AIRPORT MASTER PLAN UPDATE – FINAL DRAFT
BESSEMER MUNICIPAL AIRPORT

Presented to:
Bessemer Municipal Airport Authority
March 3, 2014

DRAFT

BWSC
Barge
Waggoner
Sumner &
Cannon, Inc.®

Bessemer Municipal Airport
Airport Master Plan

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Development of the Airport Master Plan Update for the Bessemer Municipal Airport was undertaken by the Bessemer Municipal Airport Authority for the purpose of examining the Airport's existing and future role and to provide direction for long term development of the Airport. Financial assistance for the preparation of the Master Plan Update was provided by the Alabama Department of Transportation and the Federal Aviation Administration.

1.2 Purpose of Study

The purpose of this study is to determine the aviation needs of the Bessemer Municipal Airport and its service area for the next 20 years and to ensure safety standards and facility requirements are met and /or planned for. The study is part of the continuing planning process necessary to assure adequate and compatible airport improvements as required to meet the growing aviation demands associated with the airport.

1.3 Goals and Objectives

The overall goal of this study is to provide the Bessemer Municipal Airport Authority with an effective planning tool to guide the future development of the Bessemer Municipal Airport. This Master Plan Update provides local officials with such guidance while ensuring that the development of the airport is accomplished in a manner that respects the local environment and is consistent with the financial policies of the Authority. Accomplishment of this goal requires the evaluation of existing airport activity and facilities, and determination of actions needed to maintain an adequate, safe and reliable airport facility to meet the needs of the City of Bessemer, and the surrounding areas.

Specific objectives of the Master Plan include the following purposes:

- Inventory existing airside, landside and other support facilities and services currently at the airport, as well as, the local and regional economic development and growth affecting the airport;
- Update historical aviation data and develop new forecasts based on historical trends and major changes anticipated for the future;
- Document the methodology, findings, analysis and conclusions for the technical investigation of concepts and alternatives which were performed to develop the proposed plan;
- Propose a viable, phased 5, 10, and 20-year financial plan for achieving the planned airport development and implementation schedule;

- Identify anticipated airport funding needs and proposed airport development policies for consideration by the Bessemer Municipal Airport Authority.

1.4 Master Plan Organization

The Airport Master Plan Update for the Bessemer Municipal Airport is organized into functional chapters on the following plan elements:

- Introduction – Purpose of study and overall goals and objectives;
- Airport Inventory – Inventory existing airport facilities and services including airside, landside and airport related land uses;
- Aviation Demand Forecasts – Develop forecasts of aeronautical demand for the short-term (5 years), medium (10 years) and long range (20 year) periods;
- Demand Capacity/Facilities Requirements – Determine existing airport facilities' ability to accommodate the forecasted aeronautical demands and identify needed improvements to provide the required safety and capacity of airport facilities;
- Environmental Overview – Identify and analyze potential environmental impacts of the planned airport development and its alternatives;
- Airport Layout Plans – Provide recommended plans for airport development, including the Airport Layout Plan (ALP), Terminal Area Plan, Part 77 Airspace Plan, Inner Portion of Approach Surface Drawing, Land Use Drawing, and Property Map;
- Recommended Capital Improvement Program and Financial Plan – A schedule and cost estimates of the proposed development will be prepared along with a Financial Plan that identifies future revenues, expenses, and income, as well as funding sources for the recommended facilities requirements.

The organization and format of the Bessemer Municipal Airport Master Plan Update is designed to provide an easily readable, yet comprehensive presentation of the complete plan.

CHAPTER 2
INVENTORY AND EXISTING CONDITIONS

2.1 Introduction

Preparation of the Airport Master Plan Update for the Bessemer Municipal Airport requires collection and analysis of various data relating to the airport, as well as the area it serves. This includes an inventory of the existing airport facilities, airspace and pertinent local and regional conditions as well as historical information. The data presented was collected through on-site inspections, interviews with Airport Authority members, the Federal Aviation Administration (FAA), internet sites, and a review of previous reports, maps, and aerial photographs. Data contained in this chapter will be used as references to conduct additional analyses in subsequent chapters.

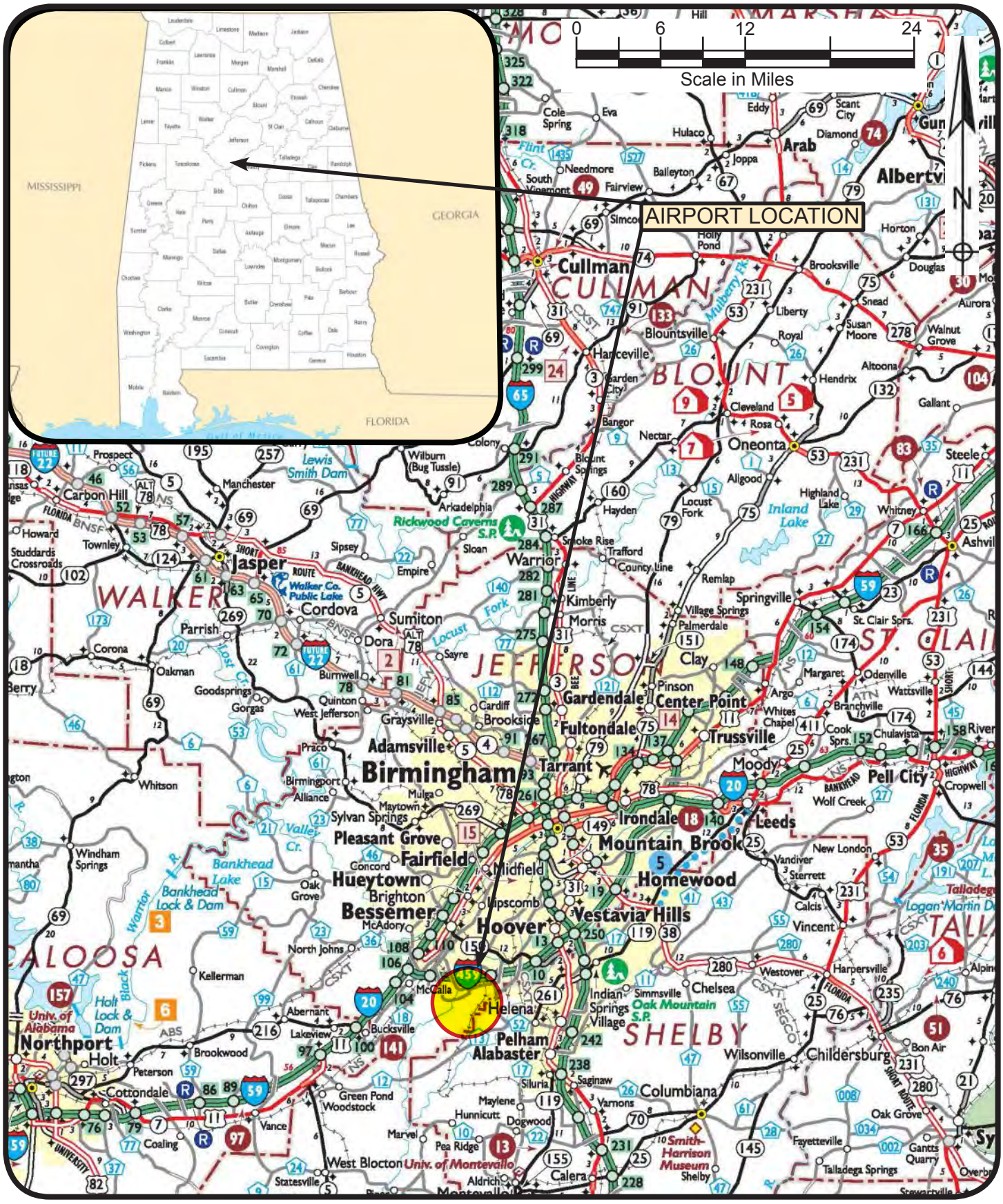
2.2 Airport Setting

The Bessemer Municipal Airport is located in Jefferson County, approximately three miles southeast of the City of Bessemer as illustrated in Figure 2-1. Ground access to the airport is Interstate 459 to Morgan Road to Aviation Road. The airport, situated on approximately 380 acres of land, is owned by the City of Bessemer. The field elevation is 700 feet MSL and the existing airport reference point (ARP) is latitude N33° 18' 45.39", longitude W86° 55' 34.69".

2.3 Airport Role

The Bessemer Municipal Airport operates as a public-use airport facility owned by the City of Bessemer and operated by the Bessemer Airport Authority. At the national level, it is included in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport System (NPIAS) as a general aviation service airport. The NPIAS includes a total of 3,330 airports according to the last updated report presented in 2013-2017. The Bessemer Municipal Airport is one of 74 airports in Alabama that is included in the NPIAS. According to the NPIAS, the Bessemer Municipal Airport is classified as a reliever for the Birmingham-Shuttlesworth International Airport. An airport must be included in the NPIAS to be eligible for federal funding.

At the state level, the Bessemer Municipal Airport is included in the Alabama Statewide Airports Plan. The purpose of the plan is to provide a comprehensive look at each airport and the overall air transportation needs of the State for the next 20 years. In addition, this plan serves as a template to provide the State Aeronautics Division with the tools needed to continue to improve Alabama's system of airports in a logical and cost-effective manner. In addition to reviewing the aviation system's future capital needs, the plan includes a detailed analysis of the economic impact aviation has on the state of Alabama. According to the plan, the Bessemer Municipal Airport is responsible for 17.15 million in annual economic activity.



Location Map

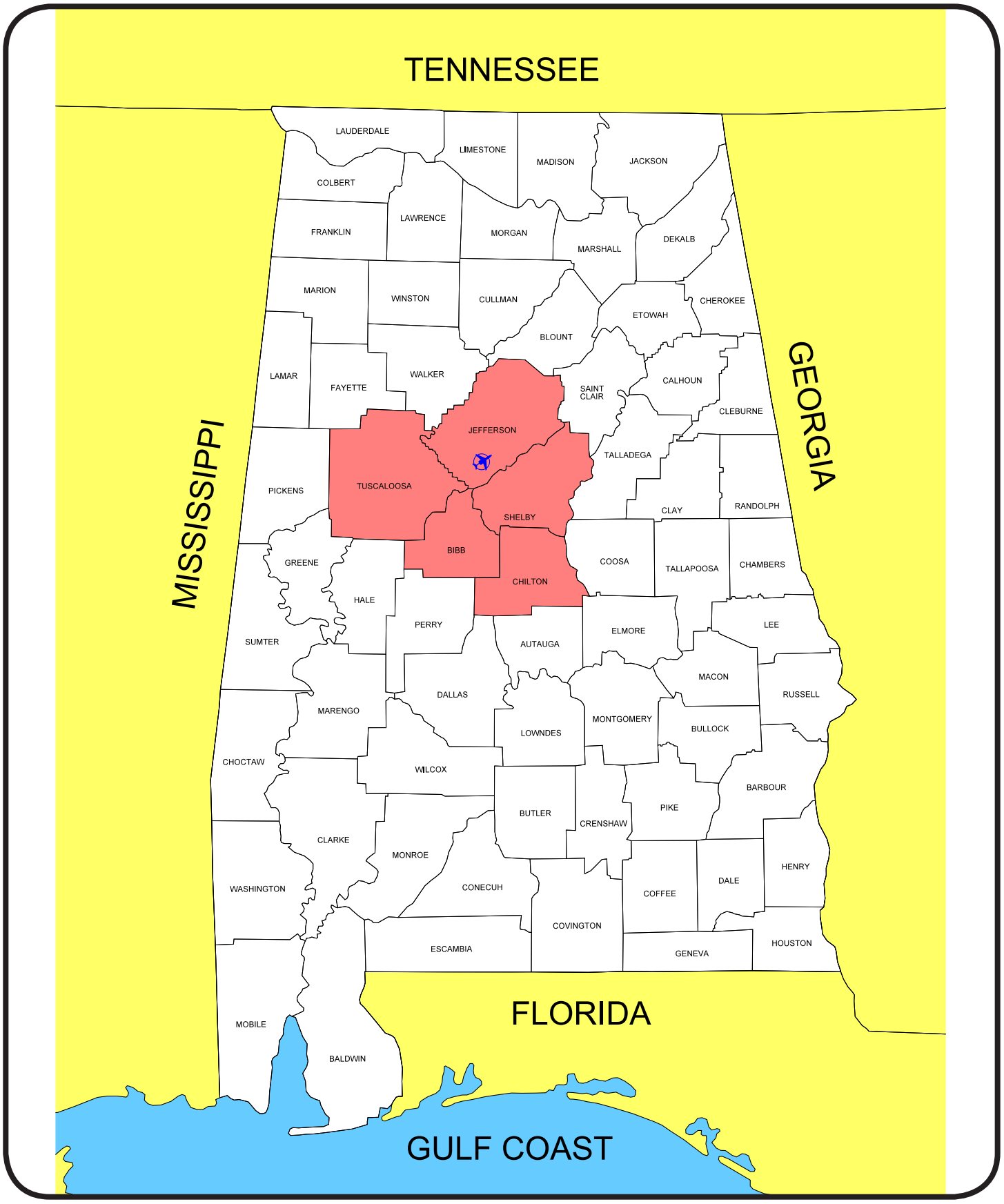
Figure 2-1

2.4 Airport Service Area

The service area for General Aviation airports may be considered the location where the majority of based aircraft owners are likely to be drawn as well as the community that is most affected by the presence of the airport. Based on the information obtained for this Master Plan, a five-county airport service area was determined to be comprised of Jefferson County, Bibb County, Chilton County, Shelby County, and Tuscaloosa County. The service area for EKY is illustrated in Figure 2-2.

2.5 Vicinity Airports

There are five public use airports within a 40 nautical mile range of the Bessemer Municipal Airport. All of the facilities serve the needs of the general aviation users. The Birmingham-Shuttlesworth International Airport is the only airport that provides commercial air service within this area. The inventory of surrounding airports is presented in Table 2-1.



Airport Service Area

Figure 2-2

Table 2-1
VICINITY AIRPORTS

Item	*Bessemer Municipal*	*Birmingham International*	*Bibb County*	*Shelby County*	*Sylacauga Municipal*	*Chilton County*	*Tuscaloosa*
FAA ID	EKY	BHM	0A8	EET	SCD	02A	M16
County	Jefferson	Jefferson	Bibb	Shelby	Talladega	Chilton	Tuscaloosa
Distance From EKY [1]	0 NM	17 NM NE	24 NM S	11 NM SE	32 NM E	32 NM SE	35 NM W
Service Level	General Aviation	Commercial	General Aviation	General Aviation	General Aviation	General Aviation	General Aviation
Longest Runway [1]	6,007 Feet	7,099 Feet	4,206 Feet	5,000 Feet	5,390 Feet	4,008 Feet	6,500 Feet
Best Approach (Visibility) [1]	ILS (3/4-Mile)	ILS (1/2-Mile)	GPS (1-Mile)	LPV (1 Mile)	LPV (1 Mile)	GPS (1-Mile)	ILS (1/2-Mile)
Tower [1]	No	Yes	No	No	No	No	No

Sources: Barge Waggoner Sumner & Cannon, Inc. March 2013, and:
(1) AirNav.com.

2.6 Existing Airside Facilities

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes those facilities that provide a terminal interface between surface and air transportation, as well as support services such as aircraft storage and maintenance. Airside facilities include runways, taxiways, lighting, signs, marking, and navigational aids. Table 2-2 provides a listing of the existing facilities and Figure 2-3 illustrate those facilities.

Table 2-2
Existing Facilities
Bessemer Municipal Airport

Airport Name:	Bessemer Municipal Airport
Identifier:	EKY
FAA Site Number:	00157.1*A
Ownership:	Bessemer Municipal Airport Authority
Field Elevation:	700 MSL
Acreage:	380
UNICOM:	123.00

RUNWAY DATA

Runway ID	RWY 05/23
Bearing:	N 230° 08’ 06”W
Length:	6,007
Width:	100’
Strength:	S-60,000, D-60,000
Marking:	Precision
Surface:	Asphalt
Condition:	Fair

AIRFIELD LIGHTING

Identification Lighting	Rotating Beacon
Runway Lighting:	HIRL
Taxiway Lighting;	MITL
Approach Lighting:	None
VGSI:	PAPI-4L/ PAPI-4L
REIL:	Yes/Yes

TAXIWAYS

Parallel:	Full (35’)
Condition:	Fair
Connector:	Yes

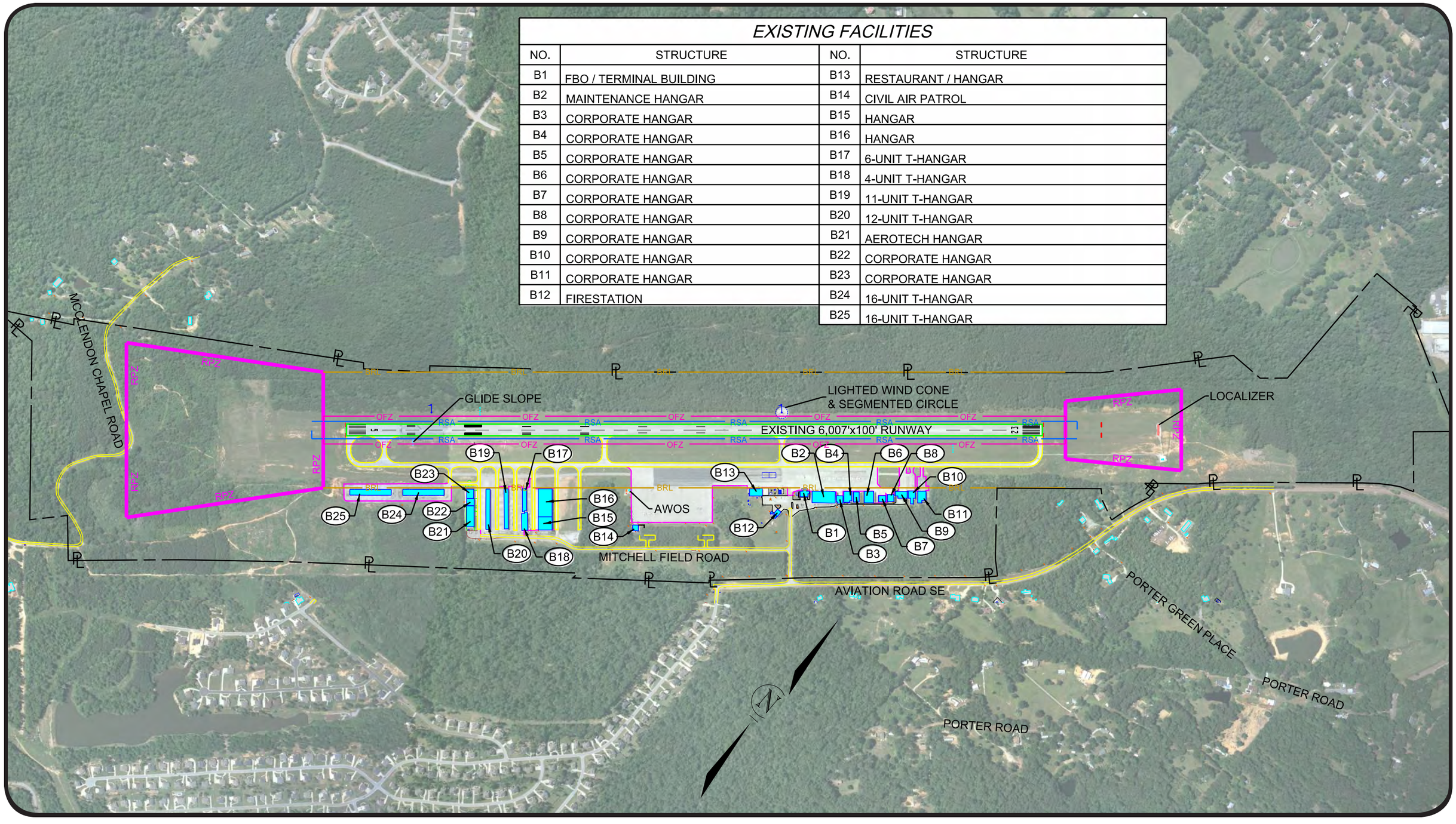
NAVIGATIONAL AIDS

Air Traffic Control Tower	No
Wind Indicator:	Yes-Lighted
Segmented Circle:	Yes
Non-Direct. Beacon:	Yes
ILS	RWY 05
GPS	RNAV (GPS) RWY 05 & 23

WEATHER REPORTING
AWOS

EXISTING FACILITIES

NO.	STRUCTURE	NO.	STRUCTURE
B1	FBO / TERMINAL BUILDING	B13	RESTAURANT / HANGAR
B2	MAINTENANCE HANGAR	B14	CIVIL AIR PATROL
B3	CORPORATE HANGAR	B15	HANGAR
B4	CORPORATE HANGAR	B16	HANGAR
B5	CORPORATE HANGAR	B17	6-UNIT T-HANGAR
B6	CORPORATE HANGAR	B18	4-UNIT T-HANGAR
B7	CORPORATE HANGAR	B19	11-UNIT T-HANGAR
B8	CORPORATE HANGAR	B20	12-UNIT T-HANGAR
B9	CORPORATE HANGAR	B21	AEROTECH HANGAR
B10	CORPORATE HANGAR	B22	CORPORATE HANGAR
B11	CORPORATE HANGAR	B23	CORPORATE HANGAR
B12	FIRESTATION	B24	16-UNIT T-HANGAR
		B25	16-UNIT T-HANGAR



Existing Facilities

Figure 2-3

Runways

The airfield is currently served by a single paved runway designated as Runway 05/23. It is 6,007 feet in length and 100 feet wide, and constructed of asphalt. The runway is listed as having a pavement strength of 60,000 pounds (single wheel) and 60,000 pounds (dual wheel). FAA 5010-1 reports that the runway is in "Fair" condition which was verified during the onsite inspection.

Taxiways

The Airport has a series of taxiways that provide access between the runway and apron areas. There is a full parallel taxiway that traverses the entire length of the primary runway (05/23). In addition to the full parallel taxiway, there are several taxiway connectors that connect the taxiway to the runway. The onsite inspection revealed that the taxiway pavement is in "Fair" condition.

Airfield Lighting

Airfield Lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of Lighting systems are installed at the airport for this purpose. They are classified as follows:

Identification Lighting

The location of the airport at night is universally identified by a rotating beacon which is located to the west of the terminal building and south of the aircraft parking apron. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart.

Pavement Edge Lighting

Pavement edge Lighting utilizes edge light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. The Lighting is essential for safe operations during night and/or time of low visibility, in order to maintain safe and efficient access to and from the runway, and aircraft parking areas. Runway 05/23 has a high intensity runway lighting system (HIRL). All major taxiways and apron edge taxiway lanes, as well as connector taxiways are equipped with medium intensity taxiway lights (MITL).

Visual Approach Lighting

Precision approach path indicators (PAPI-4L) are available for the approach to both Runway 5 and Runway 23. The PAPIs provide approach path guidance with a series of light units. The four-unit PAPI gives the pilot an identification of whether their approach is above, below, or on-path, through the pattern of red and white lights visible from the light unit.

Runway Threshold Lighting

Runway threshold lights identify the runway end. Runway threshold lights have specifically-designed lights that are green on one side and red on the other. Each end of Runway 5/23 is equipped with runway threshold lights.

Runway End Identification Lighting

Runway end identifier lights (REILS) provide rapid and positive identification of the approach end of a runway. The REIL system consists of two synchronized flashing lights located laterally on each side of the runway threshold facing the approaching aircraft. REILS are installed at the Runway 5 and Runway 23 ends.

Airfield Signage

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed at all taxiways and runway intersections. These signs also identify the aircraft holding position. All of these signs are lighted for operations at night and during low visibility periods.

Airfield Markings

Pavement markings aid in the movement if aircraft along airport surfaces and identify closed or hazardous areas on the airport. The Runway 5 end is equipped with precision runway markings and Runway 23 is equipped with non-precision markings. The runway markings are in good condition.

Taxiway and apron taxilane centerline markings are provided to assist aircraft using these airport surfaces. Centerline markings assist pilots in maintaining proper clearance from pavement edges and objects near the taxilane/taxiway edges. Aircraft hold positions are also marked on all taxiway surfaces. Pavement markings also identify aircraft parking positions.

A segmented circle and lighted wind cone is located at the center of the airport, just north of the runway. The segmented circle identifies the traffic pattern to pilots, and the wind cone indicates wind direction and approximate speed. Additional lighted wind cones are located throughout the airfield.

2.7 Weather Reporting

An Automated Weather Observing System (AWOS) is available at the airfield to inform pilots of the weather conditions at the airport. The AWOS provides automated aviation weather observations 24 hours a day. The AWOS provides pilots with information regarding temperature, wind speed and direction, thunderstorm advisories, and other information that allows pilots to make better decisions and conduct safer operations. The AWOS is located to the west of and adjacent to the aircraft parking apron. The AWOS is owned and maintained by the FAA.

2.8 Runway Navigational Aids

Navigational Aids are electronic devices that transmit radio frequencies, which pilots with properly equipped aircraft translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from the Bessemer Municipal Airport include: ILS and GPS.

Instrument Landing System (ILS) - Runway 5 is equipped with an ILS, which is an electronic ground station consisting of several components that provide properly equipped aircraft with vertical and horizontal guidance to a runway threshold. Components of the ILS include a localizer which provides for horizontal guidance and a glide slope which provides for vertical guidance. This allows pilots to land aircraft during periods of low visibility when visual and non-precision approaches are not possible. The ILS allows aircraft to make precision approaches to Runway 5.

Global Positioning Satellite System (GPS) - In addition to the localizer, a GPS allows properly equipped aircraft to make non-precision approaches to Runways 5 and 23. A GPS works by using satellites to triangulate an aircraft's position, thereby providing the pilot with information regarding the aircraft's location, distance from the airport, height, speed, descent rate, and other information that make it possible for aircraft to make safe approaches to the runway. Both Runway 5 and Runway 23 are equipped with LPV-GPS approaches. An LPV approach provides vertical guidance to aircraft in addition to lateral guidance.

2.9 Airport Navigational Aids

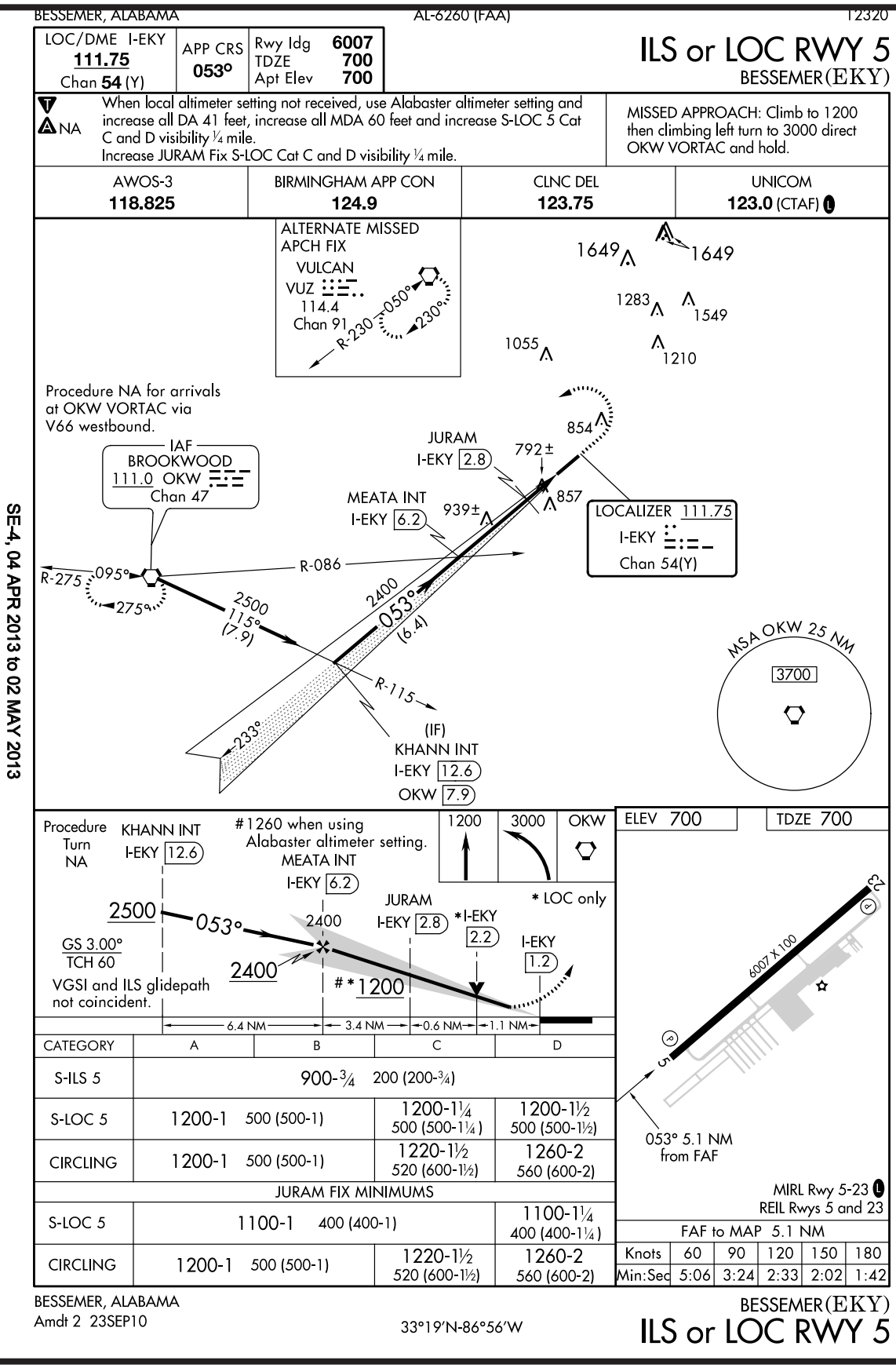
In addition to those navigational aids noted above for runways, the Bessemer Municipal Airport has several facilities associated with navigation to and from the airfield. These navigational facilities include: rotating beacon, lighted windsock, and segmented circle.

2.10 Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport, especially during instrument flight conditions. As found in the United States Government Flight Information Publication *U.S. Terminal Procedures,* the Bessemer Municipal Airport offers four published instrument approaches.

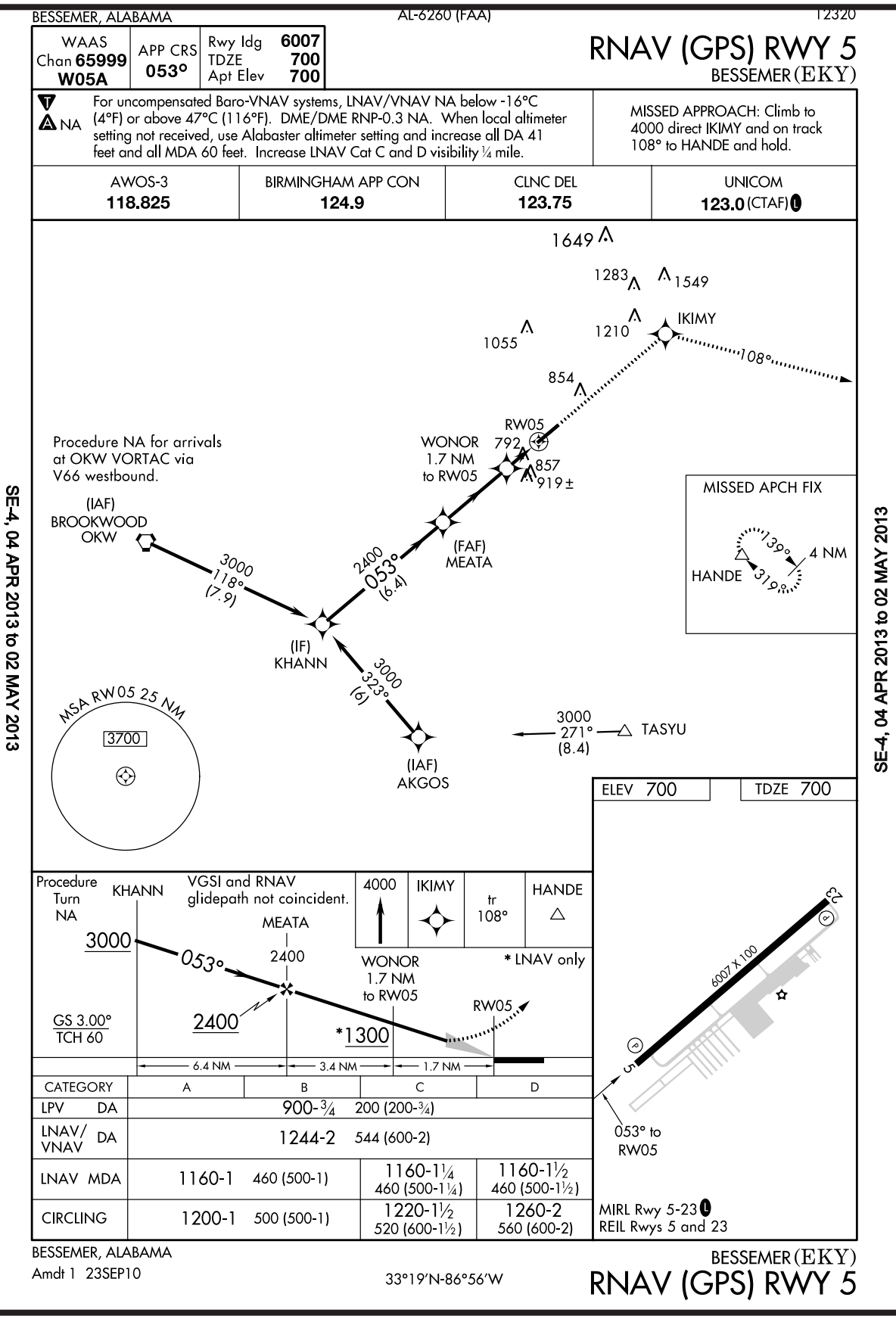
These approaches are listed below, and illustrated in Figures 2-4 through 2-7.

- ILS RWY 5
- RNAV (GPS) RWY 5
- RNAV (GPS) RWY 23
- VOR RWY 5



ILS OR LOC RWY 05

Figure 2-4



RNAV (GPS) RWY 05

Figure 2-5

RNAV (GPS) RWY 23

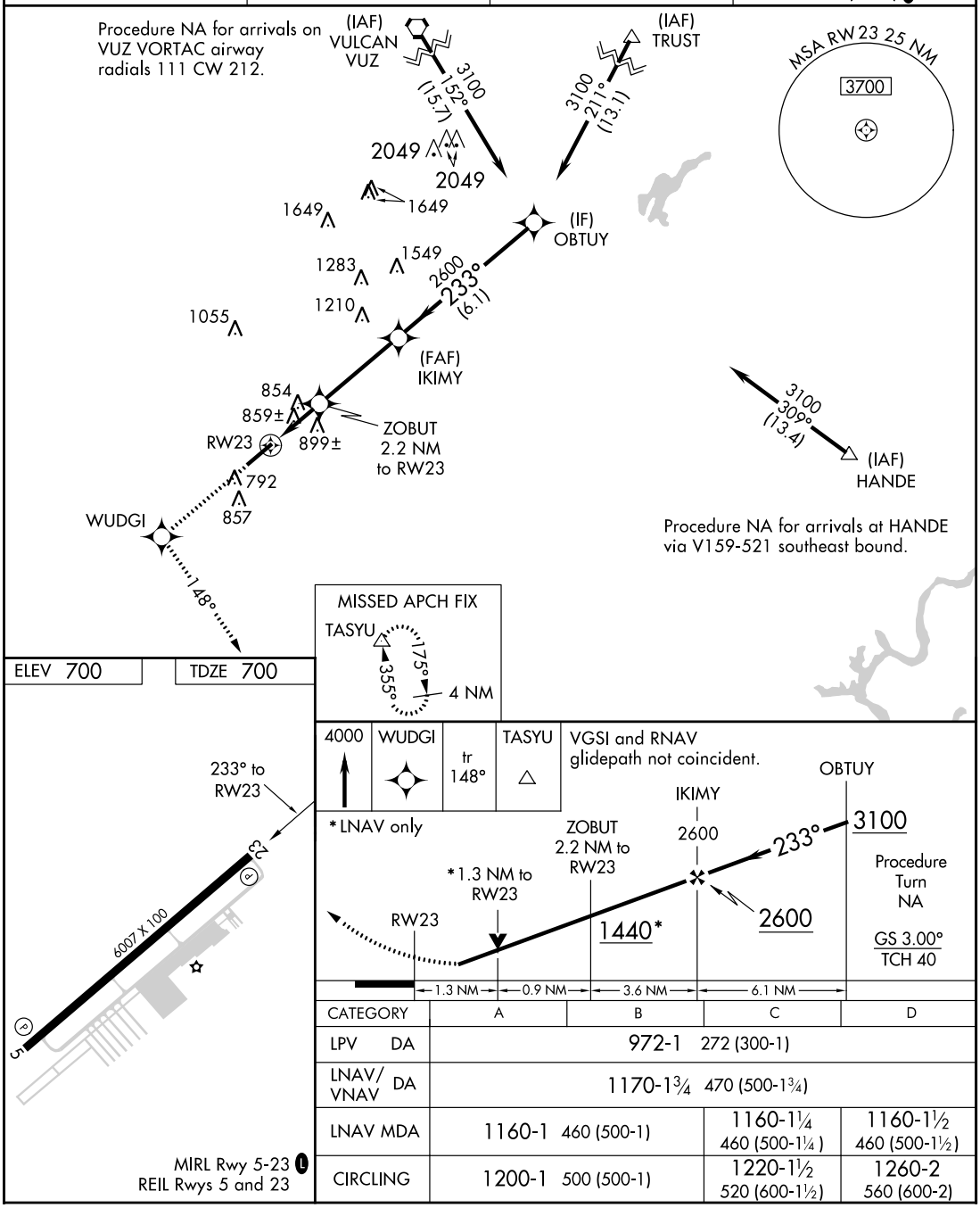
BESSEMER (EKY)

WAAS	APP CRS	Rwy Idg	6007
Ch 82199 W23A	233°	TDZE	700
		Apt Elev	700

T NA — For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16°C (4°F) or above 47°C (116°F). DME/DME RNP-0.3 NA. Visibility reduction by helicopters NA. When local altimeter setting not received, use Alabaster altimeter setting and increase all DA 41 feet and all MDA 60 feet, increase LNAV Cat C and D visibility ¼ mile. Baro-VNAV and VDP NA when using Alabaster altimeter setting.

MISSED APPROACH: Climb to 4000 direct WUDGI and on track 148° to TASYU and hold, continue climb-in-hold to 4000.

AWOS-3	BIRMINGHAM APP CON	CLNC DEL	UNICOM
118.825	124.9	123.75	123.0 (CTAF) L



CATEGORY	A	B	C	D
LPV DA	972-1 272 (300-1)			
LNAV/VNAV DA	1170-1¾ 470 (500-1¾)			
LNAV MDA	1160-1 460 (500-1)		1160-1¼ 460 (500-1¼)	1160-1½ 460 (500-1½)
CIRCLING	1200-1 500 (500-1)		1220-1½ 520 (600-1½)	1260-2 560 (600-2)

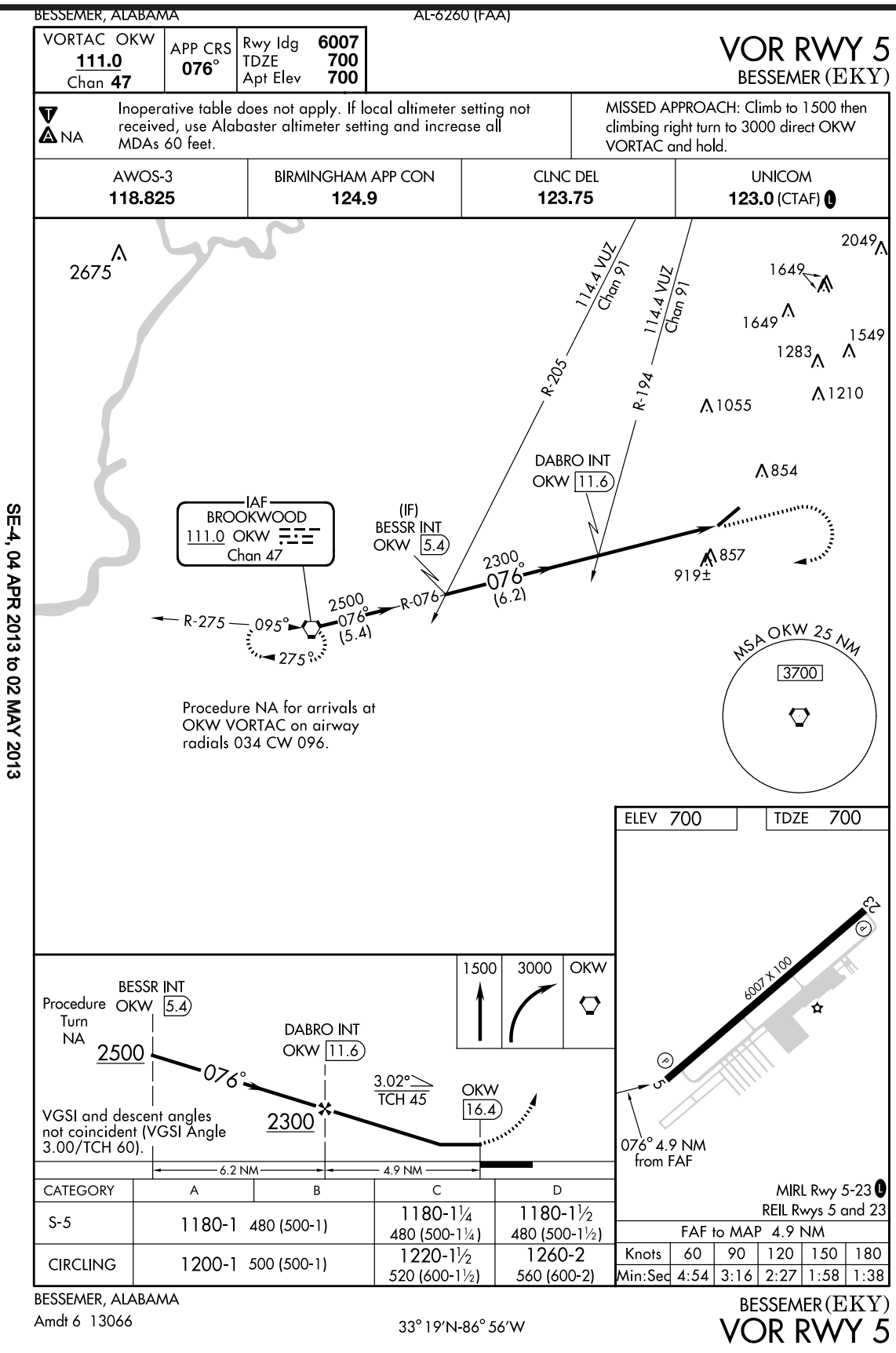
SE-4, 04 APR 2013 to 02 MAY 2013

SE-4, 04 APR 2013 to 02 MAY 2013

BESSEMER, ALABAMA
Orig 23SEP10

33°19'N-86°56'W

BESSEMER (EKY)
RNAV (GPS) RWY 23



VOR RWY 5

Figure 2-7

Table 2-3 provides information about these approaches.

Table 2-3
Approach Minimums

Runway	Type	Approach	Decision Height	Visibility
05	Precision	ILS	200’	3/4 Mile
05	Non-Precision	RNAV/GPS (LPV)	200’	3/4 Mile
23	Non-Precision	RNAV/GPS (LPV)	272’	1 Mile
05	Non-Precision	VOR	480’	1 Mile

2.11 Existing Landside Facilities

Landside facilities are the facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include a terminal building, aircraft storage/maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, and connecting roadway system. Landside facilities at the Bessemer Municipal Airport are located on the south side of the airfield.

Terminal Building
The terminal building serves as a terminal for enplaning or deplaning passengers and pilots. Facilities within the terminal building include a public lobby, administrative offices, conference room, and public restrooms. The terminal building is approximately 3,000 square feet in area and located approximately 475 feet south of Runway 05/23 along Aviation Road.

Aircraft Hangars
There are nine (9) conventional hangars located along the main aircraft parking apron. There are also hangars located to the west of the main aircraft parking apron near the Runway 05 end. These include four (4) conventional hangars, one set of 6 unit T-Hangars, one set of 4 unit T-Hangars, one set of 11 unit T-Hangars, one set of 12 unit shade hangars, and two sets of 16 unit T-Hangars. In addition, the Aerotech Hangar is located in this area.

Fixed Base Operators (FBOs)
Currently, the City of Bessemer serves as the only FBO at the airfield. The City provides general aviation customers with aircraft tie downs, storage facilities, and aircraft fueling. The FBO is located adjacent to the aircraft parking apron at the terminal complex. Administration and pilot facilities are located within the terminal building.

Aircraft Parking Apron

The main aircraft parking apron is located on the south side of the airfield and has approximately 160,000 square feet of pavement for aircraft parking and circulation taxilanes. Facilities included in the Ramp area include the passenger terminal building, FBO, aircraft storage/maintenance hangars, aircraft parking aprons, passenger, and support facilities such as fuel storage. The aircraft parking apron is in poor condition and has reached the end of its useful life. Therefore, the current capital improvement plan includes rehabilitation of the existing apron in three phases, starting at the north end and working south. However, during the master plan stakeholder's meeting held on April 23, 2013 several pilots expressed concern that the taxiways to the T-Hangars at the south end were a higher priority in pavement rehabilitation. As a result, BWSC stated that in the future, they would work with the airport authority regarding future projects and priorities.

Automobile Parking

Parking for passengers visiting or departing from the Airport is available in the designated parking lot at the end of Aviation Road in front of the terminal building. This lot is approximately 12,000 square feet and can provide approximately 30 parking spaces.

Airport Ground Access

The airport is located three miles southeast of the City of Bessemer. Primary access to the airport is Interstate 459 to Morgan Road to Aviation Road.

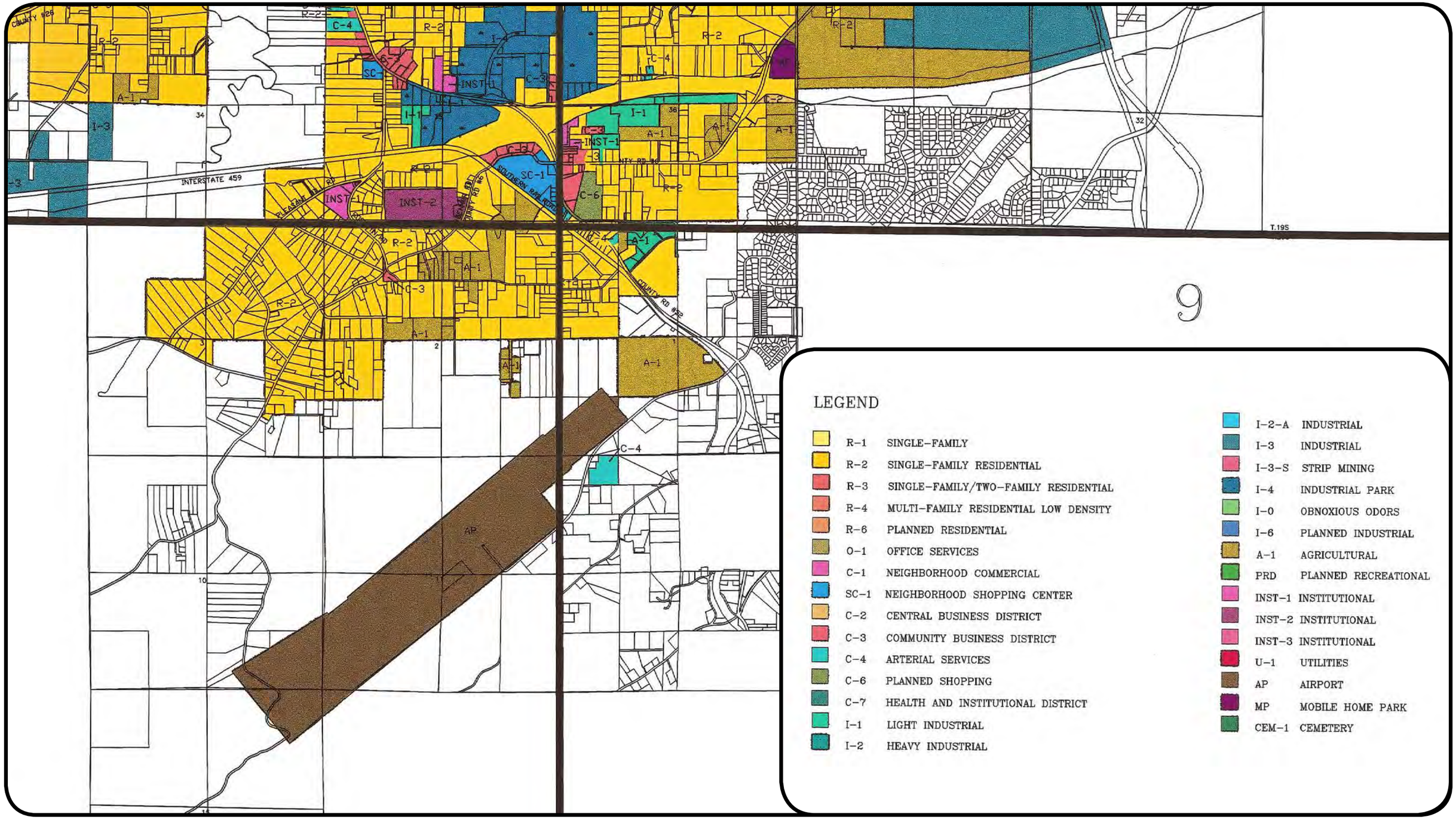
Other Facilities

Other aviation and non-aviation related facilities are also situated at the airfield. The Bessemer Composite Squadron – Civil Air Patrol is adjacent to the West Ramp along Mitchell Field Road. In addition, there is a Fire Station located to the west of the airport entrance road near the terminal building.

2.12 Airport Land Use and Zoning

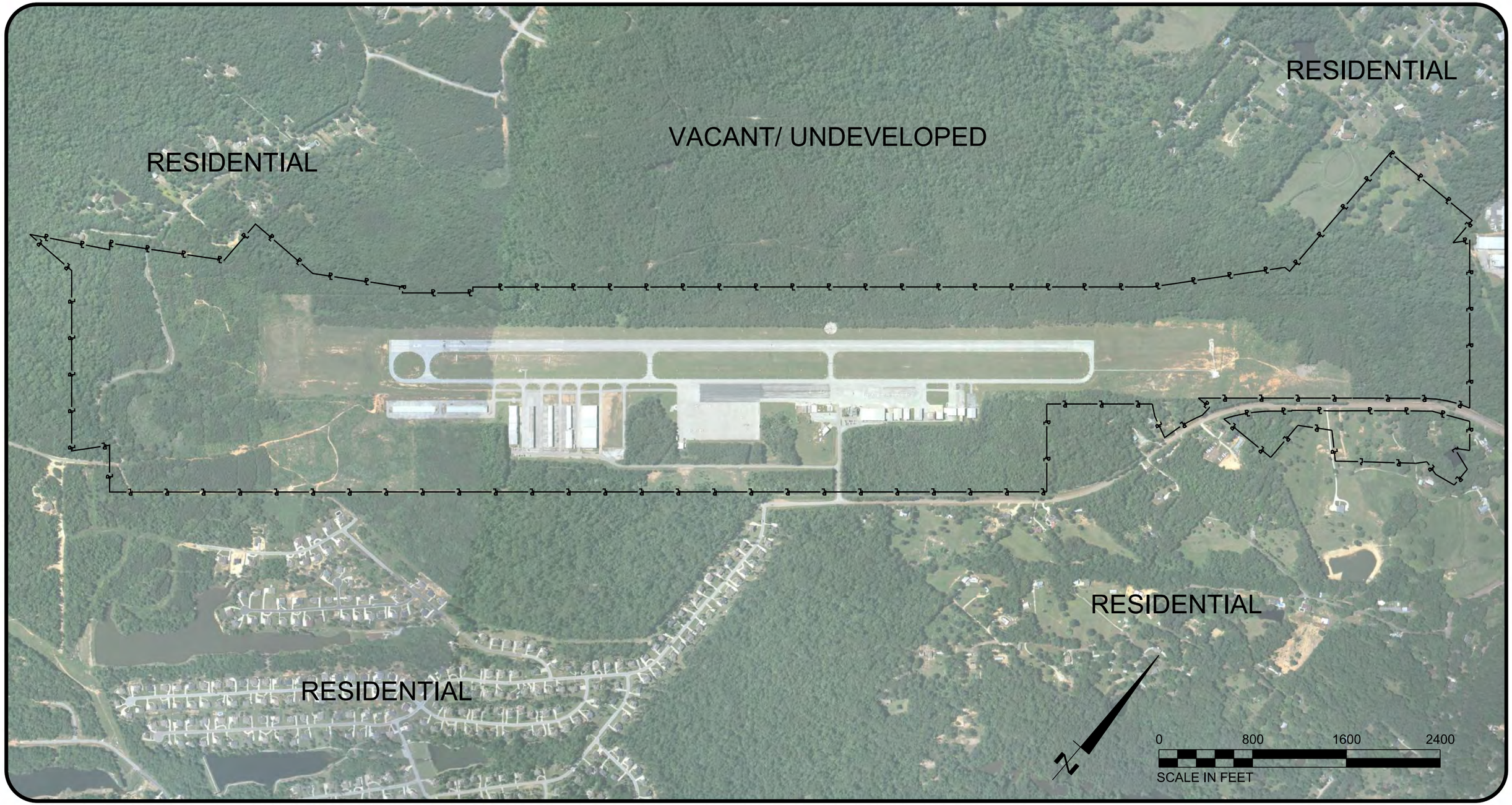
The City of Bessemer has adopted a land use zoning ordinance that controls the development of land within the city and sets criteria for different types of land uses to be developed within certain zones. However, the Bessemer Municipal Airport is located outside the City's corporate limits , therefore it is not within the City's planning jurisdiction. Land use in the vicinity of the airport generally consists of agricultural land use, residential land use, and commercial land use.

Residential land use, consisting of single-family housing, can be found scattered throughout the project area along the roadways. Commercial land use can be found along County Road 2 (Shades Crest Road), County Road 52 (Montevallo Road). There are no recreational areas, hospitals, or schools located within the immediate vicinity of the Airport. The City's zoning map is depicted in Figure 2-8 and Figure 2-9 illustrates the existing land uses in and around the Bessemer Municipal Airport.



Existing Zoning Map

Figure 2-8



Existing Land Use Map Figure 2-9

2.13 Airspace Structure

Airspace within the United States is classified as either "controlled" or uncontrolled". The difference between controlled and uncontrolled airspace relates primarily to requirements for pilot qualifications, ground-to-air communications, navigation and air traffic services, and weather conditions. Six classes of airspace have been designated in the United States as depicted in Figure 2-9. Airspace designated as Class A, B, C, D, or E is considered controlled airspace. Each of these classes has different dimensions, purposes, and requirements. A portion of the Atlanta Sectional Aeronautical Chart illustrating the airspace surrounding the Bessemer Municipal Airport is shown in Figure 2-10.

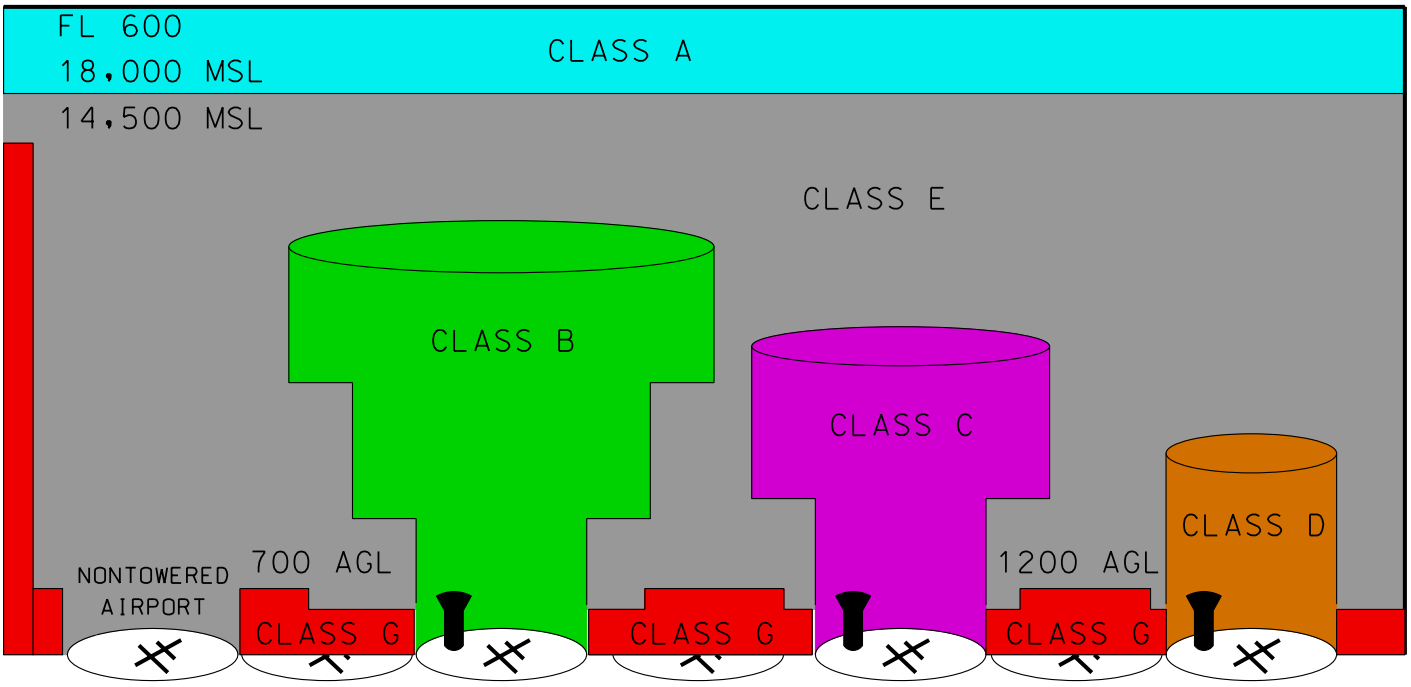
Class A Airspace
Class A Airspace includes all airspace from 18,000 feet to 60,000 feet above mean sea level (MSL). Aircraft flying in Class A airspace are required to operate under Instrument Flight Rules (IFR). The aircraft must have special radio and navigational equipment, and the pilot must obtain clearance from an air traffic control (ATC) facility to enter Class A airspace.

Class B Airspace
Class B airspace has been designated around some of the country's major airports, in order to separate arriving and departing aircraft. Class B airspace is designed to regulate the flow of uncontrolled traffic, above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at major airports up to 10,000 feet.

Class C Airspace
Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high–performance, passenger-carrying aircraft at major airports. Class C airspace is that airspace from the surface to 4,000 feet above airport elevation surrounding those airports that have an operational air traffic control tower, are serviced by a radar approach control, and have a certain number of IFR operations or passenger enplanements.

Class D Airspace
Class D airspace is controlled airspace surrounding airports with an operating ATCT. Class D airspace is that area from the surface to 2,500 feet above the airport elevation having an operational control tower.

Class E Airspace
The airspace encompassing the Bessemer Municipal Airport is Class E. Class E is usually described as controlled airspace that is not classified as class A, B, C, or D. Class E is designated to accommodate all of the instrument approach procedures required to land at an airport during IFR conditions

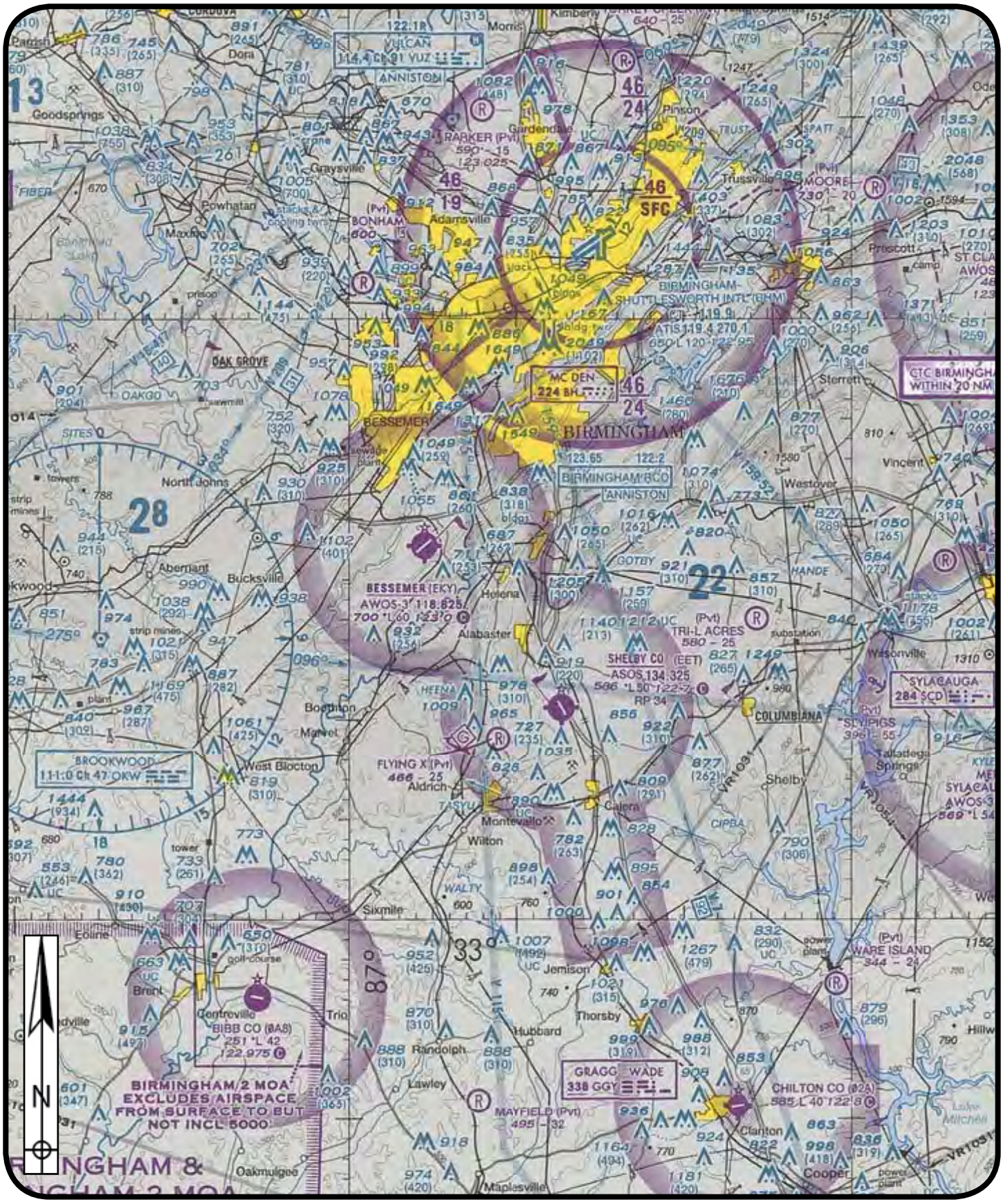


MSL – MEAN SEA LEVEL
AGL – ABOVE GROUND LEVEL
FL – FLIGHT LEVEL

	CLASS A	Generally airspace above 18,000 MSL up to and including FL 600.
	CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
	CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
	CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
	CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
	CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, or Class D.

Airspace Classes

Figure 2-10



Airspace Structures Figure 2-11

2.14 Meteorological Data

Climate

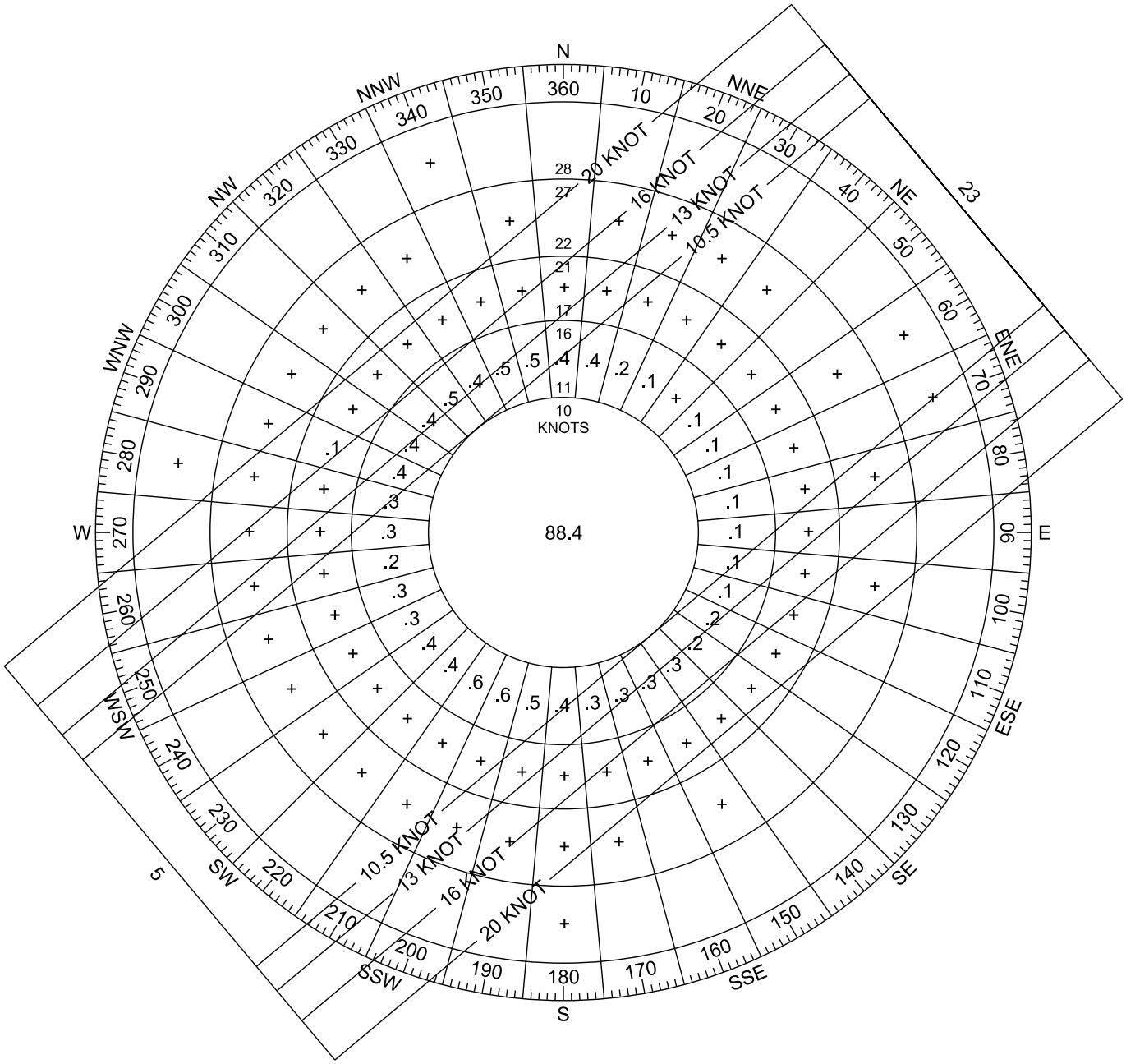
Bessemer, Alabama has a warm and humid climate as well as abundant rainfall. Average temperatures range from a low of 34 degrees Fahrenheit in January to a high of 91 degrees Fahrenheit in July.

The average rainfall is approximately 54 inches per year. The wettest season is summer, while fall is the driest. Rains in winter and spring may last for several days, but they usually occur as brief showers along the leading edge of a mass of cold air. Rains in summer come as local thundershowers.

Wind Analysis

Wind coverage indicates what percentage of the time that the crosswind components are within acceptable velocity. For the purpose of runway wind analysis, a crosswind component can be defined as the wind that occurs at a right angle to the runway centerline. The desirable wind coverage for an airport is ninety-five percent (95%). This means that the runways should be oriented so that the maximum crosswind component is not exceeded more than five (5%) of the time. In the case of the Bessemer Municipal Airport, a 16-knot crosswind component is required for runways with Airport Reference Codes of D-II and a 13-knot crosswind component for runways with an Airport Reference Code of B-II. As the All Weather Wind Rose indicates, Runway 05/23 provides 97.13 percent wind coverage for the 13 knot crosswind component and 99.54 percent wind coverage for the 16 knot crosswind component. During IFR conditions, Runway 5/23 provides 96.22 percent wind coverage for the 13 knot crosswind component and 99.28 percent wind coverage for the 16 knot crosswind component. This exceeds the FAA guidelines for recommended wind coverage.

An All Weather Wind Rose is presented in Figure 2-11 which illustrates the percentage of wind occupancy, by direction and velocity, under all-weather conditions. The IFR Wind Rose is illustrated in Figure 2-12**.**

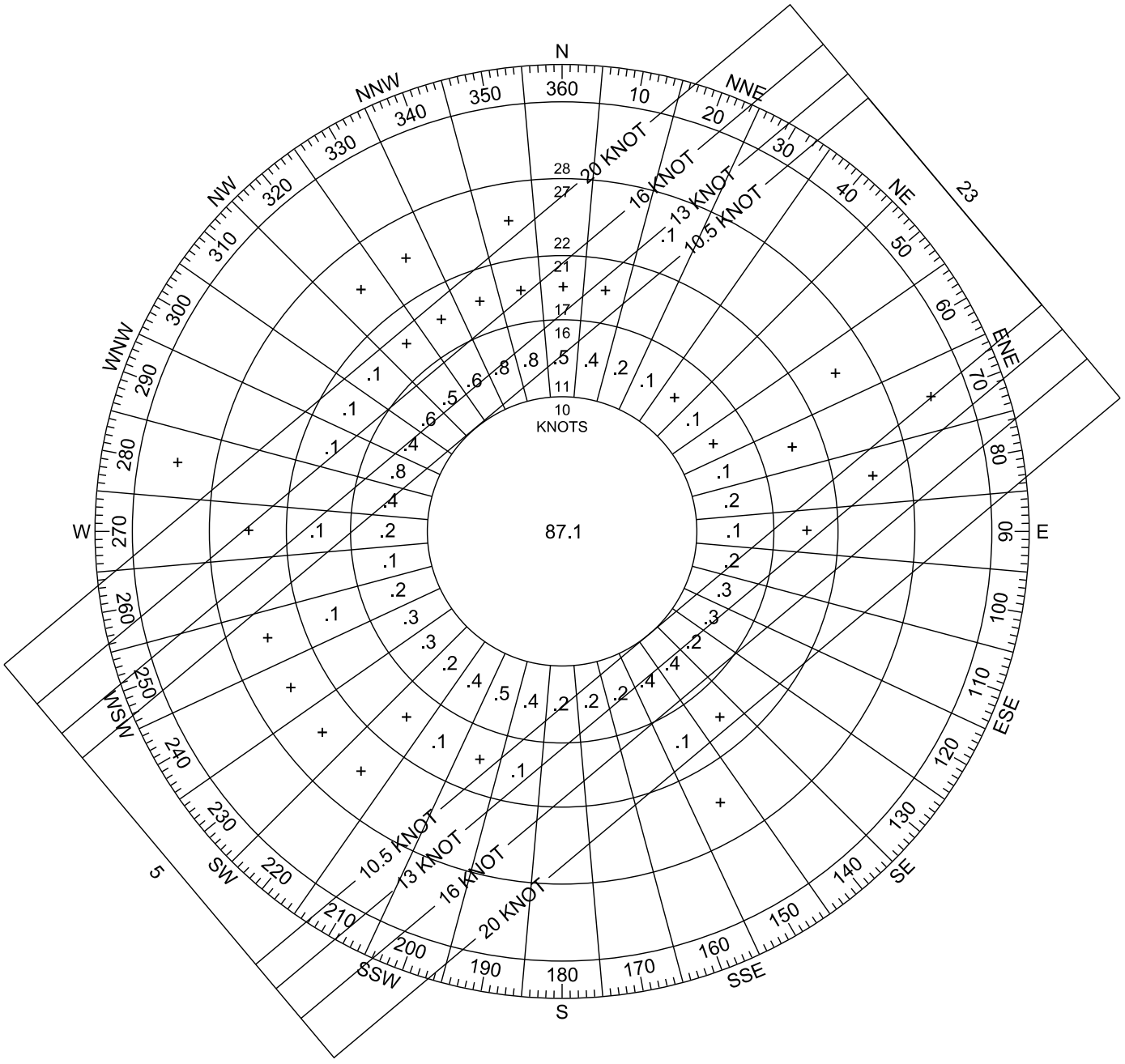


RUNWAY	10.5 KNOT	13 KNOT	16 KNOT	20 KNOT
5/23	94.42%	97.19%	99.54%	99.93%

78,083 OBSERVATIONS MADE
OVER THE PERIOD OF 1995-2004
STATION # 72228
BIRMINGHAM, ALABAMA

All Weather Wind Rose

Figure 2-12



RUNWAY	10.5 KNOT	13 KNOT	16 KNOT	20 KNOT
5/23	92.58%	96.22%	99.28%	99.83%

5,115 OBSERVATIONS MADE
OVER THE PERIOD OF 1995-2004
STATION # 72228
BIRMINGHAM, ALABAMA

IFR Wind Rose

Figure 2-13

2.15 Aerial Photogrammetry

New rectified aerial photogrammetry was completed as part of the study. Photogrammetry combines controlled aerial photography taken during high visibility times with reliable measurements made in the office using tri-dimensional instrumentation and digital software. The digital mapping depicts existing features, such as paved areas, buildings, above ground utilities, fencing, tree lines, and water bodies. Topography at a contour interval of five feet is depicted for the airport property. In addition, a high altitude aerial photograph was also taken that encompasses the airport and adjacent areas, thereby providing a current inventory of land use.

CHAPTER 3
GENERAL AVIATION FORECASTS

3.1 Introduction

The general aviation facilities at an airport should accurately reflect the aviation activity. To assist in the Airport Layout Plan Update for the Bessemer Municipal Airport, forecasts of general aviation activity have been developed for the short range (0-5 years), intermediate range (6-10 years), and the long range (11-20 years) planning period. The general aviation activity categories forecasted include based aircraft, operations, passengers, and peak hour operations. Data collected at the airport, FAA records of aircraft operations, historical aviation trends, and information collected through discussions with the City of Bessemer and the Alabama Department of Transportation have contributed to the forecasts of future general aviation activity for the Bessemer Municipal Airport.

3.2 Based Aircraft

Forecasting based aircraft requires the assumption that the airport facilities will keep pace with and meet the demand for aviation use, and will not limit the number of based aircraft to be accommodated in the future. Based on the FAA's Airport Master Record (Form 5010), a total of 99 aircraft are based at the airport. Of these, 69 are single engine aircraft, 20 are multi-engine, 7 jets, and 3 helicopters. This information, along with forecasts developed by the FAA and the Alabama Department of Transportation, is used to develop the based aircraft forecasts.

A combination of three methods was utilized to develop projections of based aircraft at the airport.

Method 1 – FAA Terminal Area Forecasts - Projections from the FAA Terminal Area Forecast were examined and extrapolated to the year 2032.

Method 2 – Alabama Aviation System Plan - Projections from the Alabama Aviation System Plan were examined and extrapolated to the year 2032.

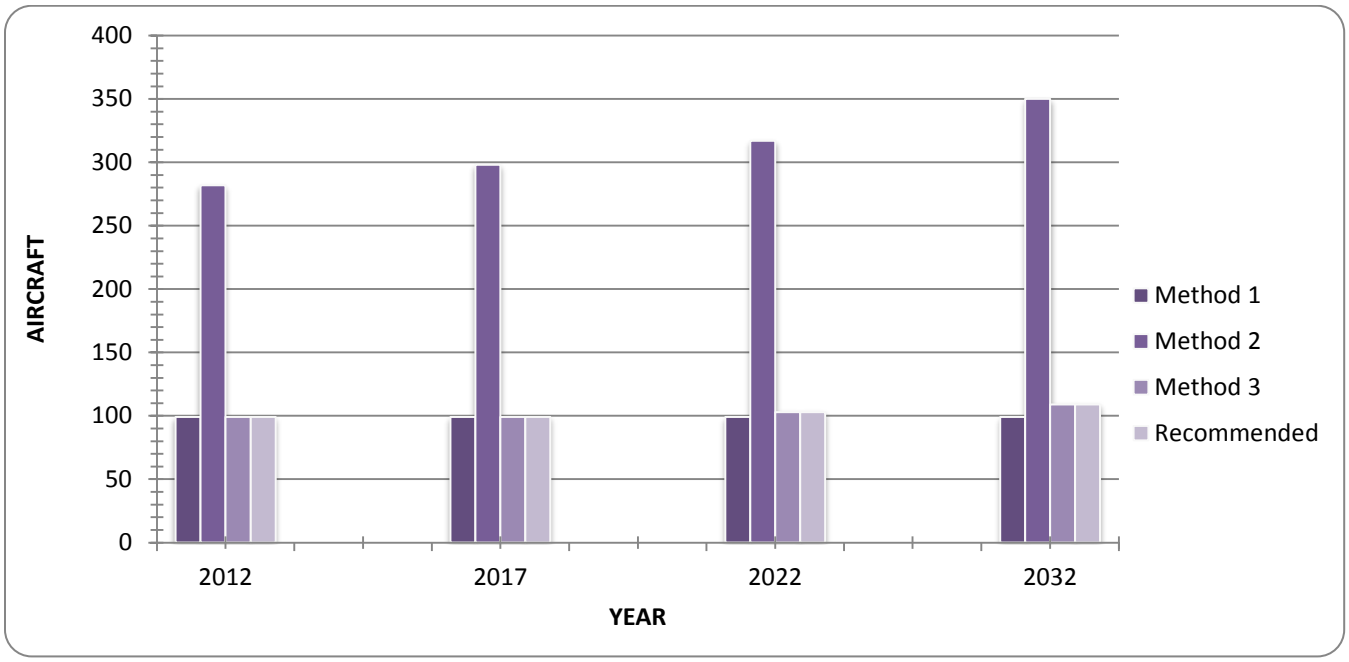
Method 3 - Projection of Historic Growth (Modified) - A single variable linear regression analysis of historic data was performed. The data consisted of the total based aircraft for historical years 1996 – 2010.

Recommended Study Forecast – The recommended forecast is based on Method 3. Specific projections are presented in Table 3-1 and Figure 3-1.

Table 3-1
Based Aircraft Forecasts
Bessemer Municipal Airport

Year	Method 1	Method 2	Method 3	Recommended
2012 (Base Year)	99	282	99	99
2017	99	298	99	99
2022	99	317	104	104
2032	99	350	109	109

Figure 3-1
Based Aircraft Forecasts
Bessemer Municipal Airport



3.3 Based Aircraft Distribution

The distribution of aircraft by number and type of engines is necessary in estimating the requirements for hangar and apron space. Consideration was given to the existing conditions and national trends, both historic and predicted, in the development of this forecast. The recommended forecast recognized that, nationally, the multi-engine, turboprop, and business jet fleets are growing at a faster rate than the single engine piston aircraft fleets.

The number of based aircraft is forecasted to increase from a total of 99 for 2012 to a total of 109 by the year 2032. The proportion of single-engine aircraft based at the Bessemer Municipal Airport is expected to increase from a total of 69 for 2012 to a total of 71 by the year 2032 (Table 3-2). The exact numbers and type of aircraft actually based at the Airport in any of the planning periods may vary from what is shown. However, it is believed that the totals and mix of aircraft shown are a reasonable representation and may be adopted for planning purpose.

Table 3-2
Based Aircraft By Category
Bessemer Municipal Airport

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Total
2012 (Base Year)	69	20	7	3	99
2017	69	20	7	3	99
2022	70	22	8	4	104
2032	71	24	9	5	109

Source: US Fleet Mix Percentages derived by BWSC from FAA Forecasts, FY 1988-1999 and FAA's Long Range Aviation Projections.

3.4 General Aviation Operations

Projections of general aviation operations were calculated to the year 2032 based upon three methodologies.

Method 1 – The Terminal Area Forecast was examined and was extrapolated to the year 2032.

Method 2 – Alabama Aviation System Plan - Projections from the Alabama Aviation System Plan were examined and extrapolated to the year 2032.

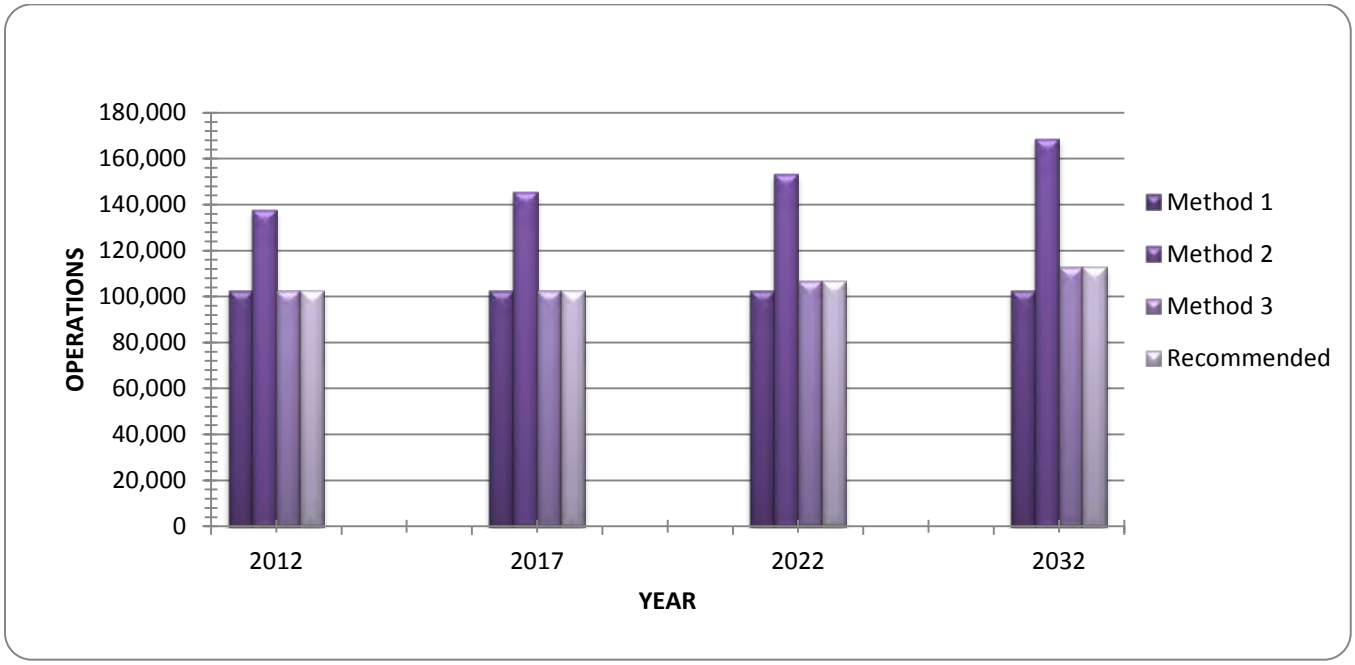
Method 3 – Operations Per Based Aircraft - This technique is based on the historical average of operations compared to based aircraft. The operations per based aircraft for the last 5 years were averaged and rounded up to arrive at a forecast ratio of 1,036 operations per based aircraft. This was held constant throughout the forecast period and applied to the forecast for based aircraft.

Of the forecasts developed, the Method 3 – Operations Per Based Aircraft used and is believed to be a reasonable forecast of general aviation operations for planning purposes. Table 3-3 and Figure 3-2 present the forecast of general aviation operations for the 20-year planning period.

Table 3-3
General Aviation Operations Forecasts
Bessemer Municipal Airport

Year	Method 1	Method 2	Method 3	Recommended
2012 (Base Year)	102,600	137,457	102,600	102,600
2017	102,600	145,252	102,600	102,600
2022	102,600	153,046	106,700	106,700
2032	102,600	168,635	112,900	112,900

Figure 3-2
General Aviation Operations Forecasts
Bessemer Municipal Airport



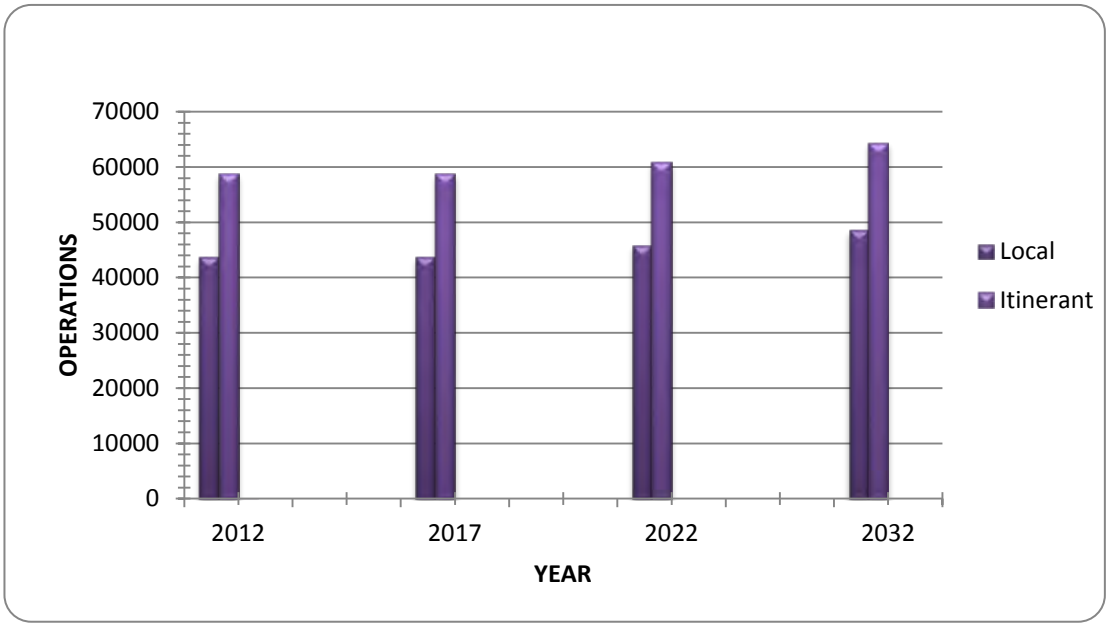
3.5 General Aviation Operations by Type

Aircraft operations are divided into two types: local and itinerant. Local operations are classified as arrivals and departures of aircraft which operate in the local traffic pattern or within sight of the tower and are known to be departing for or arriving from flights in local practice areas within a 20-mile radius of the airport and/or control tower; plus simulated instrument approaches or low passes at the airport executed by any aircraft. Itinerant operations are defined as all other operations other than local. The current ratio of local to itinerant operations is 43 percent local to 57 percent itinerant operations. This ratio is expected to remain constant throughout the study period as shown on Table 3-4 and Figure 3-3.

Table 3-4
Forecasts of General Aviation Operations By Type
Bessemer Municipal Airport

Year	Local	Itinerant	Total
2012 (Base Year)	43,700	58,900	102,600
2017	43,700	58,900	102,600
2022	45,881	60,819	106,700
2032	48,547	64,353	112,900

Figure 3-3
Forecasts of General Aviation Operations By Type
Bessemer Municipal Airport



3.6 Summary of Aviation Forecasts

The aviation forecasts made in this chapter reflect accepted methods of forecasting coupled with sound aviation planning judgments. These forecasts were based on the most recent data available. The forecasts presented in this chapter will adequately describe future conditions concerning general aviation at the Bessemer Municipal Airport.

Table 3-5
Summary of General Aviation Forecasts
Bessemer Municipal Airport

Item	Forecast			
	2012	**2017**	**2022**	**2032**
Based Aircraft	99	99	103	109
Aircraft Operations				
G/A Local	43,700	43,700	45,881	48,547
G/A Itinerant	58,900	58,900	60,819	64,353
G/A Total	102,600	102,600	106,700	112,900

CHAPTER 4
DEMAND/CAPACITY ANALYSIS

4.1 Introduction

In order to adequately plan for the future of the Bessemer Municipal Airport, airport activity characteristics and capacity levels must be analyzed. The purpose of this chapter is to determine the airfield capacity and compare it to the number of operations that are forecast throughout the 20 year planning period. The demand capacity analysis examines the capability of the existing airfield to satisfy the forecasted operational demands at the Airport. If deficiencies exist, or are expected to materialize in future years, a more specific evaluation will be made in the following chapter.

4.2 Wind Analysis

The weather experienced in a given area is often a good indicator of the facilities necessary for the airport to have continuous operation. In some areas, complete instrumentation is necessary to provide constant operation of the airport. In other areas, the frequency of weather which could necessitate precision instrument landing system (ILS) or similar equipment would be so infrequent as to not justify the cost necessary for the installation and operation of such a facility.

Runway wind coverage for aircraft is defined in terms of allowable rated crosswind of type of aircraft using the airfield. If the airfield were utilized solely by small aircraft, the critical crosswind component would be 10.5 knots. Where types of aircraft classified as larger than utility (generally those aircraft weighing in excess of 12,500 pounds) are using the facility, a crosswind component of 13 knots is used. Bessemer Municipal Airport is projected to serve aircraft in excess of 12,500 pounds. Therefore, a crosswind component of 13 knots is used for the wind analysis.

The wind data for the wind rose is based on data from the U.S. Weather Bureau in Birmingham, Alabama which is located approximately 17 miles northeast of the Bessemer Municipal Airport. It is recognized that local variations in wind pattern do occur, however, this reporting station is reasonably representative of the wind patterns present. The analysis indicates that for Runway 5/23, under All Weather conditions, crosswind velocities will not exceed 13 knots 97.19 percent of the time and for IFR conditions 99.28.

4.3 Airfield Capacity

Airport capacity includes acceptance rates expressed as weighted operations per hour on the runway, and taxiway components of a general aviation airfield. Due to the fact that operationally, one airfield component does not usually affect the capacity of another, the capacity of the entire airfield is governed by the runway and taxiway, for a general aviation airport and in the case of an air carrier airport, apron/gate capacity. At the Bessemer Municipal Airport, only runway and taxiway components will be considered since the airport will not be served by an air carrier.

Capacity and delay at the Bessemer Municipal Airport were examined using FAA Advisory Circular 150/5060-5*, Airport Capacity and Delay* and the FAA's computer *Airport Design Program, Version 4.2*. By using the methodology presented in these guidelines, it is possible to make calculations on airfield capacity in the following terms:

- Hourly Capacity of Runways: The maximum number of Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) aircraft operations that can take place on the runway system in one hour.
- Annual Service Volume: The annual capacity or maximum level of annual aircraft operations that may be used as reference in planning the runway system.
- Annual Aircraft Delay: The total delay incurred by all aircraft on the airfield in one year.

Airfield capacity is determined by several factors, including airport layout, runway use, aircraft fleet mix, total annual operations, and whether air carrier operations or general aviation operations dominate.

The basic assumptions or condition for determining capacity for this type of airport are as follows:

- Has an approved instrument approach procedure
- Arrivals equal departures
- No airspace limitations affect runway use

4.4 Airfield Layout

The airport layout refers to the location and orientation of runways, taxiways and the terminal area. The layout of the Bessemer Municipal Airport consists of one runway, oriented southwest to northeast. It is supported by a taxiway system that includes a full parallel taxiway and three connector taxiways.

4.5 Aircraft Fleet Mix

The Airport Capacity and Delay Advisory Circular categorize aircraft by their weight and number of engines. The first category, Class A, consists of single engine aircraft weighing 12,500 pounds or less. Class B includes aircraft with two or more engines that weigh 12,500 pounds or less. Class C consists of aircraft with two or more engines which weigh between 12,500 and 300,000 pounds. The final category, Class D, includes multi-engine aircraft weighing 300,000 pounds or more. Variation in aircraft approach speeds and landing distances affect runway occupancy times which, in turn, affect the airfield's capacity. Table 4.1 summarizes representative aircraft types.

Table 4.1
Typical Aircraft By Design Group

Group	Aircraft Type	
A	Cessna 172/182	**Mooney 201**
	Beech Bonanza	**Piper Cherokee**
B		
	Beech Baron	**Mitsubishi MU-2**
	Beech King Air 100	**Piper Navajo**
	Cessna 402	**Cessna Citation II/III**
C		
	Rockwell Saber	**Jet Commander**
	BAE Jetstream-31	**Lear 25/55**
	Canadair RJ-200	**Boeing 727/737/BBJ**
	Challenger 604	**Douglas DC-9**
	Grumman Gulfstream II/IV	**Hawker Sidney - 121**
D		
	Boeing 707/777/787	**Airbus A-300/A-310**

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

For airport capacity and delay analysis, a fleet mix index is prepared based on the percent of operations conducted by Class C and Class D aircraft. Since Class D aircraft create a substantial wake vortex and require greater separation from other aircraft, the percent of Class D operations is weighted three times more than that of Class C.

Thus, the formula for determining an airport's mix index is: (C+3D) with C equaling the percent of Class C operations and D equaling the percent of Class D operations. Based on a review of aircraft that are forecasted to use the airport the projected mix for capacity purposes at the Bessemer Municipal Bessemer Municipal Airport is as follows:

It is estimated that Group C aircraft will account for approximately 20 percent of operations by the year 2032, at the Bessemer Municipal Airport. The remainder of the operations will be conducted by aircraft in Group A and Group B. This estimate is based on conversations with airport personnel. These percentages are expected to remain constant throughout the planning period.

4.6 Total Annual Operations

The next variable in airport capacity and delay is the level of demand, which is the total number of annual operations. The forecast for annual operations from Chapter 3 was used to fulfill the data needed for this variable.

4.7 Annual Service Volume

Annual service volume (ASV) is a measure of the number of operations that may occur annually on the airport. The ASV considers various operating conditions (i.e., VFR, IFR and period below minimums), the hourly capacity of the runway component under those conditions, and peaking ratios. Long range planning figures are outlined in FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, Chapter 2; Figure 2-1 was used to develop the ASV. Those conditions are:

- Single runway configuration
- Departures equal landings
- Touch and Go operations up to 25%
- Mix Index - A + B aircraft (weighing less than 12,500 lbs.) = 80.0%
  Class C & D aircraft (weighing >12,500# but < 300,000 lbs.) = 20.0%

The annual service volume of Bessemer Municipal Airport is expected to be approximately 230,000 annual operations with an hourly capacity of 98 operations VFR and an IFR hourly capacity of approximately 59 operations.

4.8 Capacity versus Operations

The forecast of operations presented in Chapter 3 indicates a level of 112,900 annual operations by 2032. The capacity of the airfield configuration is calculated to be 230,000 annual operations. It is therefore evident, that the airport as planned can accommodate the air traffic expected throughout and beyond the forecast period. A comparison of the projected annual demand and long-range planning ASV is presented in Table 4-2.

Table 4-2
Annual Airfield Capacity

Year	Forecasted Annual Operations	Long Range Planning - ASV
2012	102,600	230,000
2017	102,600	230,000
2022	106,700	230,000
2032	112,900	230,000

CHAPTER 5
FACILITY REQUIREMENTS

5.1 Introduction

This chapter of the narrative report lists the facility requirements planned for the Bessemer Municipal Airport to accommodate both present and future user needs. The following subsections present detailed airfield, general aviation, ground access, security fencing, and support facility needs. The justification and rationale for the various facility improvements are summarized in each subsection. Resulting facility requirement improvements are shown on the ALP drawing set.

5.2 Airport Classification

The FAA has established aircraft classification systems that group aircraft types based on their performance and geometric characteristics. These classification systems (described below) are used to determine the appropriate airport design standards for specific runway, taxiway, taxilane, apron, and other facilities, as described in FAA AC 150/5300-13A *Airport Design*.

Aircraft Approach Category (AAC): a grouping of aircraft based on 1.3 times their stall speed in the landing configuration at the certificated maximum flap setting and maximum landing weight at standard atmospheric conditions.

Airplane Design Group (ADG): a classification of aircraft based on wingspan and tail height. When the aircraft wingspan and tail height fall in different groups, the higher group is used.

Aircraft Approach Category (AAC)

- Category A: Speeds less than 91 knots.
- Category B: Speeds of 91 knots or more, but less than 121 knots
- Category C: Speeds of 121 knots or more, but less than 141 knots.
- Category D: Speeds of 141 knots or more, but less than 166 knots.
- Category E: Speeds of 166 knots or more.

Airplane Design Group (ADG)

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet up to but not including 262 feet.

This applicability of these classification systems to the FAA airport design standards for individual airport components (such as runways, taxiways, or aprons) is presented below in Table 5.1.

Table 5.1
Applicability of Aircraft Classifications

Aircraft Classification	Related Design Components
Aircraft Approach Speed (AAC)	Runway Safety Area (RSA), Runway Object Free Area (ROFA), Runway Protection Zone (RPZ), runway width, runway-to-taxiway separation, runway to fixed object.
Airplane Design Group (ADG)	Taxiway and apron Object Free Areas (OFAs), parking configuration, hangar locations, runway-to-taxiway separation.
Taxiway Design Group (TDG)	Taxiway width, fillet design, apron area, parking layout

5.3 Design Aircraft Family

The "design aircraft" or "design aircraft family" represent the most demanding aircraft or grouping of aircraft with similar characteristics (relative to AAC, ADG, TDG), that are currently using or are anticipated to use an airport on a regular basis. Based on information obtained from the airport, the design aircraft at EKY is the Citation III. However, after discussing and analyzing the future level of activity with the airport, it is anticipated that use from larger business jets will increase over the next several years so for the purpose of this study and long range planning the ultimate design aircraft has been designated as the Gulfstream IV.

5.4 Airport & Runway Classification

The FAA classifies airports and runways based on their current and planned operational capabilities. These classifications (described below), along with the aircraft classifications defined previously, are used to determine the appropriate FAA standards (as per AC 150/5300-13A) to which the airfield facilities are to be designed and built.

Aircraft Reference Code (ARC): ARC is an airport designation that represents the AAC and ADG of the aircraft that the airfield is intended to accommodate on a regular basis. According to FAA AC 150/5325-4B *Runway Length Requirements for Airport Design*, "regular use" is defined as 500 annual itinerant by an individual airplane or grouping of airplanes. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport. The Airport's previous 2005 Airport Layout Plan (ALP) identified the EKY as a B-II facility with an ultimate facility designation of D-II. Based on the existing activity at the airport, it is recommended that the EKY's classification remain as a B-II. However, as noted above, the level of anticipated use by larger business jets is expected to increase in the future, therefore it is recommended that the ultimate classification be D-II over the planning horizon.

Runway Design Code (RDC) and Runway Reference: RDC is a code signifying the design standards to which the overall runway is to be planned and built. RRC is a code signifying the operational capabilities of each specific runway end. These classifications are expressed in three components: AAC, ADG, and the highest approach visibility minimums that either end of the runway is planned to provide.

The current ARC at the Bessemer Municipal is B-II. However, based on the planned extension of the runway to 6,007' as well as an analysis of the expected future fleet mix composition, Runway 05/23 should be designed to accommodate D-II aircraft. This is consistent with the previous Airport Layout Plan (ALP) which also identified the ultimate ARC of D-II.

5.5 Runway

5.5.1 Orientation

The orientation of runways for aircraft operations is primarily a function of wind velocity and direction coupled with the ability of the aircraft to operate under adverse conditions. Generally, the primary runway is aligned as closely as practical in the direction of prevailing winds. The most desirable configuration provides the largest wind coverage for given crosswind component. This component is the vector of wind velocity and direction, which acts at right angles to the runway. Specified coverage is that percent of time during which operations could safely occur on a given day due to acceptable crosswind coverage. The desirable crosswind component for the runway at Bessemer Municipal Airport is 16.0 knots and the coverage is 99.54 percent during All Weather conditions and 99.28 percent during IFR conditions.

5.5.2 Runway Design Standards

This master planning effort aims to achieve compliance with all FAA design and safety standards related to airfield facilities, including dimensions, separation distances, protection zones, clearance requirements, etc. These standards vary according to RDC/RRC. The FAA design and safety standards related to runways (as defined in AC 150/5300-13A *Airport Design* are described below.

Runway Width – The physical width of the runway pavement.

Runway Safety Area (RSA) – Graded surface centered on the runway centerline. The RSA shall be free of objects (except for objects that need to be located in the RSA to serve their function such as NAVAIDs and approach aids) and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting (ARFF) equipment, and the occasional passage of aircraft without causing damage to the aircraft.

Runway Object Free Area (ROFA) – The ROFA is also centered on the runway centerline and requires the clearing of all above ground objects protruding above the RSA edge elevation (unless objects need to be located in the OFA for air navigation or aircraft ground maneuvering purposes).

Runway Object Free Zone (OFZ) – The OFZ is a defined volume of airspace centered above the runway centerline that extends 200 feet beyond each end of the runway surface that precludes taxiing or parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function.

Runway Protection Zone (RPZ) – The RPZ is a trapezoidal area located 200 feet beyond the runway end and centered on the extended runway centerline. The RPZ is primarily a land use control that is meant to enhance the protection of people and property near the airport through airport control. Such control includes clearing of RPZ areas of incompatible objects and activities.

Runway Separation Standards – Separation standards between the runway and other airport facilities are established to ensure operational safety of the airport and are as follows.

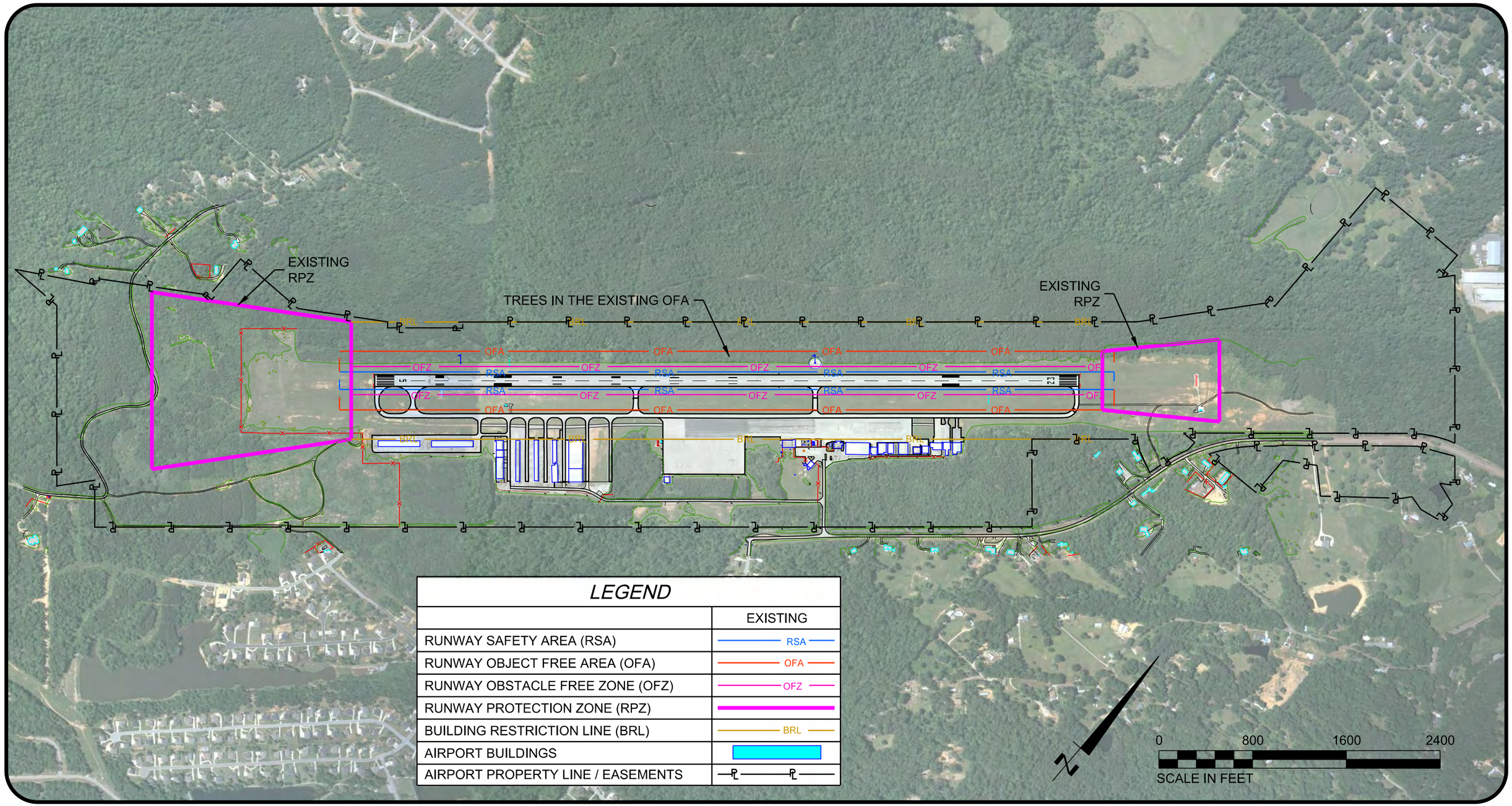
- Runway centerline to parallel taxiway centerline
- Runway centerline to holdline
- Runway centerline to edge of aircraft parking area

Building Restriction Line (BRL) – Though not a specific FAA design standard, the BRL is a reference line which provides generalized guidance on building location and height restrictions. The BRL is typically established with consideration to Object Free Areas and Runway Protection Zones as well airspace protection by identifying areas of allowable building heights such as 25 or 35 feet above ground level. It should be noted that site-specific terrain considerations (i.e. grade/elevation changes) may allow buildings taller that indicated by the generalized BRL to be developed within the limits of the BRL. These height restrictions are based on FAR Part 77 surfaces that will be described in more detail in Section 5.15 and would need to be evaluated for each specific site development plan.

Table 5.2 identifies the existing conditions at EKY and the geometric requirements of the above standards relative to RDCs of B-II and D-II. Figure 5.1 depicts these standards as they currently exist at EKY (RDC B-II) and Figure 5.2 depicts the ultimate RDC standards of D-II. As supported by Table 5.2 and Figure 5.1, the runway is complaint with all FAA design standards for B-II and through D-II aircraft (and approach visibility minimums not lower than 3/4-mile), with the exception of trees being located within the ROFA and ultimate RSA/ROFA.

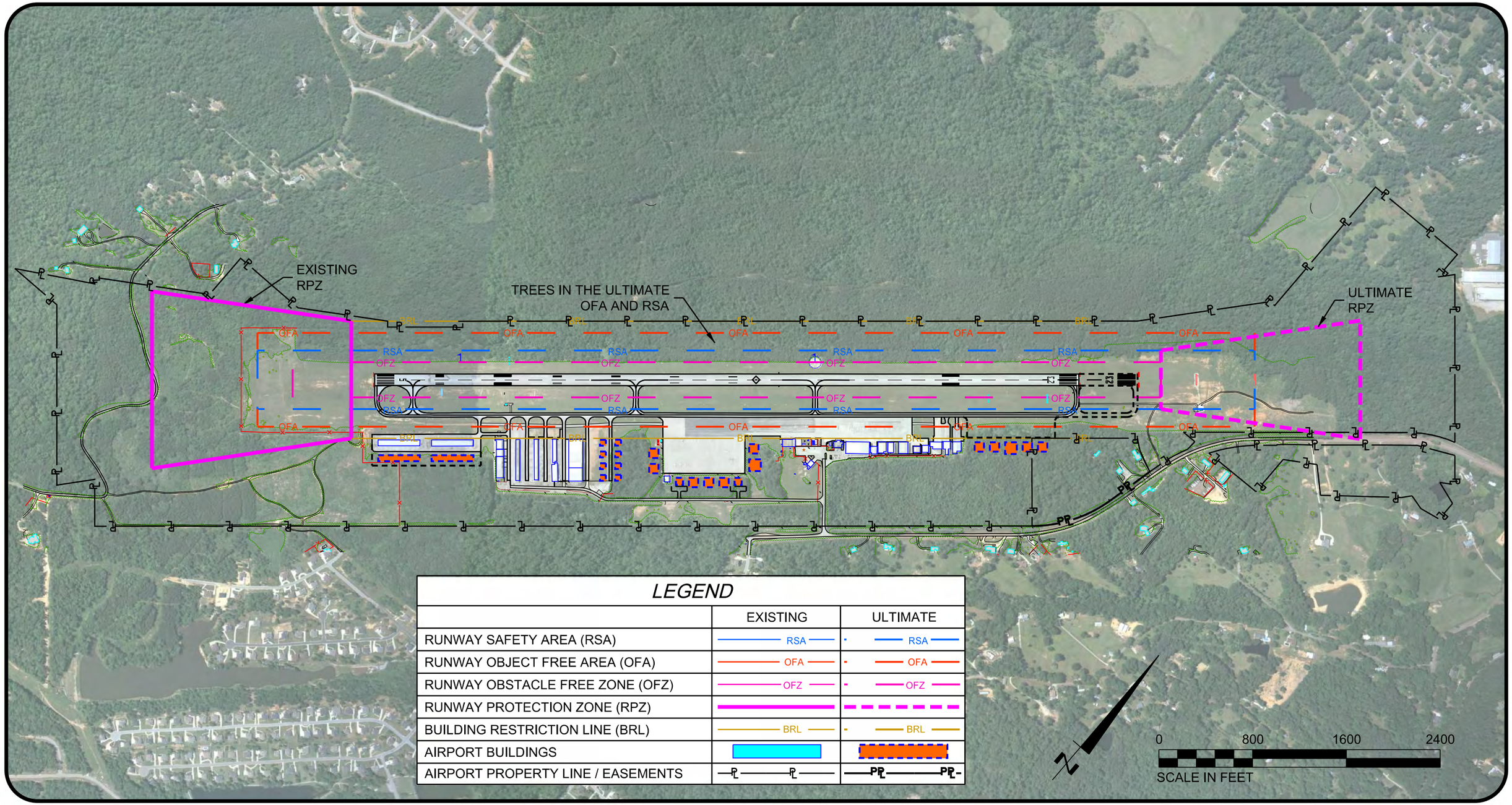
Table 5.2
Airport Design Standards Summary (Dimensions in Feet)

FAA Design Standard	Existing Conditions	AIRPLANE DESIGN GROUP II A&B Aircraft Approach Visibility 3/4 mile (Current RDC Standard)	AIRPLANE DESIGN GROUP II C&D Aircraft Approach Visibility 3/4 mile (Ultimate RDC Standard)
Runway Length	6,007	6,007	6,507
Runway Width	100	100	100
Runway Shoulder Width	10	10	10
Runway Safety Area Width	150	150	500 (contains trees)
Runway Safety Area Length	300	300	1,000
Runway Object Free Area Width	320	500 (contains trees)	800 (contains trees)
Runway Object Free Area Length	300	300	1,000
Primary Surface Width	500	500	1,000
Primary Surface Length	200	200	200
Runway Protection Zone Length	RW 05 - 1,700; RW 23 - 1,000	RW 05 - 1,700; RW 23 - 1,000	RW 05 - 1,700; RW 23 - 1,700
Runway Protection Zone Inner Width	RW 05 - 1,000; RW 23 - 500	RW 05 - 1,000; RW 23 - 500	RW 05 - 1,000; RW 23 - 500
Runway Protection Zone Outer Width	RW 05 - 1,510; RW 23 - 700	RW 05 - 1,510; RW 23 - 700	RW 05 - 1,700; RW 23 - 1,010
Runway Protection Zone Notes	Airport Owns/Controls RPZ	Airport Owns/Controls RPZ	Airport Owns/Controls Ultimate RPZ
Runway Centerline to:			
Parallel Taxiway/Taxilane Centerline	300	240	300
Aircraft Parking Apron	320	250	400
Building Restriction Line	500	500	500
Summary of Non-Standard Items		ROFA	RSA, ROFA, Apron



Existing Runway Design Standards

(ARC B-II, 3/4 Mile Visibility) Figure 5-1



Ultimate Runway Design Standards

(ARC D-II, 3/4 Mile Visibility) Figure 5-2

5.5.3 Runway Length

Analysis of existing users, as well as, the expected future fleet mix composition indicates the runway should be designed to accommodate Design Group II aircraft. This would include most of the general aviation aircraft in common use today, and use by smaller corporate jet aircraft. The runway length was calculated using FAA Advisory Circular 150/5325-4a, Airport Design Version 4.2 and the parameters as follows:

Airport and Runway Data		
A	Airport Elevation	701 Feet
B	Mean Daily Maximum Temperature of the Hottest Month	91° F
C	Maximum Difference in Runway Centerline Elevation	0 Feet
D	Length of Haul for Airplanes of more than 60,000 pounds	500 Miles

Runway Lengths Recommended for Airport Design	
Small Airplanes with Approach Speeds < 30 Knots	320 Feet
Small Airplanes with Approach Speeds < 50 Knots	860 Feet
Small Airplanes Less than 10 Passenger Seats	
75 % of these Small Airplanes	2,760 Feet
95% of these Small Airplanes	3,290 Feet
100% of these Small Airplanes	3,920 Feet
Small Airplanes with 10 or More Passenger Seats	4,410 Feet
Large Airplanes of 60,000 pounds or Less	
75% of these Large Airplanes at 60% Useful Load	4,780 Feet
75% of these Large Airplanes at 90% Useful Load	6,830 Feet
100% of these Large Airplanes at 60% Useful Load	5,670 Feet
100% of these Large Airplanes at 90% Useful Load	8,720 Feet
Airplanes of More than 60,000 pounds	Approximately 5,260 Feet

Source: AC 150/5325-4A, RUNWAY LENGTH REQUIREMENT FOR AIRPORT DESIGN. Including Change 6.

The Bessemer Municipal Airport has been identified as a general aviation reliever airport to the Birmingham International Airport (BHM). In addition to serving as a reliever airport, the Bessemer Municipal Airport supports the aviation needs of Bessemer and other surrounding communities in central Alabama. However, at the present time, the Bessemer Municipal Airport lacks the ability to fully meet the needs of the aviation community. Currently, the Airport's runway measures 6,007 feet in length and can accommodate small propeller-driven and jet aircraft. However, many of the jet aircraft that utilize the Airport are not able to optimize payloads and fuel quantity due to insufficient runway length. As a result, some aircraft operators have to make multiple trips to and from the Airport to transport passengers and cargo, or have to

make additional fuel stops between Bessemer and their final destination. As a result, a Runway Extension Justification Extension Report was prepared in 2004, which documented the need to extend the runway to 6,500 feet.

5.5.4 RUNWAY PROTECTION ZONE (RPZ)

The RPZ's function is to enhance the protection of people and property on the ground, by restricting land uses that would result in the congregation of people. Preventing these types of uses is best achieved through the airport sponsor's fee-simple ownership of the land within the RPZs. Based on the dimensions identified in Table 5.1, the RPZs for Runway 5 and Runway 23 are located within the airport property boundary (see Figure 5.1).

5.6 Instrument Approach NAVAIDs and Procedures

Instrument approach capability is predicated on the type of instrument approach NAVAIDs available at an airport and the approach procedures minimums established by the FAA. Runway 05 is equipped with an Instrument Landing System (ILS), which provides precision approach capabilities with a 200-foot ceiling and ¾ statute mile visibility minimum. RNAV (GPS) approaches are also available to each runway end, as well as a VOR approach. Table 5.3 summarizes the available instrument approach procedures at EKY. The approach capability at EKY is considered to be suitable for an Airport of its size, and there has been no explicit demand for additional facilities.

Table 5-3
Instrument Approach Procedures

Runway End	Approach Type	Approach Method	Minimum - Ceiling (AGL/Visibility
Runway 5	Precision	ILS	200' / 3/4 Mile
	Non-Precision	RNAV (GPS) - LPV	200' / 3/4 Mile
		VOR	480' / 1.25 Mile
Runway 23	Non-Precision	RNAV (GPS) - LPV	272' / 1 Mile

5.7 Taxiways

The taxiway system provides a link between the runway and other operational areas on an airport. An effective taxiway system provides for the orderly movement of aircraft and enhances operational efficiency and safely by reducing the potential for congestion, runway crossings, and pilot confusion.

5.7.1 Taxiway Design Standards

Similar to runways, taxiways are subject to FAA design requirements such as pavement width, edge safety margins, shoulder width, and safety and object free area dimensions. The FAA standards in relation to taxiways (as defined in AC 150/5300-13 *Airport Design*) are described below.

Taxiway Width – The physical width of the taxiway pavement.

Taxiway Edge Safety Margin – The minimum acceptable distance between the outside of the airplane wheels and the pavement edge.

Taxiway Shoulder Width – Taxiway shoulders provide stabilized or paved surfaces to reduce the possibility of blast erosion and engine ingestion problems associated with jet engines which overhang the edge of the taxiway pavement.

Taxiway/Taxilane Safety Area (TSA) – The TSA is located on the taxiway centerline and shall be cleared and graded, properly drained, and capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

Taxiway/Taxilane Object Free Area (TOFA) – The TOFA is centered on the taxiway centerline and prohibits service vehicle roads, parked airplanes, and above ground objects, except for objects that need to be located in the TOFA for air navigation or aircraft ground maneuvering purposes.

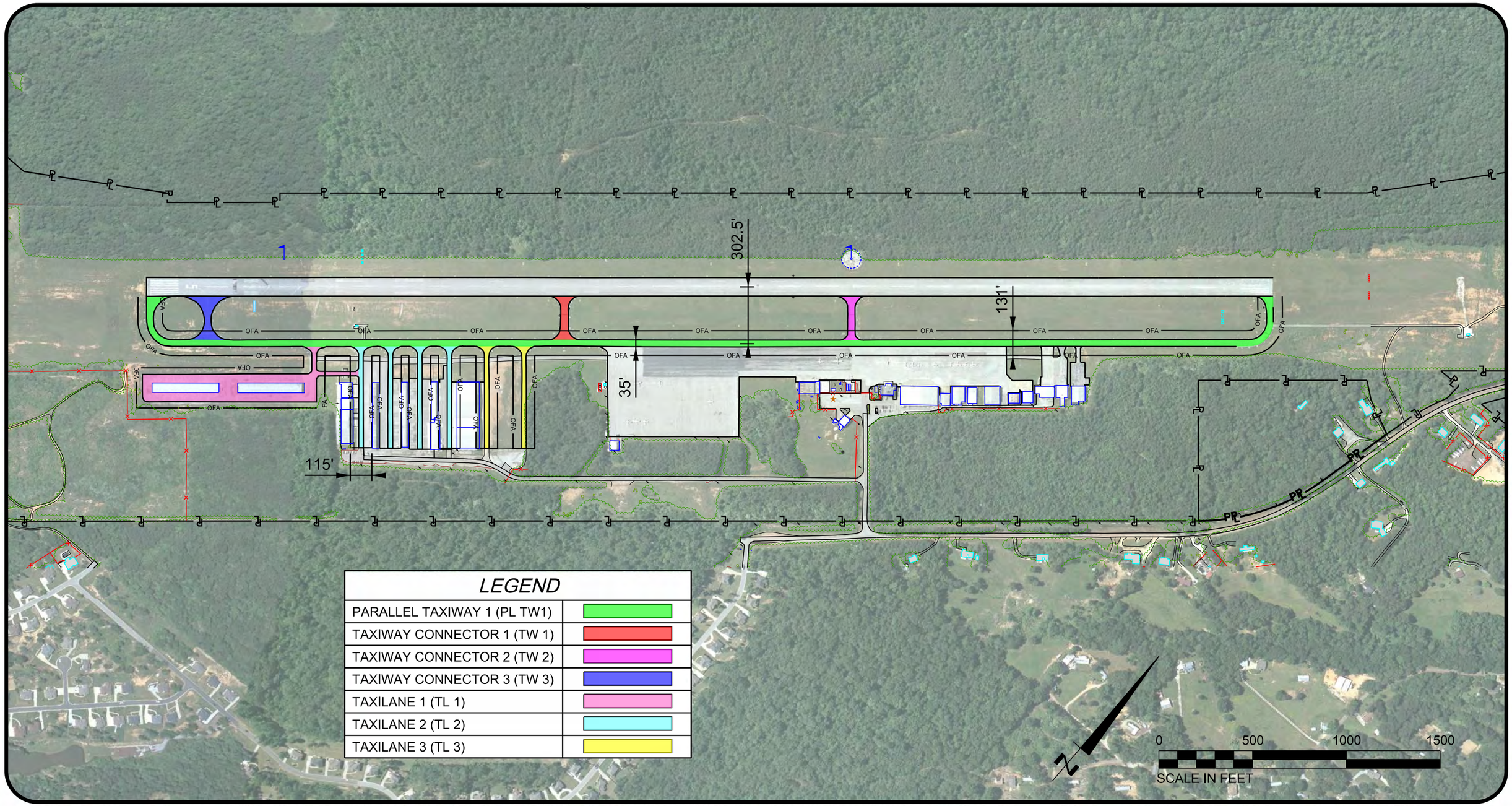
Taxiway Separation Standards – Separation standards between the taxiways and other airport facilities are established to ensure operational safety of the airport and are as follows:

- Taxiway centerline to parallel taxiway/taxilane centerline
- Taxiway centerline to fixed or movable object

The dimensions for each of these standards vary according to the group of aircraft the taxiways are intended to accommodate. Table 5.4 identifies the existing taxiway conditions at EKY and the geometric requirements of the above standards relative to Airplane Design Group II. Figure 5-3 depicts these standards as they currently exist at EKY. The existing taxiway is constructed of bituminous asphalt and meets the design standards of ADG-II. The existing taxiway system is adequate for current activities as well as capable to serve EKY throughout the planning period.

Table 5.4
Taxiway Design Standards Summary (Dimensions in Feet)

FAA Design Standard	Existing Conditions	Airplane Design Group II
Taxiway Width	35	35
Taxiway Safety Area Width	79	79
Taxiway Object Free Area Width	131	131
Taxilane Object Free Area Width	115	115
Taxiway Separation		
Taxiway Centerline to Fixed or Movable Object	65.5	65.5
Taxilane Centerline to Fixed or Movable Object	57.5	57.5



Existing Taxiway Design Standards Figure 5-3

5.8 Airfield Pavement Strength and Condition

Knowing the strengths and conditions of an airfield's pavements is critical for an airport to evaluate potential for new aircraft or increased operations and manage pavement maintenance operations.

5.8.1 Pavement Strength

Pavement strength requirements for airfield pavements are related to design aircraft weight. According to the FAA Airport Master Record (5010), the runway has a reported load bearing capacity of 60,000 pounds for aircraft with single-wheel and duel-wheel landing gear configurations. Based on the ultimate design aircraft for a Gulfstream IV, it is recommended that when the runway receives an overlay/rehabilitation the pavement have a load bearing capacity of 90,000 pounds for duel-wheel landing gear.

5.8.2 Pavement Condition

The type and timing of needed pavement maintenance and repair is based on a structural integrity evaluation metric called the Pavement Condition Index (PCI). Pavements are evaluated in logical inspection units then given a rating number of 0 – 100, with 100 representing the pavement being in excellent condition.

A PCI study of the airfield pavements at EKY was conducted in 2008 by the Alabama Department of Transportation (ALDOT) – Aeronautics Bureau. The pavement maintenance program rated the terminal apron and taxilanes as "poor". As a result, a portion of the terminal apron has recently received a major rehabilitation. The remaining terminal apron and taxilanes are scheduled for rehabilitation over the next couple of years. The runway, parallel taxiway, and taxiway connectors are considered to be in "satisfactory " to "good" condition, with exception of parallel taxiway 2 which received a "poor" rating. Preventative maintenance such as crack sealing rejuvenation will be needed to extend the life of these pavements. Figure 5.4 depicts the pavement surfaces and includes the Pavement Condition Index (PCI).

5.9 Airfield Lighting and Ground Navigation

Airports utilize a wide array of navigational systems to aid pilots in maneuvering about the airfield. The placement and conditions of the lighting, signage, and pavement markings were evaluated to determine if any improvements are required.

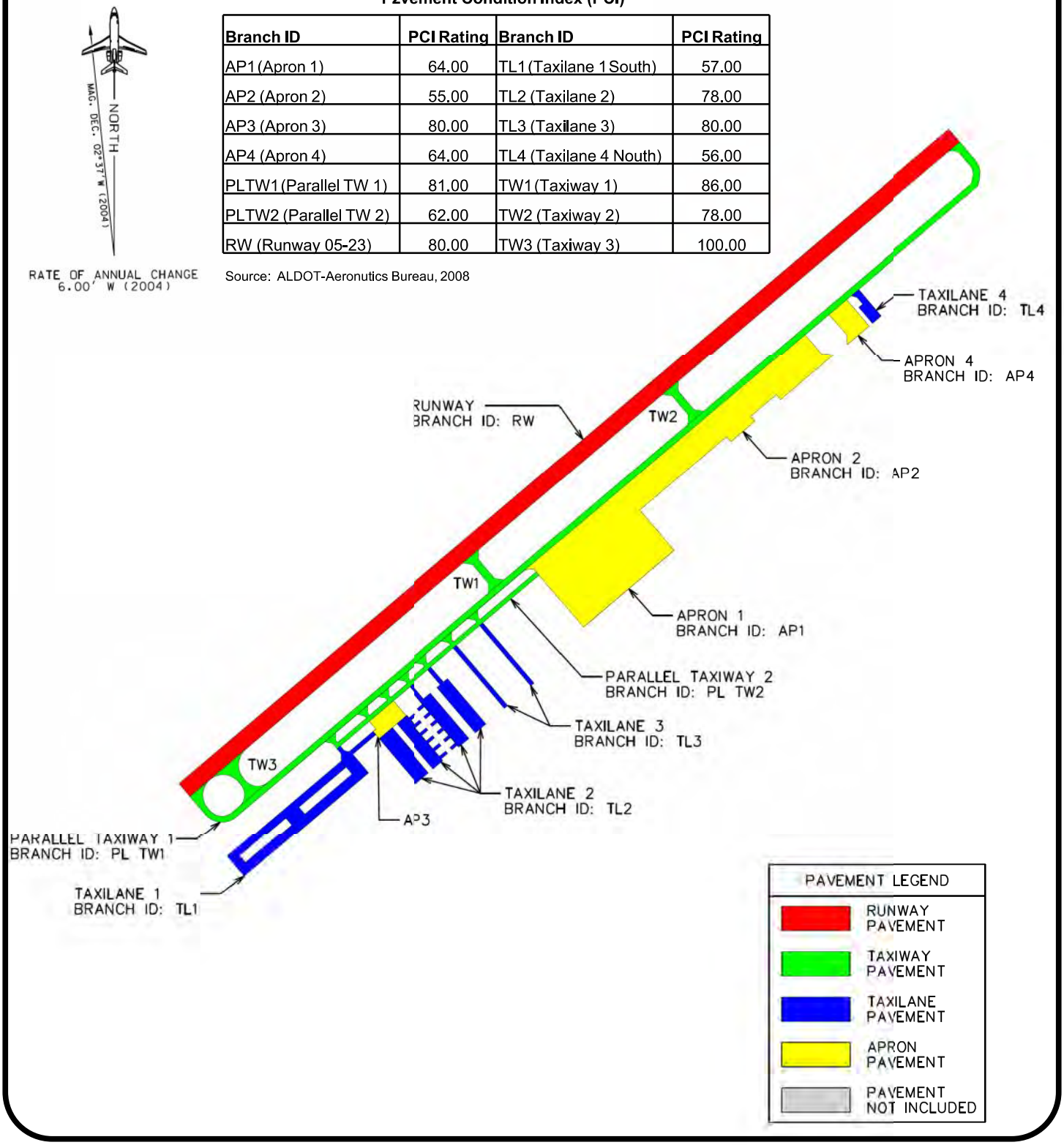
5.9.1 Airfield Lighting

The runway is equipped with high-intensity runway edge lights (HIRL), threshold lights, and end lights. Taxiways are lighted by medium-intensity taxiway lights (MITL). All runway and taxiway lighting systems are considered to be in good condition and are consistent with precision approach runway requirements, and aside from routine maintenance, should be adequate through Stage II of the planning period. However, it is recommended that the HIRL and MITL be replaced during Stage III.

Table 5.5
Pzvement Condition Index (PCI)

Branch ID	PCI Rating	Branch ID	PCI Rating
AP1 (Apron 1)	64.00	TL1 (Taxilane 1 South)	57.00
AP2 (Apron 2)	55.00	TL2 (Taxilane 2)	78.00
AP3 (Apron 3)	80.00	TL3 (Taxilane 3)	80.00
AP4 (Apron 4)	64.00	TL4 (Taxilane 4 Nouth)	56.00
PLTW1 (Parallel TW 1)	81.00	TW1 (Taxiway 1)	86.00
PLTW2 (Parallel TW 2)	62.00	TW2 (Taxiway 2)	78.00
RW (Runway 05-23)	80.00	TW3 (Taxiway 3)	100.00

Source: ALDOT-Aeronutics Bureau, 2008



Airfield Pavement Surfaces Figure 5-4

5.9.2 Signage

Runways and taxiway signage is in place for the purpose of providing pilots directional guidance to ensure safe and efficient movement of aircraft and ground vehicles on the airfield. Existing airfield signage is considered to be in good condition and meets all of the current FAA requirements. Any changes to the airfield geometry, such as new or reconfigured taxiways, may however require alteration of, or addition to, the existing signage.

5.9.3 Pavement Markings

Pavement markings are critical in providing visual guidance to the various areas of the airport and preventing incursions on the airfield. A lack of necessary markings or deterioration of markings can result in confusion of pilots navigating the airfield. All markings are marked in accordance with AC 150/5340-1K *Standards for Airfield Markings*, and are considered to be in good condition. A re-marking project is recommended during Stage II.

5.10 On Field Weather Data

The Airport has an Automated Weather Observation System (AWOS), which allows aircraft licensed under FAR Part 135 (air taxi/charter) to operate in IFR conditions. The AWOS provides adequate weather data to support airport operations in both visual and instrument conditions. The AWOS is recommended to be relocated during Stage I to provide room for future hangar development.

5.11 Corporate and General Aviation Requirements

The purpose of this section is to determine the space requirements needed during the planning period for the following types of facilities normally associated with corporate and general aviation terminal areas:

- Hangars
- Local and Itinerant Apron
- General Aviation/FBO Terminal Building
- Vehicle Parking

5.11.1 HANGARS

Predicated on historical data and conversations with the Bessemer Municipal Airport, the development of additional hangars for single and twin-engine aircraft will be needed to accommodate the hangar waiting list, as well as the future based aircraft demand. The consultant estimated that there is a potential for an approximate 70 percent hangared and 30 percent non-hangared based aircraft relationship which is expected to hold relatively constant throughout the forecast period (through 2032).

As part of this study, several options were examined for additional hangar development. The recommended hangar development, as presented on Table 5.5 will provide (2) 10 unit T-hangars, (2) 50’x50’ storage hangars, (1) 60’x60’ storage hangars, and (1) 80’x80’ storage hangar. However, for long term planning considerations, the ALP depicts additional hangars that could

be developed based on future aircraft demand. Hangar development options are depicted and described in further detail in Chapter 6 – Development Alternatives.

5.11.2 AIRCRAFT PARKING APRON

Adequate aircraft parking apron should be provided to accommodate those local aircraft not stored in hangars, as well as transient aircraft. In determining future apron requirements, it is necessary to examine local and transient tie-down facilities as separate entities. The local apron should at least meet the demand established by the non-hangared based aircraft. Transient parking requirements can be determined from knowledge of busy day operations.

The apron can be divided into three sections identified as the east apron, west apron, and southwest apron. The east apron, located directly in front of and to the east of the terminal building, has approximately 243,004 square feet available for aircraft parking. Currently, there are 25 tie-down spaces available on the east apron. The apron west of the terminal building has approximately 161,817 square feet available for aircraft parking. The third apron area is southwest of the terminal building. This apron has approximately 222,130 square feet available for aircraft parking.

From a planning – as well as an aviation demand – standpoint, the apron area(s) will not require future expansion to accommodate aviation demand activity, but mere pavement maintenance projects to ensure further efficient utilization.

The pavement maintenance program developed by the ALDOT Aeronautics Bureau rated the terminal apron pavement at a Pavement Condition Index (PCI) of 55 which is the critical PCI indicating that the apron needs major rehabilitation and is beyond the state of routine maintenance. Therefore, a pavement rehabilitation is recommended in Stage I for the entire apron area.

5.11.3 TERMINAL BUILDING

A general aviation/FBO terminal building has several functions which include providing space for passenger waiting, pilot's lounge and flight planning, concessions, storage, and various other needs. This space is not limited to a single, separate terminal building, but also includes the space offered by fixed base operators for these functions and services. The 3,000 square foot terminal building is located on the south side of the runway. Recognizing that the existing terminal has sufficient capacity to meet the forecast requirements, the primary objective will be to update the interior. Although the identification of specific interior projects are beyond the scope of this Master Plan Update, some projects could include upgrading signage, replacing carpeting, and updating finishes.

5.11.4 AUTO PARKING

The area designated for auto parking in front of the terminal building accommodates approximately 62 vehicles, which is sufficiently sized to accommodate future demand. Auto parking will require adjustments as levels of passengers using the facility increase and as the level of service increases. The parking area pavement is considered to be in "satisfactory " to "good" condition.

A crack sealing and rejuvenation is recommended in Stage II in order to extend the life of these pavements.

5.12 Fuel Storage

The location and capacity of fuel storage facilities depends largely upon the airport's operations activity and management procedures. The Airport Authority owns and operates two 10,000 gallon fuel tanks for Jet A and 100 Low Lead Avgas. Fuel delivery to aircraft is provided by mobile refuelers that are parked adjacent to the fuel farm when not in use. The Airport Authority should add fuel storage capacity as demand dictates.

5.13 Land Acquisition

No additional land acquisition in needed for the proposed runway extension and runway protection zones. However, approximately 12 acres of property located adjacent to Aviation road south of the existing hangar development area is depicted to be acquired. Acquiring this property would square up the airport property boundary and give the airport control of all the property located north of Aviation Road. In addition, a small portion of this property is needed for future hangar development.

5.14 Airport Security

In May of 2004, the Transportation Security Administration (TSA) developed *Security Guidelines for General Aviation Airports*. According to the TSA website, "this listing of recommended guidelines or "best practices" was designed to establish non-regulatory standards for general aviation airport security. Their primary purpose is to help prevent the unauthorized use of a general aviation aircraft in an act of terrorism against the United States…*Security Guidelines for General Aviation Airports* constitutes a set of federally endorsed guidelines for enhancing airport security at GA facilities throughout the nation. It is intended to provide GA airport owners, operators, and users with guidelines and recommendations that address aviation security concepts, technology, and enhancements."

The *Security Guidelines for General Aviation Airports* provides a measurement tool that is used to assess vulnerability characteristics of each general aviation airport. The TSA's measurement tool applies points and ultimately a total score to each type of facility based on a variety of characteristics including its location relative to sensitive sites and to mass population areas, type and number of based aircraft, runway length, and also relative to the number and types of operations conducted. An evaluation of the Bessemer Municipal Airport using the TSA's measurement tool revealed that due to the types and frequency of operational activity etc., the overall score given to the Airport was a 46. By comparing this score (i.e., points) versus suggested guidelines shown in Table 5-5 below, it is recommended that the Bessemer Municipal Airport implement all security procedures and recommendations described in the *Security Guidelines for General Aviation Airports*. It should be reiterated that these are recommended best practices and not necessarily requirements; however, since the TSA document is the only guidance available for identifying security standards at general aviation airports, it was utilized to establish security requirements for the Bessemer Municipal Airport. Proposed security

procedures to enhance airport security include card reader gates and fencing, to better control access to the airfield.

While it would be beneficial for security improvements to be implemented at the Bessemer Municipal Airport, such improvements can be extremely expensive and require additional staff for monitoring. The FAA and airport owners typically must prioritize funding for key airfield projects (pavement rehabilitations, runway extensions, tree obstruction removal, etc.), with limited money remaining for security improvements. Overall, the Bessemer Airport Authority should compare the information in *Security Guidelines for General Aviation Airports* against existing security procedures and features at the Airport to determine if feasible improvements may be warranted for the short or long-term.

TABLE 5-5
TSA Suggested Security Enhancements for General Aviation Airports

Points/Suggested Guidelines			
>45	25-44	15-24	0-14
• **Fencing** (Section 3.3.3) • **Hangars** (Section 3.3.1) • **CCTV** (Section 3.4.5) • **Intrusion Detection System** (Section 3.4.6)			
• **Access Controls** (Section 3.3.3) • **Lighting System** (Section 3.3.4) • **Personnel ID system** (Section 3.3.6) • **Vehicle ID system** (Section 3.3.6) • **Challenge Procedures** (Section 3.4.1)			
• **LEO Support** (Section 3.4.4) • **Security Committee** (Section 3.4.3) • **Transient Pilot Sign-In/Out Procedures** (Section 3.1.4)			
• **Signs** (Section 3.3.5) • **Documented Security Procedures** (Section 3.5.1) • **Positive Passenger/Cargo/Baggage ID** (Section 3.1.1) • **All Aircraft Secured** (Section 3.2) • **Community Watch Program** (Section 3.4.1) • **Contact List** (Section 3.5.3)			

Source: TSA Security Guidelines for General Aviation Airports, Appendix

5.15 Airspace Protection (FAA Part 77 Surfaces)

As directed by Federal Aviation Regulation (FAR) Part 77 *Obstructions to Navigable Airspace,* imaginary surfaces around the airfield are established for determining obstructions to air navigation. These surfaces can vary in shape, size, and slope depending on the available approach procedures to each runway end. Any penetration of these imaginary surfaces, either manmade or natural, are identified as obstructions and must be evaluated by the FAA to determine if they present a hazard to air navigation. If determined to be a hazard, the obstacle should be removed or altered to mitigate the penetration. If not mitigated appropriately, the obstacle could adversely affect approach and departure minimums and/or procedures. Based on the instrument approach capabilities described in Section 5.6 and the requirements of FAR Part 77, the imaginary surfaces for the Bessemer Municipal Airport are described as follows:

Primary Surface – This surface is longitudinally centered on the runway and the elevation of any point on the surface is the same as the elevation of the nearest. For Runway 05/23, this surface is 1,000 feet wide and extends 200 feet beyond the end of pavement.

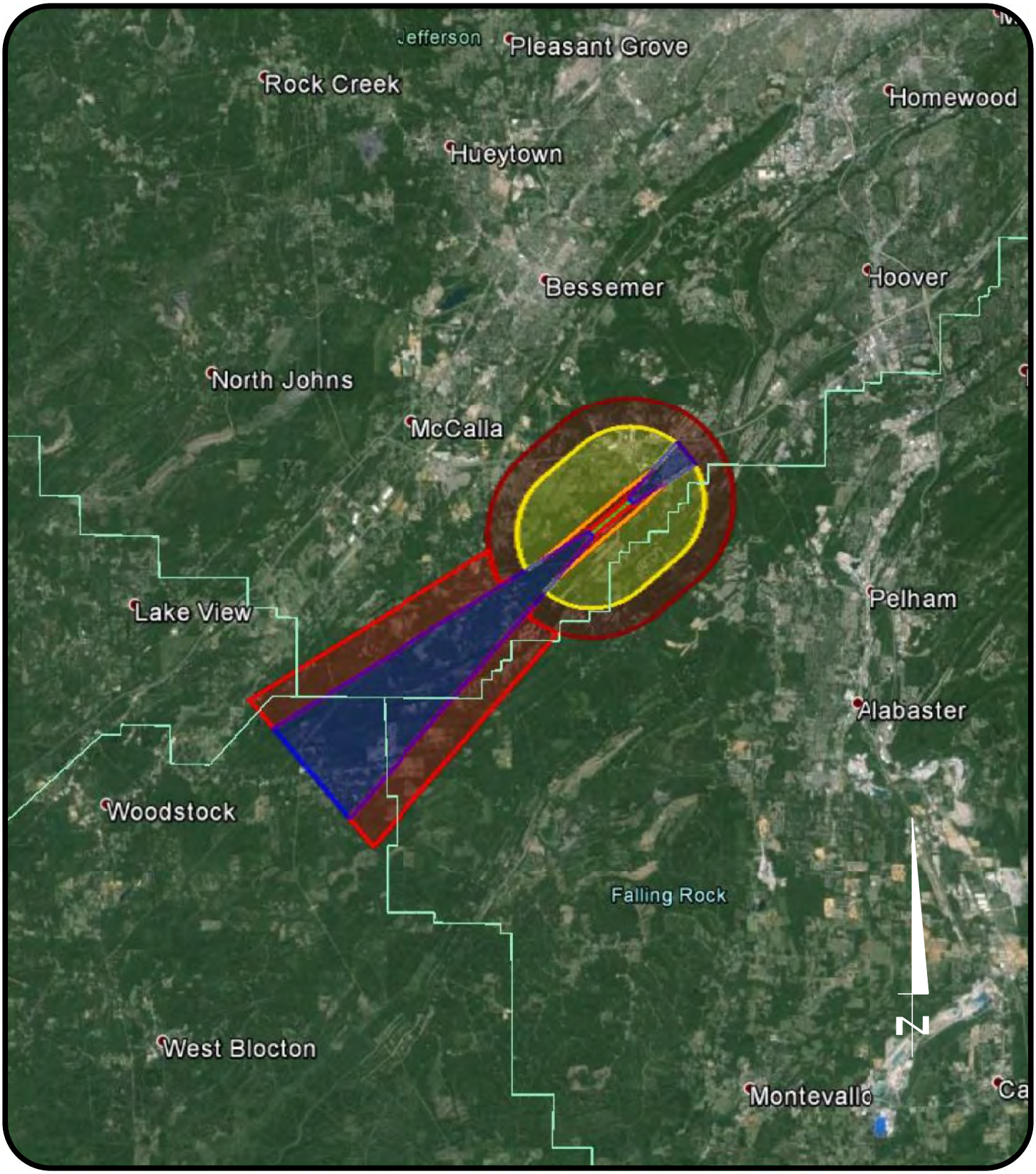
Approach Surface – This surface is longitudinally centered on the runway and extends outward and upward from the end of the Primary Surface. An Approach Surface is applied to each end of each runway based upon the type of approach available or planned for that runway end. The inner width of the Approach Surface is the same width of the Primary Surface. The Approach Surface extends at a specific slope to a uniform width and distance based on the approach capabilities of the runway. For the Runway 05 end, this surface is 50,000 feet in length, at a slope of 50 to 1 for the first 10,000 feet and a slope of 40:1 for the additional 40,000 feet at an outer width of 16,000 feet. For the Runway 23 end, this surface is 10,000 feet in length, at a slope of 34:1 and an outer width of 4,000 feet.

Transitional Surface – This surface extends outward and upward from the sides of the Primary Surface and from the sides of the Approach Surfaces at a slope of 7 to 1 up to the height of the Horizontal Surface. For those portions of the Precision Approach Surface that extend beyond the limits of the Conical Surface, the Transitional surface extends 5,000 feet horizontally from the edge of the Approach Surface.

Horizontal Surface – This surface is a horizontal plane 150 feet 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 and connecting the adjacent arcs by lines tangent to those arcs. The Horizontal Surface extends 10,000 feet from the ends of the runway, at an elevation of 851.2 feet MSL.

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

These surfaces are illustrated in Figure 5.5.



Part 77 Surfaces Figure 5-5

5.16 Summary

This chapter identified the Bessemer Municipal Airport's development needs for existing and anticipated activity levels. Although, the majority of the existing facilities at the Bessemer Municipal Airport are capable of meeting the forecasted demand throughout the planning period; some will need to be improved or expanded in order to adequately service airport patrons. The following summarizes the recommendations presented in this chapter and Table 5-1 provides a tabulation of the proposed facilities.

Property / Land Use

- Acquire approximately 12 acres of property adjacent to Aviation Road for future hangar development.
- Preserve and promote compatible land use for the proposed runway extension.
- Continue to work with local government entities to sustain compatible land use around the airport
- Continue to preserve and protect airspace surrounding the airfield

Airfield

- Preserve the capability for the airfield to meet ultimate D-II design standards
- Continue routine maintenance of airfield pavements
- Complete 500 foot runway extension on RW 23 end
- Complete 500 foot parallel taxiway extension in conjunction with RW 23 extension
- Relocate AWOS

Landside

- Rehab apron and taxilane pavements
- Preserve space for hangar development on the south side of the airfield
- Provide for additional T-Hangars and corporate/storage hangars on as "as needed" basis, evidence of demand increases

Table 5-6

Facility Requirements

Bessemer Municipal Airport

Item	Existing	Stage I (0-5 Yrs)	Stage II (6-10 Yrs)	Stage III (11-20 Yrs)
1. Terminal	3,000 SF	N/C	N/C	N/C
2. Auto Parking	62 Spaces	N/C	Crack Seal	N/C
3. Apron	160,000 SF	Pavement Rehab – Phase I (1100'x220') Pavement Rehab – Phase II (700'x220') Pavement Rehab – Phase III (700'x535')	N/C	N/C
4. Tiedowns	25	N/C	N/C	N/C
5. Hangars				
T-Type	1- 6 (Unit) 1- 4 (Unit) 1-11(Unit) 1-12 (Unit) 2-16 (Unit)	1- (10 Unit)	1- (10 Unit)	N/C
Corporate/Storage	15	1(60'x60')	2(50'x50')	1(80'x80')
Maintenance	1(100'x200')	N/C	N/C	N/C
6. Runway 5/23 Extension Widening Maintenance Overlay	6007'x100'	 N/C N/C Crack Seal	 6,507' N/C Re-Marking	 N/C N/C N/C Overlay/Rehab
7. Taxiway	Full Parallel/Connectors	N/C	N/C	N/C
a) Length			N/C'	Overlay
b) Width	35'	35'	35'	35'
8. Taxilanes		T-Hangar Taxilane Rehab	N/C	N/C
8. NAVAIDS/Visual Aids	Rotating Beacon, Lt. Wind Cone/Segmented Circle, PAPI-4L RWY 5/23 REILS RWY 5/23	N/C	N/C	N/C

9. Weather Aids	AWOS	Relocate AWOS	N/C	N/C
10. Approach	ILS RWY 05 RNAV (GPS) RWY 05 & 23	N/C	N/C	N/C
11. Lighting	HIRL, MITL	N/C	N/C	HIRL/MITL
12. Fuel	1-Gal. AVGAS Tank 1-Gal. Jet A	N/C	N/C	N/C
13. Land Acquisition		N/C	N/C	12 acres depicted for hangar development
14. Security Enhancements		Security Fence/Gates/Card Readers	N/C	N/C

CHAPTER 6
DEVELOPMENT ALTERNATIVES

6.1 Introduction

In the previous chapter, facility needs for the twenty-year planning horizon were identified. Having quantified these needs, the next step in the planning process is to identify and evaluate the various ways these facilities can be provided. As noted in the facility requirements evaluation, current and long term planning for the Bessemer Municipal Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft.

In this chapter, airport development alternatives are considered for the airport, where applicable. The ultimate goal is to develop the underlying rationale which supports the final recommended Master Plan development concept. Through this process, an evaluation of the most realistic and best uses of airport property is made while considering local development goals, physical and environmental constraints, and appropriate federal airport design standards.

The development alternatives for the Bessemer Municipal Airport can be categorized into two functional areas: airside (runways, taxiways, navigational aids, etc.) and landside (general aviation hangars, aprons, taxilanes, terminal area, etc.) Other items such as lighting improvements and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative. Resulting facility requirement improvements will be integrated and depicted on the updated airport layout drawing set (ALP). In addition, a detailed capital improvement program will be created that identifies and prioritizes specific projects that can be implemented.

6.2 No Action Alternative

In addition to proactive options that are designed to respond to future facility needs, a "no-action" option also exists, in which the Airport may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a "maintenance-only" mode.

The primary result of this alternative, as with any growing transportation market, would be the eventual inability of the airport to satisfy the increasing demands of the airport service area. As a result, the no-action alternative is inconsistent with the management and development policies of the Bessemer Municipal Airport and its long –established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable.

6.3 Airside Development Alternatives

The main component of the airside development options is a 500-foot extension of Runway 05/23 that would increase the current runway length of 6,007 feet to 6,507 feet. The existing 6,007 foot runway can accommodate small propeller-driven and jet aircraft. However, many of the jet aircraft that utilize the Airport are not able to optimize payloads and fuel quantity due to insufficient runway length. The lengthening of Runway 05/23 would allow larger aircraft to operate at higher useful load rates and accommodate longer haul distances. A Runway Extension Justification Study was completed in 2004 that documented over 500 annual itinerant operations requiring the additional length.

In this case, the extension of either end of Runway 05/23 was the dominant criteria differentiating the available airside development alternatives. After careful evaluation of the economic impacts, environmental impacts, and design considerations, an alternative will be selected that will meet the facility requirements set forth in Chapter 5. Such an alternative will be presented in this section as the Preferred Alternative.

6.3.1 Alternative 1 (Runway 23 Extension)

Alternative 1 would construct a 500 foot long extension at the approach end of Runway 23 for a total runway length of 6,507 feet, construct a 500 foot long extension to the parallel taxiway, improve the Runway 23 Safety Area (RSA), and relocate/install the necessary navigational aids for the operation of this extended runway. This alternative would also require the localizer antennae to be relocated. The following maintenance items are also recommended for this alternative: Overlay/Rehab of Runway 5/23 and all associated taxiways and replacement of HIRL and MITL. Alternative 2 will not require acquisition of property for the ultimate Runway 05 RPZ. The following elements which are depicted in Figure 6-1, are included as part of Alternative 1:

- construct 500-foot long, 100 foot-wide extension at the approach end of Runway 23;
- extend the parallel taxiway by 500 feet;
- extend the non-paved runway safety area off the approach end to Runway 23. The dimensions of the runway safety area will be 1,000 feet in length by 500 feet in width;
- relocate the threshold lights and PAPIs in conjunction with the runway extension;
- relocate the localizer in conjunction with the runway extension;
- Overlay/Rehab Runway 05/23 and associated taxiways
- Replacement of HIRL and MITL

6.3.2 Alternative 2 (Runway 05 Extension)

Alternative 2 would construct a 500 foot long extension at the approach end of Runway 05 for a total runway length of 6,507 feet, construct a 500 foot long extension to the parallel taxiway, improve the Runway 05 Safety Area (RSA), and relocate/install the necessary navigational aids for the operation of this extended runway. The following maintenance items are also recommended for this alternative: Overlay/Rehab of Runway 5/23 and all associated taxiways and replacement of HIRL and MITL. Alternative 2 will not require acquisition of property for the ultimate Runway 05 RPZ. The following elements which are depicted in Figure 6-2, are included as part of Alternative 2:

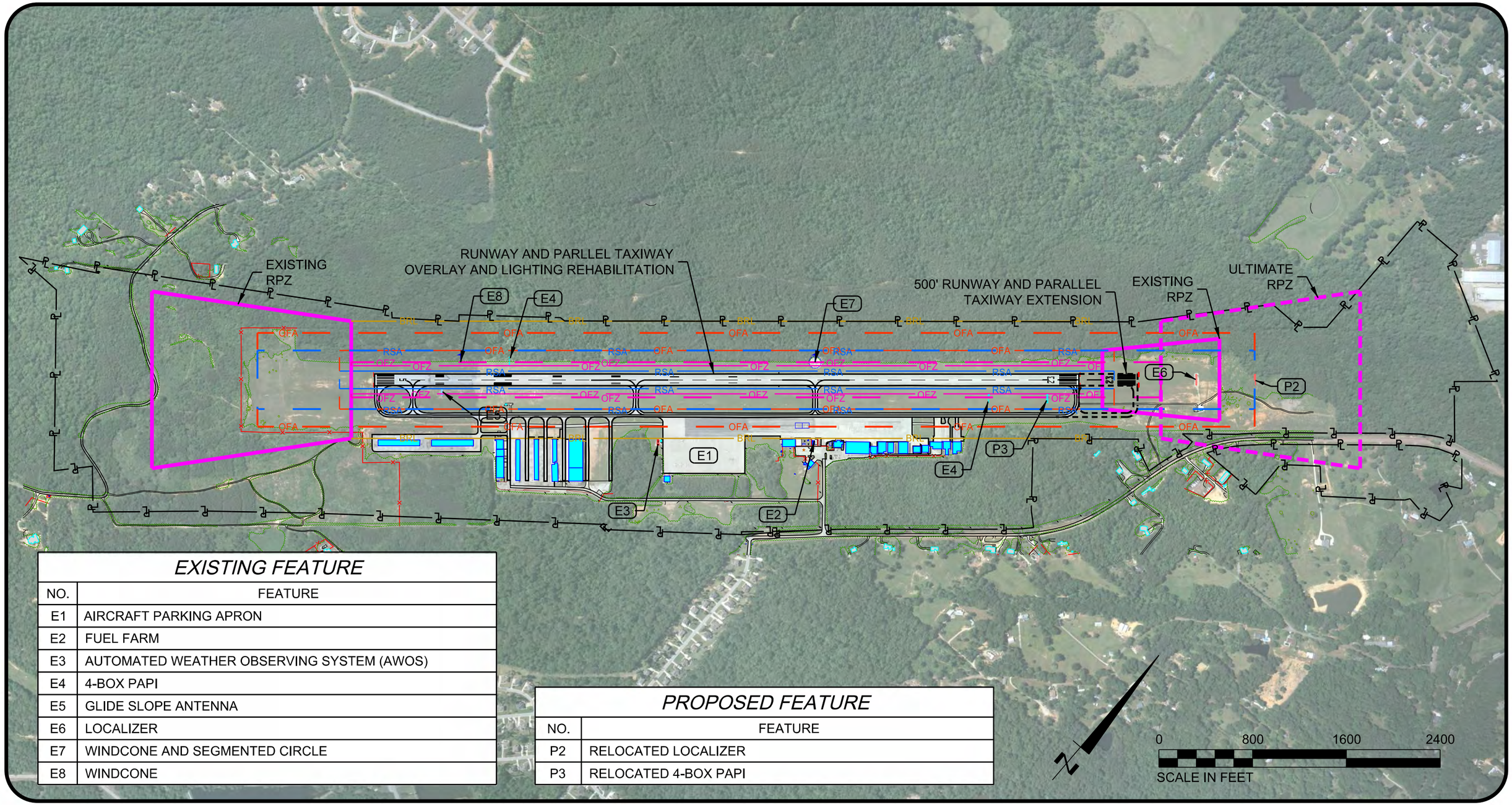
- construct 500-foot long, 100 foot-wide extension at the approach end of Runway 05;
- extend the parallel taxiway by 500 feet;
- extend the non-paved runway safety area off the approach end to Runway 05. The dimensions of the runway safety area will be 1,000 feet in length by 500 feet in width;
- relocate the threshold lights and PAPIs in conjunction with the runway extension;
- relocate the glideslope in conjunction with the runway extension;
- Overlay/Rehab Runway 05/23 and associated taxiways
- Replacement of HIRL and MITL

6.4 Airside Development Cost

Table 6-1, Airside Development Costs Comparison, provides an order of magnitude of the development costs for each of the two airside alternatives. As shown in the table, the estimated cost of alternative 1 is $6,589,246 and the cost for Alternative 2 is $9,848,626.

Table 6-1
Airside Development Costs Comparison

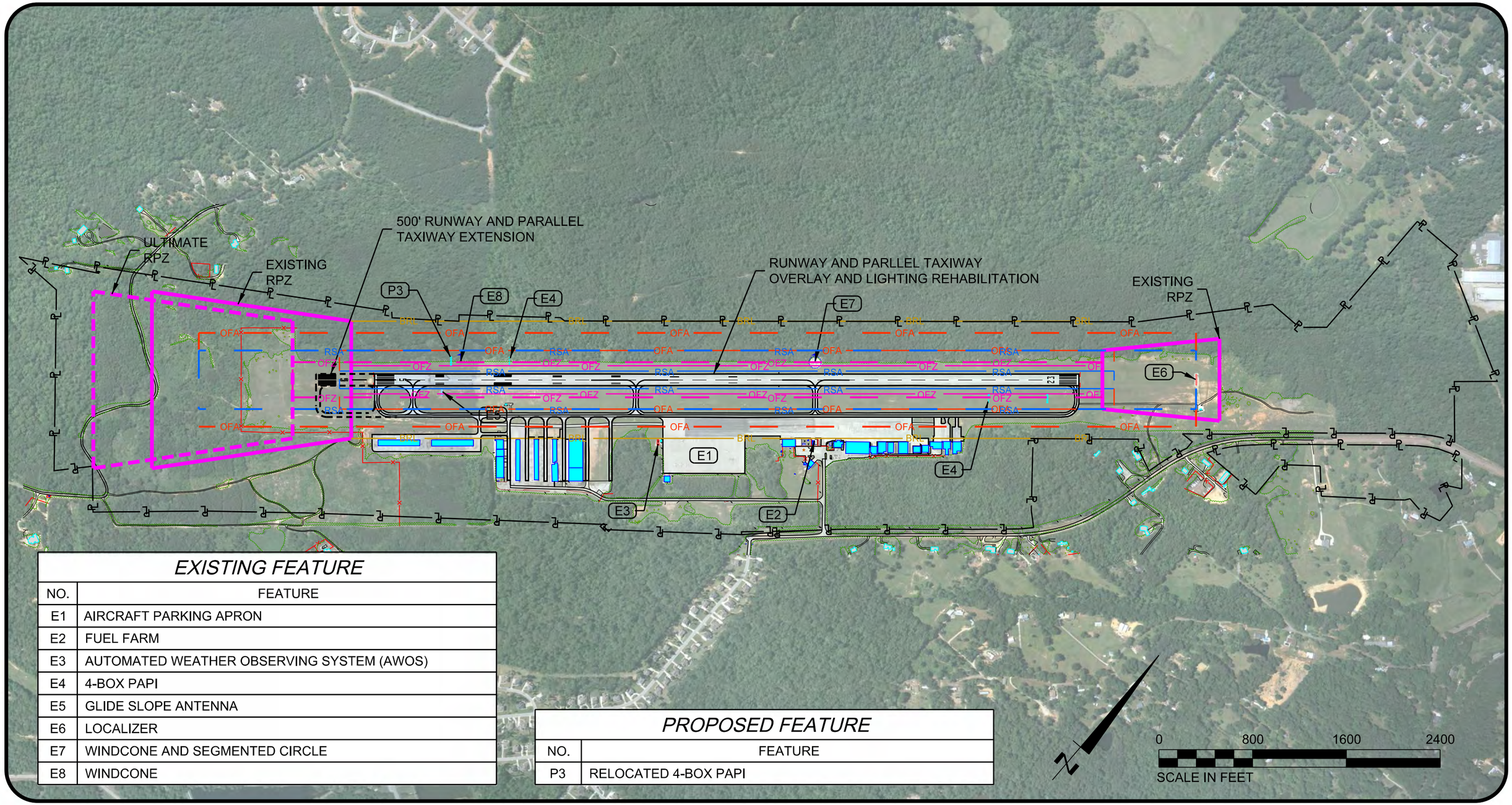
Item	Alternative 1 (RW 23 Ext.)	Alternative 2 (05 Ext.)
Runway Extension (500') including RSA Improvements	$1,814,385	$3,631,835
Taxiway Extension (500')	$986,653	$1,885,353
Overlay/Rehab. Runway	$1,326,000	$1,326,000
Overlay/Rehab. Taxiways	$706,000	$706,000
Relocate Electrical (PAPIS Threshold Lights)	$8,000	$8,000
Replace HIRL/MITL	$500,000	$500,000
Land Acquisition	N/A	N/A
Relocate Localizer	$150,000	N/A
Relocate Glideslope	N/A	$150,000
Airside Total	$5,491,038	$8,207,188
Engineering & Contingencies 20%	$1,098,208	$1,641,438
Total Airside Costs	$6,589,246	$9,848,626



EXISTING FEATURE	
NO.	FEATURE
E1	AIRCRAFT PARKING APRON
E2	FUEL FARM
E3	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)
E4	4-BOX PAPI
E5	GLIDE SLOPE ANTENNA
E6	LOCALIZER
E7	WINDCONE AND SEGMENTED CIRCLE
E8	WINDCONE

PROPOSED FEATURE	
NO.	FEATURE
P2	RELOCATED LOCALIZER
P3	RELOCATED 4-BOX PAPI

Alternative 1 - Airside Development Figure 6-1



EXISTING FEATURE	
NO.	FEATURE
E1	AIRCRAFT PARKING APRON
E2	FUEL FARM
E3	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)
E4	4-BOX PAPI
E5	GLIDE SLOPE ANTENNA
E6	LOCALIZER
E7	WINDCONE AND SEGMENTED CIRCLE
E8	WINDCONE

PROPOSED FEATURE	
NO.	FEATURE
P3	RELOCATED 4-BOX PAPI

Alternative 2 - Airside Development Figure 6-2

6.5 Landside Development Alternatives

The purpose of this section is to identify and evaluate various viable landside development alternatives at the Bessemer Municipal Airport to meet program requirements set forth in Chapter 5. Generally, the primary functions to be accommodated on the landside at an airport include terminal services, aircraft storage hangar development, aircraft parking aprons, and automobile parking and access. The interrelationship of these functions is important to defining a long range landside layout for general aviation uses at the airport. However, the focus of land side development at the Bessemer Municipal Airport will consist mainly of additional hangar development. As stated previously in the facility requirements chapter, the terminal building, aircraft parking aprons, and automobile parking and access are sufficient to meet the needs of the airport during the planning period.

The planned development of the Bessemer Municipal Airport has traditionally been focused on the south side of the airport. This is due to the north side's existing topographical conditions and the cost associated with any planned future north development. Any development on the north side would require the construction of a parallel taxiway to support any planned hangar development. However, the terrain on the north side is characterized by a severe grade drop and would require a large amount of fill material which would cause development to be cost prohibitive. As a result, landside alternatives will be evaluated on the south side only, each of which accommodates the requirements determined in Chapter 5. Each alternative provides for additional aircraft hangars and rehabilitation of aprons and taxilanes.

6.5.1 Alternative 1 (Aircraft Storage Hangars)

The facility requirements analysis indicated a need for the development of various types of aircraft storage hangars. This includes single aircraft storage facilities such as T-hangars and clear span conventional hangars for accommodating several aircraft simultaneously. The layout of Landside Alternative 1 is depicted in Figure 6-3. Hangar development in this alternative includes a combination of T-hangar and conventional hangar facilities.

The T-Hangar units are proposed to be located at the west end of the airfield adjacent to the existing T-Hangars. The T-Hangars would provide a total of 20 storage units at approximately 1,500 square feet per unit. No property would need to be purchased for the proposed T-Hangar development.

In addition to the T-hangar development, there are a variety of conventional hangars planned for development along the southern edge of the apron area. These conventional hangars could be utilized for the storage of a single large aircraft or multiple small aircraft. They could also be cross-utilized as an FBO or specialty operator, as well as aircraft storage hangar space. An approximate 12 acre parcel would need to be purchased for the proposed development of two conventional hangars located on the east end of the airfield.

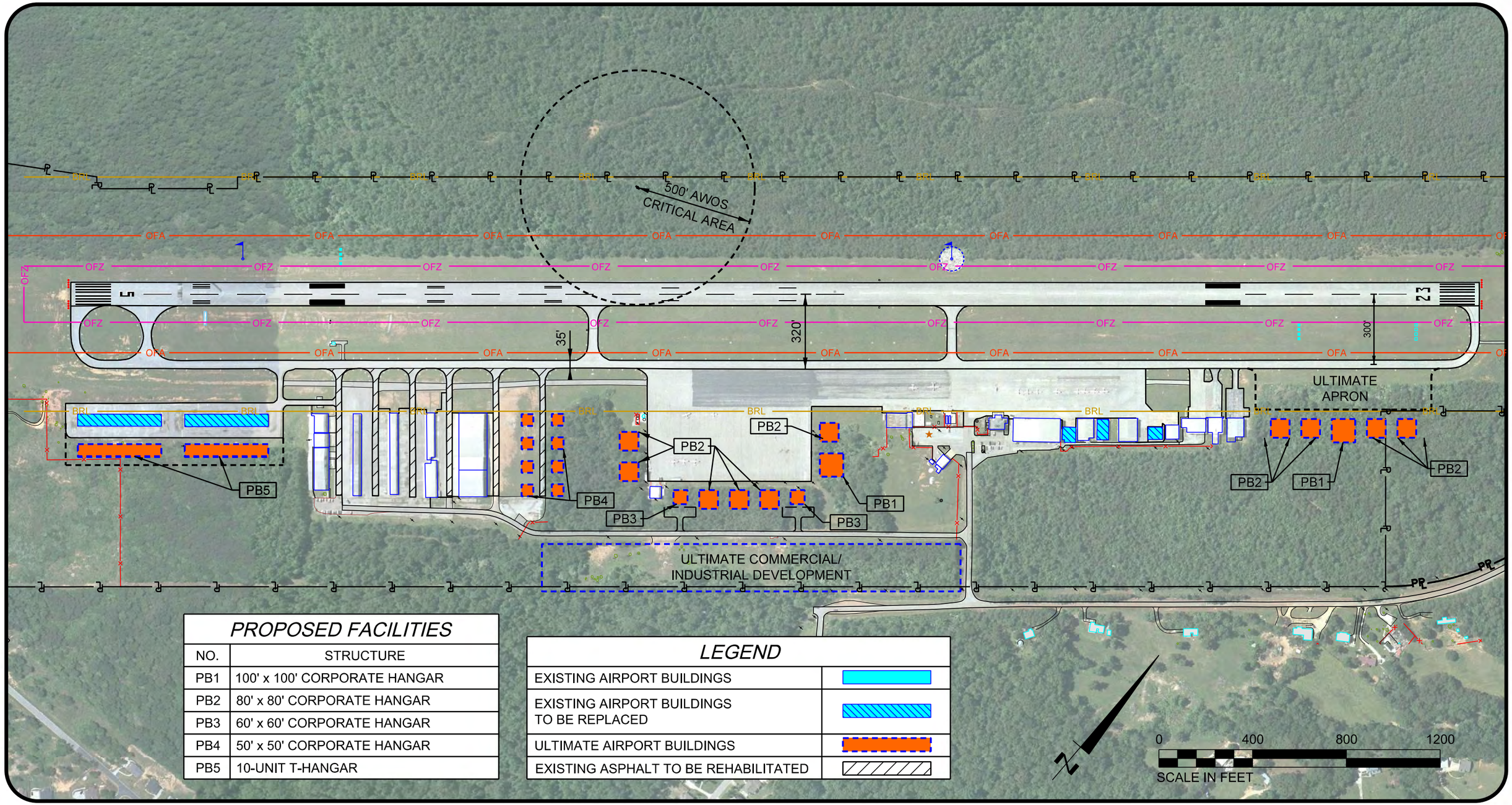
Landside Alternative 1 provides for an additional 22 individual storage units and 118,700 square feet of conventional hangar space. No apron expansion or taxiway development is needed for the planned hangar development. In addition, to general aviation T-hangars, and area south of the aircraft parking apron along Mitchell Field Road has been identified for ultimate commercial/industrial use.

6.5.2 Alternative 2 (Aircraft Storage Hangars)

Landside Alternative 2 is similar to Alternative 1 as it also provides for the development of various types of aircraft hangars. The only differences between the alternatives are the sizes, location, and types of hangars being proposed. The layout of Landside Alternative 2 is depicted in Figure 6-4.

6.6 Summary

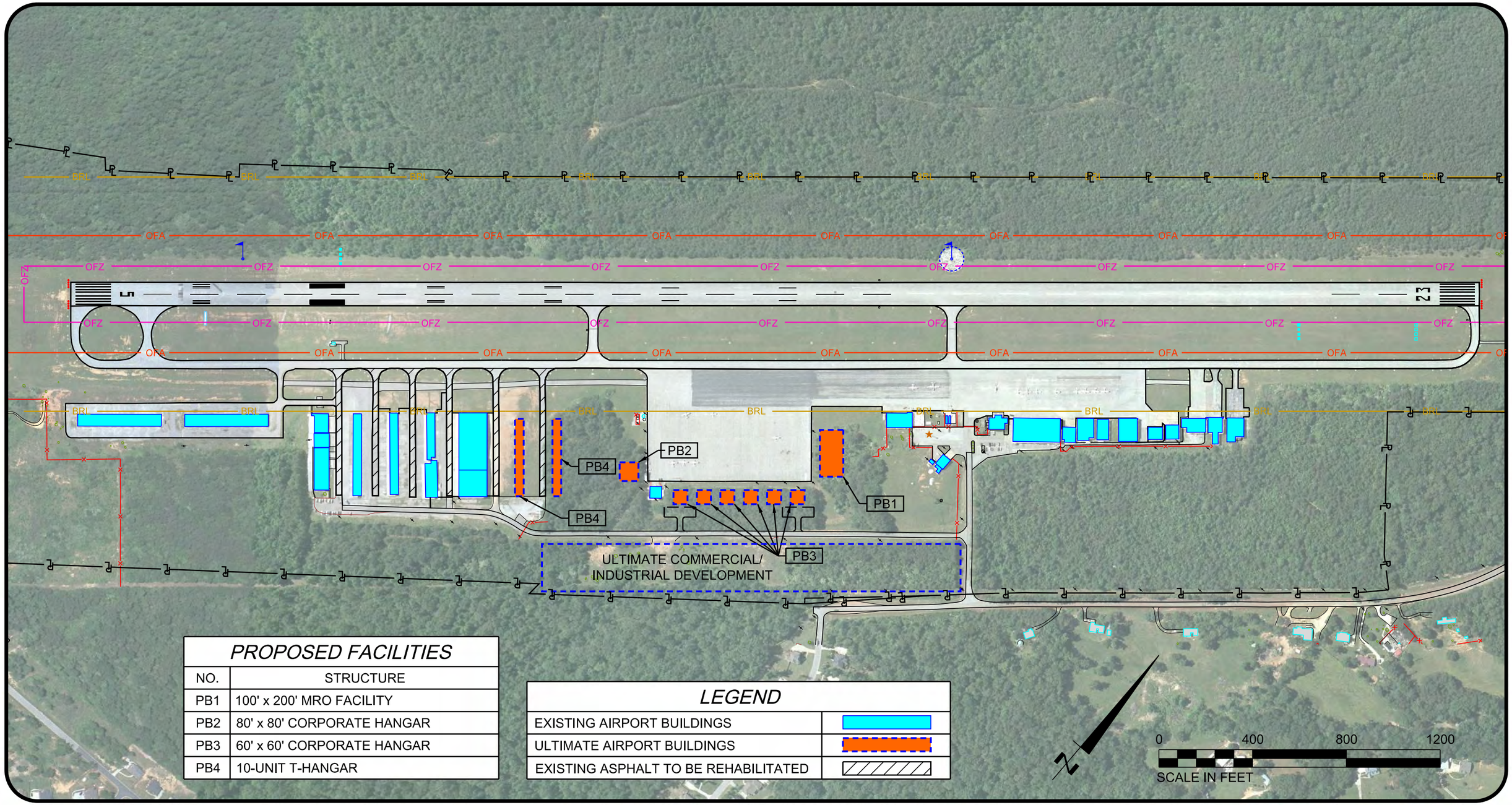
The process utilized in assessing airside and landside development alternatives involved a detailed analysis of short and long-term requirements, as well as future growth potential. Current FAA design standards were considered throughout the analysis of each alternative. The preferred alternative for the Bessemer Municipal Airport should accommodate the needs of existing and future users and also create an opportunity for aviation-related and non-aviation development. Airfield improvements that are identified in the alternatives will provide compliance with FAA standards and offer additional runway length capability. Landside development sites will provide ample opportunities for expanding general aviation facilities and adding corporate aviation space.



PROPOSED FACILITIES	
NO.	STRUCTURE
PB1	100' x 100' CORPORATE HANGAR
PB2	80' x 80' CORPORATE HANGAR
PB3	60' x 60' CORPORATE HANGAR
PB4	50' x 50' CORPORATE HANGAR
PB5	10-UNIT T-HANGAR

LEGEND	
EXISTING AIRPORT BUILDINGS	
EXISTING AIRPORT BUILDINGS TO BE REPLACED	
ULTIMATE AIRPORT BUILDINGS	
EXISTING ASPHALT TO BE REHABILITATED	

Alternative 1 - Landside Development Figure 6-3



Alternative 2 - Landside Development Figure 6-4

CHAPTER 7
ENVIRONMENTAL OVERVIEW

7.1 Introduction

This environmental analysis provides federal, state, and local officials as well as the general public with an understanding of the possible environmental impacts of the proposed development at the Bessemer Municipal Airport. The analysis presented in this chapter is modeled after the format and content of an Environmental Assessment, as described in FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*. It should be noted that a formal Environmental Assessment was previously completed for the proposed Runway 23 extension and airport improvements in April 2004.

7.2 Federal Environmental Requirements

The *National Environmental Policy Act* (NEPA) was enacted by Congress in 1969 to establish a national policy which ensured that potential environmental impacts would be thoroughly reviewed in all federally-funded projects. Prior to receiving any federal grant, the potential grantee must consider the alternatives to the proposed project(s); identify any mitigation measures that may be necessary; coordinate with appropriate federal, state, and local agencies for review; and document public participation during the decision-making process.

For airport development projects, the FAA is typically the lead governmental agency because the FAA provides funding for most major airport projects. It is also the agency responsible for reviewing the impacts, including social, economic, and environmental, of a proposed airport development project. FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, provides policies and procedures for considering environmental impacts of airport development.

Depending on the nature and extent of airport development, there are three levels of FAA environmental review:

- Development projects that are normally categorically excluded from further environmental analysis.
- Development projects normally requiring an Environmental Assessment (EA).
- Development projects normally requiring an Environmental Impact Statement (EIS).

7.2.1 Categorical Exclusions

FAA Order 5050.4B defines certain airport development projects as categorically excluded from formal environmental study. When a project is identified as a Categorical Exclusion (CE), the proposed airport development project is allowed to proceed without further environmental studies. Airport development actions that are typically categorically excluded from environmental review (EA or EIS) include:

- Runway, taxiway, apron, or loading ramp construction or repair work including extension, strengthening, reconstruction, resurfacing, marking, grooving, fillets, jet blast facilities, and new heliports on existing airports (except where such projects would create environmental impacts off-airport property).

- Installation or upgrading of airfield lighting systems, including runway end identifier lights, visual approach aids, beacons, and electrical distribution systems.

- Installation of miscellaneous items including segmented circles, wind or landing direction indicators, measuring devices, or fencing.

- Construction or expansion of passenger handling facilities.

- Construction, relocation, or repair of entrance or service roads.

- Grading or removal of obstructions on airport property and erosion control measures with no off-airport impacts.

- Landscaping generally and landscaping or construction of physical barriers to diminish impact of airport blast and noise.

- Projects to carry out noise compatibility programs.

- Land acquisition and relocation associated with any of the above items.

- Federal release of airport land.

- Removal of displaced thresholds.

7.2.2 Environmental Assessment

An Environmental Assessment (EA) examines potential impacts to determine whether they exceed a predefined threshold of significance or create sufficient controversy to require the FAA to prepare a full Environmental Impact Statement. If the potential impacts do not exceed the predefined threshold, the FAA can provide a Finding of No Significant Impact (FONSI) and the proposed airport development can proceed. Actions normally requiring an EA include the following:

- A new airport location.
- A new runway.
- A major runway extension that would involve extraordinary circumstances
- Runway strengthening that would result in a 1.5 DNL (the average day-night sound level) increase in noise impacting a sensitive area within the 65 DNL contour.
- Construction or relocation of entrance or service road connections to public roads that adversely affect the capacity of such roads.
- Land acquisition associated with any of the above items including land acquisition that would result in the relocation of residential units when there is evidence of insufficient compatible replacement dwellings, major disruption of business activities, or acquisition that involves land covered under Section 4(f) of the *Department of Transportation Act of 1966*.
- Establishment or relocation of an Instrument Landing System (ILS) or an approach lighting system.
- An airport development action that involves extraordinary circumstances or involves historical, archeological, architectural, or cultural significance; land acquisition for conversion of farm land; impacts to wetlands, coastal areas, or floodplains; or endangered and threatened species.

An EA was previously completed for the Runway 23 extension project in April 2004.

7.2.3 Environmental Impact Assessment

If the proposed development will likely result in a significant environmental impact, an Environmental Impact Statement (EIS) may be required. An EIS is a thorough review process that provides local, regional, state, federal, and other agencies an opportunity to participate on the project as coordinating or commenting agencies. The detail of the EIS is determined either by the EA or during the FAA environmental scoping process. Full evaluation of the proposed project or action and all reasonable and prudent alternatives must be undertaken. Actions normally requiring an EIS include:

- The development of a first time airport layout plan or airport location approval for a commercial service airport in a Standard Metropolitan Statistical Area (SMSA).
- Financial participation in or airport layout plan approval of, a new runway capable of handling air carrier aircraft at a commercial service airport in a SMSA.

7.3 Proposed Projects Requiring Environmental Approval

The primary elements of the improvements proposed in this Master Plan include the following:

- Extension of Runway 23 – 500'
- Extension of Parallel Taxiway in conjunction with Runway Extension – 500'
- Improve the Runway Safety Area for Runway 23 Extension – 1000' X 500'
- Construction of Aircraft Hangars
- Runway and Taxiway Rehabilitation
- Relocation of AWOS

The remainder of this chapter will analyze the typical impact categories included in an Environmental Assessment. While it provides an overview, the FAA-Jackson ADO as well as the appropriate federal, state, and local agencies should be contacted prior to any construction activities to determine the appropriate level of environmental study necessary.

7.4 Environmental Consequences

7.4.1 Noise

When development or expansion of an airport is proposed, one of the primary criticisms that are voiced from people who live or work nearby is the anticipated increase in noise. Land uses surrounding an airport become a very important factor in reducing noise impacts to nearby citizens while, at the same time, maximizing the economic benefits of the airport. Noise exposure maps are useful as a planning tool for both the airport operator and those who plan the growth of the communities in the vicinity of the airport.

As part of the EA completed in April 2004, noise exposure maps were prepared for current operations (2003) and future operations based on the proposed runway extension (2013). The noise analysis conducted for the level of activity projected for the runway extension show that aircraft operations will produce noise levels of 65 DNL and higher. However, the projected 65 DNL contour will not include any residences, schools, churches, or other noise sensitive land uses. Based on the noise analysis, the existing and forecasted aircraft noise levels do not constitute an impact on any existing or planned noise sensitive receptors or create a conflict with existing or proposed land uses.

7.4.2 Compatible Land Use

The compatibility of existing and planned land uses in the vicinity of airports is usually associated with the extent of the impact from noise. The Bessemer Municipal Airport is located in a rural area, approximately 3 miles outside the corporate limits of the City of

Bessemer. Land use in the vicinity of the Airport generally consists of agricultural land use, residential land use, and commercial land use.

Residential land use, consisting of single-family housing, can be found scattered throughout the project area along the roadways. Commercial land uses can be found along County Road 2 (Shades Crest Road) and County Road 52 (Montevallo Road). There are no recreation areas, hospitals, or schools located within the immediate vicinity of the Airport.

As discussed in the previous section, no significant noise impact due to the airport is anticipated. Although noise is a major component of compatible land use around an airport, it is not the only factor. The height of structures around an airport should be carefully controlled to prevent obstructions, which can limit the utility and development potential of the airport. Airport zoning ordinances are an effective method of preventing non-compatible land uses and obstructions. Adoption of such zoning ordinances is recommended to protect the Airport from incompatible land uses and obstructions.

7.4.3 Social Impacts

An action is judged as having significant social impacts if it involves any of the following:

- The relocation of any residences or businesses.
- The alteration of surface transportation patterns.
- The division or disruption of established communities.
- The disruption of orderly planned development.

No such actions are anticipated within the planning period for the Bessemer Municipal Airport.

7.4.4 Induced Socioeconomic Impacts

Induced socioeconomic impacts involve shifts in patterns of population growth, public service demands, and changes in economic and business activities as a result of airport development. No such actions are anticipated within the planning period for the Bessemer Municipal Airport.

7.4.5 Air Quality

In accordance with the guidelines set forth in FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, an air quality analysis must be performed if the proposed action involves the following:

- Airport location (new airport site).
- Airport development allowing an increase in aircraft operations.
- The construction or expansion of passenger handling or parking facilities.

Based on the detailed air quality assessment procedures outlined in FAA-EE-82-21, *Air Quality Procedures for Civilian and Air Force Bases*, an air carrier airport must exceed 1.3 million annual passenger enplanements or 180,000 general aviation operations to warrant further air quality assessment.

In accordance with the 1982 *Airport Act*, a water quality certification is required for the approval of an Airport Improvement Program application when a project involves airport location, a major runway extension, or a runway location. The Alabama Department of Environmental Management (ADEM)should be contacted prior to initiation of construction activities at the Airport to determine if a water quality certification is needed.

7.4.6 Water Quality

Potential adverse impacts to surface and ground water quality are normally related to those resulting from construction activities and the maintenance and use of the new facility. Potential construction-related impacts in water ways include increased turbidity, sedimentation, the improper use of fertilizers, and accidental releases of petroleum products from equipment and machinery. Increased turbidity is a temporary phenomenon while sedimentation, the improper use of fertilizers, and petroleum contamination may have a long-term adverse effect on aquatic organisms and habitats. A National Pollutant Discharge Elimination System (NPDES) Construction General Permit for Storm Water Discharges from Construction Activities will be required from ADEM for the proposed improvements.

Potential adverse impacts related to the use and maintenance of the improvements may result from the occasional use of fertilizers, herbicides, and pesticides; random spills; and storm water runoff. The improper use of fertilizers, herbicides, and pesticides can be detrimental to water quality and aquatic organisms. However, if used properly, these substances have very little effect on water quality or aquatic organisms. In regard to random spills, the frequency and magnitude of accidents cannot be accurately predicted. Vehicles and aircraft will have the potential to be involved in accidents which could result in pollution of adjacent water bodies. Airfield storm water runoff may contain varying levels of suspended solids, heavy metals, oils, nutrients, and other pollutants. The potential impact of the pollutant load on adjacent water bodies varies greatly and is influenced by numerous factors including the frequency and duration of rainfall events, wind, vegetation, traffic volumes, and adjacent land uses.

Construction of the proposed improvements to the airport facility, utilizing erosion and sedimentation control measures and pollution prevention practices, will have minimal short-term and long-term adverse impacts on water quality and aquatic habitats. The potential to adversely impact water quality in adjacent water bodies as a result of normal use and maintenance of the improvements should be no greater than if the proposed projects were not constructed.

Another potential impact to water quality involves Section 404 of The Clean Water Act of 1977 (33 USC 1344) which prohibits the filling activities in waters, including wetlands, of the United States without securing a permit from the U.S. Army Corps of Engineers (USACE). During the previous Environmental Assessment completed in April 2004, the USACE was contacted for

comments and determined that the proposed action was located in a nonwetland/upland area and will not require a permit pursuant to Section 404 of the Clean Water Act. However, that jurisdictional determination was valid for a period of five years. Therefore, prior to construction activities, the USACE should be contacted again since the previous jurisdictional determination has expired. No wetland impacts are anticipated as a result of the proposed action.

7.4.7 Department of Transportation Act Section 4(f)

Section 4(f) of the *Department of Transportation Act* provides that no program or project will be approved which requires the use of any publicly owned land from a public park, recreation area, historic site, or wildlife and waterfowl refuge of national, state, or local significance as determined by those authorities who have jurisdiction over such areas unless there is no practicable alternative available and provisions to minimize the possibility of harm are included in the planning.

The proposed runway extension at the Bessemer Municipal Airport will not involve any public park, public recreation area, or a designated wildlife or waterfowl refuge of national, state, or local significance. Since there will be no use of, or adverse impact to, public park property as a result of constructing the preferred alternate, the requirements of Section 4(f) of the *Department of Transportation Act* do not apply.

7.4.8 Historic and Archaeological Resources

An environmental review for the proposed development actions at the Bessemer Municipal Airport is required to examine thresholds concerning two basic laws which apply to this category of impact. The first law, the *National Historic Preservation Act of 1966*, as amended, requires an initial review to determine whether or not any land involved in potential environmental impact is either in, or eligible for, inclusion into the National Register of Historic Places. The second law, the *Archeological and Historic Preservation Act of 1974*, provides for the survey, recovery, and preservation of significant scientific, prehistoric, historical, or archeological data which could be damaged or irretrievably lost as the result of a development which has received federal funding.

At the request of the Alabama Historical Commission, a Phase I Cultural Resource Assessment (CRA) was conducted as part of the Environmental Assessment completed in April 2004 to determine if the proposed project will have the potential to adversely impact archaeological and cultural resources. The results of the Phase I CRA indicated that the subject property at the Bessemer Municipal Airport contains no identified cultural or archeological sites. No cultural material was recovered from the shovel tests performed. The Alabama Historical Commission reviewed the Phase I CRA and concurred with the proposed runway extension project.

7.4.9 Biotic Communities

Biotic communities are defined as areas where plants (flora) and animals (fauna) share a mutual habitat necessary for sustenance and propagation. The level of anticipated impacts determines the level of biotic assessment needed. Several factors are examined to determine the anticipated impacts to biotic communities:

- If there is any taking or impact to public owned wildlife or waterfowl refuge areas with local, regional, state or federal significance.

- If there is threatened or endangered species in the area of immediate impact.

- If the proposed development affects water resources (i.e., wetlands, groundwater, impoundment, diversion, deepening, controlling, modifying, polluting, dredging or filling).

The proposed airport runway extension project will not impact any publicly owned wildlife or waterfowl refuge of local, state, or national significance. The proposed action will not impact any critical habitat associated with federal or state-listed threatened or endangered species. The proposed action will not affect any federal or state forests.

The expansion of the airport will convert relatively few acres of habitat which represents a small percentage of the area's inventory and affects only common wildlife species. As such, no significant impact to biotic communities is anticipated as a result of the proposed action. The U.S. Fish and Wildlife Service, the Alabama Forestry Commission, and the State of Alabama Department of Conservation and Natural Resources were contacted during the Environmental Assessment completed in April 2004.

7.4.10 Endangered and Threatened Species

Consultation with the U.S. Fish and Wildlife Service (USFWS) during the EA completed in April 2004 revealed that no federally-listed threatened and endangered species occur in the vicinity of project area, and that further study is not required. As such, the requirements of Section 7 of the *Endangered Species Act of 1973*, as amended, are fulfilled. However, obligations under Section 7 of the *Endangered Species Act* must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during the consultation with the USFWS, or (3) new species are listed or critical habitat designated might be affected by the proposed action.

7.4.11 Wetlands

Section 404 of the *Clean Water Act of 1977* (33 USC 1344) prohibits filling activities in waters of the United States, including wetlands, unless the work has been authorized by a Department of the Army permit. During the EA completed in April 2004, the U.S. Army Corps of Engineers determined that the proposed action is located in a nonwetland/upland area and will not require a permit pursuant to Section 404 of the *Clean Water Act*. This jurisdictional determination reflects current policy and regulations and is valid for a period of five years. Therefore, prior to construction activities, the USACE should be contacted again since the previous jurisdictional determination has expired. However, no wetland impacts are anticipated as a result of the proposed action.

7.4.12 Floodplains

Floodplains are defined as lowland and relatively flat areas adjoining inland and coastal waters. At a minimum, floodplains include areas that are subject to a 1 percent or greater chance of flooding in any given year (i.e., the area that would be inundated by a 100-year flood). Executive Order 11988, *Floodplain Management*, directs federal agencies to take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, and to restore and preserve the natural and beneficial values served by floodplains.

Methods that may be used to minimize harm to floodplains include construction controls to minimize erosion and sedimentation, design of the proposed improvements to allow adequate flow circulation and to preserve natural drainage, use of pervious surfaces where practicable, control of runoff, and waste and spoils disposal to avoid contamination of ground and surface water. There are no floodways or floodplains located on the airport.

The proposed development is not located within the limits of a base floodplain associated with any water body, as delineated on the Jefferson County, Alabama, Flood Insurance Rate Map (Map Number 01073C0620 E and 01073C0608 E) produced by the Federal Emergency Management Agency (FEMA). This project will not indirectly support secondary development within a base floodplain.

7.4.13 Wild and Scenic Rivers

In October 1968, Congress created the National Wild and Scenic Rivers System to preserve selected rivers and stream segments in their free-flowing condition to protect the water quality of these rivers and to fulfill other national conservation purposes. In addition to the National Park Service, there are four other federal agencies charged with protecting and managing the wild and scenic rivers. The agencies include the Bureau of Land Management, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the U.S. Forest Service. There are no river or stream segments classified as wild and scenic that will be affected by the proposed project.

7.4.14 Prime and Unique Farmlands

The *Farmland Protection Policy Act (FPPA) of 1981* was designed to minimize the contribution of federal programs to the unnecessary and irreversible conversion of farmland to uses other than those which are agricultural in nature. Farmland protected under this act is defined as Aprime@ farmland, Aunique@ farmland, and farmland of local or state importance. Prime farmland is defined as land which has the best combination of physical and chemical characteristics for producing agricultural crops with minimum input of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Unique farmland is land used for production of specific high-value food and fiber crops.
As part of the EA completed in April 2004, the Natural Resources Conservation Service (NRCS) determined that the project site does not contain prime or unique farmland and farmland of local or state.

7.4.15 Energy Supply and Natural Resources

Energy requirements associated with the airport operations have been divided into two general categories. The first category involves those requirements which relate to an increased demand for electricity from stationary facilities such as the FBO/terminal area and airfield lighting. The second category involves those requirements which relate to providing aircraft fuel.

The expansion of the facilities at the Airport will increase the electricity demands slightly primarily due to additional runway, taxiway, and approach lights. The degree to which energy efficient systems are included in the plans will determine the significance of this demand. The additional electricity demand anticipated from the proposed airport expansion is not expected to be significant and can easily be provided through existing electrical distribution networks.

According to the Geological Survey of Alabama, the geology of the Bessemer Municipal Airport is mapped on the Geologic Map of Alabama (1988) as Mississippian-Pennsylvanian age Parkwood Formation consisting of dark-gray shale and medium-gray sandstone locally containing mudstone and argillaceous limestone. The project area does not contain any identified surface mineral resources that would be impacted by the proposed runway extension.

7.4.16 Light Emissions

Airfield lighting currently in use at the Bessemer Municipal Airport includes Medium Intensity Runway Lights (MIRL), which includes threshold lighting, for Runway 05/23. The proposed airfield lighting improvements will include the installation of high intensity runway lights and medium intensity taxiway lights in association with the proposed runway and taxiway extensions for Runway 05/23. In addition, the existing runway threshold lights and Runway End Identification Lights (REIL) will be relocated for Runway 05/23.

Lighting impacts are concerned with the extent to which any lighting associated with the proposed airport expansion would create an annoyance among residents or traffic in the vicinity of the airport. The proposed runway extension will not place the runway and taxiway developments in close proximity to residences or other land uses that may be sensitive to lights. The airfield and approach lighting will not be directed at area homes or roadways. Significant negative impacts related to airfield lighting are not anticipated.

7.4.17 Hazardous Materials and Solid Waste

Hazardous waste sites are regulated by the *Resource Conservation and Recovery Act* (RCRA) and the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA). Hazardous materials or wastes are defined as substances which are regulated as hazardous or toxic by the U. S. Environmental Protection Agency. Most hazardous substances have one or more of the following characteristics: ignitability, reactivity, corrosivity, or toxicity. Businesses that might use or produce these substances include service stations, auto repair shops, metal fabricators, junkyards, paint stores and other uses that routinely use or dispose of chemicals and solvents, including petrochemicals. A comprehensive file review and database search was completed by the Land Division of the Alabama Department of Environmental Management to identify any previous hazardous waste or Superfund activity in the project area. No information was discovered.

The amount of solid waste generated and collected at the Bessemer Municipal Airport is not expected to increase substantially as a result of constructing the proposed airport improvements. It is anticipated that the composition of the solid waste generated at the terminal facilities will remain constant or experience only minor changes. Solid waste generated by routine activities at the airport is collected by a private contractor and is transported for disposal at a permitted landfill. Construction waste will be removed by private contractors and all other trash associated with daily activity at the airport will be transported by appropriate personnel to a licensed landfill. FAA Advisory Circular 150/5200-33, *Hazardous Wildlife On or Near Airports,* provides guidance regarding the location of sanitary landfills on or near airports. Landfills located within the distances outlined in AC 150/5200-33 are considered incompatible land uses. There are no landfills located in the vicinity of the Airport that would be considered an incompatible land use.

7.4.18 Construction Impacts

The construction of the proposed project will result in some temporary, unavoidable impacts related to air quality, noise levels, water quality, and traffic inconveniences. The project construction plans will require that the contractor use appropriate measures to minimize any impacts which could possibly occur. The incorporation of the provisions and specifications of FAA Advisory Circular 150/5370-10, *Standards for Specifying the Construction of Airports*, Item P-156, will be used in order to avoid and/or minimize adverse construction impacts. The following discussion briefly describes the possible impacts and measures that may minimize the impacts.

The amount of airborne suspended particulates will be expected to increase temporarily in the project area during construction activities. To minimize impacts from fugitive dust, the contractor will be required to implement adequate dust control measures. Such measures may include, but not be limited to, watering of dirt stockpiles and exposed areas. Additionally, the open burning of vegetation and wood wastes, if undertaken, will be conducted in accordance with all state air pollution control regulations and local ordinances. There may be a slight and temporary impact from the noise and dust associated with the delivery of materials and the operation of machinery on site. The impacts may be mitigated, to some extent, by limiting construction to daylight hours and requiring that the contractor use designated haul routes to avoid, as much as possible, residential and other noise sensitive receptors. On-site construction noise is expected to have a negligible, temporary impact on nearby residences and businesses.

The construction of the proposed airport expansion project will include the use of commonly accepted measures to minimize erosion, sedimentation, and water pollution. Erosion and sedimentation control measures may include, but not be limited to, the use of staked hay bales and silt fences during construction. Soils exposed during construction will be re-seeded as soon as practical to minimize erosion potential and establish permanent ground cover. The construction activities will require a National Pollutant Discharge Elimination System (NPDES) permit from the Alabama Department of Environmental Management. Implementation of Best Management Practices by the contractor, as mandated by the required NPDES permit, will ensure that all steps necessary to maintain the quality of water discharged from the construction site into adjacent water courses, wetlands, and water bodies are taken. Wastes, loose soil, and other debris will not be deposited into streams or other water bodies. The disposal of wastes, debris, and excavated material will be handled in accordance with applicable state and local requirements. The

contractor will be required to use legally operating landfills for the disposal of wastes, debris, and materials generated during the construction of the proposed project. Care will be taken not to leave borrow pits behind construction. Any borrow pits will be filled with debris associated with any clearing and construction prior to being backfilled.

CHAPTER 8
AIRPORT LAYOUT PLANS

8.1 Introduction

This chapter provides a graphic description of the recommended airport development program for both airfield and landside facilities which is recommended in the Bessemer Municipal Airport Master Plan Update. The airport plan drawings include the following components:

- Airport Layout Drawing (ALD)
- Terminal Area Drawings
- Airport Airspace Drawings (Part 77)
- Inner Portion of Approach Surface Plan – Runway 05
- Inner Portion of Approach Surface Plan – Runway 23
- Exhibit "A" Property Map

Drawings depicted in these plans are contained in the 11" x 17" set of airport plan sheets accompanying this Master Plan Update. Additional 24" x 36" plans are provided to the Airport sponsor, ALDOT, and FAA as a part of the approval process as well. An explanation of the purpose and highlights of each of these plans is improved in the following sections.

8.2 Airfield Design Standards

The airfield planning and design standards depicted on this plan set are based upon the future role of the Airport and the critical aircraft expected to utilize the Airport. The FAA publishes advisory circulars containing airfield design standards that are intended to provide guidance, with flexibility in application, to insure the safety, economy, efficiency, and longevity of the Airport.

The FAA advisory circular that applies to design of airfield facilities at the Airport is FAA Advisory Circular 150/5300-13, Change 13 - *Airport Design*.

8.3 Airport Layout Drawing

The Airport Layout Drawing (ALD) depicts the existing airport facilities as well as the recommended facilities required to accommodate forecast demand through the Year 2034.

Major airfield improvements incorporated in the ALP are summarized as follows:

1. Runway 23 Extension – 500 feet

2. Parallel Taxiway Extension – 500 feet

3. Runway 05/23 Overlay/Rehabilitation

4. Parallel Taxiway Overlay/Rehabilitation

3. Development of Corporate Hangars and T-hangars on the south side of the airfield.

The ALD illustrates graphically the existing and proposed facilities identified in the Layout Plan Update. Phased development, estimated project costs and funding sources for the recommended improvements according to the 5 -, 10 -, and 20 – year planning periods are recommended in Chapter 9, "Capital Improvement Program Implementation Plan."

8.4 Terminal Area Drawings

The Terminal Area Drawings shows a higher level of detail regarding the existing and proposed terminal area facilities.

8.5 Airport Airspace Drawings (Part 77)

Ideally, airports should be located so that the surrounding airspace is free and clear of obstructions that could be hazardous to aircraft on takeoff or approach paths. It is therefore necessary to maintain the surrounding airspace free of obstacles, preventing the development and growth of obstructions to airspace that could cause the airport to become unusable. The regulations for the protection of airspace in the vicinity of airports are established by a set of imaginary obstacle limitation surfaces, penetration of which represents an obstacle to air navigation. The geometry of the imaginary surfaces is governed by the regulations set forth in Federal Aviation Regulations (FAR) Part 77. Protected airspace around airports is made up of five principal imaginary surfaces, which are shown on the FAR Part 77 Airspace Drawing:

- Primary Surface – A surface that is longitudinally centered on the runway, extending 200 feet beyond the threshold in each direction in the case of paved runways.
- Approach Surface – An inclined plane or combination of planes of varying width and slope running from the ends of the primary surface.

- Horizontal Surface – A horizontal plane 150 feet above the established airport elevation. Its dimensions are governed by the runway service category and approach procedure desired.

- Transitional Surface – An inclined plane with a slope of 7:1 extending upward and outward from the Primary Surface and Approach Surface, terminating at the horizontal surface where these two planes meet.

- Conical Surface – An inclined plant at a slope of 20:1 extending upward and outward from the periphery of the horizontal surface for a horizontal distance of 4,000 feet.

The plan should be officially adopted and integrated into the planning and zoning ordinances for the city in order to prevent obstructions that could preclude future development.

8.6 INNER PORTION OF APPROACH SURFACE PLAN - RUNWAY 05-23

The Inner Portion of Approach Surface Plan – Runway 05-23 drawing is based on Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace.* In order to protect the airspace and approaches to each runway end from hazards that could affect the safe and efficient operation of the airport, Federal criteria has been established to control the height of objects in the vicinity of the airport.

The dimensional standards for the approach surfaces and RPZ are determined by the classification of runways for precision and non-precision approaches. The FAA requires the establishment of runway protection zones (RPZ) at the ends of runways when federal funds are to be expended on new or existing airports. The airport owner should have positive control over development within the RPZ by either aviation easements or ownership in fee simple; thereby providing long-term positive assurance that there will be no encroachment within the critical portions of the inner approach surface.

The Inner Portion of Approach Surface Plan drawings show the runway end approach and RPZ profile in relation to any objects that fall with these surfaces. The Bessemer Municipal Airport owns in fee simple all RPZ's for Runway 05-23.

As depicted on the inner approach drawing, Runway 05 has an existing and ultimate approach slope of 50:1 to reflect a precision approach. In addition, the inner approach drawings depict the Threshold Siting Surfaces (TSS) for the existing and ultimate runway ends as defined by Table 3-2 Approach/Departure Requirements Table contained in AC 150/5300-13A. The existing TSS category is Category 6 which has a slope of 20:1. There are four obstructions identified as trees that are penetrating the 50:1 Part 77 approach surface. However, there are no TSS violations identified.

As depicted on the inner approach drawing, Runway 23 has an existing and ultimate approach slope of 34:1 to reflect a non-precision instrument approach. The existing TSS category is Category 5 which has a slope of 20:1. There are several obstructions identified as trees that are penetrating the 34:1 Part 77 approach surface as well as the 20:1 TSS surface.

8.7 Airport Property Map – Exhibit "A"

The purpose of the Airport Property Map is to identify all airport properties owned in fee simple title or controlled by easements. This drawing contains the names of land owners, total tract acreage, acreage of taking, interest, and how the various tracts were and will be acquired. This plan is also referred to as an Exhibit "A" Property Map, a required attachment to FAA application forms requested on federal grants for airport related improvement projects. This drawing must be updated when the Airport changes any property boundary, acquires new property, or acquires new easements.

EXISTING FEATURE

NO.	FEATURE
E1	AIRCRAFT PARKING APRON
E2	FUEL FARM
E3	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)
E4	4-BOX PAPI
E5	GLIDE SLOPE ANTENNA
E6	LOCALIZER
E7	WINDCONE AND SEGMENTED CIRCLE
E8	WINDCONE
E9	NGS SURVEY MONUMENT (BESSPORT) N=1205781.2246, E=2144371.3039, ELEV.= 696.47
E10	NGS SURVEY MONUMENT (BESSPORT AZ MK) N=1203725.1130, E=2141892.0967, ELEV.= 695.80

PROPOSED FEATURE

NO.	FEATURE
P1	AUTOMOTIVE PARKING
P2	RELOCATED LOCALIZER
P3	RELOCATED 4-BOX PAPI
P4	ULTIMATE APRON (750'x175')
P5	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)

NOTES

1. NO THRESHOLD SITING SURACE (TSS) VIOLATIONS.
2. TREES LOCATED IN OBJECT FREE AREA (OFA). TREES ARE TO BE REMOVED.

AIRPORT DATA

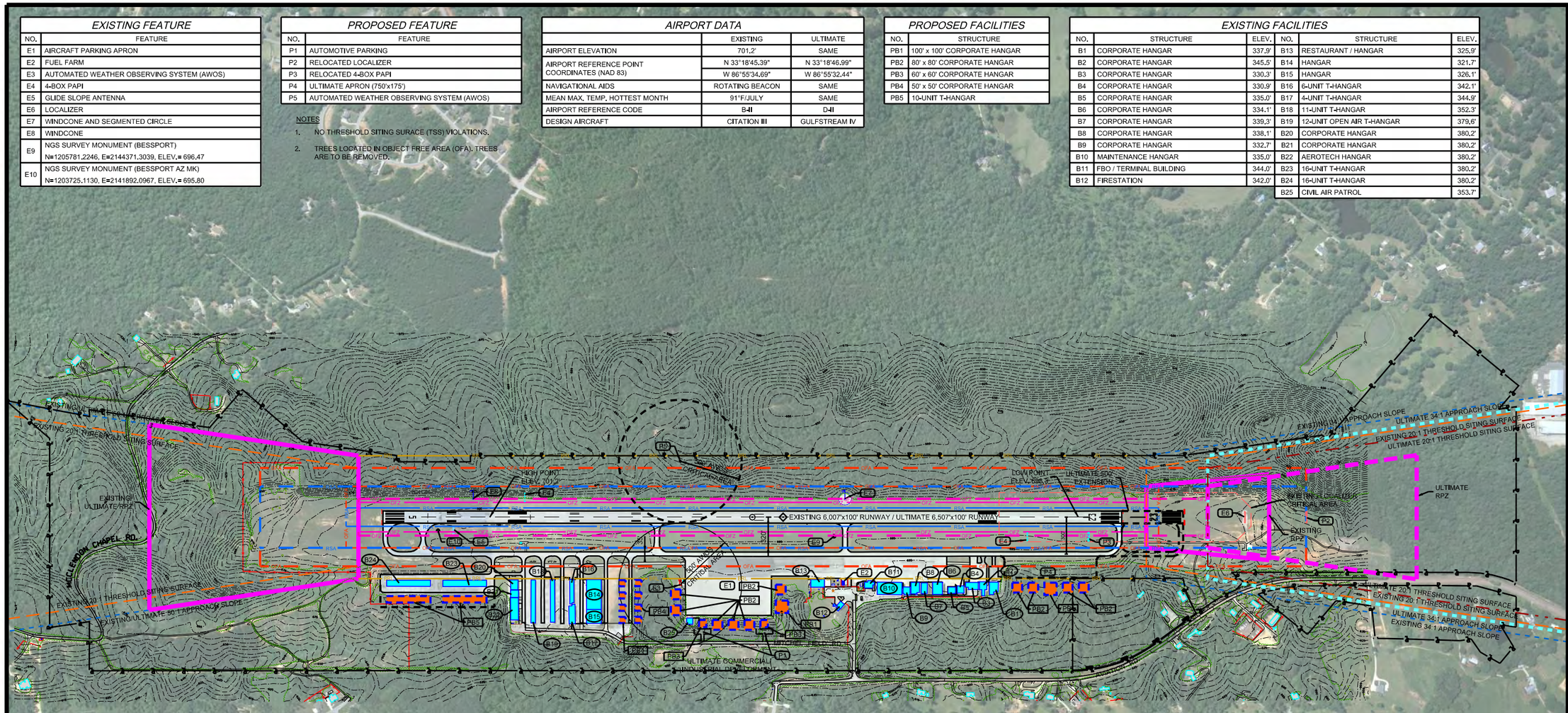
	EXISTING	ULTIMATE
AIRPORT ELEVATION	701.2'	SAME
AIRPORT REFERENCE POINT COORDINATES (NAD 83)	N 33°18'45.39" W 86°55'34.69"	N 33°18'46.99" W 86°55'32.44"
NAVIGATIONAL AIDS	ROTATING BEACON	SAME
MEAN MAX. TEMP. HOTTEST MONTH	91°F/JULY	SAME
AIRPORT REFERENCE CODE	B-II	D-II
DESIGN AIRCRAFT	CITATION III	GULFSTREAM IV

PROPOSED FACILITIES

NO.	STRUCTURE
PB1	100' x 100' CORPORATE HANGAR
PB2	80' x 80' CORPORATE HANGAR
PB3	60' x 60' CORPORATE HANGAR
PB4	50' x 50' CORPORATE HANGAR
PB5	10-UNIT T-HANGAR

EXISTING FACILITIES

NO.	STRUCTURE	ELEV.	NO.	STRUCTURE	ELEV.
B1	CORPORATE HANGAR	337.9'	B13	RESTAURANT / HANGAR	325.9'
B2	CORPORATE HANGAR	345.5'	B14	HANGAR	321.7'
B3	CORPORATE HANGAR	330.3'	B15	HANGAR	326.1'
B4	CORPORATE HANGAR	330.9'	B16	6-UNIT T-HANGAR	342.1'
B5	CORPORATE HANGAR	335.0'	B17	4-UNIT T-HANGAR	344.9'
B6	CORPORATE HANGAR	334.1'	B18	11-UNIT T-HANGAR	352.3'
B7	CORPORATE HANGAR	339.3'	B19	12-UNIT OPEN AIR T-HANGAR	379.6'
B8	CORPORATE HANGAR	338.1'	B20	CORPORATE HANGAR	380.2'
B9	CORPORATE HANGAR	332.7'	B21	CORPORATE HANGAR	380.2'
B10	MAINTENANCE HANGAR	335.0'	B22	AEROTECH HANGAR	380.2'
B11	FBO / TERMINAL BUILDING	344.0'	B23	16-UNIT T-HANGAR	380.2'
B12	FIRESTATION	342.0'	B24	16-UNIT T-HANGAR	380.2'
			B25	CIVIL AIR PATROL	353.7'



RUNWAY DATA

		EXISTING	ULTIMATE
EFFECTIVE GRADIENT		0%	SAME
% WIND COVERAGE		97.19% (13 KNOTS)	99.54% (16 KNOTS)
MAX ELEVATION (MSL)		701.2'	SAME
RUNWAY LENGTH		6,007'	6,507'
RUNWAY WIDTH		100'	SAME
RUNWAY SURFACE TYPE		ASPHALT	SAME
PAVEMENT STRENGTH		60,000 SWL/DWL	SAME
PART 77 APPROACH CATEGORY	RW 5	PRECISION	SAME
	RW 23	NON-PRECISION	SAME
TYPE INSTRUMENT APPROACH	RW 5	ILS, LPV	SAME
	RW 23	LPV	SAME
APPROACH SURFACE SLOPE	RW 5	50:1	SAME
	RW 23	34:1	SAME
APPROACH VISIBILITY MINIMUMS	RW 5	3/4 MILE	SAME
	RW 23	1 MILE	SAME
THRESHOLD SITING SURFACE	RW 5	CATEGORY 6	SAME
	RW 23	CATEGORY 5	SAME
LIGHTING		HIRL, MITL	SAME
MARKINGS	RW 5	PRECISION	SAME
	RW 23	NON-PRECISION	SAME
VISUAL APPROACH AIDS	RW 5	PAPI-4L	SAME
	RW 23	PAPI-4L	SAME
RUNWAY BEARING		49°30'23"/ 229°30'23"	SAME
RUNWAY END COORDINATES (NAD 83)	RW 5	N 33°18'26.21" W 86°56'01.74"	SAME
	RW 23	N 31°19'04.57" W 86°55'07.63"	N 33°19'07.76" W 86°55'03.13"
RUNWAY END ELEVATIONS	RW 5	699.9'	SAME
	RW 23	699.5'	SAME
TOUCHDOWN ZONE ELEVATIONS	RW 5	701.2'	SAME
	RW 23	699.6'	SAME

RUNWAY PROTECTION ZONE DIMENSIONS

RWY 5 EXISTING	1,000'IW X 1,510'OW X 1,700'L
RWY 5 ULTIMATE	SAME
RWY 23 EXISTING	500'IW X 700'OW X 1,000'L
RWY 23 ULTIMATE	500'IW X 1,010'OW X 1,700'L

RUNWAY SAFETY AREA DIMENSIONS

RWY END	EXISTING	ULTIMATE
5	150'W X 300' BEYOND END OF RUNWAY	500'W X 1,000' BEYOND END OF RUNWAY
23	150'W X 300' BEYOND END OF RUNWAY	500'W X 1,000' BEYOND END OF RUNWAY

OBJECT FREE AREA DIMENSIONS

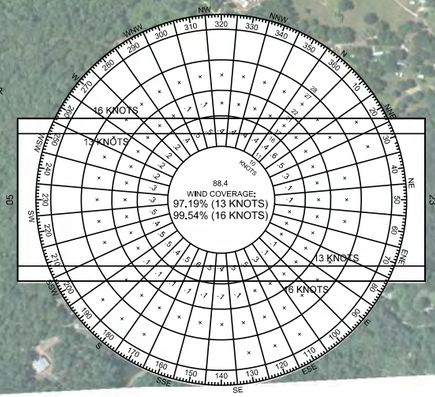
RWY END	EXISTING	ULTIMATE
5	500'W X 300' BEYOND END OF RUNWAY	800'W X 1,000' BEYOND END OF RUNWAY
23	500'W X 300' BEYOND END OF RUNWAY	800'W X 1,000' BEYOND END OF RUNWAY

OBJECT FREE ZONE DIMENSIONS

RWY END	EXISTING	ULTIMATE
5	240'W X 200' BEYOND END OF RUNWAY	300'W X 200' BEYOND END OF RUNWAY
23	240'W X 200' BEYOND END OF RUNWAY	300'W X 200' BEYOND END OF RUNWAY

ALL WEATHER WIND ROSE

SOURCE: NATIONAL CLIMATIC DATA CENTER
LOCATION: BIRMINGHAM, ALABAMA
PERIOD: 1995-2004
OBSERVATIONS: 78,083
EXISTING COVERAGE: 97.19% for 13 knots
ULTIMATE COVERAGE: 99.54% for 16 knots



LEGEND

	EXISTING	ULTIMATE
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
APPROACH SURFACE		
THRESHOLD SITING SURFACE		
AIRPORT REFERENCE POINT		
AIRPORT PAVEMENT		
AIRPORT BUILDINGS		
OTHER BUILDINGS		N/A
AIRPORT PROPERTY LINE / EASEMENTS		
OTHER PROPERTY LINES		
FENCE		
ROADS		
GROUND ELEVATION CONTOURS		N/A
ROTATING BEACON		
PAPI		
THRESHOLD LIGHTS		
REIL		
UTILITY POLE		N/A
TO BE REMOVED	N/A	

ALP APPROVAL BLOCK

DATE

KENNETH GULLEY
AVIATION MANAGER
CITY OF BESSEMER

CONSTRUCTION NOTICE REQUIREMENT

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

AIRPORT LAYOUT DRAWING

BESSEMER AIRPORT

BESSEMER, ALABAMA

BWSC
BARGE WAGGONER SUMNER & CANNON, INC.

DR.	CHK.	DATE	DESCRIPTION
JEC	DKS	1-31-2014	ALP UPDATE

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EXISTING FEATURE	
NO.	FEATURE
E1	AIRCRAFT PARKING APRON
E2	FUEL FARM
E3	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)
E4	4-BOX PAPI
E5	GLIDE SLOPE ANTENNA
E6	LOCALIZER
E7	WINDCONE AND SEGMENTED CIRCLE
E8	WINDCONE
E9	NGS SURVEY MONUMENT (BESSPORT) N=1205781.2246, E=2144371.3039, ELEV.= 696.47
E10	NGS SURVEY MONUMENT (BESSPORT AZ MK) N=1203725.1130, E=2141892.0967, ELEV.= 695.80

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NO.	FEATURE
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P2	RELOCATED LOCALIZER
P3	RELOCATED 4-BOX PAPI
P4	ULTIMATE APRON (750'x175')
P5	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)

PROPOSED FACILITIES	
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PB2	80' x 80' CORPORATE HANGAR
PB3	60' x 60' CORPORATE HANGAR
PB4	50' x 50' CORPORATE HANGAR
PB5	10-UNIT T-HANGAR

EXISTING FACILITIES					
NO.	STRUCTURE	ELEV.	NO.	STRUCTURE	ELEV.
B1	CORPORATE HANGAR	337.9'	B13	RESTAURANT / HANGAR	325.9'
B2	CORPORATE HANGAR	345.5'	B14	HANGAR	321.7'
B3	CORPORATE HANGAR	330.3'	B15	HANGAR	326.1'
B4	CORPORATE HANGAR	330.9'	B16	6-UNIT T-HANGAR	342.1'
B5	CORPORATE HANGAR	335.0'	B17	4-UNIT T-HANGAR	344.9'
B6	CORPORATE HANGAR	334.1'	B18	11-UNIT T-HANGAR	352.3'
B7	CORPORATE HANGAR	339.3'	B19	12-UNIT OPEN AIR T-HANGAR	379.6'
B8	CORPORATE HANGAR	338.1'	B20	CORPORATE HANGAR	380.2'
B9	CORPORATE HANGAR	332.7'	B21	CORPORATE HANGAR	380.2'
B10	MAINTENANCE HANGAR	335.0'	B22	AEROTECH HANGAR	380.2'
B11	FBO / TERMINAL BUILDING	344.0'	B23	16-UNIT T-HANGAR	380.2'
B12	FIRESTATION	342.0'	B24	16-UNIT T-HANGAR	380.2'
			B25	CIVIL AIR PATROL	353.7'

EXISTING 6,007'x100' RUNWAY / ULTIMATE 6,507'x100' RUNWAY

500' AWOS CRITICAL AREA

ULTIMATE COMMERCIAL/ INDUSTRIAL DEVELOPMENT

LEGEND		
	EXISTING	ULTIMATE
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
APPROACH SURFACE		
THRESHOLD SITING SURFACE		
AIRPORT REFERENCE POINT		
AIRPORT PAVEMENT		
AIRPORT BUILDINGS		
OTHER BUILDINGS		N/A
AIRPORT PROPERTY LINE / EASEMENTS		
OTHER PROPERTY LINES		
FENCE		
ROADS		
GROUND ELEVATION CONTOURS		N/A
ROTATING BEACON		
PAPI		
THRESHOLD LIGHTS		
REIL		
UTILITY POLE		N/A
TO BE REMOVED	N/A	

MAG DEC

MAGNETIC DECLINATION
3°02' W+ 2014 ANNUAL
RATE OF CHANGE - 6.4' W

0 200 400 600
SCALE IN FEET

CONSTRUCTION NOTICE REQUIREMENT
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TERMINAL AREA DRAWING

BESSEMER AIRPORT

BESSEMER, ALABAMA

BWSC
BARGE WAGGONER SUMNER & CANNON, INC.

DR.	CHK.	DATE	DESCRIPTION
JEC	DKS	1-31-2014	ALP UPDATE

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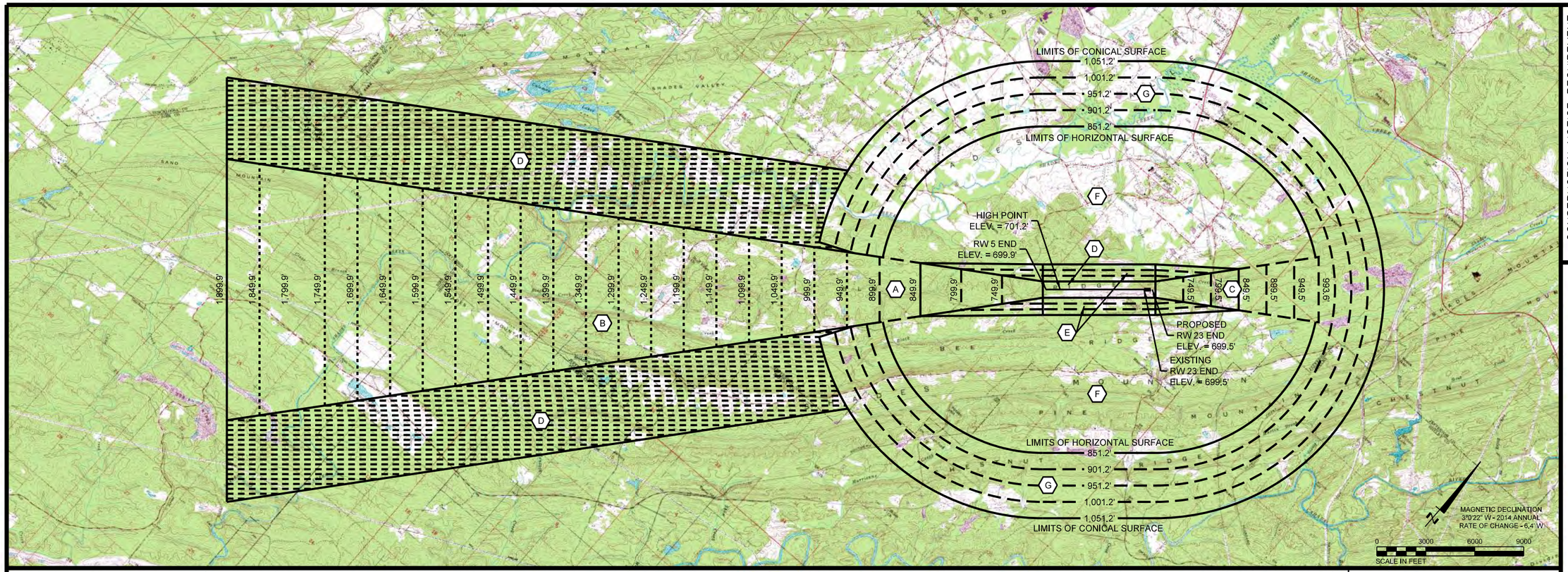

CONSTRUCTION NOTICE REQUIREMENT
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FAR PART 77 AIRSPACE DRAWING

BESSEMER AIRPORT

BESSEMER, ALABAMA

VIOLATIONS TO FAR PART 77 SURFACES

PROPOSED PART 77	DESCRIPTION	ELEVATION	VIOLATION	PROPOSED DISPOSITION	PROPOSED PART 77	DESCRIPTION	ELEVATION	VIOLATION	PROPOSED DISPOSITION	PROPOSED PART 77	DESCRIPTION	ELEVATION	VIOLATION	PROPOSED DISPOSITION	PROPOSED PART 77	DESCRIPTION	ELEVATION	VIOLATION	PROPOSED DISPOSITION
V1	TREES	718.2'	9.4'	REMOVE	V21	UTILITY POLE	722.2'	13.4'	LIGHT	V41	UTILITY POLE	726.7'	5.1'	LIGHT	* V73	UTILITY POLE	707.1'	2.4'	LIGHT
V2	TREES	724.1'	8.4'	REMOVE	V22	UTILITY POLE	716.4'	11.4'	LIGHT	V42	BUILDING	723.7'	16.1'	LIGHT	* V74	TREES	716.0'	10.9'	REMOVE
V3	TREES	731.9'	27.8'	REMOVE	V23	TREES	726.7'	15.5'	REMOVE	V43	BUILDING	721.3'	11.9'	LIGHT	* V75	UTILITY POLE	722.5'	27.1'	LIGHT
V4	TREES	735.8'	0.1'	REMOVE	V24	UTILITY POLE	724.0'	0.2'	LIGHT	V44	TREES	747.6'	26.9'	REMOVE					
V5	TREES	735.6'	28.8'	REMOVE	V25	BUILDING	732.2'	25.4'	LIGHT	* V45	TREES	759.0'	56.8'	REMOVE					
V6	TREES	739.3'	15.5'	REMOVE	V26	BUILDING	731.0'	20.9'	LIGHT	* V46	TREES	751.5'	50.9'	REMOVE					
V7	BUILDING	705.5'	3.0'	LIGHT	V27	UTILITY POLE	728.5'	5.6'	LIGHT	* V47	TREES	743.0'	27.0'	REMOVE					
V8	UTILITY POLE	708.9'	8.2'	LIGHT	V28	BUILDING	717.7'	5.3'	LIGHT	* V48	TREES	760.9'	10.6'	REMOVE					
V9	UTILITY POLE	723.2'	11.5'	LIGHT	V29	TREES	734.5'	6.1'	REMOVE	* V49	TREES	718.6'	1.5'	REMOVE					
V10	UTILITY POLE	723.8'	12.5'	LIGHT	V30	UTILITY POLE	723.6'	2.5'	LIGHT	* V50	TREES	722.7'	22.7'	REMOVE					
V11	TREES	734.1'	20.2'	REMOVE	V31	UTILITY POLE	721.9'	1.0'	LIGHT	* V51	TREES	725.5'	4.4'	REMOVE					
V12	TREES	746.4'	11.1'	REMOVE	V32	BUILDING	720.4'	10.5'	LIGHT	* V53	TREES	755.3'	28.5'	REMOVE					
V13	BUILDING	719.3'	14.1'	LIGHT	V33	BUILDING	717.7'	7.7'	LIGHT	* V54	UTILITY POLE	720.7'	5.4'	LIGHT					
V14	BEACON	745.3'	31.8'	LIGHT	V34	UTILITY POLE	725.5'	4.5'	LIGHT	* V55	TREES	734.6'	5.9'	REMOVE					
V15	BUILDING	708.4'	2.3'	LIGHT	V35	BUILDING	722.4'	13.0'	LIGHT	* V56	UTILITY POLE	726.8'	4.6'	LIGHT					
V16	UTILITY POLE	723.1'	12.1'	LIGHT	V36	BUILDING	723.5'	11.6'	LIGHT	* V57	TREES	750.8'	51.2'	REMOVE					
V17	UTILITY POLE	761.1'	7.3'	LIGHT	V37	UTILITY POLE	726.2'	5.1'	LIGHT	* V58	TREES	758.6'	44.9'	REMOVE					
V18	UTILITY POLE	722.7'	1.1'	LIGHT	V38	BUILDING	725.0'	13.7'	LIGHT	* V60	BUILDING	720.8'	11.3'	LIGHT					
V19	BUILDING	704.9'	0.7'	LIGHT	V39	UTILITY POLE	718.3'	1.1'	LIGHT	* V71	TREES	734.2'	N/A	REMOVE					
V20	BUILDING	704.9'	0.5'	LIGHT	V40	BUILDING	723.0'	15.1'	LIGHT	* V72	TREES	734.8'	9.7'	REMOVE					

* THESE VIOLATIONS ARE DEPICTED ON THE INNER APPROACH DRAWINGS

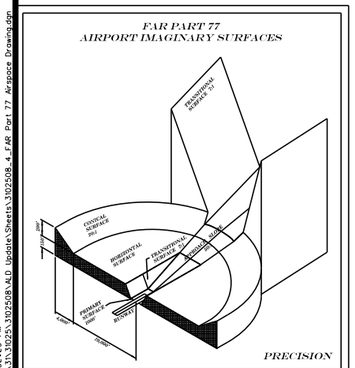
NOTE:
V71 IS A VIOLATION TO THE EXISTING RUNWAY 23 END APPROACH SURFACE, HOWEVER, IT WILL NOT BE A VIOLATION TO THE APPROACH/TRANSITIONAL SURFACE ONCE RUNWAY 23 END IS EXTENDED.

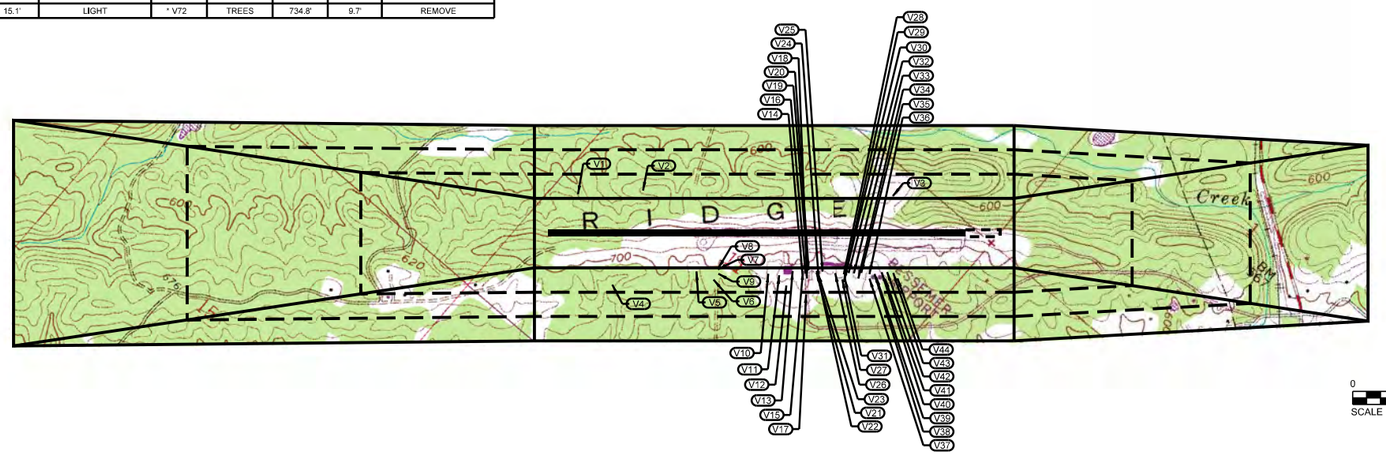
TREES ALONG THE NORTHERN EDGE OF THE ENTIRE RUNWAY ARE LOCATED WITHIN THE PRIMARY SURFACE.

LEGEND

- (A) — APPROACH SURFACE (50:1 SLOPE)
- (B) — APPROACH SURFACE (40:1 SLOPE)
- (C) — APPROACH SURFACE (34:1 SLOPE)
- (D) — PRIMARY SURFACE
- (E) — TRANSITIONAL SURFACE (7:1 SLOPE)
- (F) — HORIZONTAL SURFACE (150' ABOVE ESTABLISHED AIRPORT ELEVATION)
- (G) — CONICAL SURFACE (20:1 SLOPE)

FAR PART 77
AIRPORT IMAGINARY SURFACES





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BARGE WAGGONER SUMNER & CANNON, INC.

DR.	DESCRIPTION
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DATE	
1-31-2014	

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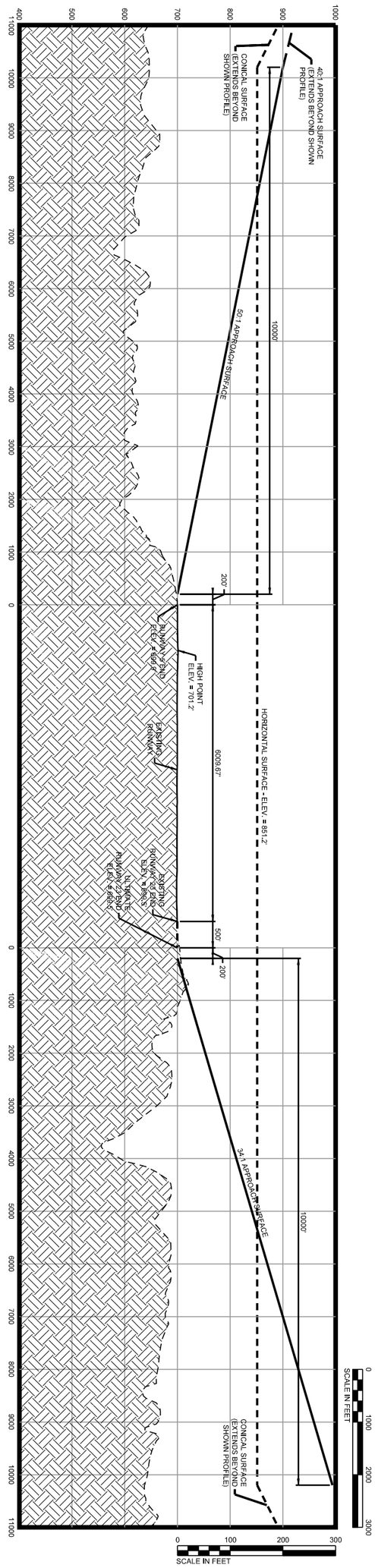

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JEC	DKS	1-31-2014	ALP UPDATE

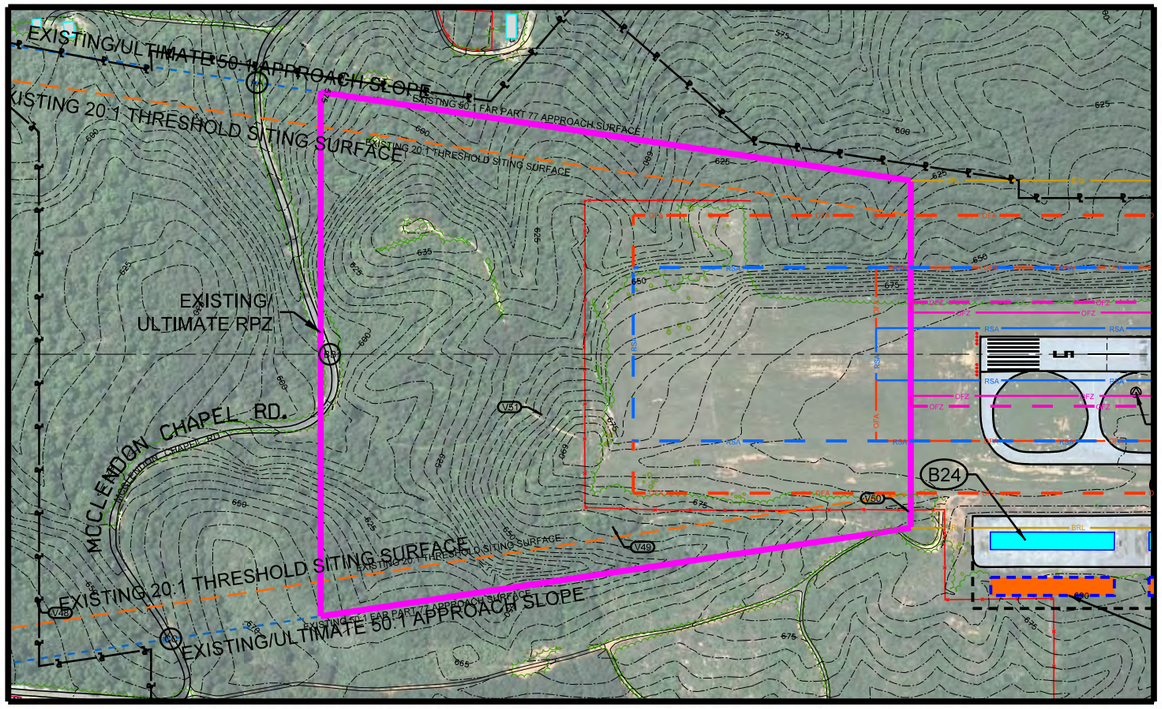
FAR PART 77 AIRSPACE PROFILE

BESSEMER AIRPORT

BESSEMER, ALABAMA

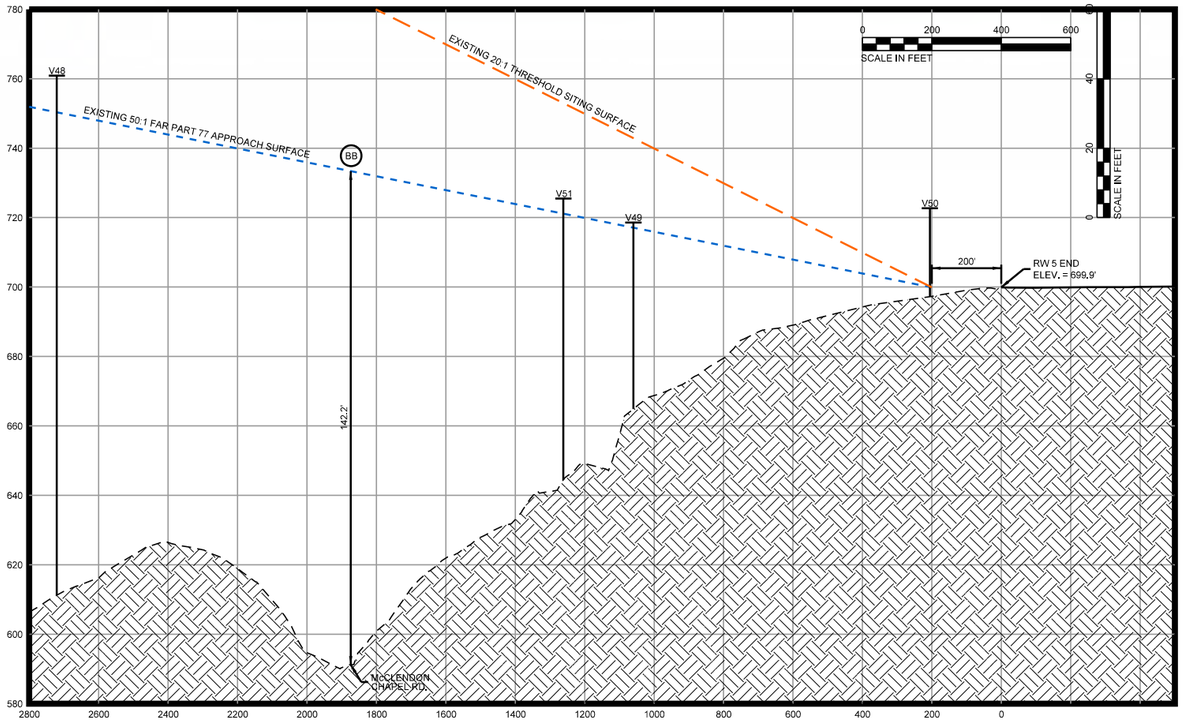
CONSTRUCTION NOTICE REQUIREMENT

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



NOTE:
ONLY THE VIOLATIONS THAT OCCUR IN THE APPROACH SURFACE ARE SHOWN IN THE PROFILE VIEW.

FOR CLARITY, THE ONLY ROAD CLEARANCE HEIGHT SHOWN ON THE PROFILE IS AT THE INTERSECTION OF THE PROJECTED RUNWAY CENTERLINE AND THE ROAD CENTERLINE.



LEGEND

	EXISTING	ULTIMATE
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
APPROACH SURFACE		
THRESHOLD SITING SURFACE		
AIRPORT REFERENCE POINT		
AIRPORT PAVEMENT		
AIRPORT BUILDINGS		
OTHER BUILDINGS		N/A
AIRPORT PROPERTY LINE / EASEMENTS		
FENCE		
ROADS		
GROUND ELEVATION CONTOURS		N/A
ROTATING BEACON		
PAPI		
THRESHOLD LIGHTS		
REIL		
UTILITY POLE		N/A
TO BE REMOVED		

OBSTRUCTION TABLE

POINT	DESCRIPTION	APPROX. TOP ELEV. (msl)	EXISTING PART 77 APPROACH SURFACES		ULTIMATE PART 77 APPROACH SURFACES		PROPOSED ACTION
			ELEV. (msl)	APPROX. PENETRATION	ELEV. (msl)	APPROX. PENETRATION	
V48	TREES	760.9'	A 750.3'	10.6'	SAME	SAME	REMOVE
V49	TREES	718.6'	A 717.1'	1.5'	SAME	SAME	REMOVE
V50	TREES	722.7'	A 700.0'	22.7'	SAME	SAME	REMOVE
V51	TREES	725.5'	A 721.1'	4.4'	SAME	SAME	REMOVE

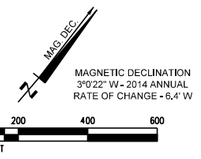
A=APPROACH T=TRANSITIONAL P=PRIMARY H=HORIZONTAL

VERTICAL ROAD CLEARANCE CHART

POINT	DESCRIPTION	APPROX. ROAD ELEV (msl)	EXISTING PART 77 APPROACH SURFACES		ULTIMATE PART 77 APPROACH SURFACES		PROPOSED ACTION
			ELEV. (msl)	APPROX. CLEARANCE	ELEV. (msl)	APPROX. CLEARANCE	
AA	McCLENDON CHAPEL RD.	551.2'	A 737.6'	186.4'	SAME	SAME	NONE
BB	McCLENDON CHAPEL RD.	591.2'	A 733.4'	142.2'	SAME	SAME	NONE
CC	McCLENDON CHAPEL RD.	645.9'	A 742.5'	96.6'	SAME	SAME	NONE

A=APPROACH T=TRANSITIONAL P=PRIMARY H=HORIZONTAL

FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
10 FEET ABOVE PRIVATE ROADS
15 FEET ABOVE PUBLIC ROADS
17 FEET ABOVE INTERSTATE HIGHWAYS
ELEVATION = ACTUAL ROADWAY ELEVATION AND FAR PART 77 CLEARANCE



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RUNWAY 5 INNER APPROACH DRAWING

BESSEMER AIRPORT

BESSEMER, ALABAMA

BARGE WAGGONER SUMNER & CANNON, INC.

BWSC

DR.	CHK.	DATE	DESCRIPTION
JEC	DKS	1-31-2014	ALP UPDATE

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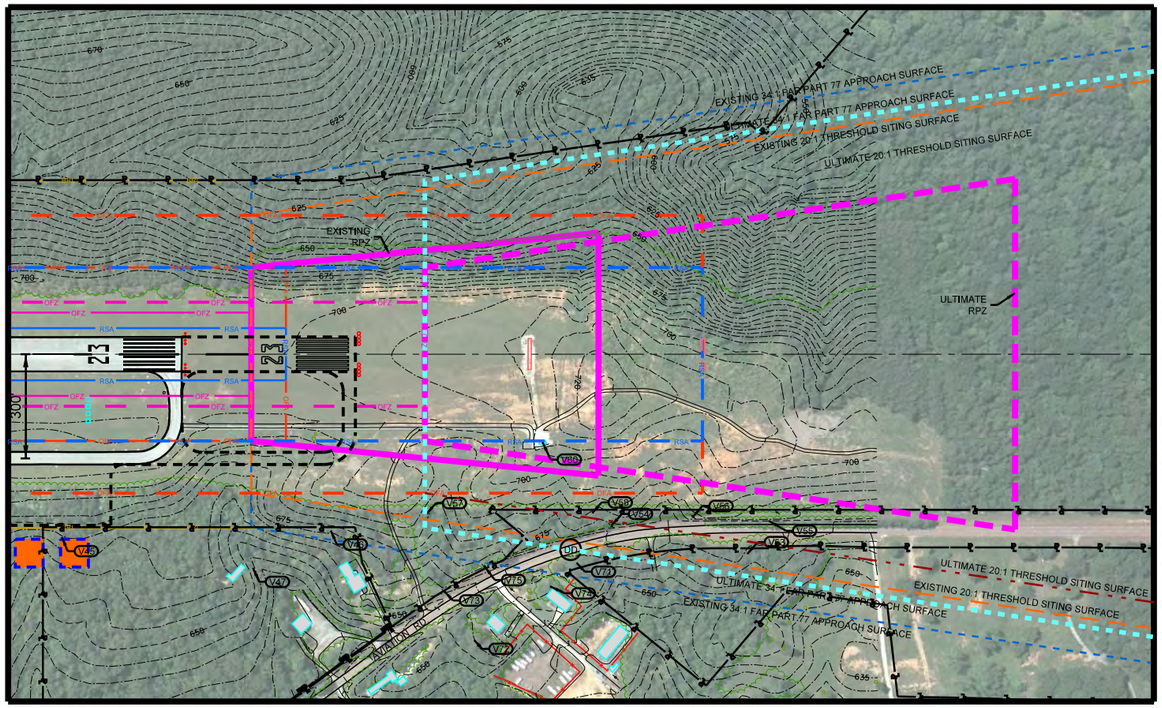
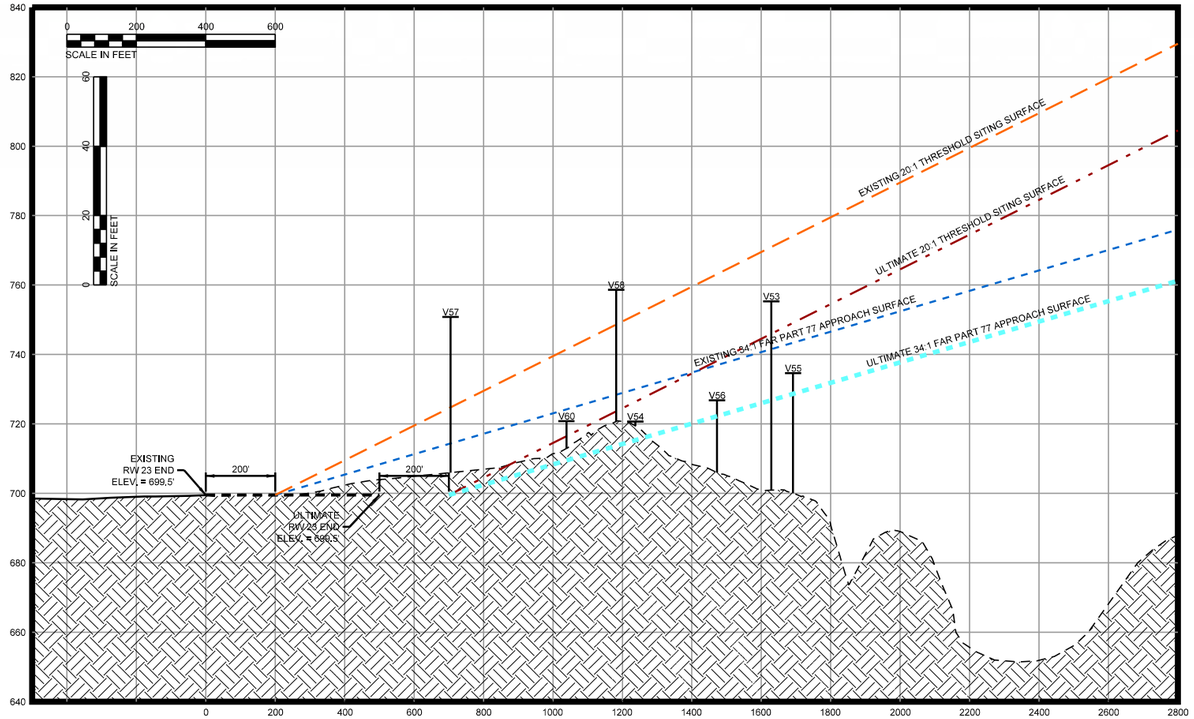


NOTE:
ONLY THE VIOLATIONS THAT OCCUR IN THE APPROACH SURFACE ARE SHOWN IN THE PROFILE VIEW.

NO ROAD CLEARANCE HEIGHTS SHOWN IN THE PROFILE DUE TO THE FACT THAT THE ROAD CENTERLINE DOES NOT CROSS THE PROJECTED RUNWAY CENTERLINE AT ANY POINT.



LEGEND

	EXISTING	ULTIMATE
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
APPROACH SURFACE		
THRESHOLD SITING SURFACE		
AIRPORT REFERENCE POINT		
AIRPORT PAVEMENT		
AIRPORT BUILDINGS		
OTHER BUILDINGS		N/A
AIRPORT PROPERTY LINE / EASEMENTS		
FENCE		
ROADS		
GROUND ELEVATION CONTOURS		N/A
ROTATING BEACON		
PAPI		
THRESHOLD LIGHTS		
REIL		
UTILITY POLE		N/A
TO BE REMOVED		

OBSTRUCTION TABLE

POINT	DESCRIPTION	APPROX. TOP ELEV. (msl)	EXISTING PART 77 APPROACH SURFACES		ULTIMATE PART 77 APPROACH SURFACES		PROPOSED ACTION
			ELEV. (msl)	APPROX. PENETRATION	ELEV. (msl)	APPROX. PENETRATION	
V45	TREES	759.0'	T 702.2'	56.8'	SAME	SAME	REMOVE
V46	TREES	751.5'	A 706.2'	45.3'	T 700.6'	50.9'	REMOVE
V47	TREES	743.0'	A/T 715.8"	27.2'	T 716.0'	27.0'	REMOVE
V53	TREES	755.3'	A 741.5'	13.8'	A 726.8'	28.5'	REMOVE
V54	UTILITY POLE	720.7'	A 730.0'	NONE	A 715.3'	5.4'	LIGHT
V55	TREES	734.6'	A 743.4'	NONE	A 728.7'	5.9'	REMOVE
V56	UTILITY POLE	726.8'	A 736.9'	NONE	A 722.2'	4.6'	LIGHT
V57	TREES	750.8'	A 714.3'	36.5'	A 699.6'	51.2'	REMOVE
V58	TREES	758.6'	A 728.4"	30.2'	A 713.7'	44.9'	REMOVE
V60	BUILDING	720.8'	A 724.2"	NONE	A 709.5'	11.3'	LIGHT
V71	TREES	753.9'	A 727.1'	26.8'	A/T 744.7'	NONE	REMOVE
V72	UTILITY POLE	734.8'	A/T 750.4'	NONE	A/T 725.1'	9.7'	LIGHT
V73	TREES	707.1'	A/T 730.0'	NONE	A/T 704.7'	2.4'	REMOVE
V74	TREES	716.0'	A/T 730.4'	NONE	A/T 705.1'	10.9'	REMOVE
V75	UTILITY POLE	722.5'	A/T 720.7'	1.8'	A/T 695.4'	27.1'	LIGHT

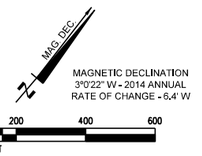
A=APPROACH T=TRANSITIONAL P=PRIMARY H=HORIZONTAL

VERTICAL ROAD CLEARANCE CHART

POINT	DESCRIPTION	APPROX. ROAD ELEV (msl)	EXISTING PART 77 APPROACH SURFACES		ULTIMATE PART 77 APPROACH SURFACES		PROPOSED ACTION
			ELEV. (msl)	APPROX. CLEARANCE	ELEV. (msl)	APPROX. CLEARANCE	
DD	AVIATION RD.	665.8'	A 726.6'	60.8'	A 711.8'	46.0'	NONE

A=APPROACH T=TRANSITIONAL P=PRIMARY H=HORIZONTAL

FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
10 FEET ABOVE PRIVATE ROADS
15 FEET ABOVE PUBLIC ROADS
17 FEET ABOVE INTERSTATE HIGHWAYS
ELEVATION = ACTUAL ROADWAY ELEVATION AND FAR PART 77 CLEARANCE



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RUNWAY 23 INNER APPROACH DRAWING

BESSEMER AIRPORT

BESSEMER, ALABAMA

BWSC Barge Waggoner Sumner & Cannon, Inc.

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EXISTING FEATURE

NO.	FEATURE
E1	AIRCRAFT PARKING APRON
E2	FUEL FARM
E3	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)
E4	4-BOX PAPI
E5	GLIDE SLOPE ANTENNA
E6	LOCALIZER
E7	WINDCONE AND SEGMENTED CIRCLE
E8	WINDCONE
E9	NGS SURVEY MONUMENT (BESSPORT) N=1205781.2246, E=2144371.3039, ELEV.= 696.47
E10	NGS SURVEY MONUMENT (BESSPORT AZ MK) N=1203725.1130, E=2141892.0967, ELEV.= 695.80

PROPOSED FEATURE

NO.	FEATURE
P1	AUTOMOTIVE PARKING
P2	RELOCATED LOCALIZER
P3	RELOCATED 4-BOX PAPI
P4	ULTIMATE APRON (750'x175')
P5	AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)

AIRPORT DATA

	EXISTING	ULTIMATE
AIRPORT ELEVATION	701.2'	SAME
AIRPORT REFERENCE POINT COORDINATES (NAD 83)	N 33°18'45.39"	N 33°18'46.99"
	W 86°55'34.69"	W 86°55'32.44"
NAVIGATIONAL AIDS	ROTATING BEACON	SAME
MEAN MAX. TEMP. HOTTEST MONTH	91°F/JULY	SAME
AIRPORT REFERENCE CODE	B-II	D-II
DESIGN AIRCRAFT	CITATION III	GULFSTREAM IV

PROPOSED FACILITIES

NO.	STRUCTURE
PB1	100' x 100' CORPORATE HANGAR
PB2	80' x 80' CORPORATE HANGAR
PB3	60' x 60' CORPORATE HANGAR
PB4	50' x 50' CORPORATE HANGAR
PB5	10-UNIT T-HANGAR

EXISTING FACILITIES

NO.	STRUCTURE	ELEV.	NO.	STRUCTURE	ELEV.
B1	CORPORATE HANGAR	337.9'	B13	RESTAURANT / HANGAR	325.9'
B2	CORPORATE HANGAR	345.5'	B14	HANGAR	321.7'
B3	CORPORATE HANGAR	330.3'	B15	HANGAR	326.1'
B4	CORPORATE HANGAR	330.9'	B16	6-UNIT T-HANGAR	342.1'
B5	CORPORATE HANGAR	335.0'	B17	4-UNIT T-HANGAR	344.9'
B6	CORPORATE HANGAR	334.1'	B18	11-UNIT T-HANGAR	352.3'
B7	CORPORATE HANGAR	339.3'	B19	12-UNIT OPEN AIR T-HANGAR	379.6'
B8	CORPORATE HANGAR	338.1'	B20	CORPORATE HANGAR	380.2'
B9	CORPORATE HANGAR	332.7'	B21	CORPORATE HANGAR	380.2'
B10	MAINTENANCE HANGAR	335.0'	B22	AEROTECH HANGAR	380.2'
B11	FBO / TERMINAL BUILDING	344.0'	B23	16-UNIT T-HANGAR	380.2'
B12	FIRESTATION	342.0'	B24	16-UNIT T-HANGAR	380.2'
			B25	CIVIL AIR PATROL	353.7'

CONSTRUCTION NOTICE REQUIREMENT
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AIRPORT PROPERTY MAP

BESSEMER AIRPORT

BESSEMER, ALABAMA

PROPERTY TABLE

TRACT	GRANTOR	GRANTEE	TOTAL ACREAGE	DATE ACQUIRED	TAKING	INTEREST	FAA AIP NO.
1	CITY OF BESSEMER	CITY OF BESSEMER	394.08±	N/A	N/A	FEE SIMPLE	UNKNOWN
2	MARTIN L. SYKES	CITY OF BESSEMER	15.67±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
3	WALTER R. CANDY, JR.	CITY OF BESSEMER	13.05±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
4	DONNIE E. AND GAY STEPHENS	CITY OF BESSEMER	5.23±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
5	ROBERT AND SARAH G. COLLINS	CITY OF BESSEMER	1.34±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
6	MARTHA CSASZAR	CITY OF BESSEMER	4.60±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
7	BRENDA GAIL AND JAMES I. WARREN	CITY OF BESSEMER	4.05±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
8	KEVIN D. BECK, BETH BECK AND JAMES I. WARREN	CITY OF BESSEMER	2.13±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
9	KEVIN G. AND GAIL C. SHEPPARD	CITY OF BESSEMER	0.58±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
10	EUGENE T. AND GLADYST SEALS	CITY OF BESSEMER	0.79±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
11	SARA SCRUGGS AND LAURA H. LAW	CITY OF BESSEMER	2.87±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
12	WILLIAM P. VARDAMAN AND CAROL VARDAMAN	CITY OF BESSEMER	0.91±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
13	WILLIAM P. VARDAMAN AND CAROL VARDAMAN	CITY OF BESSEMER	1.40±	2005	WHOLE	FEE SIMPLE	3-01-0013-009-2005
21	CITY OF BESSEMER	CITY OF BESSEMER	13.66±	N/A	WHOLE	FEE SIMPLE	UNKNOWN
23	SAMUEL ALLEN, JR. AND EVIE BALCH	CITY OF BESSEMER	3.30±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
25	RHODA LINDSEY LEASE	CITY OF BESSEMER	10.19±	2004	WHOLE	FEE SIMPLE	3-01-0013-008-2004
26	CITY OF BESSEMER	CITY OF BESSEMER	0.80±	N/A	WHOLE	FEE SIMPLE	UNKNOWN
27	WILLIAM P. VARDAMAN AND CAROL VARDAMAN	CITY OF BESSEMER	1.98±	N/A	WHOLE	FEE SIMPLE	FUTURE AIP#
28	WILLIAM P. VARDAMAN AND CAROL VARDAMAN	CITY OF BESSEMER	1.31±	N/A	WHOLE	FEE SIMPLE	FUTURE AIP#
29	FRANKLIN E. AND PRENTICE P. PORTER	CITY OF BESSEMER	4.04±	N/A	WHOLE	FEE SIMPLE	FUTURE AIP#
30	MILLARD R. AND BETTY S. COX	CITY OF BESSEMER	6.33±	N/A	WHOLE	FEE SIMPLE	FUTURE AIP#

MAG. DEC.

MAGNETIC DECLINATION
3°0'22" W - 2014 ANNUAL
RATE OF CHANGE - 6.4' W

0 400 800 1200
SCALE IN FEET

LEGEND

	EXISTING	ULTIMATE
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
APPROACH SURFACE		
THRESHOLD SITING SURFACE		
AIRPORT REFERENCE POINT		
AIRPORT PAVEMENT		
AIRPORT BUILDINGS		
OTHER BUILDINGS		N/A
AIRPORT PROPERTY LINE / EASEMENTS		
OTHER PROPERTY LINES		
FENCE		
ROADS		
GROUND ELEVATION CONTOURS		N/A
ROTATING BEACON		
PAPI		
THRESHOLD LIGHTS		
REIL		
UTILITY POLE		N/A
TO BE REMOVED	N/A	

BWSC BARGE WAGGONER SUMNER & CANNON, INC.

DR.	CHK.	DATE	DESCRIPTION
JEC	DKS	1-31-2014	ALP UPDATE

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CHAPTER 9
CAPITAL IMPROVEMENT PROGRAM IMPLEMENTATION PLAN

9.1 Introduction

The previous sections of this Master Plan present a logical, step-by-step explanation of how the long-range improvement plan was developed for the Airport. This implementation plan is designed to assist Airport management in achieving their primary goals to maximize revenues and minimize operating expenditures, while at the same time providing facilities to accommodate the flying public. The implementation plan presented in this section both describes the staging of proposed improvements and provides the basic capital requirements of each. Over the 20-year planning period, the implementation plan may serve as general financial guidance in making policy decisions regarding the development of the airport.

9.2 Program Staging and Cost Estimating

An initial development schedule was prepared based upon facility needs presented in Chapter 5, which in most cases were dependent upon the operations forecast. Therefore, since actual activity levels realized at the Airport may vary, the staging must remain sensitive to such variations. It is quite possible for some projects to move up in priority, while at the same time, others may move down. A prioritization of improvements considered the urgency of need, ease of implementation, logic of sequence, and input received from Airport staff. The objective was to establish an efficient order for project development and implementation that satisfied forecasted activity and Airport desires. The development schedule is divided into three general stages that represent the short (2014-2018), intermediate (2019-2023), and long-term (2024-2034).

9.3 Capital Improvement Program

The Capital Improvement Program (CIP) development schedule and cost summaries are presented in Table 9.1 and provide an itemized breakdown of the AIP and Non-AIP funding for the improvements proposed by this Master Plan. In addition, the proposed projects identified in Stage I, Stage II, and Stage III of the CIP are depicted in Figures 9-1, 9-2, and 9-3.

As noted, cost projections are based on 2013 dollars and include estimated engineering fees and contingencies. Although these costs are approximate, they are appropriate for planning purposes. These projections however, should be used for planning purposes only and do not imply that funding for these will necessarily be available. The total cost of the projects identified for Stage 1 (2014-2018) is $2,246,002. The FAA eligible portion is $1,499,402 which is 90 percent of the AIP Eligible total costs. The remaining $746,600 is the Non-Federal share. The total cost of the projects identified for Stage II (2019-2023) is $4,086,245. The FAA eligible portion is $3,092,621 which is 90 percent of the AIP Eligible total costs. The remaining $993,624 is the Non-Federal share. The total cost of the projects identified for Stage III (2024-2034) is $2,852,000.

The FAA eligible portion is $2,278,800 which is 90 percent of the AIP Eligible total costs. The remaining $573,200 is the Non-Federal share.

The next step focused on identifying costs associated with each capital improvement project. These project-specific development costs were then further broken down considering conventional aviation funding sources, such as AIP Eligible and Non-AIP Eligible projects. Particular focus was given to detailing estimated costs for the short-term.

Table 9.1
Proposed Capital Improvement Plan Projects
Bessemer Municipal Airport
Bessemer, Alabama

	Federal Share	State Share	Sponsor Share	Total
A. AIP Eligible - Stage I (0-5 YR)				
1. T-Hangar Taxilane Rehab	$337,410	$18,745	$18,745	$374,900
2. Terminal Apron Rehab - Phase II	$359,296	$19,961	$19,961	$399,218
3. Terminal Apron Rehab - Phase III	$399,796	$22,211	$22,211	$444,218
4. Relocate AWOS	$135,000	$7,500	$7,500	$150,000
5. Runway 5/23 Crack Seal	$204,899	$11,383	$11,383	$227,666
6. Runway 5/23 Remarking	$63,000	$3,500	$3,500	$70,000
Total - AIP Eligible-Stage I	**$1,499,402**	**$83,300**	**$83,300**	**$1,666,002**
B. **Non-AIP Eligible - Stage I (0-5 YR)				
1. Hangars				
a. 1-10 Unit T-Hangar	$0	$0	$400,000	$400,000
c. 1-60' X 60' Corporate Hangar	$0	$0	$180,000	$180,000
Total - Non-AIP Eligible-Stage I	**$0**	**$0**	**$580,000**	**$580,000**
TOTAL - STAGE I	**$1,499,402**	**$83,300**	**$663,300**	**$2,246,002**

** It should be noted that hangars are eligible for AIP funding with certain limitations.
Hangars are also eligible for state funding through a 50/50 grant with ALDOT (justification required)

Continued Table 9.1
Proposed Capital Improvement Plan Projects
Bessemer Municipal Airport
Bessemer, Alabama

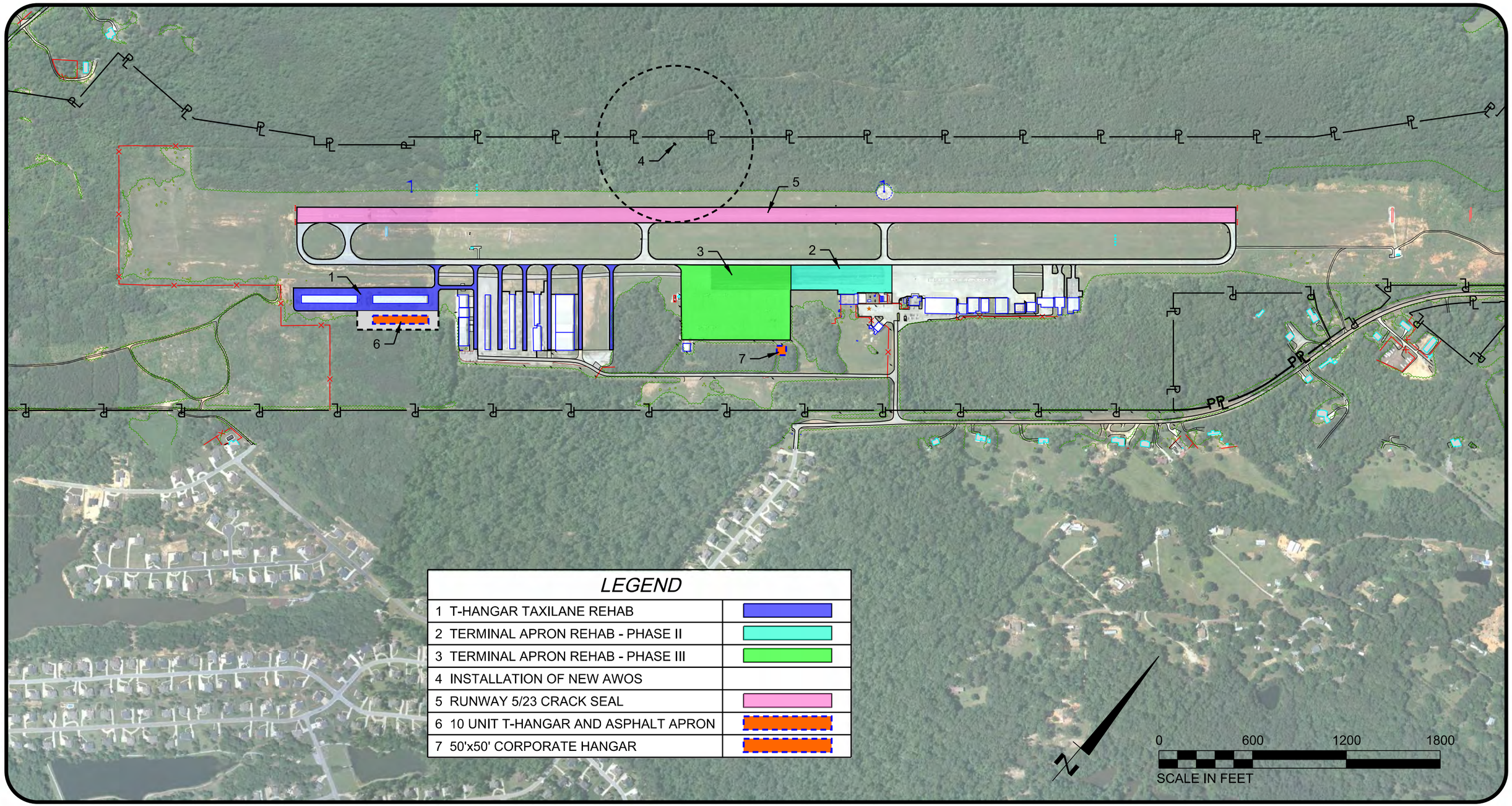
	Federal Share	State Share	Sponsor Share	Total
A. AIP Eligible - Stage II (6-10 YR)				
1. Runway Extension Justification Report	$13,500	$750	$750	$15,000
2. Environmental Assessment	$54,000	$3,000	$3,000	$60,000
3. Runway 23 Extension (500 ft)	$1,959,536	$108,863	$108,863	$2,177,262
4. Parallel Taxiway Extension (500 ft)	$1,065,585	$59,199	$59,199	$1,183,983
Total - AIP Eligible-Stage II	**$3,092,621**	**$171,812**	**$171,812**	**$3,436,245**
B. **Non-AIP Eligible - Stage II (6-10 YR)				
1. Hangars				
a. 1-10 Unit T-Hangar	$0	$0	$400,000	$400,000
b. 2-50' X 50' Coporate Hangars	$0	$0	$250,000	$250,000
Total - Non-AIP Eligible-Stage II	**$0**	**$0**	**$650,000**	**$650,000**
TOTAL - STAGE II	**$3,092,621**	**$171,812**	**$821,812**	**$4,086,245**

** It should be noted that hangars are eligible for AIP funding with certain limitations.
Hangars are also eligible for state funding through a 50/50 grant with ALDOT (justification required)

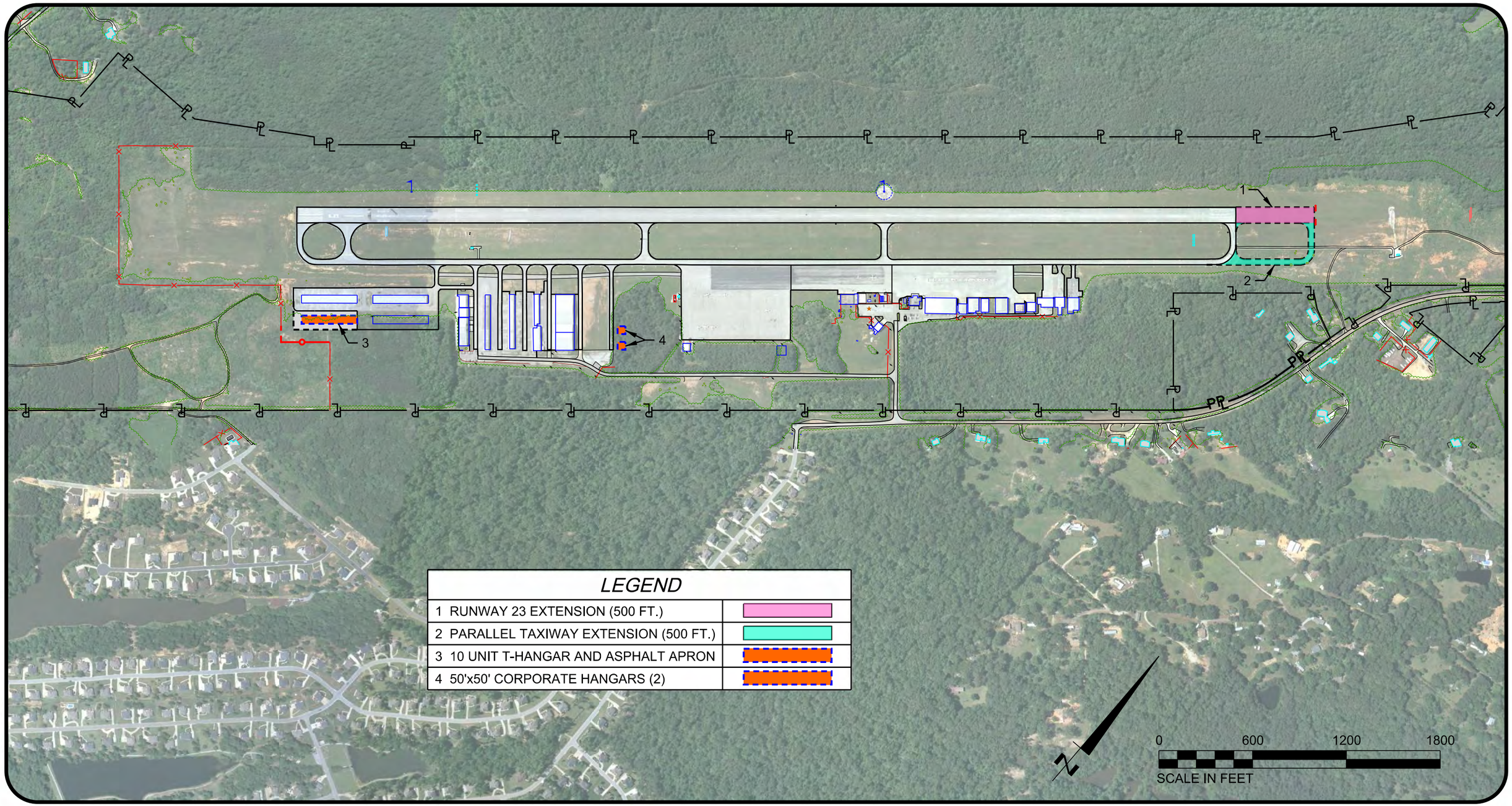
Continued Table 9.1
Proposed Capital Improvement Plan Projects
Bessemer Municipal Airport
Bessemer, Alabama

	Federal Share	State Share	Sponsor Share	Total
A. AIP Eligible - Stage III (11-20 YR)				
1. Runway 05/23 Overlay/Rehab	$1,193,400	$66,300	$66,300	$1,326,000
2. Parallel Taxiway Overlay/Rehab	$635,400	$35,300	$35,300	$706,000
3. Replace HIRL/MITL	$450,000	$25,000	$25,000	$500,000
Total - AIP Eligible-Stage III	**$2,278,800**	**$126,600**	**$126,600**	**$2,532,000**
B. **Non-AIP Eligible - Stage III (11-20 YR)				
1. Hangars				
b. 1-80' X 80' Coporate Hangars	$0	$0	$320,000	$320,000
Total - Non-AIP Eligible-Stage III	**$0**	**$0**	**$320,000**	**$320,000**
TOTAL - STAGE III	**$2,278,800**	**$126,600**	**$446,600**	**$2,852,000**

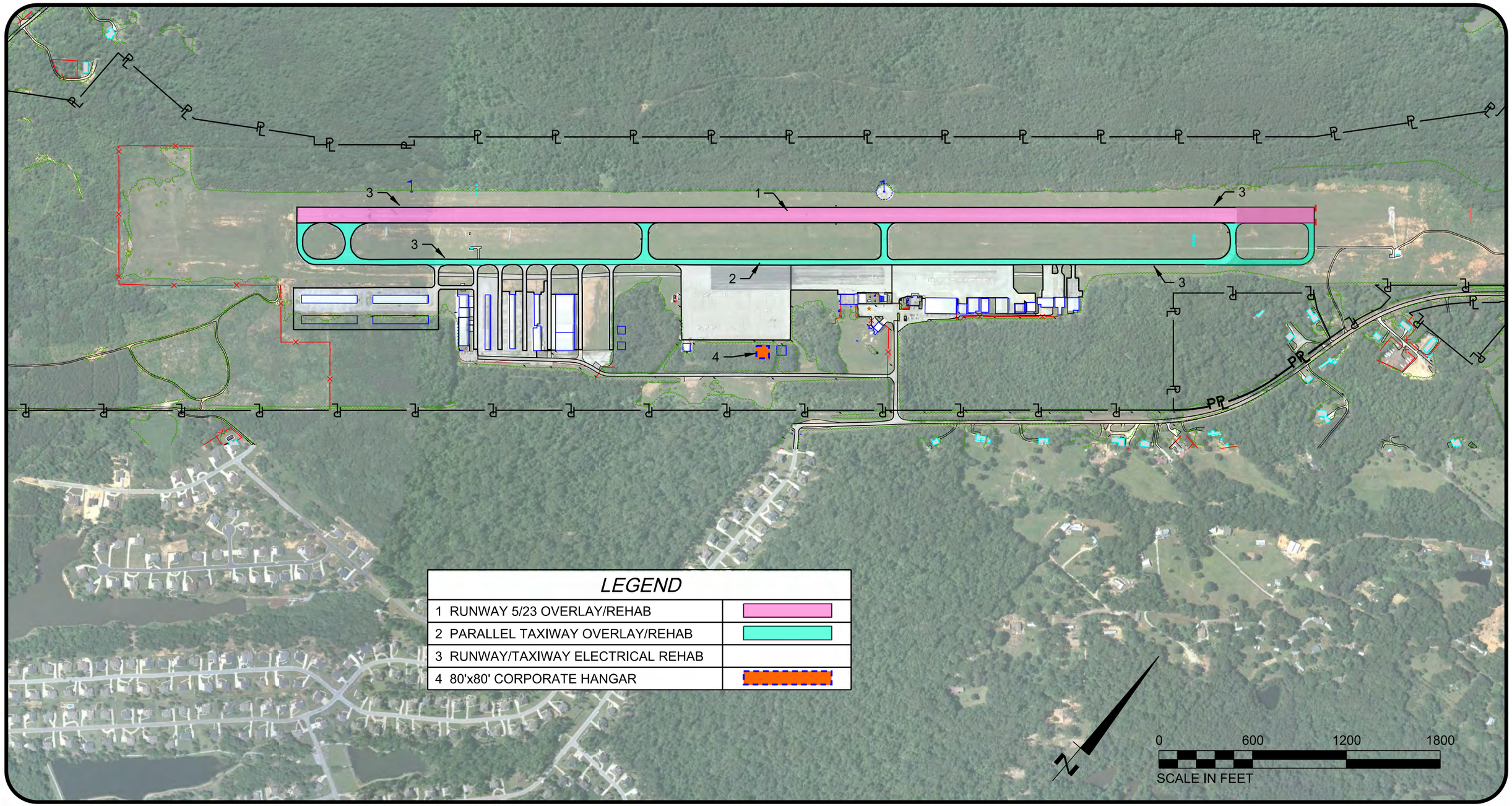
** It should be noted that hangars are eligible for AIP funding with certain limitations.
Hangars are also eligible for state funding through a 50/50 grant with ALDOT (justification required)



Stage I CIP Plan (0-5 Yr.) Figure 9-1



Stage II CIP Plan (6-10 Yr.) Figure 9-2



Stage III CIP Plan (11-20 Yr.) Figure 9-3