS facilities when demand for such capabilities develops.

- *Runway Utilization Rates* - At airports with two or more runways, it is not uncommon to find more than one configuration in use under normal operating conditions. Inadequate runway instrumentation or poor weather may also require a change in runway use. Ultimately, the airfield should use a runway configuration that affords the highest hourly capacity. However, due to varying conditions, this configuration often cannot be used 100 percent of the time. The airport's estimated ASV becomes a function of the period each configuration is used on an annual basis.

For statistical record purposes, aircraft operations are categorized as being either local operations (touch-and-go) or itinerant operations. Aircraft operations at LAL are currently limited to arrivals and departures of local and itinerant GA and itinerant military aircraft. The overall utilization of each runway (by direction of all arrivals and landings) is shown in **Table 3.14A**.

Table 3.14A
Runway Utilization Rates
Lakeland Linder Regional Airport

Existing Conditions			Future Conditions with ILS Runway 9		
Runway	**General Aviation**	**Military**	**Runway**	**General Aviation**	**Military**
5	20%	25%	**5**	16%	20%
23	14%	15%	**23**	12%	14%
9	36%	35%	**9**	40%	38%
27	30%	25%	**27**	32%	28%
Total	**100%**	**100%**	**Total**	**100%**	**100%**

Source: Lakeland Linder Regional Airport, ATCT

- *Meteorological Conditions* - Runway capacity is highest during VMC. When IMC occur and the visibility and cloud ceilings are below published minimums for instrument approaches to the runways, Instrument Flight Rules (IFR) are imposed that result in increased aircraft Air Traffic Control (ATC) separations between aircraft and increased levels of operational delay. Meteorological factors such as fog, ice, strong crosswinds, and excessive water on the runways have a major influence on runway capacity or overall airport utilization and may also cause a closure of a runway by ATC. The airport experiences Visual Meteorological Conditions (VMC) approximately 94 percent of the time.
- *Aircraft Operating Fleet Mix* - The aircraft operating fleet mix affects airfield capacity because an aircraft's size, approach speed, and braking ability affects the length of time the aircraft occupies the runway. The airport currently accommodates unrestricted operations from aircraft that have ARC characteristics that range in size from A-I to C-III. All future plans should assume that airfield improvements will be developed that will accommodate unrestricted operations of larger aircraft having an ARC of C-IV.
- *Touch-and-Go Operations* - Repeated landings and takeoffs are normally associated with pilot training or practice operations and may significantly affect runway capacity. A runway can typically accommodate more touch-and-go operations in a given period then the normal landing and takeoff activity. The airport accommodates an estimated

equal share of touch-and-go operations on all runways.

- *Taxiway System* - Similar to runways, taxiways can restrict the level of traffic an airfield may accommodate. Proper placement of exit taxiways based on the airport's operational fleet mix can reduce occupancy times and preserve optimum capacity levels.
- *Arrivals and Departures* - The percentage of time that a runway is used for landings will also have a significant impact on capacity. Since departures can normally be accommodated by ATC at a faster rate than landings, runway capacity will be reduced when arrival demand increases. For planning and capacity analysis purposes, a 50/50 approach and departure mix was utilized. This assumption remains valid with, or without, an operational Air Traffic Control Tower (ATCT).
- *Airspace* - The location of an airport with respect to other neighboring airports and natural or manmade obstructions (trees, buildings, towers, etc.) may restrict the way aircraft arrive and depart from the airport. Operations at other airports in the vicinity can conflict with operations at the subject airport, causing the capacity of both airports to suffer. Additionally, the absence of positive ATC or an active ATCT can also affect the volume of traffic safely accommodated by the airfield.

It is recommended that airspace configuration and/or capacity studies be conducted as part of the future development of additional ILS at LAL.

3.14A2 Runway Hourly Capacity

The runway hourly capacities under IFR and VFR conditions were calculated using the guidelines presented in FAA AC 150/5060-5, Airport Capacity and Delay. Using this approach, the hourly capacity of the "Closed V" runway system is 98 VFR operations per hour and 59 IFR operations per hour.

3.14A3 Hourly Demand/Capacity

For LAL a major factor in determining peak hour demand is the Sun 'n Fun Fly-In event. **Tables 3.14B – 3.14D** shows peak hour forecasts based on multiple scenarios. One scenario calculates a peak hour demand based on a 20 year average of peak month operations excluding Sun 'n Fun. This provides a good picture of the demand during normal operations. Another scenario calculates the peak hourly demand during Sun 'n Fun. This shows the

extent to which the airports capacity is pushed in order to accommodate the demand during the Sun ‘n Fun event. Peak hour calculations are also shown to include the forecast commercial service which is anticipated to be in operation by 2014. Additionally IFR peak hourly demand calculations were done for each of the different scenarios. The projected peak hour operational demand was then compared to the existing airfield hourly capacity. Scenario one, excluding Sun ‘n Fun, shows the percent of capacity used will increase from 59% in 2009 to 84% by 2029 assuming a commercial operator is in place. Scenario two, including Sun ‘n Fun, shows the percent of capacity used will increase from 169% in 2009 to nearly 240% by 2029. Based on these findings, the VFR hourly capacity of the existing runway system already exceeds its capacity during the Sun ‘n Fun event each year. One option to increase capacity is to open a parallel runway with a minimum of 700 Ft centerline to centerline separation to allow simultaneous runway operations. This would increase capacity to 197 VFR and 59 IFR peak hour operations. This would result in a percent of capacity used of 84 percent in 2009 and 119 percent by 2029. The peak hour IFR demand is anticipated to remain well within the existing peak hour capacity of the existing runway system in all scenarios.

Lakeland Linder Regional Airport
20 Year History & Peak Capacity Analysis

Peak Months Excluding Sun 'n Fun

		IFR					VFR					Local						
Date	Facility	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	Total Operations	Total Operations	% of Total	IFR % of Total Ops
Mar-90	LAL	0	0	1,357	55	1,412	0	33	4,590	188	4,811	8,449	88	8,537	14,760	129,959	11.36%	1.09%
Jan-91	LAL	0	1	1,650	37	1,688	0	2	2,467	56	2,525	6,255	132	6,387	10,600	105,999	10.00%	1.59%
Oct-92	LAL	0	2	1,607	44	1,653	0	13	3,660	80	3,753	4,801	315	5,116	10,522	144,905	7.26%	1.14%
Jun-93	LAL	0	2	1,211	67	1,280	0	9	3,282	98	3,389	5,372	286	5,658	10,327	149,893	6.89%	0.85%
Nov-94	LAL	0	4	1,669	105	1,778	0	22	3,348	63	3,433	6,906	281	7,187	12,398	165,583	7.49%	1.07%
Nov-95	LAL	0	2	1,197	32	1,231	0	10	6,009	41	6,060	6,198	107	6,305	13,596	173,578	7.83%	0.71%
Nov-96	LAL	0	12	1,155	51	1,218	0	48	6,287	78	6,413	7,233	207	7,440	15,071	186,578	8.08%	0.65%
Mar-97	LAL	0	17	1,696	53	1,766	0	45	5,779	58	5,882	6,960	136	7,096	14,744	195,884	7.53%	0.90%
Nov-98	LAL	0	17	1,225	36	1,278	0	53	6,309	75	6,437	8,222	244	8,466	16,181	201,444	8.03%	0.63%
Nov-99	LAL	0	17	1,458	40	1,515	0	64	6,106	99	6,269	8,619	166	8,785	16,569	219,713	7.54%	0.69%
Mar-00	LAL	0	27	1,586	51	1,664	4	85	5,833	84	6,006	6,900	272	7,172	14,842	193,543	7.67%	0.86%
Feb-01	LAL	0	41	1,468	67	1,576	0	64	6,128	49	6,241	8,188	298	8,486	16,303	204,556	7.97%	0.77%
Mar-02	LAL	2	108	1,431	89	1,630	0	26	5,155	26	5,207	4,947	168	5,115	11,952	138,467	8.63%	1.18%
Oct-03	LAL	0	84	1,204	61	1,349	0	86	4,490	42	4,618	4,891	131	5,022	10,989	141,367	7.77%	0.95%
Jan-04	LAL	0	49	1,156	56	1,261	0	42	5,958	72	6,072	4,662	239	4,901	12,234	127,405	9.60%	0.99%
Mar-05	LAL	0	68	1,666	92	1,826	0	4	3,432	64	3,500	3,157	114	3,271	8,597	101,361	8.48%	1.80%
Aug-06	LAL	0	124	918	68	1,110	0	4	4,328	19	4,351	4,246	219	4,465	9,926	118,713	8.36%	0.94%
Nov-07	LAL	2	127	1,235	44	1,408	0	55	3,843	13	3,911	7,309	72	7,381	12,700	147,906	8.59%	0.95%
Jan-08	LAL	0	154	1,175	113	1,442	0	5	4,486	55	4,546	6,554	123	6,677	12,665	117,237	10.80%	1.23%
Feb-09	LAL	0	180	872	83	1,135	14	0	3,777	91	3,882	2,964	338	3,302	8,319	89,179	9.33%	1.27%
Total:		**0**	**52**	**1,347**	**62**	**1,461**	**1**	**34**	**4,763**	**68**	**4,865**	**6,142**	**197**	**6,338**	**12,665**	**152,664**	**8.46%**	**1.01%**

Year	Annual Operations	Annual Operations with Commercial Service	Peak Month*	Peak Month with Commercial Service*	Average Day	Average Day with Commercial Service	Peak Hour**	Peak Hour with Commercial Service**
2009	101,966	101,966	8,700	8,700	290	290	58	58
2014	108,420	110,080	9,200	9,400	310	320	62	64
2019	118,000	120,500	10,000	10,200	340	340	68	68
2029	140,370	144,320	11,900	12,300	400	410	80	82

Year	Annual Operations	Annual Operations with Commercial Service	IFR Peak Month*	IFR Peak Month with Commercial Service*	IFR Average Day	IFR Average Day with Commercial Service	IFR Peak Hour**	IFR Peak Hour with Commercial Service**
2009	101,966	101,966	1,100	1,100	40	40	8	8
2014	108,420	110,080	1,100	1,200	40	40	8	8
2019	118,000	120,500	1,200	1,300	40	50	8	10
2029	140,370	144,320	1,500	1,500	50	50	10	10

* Peak Month calculations are rounded up to the nearest 100 and assume the average operations during the peak months from 1990-2009 as a percentage of the total annual operations, will remain constant throughout the forecast period.
** Peak hour calculations are rounded up to the nearest 10 and assume that 20% of the Average Day operations occur during the Peak Hour.

Table 3.14B
Source: FAA Form 5010, 2009; Page One Consultants, 2010

Lakeland Linder Regional Airport
20 Year History & Peak Capacity Analysis

Peak Months Including Sun 'n Fun

		IFR					VFR					Local						
Date	Facility	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	Total Operations	Total Operations	% of Total	IFR % of Total Ops
Mar-90	LAL	0	0	1,357	55	1,412	0	33	4,590	188	4,811	8,449	88	8,537	14,760	129,959	11.36%	1.09%
Jan-91	LAL	0	1	1,650	37	1,688	0	2	2,467	56	2,525	6,255	132	6,387	10,600	105,999	10.00%	1.59%
Apr-92	LAL	0	6	1,020	54	1,080	0	11	19,950	56	20,017	21,834	162	21,996	43,093	144,905	29.74%	0.75%
Apr-93	LAL	0	1	839	23	863	0	11	20,054	79	20,144	24,755	102	24,857	45,864	149,893	30.60%	0.58%
Apr-94	LAL	0	2	1,208	42	1,252	0	6	23,398	53	23,457	26,280	114	26,394	51,103	165,583	30.86%	0.76%
Apr-95	LAL	0	1	1,035	20	1,056	0	7	28,059	47	28,113	27,070	35	27,105	56,274	173,578	32.42%	0.61%
Apr-96	LAL	0	0	922	29	951	0	11	26,838	31	26,880	22,824	193	23,017	50,848	186,578	27.25%	0.51%
Apr-97	LAL	0	10	1,093	24	1,127	0	29	26,762	52	26,843	23,694	14	23,708	51,678	195,884	26.38%	0.58%
Apr-98	LAL	0	20	918	26	964	0	32	27,244	48	27,324	26,123	45	26,168	54,456	201,444	27.03%	0.48%
Apr-99	LAL	0	3	996	40	1,039	0	46	34,057	83	34,186	32,735	104	32,839	68,064	219,713	30.98%	0.47%
Apr-00	LAL	0	21	893	28	942	0	33	28,178	90	28,301	26,214	167	26,381	55,624	193,543	28.74%	0.49%
Apr-01	LAL	0	35	845	26	906	0	40	29,259	22	29,321	28,515	39	28,554	58,781	204,556	28.74%	0.44%
Apr-02	LAL	0	67	1,080	72	1,219	0	25	25,159	626	25,810	11,812	2,132	13,944	40,973	138,467	29.59%	0.88%
Apr-03	LAL	0	53	900	33	986	0	23	19,508	14	19,545	10,749	70	10,819	31,350	141,367	22.18%	0.70%
Apr-04	LAL	0	30	814	48	892	0	36	19,804	75	19,915	2,184	154	2,338	23,145	127,405	18.17%	0.70%
Apr-05	LAL	0	68	926	86	1,080	0	11	15,313	56	15,380	6,003	209	6,212	22,672	101,361	22.37%	1.07%
Apr-06	LAL	0	42	792	49	883	0	5	21,122	81	21,208	2,124	92	2,216	24,307	118,713	20.48%	0.74%
Apr-07	LAL	0	60	703	37	800	0	21	17,852	84	17,957	8,014	155	8,169	26,926	147,906	18.20%	0.54%
Apr-08	LAL	0	121	709	53	883	0	4	16,648	25	16,677	2,963	47	3,010	20,570	117,237	17.55%	0.75%
Apr-09	LAL	2	31	603	59	695	0	0	12,148	85	12,233	7,475	150	7,625	20,553	89,179	23.05%	0.78%
Total:		**0**	**29**	**965**	**42**	**1,036**	**0**	**19**	**20,921**	**93**	**21,032**	**16,304**	**210**	**16,514**	**38,582**	**152,664**	**24.28%**	**0.72%**

Year	Annual Operations	Annual Operations with Commercial Service	Peak Month*	Peak Month with Commercial Service*	Average Day	Average Day with Commercial Service	Peak Hour**	Peak Hour with Commercial Service**
2009	101,966	101,966	24,800	24,800	830	830	166	166
2014	108,420	110,080	26,400	26,800	880	900	176	180
2019	118,000	120,500	28,700	29,300	960	980	192	196
2029	140,370	144,320	34,100	35,100	1,140	1,170	228	234

Year	Annual Operations	Annual Operations with Commercial Service	IFR Peak Month*	Peak Month with Commercial Service*	IFR Average Day	IFR Average Day with Commercial Service	IFR Peak Hour**	IFR Peak Hour with Commercial Service**
2009	101,966	101,966	800	800	30	30	6	6
2014	108,420	110,080	800	800	30	30	6	6
2019	118,000	120,500	900	900	30	30	6	6
2029	140,370	144,320	1,100	1,100	40	40	8	8

* Peak Month calculations are rounded up to the nearest 100 and assume the average operations during the peak months from 1990-2009 as a percentage of the total annual operations, will remain constant throughout the forecast period.
** Peak hour calculations are rounded up to the nearest 10 and assume that 20% of the Average Day operations occur during the Peak Hour.

Table 3.14C
Source: FAA Form 5010, 2009; Page One Consultants, 2010

Lakeland Linder Regional Airport
20 Year History & Peak Capacity Analysis

IFR Peak Months

		IFR					VFR					Local						
Date	Facility	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	Total Operations	Total Operations	% of Total	IFR % of Total Ops
Jan-90	LAL	0	0	1,568	26	1,594	0	36	4,285	109	4,430	5,087	132	5,219	11,243	129,959	8.65%	1.23%
Jan-91	LAL	0	1	1,650	37	1,688	0	2	2,467	56	2,525	6,255	132	6,387	10,600	105,999	10.00%	1.59%
Oct-92	LAL	0	2	1,607	44	1,653	0	13	3,660	80	3,753	4,801	315	5,116	10,522	144,905	7.26%	1.14%
Jan-93	LAL	0	0	1,693	37	1,730	0	1	3,692	44	3,737	4,259	130	4,389	9,856	149,893	6.58%	1.15%
Dec-94	LAL	0	5	1,820	81	1,906	0	9	2,936	62	3,007	5,037	169	5,206	10,119	165,583	6.11%	1.15%
Feb-95	LAL	0	1	1,800	61	1,862	0	10	3,824	135	3,969	4,401	170	4,571	10,402	173,578	5.99%	1.07%
Feb-96	LAL	0	6	1,354	70	1,430	0	14	4,522	122	4,658	4,458	188	4,646	10,734	186,578	5.75%	0.77%
Mar-97	LAL	0	17	1,696	53	1,766	0	45	5,779	58	5,882	6,960	136	7,096	14,744	195,884	7.53%	0.90%
May-98	LAL	0	20	1,521	36	1,577	0	43	4,872	67	4,982	5,886	236	6,122	12,681	201,444	6.30%	0.78%
Oct-99	LAL	0	28	1,639	54	1,721	0	87	5,065	68	5,220	7,029	108	7,137	14,078	219,713	6.41%	0.78%
Mar-00	LAL	0	27	1,586	51	1,664	4	85	5,833	84	6,006	6,900	272	7,172	14,842	193,543	7.67%	0.86%
Sep-01	LAL	0	72	2,043	82	2,197	0	16	1,734	3	1,753	3,550	52	3,602	7,552	204,556	3.69%	1.07%
Jan-02	LAL	0	108	1,565	90	1,763	0	26	3,944	23	3,993	3,424	211	3,635	9,391	138,467	6.78%	1.27%
Mar-03	LAL	4	52	1,644	61	1,761	0	18	4,265	20	4,303	3,814	118	3,932	9,996	141,367	7.07%	1.25%
Feb-04	LAL	0	53	1,563	51	1,667	0	30	4,408	40	4,478	4,677	172	4,849	10,994	127,405	8.63%	1.31%
Mar-05	LAL	0	68	1,666	92	1,826	0	4	3,432	64	3,500	3,157	114	3,271	8,597	101,361	8.48%	1.80%
Feb-06	LAL	0	74	1,220	75	1,369	0	7	3,863	88	3,958	2,333	42	2,375	7,702	118,713	6.49%	1.15%
Feb-07	LAL	0	81	1,327	117	1,525	0	2	3,920	43	3,965	5,540	248	5,788	11,278	147,906	7.63%	1.03%
Feb-08	LAL	0	160	1,285	61	1,506	0	1	4,208	39	4,248	4,133	205	4,338	10,092	117,237	8.61%	1.28%
Feb-09	LAL	0	180	872	83	1,135	14	0	3,777	91	3,882	2,964	338	3,302	8,319	89,179	9.33%	1.27%
Total:		**0**	**48**	**1,556**	**63**	**1,667**	**1**	**22**	**4,024**	**65**	**4,112**	**4,733**	**174**	**4,908**	**10,687**	**152,664**	**7.25%**	**1.14%**

Year	Annual Operations	Annual Operations with Commercial Service	Peak Month*	Peak Month with Commercial Service*	Average Day	Average Day with Commercial Service	Peak Hour**	Peak Hour with Commercial Service**
2009	101,966	101,966	8,900	8,900	300	300	60	60
2014	108,420	110,080	9,400	9,600	320	320	64	64
2019	118,000	120,500	10,300	10,500	350	350	70	70
2029	140,370	144,320	12,200	12,500	410	420	82	84

Year	Annual Operations	Annual Operations with Commercial Service	IFR Peak Month*	Peak Month with Commercial Service*	IFR Average Day	IFR Average Day with Commercial Service	IFR Peak Hour**	IFR Peak Hour with Commercial Service**
2009	101,966	101,966	1,300	1,300	50	50	10	10
2014	108,420	110,080	1,400	1,400	50	50	10	10
2019	118,000	120,500	1,500	1,500	50	50	10	10
2029	140,370	144,320	1,800	1,800	60	60	12	12

* Peak Month calculations are rounded up to the nearest 100 and assume the average operations during the peak months from 1990-2009 as a percentage of the total annual operations, will remain constant throughout the forecast period.
** Peak hour calculations are rounded up to the nearest 10 and assume that 20% of the Average Day operations occur during the Peak Hour.

Table 3.14D
Source: FAA Form 5010, 2009; Page One Consultants, 2010

3.14A4 Annual Service Volume

The annual service volume (ASV) for LAL was developed from the guidelines presented in FAA AC 150/5060-5. For long-range planning purposes, the ASV of an airport can be estimated by identifying the runway configuration and the aircraft mix index (which is the percentage of the airport's Class C aircraft plus three times the percentage of Class D aircraft). Because there are few Class C or Class D aircraft using the airfield, an FAA mix index of 0-20 percent was used. Using the FAA's generalized "long-range" analysis technique, the ASV for the existing two-runway system was determined to be approximately 230,000 operations annually (FAA AC 150/5060-5, Runway Use Configuration No. 9).

In 2009, there were 101,966 recorded annual operations at LAL. By 2029, it is anticipated that in excess of 140,000 annual operations will occur at the airport. The percent of ASV capacity used will increase from slightly over 44 percent in 2009 to approximately 61 percent by the end of the 20-year planning period.

Based on the examination of the existing and projected levels of annual operations with the calculated ASV for the airport's existing two-runway system, airfield capacity enhancement will not be required within the 20-year planning. Because the level of demand may vary, the annual aircraft operational levels and associated average levels of aircraft operational delay should be monitored and reviewed periodically.

3.14B Runway Length Analysis

The required lengths of usable runway pavement are dependent upon the operational and design characteristics of the various make and models of aircraft that operate at the airport, particularly during the hottest periods of the year. Aircraft runway length requirements vary depending on the unique operational and design characteristics of each aircraft and include, but are not limited to: aircraft acceleration and lift off speeds, takeoff weight, non-stop trip distance, useful loads, and the airport's Above Mean Sea Level (MSL) elevation. Each of these operational factors is used by pilots as referenced in the aircraft operational handbook published by the respective aircraft manufacturers.

Runway length requirements at LAL were determined through a combination of methodologies including the following:

- FAA "Airport Design" computer program Version 4.2, and

- Takeoff and Landing Data from Performance Tables for Certain Cabin-Class Jets.

These methodologies range from general guidance (e.g., use of the FAA's computerized airport design program) to the use of aircraft operational-specific data (e.g., use of aircraft specific takeoff performance data). The results obtained using these two methodologies are described in the following paragraphs.

3.14B1 Airport Design Computer Program, Version 4.2

The use of the FAA's Airport Design computer program was predicated on the following aircraft specific operational characteristics which consider the following factors unique to LAL:

- Airport elevation of 142 feet Above MSL;
- Mean daily maximum temperature of the hottest month (94.6 degrees Fahrenheit [° F]);
- Maximum difference in runway centerline elevation of the two existing runways, 11.05 Ft (5/23) and 10.05 Ft (9/27);
- Length of haul for airplanes of more than 60,000 pounds (4,000 nautical miles [NM]); and
- Wet and slippery pavement conditions.

Information relevant to LAL for the above items was entered into the program. The results of the program are specified for aircraft of more than 60,000 pounds and aircraft of less than 60,000 pounds. The category of less than 60,000 pounds is further subdivided by the groups of aircraft and their gross takeoff weight.

Groups of aircraft are specified by using either 75 or 100 percent of the fleet. **Table 3.14E** lists some of the aircraft types that represent approximately 75 and 100 percent of the national active GA fleet. Gross takeoff weight is specified by using 60 percent or 90 percent of useful load.

The results of the runway length analysis using the Airport Design Program methodology are presented in **Table 3.14F**. FAA criteria specify that the runway length requirements for an airport such as LAL be determined using the "75 percent fleet at 60 percent useful load" unless a critical aircraft having a greater requirement can be identified. As the table indicates, a runway length of 5,750 feet is required. For aircraft greater than 60,000 pounds, the required runway length is 10,100 feet based on a non-stop international haul length of at least 4,000 NM.

Table 3.14E
Representative Aircraft Fleet
Lakeland Linder Regional Airport

Large aircraft that could comprise 75 - 100% of the fleet:

Manufacturer	Model
Aerospatiale	Sn-601 Corvette
Bae	125-700, Corporate 800/1000
Beech Jet	400A, Premier I, 2000 Starship
Bombardier	Challenger 300, Challenger 600, Challenger 601/601-3A/3ER, Challenger 604, Continental BD-100
Cessna	Citation 500/501 Sp, Citation I/II/II, Citation II 525A, Citation Bravo 550, Citation II 550, Citation II Special 551, Citation 552, Citation Encore 560, Citation Excel 560/560 XL, Citation V Ultra 560, Citation VII 650, Citation Sovereign 680, Citation S/II S550, Citation III/IV 650, Citation X 750
Dassault	Falcon 10, Falcon 20, Falcon 50/50 EX, Falcon 900/900B, Falcon 900C/900EX, Falcon 2000/2000EX
Israel Aircraft Industries	Jet Commander 1121, Westwind 1123/1124, Astra 1125, Galaxy 1126
Learjet	20 Series, 31/31A/31A ER, 35/35A/36/36A, 40/45, 45 XR, 55/55B/55C, 60
Mitsubishi	Diamond Mu-300
Raytheon	Premier 390
Raytheon Hawker	400/400 XP, 600, Horizon, 800/800 XP, 1000
Sabreliner	40/60, 75A, 80, T-39, 65/75

Table 3.14F
Runway Length Analysis
Lakeland Linder Regional Airport

Category	Recommended Runway Length (feet)*
Aircraft <= 60,000 lbs	
75% of these aircraft at:	
60% useful load	5,430 Ft
90% useful load	7,190 Ft
100% of these aircraft at:	
60% useful load	5,750 Ft
90% useful load	9,100 Ft
Aircraft > 60,000 lbs**	10,100 Ft

* Assumes wet/slippery runway conditions

** Assumes a non-stop haul length of 4,000 NM

City of LAKELAND

LAKELAND LINDER REGIONAL AIRPORT

3.14B2 Airport-Specific Operational Requirement Analysis

To provide an alternative and more representative measure of aircraft runway takeoff and landing length needs, the most demanding "critical" runway takeoff and landing distance requirements for a representative fleet of cabin-class jet aircraft that are known or are anticipated to utilize the airport were examined using manufacturer-specified data.

The FAA takeoff and landing field length requirements are presented referencing “standard day” and recorded “hottest day” conditions. Comparisons of takeoff and landing length requirements between the two conditions were developed using published aircraft performance characteristics that were based on a temperature of 59° F and 29.92 inches barometric pressure. The hottest day assumes aircraft performance based on an average maximum temperature of 94.6° F (July) at the airport elevation of 142 feet above MSL.

To accommodate projected activity and aircraft operational fleet mixes, the required overall length of the existing runway was analyzed. To determine the runway length requirements, several planning assumptions were utilized:

- The airport has a field elevation of 142 feet;
- The daily maximum temperature obtained from NOAA's Climatography of the United States Report No. 81 (30-year Monthly Station Normals) is 94.6° F in July;
- On the hottest day, the calculated density altitude is 2,165 Ft, (assuming an elevation of 142 Ft, a temperature of 94.6° F, a dew point of 78.9° F, and a pressure of 30.53 in Hg);
- Existing and future operational aircraft fleet mix will operate at maximum gross takeoff weight;
- Business jets will operate at their longest non-stop range (700 to 1,000 NM);
- Runway takeoff lengths for an existing fleet of cabin-class turboprop and business jets will operate at their respective maximum gross takeoff weight and the FAA’s “balanced field” methodology under zero wind conditions; and
- Runway takeoff lengths for future large air carrier aircraft will be based on anticipated payload, non-stop international haul length of 4,000 NM and maximum allowable takeoff weights for those conditions using the

balanced field methodology under zero wind conditions.

As shown in **Table 3.14G**, the runway takeoff length requirements for existing and anticipated Turbofan aircraft operations at LAL may require up to 7,100 feet of usable runway.

Runway Takeoff/Landing Requirements
Lakeland Linder Regional Airport

Aircraft No.	Aircraft Type	Airport Reference Code (ARC)	Empty Weight (lbs.)	Gross Takeoff Weight (lbs.)	Runway Length (Over a 50-Foot Obstacle)			
					FAA Takeoff Field Length (feet) at ISA Conditions*	FAA Takeoff Field Length (feet) at LAL Hottest Day Conditions**	FAA Landing Field Length (feet) at ISA Conditions*	FAA Landing Field Length (feet) at LAL Hottest Day Conditions**
14	Citation Jet	B-I	6,275	10,500	3,080	3,309	2,750	2,955
29	Beechjet 400A	B-I	10,255	16,100	3,802	4,085	2,960	3,181
50	350 Super King Air	B-I	9,051	15,000	3,680	3,954	2,508	2,695
13	Citation Ultra	B-II	9,250	16,500	3,180	3,417	2,800	3,009
16	Falcon 50	B-II	21,100	38,800	4,700	5,050	2,900	3,116
23	Astra SP	B-II	13,225	23,500	5,250	5,641	2,720	2,923
24	Astra SPX	B-II	13,700	24,650	5,400	5,802	2,720	2,923
31	Hawker 800 XP	B-II	16,100	28,000	5,030	5,405	2,350	2,525
35	Falcon 20F	B-II	17,500	28,660	4,950	5,319	2,450	2,633
45	C-90A King Air	B-II	6,580	10,100	2,577	2,769	2,078	2,233
46	B200 Super King Air	B-II	8,060	12,500	2,579	2,771	2,074	2,229
51	Jetstream 31	B-II	9,756	15,322	4,150	4,459	3,820	4,105
32	Sabreliner 60	C-I	11,600	20,372	5,100	5,480	2,425	2,606
34	Sabreliner 80	C-I	13,600	23,500	4,380	4,706	2,600	2,794
37	Citation Jet (Prelim)	C-I	6,030	10,100	2,960	3,181	2,800	3,009
43	Learjet 36A	C-I	9,571	17,250	4,224	4,539	3,075	3,304
44	Sabreliner 75A	C-I	13,600	23,500	4,380	4,706	2,600	2,794
1	Canadair SE	C-II	33,900	53,250	6,295	6,764	2,910	3,127
7	Corporate Jetliner	C-II	31,800	51,250	6,090	6,544	2,945	3,164
9	Citation 7	C-II	11,720	22,650	4,690	5,039	2,910	3,127
10	Citation 10	C-II	18,390	34,500	5,580	5,996	3,500	3,761
11	Citation Bravo	C-II	8,383	14,500	3,400	3,653	3,010	3,234
12	Citation Excel	C-II	10,900	18,900	3,414	3,668	3,315	3,562
18	Falcon 900B	C-II	22,573	45,500	4,950	5,319	3,510	3,771
20	Falcon 2000 (Prelim)	C-II	19,522	35,000	5,440	5,845	3,126	3,359
25	Galaxy	C-II	18,550	33,400	6,040	6,490	3,400	3,653
30	Hawker 1000	C-II	18,000	31,000	5,950	6,393	2,455	2,638
33	Sabreliner 65	C-II	13,754	24,000	5,150	5,534	2,500	2,686
36	**Falcon 200**	**C-II**	**18,800**	**32,000**	**5,300**	**5,695**	**2,300**	**2,471**
38	Citation 2	C-II	8,200	14,300	3,450	3,707	2,440	2,622
40	Citation 5	C-II	9,100	16,100	3,160	3,395	2,870	3,084
41	Citation 6	C-II	12,795	22,200	5,150	5,534	2,900	3,116
47	300 Super King Air	C-II	8,490	14,000	3,682	3,956	2,907	3,124
48	Exec-Liner	C-II	9,489	16,600	3,800	4,083	2,560	2,751
52	Saab 340 Corporate	C-II	16,120	27,000	4,000	4,298	4,000	4,298
54	Canadair Regional Jet (Series 100LR)	C-II	30,122	53,250	6,600	7,092	4,900	5,265
8	Global Express	C-III	48,500	91,250	5,100	5,480	2,600	2,794
22	Gulfstream 5	C-III	46,800	89,400	5,870	6,307	2,950	3,170
26	Learjet 31A	D-I	10,588	16,500	3,280	3,524	2,767	2,973
27	Learjet 35A	D-I	10,022	18,500	4,972	5,342	3,075	3,304
28	Learjet 60	D-I	14,240	23,500	5,450	5,856	3,710	3,986
2	Challenger CL-600W	D-II	23,385	41,400	5,700	6,125	3,050	3,277
3	Challenger CL-601-1A	D-II	25,400	43,250	5,400	5,802	3,300	3,546
4	Challenger CL-601-3A	D-II	25,500	43,250	5,400	5,802	3,300	3,546
5	Challenger CL601-3A/ER	D-II	25,760	44,750	5,875	6,313	3,300	3,546
6	Challenger CL-601A-3R	D-II	25,760	42,250	6,050	6,501	3,300	3,546
21	Gulfstream 4-SP	D-II	42,500	75,000	5,450	5,856	3,190	3,428
39	Citation 3 (Series No. 100 and up)	D-II	13,500	22,200	5,150	5,534	2,900	3,116
42	Gulfstream 3	D-II	38,000	70,200	5,100	5,480	3,200	3,438
49	Starship	D-II	9,949	14,500	4,093	4,398	2,630	2,826
53	Canadair Regional Jet (Series 100ER)	D-II	30,122	51,250	6,090	6,544	4,900	5,265

* International Standard Atmospheric Conditions, 0 Ft MSL Elevation, 59° F.
** Runway length corrected for conditions at LAL, 142 Ft MSL Elevation, 94.6° F historic hottest day average for 30 years.

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TABLE 3.14G
SOURCE: 2003 Lakeland Linder Regional Airport Master Plan

Based on the analysis provided by the two different examinations of runway length requirements, it is recommended that the 8,500 Ft runway, 9/27, be equipped with Category-I ILS to offer unrestricted access to the airport during periods of low cloud ceilings and reduced visibility for all aircraft used in this analysis.

3.14B3 Long-Range Planning Considerations

The possibility of an airline, cargo, and/or charter service operating out of LAL has been a topic of discussion since the early 1990's. A variety of investment groups have expressed interest in developing air service to and from the Central Florida Area, primarily from within Polk County. The aircraft identified as potentially operating out of LAL range in size from the Boeing 737 and MD-80 series to the Boeing 757. To fully support long-haul international charter air service, the associated runway takeoff length requirements for long-haul non-stop flights aircraft may be in excess of the runway's current 8,500-foot length. For this reason it is proposed that Runway 9/27 be extended to an ultimate length of 10,100 Ft. This recommendation was identified in previous planning efforts and is depicted in this Master Plan Update and Airport Layout Drawing.

The extension of Runway 9/27 is considered to represent one of several critical elements necessary to meet the Airport's expressed goal of providing facilities and services that would be required to accommodate the future GA, cargo, charter and/or scheduled air service activities.

3.14B4 Runway Width

The current runway width of 150 feet meets the FAA's prescribed planning criteria of 150 feet for ARC C-III/C-IV planning purposes.

3.14B5 Runway Strength

Detailed information about the load bearing capacity of the two runways can be found in Appendix A of this Master Plan Update.

The load bearing capabilities listed are considered sufficient to accommodate the majority of current and forecast aircraft operation.

3.14C Holding Bays

The purpose of holding bays is to provide space for one aircraft to pass another in order to reach the runway end. This reduces airfield delays when one aircraft is conducting engine run-ups or is being held for air traffic control reasons. Although

three holding bays or designated aircraft run-up areas have been specifically designed as part of the airport's taxiway system, the wide expanse of the two Taxiway A connectors at each end of Runway 9/27 currently serves to provide bypass capabilities for ARC A-I and for B-II aircraft. It is also recommended that Taxiway A connectors A2, A3, A4, and A5 all be expanded to 75 Ft to provide additional bypass areas and to meet Group IV design criteria.

3.14D Taxiways

The existing system of parallel and connector taxiways serving Runway 9/27 are expected to require some improvements to accommodate the activity that is forecast within the 20-year planning period. The current 400-foot runway centerline to taxiway centerline separation fully satisfies the FAA ARC C-IV design requirements. Recent taxiway improvements to Taxiway H, J, and K included more direct hangar/terminal access, and widening of Taxiway J fully accommodate the future operations of aircraft having ARC C-IV design characteristics. Future plans include extensions of Taxiways D and B, and widening a portion of Taxiway E. These improvements are expected to fully meet the needs of the demand for the remaining portion of the 20-year planning period.

3.14E Airfield Lighting

3.14E1 Approach Lighting

Runway 5 is currently served by a Category-I ILS that has a pilot-controlled Medium-Intensity Approach Light System (MALSR) with Runway Alignment Indicator Lights (RAIL). At such time that a Category-I ILS is developed for Runway 9, a similar approach lighting system will be required.

3.14E2 Runway and Taxiway Lighting

Currently, Runway 5 is equipped with High Intensity Runway Edge Lights (HIRL) and Runways 9/27 and Runway 23 are equipped with Medium Intensity Runway Edge Lights (MIRL). Taxiways A, B, C, E, F, G, H, and J are equipped with Medium-Intensity Taxiway Lights (MITL). It is recommended that MITLs be used for all parallel taxiways serving Runways 9/27 and 5/23.

3.14F Visual NAVAIDS

Existing visual NAVAIDs located at LAL include Precision Approach Path Indicators (PAPIs) serving both Runway 9/27 and Runway 5/23.

3.14G Electronic NAVAIDS

At such time that Runway 9/27 is extended to a length of 10,100 feet, it is recommended that a Category-I ILS be installed to serve Runway 9. The ILS would include a Glide Slope Antenna, Localizer Antenna and Runway Visual Range (RVR) equipment and an Outer Marker beacon that would be located approximately 5 NM west of the airport and located on the extended runway centerline.

It is recommended that the existing localizer antenna array supporting the Runway 5 Category-I ILS be removed once ILS capability has been established for Runway 9.

3.14H Rotating Beacon

Inspection of the airport's rotating beacon reveals that it is currently in adequate condition but it is anticipated to require service/replacement at some point during the 20-year planning period.

3.14I Windsock/Segmented Circle

LAL airport management maintains a lighted windsock and segmented circle at the intersection of Runways 9/27 and 5/23. Three additional lighted windsocks are located at each end of Runway 5/23 and Runway 9. The four windsocks and the segmented circle are in good condition and are anticipated to remain adequate throughout the 20-year planning period. However, the lighted windsock and segmented circle may need to be relocated when the expansion of Taxiway B is started.

3.14J Air Traffic Control Tower

LAL is served by a contract ATCT located in the former terminal building site. Built in 1980, this structure contains the ATCT cab that operates from 6:00 a.m. to 10:00 p.m. It is recommended that once funds are available, a new strategically located ATCT facility be constructed. In addition, it is recommended that the existing ATCT facility be demolished to better utilize the land.

The preferred tower development site is located south of Taxiway P and west of Taxiway F. The physical design, safety and security setbacks associated with the development of the new tower will be determined at the time of final design and construction. The new ATCT will provide personnel with improved views and control of the existing and future runways and taxiways.

3.15 SUMMARY OF IDENTIFIED AIRSIDE FACILITY REQUIREMENTS

The following airfield improvements are recommended to occur within the 20-year planning period:

- Extension of Runway 5/23 1,780 feet to the southwest;
- Extend Runway 9/27 1,600 feet to the west;
- Extension of Taxiway D to the east;
- Extension of Taxiway B to the southwest;
- Remove Runway 5 localizer antenna array;
- Constructed new ATCT;
- Acquire land;
- Expand Terminal Apron.

Detailed information regarding the phased development, timing and anticipated costs of these planned airport improvements are provided in the Alternatives chapter of this Master Plan Update.

3.16 LANDSIDE DEMAND/CAPACITY ANALYSIS AND IDENTIFICATION OF FACILITY NEEDS

The objective of the landside demand/capacity analysis is to determine the capability of existing airport landside facilities to accommodate existing and future aviation demands as quantified by the aviation forecasts developed in Chapter Two of this report. Once the demand/capacity analysis is performed, facility requirements can be determined. This section will describe those additional facilities identified as being required to meet future aviation demands as well as identify a timeframe in which the new facilities need to be implemented. Other facilities recommended based on safety, operating efficiency, or to maintain, restore, and upgrade facilities to current standards will also be described.

3.16A Commercial Passenger Terminal Facilities

A two-story 27,260 Sq Ft terminal building was constructed in 2001. Common area commercial/retail space is located at ground level and provides ample walk-up counter space for FBOs, rental car services, and future air service operators. Public restrooms, pilot lounge/briefing room and vending areas are also provided at this level. Today, approximately 2,400 square feet of the lower level is reserved for use by future commercial operators.

The terminal's second level offers a full service restaurant, meeting rooms, observation deck, and airport administrative offices.

Public, employee and rental car automobile parking space spaces are

located in front of the terminal building within easy walking distance of the terminal entrance.

The existing terminal building fully satisfies the current and projected facility needs of the GA flying public. As opportunities for the development of FAR Part 135 air charter services arise, the existing use, space allocation and adjacencies of the GA terminal should be reviewed as required.

3.16B General Aviation Facilities

This section addresses GA facility requirements according to current and projected levels of local and itinerant GA activity.

3.16B1 Transient and Based Aircraft Apron Tie-Down Space

Apron areas (in excess of what is currently available) are needed to accommodate the parking/storage needs of aircraft permanently based at the airport and aircraft that visit the airport for refueling, maintenance or short stays. Additional Apron areas will most likely need to be developed to meet immediate or short-term aircraft tie-down demand.

3.16B2 Aircraft Storage

As of March 2010, the airport recorded 65 Airport owned T-hangars and16 apron tie-down spaces. In addition to the City T-hangar facilities, an additional 24 conventional hangars are used for aircraft storage. These conventional hangars are a mix of private, commercial, and city owned. **Table 3.16A** presents the existing and projected future distribution of based aircraft by hangar/tie-down facility (e.g., T-hangar, conventional and open apron tie-down). The future demand for T-hangar, conventional hangar, and open apron tie-down storage space is projected to increase as the levels of based aircraft increase throughout the 20-year planning period.

It is estimated that by the end of the 20-year planning period, an additional 60 T-hangar units and conventional hangar space to accommodate approximately 70 aircraft (ranging in size from the smallest of single-engine aircraft to the largest of cabin-class corporate jets) will be needed.

Aircraft Storage Distribution
Lakeland Linder Regional Airport

Aircraft Type		Aircraft Storage Type		Year			
				2009 (Existing)	2014	2019	2029
Single Engine		Hangar (80%)	T-Hangar (80%)	78	85	90	100
			Conventional Hangar (20%)	20	21	22	25
		Apron (20%)		24	26	28	31
		Total Single Engine Aircraft		**122**	**132**	**140**	**156**
Multi-Engine	High-Performance Aircraft (25%)	Hangar (100%)	T-Hangar (0%)	---	---	---	---
			Conventional Hangar (100%)	6	7	7	9
		Apron (0%)		---	---	---	---
	Low-Performance Aircraft (75%)	Hangar (75%)	T-Hangar (100%)	13	15	17	20
			Conventional Hangar (0%)	---	---	---	---
		Apron (25%)		4	4	5	7
		Total Multi-Engine Aircraft		**23**	**26**	**29**	**36**
Jet Engine Aircraft		Hangar (100%)	Executive Hangar (20%)	3	3	5	7
			Small Hangar (10%)	1	2	2	4
			Medium Hangar (60%)	7	10	13	21
			Large Hangar (10%)	1	2	2	4
		Apron (0%)		---	---	---	---
		Total Jet Engine Aircraft		**12**	**17**	**22**	**36**
Helicopter		Hangar (100%)	T-Hangar (0%)	---	---	---	---
			Conventional Hangar (100%)	8	10	12	17
		Apron (0%)		---	---	---	---
		Total Helicopter		**8**	**10**	**12**	**17**
Total Based Aircraft				**165**	**185**	**203**	**245**

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TABLE 3.16A
SOURCE: 2009 LAL FAA Form 5010, 2003 Lakeland Linder Regional Airport Master Plan

It is anticipated that the need for additional hangar storage of aircraft will be satisfied by various avenues as demand dictates. The timing, location and size of these aircraft storage facilities will be determined on a case by case basis and will primarily be driven by factors such as aircraft fleet mix, private or commercial use, and tenant/operational space requirements.

Airport management maintains a list of aircraft owner/operators who request aircraft storage space. This information is used to help determine the need for additional T-hangar units.

3.16B3 Airport Maintenance Facilities

The airport is supported with two maintenance buildings, designated open-air storage, and a staging area located on the east and south sides of the airfield.

3.16B4 Aircraft Fueling Storage and Distribution

There are two existing aircraft fuel farms on the airfield. One is situated immediately to the west of the terminal building and the other is located further to the west near one of Colombia Air Services hangars. The existing fuel storage and settling period capacities are considered adequate to meet current and near-term aviation activity needs of the airport's FBOs.

3.16B5 Airport Rescue and Fire Fighting

FAA AC 150/5210-6C, Aircraft Fire and Rescue Facilities and Extinguishing Agents, outlines levels of protection and levels and type of equipment considered as the minimum recommended requirements to satisfy FAR Part 139. The requirements are listed in **Table 3.16B** and vary depending upon aircraft sizes and frequency of operations. As the table indicates, the requirements are stated in terms of "indexes" that begin with the letter "A" for airports serving small aircraft and extend to the letter "E" for airports serving large aircraft. Each index letter defines a range for aircraft length. Index A is defined as aircraft that have a length of less than 90 feet. The longest index group with an average of 5 or more daily departures by air carrier aircraft is the Index required for the airport. LAL is currently classified as an Index A ARFF facility.

If scheduled air carrier/commuter service were to commence at the airport, LAL would be required to operate under the guidelines of FAR Part 139 covering airports with scheduled and non-scheduled passenger flights. The current ARFF facility and equipment would satisfy these requirements.

Table 3.16B
ARFF Equipment Requirements
Lakeland Linder Regional Airport

Airport Index	Length of Aircraft*	Vehicles		Extinguishing Agents	
		Light-Weight	Self-Propelled	Dry Chemicals (Pounds)	Water (Gallons)
A	Under 90 Ft	1	0	500 Sodium or 450 Potassium	0 or 100
B	90 - 125 Ft	1	1	500 Sodium or Halon	1,500
C	126 - 158 Ft	1	2	500	3,000
D	159 - 199 Ft	1	2	500	4,000
E	Over 200	1	2	500	6,000

Source: FAA AC 150/5210-6C, FAR Part 139

3.16B6 Airport Administration Office

The Airport Administration Office are located on the east side of the terminal building on the second floor. The office consists of 6,200 Sq Ft which is divided between general office space, a large conference room, and a small conference room. If scheduled commercial service were to start it is recommended that the Administrative Offices relocate and the space be used to support the security and baggage needs for the commercial service operator.

3.16B7 Airport Utilities

Airport utilities at LAL include electrical, telephone, water, gas, and sanitary sewer. Providers of these utilities are identified in Chapter One, Inventory. No known deficiencies are noted and it is anticipated that these utilities will remain adequate throughout the 20-year planning period.

3.16B8 Airport Surface Access and On-Airport Circulation

Don Emerson Drive provides access to the airport terminal building from Drane Field Road (SR 572), located on the north side of the airport. Drane Field Road also provides access via Florida Avenue (SR 37) and Harden Boulevard. to the City of Lakeland. Medulla and West Pipkin Roads, located on the south side of the airport, provide access to the central and southern portions of Polk County. I-4, accessed via County Line Road, provides access to Tampa and Orlando.

The Polk County Parkway (SR 570) provides additional surface access to the airport. This limited access roadway forms

a partial loop to the west, south, and east of the City of Lakeland. Interchanges providing access to the airport are located at Airport Road and Waring Road. It is anticipated that these access points will remain adequate throughout the 20-year planning period.

East and West Perimeter Roads are two main internal roadways which provide access from one side of the airfield to the other. From the main terminal building there is a zipper road which parallels Taxiway B heading northeast where it connects with East Perimeter Road. East Perimeter Road follows the airports property line along the east side of the airfield and provides direct access to the airfield maintenance facility and electrical vault. East Perimeter Road continues southward and provides access to the LAL VORTAC. A gate at the southern most end of East Perimeter Road provides off airfield access to the south side of the airport via Medulla Road, Airside Center Drive, and West Pipkin Road.

On the western side of the airfield is West Perimeter Road (also called Kevin Howard Road), which provides additional north/south access. On the south side of the airfield, West Perimeter Road connects to Poberezny Road and Aaron Morgan Road which provide access to the Sun ‘n Fun campground area and the main Sun ‘n Fun campus.

It is recommended that as the airfield’s runways and taxiways are extended and developed, that an on-airport circulation/security road be constructed and or relocated (as appropriate) to remain clear of all required RSAs and ROFAs. Where possible, the road should avoid crossing runways, taxiways and associated ILS glide slope and localizer critical areas.

3.17 SUMMARY OF IDENTIFIED LANDSIDE FACILITY REQUIREMENTS

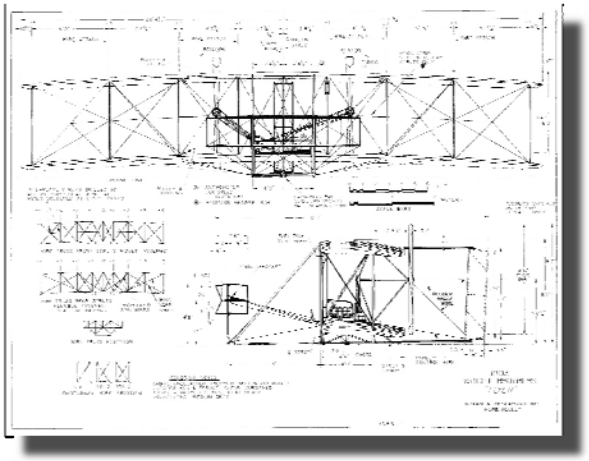
The following landside improvements are recommended to occur within the 20-year planning period:

- Construct T-hangars, conventional hangars, and commercial hangar space as demand dictates;
- Construct or relocate on-airport service road as airfield developments dictate;
- Security Fencing and Gates to meet the requirement for a commercial service operator; and
- Construct a new ARFF Facility

Alternatives Analysis

This chapter presents and discusses the physical 20 – year Master Plan for Lakeland Linder Regional Airport (LAL). The preferred alternatives for each area of development on the airport make up the Master Plan. Also presented in this chapter are the other alternatives developed during the planning process. There is a brief description of each plan with an explanation of what issues made that plan less feasible than the preferred alternative.

The plans discussed in this chapter were all designed to address current and future demand/capacity at the airport in addition to maximizing land usage. Part of the design planning process included meeting with the Stakeholders Advisory Committee and the Technical Advisory Committee to



gather input about how the airport can best serve the aviation community, the city of Lakeland, and the surrounding area. The two committees were presented with the different alternatives and a preferred alternative for each area of development was chosen. Each of these plans was developed based on the recommendations outlined in the Demand/Capacity and Facility Requirements chapter of this Master Plan.

4.2 PREFERRED ALTERNATIVE

4.21 KEY FEATURES

The preferred alternative shown in **Figure 4.2** depicts the airport as it might look at the end of the 20 year forecast period. The recommended improvements outlined in the facility requirements chapter are included in this figure. While this was determined to be the preferred alternative by the SAC, TAC, and the airport staff, this layout is not intended to be a finite plan, but is meant to simply provide a visual representation of how the facility requirements and other airport needs can be met. The key features of the plan include:

- Construction of Cargo Operations Area on the Northwest side of RWY 9/27
- Construction of Additional T-Hangars on North side of RWY 9/27
- Expansion of the Existing Terminal Building to Accommodate Commercial Service
- Relocation of the ATCT to the South side of RWY 9/27
- Relocation of Instrument Landing System (ILS) from RWY 5/23 to RWY 9/27
- Extension of RWY 9/27 to 10,100 FT
- Extension of RWY 5/23 to 5,750 FT With Displaced Threshold
- Extension of TWYs P, B and D
- Realignment/Widening of TWY E
- Rehabilitation/Expansion of FEMA Staging Area Apron
- Construction of an ARFF Facility
- Construction of Fixed Base Operator (FBO) Facility on the South side of the airfield
- Construction of GA/Corporate Hangars in the Southeast corner of the airfield
- Construction of an All Weather Observation System (AWOS)
- Construction of High Speed Taxiways on RWY 9-27
- Land Acquisition for New RWYs on Southwest corner of the airfield
- Construction of a Grass RWY and a Seaplane Base in the Southwest corner of the airfield
- Environmental Assessment (EA) for New RWYs
- Environmental Assessment (EA) for Extended RWYs
- Construct a New Perimeter Road on the West side of the airfield
- Fencing/Gate Plan

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DRANE FIELD ROAD

FUTURE NON-AVIATION

KELVIN HOWARD ROAD

FUTURE NON-AVIATION

FUTURE NON-AVIATION

FUTURE NON-AVIATION

FUTURE FUEL FARM ROADWAY NETWORK

FUTURE AVIATION

FUTURE AVIATION

FUTURE SOLAR FARM

TAXIWAY A EXTENSION

FUTURE PAPI (TYP)

FUTURE CARGO/TERMINAL COMMERCIAL RAMP AND BUILDING

FUTURE MRO

KIDRON ROAD

AIR PARK DRIVE

FUTURE CORPORATE

FUTURE CORPORATE

FUTURE LEASE LOT

FUTURE LEASE LOT

AIRPORT ROAD

FUTURE DUAL PURPOSE ARFF

DRANE FIELD ROAD

FUTURE AUTO PARKING

FUTURE QTA

FUTURE NON-AVIATION

FUTURE APRON/ FBO

TERMINAL APRON

FUTURE APRON

FUTURE APRON

FUTURE APRON

FUTURE APRON

FBO

FUTURE APRON

TAXIWAY J

TAXIWAY B

TAXIWAY C

MAINTENANCE ACCESS ROAD

FUTURE RPZ

FUTURE ARFF

LOCALIZER RELOCATED

FUTURE MALSR

TAXIWAY A

TWY A1

TWY A4

TAXIWAY A5

TAXIWAY A

FUTURE RUNWAY 9L-27R (10,100' X 150')

TAXIWAY P EXTENSION

TWY P1

TWY P2

TAXIWAY P

TAXIWAY P EXTENSION

TAXIWAY B EXTENSION

EXISTING PAPI (TYP)

TAXIWAY P EXTENSION

TAXIWAY C

TAXIWAY E

FUTURE RPZ

FUTURE RPZ (TYP)

FUTURE AWOS

TAXIWAY D

TAXIWAY D EXTENSION

FUTURE ATCT

TAXIWAY S

TAXIWAY

NEW FEMA STAGING AREA CONFIGURATION

FUTURE RUNWAY 9R-27L (4,200' X 50')

FUTURE RUNWAY 5-23 (5,750' X 150') DISPLACED THRESHOLD

EXISTING VORTAC/RCO

TAXIWAY E WIDENING

TAXIWAY E REALIGNMENT & WIDENING

TAXIWAY E

FUTURE FBO

FUTURE APRON

FUTURE APRON

FUTURE APRON

FUTURE MRO/CORPORATE

FUTURE SOLAR FARM

GLIDE SLOPE RELOCATED FOR RUNWAY 9 EXTENSION

LAND ACQUISITION

FUTURE GRASS RUNWAY (2,600' X 250')

FUTURE SEAPLANE BASE (2,600' X 250')

FUTURE TAXIWAY AND APRON

SUN 'N FUN COMPLEX

MEDULLA ROAD

FUTURE CENTRAL FLORIDA AEROSPACE ACADEMY

FUTURE TAXIWAY

FUTURE RPZ

APRON

LAND ACQUISITION FUTURE NON-AVIATION

MEDULLA ROAD

FUTURE FUEL FARM

OLD MEDULLA ROAD

WEST PIPKIN ROAD

LEGEND

BUILDINGS

AIRFIELD PAVEMENT (AOA)

GRAPHIC SCALE IN FEET

500 0 500 1000

City of LAKELAND

H:\CAD\2008\Lakeland\080338_Master Plan Update\Report Graphics\4.2-Preferred Alternative.dwg Feb 28, 2011 - 3:51pm

FIGURE 4.2
PREFERRED ALTERNATIVE

4.3 AIRSIDE IMPROVEMENTS

As shown on **Figure 4.3A**, the ultimate airfield geometry at LAL includes the extension of the two existing runways, conversion of TWY D to a new GA runway, construction of a new grass runway, and a new Seaplane Base.

4.31 RUNWAYS

4.31A Runway 9/27 (Future 9L/27R)

RWY 9/27 (Future 9L/27R) will remain the primary runway throughout the forecast period. It will be extended 1,600 FT for a total length of 10,100 FT. The current (ARC) for RWY 9/27 is C-III based on the design aircraft being the CRJ-200. The future ARC will be C-IV and will be designed around aircraft like the B757, B767-300, or the A300.

RWY 9 will be outfitted with an ILS providing precision approaches, while RWY 27 will remain non-precision. The existing RWY 9 PAPIs will be relocated based on the runway extension. The future NAVAID locations shown on the Airport Layout Plan (ALP) are for planning purposes only. Once each NAVAID is authorized by the FAA, they will provide the site location which may or may not correspond to the illustrated location. Under this ultimate plan, no modification of standards is required for RWY 9L/27R.

4.31B Runway 9R/27L (Future)

RWY 9R/27L (Future) will serve as a utility runway and will be primarily used for flight training. It will be 4,200 FT long and 50 FT wide. The proposed (ARC) for RWY 9R/27L is B-II.

In order to keep the RPZ for 27L on airport property it is recommended that the threshold be displaced.

PAPI's are the only recommended NAVAID for the proposed RWY 9R/27L.

4.31C Runway 5/23

RWY 5/23 will be extended and the threshold displaced providing a total take off length of 5,750 FT.

The ILS for RWY 5 will be removed, reverting RWY 5 to a non-precision runway. RWY 23 will remain non-precision. The existing RWY 5 PAPIs will be relocated based on the runway extension. The future NAVAID locations shown on the Airport Layout Plan (ALP) are for planning purposes only. Once each NAVAID is authorized by the FAA, they will provide the site location which may or may not correspond to the illustrated location.

4.31D Grass Strip 8L/26R (Future)

A future 250 Ft wide, 2,600 FT long grass strip will be developed on the Southwest corner of the airfield to accommodate light aircraft in VFR conditions. There are no planned NAVAIDs for the grass strip.

4.31E Water Strip 8R/26L (Future)

A future 250 Ft wide, 2,600 FT long water strip will be developed on the Southwest corner of the airfield to accommodate small sea planes in VFR conditions. There are no planned NAVAIDs for the water strip.

4.32 TAXIWAYS & TAXI SYSTEM

4.32A Taxiway D (Future Runway 9R/27L)

TWY D will be extended and converted to RWY 9R/27L. This will be a utility GA runway designed for capacity enhancement at the airport.

RWY 9R/27L will be equipped with a non-precision PAPI system.

4.32B Taxiway System

An essential part of an airport's layout and efficiency is the ground circulation system which connects the runways with the airfields aviation facilities. In general, the most efficient taxiway is one that parallels the runways and provides multiple entry and exit points for aircraft. The taxiway system shown in **Figure 4.3A** depicts the recommended changes necessary to meet this criteria. The following is an outline of these recommended changes but does not necessarily reflect an order or priority or precedence:

- Construct TWY B South of 9/27
- Widening/Realignment of TWY E
- Extend TWY P East to the end of RWY 27
- Extend TWY D East to TWY E
- Construct a New TWY from RWY 5 Northeastward to TWY E
- Construct New High Speed Taxiways North of RWY 9L-27R

4.33 AIRSPACE & APPROACHES

4.33A Airspace/Approach Zone

In accordance with FAR Part 77 and FAA Advisory Circular (AC) 150/5070-6B, an airport airspace drawing was prepared for LAL and is shown on **Figure 4.3B**. The purpose of this drawing is to identify potential obstructions to navigable airspace in the vicinity of the airport. This figure represents the conditions that would exist on the airport given that all of the preferred alternatives where implemented. This includes one precision approach (RWY 9), three non-precision approaches

(RWYs 5, 23, and 27), and visual approaches for all paved RWYs including the future (RWY 9R/27L).

4.33B Instrument Approaches

In order to facilitate existing and future demand, installation of a precision instrument approach for RWY 9 will need to occur. This system will provide a Category-I precision instrument approach. The existing ILS for RWY 5 will be removed, in order to minimize the potential noise impact to the community, and to remedy the current infringement of the localizer on the safety area for RWY 23.

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD

KELVIN HOWARD ROAD

KIDRON ROAD

AIR PARK DRIVE

AIRPORT ROAD

FBO

TERMINAL

MAINTENANCE ACCESS ROAD

TAXIWAY H

TAXIWAY J

TAXIWAY B

TAXIWAY C

TAXIWAY A

TAXIWAY A5

TAXIWAY P

TAXIWAY D

TAXIWAY E

TAXIWAY S

TAXIWAY

TWY A1

TWY A4

TWY P1

TWY P2

FUTURE RUNWAY 9L-27R (10,100' X 150')

FUTURE RUNWAY 9R-27L (4,200' X 50')

FUTURE RUNWAY 5-23 (5,750' X 150') DISPLACED THRESHOLD

TAXIWAY B EXTENSION

TAXIWAY P EXTENSION

TAXIWAY D EXTENSION

FUTURE RPZ (TYP)

LAND ACQUISITION

FUTURE GRASS RUNWAY (2,600' X 250')

FUTURE SEAPLANE BASE (2,600' X 250')

SUN 'N FUN COMPLEX

MEDULLA ROAD

WEST PIPKIN ROAD

OLD MEDULLA ROAD

75' (TYP)

LEGEND

BUILDINGS

EXISTING AIRPORT PROPERTY

FUTURE AIRPORT PROPERTY

GRAPHIC SCALE IN FEET

500 0 500 1000

City of LAKELAND

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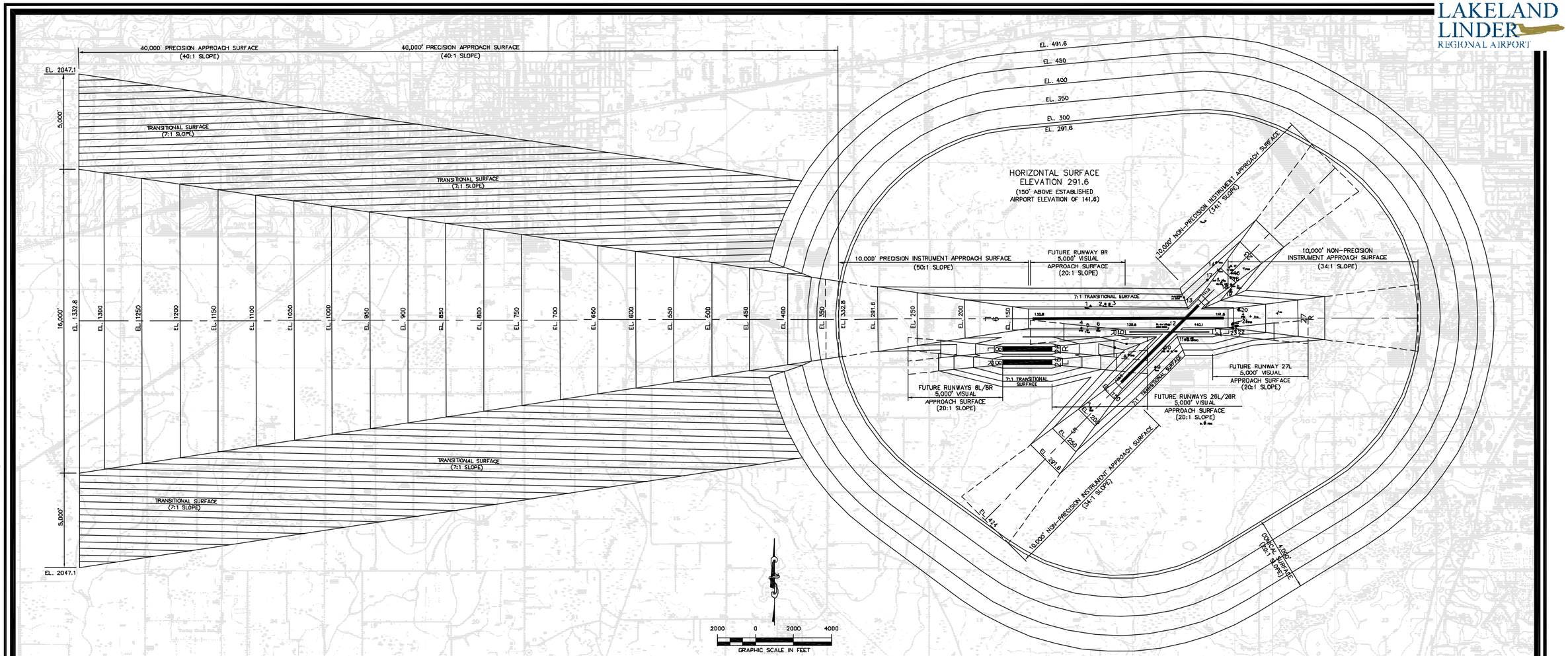
FIGURE 4.3A
ULTIMATE AIRFIELD GEOMETRY



OBSTRUCTION TABLE						
NO.	DESCRIPTION	OBSTACLE ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	PENETRATION (FEET)	RECOMMENDED ACTION	LIGHTED
1	TREE	199.2	TRANSITIONAL SURFACE	46.2	TRIM OR REMOVE	NO
2	TREE	214.2	TRANSITIONAL SURFACE	46.5	TRIM OR REMOVE	NO
3	TREE	201.2	TRANSITIONAL SURFACE	36.1	TRIM OR REMOVE	NO
4	TREE	183.2	PRIMARY SURFACE RW9-27R	52.2	TRIM OR REMOVE	NO
5	TREE	197.2	TRANSITIONAL SURFACE	51.1	TRIM OR REMOVE	NO
6	TREE	182.2	TRANSITIONAL SURFACE	40.3	TRIM OR REMOVE	NO
7	TREE	196.2	INNER APPROACH - RW9	32.5	TRIM OR REMOVE	NO
8	TREE	192.2	TRANSITIONAL SURFACE	24.7	TRIM OR REMOVE	NO
9	TREE	188.2	TRANSITIONAL SURFACE	11.1	TRIM OR REMOVE	NO
10	ROD ON OBSTRUCTION LIGHTED DEER	172.2	PRIMARY SURFACE RW9-27	41.2	FIXED BY FUNCTION	YES
11	OBSTRUCTION LIGHTON ANTENNA	174.2	TRANSITIONAL SURFACE	9.2	FIXED BY FUNCTION	YES
12	OBSTRUCTION LIGHTON LIGHTED WINDSOCK	161.2	PRIMARY SURFACE RW9-27R	27.9	FIXED BY FUNCTION	YES
13	ANTENNA AIRPORT BEACON ON ATCT	206.2	TRANSITIONAL SURFACE	21.6	FIXED BY FUNCTION	NO
14	TREE	192.2	TRANSITIONAL SURFACE	27.7	TRIM OR REMOVE	NO
15	TREE	161.2	INNER APPROACH - RW23	5.1	TRIM OR REMOVE	NO
16	TREE	176.2	INNER APPROACH - RW23	8.1	TRIM OR REMOVE	NO
17	TREE	166.2	TRANSITIONAL SURFACE	9.7	TRIM OR REMOVE	NO
18	TREE	177.2	INNER APPROACH - RW23	14.4	TRIM OR REMOVE	NO
19	TREE	174.2	TRANSITIONAL SURFACE	9.1	TRIM OR REMOVE	NO
20	TREE	180.2	INNER APPROACH - RW27R	27.4	TRIM OR REMOVE	NO
21	TREE	155.2	INNER APPROACH - RW27R	5.9	TRIM OR REMOVE	NO
22	TREE	159.2	INNER APPROACH - RW27R	11.0	TRIM OR REMOVE	NO
23	TREE	160.2	INNER APPROACH - RW27R	15.0	TRIM OR REMOVE	NO

NOTES

1. AIRSPACE DRAWING BASED ON FUTURE (ULTIMATE) AIRFIELD LAYOUT DEPICTED HEREIN.
2. CIVIL AIRPORT IMAGINARY SURFACES DEPICTED PER FAR PART 77, OBJECTS AFFECTING NAVIGABLE AIRSPACE, PUBLISHED MARCH, 1993, SUBPART "C". ALL APPLICABLE CHANGES TO PART 77 INCLUDED.
3. END ELEVATIONS FOR EXISTING RUNWAYS DERIVED REFERENCING USDOC/NOAA NATIONAL GEODETIC SURVEY–OBSTRUCTION DATA SHEET: 0939, LAKELAND LINDER REGIONAL AIRPORT, SURVEY DATE 16TH DAY 1998.
4. SEE POLK COUNTY JOINT ZONING REGULATIONS OF THE POLK COUNTY JOINT AIRPORT ZONING BOARD FOR APPLICATION OF ALL APPLICABLE FAR PART 77, SUBPART "C" CIVIL AIRPORT IMAGINARY SURFACES DEPICTED HEREIN.

LAKELAND LINDER REGIONAL AIRPORT

City of LAKELAND

FIGURE 4.3B
AIRPORT AIRSPACE PLAN

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4.34 *SECURITY*

4.34A Airport Security Fencing

With commercial service on the horizon for LAL, it is recommended that a complete airport security and fencing study be conducted to determine what changes are necessary to meet FAA and TSA requirements.

4.4 LAND

4.41 LAND ACQUISITION

In order to accommodate the ultimate plan for the airport, including the development of the grass and water strips, additional land will need to be acquired in the Southwest corner of the airfield. Another parcel near the Southeast corner of the airfield is recommended as land acquisition for other potential aviation and non-aviation related use. These parcels are depicted on **Figure 4.4A**.

4.42 ULTIMATE LAND USE PLAN

One of the most important parts of airport planning is effective and efficient use of the land. This requires consideration to be given to existing land usage as well as future land usage. Throughout the planning process Airport Staff along with the Technical Advisory and Stakeholders Advisory Committees meet to discuss a variety of ideas on how to maximize land use at the airport. The Ultimate Land Use Plan depicts the final plan as decided by all of the staff and committees involved. There are several categories of on-airport land use including:

- Airfield Area
- Terminal Area
- Aviation Related
- Airport Industrial Park
- Lakeland Airside Center
- Sun ‘n Fun Facilities

Each of the above listed categories is further defined in the following sub-sections and are depicted in **Figure 4.4B**.

4.42A Airfield Area

This category includes all of the land used for air operations and includes runways, taxiways, NAVIADS, and any of their related safety and critical areas. The airfield area also includes the Runway Protection Zones which restrict the height of buildings near runway ends. The RPZ’s size and shape is defined by FAR Part 77.

4.42B Terminal Area

The Terminal Area includes all of the areas specifically designated to provide services for the airport user/passenger. The airport terminal building, aircraft apron

areas, auto parking, are all included in this category.

4.42C Aviation Related (GA)

The General Aviation area of the airport includes all areas which provide services for GA activities including FBO's and aircraft storage hangars. This category also includes aircraft services like maintenance, sales, avionics, fuel, and even non-scheduled charter service.

4.42D Sun 'n Fun

The Sun 'n Fun area is host to a variety of different aviation related events throughout the year including the annual Sun 'n Fun Fly-In. This area is also home to the Florida Air Museum, the FAA National Resource Center, and the Central Florida Aerospace Academy.

4.42E Airport Industrial Park

The Industrial Park area is reserved for aviation or non-aviation related type businesses. This area can help provide the airport with steady revenue even if aviation services are slow.

4.42F Lakeland Airside Center

This area encompasses the Airside Center Building and the land south and east of the building. It consists of a mixture of Aviation and Non-Aviation facilities. Some of the facilities included in this area are: the Lakeland Police Department Aviation Hangar, Aircraft Refinishing and Painting Hangar, Sky King Maintenance Hangar, Flight Safety International, Publix, Lakeland Electrical, and Polk Community College.

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD
KELVIN HOWARD ROAD
KIDRON ROAD
AIR PARK DRIVE
AIRPORT ROAD
FBO
TERMINAL
MAINTENANCE ACCESS ROAD
TAXIWAY A EXTENSION
RUNWAY 9L–27R EXTENSION
TAXIWAY P EXTENSION
FUTURE RPZ (TYP)
TAXIWAY A
TWY A1
TWY A4
TAXIWAY A5
TAXIWAY A
FUTURE RUNWAY 9L–27R (10,100' X 150')
TWY P1
TWY P2
TAXIWAY P
TAXIWAY B EXTENSION
TAXIWAY P EXTENSION
TAXIWAY H
TAXIWAY J
TAXIWAY B
TAXIWAY C
TAXIWAY C
TAXIWAY E
TAXIWAY D
TAXIWAY D EXTENSION
DISPLACED THRESHOLD
FUTURE RUNWAY 9R–27L (4,200' X 50')
FUTURE RUNWAY 5–23 (5,750' X 150')
TAXIWAY S
TAXIWAY F
TAXIWAY E
PARCEL 2
1 AC.
PARCEL 1
40 AC.
PARCEL 3
31 AC.
PARCEL 4
62 AC.
SUN N FUN PROPERTY
PARCEL 5
16 AC.
PARCEL 6
8 AC.
SUN 'N FUN COMPLEX
MEDULLA ROAD
PARCEL 7
29 AC.
OLD MEDULLA ROAD
WEST PIPKIN ROAD

LEGEND
- BUILDINGS
- FUTURE LAND ACQUISITION
- EXISTING AIRPORT PROPERTY
- PARCEL BOUNDARY LINE

GRAPHIC SCALE IN FEET
500 0 500 1000

City of LAKELAND

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FIGURE 4.4A
FUTURE LAND ACQUISITION PLAN

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD

KELVIN HOWARD ROAD

KIDRON ROAD

AIR PARK DRIVE

AIRPORT ROAD

FBO

TERMINAL

MAINTENANCE ACCESS ROAD

TAXIWAY A EXTENSION

TAXIWAY H

TAXIWAY J

TAXIWAY B

TAXIWAY C

RUNWAY 9L–27R EXTENSION

TAXIWAY A

TWY A1

TWY A4

TAXIWAY A5

FUTURE RUNWAY 9L–27R (10,100' X 150')

TAXIWAY P EXTENSION

TWY P1

TWY P2

TAXIWAY P

TAXIWAY B EXTENSION

TAXIWAY P EXTENSION

TAXIWAY C

TAXIWAY E

FUTURE RPZ (TYP)

TAXIWAY D

TAXIWAY D EXTENSION

TAXIWAY S

TAXIWAY F

FUTURE RUNWAY 5–23 (6,750' X 150') DISPLACED THRESHOLD

FUTURE RUNWAY 9R–27L (4,200' X 50')

SUN 'N FUN COMPLEX

TAXIWAY E

MEDULLA ROAD

MEDULLA ROAD

OLD MEDULLA ROAD

WEST PIPKIN ROAD

LEGEND

- AIRFIELD
- TERMINAL AREA
- AVIATION RELATED
- SUN N FUN
- LAKELAND AIR CENTER
- AIRPORT INDUSTRIAL PARK
- AIRPORT PROPERTY LINE
- FUTURE AIRPORT PROPERTY LINE

GRAPHIC SCALE IN FEET

500 0 500 1000

City of LAKELAND

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FIGURE 4.4B
ULTIMATE ON-AIRPORT LAND USE PLAN

4.43 SURROUNDING LAND USE

The land surrounding the airport property is utilized in a variety of different ways including: industrial, residential, agricultural, and business park. This land is controlled by locally adopted zoning regulations. These regulations provide both airspace and land use compatibility protection, and are enforced by the Polk County Joint Airport Zoning Board. **Figures 4.4C** and **4.4D** depict the zones outlined by the Zoning Board.

The zoning regulations ensure that all airports licensed for public-use in Polk County can effectively function. These regulations control uses of land surrounding an airport relative to:

- Height of structures and objects (natural or man-made)
- Uses of land in areas subject to aircraft overflight potential
- Uses of land in areas subject to airport-generated noise
- Use of land which result in aircraft bird strike hazard
- Establishment of educational facilities of public and private schools
- Uses of land which result in the generation of in-flight visual or electronic interference

If an individual or business wants to build on land surrounding the airport, all proposals must be submitted to the Zoning Board for review. If there is a conflict between the proposal and the zoning regulations then a variance may be requested. The decision to allow or not allow a variance rests solely with the Zoning Board.

The Zoning Board regulations are established based on the authority given to the Polk County Joint Airport Zoning Board by Chapters 163 and 333, Florida Statutes. These regulations are periodically reviewed and amended as deemed necessary by the Zoning Board.

The zoning regulations outline three primary “zones of influence”, the Airport Height Notification Zone, the Airport Overflight Zone, and the Airport Noise Zone.

4.43A Airport Height Notification Zone

This zone regulates the height of any structure natural or man-made within an area consisting of two sub zones.

Subzone 1: Includes that area which lies within 20,000 FT of an airports runways.

Subzone 2: Includes that area which lies within the territorial limits over which the

local governments represented on the Polk County Joint Airport Zoning Board have jurisdiction, excluding that area which lies within the Airport Height Notification Subzone 1.

The boundary for the Airport Height Notification Zone is based on the runway configuration, which is planned and documented in the most recent approved ALP for LAL.

4.43B Airport Overflight Zone

The Airport Overflight Zone regulates the uses of land lying in specified areas above which aircraft must routinely operate at low altitudes and climb from or descend to the runways of the airport along these flight paths. Within an Airport Overflight Zone, certain land uses are restricted or prohibited due to land use characteristics which could result in further death, injury, and property damage in the event of an aircraft accident. These areas are statistically more likely to be exposed to accidents involving aircraft climbing from or descending to a runway at low altitudes.

The Airport Overflight Zone includes the area over which aircraft routinely operate at altitudes of 50 FT above the runway end elevation, and is defined as follows: The Primary Surface as defined by 14 CFR Part 77.25(a), and that portion of the Approach Surface, as defined by 14 CFR Part 77.25(d), which extends outward from, and perpendicular to, its common boundary with the Primary Surface, as defined in 14 CFR Part 77.25(a), for a horizontal distance of:

- 1,000 FT for utility/visual runways
- 1,700 FT for non-precision instrument/non-utility runways
- 2,500 FT for precision instrument runways

The boundary of the Airport Overflight Zone is based on the runway configuration that is planned and documented in the most recent approved ALP for LAL.

4.43C Airport Noise Zone

This zone regulates land uses sensitive to sound levels generated by the routine operation of the airport. Within the Airport Noise Zone, land use restrictions and special construction standards are established to minimize impacts of airport-generated noise. The Airport Noise Zone consists of three subzones, defined as follows:

Airport Noise Subzone A: The area commencing at the airport reference point and extending outward to that boundary

which approximates a day/night average sound level of 75 Ldn.

Airport Noise Subzone B: The area commencing at the airport reference point and extending outward to that boundary which approximates a day/night average sound level of 70 Ldn, excluding Subzone A.

Airport Noise Subzone C: The area commencing at the airport reference point and extending outward to that boundary which approximates a day/night average sound level of 65 Ldn, excluding Subzones A and B.

The boundary for the Airport Noise Zone is based on the forecast day/night average sound levels documented in its approved airport master plan, ALP, or both.

The boundary of the Airport Noise Zone shall be amended as necessary to reflect any changes in the documentation of forecast day/night average sound levels on which the Airport Noise Zone is based.

Notwithstanding other provisions of Section 4(c) of the Polk County Airport Zoning Regulations, at such time that the airport conducts an official 14 CFR Part 150 study, the boundaries of the Airport Noise Zone shall be modified to comply with the official noise study.

4.43D In-Flight Visual/Electronic Interference

This zone regulates land uses sensitive to sound levels generated by the routine operation of the airport. Within the Airport Noise Zone, land use restrictions and special construction standards are established to minimize impacts of airport-generated noise. The Airport Noise Zone consists of three subzones, defined as follows:

- Electronic interference with navigation signals or radio communications of any airborne aircraft or aircraft operations at the airport
- High energy beam devices that interfere with aircraft operations at the airport, and for which such energy transmission is not fully contained within a structure, or absorbing or masking vessel
- Lights or illumination arranged or operated in such a manner that either misleads or obscures the vision of pilots during take-off and landing stages of aircraft operations at the airport

4.43E Aircraft Bird Strike Hazard

The Aircraft Bird Strike Hazard zone regulates land uses in the vicinity of the

airport which may attract birds and other wildlife that present a hazard to aircraft operations. Specifically, the regulation states that no land shall be permitted to store, handle, or process organic or any other materials that foster or harbor the growth of insects, rodents, amphibians, or other similar organisms, in such a way as to significantly increase the potential for aircraft bird strike hazard to aircraft operations at the airport:

- Within 10,000 FT of the nearest point of any airport's runway used or planned to be used by turbine powered aircraft
- Within 5,000 FT of the nearest point of any of the airport's runways used or planned to be used only by conventional piston engine powered aircraft
- Within the lateral limits of the airport's civil imaginary surfaces as defined in 14 CFR Part 77.25
- In locations where the passage of a significant volume of bird traffic originating from or destined to bird feeding, watering, or roosting areas is induced across any Primary Surface or Approach Surface, as defined in 14 CFR Part 77.25 (c) and 14 CFR Part 77.25 (d), respectively for the airport

4.43F Restriction on Educational Facilities

This restriction governs the construction of any educational facility of a public or private school in proximity to the airport. This restricted area extends five miles out from either end of any of the airport's runways, along the extended runway centerline, and which has a width measuring one-half the length of the runway. The boundary of this restricted area shall be amended as necessary to reflect any changes in the documentation of the runway configuration on which the restriction areas are based.

4.43G Surface Access/Transportation

Don Emerson Drive provides access to the airport terminal building from Drane Field Road (SR 572), located on the north side of the airport. Drane Field Road also provides access via Florida Avenue (SR 37) and Harden Boulevard to the City of Lakeland. Medulla and West Pipkin Roads, located on the south side of the airport, provide access to the central and southern portions of Polk County. I-4, accessed via County Line Road, provides access to Tampa and Orlando.

The Polk County Parkway (SR 570) provides additional surface access to the airport. This limited access roadway forms

a partial loop to the west, south, and east of the City of Lakeland. Interchanges providing access to the airport are provided at Airport Road and Waring Road.

The City of Lakeland's public bus transportation, the Citrus Connection, provides a low-cost means of transportation around the city. The Airport and Airside Center are served by the Blue Transit Bus 57 which also provides access to Central Park Plaza, Lakeside Village Mall, VA Clinic, and Lakeland Christian School.

Mass transit service to the airport is currently unavailable. The completion of an Amtrak Station in late 1998 has brought upgraded rail service to Lakeland. This station operates daily routes to Miami and Jacksonville. In addition, the CSX Railroad system provides access to the vast network of rail within the county. CSX offers multi-modal service for freight and distribution including train, truck, barge, and container services. In addition, several switching yards are available, and the north-south and east-west mainlines extend from the center of Polk County. Several rail spurs are located north of Drane Field Road, in the Winston Railroad Yard.

During the planning process additional consideration was given to the possibility of a High Speed Rail system being installed along the I-4 corridor. At the time this update was written no official decision has been made regarding where a station in the Lakeland area would be located. The preferred alternative for development at the airport does include an expansion of the loop system at the airport terminal, and also incorporates a separate lane for bus and taxi service. If a High Speed Rail station was constructed in Lakeland it is recommended that transportation to/from the station and airport should be provided.

LAKELAND LINDER REGIONAL AIRPORT

LEGEND

- RESIDENTIAL
- RESIDENTIAL LOW
- AGRICULTURAL/RURAL RESIDENTIAL
- BUSINESS PARK
- BUSINESS PARK CENTER
- INDUSTRIAL
- UNCLASSIFIED
- CITY LIMITS
- AIRPORT PROPERTY LINE
- ULTIMATE OVERFLIGHT ZONES

SOURCE: POLK COUNTY AIRPORT ZONING REGULATION, POLK COUNTY JOINT AIRPORT ZONING BOARD, SECTIONS (4)(B)1, DATED 01/17/02.

2,500' PRECISION INSTRUMENT

1,700' NON-PRECISION INSTRUMENT

1,700' NON-PRECISION INSTRUMENT

1,000' VISUAL/UTILITY

1,000' VISUAL/UTILITY

1,000' VISUAL/UTILITY

1,000' VISUAL/UTILITY

1,700' NON-PRECISION INSTRUMENT

DRANE FIELD ROAD

DRANE FIELD ROAD

HAMILTON ROAD

AIRPORT ROAD

MAINTENANCE ACCESS ROAD

WARING ROAD

MEDULLA ROAD

MEDULLA ROAD

WEST PIPKIN ROAD

SUN 'N FUN COMPLEX

RUNWAY 9L-27R EXTENSION

TAXIWAY A EXTENSION

TAXIWAY P EXTENSION

TAXIWAY A

TAXIWAY P

TAXIWAY B EXTENSION

TAXIWAY P EXTENSION

TAXIWAY D

TAXIWAY E

TAXIWAY A

TAXIWAY C

TAXIWAY J

TWY B

TWY H

TWY A1

TWY A4

TWY A5

TWY P1

TWY P2

APRON

APRON

APRON

APRON

FUTURE RUNWAY 9L-27R (10,100' X 150')

DISPLACED THRESHOLD

FUTURE RUNWAY 9R-27L (4,200' X 50')

FUTURE RUNWAY 5-23 (6,750' X 150') DISPLACED THRESHOLD

9L

27R

9R

27L

23

5

GRAPHIC SCALE IN FEET

1000 0 1000 2000

City of LAKELAND

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FIGURE 4.4C
ULTIMATE AIRPORT RUNWAY CONFIGURATION
AND ASSOCIATED AIRPORT OVERFLIGHT ZONES

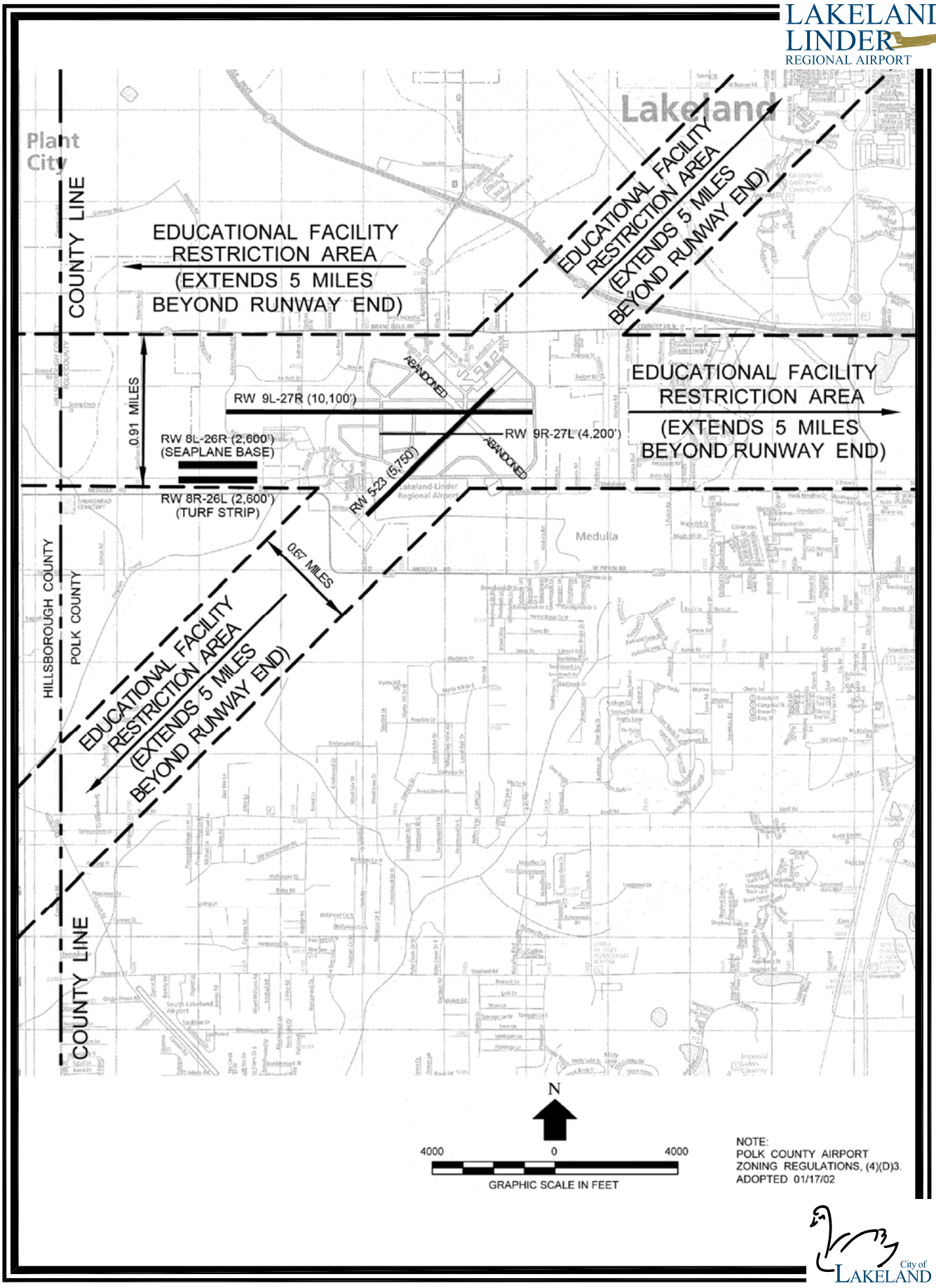

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FIGURE 4.4D
EDUCATION FACILITY RESTRICTION AREAS

4.44 BUILDING AREA PLANNING

Several options for future development of the north side (terminal building, cargo operations area, commercial operations area, FBO facilities, and hangars) and the south side (grass and water landing strip, FBO facilities, MRO facilities, hangars) are all presented in the following sections. Each option was thoroughly reviewed by the Airport Staff, in addition to the Technical Advisory Committee, and the Stakeholders Advisory Committee until a best option for each area of development was chosen. These best options make up the Preferred Alternative which was discussed earlier in this chapter. The remaining options are outlined in the following sections with a brief explanation as to why it was not selected as the best option.

4.441 North Side Building Area

For the purposes of this Master Plan Update, the north side building area is basically defined as airport property in the area between Drane Field Road (to the north) and extending southward to the Building Restriction Line (BRL) for RWY 9/27. The preferred alternative for the development of this area can be seen on **Figure 4.4E.**

4.441A Alternatives

Discussions with Airport Staff, the Technical Advisory Committee, and the Stakeholders Advisory Committee considered how the airport could maximize the airports land usage. One of the issues with previous development is that plans were made based on the location of old military pavement. These areas were used as a way to minimize some of the construction cost, but as a result they have not efficiently utilized the airports property.

For this Master Plan a couple of alternatives were developed for the north side building area.

The first of these options is to do nothing. This option simply tries to maximize the utilization of existing buildings and pavement without incurring additional construction costs associated with new development.

The second option looks at adding an ILS approach to RWY 9, the expansion of RWY 9/27 to a length of 10,100 FT to provide coverage for a larger variety of airplanes, and the development of specific areas designated for cargo, commercial service, FIS facilities, FBO facilities, expanded apron areas, and additional hangars. This option became the preferred

alternative for the development on the north side with the exception of the development plan for the Terminal Building which is discussed in the next section.

4.441B Terminal Alternatives

In order to plan for commercial operation on the north side a location for housing the passenger screening area, ticketing, and baggage services had to be identified. In an effort to minimize cost and maximize usage of the existing terminal building, two plans where developed that addressed the issue of housing commercial operations in the existing terminal building.

The first plan utilized both the first and second floor of the terminal building to provide adequate space for commercial operations. As shown in **Figure 4.441A** and **Figure 4.441B** the first floor would maximize the usable space by housing the baggage claim area and the ticket counter in the southeast corner of the terminal, while the west side of the first floor remained an FBO. The second floor in this alternative included a security screening area where the current airport administrative offices are located. The plan also shows the existing restaurant as being replaced by new administrative office space.

The second terminal alternative explored the option of containing all the commercial service operations on the first floor. This allowed the second floor to remain as it is today with a full service restaurant, and the airport administrative offices. As shown in **Figure 4.441C** and **4.441D** the FBO on the first floor is replaced with the security screening area and the southeast corner is designed to house the ticket counter and baggage handling area. This plan was initially chosen as the preferred alternative for the terminal building, however due to some proposed funding from the FDOT a new plan was developed which actually expands the existing terminal building to the east. This expansion would house all of the commercial operations, leaving the existing terminal building as it is today.

LAKELAND LINDER REGIONAL AIRPORT

GRAPHIC SCALE IN FEET
400 0 400 800

LEGEND

- NON-AVIATION
- NON-COMMERCIAL AVIATION
- COMMERCIAL AVIATION
- OFF-AIRPORT PUBLIC ROAD
- ON-AIRPORT CIRCULATION
- AIRPORT PROPERTY LINE

DRANE FIELD ROAD
AIRPORT ROAD
KELVIN HOWARD ROAD
RIDGE ROAD
AIR PARK DRIVE
MAINTENANCE ACCESS ROAD
FUTURE NON-AVIATION
FUTURE NON-COMMERCIAL AVIATION
FUTURE CARGO/TERMINAL COMMERCIAL RAMP AND BUILDING
FUTURE MRO
FUTURE AUTO PARKING
FUTURE QTA
FUTURE APRON
TERMINAL
FUTURE FIS
FUTURE FBO
TAXIWAY A
TAXIWAY A1
TAXIWAY A4
TAXIWAY A5
TAXIWAY B
TAXIWAY C
TAXIWAY D
TAXIWAY E
TAXIWAY F
TAXIWAY J
TAXIWAY P
TAXIWAY S
TWY P1
TWY P2
FUTURE RUNWAY 9L-27R (10,100' X 150')
TAXIWAY B EXTENSION
FUTURE RUNWAY 5-23 (5,750' X 150') DISPLACED THRESHOLD
FUTURE RUNWAY 9R-27L (4,200' X 50')
9
27

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City of LAKELAND

FIGURE 4.4E
NORTH SIDE BUILDING AREA
FUTURE LAND USE OPPORTUNITIES

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LAKELAND LINDER REGIONAL AIRPORT

LEGEND

- Airline
- Circulation
- Lease Space - FBO
- Lease Space - Office
- Mechanical/Electrical/Storage
- Restrooms

City of LAKELAND

Figure 4.441A
TERMINAL ALTERNATIVES - FIRST FLOOR CONCEPT 1

LAKELAND LINDER REGIONAL AIRPORT

LEGEND

- Airline
- Circulation
- Concessions
- Lease Space - Office
- Mechanical/Electrical/Storage
- Restrooms

City of LAKELAND

Figure 4.441B
TERMINAL ALTERNATIVES - SECOND FLOOR CONCEPT 1

LAKELAND LINDER REGIONAL AIRPORT

LEGEND

- Airline
- Circulation
- Concessions
- Lease Space - Office
- Mechanical/Electrical/Storage
- Restrooms

City of LAKELAND

Figure 4.441C
TERMINAL ALTERNATIVES - FIRST FLOOR CONCEPT 2

LAKELAND LINDER REGIONAL AIRPORT

LEGEND

- Circulation
- Lease Space - Office
- Mechanical/Electrical/Storage
- Restaurant
- Restrooms

City of LAKELAND

Figure 4.441D
TERMINAL ALTERNATIVES - SECOND FLOOR CONCEPT 2

4.442 South Side Building Area

For the purposes of this Master Plan Update, the south side building area is basically defined as airport property in the area between West Pipkin Road and extending northward to the Building Restriction Line (BRL) for RWY 9/27.

4.442A Alternatives

For this Master Plan several alternatives were developed for the south side building area.

The first of these options is to do nothing. This option simply tries to maximize the utilization of existing buildings and pavement without incurring additional construction costs associated with new development.

The second option looks at the removal of the RWY 5 ILS, displacement of RWY 23 to bring the Runway Protection Zone back onto airport property, and expansion of RWY 5/23 south to a length of 5,750 FT to provide coverage for a larger variety of airplanes. Specific areas were also designated for grass and water landing strips, conversion of TWY D to a utility runway, new FBO facilities, a new ATCT, expanded apron areas, a helicopter landing pad, and additional hangars.

A third option was also developed which included all of those changes proposed in the second alternative with the exception of the helicopter landing pad. This option became the preferred alternative for the development on the south side and can be seen on **Figure 4.4F**.

4.45 SUMMARY

Throughout the planning process some of the key strategies that were emphasized were; maximization of land usage, anticipation and fulfillment of future need, and minimization of negative environmental impacts. **Figure 4.4G** depicts the Ultimate Potential New Development Areas provided in the preferred alternative and separates these areas into potential aviation or non-aviation related development.

LAKELAND LINDER REGIONAL AIRPORT

GRAPHIC SCALE IN FEET
400 0 400 800

LEGEND
- NON-AVIATION
- NON-COMMERCIAL AVIATION
- COMMERCIAL AVIATION
- OFF-AIRPORT PUBLIC ROAD
- ON-AIRPORT CIRCULATION
- AIRPORT PROPERTY LINE

TWY P1
TWY P2
TAXIWAY P
TAXIWAY B EXTENSION
TAXIWAY P EXTENSION
TAXIWAY D
TAXIWAY S
TAXIWAY F
TAXIWAY E
FUTURE RUNWAY 9R-27L (4,200' X 50')
FUTURE RUNWAY 5-23 (5,750' X 150') DISPLACED THRESHOLD
FUTURE SEAPLANE BASE 8L-26R (2,600' X 250')
FUTURE GRASS RUNWAY 8R-26L (2,600' X 250')
FUTURE NON-COMMERCIAL AVIATION
FUTURE APRON
FUTURE TERMINAL
SUN N FUN COMPLEX
FUTURE FBO
FUTURE APRON
FUTURE NON-COMMERCIAL AVIATION
FUTURE MRO
FUTURE NON-AVIATION
MAINTENANCE ACCESS ROAD
MEDULLA ROAD
OLD MEDULLA ROAD
WEST PIPKIN ROAD

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City of LAKELAND

FIGURE 4.4F
SOUTH SIDE BUILDING AREA
FUTURE LAND USE OPPORTUNITIES

LAKELAND LINDER REGIONAL AIRPORT

DRANE FIELD ROAD

KELVIN HOWARD ROAD

KIDRON ROAD

AIR PARK DRIVE

AIRPORT ROAD

TERMINAL

MAINTENANCE ACCESS ROAD

TAXIWAY H

TAXIWAY J

TAXIWAY B

TAXIWAY C

FUTURE RPZ

TAXIWAY A

TWY A1

TWY A4

TAXIWAY A5

FUTURE RUNWAY 9L-27R (10,100' X 150')

TWY P1

TWY P2

TAXIWAY P

TAXIWAY P EXTENSION

TAXIWAY B EXTENSION

TAXIWAY D

TAXIWAY D EXTENSION

TAXIWAY E

FUTURE RUNWAY 9R-27L (4,200' X 50')

EXISTING VORTAC/RCO

TAXIWAY S

TAXIWAY F

FUTURE RUNWAY 5-23 (5,750' X 150') DISPLACED THRESHOLD

SUN 'N FUN COMPLEX

FUTURE GRASS RUNWAY (2,600' X 250')

FUTURE SEAPLANE BASE (2,600' X 250')

26 R

26 L

MEDULLA ROAD

OLD MEDULLA ROAD

WEST PIPKIN ROAD

LEGEND

POTENTIAL AVIATION DEVELOPMENT (264 TOTAL ACRES)

POTENTIAL NON-AVIATION DEVELOPMENT (250 TOTAL ACRES)

NORTHEAST	NORTHEAST
34.6 AC. - AVIATION	85.5 AC. - AVIATION
21.8 AC. - NON-AVIATION	137.2 AC. - NON-AVIATION
NORTH WEST	**NORTH WEST**
91.3 AC. - AVIATION	52.5 AC. - AVIATION
73.6 AC. - NON-AVIATION	17.8 AC. - NON-AVIATION

GRAPHIC SCALE IN FEET

500 0 500 1000

City of LAKELAND

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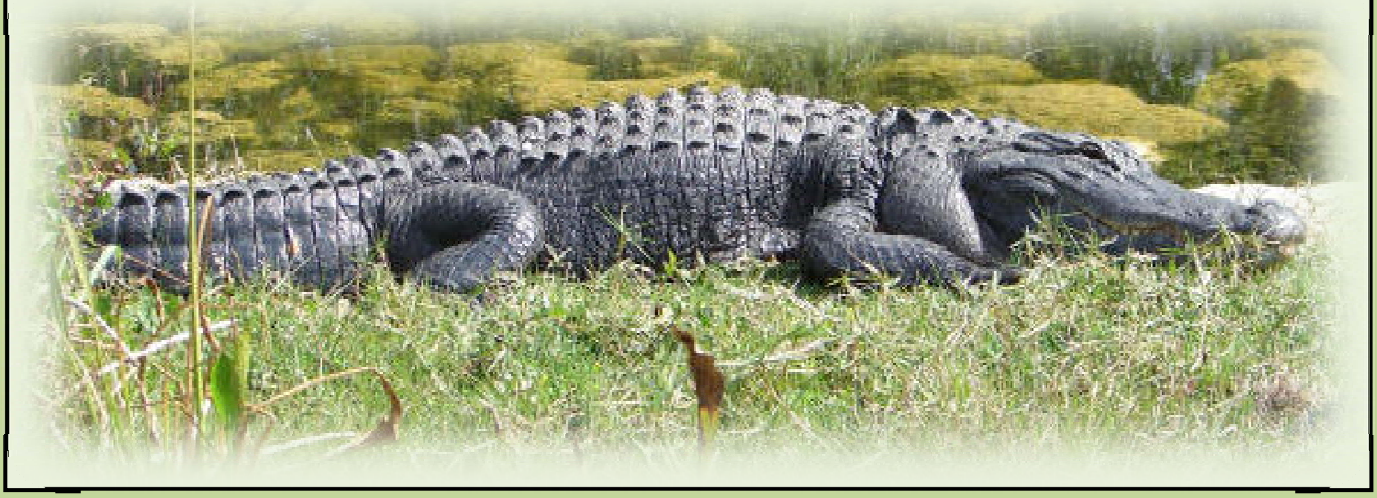
FIGURE 4.4G
ULTIMATE POTENTIAL NEW DEVELOPMENT AREAS

Environmental Overview

The objective of the environmental overview is to provide an outline of the environmental categories that may be impacted as a result of the development of the preferred alternative for the Lakeland Linder Regional Airport Master Plan Update. While other alternatives were considered during the planning process, the preferred alternative maximized airport land usage while minimizing the potential impact to the surrounding environment. It is important to note that this is not a full environmental assessment nor is it an environmental impact study, this overview is simply a general look at the potential impacts.

5.2 ENVIRONMENTAL PROCESS

Any airport improvements which receive Federal funding requires that an environmental review be conducted in compliance with the National Environmental Policy Act (NEPA), FAA Order 1050.1E *Environmental Impacts: Policies and Procedures,* and other pertinent laws. For any proposed project the FAA determines the type of environmental review that will be required. Generally this determination will fall into one of three categories:



5.2A Categorical Exclusion (Cat Ex)

A categorical exclusion is when a proposed action does not result in a significant impact to the environment, one which would require an Environmental Assessment (EA) or an Environmental Impact Statement.

A brief overview of the project's description and any potential environmental impact may be required in order to support processing as a Cat Ex.

5.2B Environmental Assessment (EA)

If a proposed project is expected to have minor or uncertain environmental impacts then an EA should be prepared. Depending on the outcome of the EA either a Finding of No Significant Impact (FONSI) will be issued or preparation of an Environmental Impact Statement will be required.

5.2C Environmental Impact Statement (EIS)

When a proposed project is expected to have the potential for a significant impact on the environment, an EIS is prepared. An example of some projects that typically require an EIS are: initial Airport Layout Plan (ALP) approval or new airport location approval, Federal financial participation, or ALP approval for a new runway capable of handling air carrier aircraft at a commercial service airport. An EIS requires in-depth evaluation and documentation of the proposed action, its need, any alternatives, what environment may be impacted, and what the consequences of the environmental impact might be. This level of detail also requires coordination with Federal, state, and local agencies, in addition to public involvement.

This environmental overview was conducted in accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures,* and the FAA's *Environmental Desk Reference for Airport Actions* which requires the analysis of the following environmental impact categories prior to project implementation:

- 5.3A Air Quality
- 5.3B Biotic Resources/ Federally-listed Endangered and Threatened Species
- 5.3C Coastal Barriers/Coastal Zone Resources
- 5.3D Compatible Land Use
- 5.3E Construction Impacts
- 5.3F Section 4(f)

5.3G Energy Supplies, Natural Resources, and Sustainable Design
5.3H Farmlands
5.3I Floodplains
5.3J Hazardous Materials
5.3K Historical and Archeological Resources
5.3L Light Emissions and Visual Impacts
5.3M Noise
5.3N Social Impacts / Environmental Justice
5.3O Solid Waste
5.3P Water Quality
5.3Q Wetlands
5.3R Wild and Scenic Rivers
5.3S Induced Socioeconomic / Cumulative Impacts

Each of these impact areas is discussed in further detail in this chapter.

The following sections discuss the preliminary evaluation of the recommended airport development projects for each of the environmental impact categories included in FAA Order 1050.1E. For those proposed airport projects that are not categorically excluded from further environmental review, additional environmental analyses will be conducted and documented in a formal Environmental Assessment (EA) or Environmental Impact Statement (EIS) prior to project implementation.

5.3 ENVIRONMENTAL CATEGORIES

5.3A 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 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 plan (State Implementation Plan or SIP) to achieve the NAAQS for each pollutant within

timeframes established under CAA. Lakeland Linder Regional Airport is located in Polk County, Florida which is currently in attainment for all criteria pollutants[1].

In addition to NEPA, the Clean Air Act of 1990 Amendments required the Environmental Protection Agency (EPA) to issue rules that would ensure 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. The General Conformity Rule only applies in areas that EPA has designated non-attainment or maintenance. Because Lakeland Linder Regional Airport is located in Polk County, which is currently in attainment for all criteria pollutants, the General Conformity Rule does not apply to this project.

FAA air quality analysis guidelines indicate that, if a proposed Federal action is in a state that does not have applicable indirect source review (ISR) requirements, then the projected airport activity levels are examined to determine if a detailed air quality analysis is required. The State of Florida does not have ISR requirements; therefore, the determination of whether or not a detailed air quality analysis is required for a proposed project is based on annual aircraft operations. According to FAA guidelines, an air quality analysis is required for general aviation airports with more than 180,000 projected annual operations. Since Lakeland Linder Regional Airport is located in an area that is in attainment of all criteria pollutants, and because the projected operations at the airport are significantly less than 180,000 annual general aviation operations over the 20-year planning period, a detailed air quality analysis will not be required as part of the NEPA documentation for these projects.

[1] EPA Nonattainment Areas: http://www.epa.gov/air/data/nonat.html?st~FL~Florida

5.3B 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, generally the lead 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 Department of the Interior (FWS) concerning the conservation of wildlife resources where the water of 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.

As shown in **Table 5.3A**, there are 40 federally listed threatened, endangered, proposed or candidate species which are known to occur in Polk County, Florida. As part of any follow on NEPA documentation, an on-site biotic survey may be required to identify the presence of the species or any habitats necessary to support them within the project area. If potential impacts to these species are identified, Section 7 coordination with the USFWS will be required.

Table 5.3A
Identified Endangered Species
Polk County

Common Name	Scientific Name	Status
Animals		
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	Endangered
Brown Pelican	*Pelecanus occidentailis*	Recovery
Arctic Peregrine Falcon	*Falco peregrines tundrius*	Recovery
Red-Cockaded Woodpecker	*Picoides borealis*	Endangered
Wood Stork	*Mycteria Americana*	Endangered
Audubon's Crested Caracara	*Polyborus plancus audubonii*	Threatened
Florida Grasshopper Sparrow	*Ammodramus savannarum floridanus*	Endangered
Florida Scrub-Jay	*Aphelocoma coerulescens*	Threatened
Florida Panther	*Puma concolor coryi*	Endangered
Red Wolf	*Canis rufus*	Endangered
Puma (Mountain Lion)	*Puma concolor*	Threatened
American Alligator	*Alligator mississippiensis*	Threatened
Eastern Indigo Snake	*Drymarchon corais couperi*	Threatened
Bluetail Mole Skink	*Eumeces egregious lividus*	Threatened
Sand Skink	*Neoseps reynoldsi*	Threatened
Round Ebonyshell	*Fusconaia rotulata*	Candidate
Narrow Pigtoe	*Fusconaia Escambia*	Candidate
Highlands Tiger Beetle	*Cicindela highlandensis*	Candidate
Plants		
Short-leaved rosemary	*Conradina brevifolia*	Endangered
Scrub Mint	*Dicerandra frutescens*	Endangered
Highlands Scrub Hypericum	*Hypericum cumulicola*	Endangered
Scrub Blazingstar	*Liatris ohlingerae*	Endangered
Papery Whitlow-Wort	*Paronychia chartacea*	Threatened
Lewton's Polygala	*Polygala lewtonii*	Endangered
Wireweed	*Polygonella basiramia*	Endangered
Sandlace	*Polygonella myriophylla*	Endangered
Scrub Plum	*Prunus geniculata*	Endangered
Florida Bonamia	*Bonamia grandiflora*	Threatened
Pygmy Fringe-Tree	*Chionanthus pygmaeus*	Endangered
Pigeon Wings	*Clitoria fragrans*	Threatened
Scrub Buckwheat	*Eriogonumlongifolium*	Threatened
Britton's Beargrass	*Nolina brittoniana*	Endangered
Wide-Leaf Warea	*Warea amplexifolia*	Endangered
Carter's Mustard	*Warea carteri*	Endangered
Scrub Lupine	*Lupinus aridorum*	Endangered
Florida ziziphus	*Ziziphus celata*	Endagered
Avon Park Harebells	*Crotalaria avonensis*	Endangered
Florida Bristle Fern	*TRichomanes punctatum*	Candidate

Source: US Fish & Wildlife Endangered Species Program, Wilbur Smith Associates

5.3C Coastal Barriers/Coastal Zone Resources

The Coastal Barriers Resources Act (CBRA) and the Coastal Zone Management Act (CZMA) govern Federal activities involving or affecting coastal resources. Although Lakeland Linder Regional Airport is not located on the coast, it is included in Florida's coastal zone as defined by the CZMA (the entire state of Florida is included in the Coastal Zone Program. Therefore, the impact of the proposed development on coastal resources will be evaluated by the Florida Department of Environmental Protection.

5.3D 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. If the noise analysis concludes that there is no significant impact, a similar conclusion usually can be made with regard to compatible land use. Land use impacts also can occur if the proposed projects exceed the threshold of significance of other impact areas that have land use ramifications, including disruption of communities, relocation, and induced socioeconomic impacts (FAA Order 1050.1E).

The 2009 and 2029 noise contours were developed as part of the Noise Analysis to evaluate the impact of aircraft noise on sensitive land uses in the airport area. 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. As shown on Figures 5-1 and 5-2, no existing residences or businesses would be exposed to noise equal to or greater than 65 DNL; therefore, there are no incompatible land use impacts.

5.3E Construction Impacts

Specific impacts that would occur as a result of construction activities include noise of construction equipment on the site, noise and dust from 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 150/5370-10A, *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. Guidelines as cited in FAA Advisory Circular 150/5370/2C, *Operation Safety on Airports, During Construction,* would be enforced where applicable. Runway or taxiway closure conditions will be kept to a minimum in an effort to minimize inconvenience to Airport users.

5.3F 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." Section 6(f) of the Land and Water Conservation Fund Act (L&CWFA) prohibits the taking of lands purchased with L&CWFA funds. There are no historic or archaeological properties within the Area of Potential Effect of the proposed airport projects. In addition, the project would not impact any parks, recreational areas, or other Section 4(f) resources or lands purchased with L&CWFA funds. Therefore, there will be no direct or indirect impacts to Section 4 (f) or Section 6(f) lands as a result of the proposed Airport development projects. However, as part of a follow on environmental assessment additional coordination may be required with the Florida Division of Historical Records.

5.3G Energy Supplies and Natural Resources

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 the airport development on energy supply typically relate to the amount of energy required for the following:

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

The effects of airport development on natural resources typically relate to basic materials, such as gravel, fill dirt, etc., that are required for construction.

It is anticipated that the local power company will have no difficulty in meeting the energy demands of the proposed airport development.

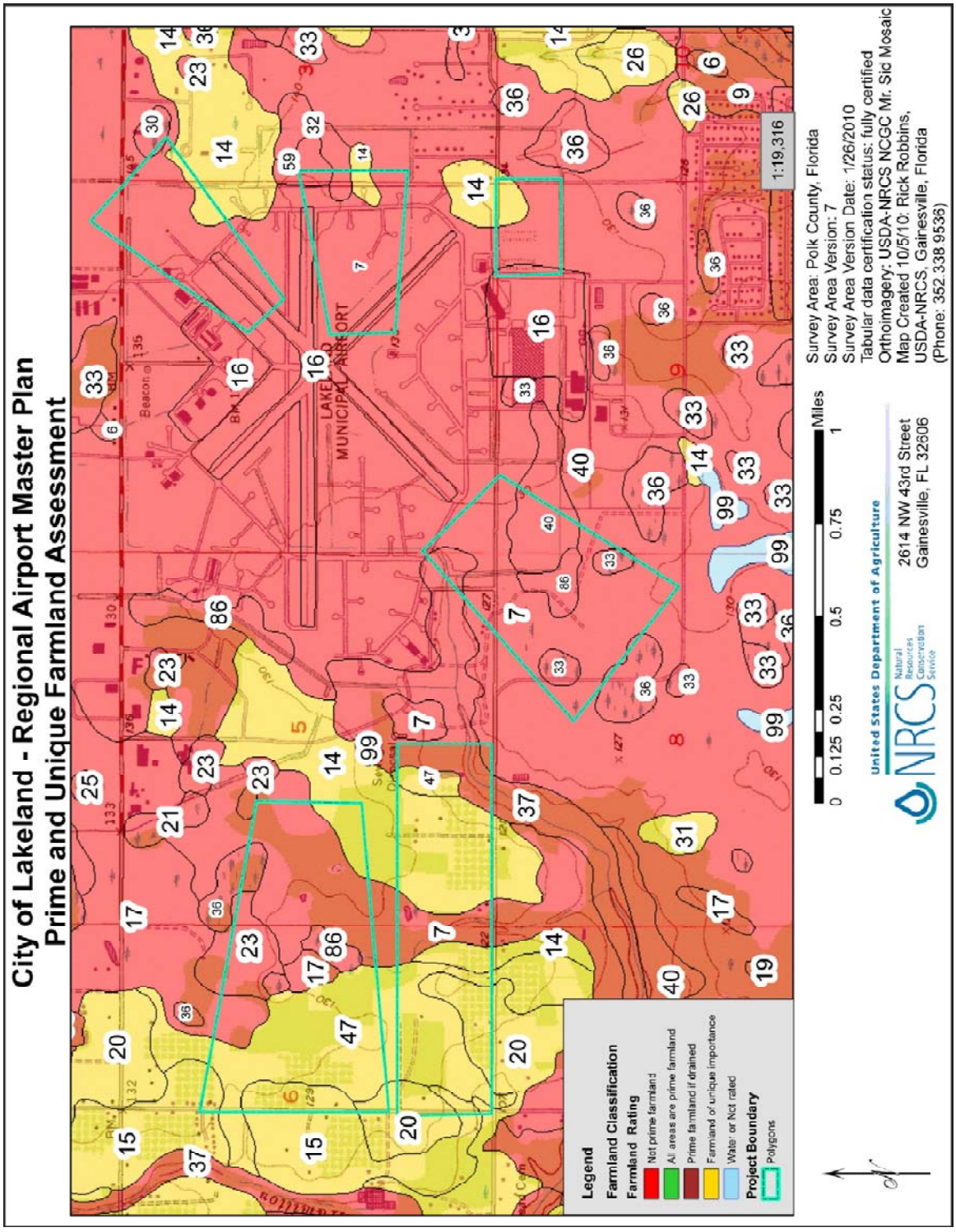
Aviation activity at the Airport is projected to increase approximately four percent compounded annually. Therefore, energy consumption by aircraft and vehicles is expected to increase due to the proposed airport development. The projected increase in fuel consumption from the proposed airport development would not cause a statistically significant increase in fuel consumption and the increased demand could be met by existing fuel supplies.

5.3H Farmlands

The Farmland Protection Policy Act (FPPA) regulates Federal actions with the potential to convert farmland to nonagricultural uses. The proposed airport development projects would occur mostly on airport property. Any development to occur outside of airport property is not presently farmland. According to the United States Department of Agriculture Natural Resources Conservation Service, there are no Prime Farmland map units within the planning area; therefore, there will be no impacts to farmlands as a result of the proposed projects. However, as shown in Figure 5.1, there are Soils of Unique Importance within the Planning Area. If future expansion activities utilize Federal Funds or State Revolving Funds (which are partially funded from Federal entities), and Farmlands of Unique Importance will be converted, an AD-1006 (Farmland Impact Conversion Form) will be required by the USDA-NRCS[2]

[2] See Letter from Rick Robbins, USDA-NRCS, dated October 5, 2010 included in Appendix A

Figure 5.3A
Prime and Unique Farmland Assessment
Lakeland Linder Regional Airport



Source: USDA Natural Resources Conservation Service

5.3I 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 a base floodplain based on a 100-year flood (7 CFR Section 650.250).

According to the Flood Insurance Rate Map (FIRM) for Polk County, Florida dated December 20, 2000 (Panel 460 of 1025); it was determined that within the boundaries of the airport, there are approximately 163 acres of Zone A floodplain defined as being a 100-year floodplain with no base flood elevations and flood hazards determined. The remaining airport acreage is located within Zone C defined as areas outside of the 100-year flood plain with nominal flooding.

Based on the proposed extensions to runways previously discussed, it is estimated that at least two Zone A (100-year) floodplain boundaries would be impacted by construction of new runway and taxiway pavement. These respective airfield projects would require additional analysis and mitigation measures will be required prior to construction permitting.

5.3J Hazardous Materials, Pollution Prevention, and Solid Waste

The two statutes of most importance in the construction and operation of airport facilities and navigational aids 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 wastes 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 Environmental Protection Agency (EPA) databases for hazardous waste information were searched. These

databases include information on hazardous waste generators, as well as hazardous waste sites[3]. There are two facilities in the vicinity of Lakeland Linder Regional Airport that are on the RCRA Toxic Releases Inventory, including Industrial Plastic Systems Inc and Kidron Specialized Vehicles Corp. Industrialized Plastic Systems Inc is located approximately 1 (one) mile from airport property, and due to its distance there would be no impacts to these facilities as a result of the proposed airport projects. Kidron Specialized Vehicles Corp is located on airport property on Flightline Drive and although no development is to take place directly on the Kidron site, further coordination with the Florida Department of Environmental Protection may be necessary as part of an environmental assessment.

In addition to hazardous waste sites, 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

No significant increases in solid waste generation are anticipated as a result of the proposed Airport improvements. The only additional waste anticipated is that which will be associated with the construction of the aviation facilities. Existing waste collection and disposal facilities will 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 an 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 turbo aircraft. Airports located closer than these distances to sanitary landfills have an increased risk of bird hazards. The nearest municipal landfill licensed by the Florida Department of Environmental Protection Bureau of Solid and Hazardous Waste is located in Eaton Park, approximately 8 miles from Lakeland Linder Regional Airport, well

[3] Right-to-Know Network: http://www.rtknet.org/db/tri/tri.php?reptype=a&zip=33811.

outside the recommended distance of 3,000 meters. Therefore, there would be no potential bird hazards as a result of the proposed runway improvements.

5.3K Historical, Architectural, Archeological, and Cultural 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, prehistoric, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a Federal, federally licensed, or federally funded project.

Due to previous development and disturbance, the proposed developments are not believed to directly or indirectly impact any historic, architectural, archaeological, or cultural resource sites. However, as part of a follow on environmental assessment additional coordination will be required with the Florida Division of Historical Resources Office of Cultural and Historical Programs. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 8090.13(b) will apply.

5.3L 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 (NAVAIDS) and other airport development actions.

The proposed airport improvements include the installation of Medium-intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) to the approach end of Runway 9L. The MALSR system is a lane of lights, coupled with flashing strobe lights, to assist pilots in visually identifying the runway environment. It typically consists of nine light-bars and 5 sequence flashing lights extending approximately 2,400 FT beyond the runway on centerline (prior to the runway) and is installed in conjunction with an Instrument Landing System (ILS). The MALSR system is intended to provide a visual lighting path for landing aircraft. Despite increased numbers of lighted visual aids are recommended in this plan, it is not anticipated that they would result in any significant impacts to light sensitive locations. Only in unusual circumstances, such as when high intensity strobe lights would shine directly into peoples' homes, will the impact of light emissions be considered sufficient to warrant special study and a more detailed examination of alternatives in an environmental assessment.

5.3M Noise

Noise impacts were evaluated using the FAA-approved Integrated Noise Model (INM), version 7.0b. This standard practice was used to develop noise contours for Lakeland Linder Regional Airport for 2009 and 2029.

Methodology

The INM works by defining a network of grid points at ground level around the 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 (e.g., 65, 70, and 75 DNL). The decibel scale from zero to 120 includes most of the range of typical daily sound levels, and is shown in **Table 5.3B**.

Table 5.3B
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

Source: FAA, 2010

Noise Contour Mapping

DNL noise levels are indicated by a series of modeled contour lines superimposed on an airport 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 from the west.

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 2009 and 2029 operational data used in the noise modeling analysis.

Aircraft Operations – The annual operations for 2009 were 101,966, approximately 279 operations per day, and the annual operations for the forecast year are estimated to be 140,370, approximately 385 operations per day.

Aircraft Operations Mix – The operations mix consists of various categories of aircraft operating at Lakeland Linder Regional Airport, as determined by the inventory of current operations and the forecast of future operations, as well as information provided by the personnel in the ATCT. These operations reflect the mix of airport users and include the aircraft based at the airport, including two Learjet 60s, a Hawker 800XP, a Cessna Citation, and several King Airs. Military operations, which include a mix of flights by C-130s, P-3s, and UH-60 Blackhawks,

were estimated based on input from air traffic controllers familiar with the airport. Commercial operations were assumed to be conducted by Boeing 737-800 aircraft.

Table 5.3B summarizes the mix of aircraft operations used in the noise analysis. The aircraft in the table are representative of all the aircraft that operate at Lakeland Linder Regional Airport. Because of the similarity in noise signatures between various aircraft and the need to limit the number of INM aircraft models, certain aircraft are substituted for a wide variety of aircraft. For example, INM does not model a Beech King Air C90. Instead, it substitutes a Cessna Conquest II (CNA441) to represent King Air operations. The operation estimates in **Table 5.3C** were based on the existing and projected fleet mix detailed in the Forecasts of Aviation Demand chapter.

Table 5.3C
Aircraft Operations Mix

	2009		2029	
Aircraft Type	**Annual Operations**	**Percent**	**Annual Operations**	**Percent**
General Aviation				
Lear 35	2,477	2.4%	3,294	2.3%
CIT3	13,535	13.3%	17,395	12.4%
CNA441	3,379	3.3%	4,547	3.2%
DHC6	6,179	6.1%	8,561	6.1%
CNA172	47,039	46.1%	66,526	47.4%
CNA206	11,600	11.4%	16,544	11.8%
BEC58P	13,577	13.3%	19,313	13.8%
General Aviation Total	**97,786**	**95.9%**	**136,180**	**97.0%**
Commercial	16	Less than 0.1%	20	Less than 0.1%
Military	4,164	4.1%	4,170	3.0%
Total Aviation Activity	**101,966**	**100%**	**140,370**	**100%**

Source: Lakeland Linder Regional Airport records and Wilbur Smith Associates, Inc., 2010

These operations were split between day and night periods, since night operations are weighted with an additional 10 decibels. Based on information from the airport's ATCT personnel, each type of aircraft was assumed to conduct between 3 percent and 7 percent of its operations at night. Overall, night operations comprise 5.6 percent of all 2009 operations and 6.5 percent of all 2029 operations

.***Runway Utilization and Traffic Patterns*** – Lakeland Linder Regional Airport's primary runway, Runway 9/27, is aligned with the prevailing winds of the region. A crosswind runway, Runway 5/23, is available for use for when winds do not favor the primary runway. Air traffic controllers located in the airport's air traffic control tower (ATCT) assign runways for take offs and landings, based on the existing weather conditions, pilot needs and requests, aircraft performance, and efficient use of the runway system. In general, larger aircraft need longer runways, so these aircraft tend to use Runway 9/27 more often than Runway 5/23.

For the model for 2029, Runway 9/27 was extended by 1,600 feet, while Runway 5/23 was shifted to the southwest and extended approximately 750 feet. Additionally, a grass runway, Runway 8/26, was added to the southwest of the two hard-surface runways. This grass runway was assumed to handle only small single-engine aircraft. Its traffic pattern was assumed to be to the south of the runway in order to avoid conflicts with traffic on Runway 9/27 to the north.

Table 5.3D shows the allocation of runway use. Military and general aviation traffic is expected to shift slightly to Runway 9 following the installation of an instrument landing system (ILS) on that runway. The ILS will make Runway 9 available during certain low visibility weather conditions that can prevent the other runways from being used, but the greatest increase in use is expected to come from the increased training opportunities the ILS will provide.

Table 5.3D
Runway Utilizations

	2009			2029		
	Commercial	Military	General Aviation	Commercial	Military	General Aviation
Runway 5	10.0%	25.0%	20.0%	10.0%	20.0%	12.0%
Runway 23	7.0%	15.0%	14.0%	7.0%	14.0%	10.0%
Runway 9	47.2%	35.0%	36.0%	47.2%	38.0%	38.0%
Runway 27	35.8%	25.0%	30.0%	35.8%	28.0%	30.0%
Runway 8	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%
Runway 26	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Lakeland Linder Regional ATCT, 2010

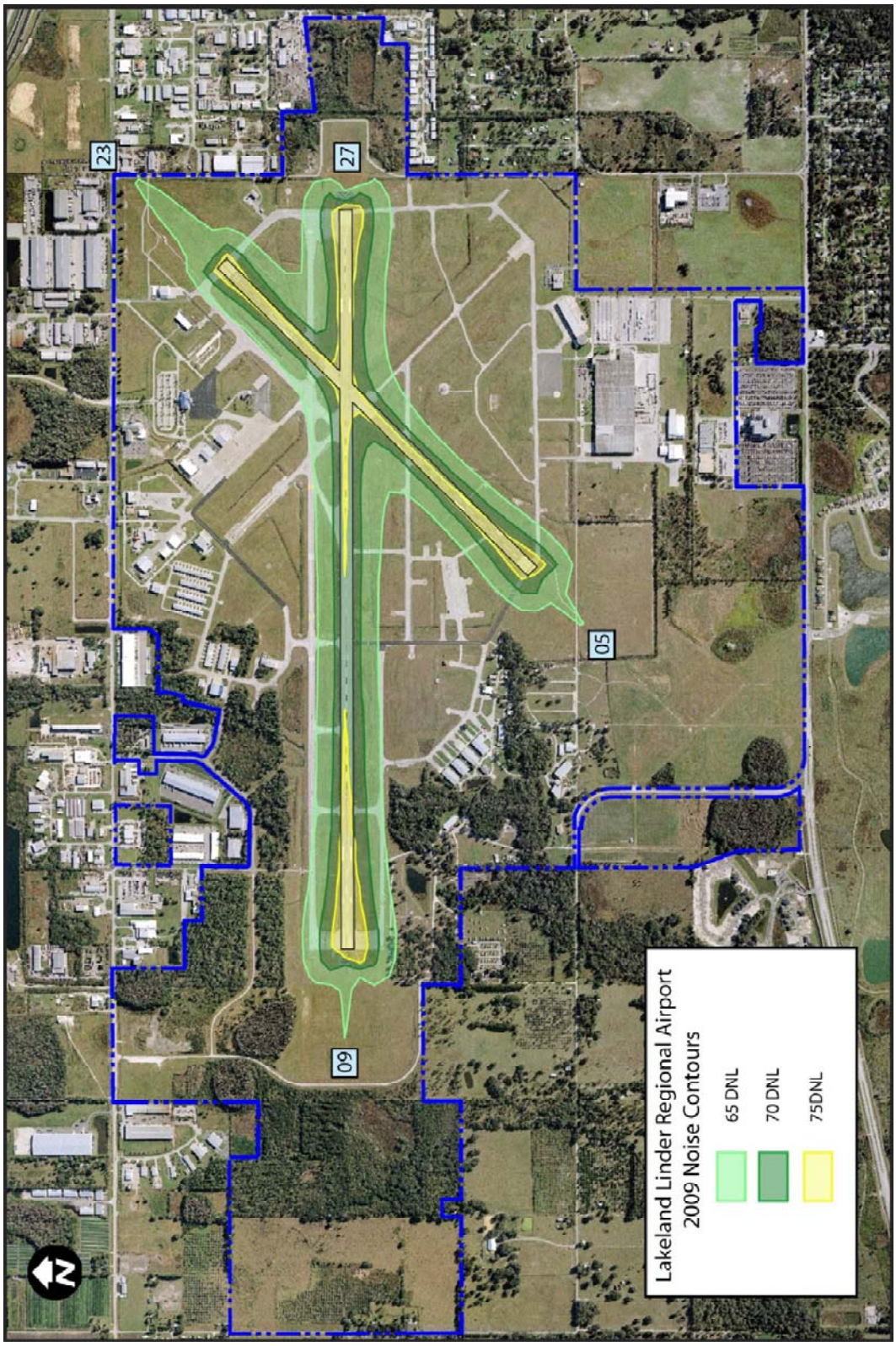
Approach and Departure Profiles – Approach and departure profiles illustrate an aircraft's altitude along its flight path. INM's vast database includes information regarding standard approach and departure profiles for the aircraft in this analysis.

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. Generalized flight tracks were developed for Lakeland Linder Regional Airport based on operations and fleet mix data. These flight tracks took into account local traffic patterns, variable entry and exits to the pattern, and arrival and departure paths used by aircraft. The planned runway extensions and shifting of Runway 5/23 were also taken into account.

Noise Exposure Impacts

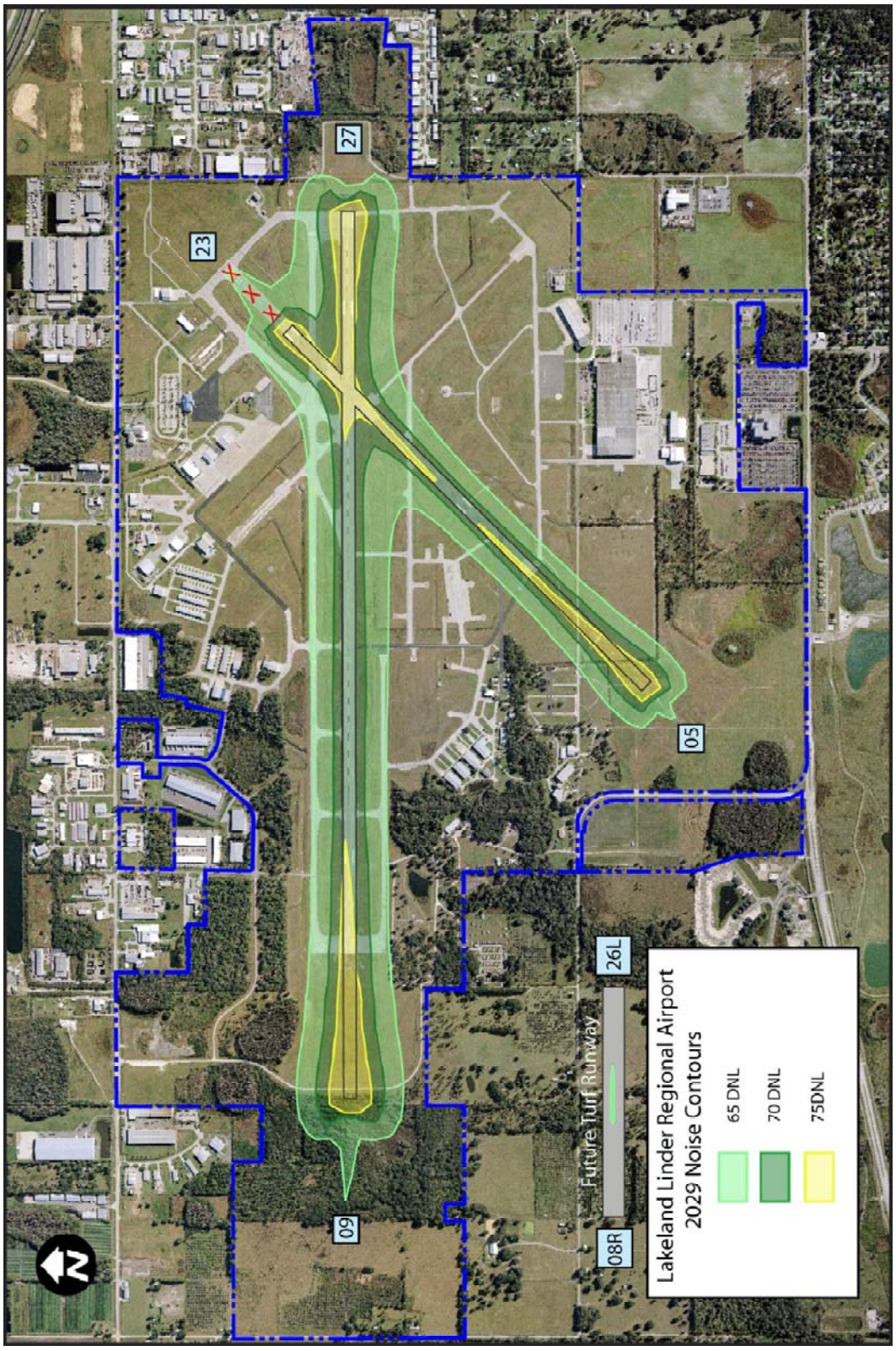
FAA Order 5050.4B requires that the 65, 70, and 75 DNL noise contours be developed for existing and future airport conditions. Noise levels greater than 65 DNL are generally considered unacceptable for noise-sensitive land uses, such as residences, hospitals, and schools. The existing and forecast year noise contours modeled for this analysis are displayed as **Figures 5.3B and 5.3C**, respectively, on the following page.

Figure 5.3B
Lakeland Linder Regional Airport Noise Contours, 2009



Source: Page One Consultants, Wilbur Smith Associates, FAA INM

Figure 5.3C
Future Lakeland Linder Regional Airport Noise Contours, 2029



Source: Page One Consultants, Wilbur Smith Associates, FAA INM

Throughout the forecast period, the 75 DNL area encompasses approximately 51 acres, all of it on airport property, with most of it confined to the runway boundaries. The 70 DNL area covers approximately 160 acres; and, the 65 DNL covers approximately 340 acres. Although a small amount of noise does fall beyond the airport property line, the affected areas are small in size and do not appear to be suitable for incompatible land uses.

Noise Exposure Impacts

Through the use of the FAA's INM, noise contours for Lakeland Linder Regional Airport were estimated for 2009 and 2029. Based on guidance provided by the FAA's National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects (FAA Order 5050.4B), the 65, 70, and 75 DNL contours were plotted to show relevant noise levels in relation to the airport and surrounding property. These noise contours show that over the time period, the increase in aircraft operations results in an increase in the size of the noise contours, but the relevant noise effects are expected to remain within airport boundaries. The shift of Runway 5/23 to the southwest helps to keep aircraft noise within the airport property line.

The addition of a grass runway to the southwest of the existing runways is expected to result in an inconsequential noise signature, all of it within the confines of the new runway. It is anticipated that small, single-engine aircraft will use this new runway less frequently than the existing runways are used.

5.3N Social Impacts / Environmental Justice / Children's Environmental Health and Safety Risks

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 are as follows:

- 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

Each of these impacts is discussed below:

Relocation of residences and/or businesses: The proposed Airport development projects will not result in the relocation of residences and/or businesses.

Alterations in traffic patterns that may permanently or temporarily restrict traditional community access: The proposed airport improvement projects will not result in changes to local roads or access to the Airport.

Division or disruption of established communities: There will not be any division or disruption of established communities or neighborhoods adjacent to the Airport as a result of the proposed projects.

Creation of appreciable employment: The construction of the Airport development projects will result in the creation of construction-related jobs in Polk County. However, the number of jobs that will be created will not result in significant economic changes in Polk County.

Environmental Justice **-** On April 15, 1997, the Department of Transportation (DOT) released DOT Order 5680.1 to comply with the Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. This Order requires 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 will not result in any disproportionate adverse impacts to minority and low-income populations because there will be no significant impacts off Airport property to adjacent residential areas.

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 development projects will not result in any

disproportionate health and safety risks to children.

5.3O Solid Waste

There are several things to consider when assessing the potential impacts to solid waste facilities:

- Refuse and debris generated from project construction
- Long-term generation as a result of increased airport operations
- Increase risk of bird strikes when runways are operated near an active landfill

The most likely of these categories to be impacted would be the increase in refuse and debris generated from project construction. Some additional long-term impacts could occur as a result of increased airport operations including the addition of commercial air service. FAA AC 150/5200-33B, provides guidance on how far a wildlife attractant area should be from an airport air operations area (AOA). For airport like LAL that service both piston and jet aircraft it is recommended that wildlife attractant areas should be kept a minimum of 10,000 FT away from the AOA. There are no current landfills within 10,000 FT of LAL's AOA, nor are any anticipated throughout the 20-year planning period.

5.3P 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 otherwise 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 Fish and Wildlife Service (FWS) and the applicable state agency to identify means to prevent loss or damage to wildlife resources resulting from the proposal.

If there is the potential for contamination of an aquifer designated by the Environmental Protection Agency (EPA)

as a sole or 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.

Lakeland Linder Regional Airport is located within the Peace River Watershed. Several small creeks are located adjacent to airport property, while on the west side of the airport there are some manmade drainage canals dating back to the original construction of the airport. Potential water quality impacts associated with airport development result from disturbances of large areas of soil during construction; significant alternation of site grading and drainage; creation of large areas of impervious surface; and altered stormwater runoff volumes and direction of flow. As a result, the Southwest Florida Water Management District should be contacted to assess the potential impacts to the watershed as projects are being designed.

A National Pollution Discharge Elimination System (NPDES) permit will be required since more than five (5) acres of existing vegetated land will be disturbed as a result of the proposed airport development projects. Disturbance refers to activities such as clearing, grading, and excavating that leave soil exposed. The general NPDES Construction Permit requires the submittal of a Notice of Intent and an Erosion and Sediment Control Plan to the county conservation district.

Measures identified in FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control,* should be incorporated into the design and construction of the proposed Airport development projects to minimize adverse water quality effects, including control of water pollution during construction.

The proposed airport improvement projects would not impound, divert, drain, control, or otherwise modify the waters of any stream or other body of water. Therefore, the Fish and Wildlife Coordination Act does not apply to these projects. In addition, Lakeland Linder Regional Airport is not within an area of a Sole Source Aquifer[4]; therefore, Section 1424(e) of the Safe Drinking Water Act, as amended, does not apply.

[4] EPA Region IV Sole Source Aquifer: http://www.epa.gov/safewater/sourcewater/pubs/reg4.pdf .

5.3Q 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 (7CFR Part 650.26, August 6, 1982). DOT Order 5660.1A sets forth DOT policy that transportation facilities should be planned, construction, and operated to ensure protection and enhancement of wetlands.

Approximately 211 acres of wetland communities were inventoried as part of the airport's Stormwater Master Plan. All are located within the airport's property boundaries and are comprised of six wetland community types: streams and waterways, reservoirs, bay swamp, stream and lake swamp, cypress, and wetland scrub. Based on the proposed extensions of Runway 9L/27R (1,600 feet to the west) and Runway 5/23 (1,800 feet to the southwest), there would be direct impacts to inventoried wetland communities on the airport related to the proposed runway extensions. These wetlands and waters are jurisdictional pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act and are, therefore, regulated by the U.S. Army Corps of Engineers, Jacksonville District and would require a Section 404 wetlands permit. As part of the NEPA process, a wetland delineation of the runway expansion project area should be conducted and further coordination with the US Corps of Engineers will be conducted. Any unavoidable impacts to wetlands must be mitigated in compliance with the Jacksonville District's Mitigation Standard Operating Procedures (Mitigation SOP) dated 2002. Authorizations from the Florida Department of Environmental Protection and the Southwest Florida Water Management District would also be required.

5.3R 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 within a 1,000 feet radius listed on the U.S. Department of Interior's Inventory of National Wild and Scenic Rivers or on the

Florida list of state scenic rivers in the vicinity of the Airport. Therefore, there will be no impacts to designated wild and scenic rivers as a result of the implementation of the airport projects included in the Master Plan Update.

5.3S Induced Socioeconomic /Cumulative Impacts

Induced Socioeconomic Impacts

The potential for airport projects to cause induced or secondary socioeconomic impacts on surrounding communities is evaluated by addressing the following factors: shifts in patterns of population movement and growth; changes in public service demands; and changes in business and economic activity.

The proposed Airport development projects at Lakeland Linder Regional Airport will not result in shifts in patterns of population movement and growth. With the exception of the future land acquisitions for alternate runways and non-aviation use, the majority of the proposed projects will occur on Airport-owned land and will not require any re-zoning of adjacent land. The future grass runway and seaplane base will extend beyond airport property into the river marsh, and therefore may be subject to re-zoning after land acquisition approval as determined by the Polk County Long Range Planning Division. However, this re-zoning would not result in shifts in patterns of population growth.

Airport improvement projects will not require an expansion of utilities or public safety services, including fire and police service that are available to the Airport. However, development concepts include plans for the construction of a new Airport Rescue Fire Fighting (ARFF) station.

The proposed Airport development will not result in significant changes in economic activity. There will be some construction-related employment generated by the projects that will have minor short-term economic benefits to Polk County. It is not anticipated that there will be any long-term Airport jobs created by the projects. The Airport projects may encourage the location of businesses in Polk 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.

Cumulative Impacts

According to the Council on Environmental Quality (CEQ), cumulative impacts are defined as:

"…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time."

Cumulative impacts occur if the proposed airport development projects, combined with other local development projects, such as road improvements or economic development projects, create significant socioeconomic impacts for the surrounding area.

A thorough cumulative impact analysis, while beyond the scope of this Environmental Overview, will be required for the proposed airport projects as part of the NEPA process. Follow-on environmental assessments and permitting may include consultation and scoping to obtain information from other governmental and non-governmental sources to identify past actions, proposed actions, and any foreseeable actions that would affect resources within the areas of affect.

5.4 Summary

This Environmental Inventory identified several environmental issues to be evaluated in greater detail during the NEPA documentation process which includes the preparation of environmental assessments and applicable permits that will be required prior to the implementation of the airport projects. These include: land acquisition/re-zoning approval, water quality impacts, stormwater impacts, wildlife impacts, hazardous waste impacts, and wetland impacts. In addition, further coordination with resource agencies and the public will be required as part of the NEPA process.

Implementation Program

6.1 Introduction

The importance of long-term planning is to ensure that provisions are made to incorporate the visions of the stakeholders and that land use is organized in such a fashion that expenditures for capital improvements will become part of a long-range development program. While it's impractical to complete 100% of the improvements shown within the 20-year planning period, construction and development of capital improvements should occur as market demands may suggest the economic and intangible benefits of making such improvements. However, it is practical to establish priorities and to set forth those priorities within the framework of the Short Range (1-5 years), Intermediate Range (6-10 years) and Long Range (11-20 years) planning periods.

In using a theory of constructing new facilities only when demand indicates a need, periodic reviews of the overall plan and individual projects must be made and are suggested biannually. This review will ensure that any changes in criteria resulting from technological

advances, economic factors, industry trends, etc. will be fully considered as the Capital Improvement Program is implemented.

The efforts of this study suggest a focus shall remain on the following priorities:

- Ensure that all airfield (runway/taxiway system) elements are adequate and permit for safe, reliable aircraft operations.
- Develop additional aviation facilities to increase airport revenues.
- Develop non-aviation industrial/commercial areas to increase airport revenues.
- Continue efforts to enhance both aviation and non-aviation tenant bases.
- Maintain a balance with the General Aviation and Commercial Service sectors.
- Promote industry and regional partnerships.
- Acquire land to permit airfield expansion, to preclude incompatible land use encroachment and to provide adequate noise buffer zones.
- Reserve aviation development areas to meet long-range activity demands.

With consideration to this general priority list, improvement programs have been developed for the planning period with the assumption that the funding entities have the financial capacity to implement the programs. The following paragraphs set forth the programs on this basis.

It should be noted that possible changes in the funding capacities of the City of Lakeland, Federal, or State Governments may require a change in sequencing of certain improvements until funding is available. However, the overall development plan should remain as shown. Finally, it's understood that needs arise that may alter the list of improvements and that the list of improvements shown herein should not be considered exhaustive in nature.

6.2 Recommended Short-Range Capital Improvements (1-5 Years)

The program recommends specific annual airport improvements beginning in 2011 and continuing through 2015. **Table 6.2A** lists the recommended 1-5 year capital improvements.

Table 6.2A

1-5 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item
2011	
1	Construct Solar Farm
2	Construct Regional Pond
3	Construct & Realign Taxiway H
4	Construct Taxiway J
5	Construct FBO Facilities
6	Install AWOS
7	Airside Center Apron Expansion - Phase I
2012	
8	Construct MRO
9	Entrance Road Realignment - Phase I
10	Additional Auto Parking
11	RAC Return Parking
12	Bus Parking
13	QTA Parking
14	Install ILS on RWY 9
2013	
15	Construct ARFF Facility
16	Construct Corporate Hangars - Phase I
17	Construct T-Hangars - Phase I
18	Taxiway B Extension
2014	
19	FEMA Staging Area Reconfiguration
20	Taxiway E Widening - Phase I
2015	
21	Construct ATCT
22	Taxiway D Extension

The cost estimates for this program show total project costs and possible sources of funding. The project cost for the Short Range Improvement Program which includes professional services, contingencies, etc., is estimated at $61,936,900 (2011 dollars). These estimates are identified in **Table 6.2B**, which is presented after the description of recommended capital improvements. Proposed improvement items in the (1-5) year capital improvement program are graphically illustrated in **Figure 6.2A**.

The following list of airside and landside projects recommended to be completed during the 1-5-year timeframe are described in the following paragraphs which include a project narrative, project justification statement, and project cost:

1) Construct Solar Farm

Project Narrative: Construction of a Solar Farm on Airport Property.

Project Justification: Construction of a Solar Farm on the western most boundary of the airport will provide a new (continuous) revenue source for the airport while also generating clean renewable energy.

Project Cost: $25,000,000

2) Construct Regional Pond

Project Narrative: Construct a Regional Pond to serve development on the north side of the airport.

Project Justification: The regional pond will mitigate and minimize the need for additional storm water systems on the north side of the Airport. The regional pond will eliminate the need for the surge basin south of RWY 9/27 which is encroaching on the TWY P safety area. This regionalization will enhance and open critical areas that would otherwise be required to satisfy storm water requirements.

Project Cost: $1,456,800

3) Construct & Realign Taxiway H

Project Narrative: This will be the first project in the realignment of the taxiways serving the area southwest of the Terminal building. TWY H will be realigned to connect directly to TWY A.

Project Justification: Realigning TWY H will enhance runway safety and reduce the potential for runway incursions by eliminating direct access to Runway 9-27 from the hangar area.

Project Cost: $985,800

4) Construct Taxiway J

Project Narrative: This will be the second project in the realignment of the taxiways serving the area southwest of the Terminal building. TWY J will be

constructed to Group IV standards and provide access to the terminal apron via TWY A.

Project Justification: Construction of TWY J will enhance runway safety and reduce the potential for runway incursions by eliminating direct access to Runway 9-27 from the terminal apron area.

Project Cost: $1,636,700

5) Construct FBO Facilities

Project Narrative: Construct a new FBO building just south west of the existing terminal building

Project Justification: With the arrival of new commercial service and the associated space requirements in mind, the FBO facility located in the existing airport terminal has been relocated to a new FBO building just south west of the existing terminal.

Project Cost: $585,000

6) Install AWOS

Project Narrative: Installation of an All Weather Observation Station at LAL.

Project Justification: With the increase of air traffic in and out of the Lakeland area and with the onset of commercial service, installation of an AWOS facility has become a necessity.

Project Cost: $300,000

7) Airside Center Apron Expansion - Phase I

Project Narrative: This project consists of the expansion of the existing apron between TWY E and the Airside Center Building, to accommodate additional aircraft volume.

Project Justification: With an increase of air traffic in and around the Airside Center building, additional apron area is required.

Project Cost: $1,288,000

8) Construct MRO

Project Narrative: Construct New Airport Maintenance and Repair Facility

Project Justification: The airport does not have a facility suitable for an MRO. Currently, and MRO is living with a retrofit facility on the south side of the airfield and requires something more permanent.

Project Cost: $6,292,000

9) Entrance Road Realignment – Phase I

Project Narrative: Realign Terminal entrance roadway to allow for the anticipated increase of traffic flow due to the implementation of commercial service and the increased passenger transportation requirements.

Project Justification: With the anticipated increase of commercial service, the airport will require realignment of the existing entrance roadway to improve terminal access for an increased volume of automobiles, taxis, buses, and rental cars.

Project Cost: $998,000

10) Additional Auto Parking

Project Narrative: Construct additional automobile parking.

Project Justification: With the addition of commercial service at LAL, additional automobile parking is required at the terminal building.

Project Cost: $2,317,000

11) RAC Return Parking

Project Narrative: Construct a Rental Car Return Parking lot.

Project Justification: With the addition of commercial service at LAL, a Rental Car Return parking lot is required at the terminal building.

Project Cost: $144,000

12) Bus Parking

Project Narrative: Construct a Bus Parking Lot.

Project Justification: With the addition of commercial service at LAL, a Bus parking lot is required at the terminal building.

Project Cost: $591,000

13) QTA Parking

Project Narrative: Construct a Quick Turn Around parking lot.

Project Justification: With the addition of commercial service at LAL, a Quick Turn Around parking lot is required at the terminal building.

Project Cost: $1,137,800

14) Install ILS on RWY 9

Project Narrative: Install ILS on RWY 9 including MALSR.

Project Justification: The current ILS on RWY 5 is 29 years old and does not meet the new FAA safety area requirements. This project would enhance runway safety by relocating the ILS and associated approach lighting to RWY 9, the airport's primary runway. As a Part 139 Reliever Airport, we currently do not have a precision approach to our primary runway.

Project Cost: $2,500,000

15) Construct ARFF Facility

Project Narrative: Construct a permanent Airport Rescue and Fire Fighting (ARFF) building necessary to house future airport rescue and firefighting equipment.

Project Justification: The ARFF station is currently housed in temporary facilities located at the base of the tower. The facility does not provide adequate facilities to maintain a permanent fire station. The equipment is not garaged and is being exposed to the elements significantly reducing

its useful life. The cost estimate has been revised to reflect a much more accurate amount. The cost of a recent city fire station was taken into consideration as well as current costs of ARFF vehicles.

Project Cost: $2,000,000

16) Construct Corporate Hangars - Phase I

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $1,499,800

17) Construct T-Hangars - Phase I

Project Narrative: Construct additional single engine T-Hangars plus twin engine T-Hangars.

Project Justification: The demand is based on the Master Plan predictions and the current waiting list for space.

Project Cost: $2,755,000

18) Taxiway B Extension

Project Narrative: Rehabilitate and partially realign Taxiway F becoming TWY B extension to the approach end of Runway 5.

Project Justification: Aircraft located on the North side of the Airport have to traverse through a maze of TWY's to reach the approach end of RWY 5. This environment creates an inefficient and unsafe environment for taxiing aircraft. Currently there is no direct route or parallel taxiway to RWY 5/23 south of RWY 9/27. This will become the primary route from the Terminal area to RWY 5. Taxiway F also shows significant deterioration including extensive alligator cracking, stress, failing sub-base material and numerous safety area issues. Essentially the airport will convert portions of TWY F to a non-movement area. The

extension of TWY B to the south will allow for the safe and efficient movement of aircraft to RWY 5 and will allow for C-III aircraft movement to the south side MRO.

Project Cost: $2,550,000

19) FEMA Staging Area Reconfiguration

Project Narrative: Construct new apron on the airfield south of Runway 9/27.

Project Justification: Additional apron is needed to accommodate traffic on the south side of the airport and to handle special events including FEMA/SERT operations as well as to support Group IV aircraft.

Project Cost: $1,600,000

20) Taxiway E Widening - Phase I

Project Narrative: This project will rehabilitate, partially realign and widen Taxiway E (including drainage) from RWY 5 to the Airside Center ramp and the design of Phase I thru III.

Project Justification: This taxiway is showing signs of stress, failing sub-base and provides access for C-III aircraft to the large hangars on the south side of the airfield. (Approximately 2,000 feet).

Project Cost: $1,900,000

21) Construct ATCT

Project Narrative: Perform a site selection study, construct a new air traffic control facility and relocate the existing electrical vault.

Project Justification: This project will replace the existing control tower. The existing control tower does not have adequate height or location to comply with FAA standards. From its location at the east end of the airport, the present tower does not afford controllers an adequate view of the movement areas nor proper line of sight. A new tower in a more suitable location is essential to permit controllers to provide the

highest level of safety. Relocation of the electrical vault, which is included in this project, is necessary to meet object free area requirements for TWY C.

Project Cost: $3,200,000

22) <u>Taxiway D Extension</u>

Project Narrative: Extend TWY D to TWY E to facilitate an east west parallel TWY on the south side of RWY 9/27 that does not exist today.

Project Justification: The extension of TWY D to TWY E will allow for safe and efficient movement of aircraft on the south side of the airfield (parallel to RWY 9/27) by adding a 1,700 foot extension to TWY D, versus a 5,000 foot extension to TWY P which would be phased at a later date. This will provide the most cost effective approach to the creation of a partial parallel taxiway on the south side of the airfield which currently does not exist.

Project Cost: $1,200,000

Table 6.2B

Cost Estimates For The 1-5 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item	Federal	State	Local	Other	Total Project Cost Estimate
			2011			
1	Construct Solar Farm	$0	$0	$0	$25,000,000	$25,000,000
2	Construct Regional Pond	$1,383,960	$36,420	$36,420	$0	$1,456,800
3	Construct & Realign Taxiway H	$936,510	$24,645	$24,645	$0	$985,800
4	Construct Taxiway J	$1,554,865	$40,918	$40,918	$0	$1,636,700
5	Construct FBO Facilities	$0	$0	$585,000	$0	$585,000
6	Install AWOS	$0	$240,000	$60,000	$0	$300,000
7	Airside Center Apron Expansion - Phase I	$0	$1,030,400	$257,600	$0	$1,288,000
Total Cost 2011 Projects		**$3,875,335**	**$1,372,383**	**$1,004,583**	**$25,000,000**	**$31,252,300**
			2012			
8	Construct MRO	$0	$5,033,600	$1,258,400	$0	$6,292,000
9	Entrance Road Realignment - Phase I	$0	$798,400	$199,600	$0	$998,000
10	Additional Auto Parking	$0	$1,853,600	$463,400	$0	$2,317,000
11	RAC Return Parking	$0	$115,200	$28,800	$0	$144,000
12	Bus Parking	$0	$472,800	$118,200	$0	$591,000
13	QTA Parking	$0	$910,240	$227,560	$0	$1,137,800
14	Install ILS on RWY 9	$0	$2,000,000	$500,000	$0	$2,500,000
Total Cost 2012 Projects		**$0**	**$11,183,840**	**$2,795,960**	**$0**	**$13,979,800**
			2013			
15	Construct ARFF Facility	$0	$1,600,000	$400,000	$0	$2,000,000
16	Construct Corporate Hangars - Phase I	$0	$1,199,840	$299,960	$0	$1,499,800
17	Construct T-Hangars - Phase I	$0	$2,204,000	$551,000	$0	$2,755,000
18	Taxiway B Extension	$2,422,500	$63,750	$63,750	$0	$2,550,000
Total Cost 2013 Projects		**$2,422,500**	**$5,067,590**	**$1,314,710**	**$0**	**$8,804,800**
			2014			
19	FEMA Staging Area Reconfiguration	$0	$1,280,000	$320,000	$0	$1,600,000
20	Taxiway E Widening - Phase I	$1,805,000	$47,500	$47,500	$0	$1,900,000
Total Cost 2014 Projects		**$1,805,000**	**$1,327,500**	**$367,500**	**$0**	**$3,500,000**
			2015			
21	Construct ATCT	$0	$1,860,000	$640,000	$700,000	$3,200,000
22	Taxiway D Extension	$1,140,000	$30,000	$30,000	$0	$1,200,000
Total Cost 2015 Projects		**$1,140,000**	**$1,890,000**	**$670,000**	**$700,000**	**$4,400,000**
Total Cost 1-5 Year Projects		**$9,242,835**	**$20,841,313**	**$6,152,753**	**$25,700,000**	**$61,936,900**

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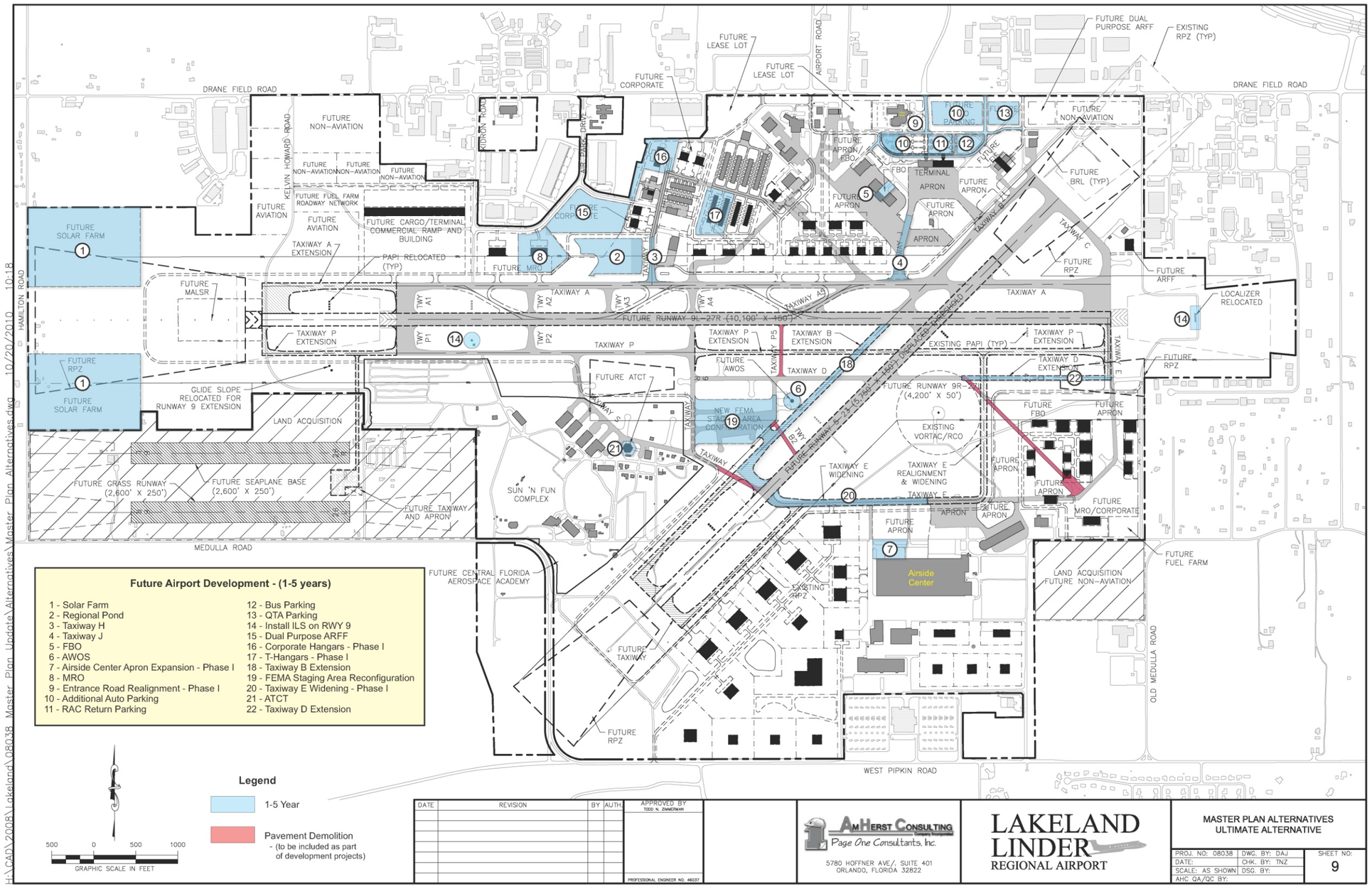
LAKELAND LINDER REGIONAL AIRPORT



Future Airport Development - (1-5 years)

1 - Solar Farm
2 - Regional Pond
3 - Taxiway H
4 - Taxiway J
5 - FBO
6 - AWOS
7 - Airside Center Apron Expansion - Phase I
8 - MRO
9 - Entrance Road Realignment - Phase I
10 - Additional Auto Parking
11 - RAC Return Parking
12 - Bus Parking
13 - QTA Parking
14 - Install ILS on RWY 9
15 - Dual Purpose ARFF
16 - Corporate Hangars - Phase I
17 - T-Hangars - Phase I
18 - Taxiway B Extension
19 - FEMA Staging Area Reconfiguration
20 - Taxiway E Widening - Phase I
21 - ATCT
22 - Taxiway D Extension

Legend

1-5 Year

Pavement Demolition
- (to be included as part of development projects)

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DATE	REVISION	BY	AUTH.

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LAKELAND LINDER REGIONAL AIRPORT

MASTER PLAN ALTERNATIVES
ULTIMATE ALTERNATIVE

PROJ. NO: 08038	DWG. BY: DAJ
DATE:	CHK. BY: TNZ
SCALE: AS SHOWN	DSG. BY:
AHC QA/QC BY:	

SHEET NO: 9

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City of LAKELAND

Figure 6.2A
1-5 Year Capital Improvement Program
Lakeland Linder Regional Airport

6.3 Recommended Intermediate-Range Capital Improvements (6-10 Years)

The Capital Improvements Program for LAL recommends specific annual airport improvements beginning in 2016 and continuing through 2020. **Table 6.3A** lists the recommended (6-10) year capital improvements.

Table 6.3A

6-10 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item
2016	
23	Construct Secure Road - Phase I
24	Runway 9/27 Extension
25	Taxiway A Extension
26	Taxiway P Extension - Phase I
27	Relocate Glide Slope on RWY 9
28	MRO Expansion
29	Terminal Apron Expansion - Phase I
2017	
30	Construct High Speed Taxiways
31	Widen Taxiway A4
32	Access Road Extension
33	Entrance Road Realignment - Phase II
34	Corporate Hangar Access Road
35	Apron Expansion
36	Terminal Expansion
37	Construct FIS Facility
38	Access Roadway to FIS
2018	
39	Construct Taxiway I
40	Construct Corporate Hangars - Phase II
2019	
41	Construct T-Hangars - Phase II
42	Airside Center Apron Expansion - Phase II
Total Cost 2019 Projects	
2020	
43	Taxiway P Extension - Phase II
44	Taxiway E Realignment & Widening - Phase II
45	Land Acquisition - South West

The costs estimates for this program show total project costs and possible sources of funding. The project cost for the intermediate-range capital improvement program which includes professional services, contingencies, etc., is estimated at $56,177,900 (2011 dollars). These estimates are identified in **Table 6.3B**, which is presented after the description of recommended capital improvements. Proposed improvement items in the (6-10) year capital improvement program are graphically illustrated in **Figure 6.3A**.

The following list of airside and landside projects recommended to be completed during the (6-10) year timeframe are described in the following paragraphs which include a project narrative, project justification statement, and project cost:

23) Construct Secure Road - Phase I

Project Narrative: Design and construct a perimeter service road parallel to the north side of RWY 9-27 from the east perimeter road to the west perimeter road.

Project Justification: The construction of a secure service road on the north side of RWY 9/27, connecting the eastern airport service road to the western airport service road (which currently does not exist) will allow service vehicles and fuel trucks to traverse the airport without crossing movement areas, significantly enhancing safety by reducing the opportunity for airfield incursions.

Project Cost: $850,000

24) Runway 9/27 Extension

Project Narrative: Extend RWY 9 1,600 feet to an overall length of 10,100 feet.

Project Justification: The 1,600 foot westerly extension of RWY 9 would bring the overall length of the runway to 10,100 feet. This additional runway length is forecasted to meet the projected commercial and potential cargo traffic needs of the Airport.

Project Cost: $3,325.000

25) Taxiway A Extension

Project Narrative: Extend TWY A 1,600 feet to the extended RWY 9 end.

Project Justification: This additional Group IV taxiway length is forecasted to meet the projected commercial and potential cargo traffic needs of the Airport.

Project Cost: $3,200,000

26) Taxiway P Extension - Phase I

Project Narrative: Extend TWY P 1,600 feet to the extended RWY 9 end.

Project Justification: This additional Group III taxiway length is forecasted to meet the projected General Aviation & Flight School traffic needs of the Airport (south of RWY 9/27).

Project Cost: $1,500,000

27) Relocate Glide Slope on RWY 9

Project Narrative: With the 1,600 foot westerly extension of RWY 9 the Glide Slope at the RWY 9 end will need to be relocated closer to the extended runway end.

Project Justification: With the 1,600 foot westerly extension of RWY 9 the Glide Slope Antenna and Equipment Building will need to be relocated closer to the extended runway end to operate properly as per FAA guidelines.

Project Cost: $1,000,000

28) MRO Expansion

Project Narrative: Expand Airport Maintenance and Repair Facility

Project Justification: With the expansion of General Aviation, Commercial and Cargo operations at the airport, the maintenance facilities at the airport must also expand to keep pace with the airports maintenance equipment and parts inventory requirements.

Project Cost: $3,484,500

29) Terminal Apron Expansion - Phase I

Project Narrative: Expand the terminal apron on the east side to accommodate increased charter and corporate operations and commercial service. This would include additional access to TWY B and related drainage work.

Project Justification: Additional terminal/ramp is needed to accommodate the charter and corporate operations. This will improve capacity for the increase in business jet activity for daily operations and special events.

Project Cost: $2,700,000

30) Construct High Speed Taxiways

Project Narrative: To rehabilitate and widen TWY A connectors on the north side of RWY 9-27 and construct three new high speed TWY connectors to meet C-IV design standards.

Project Justification: RWY 9-27 and parallel TWY A (to the north) currently meet Group IV aircraft requirements while the TWY A connectors are C-III, creating safety risks. This project would upgrade the existing taxiway connectors to C-IV criteria and eliminate these safety concerns. The construction of three new high speed exit TWY's would support the anticipated increased operations due to the onset of commercial activity, and will be critical to maximize the capacity of the RWY 9/27 and parallel TWY A system.

Project Cost: $3,000,000

31) Widen Taxiway A4

Project Narrative: Widen TWY A4 to meet the C-IV design criteria.

Project Justification: With the 1,600 foot extension of RWY 9/27 and its associated taxiways, Taxiway A4 will be located near the midpoint of RWY 9/27 and will experience an increase in traffic.

Project Cost: $412,500

32) Access Road Extension

Project Narrative: Construct an access road extension westward to the corporate hangars.

Project Justification: With the addition of new corporate hangars west of the terminal, additional access to the area is required.

Project Cost: $286,000

33) Entrance Road Realignment – Phase II

Project Narrative: Extends Airport Road south of Drane Field Road. Project will consist of construction of new road segment, affiliated drainage and additional AOA security fencing.

Project Justification: Access road required for corporate hangars and FBO site relocation resulting from expanded main terminal ramp. This project will provide increased traffic flow capacity for the flying public.

Project Cost: $892,000

34) Corporate Hangar Access Road

Project Narrative: Construction of a new access road will allow for additional Corporate Hangar development west of the Terminal and north of RWY 9/27.

Project Justification: With the construction of a new access road, the airport will have increased opportunities for corporate hangar development on the north side of the airport.

Project Cost: $1,670,800

35) Apron Expansion

Project Narrative: Apron expansion in the area due west of the terminal will be required to support additional corporate hangars and aviation related developments.

Project Justification: Apron expansion will be required to support additional corporate hangars and aviation related developments west of the terminal.

Project Cost: $4,112,500

36) Terminal Expansion

Project Narrative: The Airport's Terminal building will require expansion to meet future growth projections.

Project Justification: With the anticipated growth of charter/commercial service operations the Terminal building will require expansion to meet those growth demands.

Project Cost: $4,000,000

37) Construct FIS Facility

Project Narrative: Construct Customs facility to be able to process international passengers arriving at the Airport.

Project Justification: The Airport intends to pursue international activity and will need to be able to process arriving passengers at the terminal building in a manner that is defined by the US Border Protection. The existing terminal building does not have any available space to handle the federal requirements. A new facility that can accommodate the security and processing of passengers and or cargo is required.

Project Cost: $3,000,000

38) Access Roadway to FIS

Project Narrative: Construct a new access road to support the new FIS facility.

Project Justification: With the construction of a new FIS facility, construction a new access road to support the new FIS facility will be required.

Project Cost: $420,300

39) Construct Taxiway I

Project Narrative: This will be the second project in the realignment of the taxiways serving the area southwest of the Terminal building. This project includes design and lighting of TWY I.

Project Justification: Realigning TWY G (and renaming TWY I) will reduce the potential for RWY incursion by eliminating direct access to RWY 9/27 (the primary RWY) at the TWY A4 connector. The construction of a new TWY I will facilitate both the existing and future T-Hangar/Corporate Hangars southwest of the Terminal Building.

Project Cost: $2,100,000

40) Construct Corporate Hangars - Phase II

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $4,906,800

41) Construct T-Hangars - Phase II

Project Narrative: Construct additional single engine T-Hangars and twin engine T-Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $3,242,500

42) Airside Center Apron Expansion - Phase II

Project Narrative: This project consists of the expansion of the existing apron between TWY E and the Airside Center Building to accommodate additional aircraft on the south side of the field.

Project Justification: With an increase of air traffic in and around the Airside Center building, additional apron area is required.

Project Cost: $2,362,500

43) Taxiway P Extension - Phase II

Project Narrative: Extend TWY P from RWY 5/23 to TWY E to facilitate an east west parallel TWY on the south side of RWY 9/27.

Project Justification: The extension of TWY P from RWY 5/23 to TWY E will allow for safe and efficient movement of aircraft on the south side of the airfield (parallel to RWY 9/27). This extension will provide the second phase of the creation of a parallel TWY on the south side of the Airfield which currently does not exist. This will also allow for additional development opportunities in the southeast corner of the airfield.

Project Cost: $2,512,500

44) Taxiway E Realignment & Widening - Phase II

Project Narrative: Realign and widen TWY E (to Group IV criteria), from the Airside Center ramp eastward, then northward to TWY P, and finally to the RWY 27 end.

Project Justification: The existing taxiway is showing signs of stress and failing sub-base material. This taxiway currently provides primary access to the south side of the airfield. With the realignment and widening of Taxiway E and associated drainage improvements, the southeast portion of the airport can be redeveloped to better suit the airport's future plans.

Project Cost: $3,200,000

45) Land Acquisition - South West

Project Narrative: Acquire land in the south west corner of the airport adjacent to and just west of the Sun 'n Fun Complex.

Project Justification: The acquisition of this land will preserve the potential for future aviation development to accommodate growth at the Airport while protecting the environs around the perimeter of the airport from future non compatible development. A Regional pond that will drain the southwest segment of the airport would be incorporated into the area as well as a grass landing strip.

Project Cost: $4,000,000

Table 6.3B

Cost Estimates For The 6-10 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item	Federal	State	Local	Other	Total Project Cost Estimate
2016						
23	Construct Secure Road - Phase I	$0	$680,000	$170,000	$0	$850,000
24	Runway 9/27 Extension	$3,158,750	$83,125	$83,125	$0	$3,325,000
25	Taxiway A Extension	$3,040,000	$80,000	$80,000	$0	$3,200,000
26	Taxiway P Extension - Phase I	$1,425,000	$37,500	$37,500	$0	$1,500,000
27	Relocate Glide Slope on RWY 9	$0	$800,000	$200,000	$0	$1,000,000
28	MRO Expansion	$0	$2,787,600	$696,900	$0	$3,484,500
29	Terminal Apron Expansion - Phase I	$0	$1,439,000	$540,000	$721,000	$2,700,000
Total Cost 2016 Projects		**$7,623,750**	**$5,907,225**	**$1,807,525**	**$721,000**	**$16,059,500**
2017						
30	Construct High Speed Taxiways	$2,850,000	$75,000	$75,000	$0	$3,000,000
31	Widen Taxiway A4	$391,875	$10,313	$10,313	$0	$412,500
32	Access Road Extension	$0	$228,800	$57,200	$0	$286,000
33	Entrance Road Realignment - Phase II	$0	$713,600	$178,400	$0	$892,000
34	Corporate Hangar Access Road	$0	$1,336,640	$334,160	$0	$1,670,800
35	Apron Expansion	$0	$3,290,000	$822,500	$0	$4,112,500
36	Terminal Expansion	$0	$2,457,300	$800,000	$742,700	$4,000,000
37	Construct FIS Facility	$0	$2,400,000	$600,000	$0	$3,000,000
38	Access Roadway to FIS	$0	$336,240	$84,060	$0	$420,300
Total Cost 2017 Projects		**$3,241,875**	**$10,847,893**	**$2,961,633**	**$742,700**	**$17,794,100**
2018						
39	Construct Taxiway I	$1,229,900	$52,500	$52,500	$765,100	$2,100,000
40	Construct Corporate Hangars - Phase II	$0	$3,925,440	$981,360	$0	$4,906,800
Total Cost 2018 Projects		**$1,229,900**	**$3,977,940**	**$1,033,860**	**$765,100**	**$7,006,800**
2019						
41	Construct T-Hangars - Phase II	$0	$2,594,000	$648,500	$0	$3,242,500
42	Airside Center Apron Expansion - Phase II	$0	$1,101,800	$472,500	$788,200	$2,362,500
Total Cost 2019 Projects		**$0**	**$3,695,800**	**$1,121,000**	**$788,200**	**$5,605,000**
2020						
43	Taxiway P Extension - Phase II	$1,574,875	$62,813	$62,813	$812,000	$2,512,500
44	Taxiway E Realignment & Widening - Phase II	$3,040,000	$80,000	$80,000	$0	$3,200,000
45	Land Acquisition - South West	$0	$3,000,000	$1,000,000	$0	$4,000,000
Total Cost 2020 Projects		**$4,614,875**	**$3,142,813**	**$1,142,813**	**$812,000**	**$9,712,500**
Total Cost 6-10 Year Projects		**$16,710,400**	**$27,571,670**	**$8,066,830**	**$3,829,000**	**$56,177,900**

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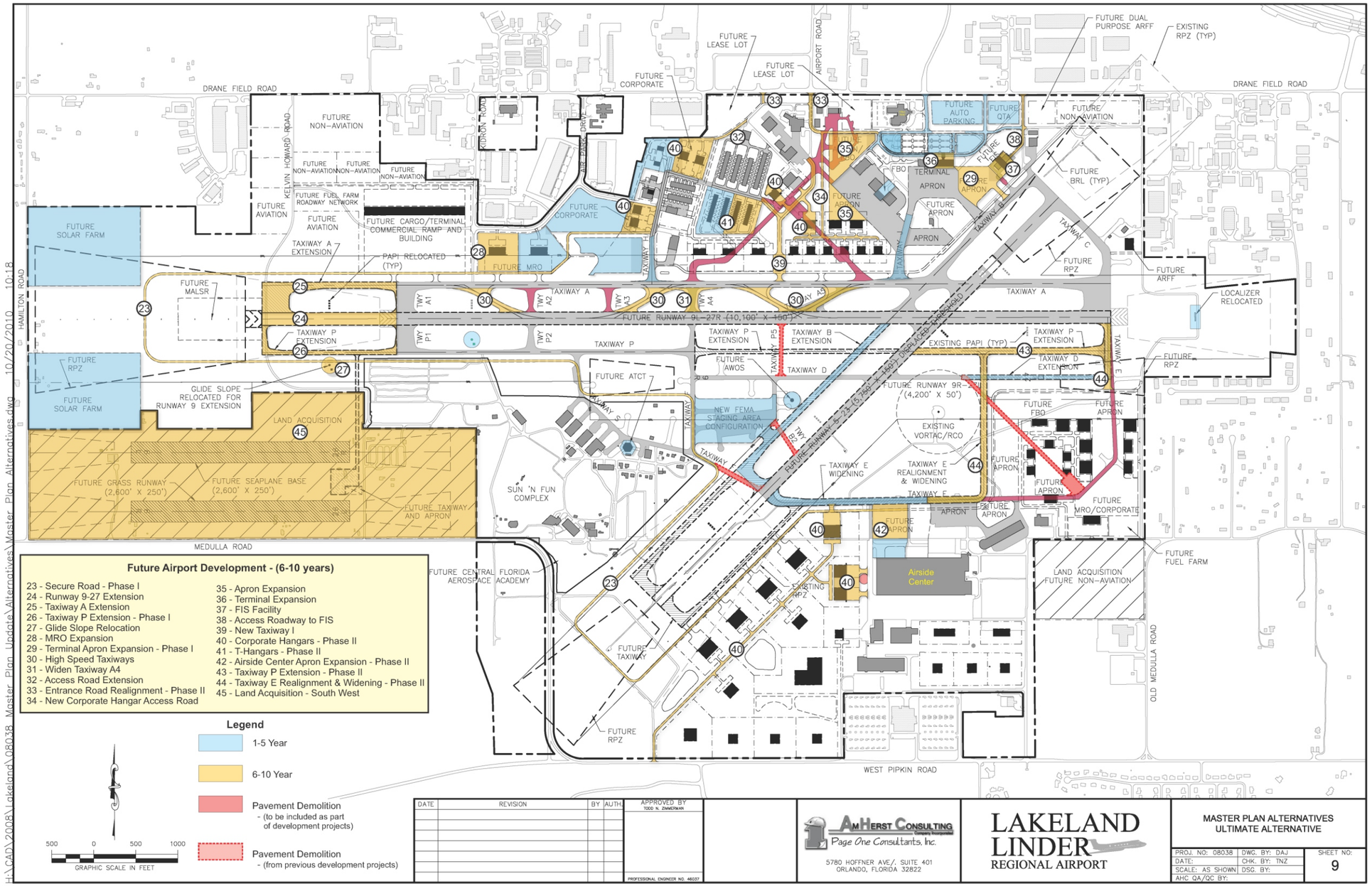

Future Airport Development - (6-10 years)

23 - Secure Road - Phase I
24 - Runway 9-27 Extension
25 - Taxiway A Extension
26 - Taxiway P Extension - Phase I
27 - Glide Slope Relocation
28 - MRO Expansion
29 - Terminal Apron Expansion - Phase I
30 - High Speed Taxiways
31 - Widen Taxiway A4
32 - Access Road Extension
33 - Entrance Road Realignment - Phase II
34 - New Corporate Hangar Access Road
35 - Apron Expansion
36 - Terminal Expansion
37 - FIS Facility
38 - Access Roadway to FIS
39 - New Taxiway I
40 - Corporate Hangars - Phase II
41 - T-Hangars - Phase II
42 - Airside Center Apron Expansion - Phase II
43 - Taxiway P Extension - Phase II
44 - Taxiway E Realignment & Widening - Phase II
45 - Land Acquisition - South West

Legend

- 1-5 Year
- 6-10 Year
- Pavement Demolition - (to be included as part of development projects)
- Pavement Demolition - (from previous development projects)

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DATE	REVISION	BY	AUTH.

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LAKELAND LINDER REGIONAL AIRPORT

MASTER PLAN ALTERNATIVES
ULTIMATE ALTERNATIVE

PROJ. NO: 08038	DWG. BY: DAJ	SHEET NO: 9
DATE:	CHK. BY: TNZ	
SCALE: AS SHOWN	DSG. BY:	
AHC QA/QC BY:		

Figure 6.3A
6-10 Year Capital Improvement Program
Lakeland Linder Regional Airport

6.4 Recommended Long-Range Capital Improvements (11-20 Years)

The Capital Improvements Program for LAL recommends specific annual airport improvements beginning in 2021 and continuing through 2030. **Table 6.4A** lists the recommended 11-20 year capital improvements.

Table 6.4A

11-20 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item
2021	
46	Construct Corporate / T-Hangar Access Road
47	Construct Corporate Hangars - Phase III
2022	
48	Taxiway P Extension - Phase III
49	Terminal Apron Expansion - Phase II
50	Airside Center Apron Expansion - Phase III
2023	
51	Construct South East Access Road
52	Construct Corporate Hangars - Phase IV
53	Construct Secure Road - Phase II
2024	
54	Construct Corporate Hangars - Phase V
2025	
55	Construct Cargo / Terminal Access Road
56	Construct Cargo / Terminal / Commercial Ramp & Building
2026	
57	Construct Corporate Hangars - Phase VI
2027	
58	Runway 5/23 Extension
59	Taxiway B Extension to RWY 5 End
2028	
60	Construct MRO / Corporate Facility
2029	
61	Construct Corporate Hangars - Phase VII
62	Construct Secure Road - Phase III
2030	
63	Construct Taxiway R
64	Land Acquisition - South East

The costs estimates for this program show total project costs and possible sources of funding. The project cost for the long-range improvement program which includes professional services, contingencies, etc., is estimated at $110,773,500 (2011 dollars). These estimates are identified in **Table 6.4B**, which is presented after the description of recommended capital improvements. Proposed improvement items in the (11-20) year capital improvement program are graphically illustrated in **Figure 6.4A**.

The following list of airside and landside projects recommended to be completed during the next (11-20) year timeframe are described in the following paragraphs which include a project narrative, project justification statement, and project cost:

46) Construct Corporate / T-Hangar Access Road

Project Narrative: Construct a new North/South access road to the west of the existing T-Hangars to facilitate access to the T-Hangars, existing Corporate Hangars and to new Corporate Hangars North of TWY A.

Project Justification: This access road is required to provide access to existing Corporate Hangars, T-Hangars and planned Corporate Hangar additions north of TWY A.

Project Cost: $686,800

47) Construct Corporate Hangars - Phase III

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $6,554,000

48) Taxiway P Extension - Phase III

Project Narrative: Extend TWY P from TWY F to RWY 5/23 to complete a full-length parallel taxiway on the south side of RWY 9/27.

Project Justification: The extension of TWY P from TWY F to RWY 5/23 will allow for safe and efficient movement of aircraft on the south side of the airfield (parallel to RWY 9/27). This extension will complete the parallel

taxiway on the south side of the Airfield which currently does not exist. This will also allow for additional development opportunities in the southeast corner of the airfield.

Project Cost: $1,837,500

49) Terminal Apron Expansion - Phase II

Project Narrative: Expansion of the Terminal Apron.

Project Justification: With the increased commercial service operations, additional Terminal Apron will be required to accommodate the efficient movement of passengers.

Project Cost: $5,150,000

50) Airside Center Apron Expansion - Phase III

Project Narrative: This project consists of the continued expansion of the existing apron between TWY E and the Airside Center building.

Project Justification: With an increase of air traffic in and around the Airside Center building, additional apron area is required.

Project Cost: $3,912,500

51) Construct South East Access Road

Project Narrative: Construction of an access road in the south east area of the airport is required to allow for more efficient ingress/egress to the South East development areas.

Project Justification: To serve additional Corporate Hangar development in the south east area of the airport, a new access road is required.

Project Cost: $779,000

52) Construct Corporate Hangars - Phase IV

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $10,829,000

53) Construct Secure Road - Phase II

Project Narrative: This project consists of the design and construction of a secure road (Phase II) as part of a planned overall secure perimeter road system surrounding the airport.

Project Justification: The development of a perimeter secure road system within airport property will enable airport and service vehicles to cross the airport without having to use taxiways and cross runways. The reduction in the number of vehicles operating on movement areas will minimize ATCT coordination and the opportunity for incursions. The perimeter road system is consistent with the FAA's Runway Safety Program and Surface Incident Prevention Plan.

Project Cost: $2,000,000

54) Construct Corporate Hangars - Phase V

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $17,854,400

55) Construct Cargo / Terminal Access Road

Project Narrative: Construct an access road in the northwest corner of the Airport to serve future development of a Cargo/Terminal Commercial Ramp.

Project Justification: To further develop the northwest corner of the Airport, an access road is required.

Project Cost: $2,788,000

56) Construct Cargo / Terminal / Commercial Ramp & Building

Project Narrative: Construct a Cargo/Terminal/Commercial Ramp and Building in the northwest corner of the airport.

Project Justification: Development of a Cargo/Terminal/Commercial Ramp and Building on the north side of TWY A will enhance the capacity of the existing terminal building.

Project Cost: $19,060,000

57) Construct Corporate Hangars - Phase VI

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $8,039,600

58) Runway 5/23 Extension

Project Narrative: The construction of a RWY 5/23 extension to the southwest.

Project Justification: With the construction of a 1,780 foot extension to RWY 5/23, the threshold of the existing RWY 23 end can be displaced 1,030 feet. This will allow for RWY 5/23 to maintain a required runway length of 5,750 feet and allow for the Runway Protection Zones (RPZ) at each end to be completely on Airport property. This will eliminate the need for the aviation easement in place for RWY 23.

Project Cost: $3,737,500

59) Taxiway B Extension to RWY 5 End

Project Narrative: Extend TWY B to the relocated RWY 5 end.

Project Justification: With the 1,780 foot extension of the RWY 5 end, TWY B also must be extended to the RWY 5 end.

Project Cost: $2,637,500

60) Construct MRO / Corporate Facility

Project Narrative: Construct an MRO/Corporate Facility in the southeast corner of the airport.

Project Justification: Construction of an MRO/Corporate Facility in the Southeast corner of the airport property.

Project Cost: $4,459,000

61) Construct Corporate Hangars - Phase VII

Project Narrative: Construct additional Corporate Hangars.

Project Justification: The demand is based on the Master Plan predictions and current waiting list for space.

Project Cost: $14,086,200

62) Construct Secure Road - Phase III

Project Narrative: This project consists of the design and construction of a secure road (Phase III) as part of a planned overall perimeter secure road system surrounding the airport. The design and construction of this project (from the east perimeter road to the existing Airside Center ramp on the south side of the airport) will complete the secure perimeter service road around the airport.

Project Justification: The completion of a perimeter service road system within airport property will enable airport and service vehicles to cross the airport without having to use taxiways and runways, thus eliminating potential runway incursions. The reduction in the number of vehicles operating on movement areas will reduce ATCT coordination and nearly eliminate the chance of collision between aircraft and vehicles. The perimeter road system is consistent with the FAA's Runway Safety Program and Surface Incident Prevention Plan.

Project Cost: $1,100,000

63) Construct Taxiway R

Project Narrative: Construct a parallel TWY R from the RWY 5 end to TWY E.

Project Justification: Construction of Parallel TWY R from the RWY 5 end to TWY E is required to further develop the area for corporate hangars, just west of the Airside Center.

Project Cost: $2,162,500

64) Land Acquisition - South East

Project Narrative: Acquire land in the south east corner of the airport to enable further aviation development and to provide a buffer of protection for airport lands.

Project Justification: The southeastern section of the airport would be ideal for Cargo/Corporate hangars, an MRO/Corporate facilities or any non-passenger activity and would help create competition for services at the airport.

Project Cost: $3,000,000

Table 6.4B

Cost Estimates For The 11-20 Year Capital Improvement Program
Lakeland Linder Regional Airport

Item	Development Item	Federal	State	Local	Other	Total Project Cost Estimate
			2021			
46	Construct Corporate / T-Hangar Access Road	$0	$549,440	$137,360	$0	$686,800
47	Construct Corporate Hangars - Phase III	$0	$5,243,200	$1,310,800	$0	$6,554,000
Total Cost 2021 Projects		**$0**	**$5,792,640**	**$1,448,160**	**$0**	**$7,240,800**
			2022			
48	Taxiway P Extension - Phase III	$1,745,625	$45,938	$45,938	$0	$1,837,500
49	Terminal Apron Expansion - Phase II	$0	$2,421,800	$1,030,000	$1,698,200	$5,150,000
50	Airside Center Apron Expansion - Phase III	$0	$3,130,000	$782,500	$0	$3,912,500
Total Cost 2022 Projects		**$1,745,625**	**$5,597,738**	**$1,858,438**	**$1,698,200**	**$10,900,000**
			2023			
51	Construct South East Access Road	$0	$623,200	$155,800	$0	$779,000
52	Construct Corporate Hangars - Phase IV	$0	$8,663,200	$2,165,800	$0	$10,829,000
53	Construct Secure Road - Phase II	$0	$712,400	$400,000	$887,600	$2,000,000
Total Cost 2023 Projects		**$0**	**$9,998,800**	**$2,721,600**	**$887,600**	**$13,608,000**
			2024			
54	Construct Corporate Hangars - Phase V	$0	$14,283,520	$3,570,880	$0	$17,854,400
Total Cost 2024 Projects		**$0**	**$14,283,520**	**$3,570,880**	**$0**	**$17,854,400**
			2025			
55	Construct Cargo / Terminal Access Road	$0	$1,316,200	$557,600	$914,200	$2,788,000
56	Construct Cargo / Terminal / Commercial Ramp & Building	$0	$14,306,500	$3,812,000	$941,500	$19,060,000
Total Cost 2025 Projects		**$0**	**$15,622,700**	**$4,369,600**	**$1,855,700**	**$21,848,000**
			2026			
57	Construct Corporate Hangars - Phase VI	$0	$6,431,680	$1,607,920	$0	$8,039,600
Total Cost 2026 Projects		**$0**	**$6,431,680**	**$1,607,920**	**$0**	**$8,039,600**
			2027			
58	Runway 5/23 Extension	$2,581,125	$93,438	$93,438	$969,500	$3,737,500
59	Taxiway B Extension to RWY 5 End	$1,506,725	$65,938	$65,938	$998,900	$2,637,500
Total Cost 2027 Projects		**$4,087,850**	**$159,375**	**$159,375**	**$1,968,400**	**$6,375,000**
			2028			
60	Construct MRO / Corporate Facility	$0	$3,567,200	$891,800	$0	$4,459,000
Total Cost 2028 Projects		**$0**	**$3,567,200**	**$891,800**	**$0**	**$4,459,000**
			2029			
61	Construct Corporate Hangars - Phase VII	$0	$11,268,960	$2,817,240	$0	$14,086,200
62	Construct Secure Road - Phase III	$0	$51,000	$120,000	$1,029,000	$1,200,000
Total Cost 2029 Projects		**$0**	**$11,319,960**	**$2,937,240**	**$1,029,000**	**$15,286,200**
			2030			
63	Construct Taxiway R	$994,575	$54,063	$1,113,863	$1,059,800	$2,162,500
64	Land Acquisition - South East	$0	$2,250,000	$750,000	$0	$3,000,000
Total Cost 2030 Projects		**$994,575**	**$2,304,063**	**$1,863,863**	**$1,059,800**	**$5,162,500**
Total Cost 11-20 Year Projects		**$6,828,050**	**$75,077,675**	**$21,428,875**	**$8,498,700**	**$110,773,500**

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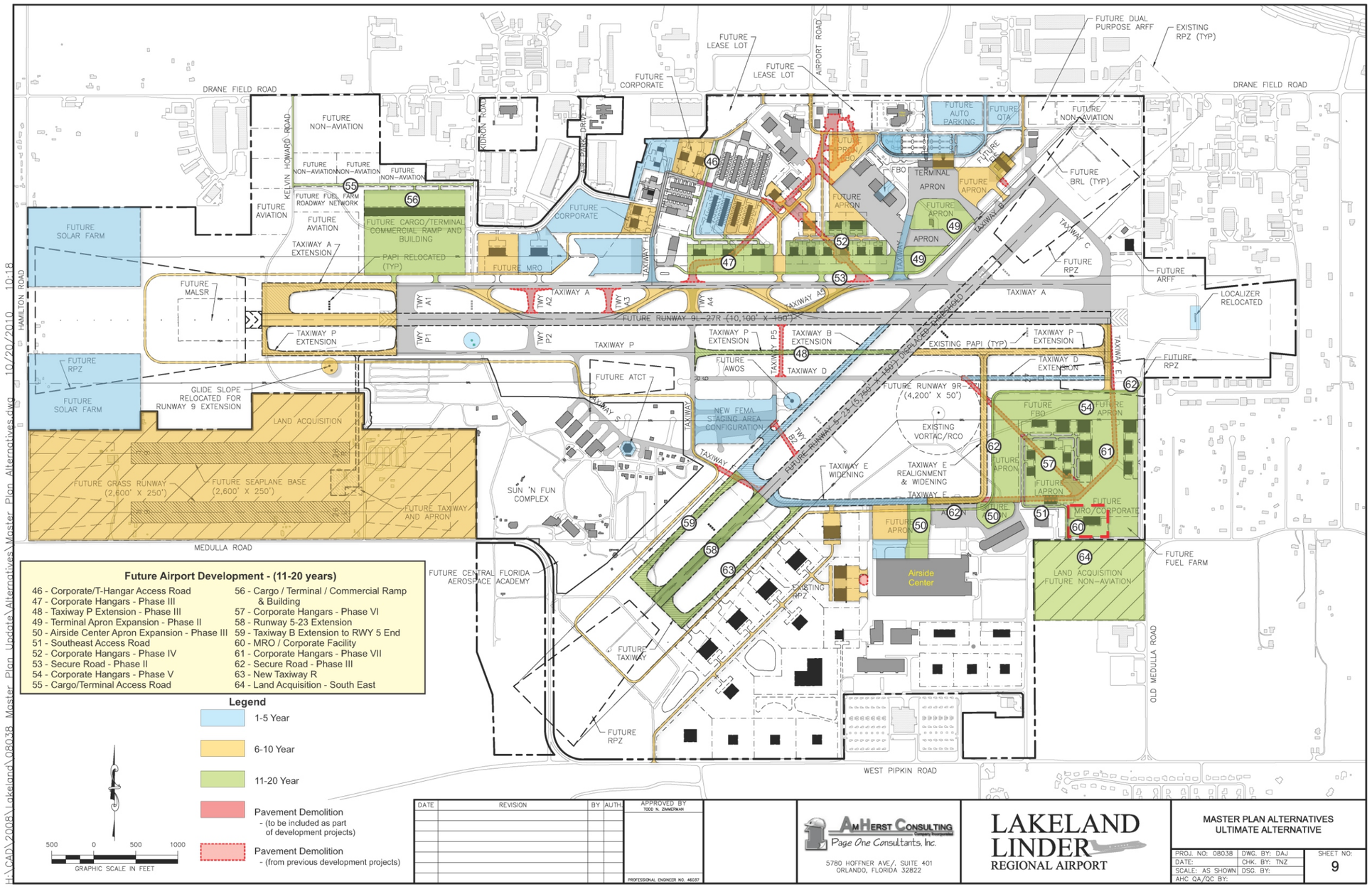

Future Airport Development - (11-20 years)

46 - Corporate/T-Hangar Access Road
47 - Corporate Hangars - Phase III
48 - Taxiway P Extension - Phase III
49 - Terminal Apron Expansion - Phase II
50 - Airside Center Apron Expansion - Phase III
51 - Southeast Access Road
52 - Corporate Hangars - Phase IV
53 - Secure Road - Phase II
54 - Corporate Hangars - Phase V
55 - Cargo/Terminal Access Road
56 - Cargo / Terminal / Commercial Ramp & Building
57 - Corporate Hangars - Phase VI
58 - Runway 5-23 Extension
59 - Taxiway B Extension to RWY 5 End
60 - MRO / Corporate Facility
61 - Corporate Hangars - Phase VII
62 - Secure Road - Phase III
63 - New Taxiway R
64 - Land Acquisition - South East

Legend

- 1-5 Year
- 6-10 Year
- 11-20 Year
- Pavement Demolition - (to be included as part of development projects)
- Pavement Demolition - (from previous development projects)

500 0 500 1000
GRAPHIC SCALE IN FEET

DATE	REVISION	BY	AUTH.

APPROVED BY
TODD N. ZIMMERMAN
PROFESSIONAL ENGINEER NO. 46037

AMHERST CONSULTING Company Incorporated
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LAKELAND LINDER REGIONAL AIRPORT

MASTER PLAN ALTERNATIVES
ULTIMATE ALTERNATIVE

PROJ. NO: 08038	DWG. BY: DAJ
DATE:	CHK. BY: TNZ
SCALE: AS SHOWN	DSG. BY:
AHC QA/QC BY:	

SHEET NO: 9

Figure 6.4A
11-20 Year Capital Improvement Program
Lakeland Linder Regional Airport

6.5 Summary of LAL Capital Improvement Program

The total estimated cost for projects listed in the Short Range (2011-2015) Capital Improvement Program is $61,936,900. Federal participation is estimated at $9,242,835 with projected State involvement at $20,841,313. Local participation is estimated at $6,152,753 with another $25,000,000 coming from other sources (ref. Solar Farm/Lakeland Electric Public Private Partnership (PPP)) to include revenues from a new LAL Passenger Facility Charge (PFC).

The total estimated cost for projects listed in the Intermediate Range (2016-2020) Capital Improvement Program is $56,177,900. Federal participation is estimated at $16,710,400 with projected State involvement at $27,571,670. Local participation is estimated at $8,066,830 with another $3,829,000 coming from PFC's.

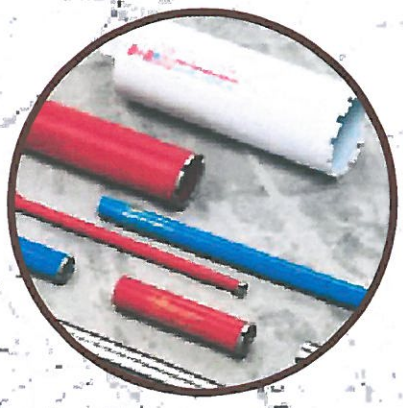
The total estimated cost for projects listed in the Long Range (2021-2030) Capital Improvement Program is $110,773,500. Federal participation is estimated at $6,828,050 with projected State involvement at $75,077,675. Local participation is estimated at $21,428,875 with another $8,498,700 coming from PFC's.

The total estimated cost of all airport improvements proposed during the 20-year planning period (2011-2030) is $228,888,300. Federal participation is estimated at $32,781,285 with projected State involvement at $123,490,658. Local participation is estimated at $35,648,458 with another $25,000,000 coming from PPP(s) and projected revenues in the amount of $13,027,700 from a new LAL Passenger Facility Charge (PFC).

It should be noted that assumptions for the LAL PFC's were derived using input from airport representatives, which included the inception of the LAL PFC program for 2015 using a passenger enplanement projection of 100,000 passengers in the base year and growing at a rate of 3% annually for the 20-year planning period. While the current PFC is capped at $4.50/passenger, a PFC of $7/passenger was used for the purpose of this exercise. That figure, while anticipated, is currently being discussed within the industry but has not been formally adopted.

AIRFIELD PAVEMENT STRUCTURE INVESTIGATION

DECEMBER 2008



LAKELAND LINDER REGIONAL AIRPORT

AMHERST CONSULTING Company Incorporated
Page One Consultants, Inc.

AIRFIELD PAVEMENT STRUCTURE INVESTIGATION

AT THE

LAKELAND LINDER REGIONAL AIRPORT

DECEMBER 2008

PREPARED BY:

AMHERST CONSULTING Company Incorporated
Page One Consultants, Inc.

PREPARED FOR:

LAKELAND LINDER REGIONAL AIRPORT

PAGE ONE CONSULTANTS, INC.
Signature of Engineer

12/10/08

TODD N. ZIMMERMAN, PE
FL PE No. 46037

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for the

AIRFIELD PAVEMENT STRUCTURE INVESTIGATION

at the

LAKELAND LINDER REGIONAL AIRPORT

AHC/POC No. 06091

Disclaimer: *Any other use of this document that would require engineering interpretations should be performed only by a registered Professional Engineer with expertise in structural airfield pavement designs. AHC/POC cannot be held responsible for any interpretations made by others.*

Recommendations for Publication Purposes: *With the knowledge that the Airport Master Plan is under contract and expected to be adopted by the FAA in January 2010 (or soon thereafter), it is recommended that the information contained in this report be incorporated into that document at the appropriate time. Accordingly, any and all publications can be updated upon the City and FAA's adoption of the Airport Master Plan.*

AIRFIELD PAVEMENT STRUCTURE INVESTIGATION

at the

LAKELAND LINDER REGIONAL AIRPORT (LAL)

Amherst Consulting Company Inc./Page One Consultants, Inc. (AHC/POC) has performed the field exploration and pavement analysis for the subject project. The field exploration program was performed in November 2007 and included pavement corings for surface and base thickness determination only. All sampling and testing locations were determined by Airport and AHC/POC representatives prior to the date of performance of the scope of work. Results of the testing provided information characterizing properties of the existing pavement sections at the desired locations. See Appendix A.

FIELD SAMPLING AND TESTING

Subgrade CBR's: None performed.

Concrete Flexural/Compressive Strength: None performed.

Existing Pavement Sections – From Cores: Existing surface and base course thicknesses were obtained at the predetermined locations during the coring operation to determine average thickness information on the existing flexible pavement section. Average thickness results are depicted graphically in the logs in Appendix B.

HISTORICAL DATA RESEARCH

Subgrade CBR's (Flexible Pavements): In accordance with FAA AC 150/5320-6D, Paragraph 315: *"As a general rule of thumb the design CBR value should be equal to or less than 85% of all the subgrade CBR values. This corresponds to a design value of one standard deviation below the mean as recommended in Chapter 2…"*

- ***For pavements where new construction or rehabilitation plans could not be found:***
    - The average CBR value used for the purposes of this study for pavements that had no apparent record of significant construction activity over the last 20 years was derived from a series of projects at LAL dating back to the early to mid-1990's and developed in accordance with the above criteria. Design subgrade CBR values utilized for pavement designs for those known airfield projects were averaged and resulted in a global ***CBR value of 13*** for the purposes of this effort.

    - The following pavements fall into this category:
        - Warbird Ramp
        - South Ramp

- Taxiway D
- Taxiway S
- Taxiway B2
- Taxiway L
- ATCT Ramp
- Taxiway E
- Taxiway F
- Taxiway G
- Taxiway H

- ***For designed pavement sections and completed projects:***
  - Existing surface and base course thicknesses for a number of previously completed projects since the early 1990's were obtained from plans and/or Engineer's reports for those projects. In accordance with the FAA's prescribed method for pavement design, the subgrade ***CBR value is 20*** for these pavements.

  - The following pavements fall into this category:
    - Taxiway B1
    - Taxiway G1 (to be renamed Taxiway A8)
    - GA Terminal Ramp
    - Runway 9-27 (East 6,000LF)
    - Runway 5-23
    - Taxiway A (East of Runway 5-23 to Runway 9-27, including Connectors)
    - Taxiway B
    - Taxiway C
    - Runway 9-27 (West 2,500LF)
    - Taxiway A (West of Runway 5-23, including Connectors)
    - Taxiway P (including Connectors)

Flexural Strength/Design Modulus (Rigid Pavements): For the purposes of this exercise, minimum flexural strength (psi) and design modulus' (k value, pci) were assumed.

  - The following pavements fall into this category:
    - ATCT Ramp (portion)
    - Ramp South of Hangars 1, 2 and 3

PROCEDURE FOR DETERMINATION OF PAVEMENT STRENGTH RATING

Flexible Pavements

1. **Surface and Base Course Thicknesses Tabulation**
   a. For each pavement surface, the existing surface and base course thicknesses were tabulated according to the results of the field sampling and historical data research.

2. **Determination of Adequate Surface Course Thickness**
    a. FAA AC 150/5320-6D states that the required flexible surface course thickness required should be 4" (four inches) in critical areas. For the purposes of this analysis, all pavement surfaces were deemed critical. Each pavement section was analyzed to determine the adequacy of the critical surface course thickness. The Flexible Pavement Design Curves shown in Chapter 3 of the Advisory Circular are based upon the minimum critical area thickness criteria. Therefore, it is essential to determine the adequacy of the surface course thickness.
        i. If the surface course thickness was deemed adequate, then the total pavement thickness was computed as the sum of the surface and base course thicknesses.
        ii. If the surface course thickness was found to be less than the required critical area thickness, then a translation of underlying base course into surface course to meet that minimum thickness was required.

3. **Determination of Equivalency Factor for the Conversion of Base Course to Critical Area Thickness Surface Minimum Thickness (4")**
    a. For the purposes of translating underlying base course into an equivalent surface course thickness (or visa versa), FAA AC 150/5320-6D recommends an Equivalency Factor range between 1.7 and 2.3 (ie. 1.0" of asphalt can be translated to 1.7-2.3" of equivalent base). Similarly, the reverse can occur when translating base course to surface course thickness (ie. 1.7-2.3" of base can be translated to 1.0" of equivalent surface), as is the case with this analysis. Conservatively and due to existing base course conditions, an Equivalency Factor of 1.7 was selected.

4. **Conversion of Base Course to Surface Course Using Equivalency Factor**
    a. Using the 1.7 Equivalency Factor, an amount of base course was translated into surface course for each pavement studied.

5. **Determine Equivalent Total Pavement Thickness**
    a. Once the surface course thickness was either deemed adequate to meet the minimum critical surface thickness or an amount of base course translated accordingly, then the total pavement thickness was computed as the sum of the existing or translated surface course thickness and the existing or reduced (by surface course translation) base course thicknesses. Together with the core logs, these calculations are shown in Appendix B.

6. **Determine Flexible Pavement Strength Rating Using Curves Contained in FAA AC 150/5320-6D**
    a. Using the computed Equivalent Total Pavement Thickness and the curves shown in Figures 3-2, 3-3 and 3-4 (which are developed from historical data based upon a surface course thickness of 4" for critical areas and 3" for non-critical areas), the flexible strength rating was computed for each section for:
        i. Single Wheel Gear
        ii. Dual Wheel Gear

iii. Dual Tandem Gear

b. For the purposes of this exercise, a minimum of 1,200 Equivalent Annual Departures (EAD) were used.
c. The following tables illustrate the pavement strength ratings for each pavement studied in this report.

NOTE: For the two (2) rigid pavement sections sampled, ratings were obtained from the rigid pavement curves (Figures 3-17, 3-18 and 3-19) contained in FAA AC 150/5320-6D using the minimum criteria the curves would accept.

TABLE 1
STRENGTH RATINGS FOR PAVEMENTS WHERE NEW CONSTRUCTION OR REHABILITATION PLANS WERE NOT FOUND

Equivalent Total Pavement Thickness (inches)	SW Rating (lbs.)	DW Rating (lbs.)	DT Rating (lbs.)	PAVEMENT FEATURE
FOR SUBGRADE CBR = 13				
5.33	15,000	19,300	29,000	WARBIRD RAMP
6.60	30,000	35,300	53,700	SOUTH RAMP
7.42	33,700	43,700	67,300	TWY D
8.30	39,500	52,100	84,500	TWY S
8.33	39,600	52,200	84,600	TWY B2
9.43	45,000	60,200	103,000	TWY L
10.60	52,500	68,400	116,000	ATCT RAMP (Asphaltic Portion)
11.51	58,500	75,000	129,600	TWY E
12.25	61,700	80,500	136,200	TWY F
12.40	62,500	81,500	138,900	TWY G
13.29	65,500	89,000	150,000	TWY H
FOR FLEXURAL STRENGTH = 500 PSI; K = 50 PCI				
6.00	30,000	50,000	100,000	ATCT RAMP (Concrete Portion)
5.75	30,000	50,000	100,000	RAMP SOUTH OF HANGARS 1, 2 AND 3

Note: Pavement thickness data from limited number of core samples taken.

TABLE 2
STRENGTH RATINGS FOR DESIGNED PAVEMENT SECTIONS AND COMPLETED PROJECTS

Equivalent Total Pavement Thickness (inches)	SW Rating (lbs.)	DW Rating (lbs.)	DT Rating (lbs.)	PAVEMENT FEATURE
FOR SUBGRADE CBR = 20				
12.00	98,800	179,800	272,000	TWY B1; TWY G1; GA TERMINAL RAMP
12.30	100,100	182,900	283,700	RWY 9-27 (EAST 6,000LF); RWY 5-23; TWY A (EAST OF RWY 5-23 to RWY 9-27); TWY B; TWY C
14.30	108,100	213,900	351,100	RWY 9-27 (WEST 2,500LF); TWY A (WEST OF RWY 5-23, incl. Connectors); TWY P (incl. Connectors)

Note: Pavement thickness data from Engineer's Reports and/or as-built plans.

d. From the ratings tabulated above, curves showing the relationship of the Equivalent Total Pavement Thicknesses (meeting the 4-inch minimum surface requirement) to the Pavement Weight Ratings were established for the flexible (asphaltic) pavements only. See Appendix C.
    i. Curves were not generated for the concrete pavements due to the small sample size and the ability to generate relational trends.

HOW TO USE THIS REPORT

1. Pavement Weight Ratings derived in this study are based upon information obtained from actual core locations sampled or from data collected from other known sources.

2. Weight Ratings for each pavement feature are reported with confidence that this information is true and correct. Tables 1 and 2 in Section 6 of this report should be the only information used for each pavement feature listed in this study.
    a. ***Example:*** ***The airport receives an inquiry from XYZ Corporation inquiring whether it can land a DC-9-30, stay overnight, receive fuel and depart in the morning.***
        1) Determine Aircraft Specifications:
            a. Geometry: The DC-9-30 is a C-III aircraft, therefore pavements widths, etc. would need to be checked first. (ie. 50 FT wide taxiways, Group III turning radii, 100 FT wide runways). Reference is made to FAA AC 150/5300-13.
            b. DC-9-30 Weight Characteristics
                i. Maximum Takeoff Weight is 110,000 lbs.
                ii. Maximum Landing Weight is 99,000 lbs.
            c. DC-9-30 Wheel Configuration
                i. This is a Dual Wheel (DW) aircraft.
        2) Go to Tables in Section 6
            a. It does not appear that any of the Table 1 pavements can handle this aircraft.
            b. All pavements listed in Table 2 can handle this aircraft.

END OF REPORT

APPENDIX A

PAVEMENT CORE LOCATIONS

PAVEMENT CORE LOCATIONS

PROJ. NO:	DWG BY: JMH	SHEET NO:
DATE: 6/2/08	CHK BY: TNZ	
SCALE: N.T.S.	DSG BY: JMH	
AHC QA/QC BY:		

LAKELAND LINDER REGIONAL AIRPORT

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APPENDIX B

PAVEMENT THICKNESS LOGS
EQUIVALENT TOTAL PAVEMENT THICKNESS CALCULATIONS

LAKELAND LINDER REGIONAL AIRPORT
TAXIWAY PAVEMENT ANALYSIS (CORES)

PAVEMENT FEATURE	CORE NO.	SURFACE (1) TYPE Asphalt (A) or Concrete (PCC)	SURFACE (2) TYPE Asphalt (A) or Concrete (PCC)	SURFACE (1) THICKNESS (inches)	SURFACE (2) THICKNESS (inches)	TOTAL SURFACE THICKNESS (inches)	PAVEMENT FEATURE AVG. SURFACE THICKNESS (inches)	BASE TYPE Limerock (LR) or Sand Asphalt Mix (SAM)	BASE THICKNESS (inches)	PAVEMENT FEATURE AVG. BASE THICKNESS (inches)	TOTAL EXISTING PAVEMENT THICKNESS (inches)	SURFACE THICKNESS DEFICIENCY (inches) - (MIN. 4" REQUIRED IN CRITICAL AREAS)	EQUIVELANCY FACTOR FOR BASE TRANSLATION INTO SURFACE (if required)	EQUIVELANT BASE THICKNESS FOR 4" SURFACE REQUIREMENT (inches)	EQUIVELANT TOTAL PAVEMENT THICKNESS FOR 4" SURFACE REQUIREMENT (inches)
TAXIWAY B2							*1.25*			*9.00*	*10.25*	2.75	1.7	4.33	**8.33**
TWY B2 (Leg North of Warbird Ramp)	9	A		1.250	0.000	1.25		SAM	9.00						
TAXIWAY D							*2.19*			*6.50*	*8.69*	1.81	1.7	3.42	**7.42**
TWY D (Between RWY 5 and TWY L)	4	A		1.375	0.000	1.38		LR	4.00						
TWY D (Between RWY 5 and TWY P)	10	A	A	1.500	1.500	3.00		LR	9.00						
TAXIWAY E							*2.94*			*9.31*	*12.25*	1.06	1.7	7.51	**11.51**
TWY E (Near RWY 27)	1	A	A	2.250	0.875	3.13		LR	10.00						
TWY E (Near TWY L)	2	A	A	2.000	0.875	2.88		LR	10.00						
TWY E (North of Flight Safety)	5	A		3.000	0.000	3.00		LR	9.00						
TWY E (Between South Ramp and RWY 5)	6	A		2.750	0.000	2.75		LR	8.25						
TAXIWAY F							*4.00*			*8.25*	*12.25*	0.00	1.7	8.25	**12.25**
TWY F (Intersection at Sun 'N Fun, South of Warbird Ramp)	7	A	A	1.500	2.500	4.00		LR	9.00						
TWY F (at TWP intersection)	11	A	A	1.500	2.500	4.00		LR	7.50						
TAXIWAY G							*3.50*			*9.25*	*12.75*	0.50	1.7	8.40	**12.40**
TWY G (Adjacent to Concrete Ramp, North of AeroMech)	18	A	A	2.000	1.500	3.50		LR	9.25						
TWY G (East of TWY A4, South of TWY L)	20	A	A	1.500	2.000	3.50		LR	9.25						
TAXIWAY H							*3.88*			*9.50*	*13.38*	0.13	1.7	9.29	**13.29**
TWY H (West of Lance Aviation)	21	A	A	2.000	2.000	4.00		LR	10.00						
TWY H (Near City T-Hangars)	22	A	A	1.750	2.000	3.75		LR	9.00						
TAXIWAY L							*3.00*			*7.13*	*10.13*	1.00	1.7	5.43	**9.43**
TWY L (Near TWY R)	3	A	A	1.750	1.250	3.00		LR	8.00						
TWY L (Between TWY A/A5 and TWY G)	19	A	A	1.750	1.250	3.00		LR	6.25						
TAXIWAY S							*3.00*			*6.00*	*9.00*	1.00	1.7	4.30	**8.30**
TWY S (North of Fence at Sun 'N Fun)		A		3.000	0.000	3.00		LR	6.00						

LAKELAND LINDER REGIONAL AIRPORT
RAMP PAVEMENT ANALYSIS (CORES)

PAVEMENT FEATURE	CORE NO.	SURFACE (1) TYPE Asphalt (A) or Concrete (PCC)	SURFACE (2) TYPE Asphalt (A) or Concrete (PCC)	SURFACE (1) THICKNESS (inches)	SURFACE (2) THICKNESS (inches)	TOTAL SURFACE THICKNESS (inches)	PAVEMENT FEATURE AVG. SURFACE THICKNESS (inches)	BASE TYPE Limerock (LR) or Sand Asphalt Mix (SAM)	BASE THICKNESS (inches)	PAVEMENT FEATURE AVG. BASE THICKNESS (inches)	TOTAL PAVEMENT THICKNESS (inches)	SURFACE THICKNESS DEFICIENCY (inches) - (MIN. 4" REQUIRED IN CRITICAL AREAS)	EQUIVELANCY FACTOR FOR BASE TRANSLATION INTO SURFACE (if required)	EQUIVELANT BASE THICKNESS FOR 4" SURFACE REQUIREMENT (inches)	EQUIVELANT TOTAL PAVEMENT THICKNESS FOR 4" SURFACE REQUIREMENT (inches)
Warbird Ramp							*1.25*			*6.00*	*7.25*	2.75	1.7	1.33	**5.33**
Approximate Center of Ramp	8	A	N/A	1.250	0.000	1.25		SAM	6.00						
ATCT Ramp							*6.00*			*0.00*	*6.00*	N/A	1.7	#VALUE!	**#VALUE!**
Concrete Portion South of ATCT	15	PCC	N/A	6.000	0.000	6.00		N/A	0.00						
ATCT Ramp							*2.00*			*10.00*	*12.00*	2.00	1.7	6.60	**10.60**
Asphalt Portion South of ATCT	16	A	N/A	2.000	0.000	2.00		LR	10.00						
Hangars 1/2/3 Ramp							*5.75*			*0.00*	*5.75*	N/A	1.7	#VALUE!	**#VALUE!**
Concrete Portion West of TWY G1/East of Hangar 1	17	PCC	N/A	5.750	0.000	5.75		N/A	0.00						

LAKELAND LINDER REGIONAL AIRPORT
OTHER PAVEMENT ANALYSIS (FROM ENGINEER'S REPORTS)

PAVEMENT FEATURE	SURFACE TYPE Asphalt (A) or Concrete (PCC)	SURFACE THICKNESS (inches)	BASE TYPE Limerock (LR) or Sand Asphalt Mix (SAM)	BASE THICKNESS (inches)	TOTAL PAVEMENT THICKNESS (inches)	SURFACE THICKNESS DEFICIENCY (inches) - (MIN. 4" REQUIRED IN CRITICAL AREAS)	EQUIVELANCY FACTOR FOR BASE TRANSLATION INTO SURFACE (if required)	EQUIVELANT BASE THICKNESS FOR 4" SURFACE REQUIREMENT (inches)	EQUIVELANT TOTAL PAVEMENT THICKNESS FOR 4" SURFACE REQUIREMENT (inches)
Runway 9-27 (Westerly 2,500 LF)					*15.00*	1.00	1.7	10.30	14.30
Greiner, Inc.	A	3.000	LR	12.00					
Runway 9-27 (Easterly 6,000 LF)					*13.00*	1.00	1.7	8.30	12.30
URS Greiner Woodward Clyde	A	3.000	LR	10.00					
Runway 5-23					*13.00*	1.00	1.7	8.30	12.30
AHC/POC	A	3.000	LR	10.00					
Taxiway A (West of RWY 5-23, Including Connectors)					*15.00*	1.00	1.7	10.30	14.30
URS Greiner	A	3.000	LR	12.00					
Taxiway A (East of RWY 5-23 to RWY 27)					*13.00*	1.00	1.7	8.30	12.30
URS Corporation	A	3.000	N/A	10.00					
Taxiway B					*13.00*	1.00	1.7	8.30	12.30
AVCON, Inc.	A	3.000	N/A	10.00					
Taxiway C					*13.00*	1.00	1.7	8.30	12.30
AVCON, Inc.	A	3.000	N/A	10.00					
Taxiway B1 (GA Terminal East Connector)					*12.00*	0.00	1.7	8.00	12.00
URS Greiner Woodward Clyde	A	4.000	N/A	8.00					
Taxiway G1 (GA Terminal West Connector)					*12.00*	0.00	1.7	8.00	12.00
URS Greiner Woodward Clyde	A	4.000	N/A	8.00					
Taxiway P (Including Connectors)					*15.00*	1.00	1.7	10.30	14.30
Greiner, Inc.	A	3.000	N/A	12.00					
South Ramp					*8.00*	2.00	1.7	2.60	6.60
AHC/POC (FEMA Repair)	A	2.000	N/A	6.00					
GA Terminal Ramp					*12.00*	0.00	1.7	8.00	12.00
URS Greiner Woodward Clyde	A	4.000	N/A	8.00					

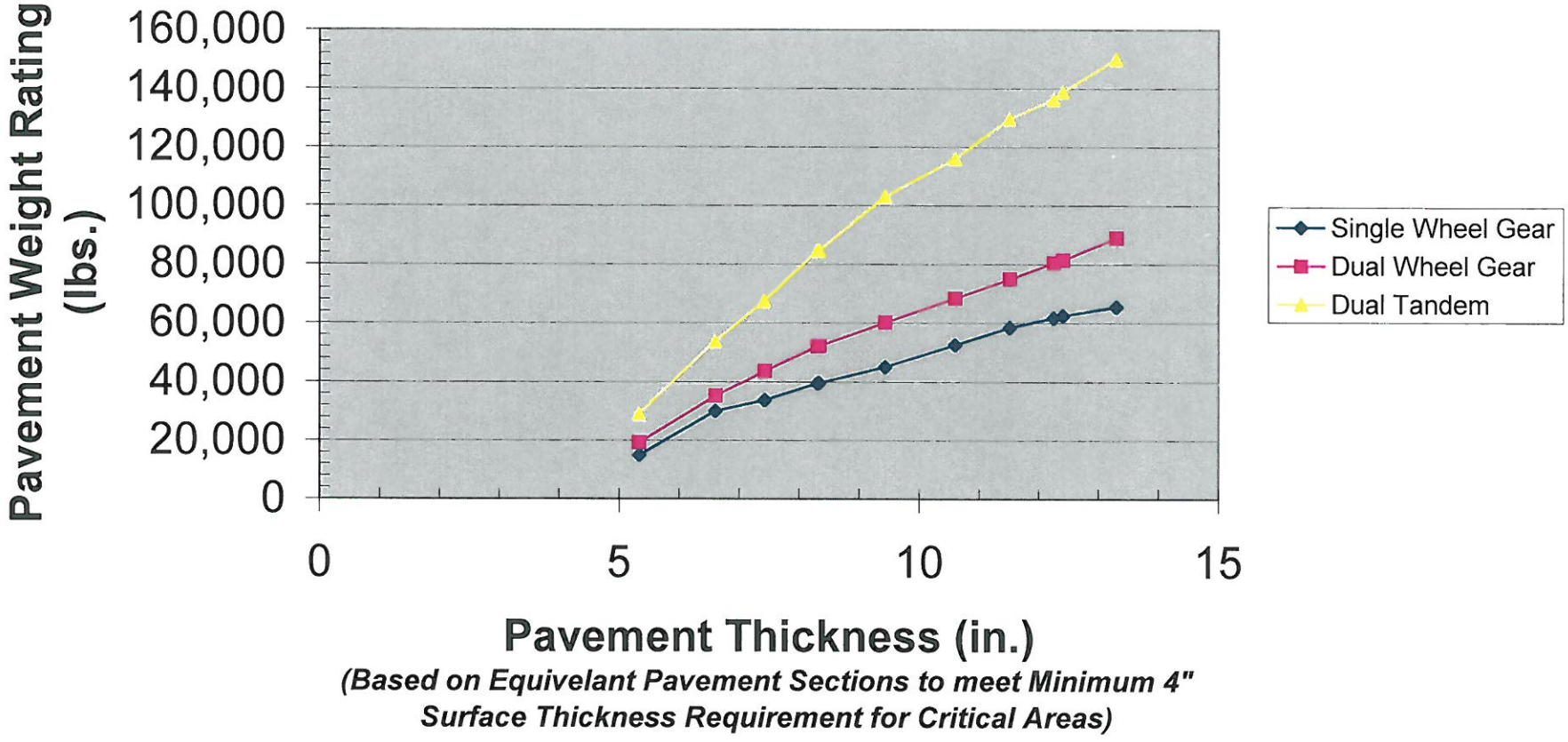
APPENDIX C

PAVEMENT STRENGTH/CORE ANALYSIS
WEIGHT RATING CURVES

Lakeland Linder Regional Airport
Pavement Strength/Core Analysis

Trends for:

CBR = 13/EAD = 1,200

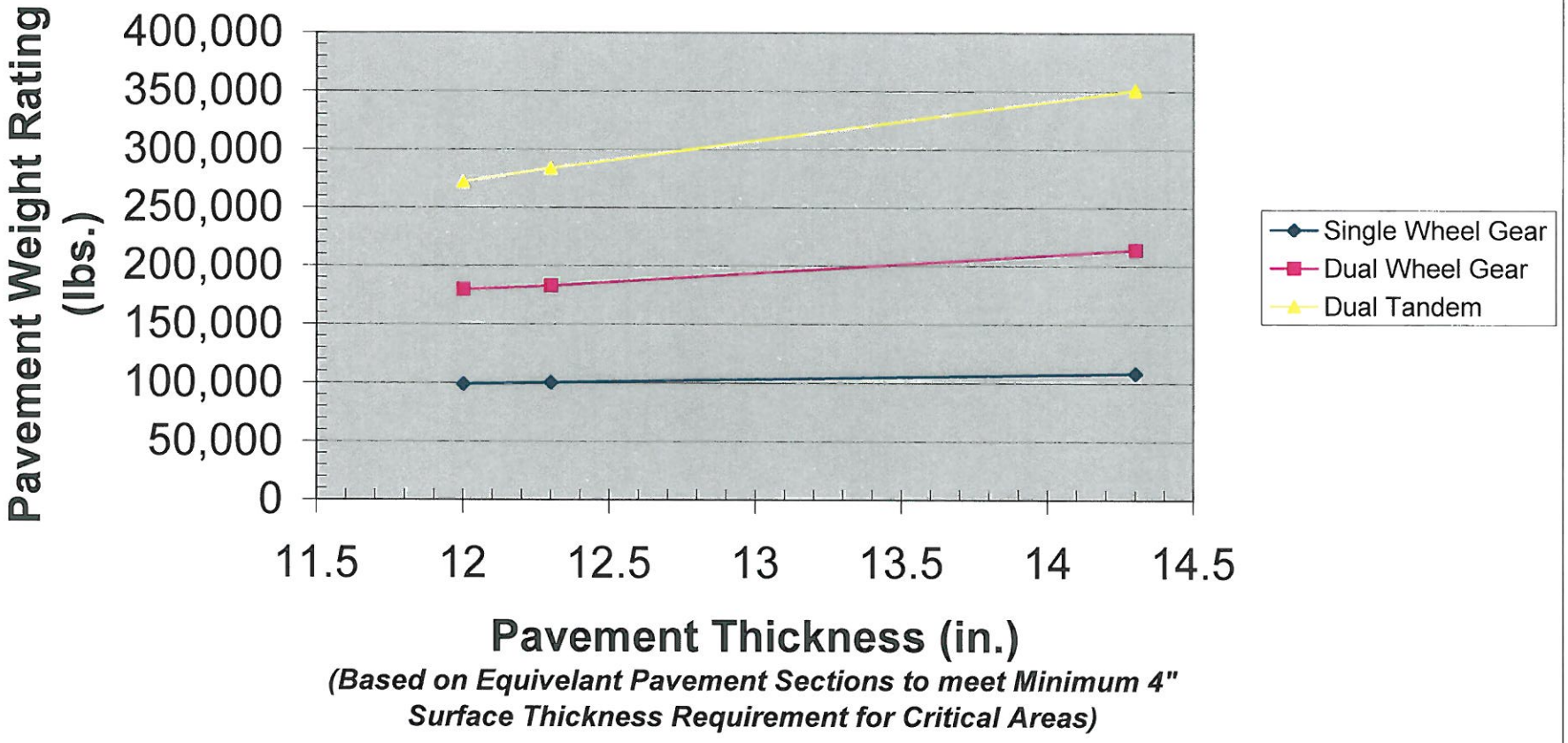


(Based on Equivelant Pavement Sections to meet Minimum 4" Surface Thickness Requirement for Critical Areas)

Lakeland Linder Regional Airport
Pavement Strength/Core Analysis

Trends for:

CBR = 20/EAD = 1,200



(Based on Equivelant Pavement Sections to meet Minimum 4" Surface Thickness Requirement for Critical Areas)