July 2016

Bentonville
MUNICIPAL AIRPORT
MASTER PLAN

Prepared for:

MUNICIPAL AIRPORT
BENTONVILLE

Prepared by:

MORRISON SHIPLEY
ENGINEERS • SURVEYORS

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Bentonville Municipal Airport

Louise M. Thaden Field (VBT)

Master Plan Update

Prepared for:

The City of Bentonville, Arkansas

Final Report

July 2016

NOTICE: The preparation of this document was financed in part through a planning grant from the Federal Aviation Administration (FAA) as provided under Section 505 of the Airport and Airway Improvement Act as Amended. The contents of this document do not necessarily reflect the official views of the FAA. Acceptance of the report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein, nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws.

Prepared by:

MORRISON SHIPLEY

5704 Euper Lane, Suite 200
Fort Smith, Arkansas 72903
www.morrisonshipley.com

Kimley»Horn

11400 Commerce Park Drive, Suite 400
Reston, Virginia 20191
www.kimley-horn.com

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1 INTRODUCTION

With grant funding from the Federal Aviation Administration (FAA) and the Arkansas Department of Aeronautics (ADA), the City of Bentonville has prepared a Master Plan Update (MPU) for the Bentonville Municipal Airport/Louise M. Thaden Field (VBT or Airport). The purpose of this MPU is to provide a comprehensive planning guide for the continued development of a safe, efficient, and environmentally compatible aviation facility that meets the needs and objectives of the City, Airport users and tenants, and the surrounding Airport service area. The MPU was prepared in collaboration with Federal and State agencies, local officials, and interested Airport users and stakeholders. The MPU considers Airport needs over a 20-year planning period including a short-term horizon (1 to 5 years), an intermediate-term horizon (6 to 10 years) and a long-term horizon (11 to 20 years).

1.1 Airport Vision

The highest priority for the City of Bentonville is to meet the air travel needs of the flying public by providing a safe and efficient airport environment. Bentonville City officials have also expressed interested in seeing VBT developed in a manner that supports additional recreational aircraft and the Mayor has advocated that the Airport Advisory Board seek to match or assimilate with the growth in the community, to be part of the community, and create an environment that generates interest in aviation. The City's goal is to attract a broader scope of people beyond just pilots and tenants to the Airport and engage them not only in typical aviation-related activities such as flight training or air expositions, but rather a unique, interactive Airport environment. The ultimate intent of the City and VBT is to generate public engagement and interest in aviation by constructing facilities that would accommodate and attract vintage and unique aircraft, beyond those that are already based at or utilize VBT.

1.2 Master Plan Goals and Objectives

The previous Master Plan for VBT was completed in 2003 (Delta Airport Consultants) and since that time the aviation industry has experienced a fluctuating economy, changing aircraft trends, new navigation technologies, and changing FAA standards and guidance. The MPU was undertaken to evaluate the Airport's capabilities and role, to forecast future aviation demand, and to plan for the timely development of new or expanded facilities that may be required to meet that demand. Specific objectives of the MPU include:

- Examine factors likely to affect air transportation demand in the City of Bentonville and surrounding area over the next 20 years, including the substantial growth in population and the regional economy, and develop updated operational and based aircraft forecasts.
- Determine projected needs of existing and potential Airport users, taking into consideration recent changes to FAA design standards and continued maintenance, as well as necessary improvements to the Airport's infrastructure, to ensure maximum utility of public and private facilities at VBT.
- Reflect the goals and visions of the surrounding area, especially those related to quality of life, business and development, and land use.

- Establish a schedule of development priorities, a financial program for implementation of development, and analyze potential funding sources consistent with FAA, ADA, and local planning.
- Maintain safety as an essential consideration in the planning and development of the Airport.

1.3 Baseline Assumptions

The baseline assumptions used throughout the preparation of this MPU include:

- Bentonville Municipal Airport will continue to operate as a general aviation airport through the planning period.
- The other Northwest Arkansas regional airports will remain open for the foreseeable future.
- Bentonville Municipal Airport will continue to seek general aviation and small corporate business aviation based tenants and transient operations, including recreational aircraft.
- The aviation industry on the national level will grow as forecast by the FAA in its annual Aerospace Forecasts.
- The socioeconomic characteristics of the Northwest Arkansas region will continue to grow as forecasted, at a rate higher than the Arkansas average.
- Both Federal and State aviation programs will be in place through the planning period to assist in funding future capital development needs.

2 INVENTORY

The initial step in the master planning process was to develop a thorough inventory of existing conditions at the Airport, and in and around the Airport's market area. The inventory process incorporated a broad spectrum of information including data on landside and airside facilities, surrounding land uses, weather conditions, area airspace, historical activity levels, and socioeconomic factors. The collected data established the foundation for evaluating future Airport needs and facility requirements. The information summarized in the following sections of this chapter was obtained through on-site visits, discussions with Airport staff, review of previous Airport planning documents, review of FAA records, and review of various local and regional planning documents. Inventory data is presented in the following sections:

- Airport Ownership and History
- Airport Location and Access
- Airport Role
- Airport Activity
- Existing Airport Facilities
- Airspace and Instrument Procedures
- Climatic and Meteorological Conditions
- Area Socioeconomic Data
- Area Land Use Patterns and Zoning
- Environmental Considerations
- Other Area Airports
- Near-Term Planned Development

2.1 Airport Ownership and History

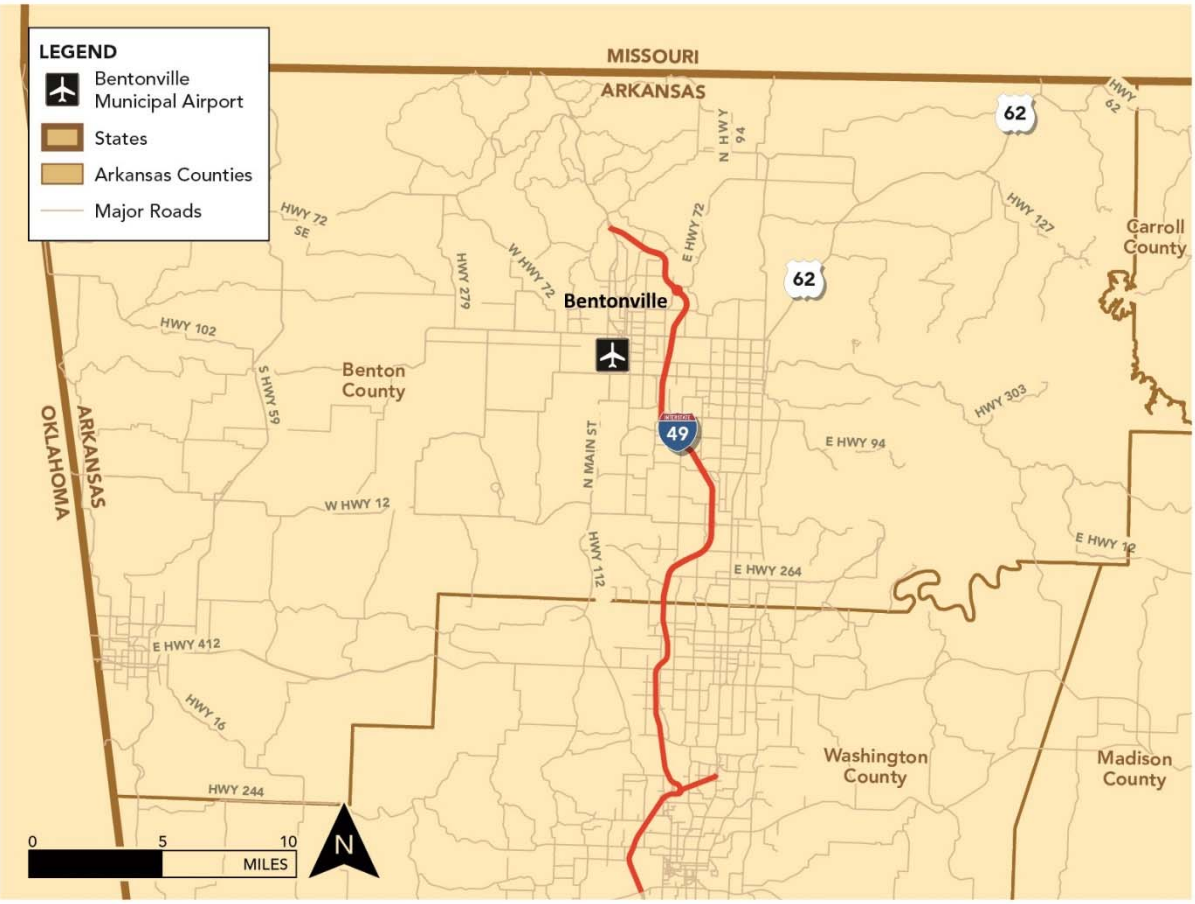
Bentonville Municipal Airport is owned and operated by the City of Bentonville. An Airport Advisory Board was created to assist the City in the oversight of the Airport's activities. The Advisory Board submits a five-year capital improvements plan (CIP) to the Mayor; prepares an annual budget and bi-annual reports; and meets monthly to review the ongoing operational and financial conditions of the Airport. The Advisory Board has five members as well as a City Council member that serves as an ex-officio member.

The Airport was named after Louise McPhetridge Thaden who was born in Bentonville and is an aviation pioneer. In the late 1920s, she set the women's altitude record, solo endurance record, and speed record. She was a co-founder of the Ninety-Nines with Amelia Earhart, and is recognized for her significant contributions to aviation.

2.2 Airport Location and Access

As shown in **Exhibit 2-1**, VBT is located in the northwestern corner of Arkansas, and is two miles to the south of the center of the City of Bentonville at an elevation of approximately 1,296 feet.

Exhibit 2-1. VBT Airport Region

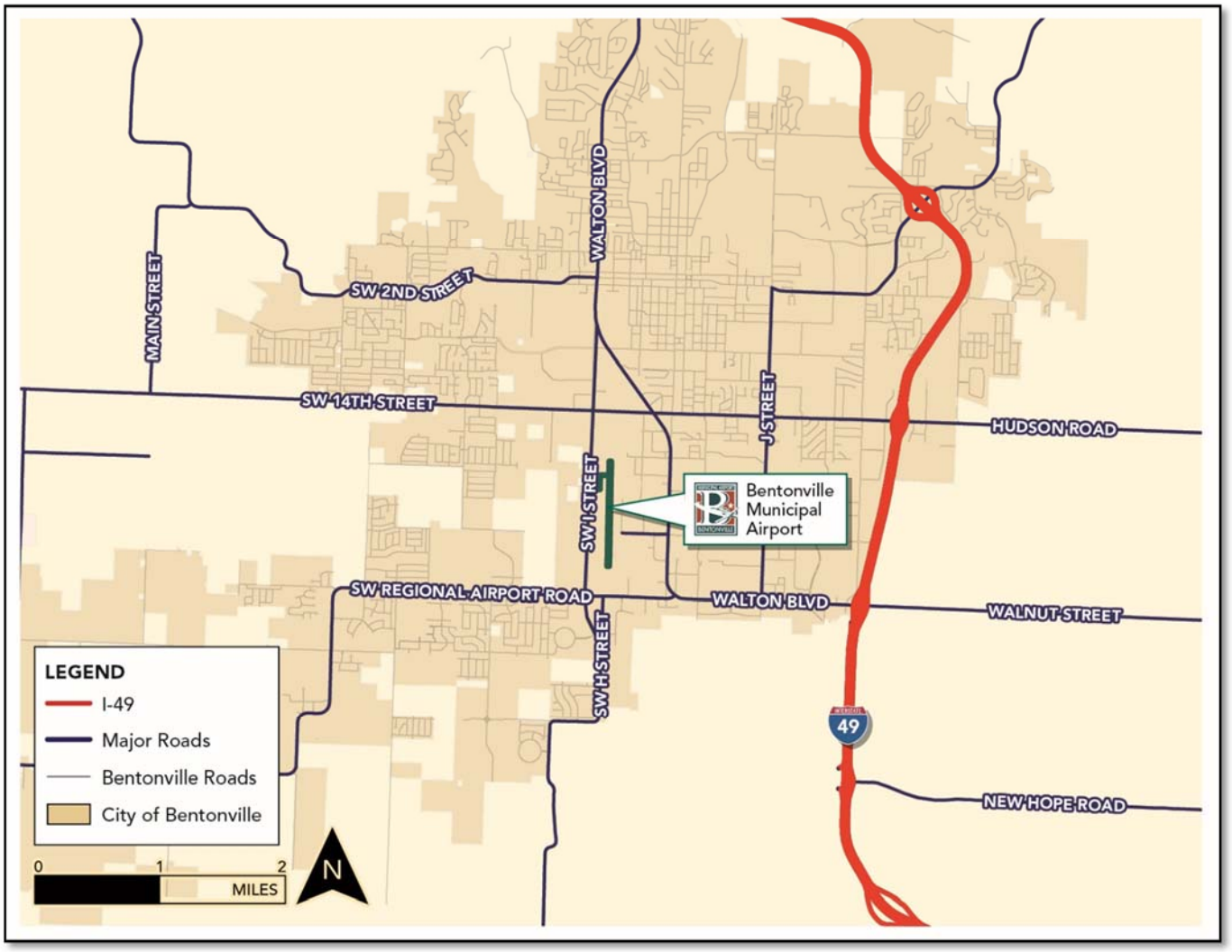


Sources: City of Bentonville GIS, Kimley-Horn and Associates

Prepared: November 2014

The surface transportation network and local community surrounding the Airport are depicted in **Exhibit 2-2** and **Exhibit 2-3**. Interstate 49 (I-49) provides major north-south access between Fort Smith and Kansas City as well as access to the City of Bentonville. Connections between I-49 and VBT are provided by Airport Road (AR Hwy. 204) via S. Walton Boulevard (US 71B) and SE 14th Street (AR Hwy. 102). SW Regional Airport Boulevard (AR Hwy. 12) provides access to the Northwest Arkansas Regional Airport (XNA), the commercial service airport that serves the region, which is located approximately six miles to the southwest of VBT.

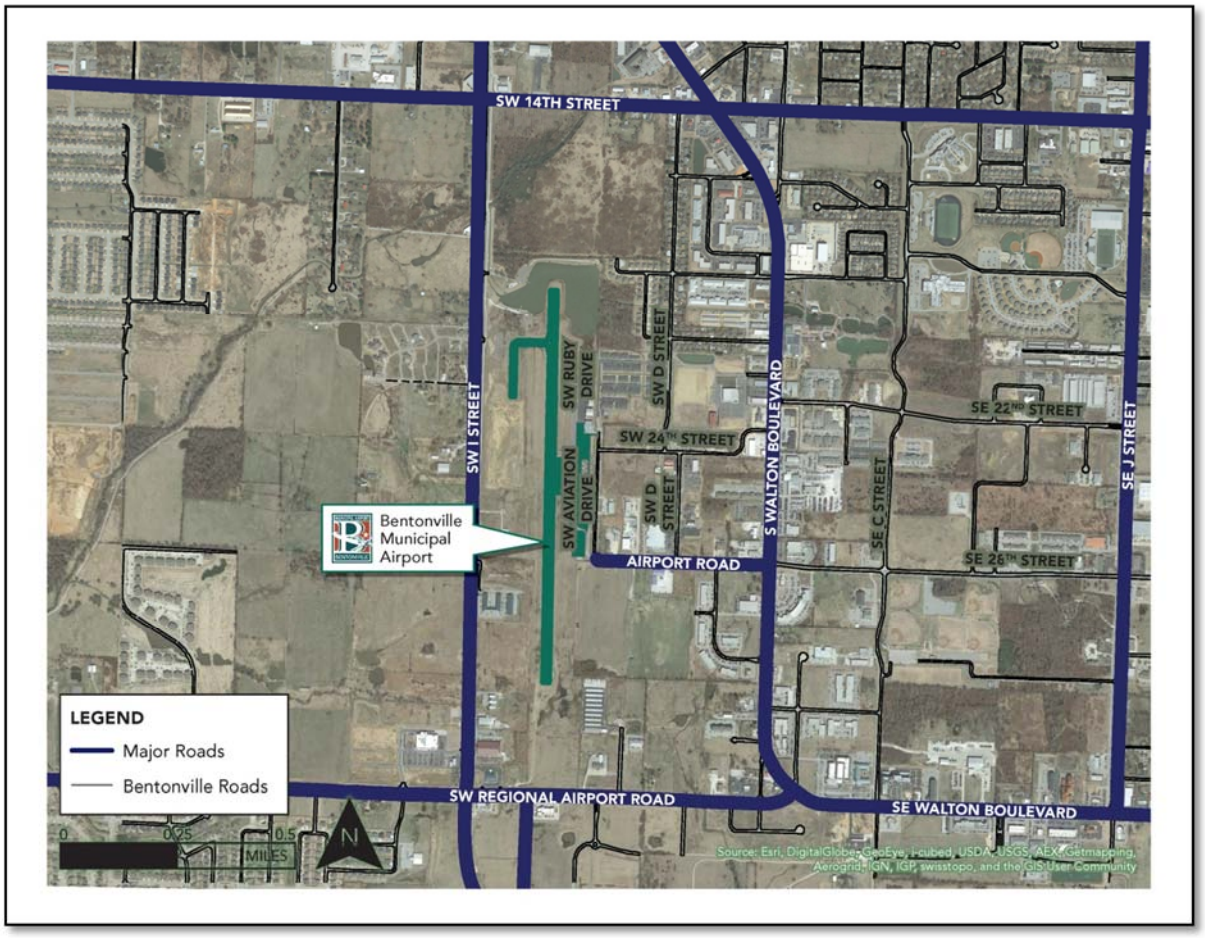
Exhibit 2-2. Surface Transportation Network around VBT



Sources: City of Bentonville GIS, Kimley-Horn and Associates

Prepared: November 2014

Exhibit 2-3. Airport Access



Source: City of Bentonville GIS, Kimley-Horn

Prepared: November 2014

2.3 Airport Role

An important aspect of the master planning effort is to ensure that the Airport has the necessary facilities to adequately support the various roles that it may play in the local, regional, and national transportation systems.

The FAA's National Plan of Integrated Airport Systems (NPIAS) identifies airports that are significant to the national air transportation system. The NPIAS is used by the FAA in managing and administering the Airport Improvement Program (AIP) and supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility. Airports included in the NPIAS are classified as having one of the following roles within the national system:

- **Primary Commercial Service Airports** – Publicly owned commercial service airports that have more than 10,000 passenger boardings or enplanements each calendar year and receive scheduled passenger service. Northwest Arkansas Regional Airport (XNA) is the only primary commercial service airport in the area. Other primary commercial service airports in Arkansas include Fort Smith Regional Airport (FSM), Bill and Hillary Clinton National Airport/Adams Field (LIT), and Texarkana Regional-Webb Field (TXK).
- **Nonprimary Commercial Service Airports** – Publicly owned commercial service airports that have at least 2,500 and not more than 10,000 passenger boardings each year. Arkansas has no nonprimary commercial service airports.
- **Reliever Airports** – Airports designated by the FAA to relieve congestion at commercial service airports and to provide improved general aviation access to the overall community. These may be publicly or privately-owned. Reliever airports in Arkansas include North Little Rock Municipal Airport (ORK) and West Memphis Municipal Airport (AWM).
- **General Aviation Airports** – Airports included in the national system that are not categorized as commercial service or reliever airports. General aviation airports can be publicly or privately owned. There are 71 NPIAS general aviation airports in Arkansas.

Bentonville Municipal Airport is currently classified in the NPIAS as a general aviation airport. VBT plays an important role in supporting general aviation for Benton County and the City of Bentonville by supporting local businesses and residents as well as transient users.

Recognizing the unique roles played by general aviation airports throughout the U.S., the FAA conducted an 18-month study to further classify the general aviation airports included in the NPIAS and published the report titled *General Aviation Airports: A National Asset (ASSET)* in May 2012. This report documents the importance of the general aviation airport system, the need for new general aviation categories, a description of each of the four ASSET categories, and lists each airport in the NPIAS by ASSET category.

ASSET noted five key aeronautical functions provided by the general aviation airport system. The functions include:

- Emergency preparedness and response,
- Critical community access for remote areas,
- Commercial, industrial, and economic activity functions,
- Access to tourism and special events, and
- Other aviation specific functions including corporate flights and flight instruction.

Four new categories were developed by the FAA to classify the general aviation airports included in the NPIAS by their current role in the national airport system. These new categories were developed to provide policymakers with a better understanding of the vast and diverse general aviation system. While more detailed than the previous category designation of general aviation-reliever or general aviation, these Federal categories are still broad and will not replace existing statewide system planning or airport master planning, which utilize unique and more-

detailed site specific data to determine their role in the state or community. The four new ASSET categories and the criteria used to evaluate each airport are presented in **Table 2-1.**

Table 2-1. ASSET Airport Categories and Criteria

Asset Category (# of NPIAS Airports)	Criteria
National (84): Supports national and state system by providing communities with access to national and international markets in multiple states and throughout the U.S.	1) 5,000+ instrument operations, 11+ based jets, 20+ international flights, or 500+ interstate departures 2) 10,000+ enplanements OR 3) 500+ million pounds of landed cargo
Regional (467): Supports regional economies connecting communities to statewide and interstate markets.	1) Metropolitan Statistical Area (MSA) and 10+ domestic flights of 500 miles, 1,000 instrument ops, 1+based jet or 100+ based aircraft 2) Located in a MSA and meets definition of commercial service
Local (1,236): Supplements local communities by providing access to intrastate and some interstate markets.	1) 10+ instrument operations and 15+ based aircraft OR 2) 2,500+ passengers
Basic (668): Provides basic aeronautical needs in local economy.	1) 10+ based aircraft; OR 2) 4+ based helicopters; OR 3) Located 30+ miles from nearest NPIAS airport 4) Used by US Forest Service, or US Marshalls, or US Customs and Border Protection, or US Postal Service, or has Essential Air Service; OR 5) New or replacement airport activated after 1/1/2001; and 6) Public or private "Reliever" with a minimum of 90 based aircraft

Source: FAA, General Aviation Airports: A National Asset, May 2012 Prepared: November 2014

Bentonville Municipal Airport was classified in the 2012 ASSET as a Local airport.

In addition to the classifications provided by the FAA, the Arkansas State Airport System Plan (ASASP) has its own classification system for airports in Arkansas. Currently, there are five levels of airports in the ASASP, Levels 1-5. Each airport's level assignment specifies its intended role within the system. Airport roles are a function of several factors including geographical location, existing or desired facilities and services, and aviation activity. For each level, the ASASP provides specific facility and service objectives that an airport can use as a

guideline (not standards or requirements) during its individual planning efforts. VBT is currently classified as a Level 2 airport. In general, Level 2 airports should be able to accommodate smaller twin-engine and all single-engine general aviation aircraft.

2.4 Airport Activity

In addition to providing an understanding of the levels and types of aviation activity that occur at VBT, historic Airport activity can be used to identify recent trends that may impact future activity levels. Historic data for the aircraft operations and based aircraft components of Airport activity are summarized in the following sections.

2.4.1 Aircraft Operations

A common measure of airport activity is the number of aircraft operations occurring on an annual basis. An aircraft operation is defined as either a landing or a departure (also referred to as a takeoff). For example, a touch-and-go operation, where an aircraft lands and takes off without leaving the active runway which is typical of training aircraft, counts as two operations. Aircraft operations are categorized in several ways, one of which is whether the operation is itinerant or local in nature. Itinerant operations are those conducted by aircraft coming from outside the Airport's traffic pattern. Local operations are conducted by aircraft remaining in the local traffic pattern, conducting simulated instrument approaches at the Airport, or by aircraft going to or from the Airport and a practice area within a 20-mile radius. Touch-and-go training activity is an example of local activity. Once categorized as itinerant or local operations, aircraft activity is further categorized by the nature of the operator. Transient aircraft operations are categorized into one of the following groups: air carrier, air taxi, general aviation, or military. Local operations are categorized as either general aviation or military.

It is important to note that at airports that do not have air traffic control towers such as VBT, operational estimates are typically provided by airport management or a fixed-base operator that is located at the airport. These estimates reflect the operator or manager's opinion of activity, but actual counts are typically not available, especially for an entire year.

A summary of estimated total annual aircraft operations for VBT for the period 2004 to 2014 is presented in **Table 2-2**.

Table 2-2. Annual Aircraft Operations

Year	Itinerant Operations			Local Operations	Total Operations
	Air Taxi	General Aviation	Military	General Aviation	
2004	1,500	2,500	100	14,000	18,100
2005	1,500	2,500	100	14,000	18,100
2006	1,500	2,500	100	14,000	18,100
2007	1,500	2,500	100	14,000	18,100
2008	1,500	2,500	100	14,000	18,100
2009	0	6,000	100	12,000	18,100
2010	0	6,000	100	12,000	18,100
2011	0	6,000	100	12,000	18,100
2012	0	8,000	100	15,000	23,100
2013	0	8,000	100	15,000	23,100
2014	0	9,520	100	17,800	27,420

Sources: FAA Form 5010, FAA Terminal Area Forecast, and Airport Management Records Prepared: September 2014

To add to this analysis, it is also beneficial to understand the nature of the operations occurring at the Airport. As **Table 2-2** indicates, VBT was estimated to experience 27,420 total annual operations in 2014. Using data received from AirportIQ, which reported on filed flight plans between October 1, 2013, and September 30, 2014, more specific data was able to be analyzed regarding this segment of operations at the Airport. The data received from AirportIQ is separated by departures and arrivals and contains 624 and 675 filed flight plans for each, respectively, for a one-year period.

Using this data, it was found that 99 percent of arrivals at the Airport occur during daytime hours (7:00 am to 10:00 pm) while 95 percent of departures at the Airport occur during daytime hours. Both arrivals and departures were evenly split with regards to the physical classification of the aircraft completing the operations, as shown in **Table 2-3** and **Table 2-4**.

Table 2-3. Physical Classification of Arrivals

Physical Classification		
Piston	480	77%
Turbine	90	14%
Jet	54	9%
Total:	**624**	100%

Source: Airport IQ Prepared: October 2014
Period 10/1/2013 to 9/30/2014

Table 2-4. Physical Classification of Departures

Physical Classification		
Piston	524	78%
Turbine	97	14%
Jet	54	8%
Total:	**675**	100%

Source: Airport IQ Prepared: October 2014
Period 10/1/2013 to 9/30/2014

The data acquired from AirportIQ presented a slightly different split in user classes than shown in data provided by FAA's Form 5010 Airport Master Record and Terminal Area Forecast (TAF). **Table 2-5** and **Table 2-6** show the user classes as reported by AirportIQ. As shown and compared to the previous data, no military arrivals or departures were noted and a small percentage were classified as air taxi and commercial. These classifications are only estimates and do not reflect the likely nature of the operations.

Table 2-5. User Classification of Arrivals

User Class	Number	Percent
Air Taxi	35	6%
Cargo	0	0%
Commercial	13	2%
GA	499	80%
Military	0	0%
Other	77	12%
Total:	**624**	

Source: Airport IQ Prepared: October 2014
Period 10/1/2013 to 9/30/2014

Table 2-6. User Classification of Departures

User Class	Number	Percent
Air Taxi	35	6%
Cargo	0	0%
Commercial	13	2%
GA	499	80%
Military	0	0%
Other	77	12%
Total:	**624**	

Source: Airport IQ Prepared: October 2014
Period 10/1/2013 to 9/30/2014

2.4.2 Based Aircraft

The FAA defines a based aircraft as "an aircraft that is operational and airworthy, which is typically based" at an airport "for a majority of the year." Based aircraft are stored at an airport in a hangar building or tied down on an airport apron area. Historic based aircraft counts for the Airport taken from the FAA's Form 5010 and Airport Management records for the years 2004 through 2014 are presented in **Table 2-7**.

Table 2-7. Based Aircraft

Year	Single Engine	Multi Engine	Jet	Military	Helicopter	Other	Total
2004	42						42
2005	43						43
2006	43						43
2007	43						43
2008	40						40
2009	40						40
2010	31						31
2011	31						31
2012	31						31
2013	28	3					31
2014*	56	5			2		63

* 2014 numbers are based on a survey of the airport conducted by the FBO and reflect data on www.basedaircraft.com.
Sources: FAA Form 5010, Airport Management Records, www.bentonvillear.com. Prepared: September 2014

The number and types of based aircraft at an airport typically fluctuate as aircraft owners relocate and/or change the type of aircraft they own. In addition, on-airport flight schools and charter services that may be provided by FBOs frequently adjust their aircraft operating fleet to match the demand for their services.

2.5 Existing Airport Facilities

The inventory of existing facilities at the Airport, as of 2015, was completed through physical inspection, discussions with Airport management and staff, and review of existing Airport documents, airport layout plans, and related studies. Existing Airport facilities are categorized and examined in the following sections:

- Airport Property
- Airfield Facilities
- Landside Facilities
- Utilities
- Surface Access and Parking System
- Airport Fencing and Security

These inventory categories comprise important components of the Airport's infrastructure. For the Airport to efficiently accommodate future demand, each component must provide sufficient capacity while at the same time seamlessly integrate with other infrastructure components to support general aviation, limited military operations, and tenant needs.

2.5.1 Airport Property

Existing facilities at VBT are located on approximately 130 acres currently owned by the City of Bentonville. Current Airport property is identified in **Exhibit 2-4**.

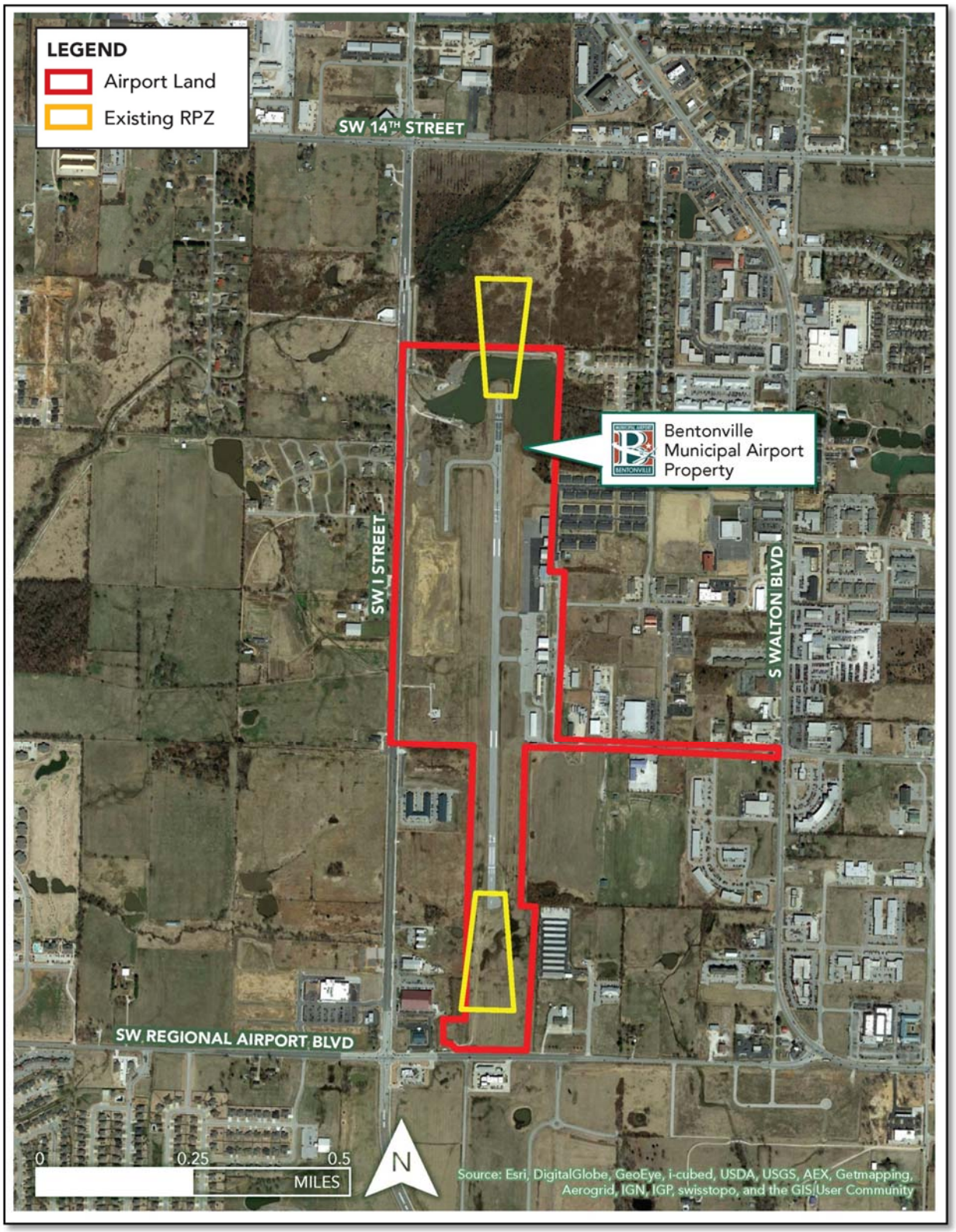
2.5.2 Airfield Facilities

Airfield (also referred to as airside) facilities are those facilities that accommodate aircraft operations and support the transitioning of aircraft from the air to the ground, and vice versa. These include runways, taxiways, aprons and navigational aids. The following describes the existing airfield facilities at VBT, which are also depicted in **Exhibit 2-5**.

Runways and Taxiways

Bentonville Municipal Airport is served by a single paved runway, Runway 18-36. Runway 18-36 is 4,426 feet in length and 65 feet in width and is constructed of asphalt. The dimensions, conditions, and weight bearing capacity of the runway are summarized in **Table 2-8**.

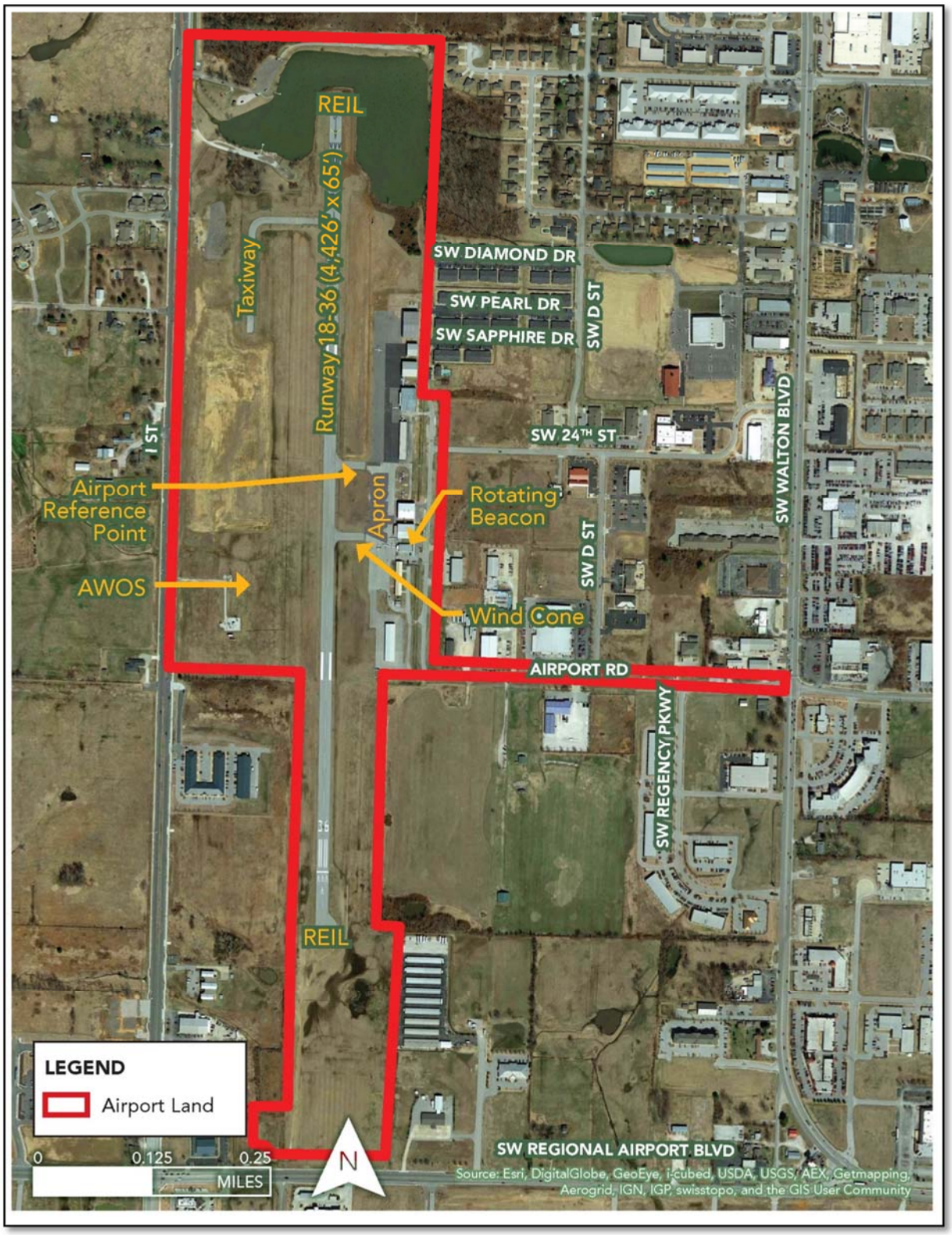
Exhibit 2-4. Current Airport Property



Sources: City of Bentonville GIS, Kimley-Horn

Prepared: November 2014

Exhibit 2-5. Current Airfield Facilities



Source: City of Bentonville GIS, Airport ALP, Kimley-Horn

Prepared: November 2014

Table 2-8. Runway 18-36 Specifications

Runway 18-36		
Length	4,426 feet	
Width	65 feet	
Surface/Conditions	Asphalt/Good	
Weight Limitations	12.5 SW*/21.5 DW**	
Declared Distances***	**18**	**36**
Displaced Threshold	230	345
Takeoff Run Available (TORA)	4,426	4,426
Takeoff Distance Available (TODA)	4,426	4,426
Accelerate-Stop Distance Available (ASDA)	4,426	4,196
Landing Distance Available (LDA)	4,196	3,851

*Single Wheel
**Dual Wheel
*** No Declared Distances are officially published at this time
Source: FAA Form 5010, Airport Layout Plan Prepared: September 2014

There is not currently a full parallel taxiway associated with Runway 18-36, though a partial taxiway does exist on the northwest side. A turnaround is located on the south end of Runway 18-36, providing aircraft the ability to turn and then taxi down the runway to the terminal area.

Aprons and Tie-Downs

Airport apron areas serve a variety of purposes and are generally classified based on the users they are intended to support, the activities conducted on the apron area and/or their location on the airport. VBT currently has only a terminal area apron. This apron area is approximately 1,500 feet by 125 feet and is in good condition. The apron area was recently expanded to the north. The Airport currently has 18 tie-down locations on the apron. Tie-down locations are generally used for short-term storage of transient aircraft, but can also be used by based aircraft not stored in hangars. Currently there are five based aircraft that are stored in tie-downs on the apron. Of the 18 tie-downs, 12 are for itinerant aircraft and six are for based aircraft. In late 2014, VBT added ten additional tie-downs to the northern end of the apron. Of these ten additional tie-down locations, seven are intended for use by based aircraft and three are for itinerant aircraft.

Lighting, Runway Markings, and Navigational Aids

Airport lighting and runway markings are important to supporting the control and movement of aircraft in the airfield area. They also help pilots visually identify their location relative to the airport and the airfield area. Navigational aids, or NAVAIDS, are electronic or visual devices that provide guidance to pilots during the landing or takeoff of an aircraft. Existing airfield lighting and NAVAID equipment at VBT are summarized in **Table 2-9**.

Table 2-9. Runway 18-36 Markings and NAVAIDs

Runway 18-36	
Runway Edge Lighting/Other	Medium Intensity Runway Lighting (MIRL)/Runway End Identifier Lights (REILs)
Runway Marking/Condition	Non-Precision Instrument (NPI)/Good
NAVAIDS	10” CG Airport Beacon, NOTAM-D service available, Windsock
Weather Reporting	Automated Weather Observation System (AWOS)-III

Sources: FAA Form 5010, www.airnav.com. Prepared: September 2014

Lighting at the Airport

Medium intensity runway lights (MIRLs) - MIRLs define the lateral limits of a runway and are spaced 200 feet apart.

Runway end indicator lights (REILs) - REILs are located on both ends of Runway 18-36.

Runway Markings at the Airport

Non-precision runway markings – Non-precision runway markings are used under visual flight rules. These markings include centerlines, runway designations, threshold markings, and aiming points. The non-precision runway markings at VBT are in good condition.

Navigational Aids at the Airport

Rotating Beacon – The Airport is equipped with a standard rotating white-green beacon that operates from sunset to sunrise. The beacon is located between the corporate hangars to the north of the FBO terminal facility.

Wind Indicator – The Airport also has a lighted wind indicator. This is used to determine the direction of the wind on the ground as compared to the wind at the altitude a pilot is flying. The wind indicator is located between the runway and the apron area.

AWOS-3 – An Automated Weather Observation System (AWOS) is a system that allows pilots to have the most accurate account of weather at an airport that is available. It provides information on sky condition, cloud ceiling height, precipitation accumulation, visibility, wind speed and direction, and density altitude.

2.5.3 Landside Facilities

Landside facilities at airports consist of a wide variety of buildings and equipment that support airport operations. For the purposes of this MPU, the following landside facilities at VBT have been inventoried:

- General Aviation Terminal
- Fixed Base Operator (FBO)
- Aircraft Hangars
- Fuel Facility
- Automobile Parking
- Airport Fencing and Security

General Aviation Terminal

The VBT general aviation terminal, which also accommodates the FBO, has a pilot's lounge, conference room, restrooms, break/concessions room, and computers with internet access. The terminal is approximately 2,400 square feet and is located to the east of the runway apron area, between Airport Road and SW 24th Street.

FBO

An FBO supports a variety of aviation activity at VBT and is the primary provider of services and facilities for general aviation operators at the Airport. The FBO facilities are located in the general aviation terminal. There is currently only one FBO operating on the Airport, Summit Aviation. Summit Aviation provides a laser grade testing center, car rental, catering, fuel, a pilot's lounge, a conference room, and charts, books, and aviation supplies.

Aircraft Hangars

As of late 2014, there were nine hangars on Airport property that stored 59 airplanes (with the five other based aircraft being stored on the apron). There were three T-hangars (one open and two closed) and six corporate box hangars. Additional aircraft storage is available on the ramp in front of the terminal facility. An additional T-hangar was being constructed on the west side of Runway 18-36, which is anticipated to be completed in 2015. This facility will have the capacity to store an additional seven airplanes. The FBO manager noted that, at that time, there were 15 people on the waiting list for hangar space.

Fuel Facility

The Airport's fuel storage facility is located to the south of the Summit Aviation offices. On this site, the Airport maintains two above ground storage tanks, one with 100LL gas (10,000 gallons) and one with Jet A fuel (10,000 gallons). VBT also has a fuel truck that serves the Airport. Self-service fuel is available 24 hours a day.

2.5.4 Utilities

Utilities are provided to the Airport from a variety of sources. **Table 2-10** provides more information on the utility providers for the Airport.

Table 2-10. Airport Utilities

Utilities	Source
Electricity	City of Bentonville
Water	City of Bentonville
Natural Gas	SourceGas
Sanitary	City of Bentonville
Telephone	AT&T

Source: Kimley-Horn Site Visit, October 2014 Prepared: October 2014

2.5.5 Automobile Parking

The vast majority of Airport parking facilities support the terminal area and the adjacent FBO and tenant areas. The general aviation terminal and Summit Aviation together provide 28 standard parking spaces and two handicap accessible spaces.

2.5.6 Airport Fencing and Security

The Airport is partially surrounded by open space, a community park, and Airport facilities. Portions of the Airport property are protected with a combination of eight-foot and six-foot chain link fence with three strands of barbed wire. The Airport has an access control system that limits access to the operating areas within the Terminal Area. It was noted during site visits to the Airport that no fence exists along SW I Street, so access to the airfield is unrestricted along the western boundary of the Airport.

2.6 Airspace and Instrument Procedures

Airspace in the U.S. is classified generally as controlled, uncontrolled, or special use. Controlled airspace encompasses those areas where there are specific certification, communication, and navigation equipment requirements that pilots and aircraft must meet to operate in that airspace.

2.6.1 Airspace Designations

Through Federal Aviation Regulations (FARs), airspace classifications have been developed to promote the safe and efficient movement and control of aircraft during flight and approach/departure procedures. Airspace classifications are identified on sectional aeronautical charts published by the FAA's National Aeronautical Charting Office, as well as Arkansas's own aeronautical chart published by the Arkansas Department of Aeronautics.

FAR Part 71 and FAR Part 73 establish classifications of airspace with the following characteristics:

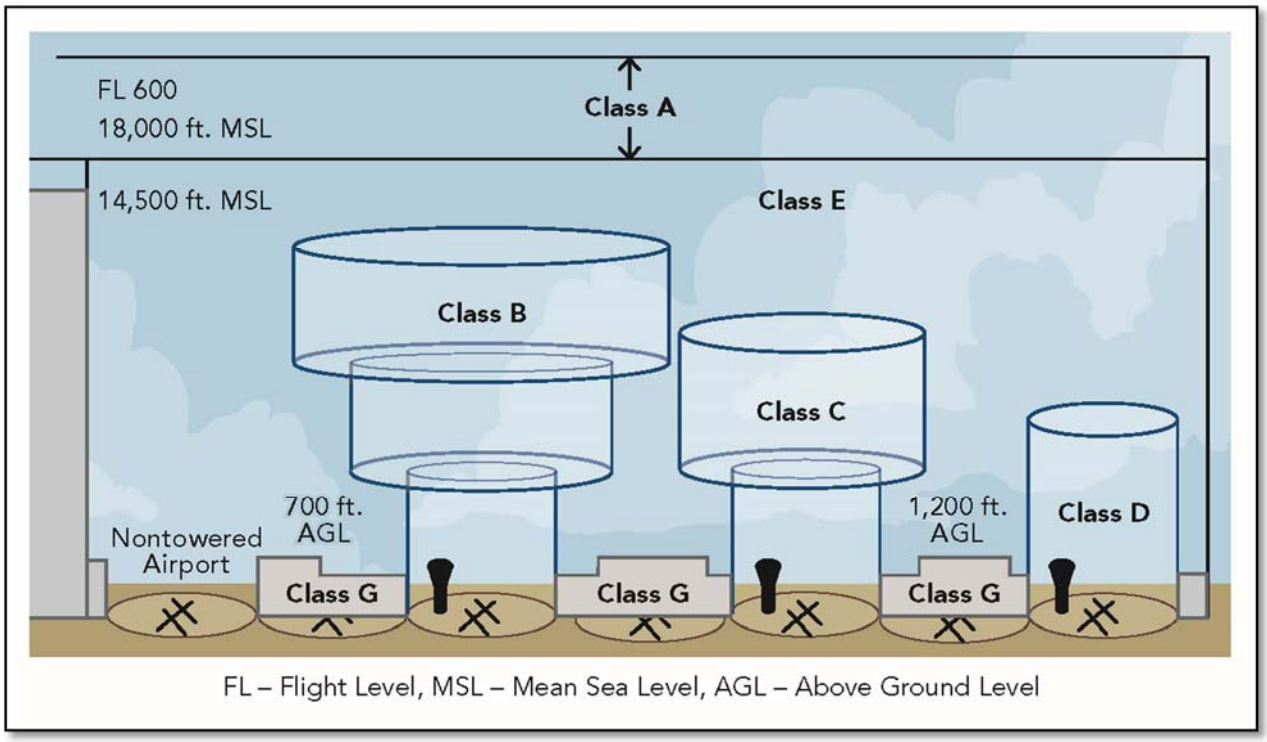
- **Class A Airspace** – Class A airspace is not shown on aeronautical charts. It begins at 18,000 feet above mean sea level (MSL) and extends to higher altitudes. This airspace is designated in FAR Part 71.193 for positive control of aircraft. The Positive Control Area allows flights only operating under instrument flight rules (IFR), with a pilot who has an instrument rating, and prior permission is required. Class A airspace does not significantly impact the operation of VBT.
- **Class B Airspace** – Class B airspace is found around major airports. Pilots must get permission to enter this airspace from the controlling agency, typically the Terminal Radar Approach Control (TRACON) facility associated with the airport and region. There is no Class B airspace near VBT.
- **Class C Airspace** – Class C airspace is the airspace from the surface to 4,000 feet above the airport elevation. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a five mile radius, and an outer circle with a 1 mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. An aircraft must establish two-way radio communication with the controlling agency providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace. The airspace above VBT is designated as Class C airspace.
- **Class D Airspace** – Class D airspace exists at any airport with an operating air traffic control tower where Class B or Class C airspace does not exist. Class D airspace typically extends 5 miles from the airport to an altitude of 2,500 feet AGL. Pilots must establish two-way radio communication with the controlling agency, usually the air traffic control tower, before entering this classification of airspace. Class D airspace does not impact operations at VBT.
- **Class E Airspace (with floor 700 feet above surface)** – Class E airspace typically surrounds airports having instrument approaches and encompasses portions of the instrument approach paths. The flight requirements within Class E airspace result in increased aircraft separation requirements thereby promoting safety and minimizing

potential incidents between IFR and VFR aircraft in this airspace. Class E airspace is located above VBT.

- **Class G Airspace** – Class G airspace is referred to as uncontrolled airspace and is not depicted on aeronautical charts. This classification of airspace comprises all airspace not identified as another class. IFR flights typically do not operate in Class G airspace, as no Air Traffic Control (ATC) services are provided. VFR flights are permitted as long as visibility and cloud clearance minimums are met.
- **Restricted Areas** – Restricted areas contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft; examples include artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. There are currently no restricted areas located near VBT.
- **Prohibited Areas** – Prohibited areas contain airspace within which the flight of unauthorized aircraft is prohibited. Such areas are established for security or other reasons associated with the national welfare. Prohibited areas are published in the National Register and are depicted on aeronautical charts. There are no areas of prohibited airspace proximate to VBT.
- **Alert Areas** – Alert areas are depicted on aeronautical charts to inform nonparticipating pilots of areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should be particularly alert when flying in these areas. All activity within an alert area shall be conducted in accordance with the Code of Federal Regulations (CFRs), without waiver, and pilots of participating aircraft as well as pilots transiting the areas shall be equally responsible for collision avoidance. There are currently no alert areas located near VBT.

As the summary descriptions of airspace classifications indicate and **Exhibit 2-6** and **Exhibit 2-7** show, different classes of airspace have different characteristics, dimensions, altitudes, and requirements based on the types of activity that they are intended to support. Existing airspace classifications in the vicinity of VBT and those that could have the potential to impact aircraft operations at the Airport have been identified.

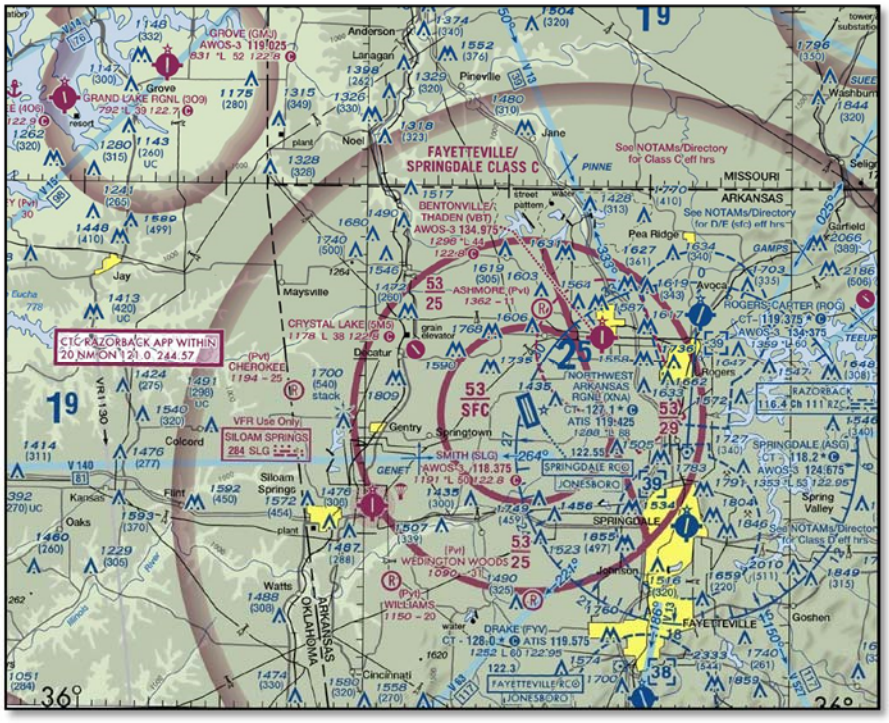
Exhibit 2-6. Airspace Classifications



Source: FAA Aeronautical Information Manual

Prepared: November 2014

Exhibit 2-7. Airspace Classifications around VBT



Source: FAA

Prepared: October 2014

2.6.2 Military Airspace

Military operation areas (MOAs) consist of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. Whenever a MOA is being used, nonparticipating IFR traffic maybe be cleared through a MOA if IFR separation can be provided by air traffic control. Otherwise, air traffic control will reroute or restrict nonparticipating IFR traffic. Pilots operating under VFR should exercise caution while flying within a MOA when military activity is being conducted. Prior to entering an active MOA, pilots should contact the controlling agency for traffic advisories. There are currently no MOAs located near VBT.

2.6.3 Instrument Approach Procedures

An instrument approach procedure is defined as a series of predetermined maneuvers for guiding an aircraft from the beginning of the initial approach to a landing, or a point from which a landing may be made visually. Instrument approach procedures are especially important during instrument meteorological conditions (IMC) when cloud ceilings are lower than 1,000 feet above ground level (AGL) and visibility becomes less than 3 statute miles. Under these conditions, properly trained pilots with adequately equipped aircraft can follow FAA published Instrument Approach Procedures (IAPs) to land at an airport.

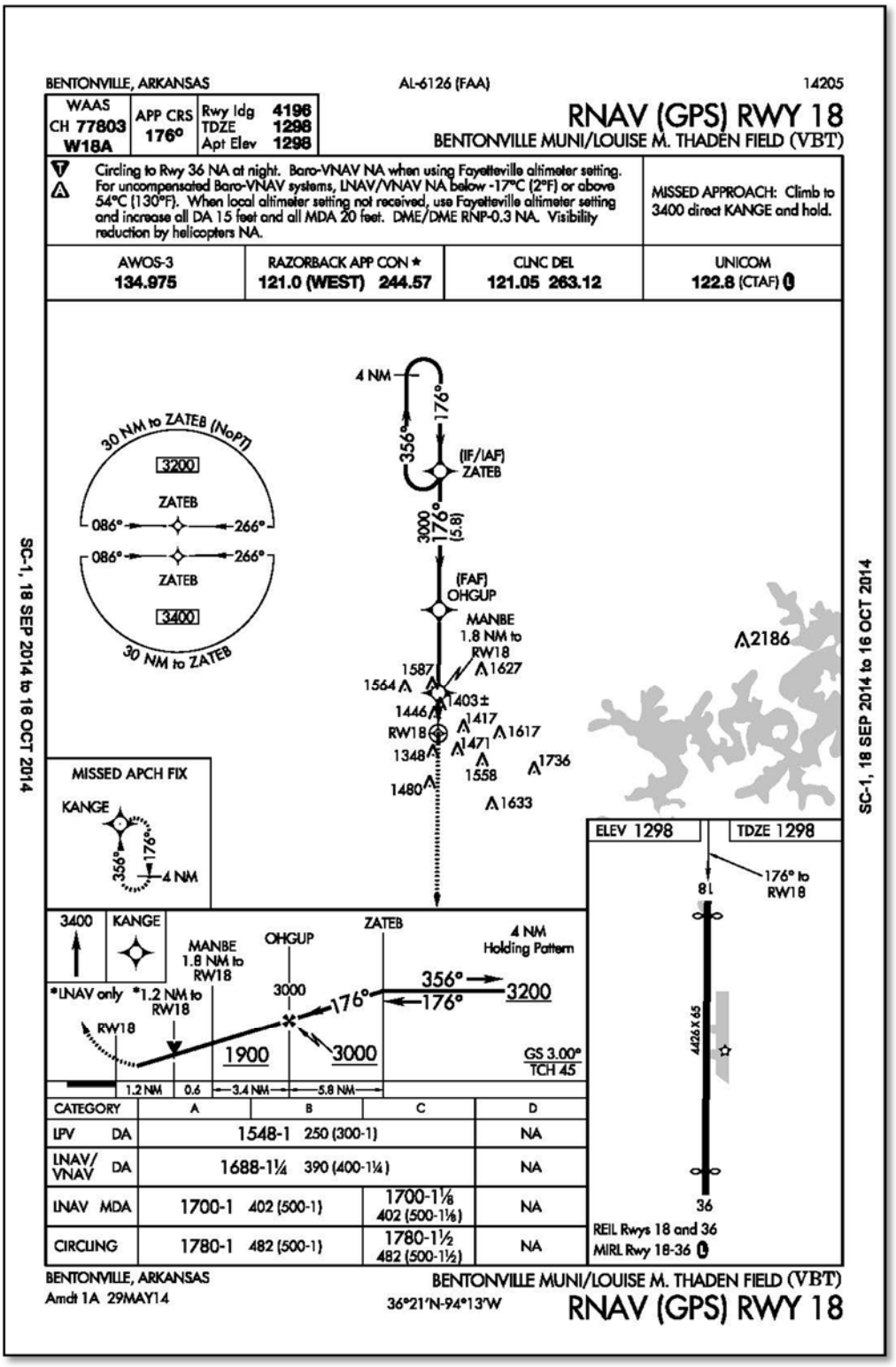
Bentonville Municipal Airport has four Non-Precision IAPs; two that provide straight-in approaches to the specific runway ends, and two that provide instrument guidance to the Airport with visual circling to land on either runway end. These are listed in **Table 2-11** which also identifies the lowest approach minimums (ceiling height and visibility) provided by that procedure. The corresponding FAA published procedures, or "approach plates", are provided in **Exhibit 2-8** through **Exhibit 2-11**.

Table 2-11. Approach Procedures at VBT

Runway End	Approach Type	Lowest Minimums – Ceiling (HATh) / Visibility
18	RNAV/GPS	250' / 1 mile
36	RNAV/GPS	250' / 1 mile
18 or 36	VOR/DME-B	562' / 1 mile
18 or 36	VOR-A	482' / 1 mile

HATh = height above threshold/decision height, feet above ground level (AGL)
Source: FAA Instrument Approach Charts, VBT 18 September 2014 – 16 October 2014

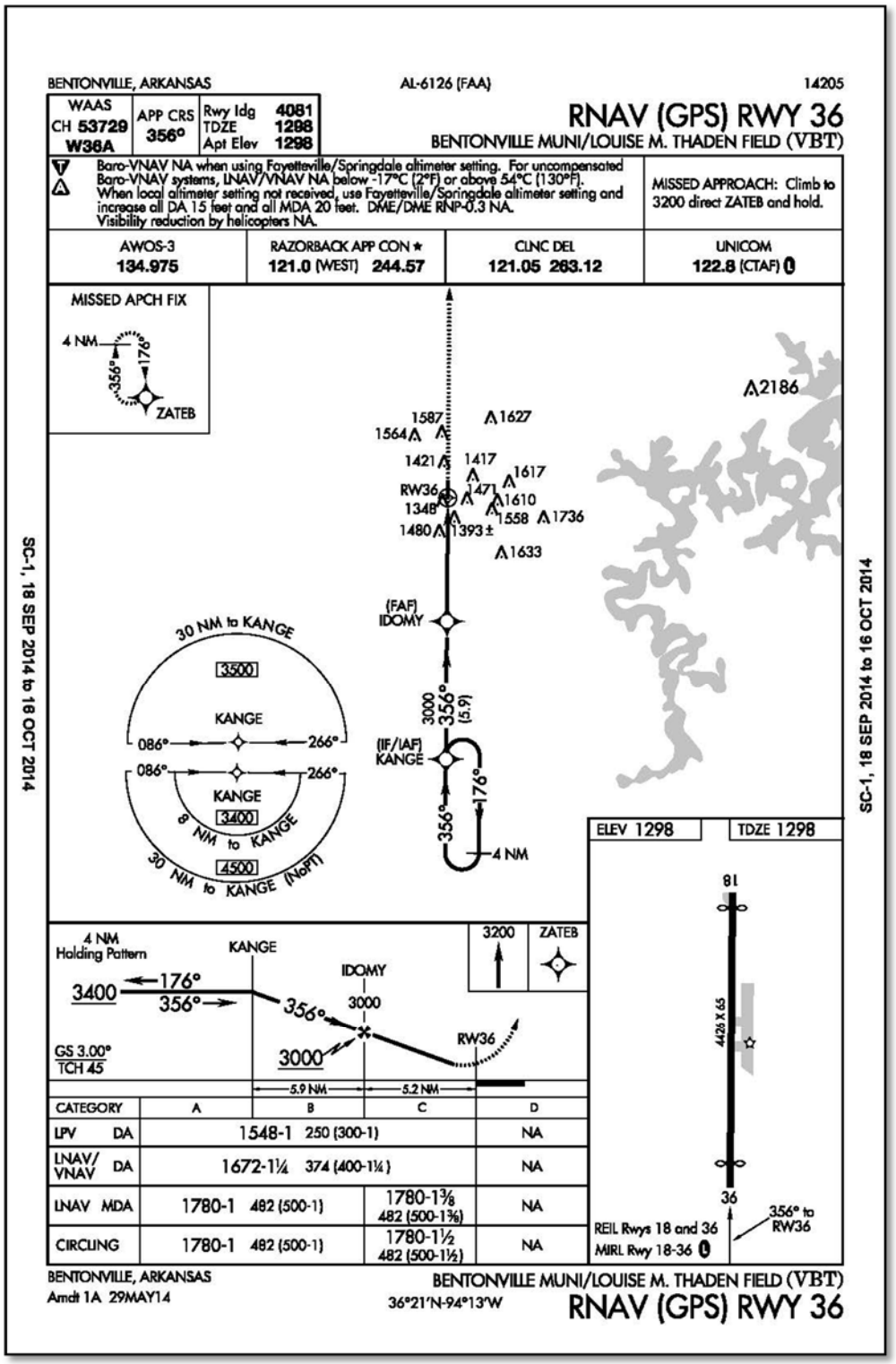
Exhibit 2-8. Instrument Approach RNAV (GPS) – Runway 18



Source: FAA

Prepared: November 2014

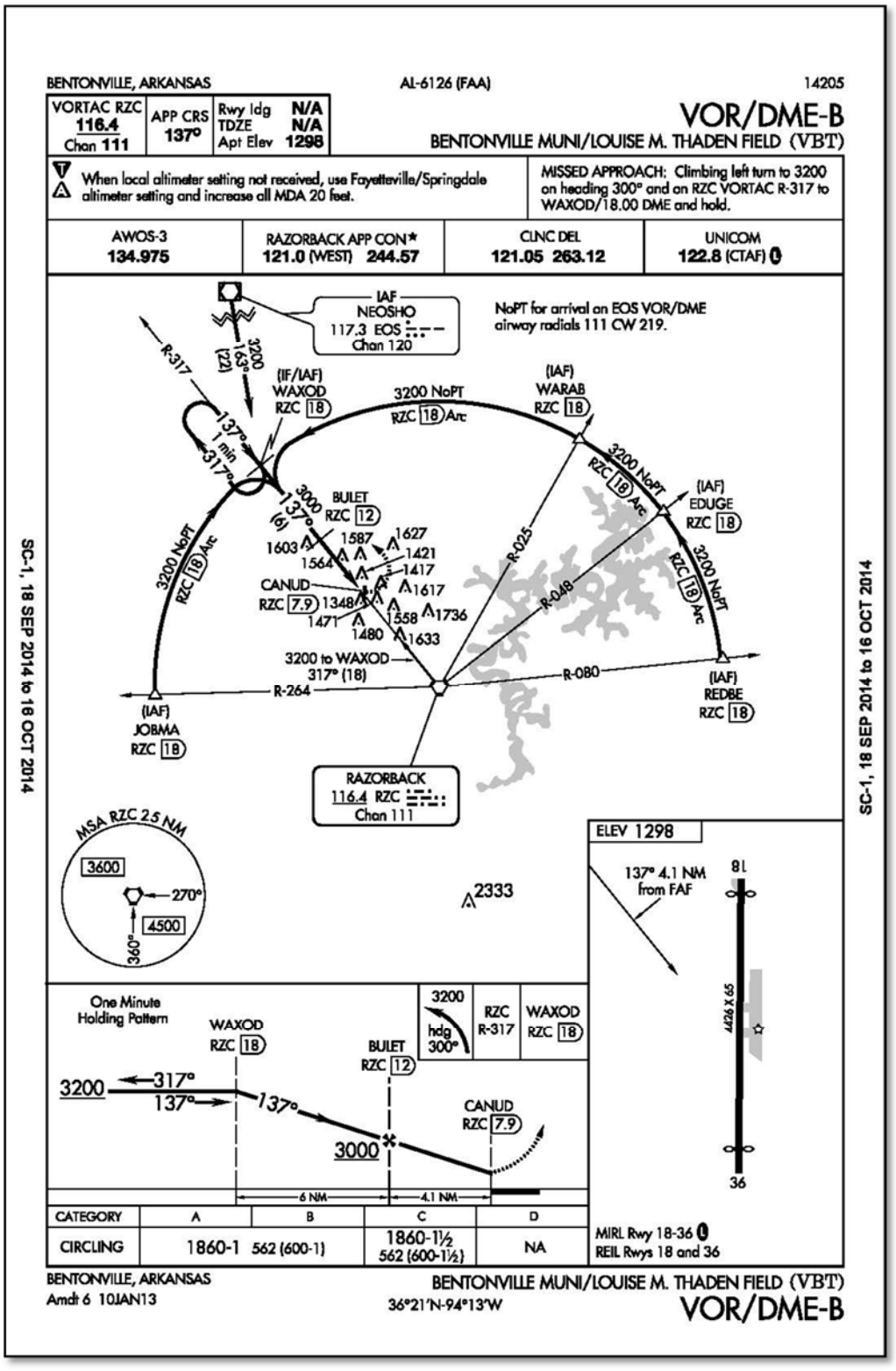
Exhibit 2-9. Instrument Approach RNAV (GPS) – Runway 36



Source: FAA

Prepared: November 2014

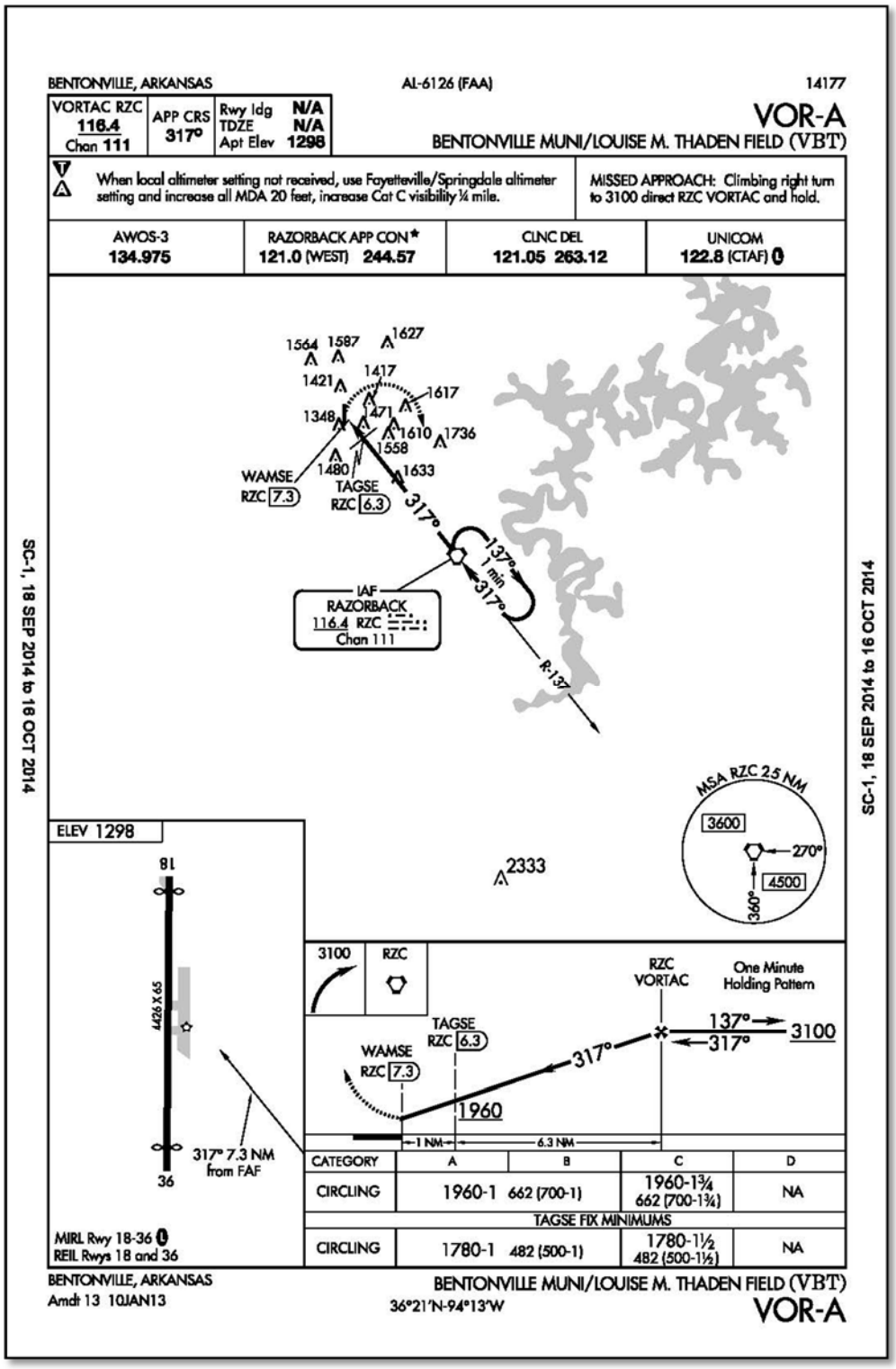
Exhibit 2-10. Instrument Approach VOR/DME-B



Source: FAA

Prepared: November 2014

Exhibit 2-11. Instrument Approach VOR-A



Source: FAA Prepared: November 2014

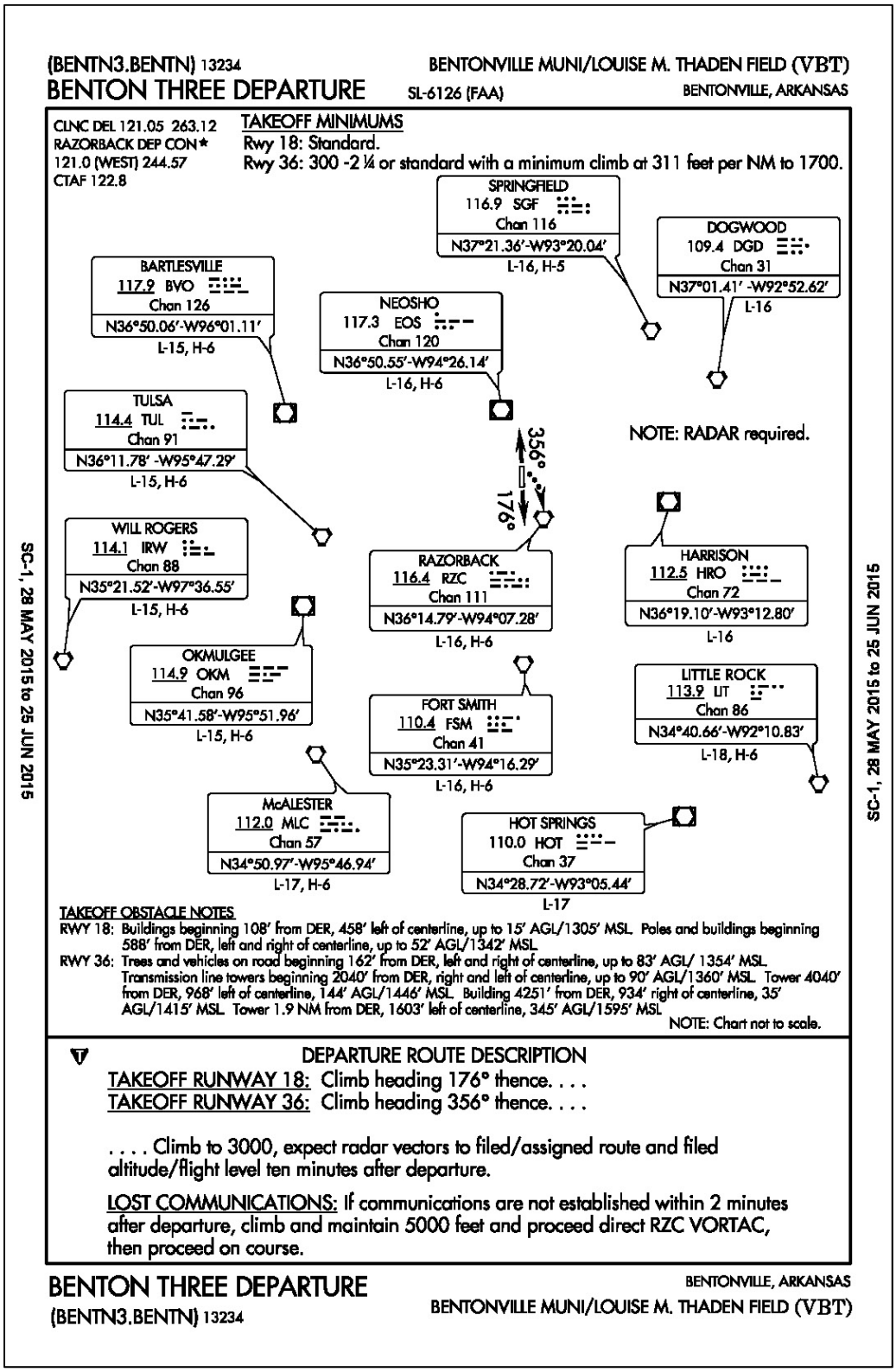
2.6.4 Instrument Departure Procedure

An instrument departure is a pre-planned flight procedure to be used on an IFR flight plan immediately after taking off from an airport. Departure procedures are intended to provide pilots with a way to depart the airport and transition to the enroute air traffic control structure safely. The procedure identifies a route, or heading, and specifically identifies obstacles that impact the climb gradient for IFR aircraft. VBT has one instrument departure procedure ("Benton Three") that can be used from either runway end. The FAA published procedure chart is provided in **Exhibit 2-12** and the following lists the noted obstacles.

For runway 18, there is a building 108 feet from the departure end of runway (DER) and 458 feet to the left of the centerline up to 15 feet AGL. Poles and buildings begin 588 feet from the DER, left and right of the runway centerline, and up to 52 AGL.

For runway 36, trees and vehicles begin 162 feet from the DER left and right of the runway up to 83 feet AGL. Transmission line towers are located 2,040 feet from the DER on the left and right of the runway centerline up to 90 feet AGL. A tower is located 4,040 feet from the DER 968 feet left of the centerline and 144 feet AGL. There is an additional tower located 1.9 nautical miles (NM) from the DER, 1,603 feet left of the centerline, and 345 feet AGL. There is also a building 4,251 feet from the DER, 934 feet left of the centerline, and 35 feet AGL.

Exhibit 2-12. Instrument Departure – Benton Three



Source: FAA

Prepared: January 2016

2.7 Climatic and Meteorological Conditions

Climatic and meteorological conditions, particularly temperature and wind speed, are important considerations in the analysis and development of airfield facilities. These factors directly affect the planning and design of runway facilities as well as utility and operational efficiency of the airfield. Climate data for Fayetteville, Arkansas was collected from the National Weather Service's Weather Forecast Office for the years 1981 through 2010. Climatic and meteorological data relevant to the master planning process at VBT can be summarized as follows:

- Over 96 percent of the wind is under 10.5 knots
- Mean daily max temperature at the Airport is 89 degrees
- In August, the normal maximum temperature is 89.1 degrees while the normal average temperature is 77.1
- In January, the coldest month, normal minimum temperature is 24.8 degrees and the normal average temperature is 35.6 degrees

2.8 Area Socioeconomic Data

The relationship between socioeconomic factors and an airport's role and activity levels is an important consideration in the master planning process. In addition to providing a general understanding of the existing conditions in an airport area, socioeconomic data is instrumental in developing future projections of aviation activity. The following provides a summary of the socioeconomic data for the City of Bentonville, Benton County, the State of Arkansas and the United States. As evidenced in **Table 2-12**, the population growth in the City and County has well outpaced that of the State and Nation.

Table 2-12. Socioeconomic Characteristics

Year	City of Bentonville	Benton County	Arkansas	United States
2000	19,730	153,409	2,673,400	281,421,906
2010	35,301	221,339	2,915,918	308,745,538
2011	36,976	227,224	2,938,506	311,587,816
2012	38,390	232,658	2,949,828	313,914,040
2013	40,167	237,297	2,959,373	316,128,839
Change (2000-2013)	103.6%	54.7%	10.7%	12.3%

Source: http://iea.ualr.edu/demores/demoscripts/coest2013alldata.php?type=totalpop and American FactFinder. Prepared: October 2014

Table 2-13 summarizes historic data related to employment and unemployment in Benton County, the State of Arkansas, and the United States from 2000 to 2013. **Table 2-14** shows the breakdown of employment by industry for Benton County.

Table 2-13. Employment Summary

Year	Benton County % employed (% unemployed)	Arkansas % employed (% unemployed)	United States % employed (% unemployed)
2000	61.6% (2.1%)	56.6% (3.7%)	59.7% (3.7%)
2005	64.6% (4.5%)	58.5% (6.9%)	61.0% (6.9%)
2010	62.2% (5.3%)	55.8% (7.8%)	59.4% (7.9%)
2011	61.4% (5.5%)	55.2% (8.4%)	58.8% (8.7%)
2012	61.3% (5.2%)	54.8% (8.6%)	58.2% (9.3%)
2013	61.2% (4.2%)	53.4% (8.1%)	57.9% (8.4%)

Source: American FactFinder Prepared: October 2014

Table 2-14. Employment by Industry in 2013

Subject	Benton County, Arkansas	
	Estimate	Percent
Civilian employed population 16 years and over	109,636	100%
Agriculture, forestry, fishing and hunting, and mining	1,608	1%
Construction	6,160	6%
Manufacturing	14,344	13%
Wholesale trade	3,377	3%
Retail trade	25,714	23%
Transportation and warehousing, and utilities	5,040	5%
Information	899	1%
Finance and insurance, and real estate and rental and leasing	4,418	4%
Professional, scientific, and management, and administrative and waste management services	12,003	11%
Educational services, and health care and social assistance	20,129	18%
Arts, entertainment, and recreation, and accommodation and food services	8,543	8%
Other services, except public administration	4,885	4%
Public administration	2,516	2%

Source: American FactFinder Prepared: October 2014

Table 2-15 summarizes the median and mean income information for 2013 for Benton County, Arkansas and the United States.

Table 2-15. Income Comparison by Household

	Benton County	Arkansas	United States
Median Income	$56,570	$40,511	$52,250
Mean Income	$75,142	$55,547	$73,767

Source: American FactFinder Prepared: October 2014

As indicated in **Tables 2-12** through **Table 2-15**, VBT is in a very strong socioeconomic area. Not only has the region and the City experienced significant growth in the overall population, but the unemployment rate is much lower than the national and state average and the median and mean income of the County are higher than the state and national average. These socioeconomic factors and on-going economic development in Benton County are important considerations in the development of projections of aviation demand in the market area. This information will be considered when developing forecasts later in this MPU.

2.9 Area Land Use Patterns and Zoning

Identifying land use and zoning characteristics in the environs of airports is an important task in the master planning process because of significant impacts that incompatible development in the airport area can have on the facility's continued operation and development. Working with the relevant planning commissions, counties, municipalities, or other entities to promote compatible land uses and zoning in the environs of VBT can allow the Airport to continue to operate and develop in a manner that minimizes the impacts of the Airport on non-compatible land uses.

Currently, the Airport property is zoned as A-1 (Agricultural) with surrounding zoning districts including C-1 (Neighborhood Commercial), C-2 (General Commercial), PRD (Planned Residential Development), R-1 (Single Family Residential), R-O (Residential Office) , I-1 (Light Industrial), and R-3 (Medium Density Residential). **Exhibit 2-13** shows the current zoning designation of the Airport property as well as the areas surrounding the Airport.

In May of 2007, the City of Bentonville adopted the *City of Bentonville General Plan* to serve as the document to define the urban form, economic success, and quality of life for citizens in the city. As part of this, future land use categories were developed to show the desired locations for land uses as the City continues to develop.

The future land uses of land surrounding the VBT are comprised mostly of low and medium density residential, commercial, agricultural, and mixed-use development. The western border of the Airport is comprised of commercial, mixed-use, and medium density residential land. While the northern border is entirely agricultural land, the eastern border is comprised of low density residential, commercial, and office. The southern boundary is mixed-use, commercial, and office. **Exhibit 2-14** shows the future land uses of the Airport property as well as the areas surrounding the Airport.

Also included in the General Plan were two policies developed to assist the Airport in its future growth. These include:

Policy PF-39: The City shall protect the function of the municipal airport by limiting residential encroachment into approach zones.

Policy PF-40: The City shall regulate land uses, intensities, and structural heights to protect the functionality and safety of long-term airport operations.

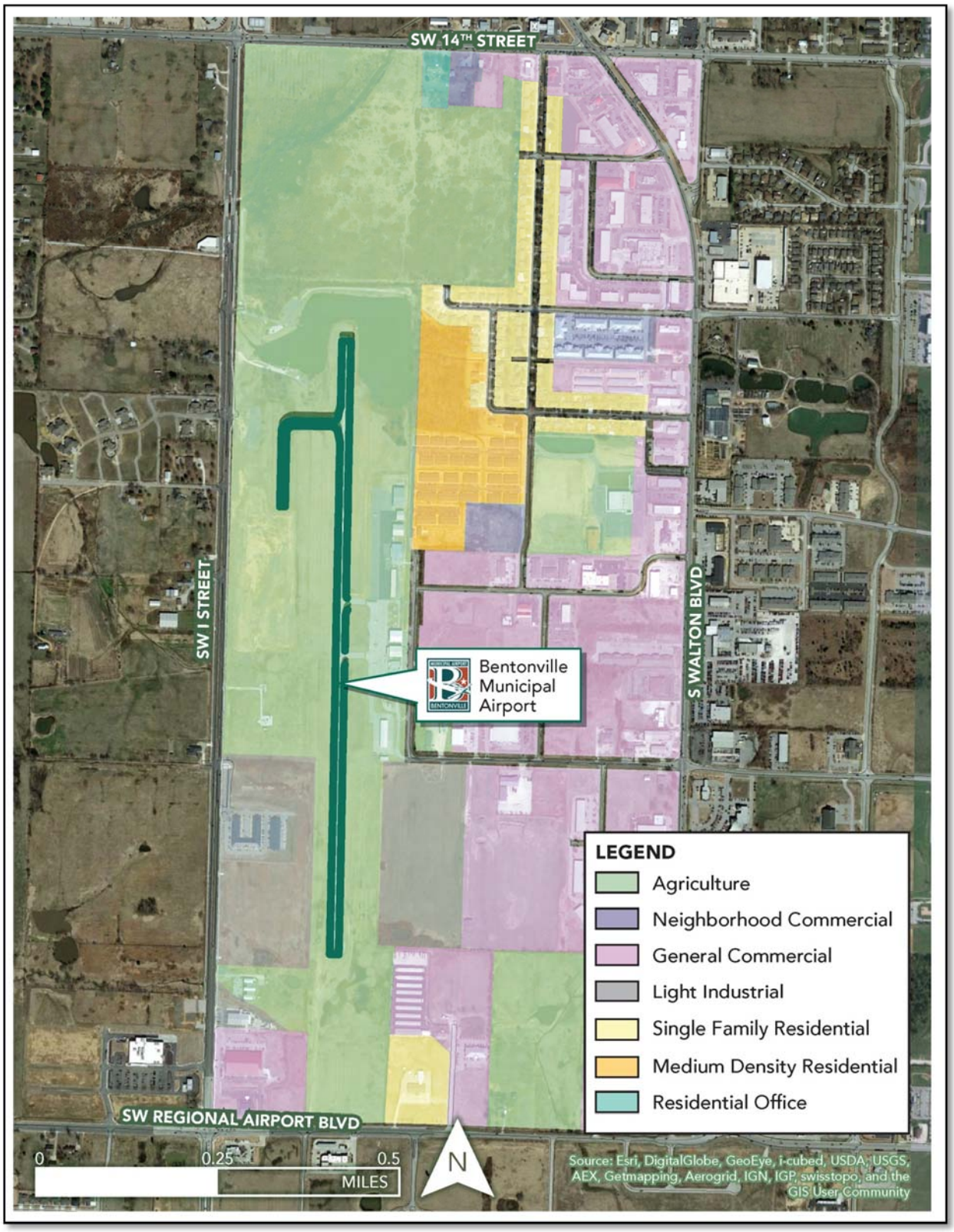
Arkansas has several statutes in place that were developed to promote safe development in the areas surrounding its airport facilities. SS 27-117-103 and SS 27-117-105 regulate electrical wires and minimum distances between towers and runways, respectively and can be accessed at:

http://statutes.laws.com/arkansas/title-27/subtitle-8/chapter-117/27-117-105

SS 27-117-103 stipulates that no wires of any kind or description, including, but not limited to, those over which electricity or messages are transmitted shall be constructed, operated, or maintained within the approach zone of any airport in the state.

SS 27-117-105 stipulates that no structure in excess of one hundred feet (100') in height may be constructed within twenty-five hundred feet (2,500') from either side of a runway centerline running the full length of that runway, including the runway protection zone and runway safety area, extending outward from the approach end of any runway for seven (7) nautical miles, and rising upward from that runway end surface at a slope of sixty-five feet (65') horizontally to one foot (1') vertically for the seven (7) nautical miles of any aeronautical facility used by the public unless a permit for such construction has been issued by the governing body responsible for operations at the aeronautical facility.

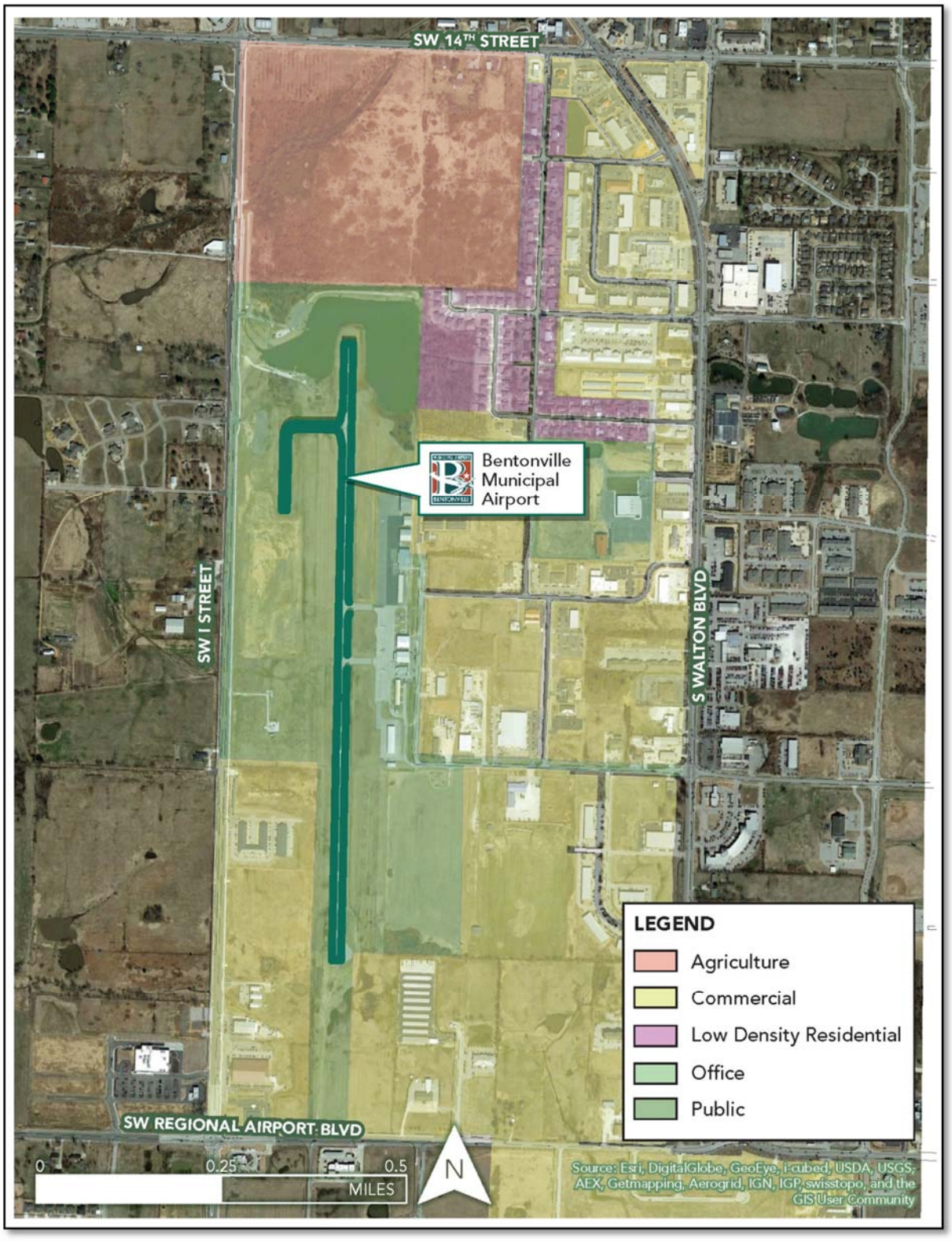
Exhibit 2-13. Current Zoning Designations around VBT



Source: City of Bentonville GIS

Prepared: November 2014

Exhibit 2-14. Future Land Use Categories around VBT



Source: City of Bentonville GIS

Prepared: November 2014

2.10 Environmental Considerations

Local and regional environmental factors can affect how an airport is developed. Conversely, airport development has the potential to impact those environmental resources. For these reasons, the FAA requires that airport sponsors incorporate environmental considerations into the master planning process. While a detailed overview of the various environmental resources near the Bentonville Municipal Airport is provided in Chapter 5, the following three resources are considered of significant importance to the ongoing development of the Airport.

2.10.1 Wetlands

Based on data provided by the National Wetlands Inventory, there are multiple wetland areas located on, and in the vicinity of, the Airport. Lake Bentonville, located to the north of Runway 18-36 on Airport property, surrounds the north end of the runway with a substantial amount of wetland coverage. There are additional pockets of wetlands located around the Airport, as shown in **Exhibit 2-15.**

2.10.2 Floodplains

As depicted in **Exhibit 2-16**, a floodplain is located north of the airfield with a small portion of designated "flood fringe" extending slightly onto airport property on the north side of Lake Bentonville. This floodplain feeds into the Little Osage Creek.

2.10.3 Public Parks

Lake Bentonville Park is open to the public, used for recreational fishing, and includes a playground and picnic area. It was constructed in the 1960's and is maintained by the City of Bentonville.

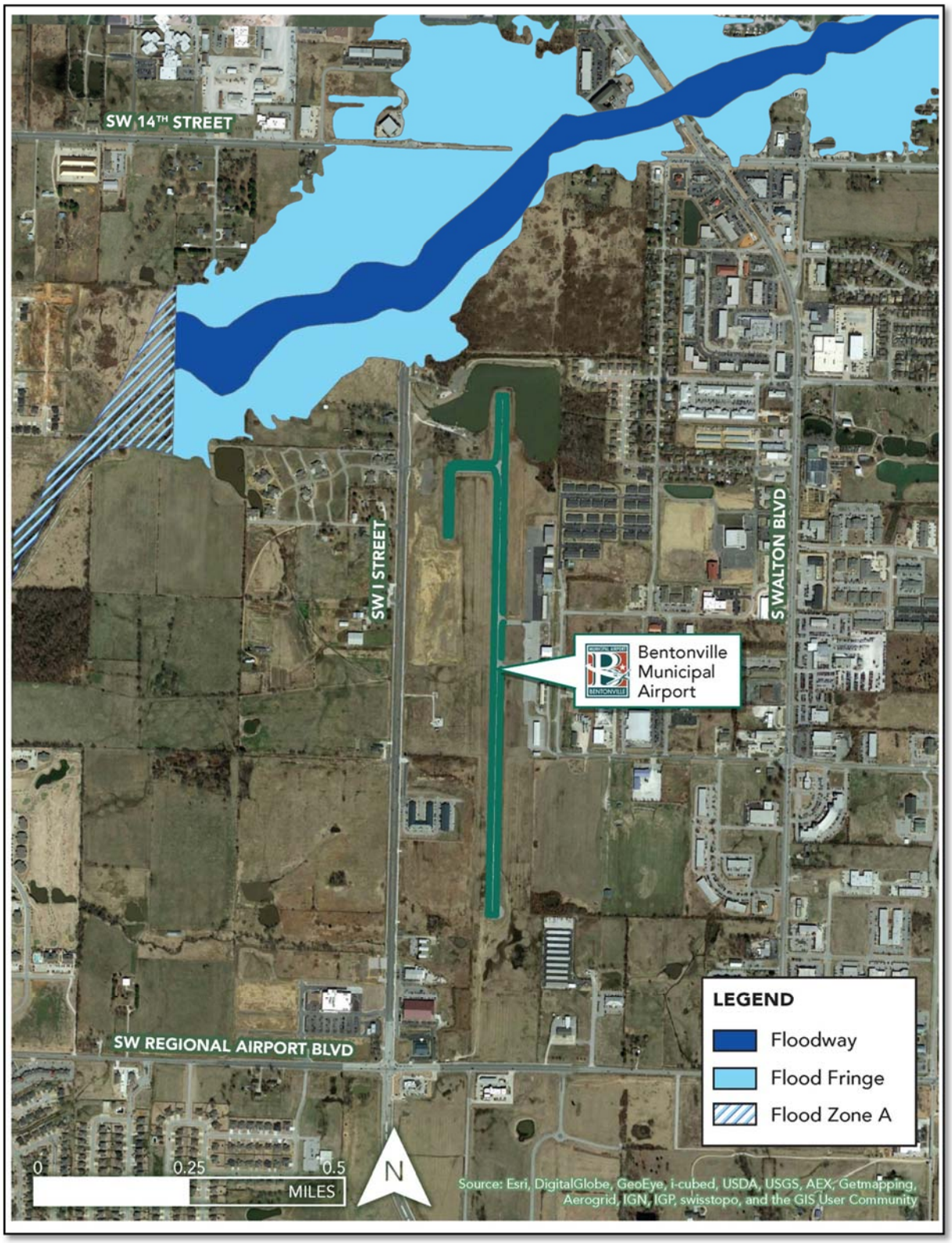
Exhibit 2-15. Wetlands Near VBT

Source: City of Bentonville GIS

Prepared: November 2014

Prepared By:
Morrison-Shipley Engineers
Kimley-Horn and Associates

Exhibit 2-16. Floodplains Near VBT



Source: City of Bentonville GIS

Prepared: November 2014

Prepared By:
Morrison-Shipley Engineers
Kimley-Horn and Associates

2.11 Other Area Airports

In addition to examining market area demographic and socioeconomic characteristics, it is also important to understand the dynamics of aviation activity in the Bentonville area and the impacts that other nearby airports may have on aviation demand. The location of other airports and the level of service and activity that they support is an important consideration in developing a long-range development plan for VBT. Nearby public use airports and their relevant characteristics are summarized in **Table 2-16**.

Table 2-16. Airports within 20 NM of VBT

Airport	FAA ID	NPIAS Role	Distance from VBT	Runway Dimensions (ft)	Approach Type	Based Aircraft (2014)	Annual Operations (2014)
Bentonville Municipal Airport	**VBT**	**GA-Local**	**0 NM**	**4,426 x 65**	**Non-Precision**	**63**	**27,420**
Crystal Lake Airport	5M5	n/a	11 NM	3,863 x 75	Non-Precision	2	500
Drake Field Airport	FYV	GA-Regional	20 NM	6,005 x 100	Precision	113	28,859
Northwest Arkansas Regional Airport	XNA	Commercial small hub	6 NM	8,800 x 150	Precision	8	41,254
Rogers Municipal Airport-Carter Field	ROG	GA-National	6 NM	6,011x 100	Precision	112	32,000
Siloam Springs Smith Field Airport	SLG	GA-Regional	16 NM	4,997 x 75	Non-Precision	42	24,050
Springdale Municipal Airport	ASG	GA-Regional	11 NM	5,302 x 76	Precision	104	62,450

Source: FAA Form 5010, FAA NPIAS 2015-2019 Prepared: October 2014

2.12 Near-Term Planned Development

As discussed in Chapter 1, the City has expressed interested in seeing VBT developed as an interactive community asset that engages the general public and attracts additional vintage and unique aircraft beyond those that are already based at, or utilize, the Airport. Many of these aircraft are “taildraggers” or have balloon tires and operate more easily on turf runways. With VBT accommodating a large amount of activity from these types of aircraft already, the City is pursuing the development a turf runway to be located between the existing Runway 18-36 and the western partial parallel taxiway. Coordination with the FAA for approval of this turf runway began in 2014 and is described in more detail in subsequent sections of this Master Plan Update. In addition to the turf runway, private investors are working with the Airport Board and have prepared preliminary plans for the development of additional general aviation facilities on the west side of the airfield. Development concepts include hangar and apron facilities for both based and transient aircraft, additional FBO facilities, public parking, and other aviation related amenities.

3 FORECASTS

This chapter discusses the findings and methodologies used to project aviation demand at Bentonville Municipal Airport (VBT). It is important to recognize that there can be short-term fluctuations in an airport's activity due to a variety of factors that cannot be anticipated. The forecasts developed in this Master Plan Update provide a meaningful framework to guide analysis for future Airport development needs and alternatives.

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

- Socioeconomic Factors
- Historical and Current Activity
- National Aviation Trends
- Based Aircraft Projections
- Aircraft Operations Projections
- Peaking Characteristics and Peak Operations Projections
- Critical Aircraft
- Forecast Summary
- FAA Forecast Review and Approval

This forecast analysis includes methodologies that consider historical aviation trends at the Airport and throughout the nation. Local historical data were collected from FAA Terminal Area Forecast (TAF) records, Airport records, and Airport representatives. In addition, demographic data for Benton County were used to track local trends and conditions that can impact general aviation demand levels. Projections of aviation activity for the Airport were prepared for near-term (2020), mid-term (2025), and long-term (2035) timeframes. These projections are generally unconstrained and assume the Airport will be able to develop the various facilities necessary to accommodate based aircraft and future operations.

3.1 Socioeconomic Factors

Regional socioeconomic trends were identified in the preceding chapter. Where applicable, these data can be used in the Master Plan process to relate future aviation activity levels at the Airport to local and regional socioeconomic trends. Benton County and the City of Bentonville are unique in their demographic makeup compared with other regions in Arkansas. Because of this, Benton County will be used as the regional market area for VBT. To provide more detail, data will be provided for the City of Bentonville, as available and appropriate. The analysis examines historical trends and future projections of the region's population, employment, and earnings. Several sources of data were used for this section. Data provided in this section were provided by Woods and Poole Economics, Inc., the University of Arkansas at Little Rock, and the U.S. Census Bureau's American FactFinder.

Table 3-1 summarizes the population trends of the City of Bentonville, Benton County, Arkansas, and the United States, with the compound annual growth rate (CAGR) for various periods indicated for each of the areas. It should be noted that CAGR calculates a constant rate of change over a given time period. It dampens the effect of volatility during periods that experience significant change, and is essentially a "smoothed" annual growth rate.

Table 3-1. Comparison of Historical Population Growth Trends

Year	City of Bentonville[1]	Benton County[2]	Arkansas[2]	United States[3]
2000	19,731	154,740	2,678,590	281,421,906
2008	31,424	210,810	2,874,550	303,076,408
2009	33,306	216,620	2,896,840	305,897,840
2010	35,301	222,890	2,921,610	308,745,538
2011	36,973	231,748	2,953,770	311,587,816
2012	38,390	240,606	2,985,930	313,914,040
2013	40,167	249,464	3,018,090	316,128,839
2014	41,934	258,322	3,050,250	318,628,969
CAGR				
2000-2010	6.0%	3.7%	0.9%	0.9%
2010-2014	4.4%	3.8%	1.1%	0.8%

[1]Data provided by University of Arkansas at Little Rock for years 2000 and 2010, extrapolated out for years 2011 – 2014
[2]Data provided by Woods and Poole Economics, Inc. for years 2000 and 2008-2010, extrapolated through 2014
[3]Data provided by U.S. Census Bureau's American FactFinder for years 2000 and 2010, extrapolated for all others
Sources: University of Arkansas at Little Rock, Woods and Poole, and American FactFinder. Prepared: November 2014

As shown in **Table 3-1**, historical population growth in the City of Bentonville grew at a CAGR of 6.0 percent between 2000 and 2010 while Benton County grew at a CAGR of 3.7 percent. Both of these growth rates are well above the CAGR for Arkansas and the United States, both 0.9 percent, between 2000 and 2010. For reference, the next highest CAGR for county population in Arkansas between 2000 and 2010 was 2.8 percent, with many counties experiencing no growth or negative growth. The City of Bentonville and Benton County continued to grow at a higher than average rate between 2010 and 2014 as well. During that time Bentonville grew at an estimated CAGR of 4.4 percent while Benton County grew at a CAGR of 3.8 percent. Both of these growth rates are also higher than those for Arkansas and the United States.

In addition to population, there are other demographic factors that impact demand for general aviation in a particular region. The regional economy can also significantly impact aviation demand. Regional economic trends are summarized in this analysis through an examination of employment and earnings data. **Table 3-2** presents historical employment and earnings data for Benton County and Arkansas. It should be noted that total earnings data obtained from Woods and Poole is reported in constant dollars (year 2005) to adjust for inflation over time.

Table 3-2. Historical Benton County and State of Arkansas Employment and Earnings

Year	Benton County		State of Arkansas	
	Employment (in thousands)	Total Earnings (in millions)	Employment (in thousands)	Total Earnings (in millions)
2000	93.28	3,539.00	1,493.32	49,994.42
2008	126.81	5,372.53	1,578.52	58,584.09
2009	122.64	5,360.87	1,542.86	57,332.16
2010	123.97	5,409.29	1,530.68	57,485.61
2011	127.17	5,606.47	1,548.86	58,869.74
2012	130.37	5,803.64	1,567.03	60,253.87
2013	133.57	6,000.82	1,585.21	61,637.99
2014	136.77	6,197.99	1,603.38	63,022.12
CAGR				
2000-2010	2.9%	4.3%	0.2%	1.4%
2010-2014	2.5%	3.5%	1.2%	2.3%

Source: Woods and Poole Economics, Inc. Prepared: November 2014

As shown in **Table 3-2**, overall employment and earnings growth in Benton County between 2000 and 2010 was moderately high (2.9 and 4.3 percent, respectively). These figures far outpaced the growth in employment and earnings that were seen in Arkansas as a whole (0.2 and 1.4 percent, respectively). In recent years (2008-2010), employment and earnings growth in Benton County and Arkansas has stagnated, most likely due to the volatility of the U.S. economy**,** however, Benton County continues to outpace the state for both indicators. As reported in Chapter 2, Benton County also has a significantly lower unemployment rate at 4.2 percent in 2013 (the latest year available at the time), than Arkansas at 8.1 percent or the U.S. at 8.4 percent. This also lends credibility to the substantial differences between Bentonville/Benton County and the State of Arkansas's economic conditions.

Statistical analysis typically indicates that regional earnings is one of the most important demographic factors impacting aviation demand, illustrating an underlying assumption that as earnings, and consequently discretionary income grows, individuals have more income to spend on goods and services, including aviation-related goods and services. Total earnings in Benton County grew at a CAGR of 4.3 percent between 2000 and 2010, outperforming growth in Arkansas and are expected to influence the growth at VBT. Overall, the unique business climate and socioeconomic structure of Benton County and the City of Bentonville should support the growth of the Airport throughout the planning horizon.

Per capita personal income (PCPI) is another way to measure the economic growth of an area. PCPI is a composite measure of market potential and indicates the general ability of persons to purchase products and services. **Table 3-3** provides a summary of historical PCPI figures for Benton County and Arkansas. It should be noted that PCPI data obtained from Woods and Poole is reported in constant dollars (year 2005) to adjust for inflation over time.

Table 3-3. Historical Benton County and State of Arkansas Per Capita Personal Income

Year	Benton County (in 2005 $)	Arkansas (in 2005 $)
2000	$28,669	$25,145
2008	$32,567	$29,851
2009	$31,531	$29,526
2010	$31,001	$29,653
2011	$30,949	$29,913
2012	$30,897	$30,174
2013	$30,846	$30,435
2014	$30,794	$30,696
CAGR		
2000-2010	0.8%	1.7%
2010-2014	-0.2%	0.9%

Source: Woods and Poole Economics, Inc. Prepared: November 2014

As **Table 3-3** shows, personal income has grown at a faster rate in Arkansas, but personal income in Benton County is consistently higher than the state as a whole although the gap between Benton County and Arkansas has continued to close with the statewide growth and general decline in Benton County since 2008.

3.2 Historical and Current Activity

At general aviation airports such as VBT, there are two primary indicators of activity: based aircraft and annual operations. A based aircraft is generally defined as an aircraft that is permanently stored at an airport. An aircraft operation represents either a take-off or landing conducted by an aircraft. For example, a takeoff and a landing would count as two operations.

Historical based aircraft and operations data for VBT provides the baseline from which future activity at the Airport can be projected. While historical trends are not always reflective of future periods, historical data does provide insight into how local, regional, and national demographic and aviation-related trends may be tied to an airport. It is also important to point out that historical data reflect the available facilities at the Airport. For example, with a runway length of 4,426 feet, the Airport has not historically experienced a high level of jet aircraft operational activity and does not have any based jet aircraft. As discussed in Chapter 2, jet activity was recorded at the Airport according to data purchased from Airport IQ, with jets accounting for approximately 8 percent of the recorded filed flight plans (arrivals and departures). However, these jets are categorized as small personal or corporate jet aircraft such as the Cessna Citation Sovereign and Excel. It is likely that jet aircraft activity is limited due to the current runway length.

The Airport has also experienced growth with the development of hangar facilities that have resulted in an increase in based aircraft. Airport representatives indicated that 10 additional aircraft signed lease agreements to base at the Airport during 2014. A new seven unit T-hangar facility was completed in early 2015 on the west side of VBT, opening a new storage area at the

Airport. This new facility has commitments that will bring additional based aircraft to the Airport in 2015.

As discussed in Chapter 1, Bentonville City officials have expressed interested in seeing VBT developed in a manner that supports additional recreational aircraft. The City's goal is to generate public engagement and interest in aviation by constructing facilities that would accommodate and attract vintage and unique aircraft. Many of these aircraft are "taildraggers" or are equipped with balloon tires and operate more easily on turf runways. While a good volume of these aircraft are currently operating at VBT, it is anticipated that growth in this segment will occur once the planned turf runway is constructed, providing additional based aircraft and operations at the Airport beyond what is anticipated if the Airport's facilities were to remain the same as in 2015.

These conditions were considered in the process of developing forecasts for VBT's future activity. In order to establish the historical perspective, previous activity data were compiled from several sources including Airport management and FAA TAF records. Information from the Arkansas Department of Aeronautics (ADA) was utilized where applicable.

3.2.1 Based Aircraft

The only resource available to identify historical based aircraft at VBT is the FAA TAF. No other sources of historical based aircraft activity were identified through discussions with City and Airport officials. The most recent version of the TAF reports that there were 42 based aircraft at the Airport in 2004, and 31 in 2014. However, based on an Airport survey conducted in 2014, 63 based aircraft were identified at VBT and an additional four based aircraft were anticipated to be based at the Airport in 2015 following the completion of the seven unit T-hangar on the west side of the airfield. The 2015 estimate was determined based on leases signed for hangars under construction at the Airport as of December 2014. While 10 aircraft signed leases for hangars in 2014, the other growth in activity cannot be attributed to a definitive timeframe, although it is likely that the Airport did not experience all of this growth in one year, but rather, the TAF was not updated to reflect the actual activity in the years 2010 through 2013.

Table 3-4 presents historical based aircraft at Bentonville Municipal Airport using TAF estimates from 2004-2013, and Airport survey data for 2014 and a 2015 estimate.

Table 3-4. Historical VBT Based Aircraft

Year	Single-Piston	Multi-Piston	Helicopter	Total
2004	42			42
2005	43			43
2006	43			43
2007	43			43
2008	40			40
2009	40			40
2010	31			31
2011	31			31
2012	31			31
2013	28	3		31
2014*	56	5	2	63
2015 (est.)**	59	6	2	67
CAGR				
2004-2014	4.1%			4.1%
2010-2014	16.0%			19.4%

* 2014 numbers came from a survey of the airport by the Airport manager
**2015 numbers account for hangar construction that is currently occurring at VBT
Sources: FAA Terminal Area Forecasts and Airport manager Prepared: November 2014

Because of the significant difference in the number of based aircraft reported by the TAF compared with Airport survey data, TAF estimates are not used to project future based aircraft at the Airport.

3.2.2 Aircraft Operations

Annual aircraft operations represent the number of takeoffs and landings occurring at the Airport during a calendar year. Historical operations data include operations conducted by both based aircraft (typically referred to as local operations) as well as operations conducted by itinerant aircraft stored at other airports arriving at the Airport for a variety of reasons including business, recreation, or flight training purposes.

Since VBT does not have an air traffic control tower (ATCT), the recorded aircraft operations represent estimates of activity from the fixed-base operator (FBO) at the Airport. No additional operational methods were included in the scope for the Master Plan Update to estimate annual operations, however data on fuel sales, data from filed flight plans (from Airport IQ), and discussions with tenants, including those that conduct flight training, were considered in estimating annual operations.

Estimated aircraft operations data for VBT are summarized in **Table 3-5**. Unlike based aircraft, estimates of annual operations for 2015 are not available and cannot be made at this time. While the estimates reflect an increase between 2011 and 2012, it is possible this is just a change in reporting and not necessarily growth in the operational activity.

Table 3-5. Historical VBT Aircraft Operations

Year	Itinerant Operations			Local Operations	Total
	Air Taxi	GA	Military	Civil	
2004	1,500	2,500	100	14,000	18,100
2005	1,500	2,500	100	14,000	18,100
2006	1,500	2,500	100	14,000	18,100
2007	1,500	2,500	100	14,000	18,100
2008	1,500	2,500	100	14,000	18,100
2009	0	6,000	100	12,000	18,100
2010	0	6,000	100	12,000	18,100
2011	0	6,000	100	12,000	18,100
2012	0	8,000	100	15,000	23,100
2013	0	8,000	100	15,000	23,100
2014	0	8,000	100	15,000	23,100
CAGR					
2004-2014		12.3%		0.8%	2.5%
2010-2014		7.5%		7.7%	6.3%

Sources: FAA Form 5010, Airport Management Records, and FAA TAFs Prepared: November 2014

3.2.3 Anticipated Activity

Consistent with the City's interest in developing facilities at the Airport to attract and accommodate additional recreational aircraft activity, one of the Airport's current tenants is seeking to purchase several additional recreational aircraft that will be hangared at VBT. A specific timeline has not been identified, but it is anticipated that these aircraft will be part of the long-term future of the Airport. As such, the forecast assumes this activity will be initiated, especially as the turf runway is developed, and the forecast includes growth in this activity. The growth will be both in based aircraft as well as operations.

3.3 National Aviation Trends

The preparation of forecasts of aviation-related demand requires a general understanding of recent and anticipated national trends in the aviation industry. National trends provide insight for the development of aviation activity projections for the Airport. Some trends in the aviation industry will undoubtedly have a greater impact on VBT than others. Since all of the activity at the Airport is associated with general aviation, this section focuses on past and anticipated trends in the general aviation industry. General aviation aircraft are defined as all aircraft not flown by commercial airlines or the military.

The aviation and general aviation industries have experienced significant changes in recent years. At the national level, fluctuating levels of general aviation usage caused by economic upturns/downturns resulting from the nation's business cycle have all impacted general aviation demand. This section examines general aviation trends, and the numerous factors that have influenced those trends in the U.S.

3.3.1 General Aviation Overview

There are 19,360 public and private airport facilities located throughout the United States, as reported by the FAA; 3,331 of these airports are included in the FAA's National Plan of Integrated Airport Systems (NPIAS), indicating that they are eligible for federal funding assistance. VBT is identified as a general aviation airport in the NPIAS. Commercial service airports, those that accommodate scheduled passenger airline service, represent a relatively small portion (514 or roughly 15 percent) of the airports in the NPIAS. General aviation airports, including relievers, comprise 85 percent of the NPIAS. General aviation activity has declined in recent years. Since 2000, operations on the national level have declined at an average annual rate of 3.3 percent. According to the FAA, much of this decline can be attributed to economic conditions and fuel prices. Operational estimates at VBT reflect an increase between 2011 and 2012, however, it is possible this is just a change in reporting and not necessarily growth in the operational activity. The FBO at VBT indicated that activity has changed in recent years with more small corporate and personal jet operations, but that overall the trend in total operations appears to be stable and not declining similar to the national trend in general aviation activity.

3.3.2 Business Use of Aviation

Business use of aviation is very important at VBT and in the nation as a whole. The City of Bentonville has a large concentration of businesses that utilize aviation on a daily basis. For the purposes of this Master Plan Update, the terms business and corporate aircraft are used interchangeably, as they both refer to aircraft used to support a business enterprise; though, as defined by the FAA, they each have their own distinct definition. The FAA defines business use as:

> "Any use of an aircraft (not for compensation or hire) by an individual for transportation required by the business in which the individual is engaged."

The FAA defines corporate transportation as:

> "Any use of an aircraft by a corporation, company or other organization (not for compensation or hire) for the purposes of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft."

The FAA estimated in their 2015-2019 Report to Congress that business aircraft usage comprises 8.7 percent of all aviation activity. An additional 9.7 percent of the nation's general aviation activity is considered corporate. These figures represent a general decline nationally in the use of business/corporate aviation between 2008 and 2012 when they totaled 9.6 percent and 11.9 percent, respectively.

Increased personnel productivity is one of the most important benefits of using business aircraft. Companies flying general aviation aircraft for business control scheduling capabilities. Itineraries can be changed as needed, and aircraft can fly to destinations not served by scheduled airlines.

Business aircraft usage provides the following:

- Employee time savings
- Increased enroute productivity
- Minimized time away from home
- Enhanced industrial security
- Enhanced personal safety
- Management control over scheduling

Many of the nation's employers that use general aviation aircraft are members of the National Business Aircraft Association (NBAA). The NBAA's *Business Aviation Fact Book 2014* shows that nationwide business aviation contributes $150 billion to the U.S. economic output. The NBAA Fact Book also indicates that only three percent of business aircraft are flown by Fortune 500 companies; the remaining 97 percent are operated by a large spectrum of companies and organizations of various sizes. This indicates that the use of business aviation is not exclusive to large companies, and has practicable applications for many different types of businesses.

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

Though business use of general aviation aircraft has declined in recent years nationally, it is anticipated that the unique business climate within the Bentonville Municipal Airport catchment area will result in continued steady growth in the local aviation environment. This business climate is reflected in the previously presented data on Benton County employment and earnings and includes major companies such as Walmart (world headquarters), JB Hunt Transport, Tyson Foods, and others. Also of specific note is that Walmart requires its suppliers to establish offices near the Bentonville headquarters, contributing to the high growth in employment and specifically in higher earning jobs. This growth has occurred in Bentonville even though nationally a decline in employment was experienced during the 2008 through 2010 timeframe. While many of the corporate aircraft of the regional firms are not based at VBT, the employees, suppliers, and vendors do utilize VBT for personal and business travel, including members of the Walton Family.

3.3.3 FAA Forecasts

The FAA publishes forecasts on an annual basis that summarize anticipated trends in most components of civil aviation activity. Each published forecast revisits previous activity forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of forecasts, including U.S. and international economic trends and projected fuel costs. FAA forecasts provide detailed analyses of historical and forecasted aviation trends and provide a general framework for anticipated future levels of regional and national aviation activity.

Examples of measures of national general aviation activity that are monitored and forecast by the FAA on an annual basis in the FAA Aerospace Forecasts include active pilots, active hours flown, and active aircraft fleet. Historical and projected activity in each of these categories is examined in the following sections. The data presented is based on the most recent available information, contained in *FAA Aerospace Forecasts, Fiscal Years 2014- 2034.*

Active Pilots

Active pilots are defined by the FAA as those persons with a pilot certificate and a valid medical certificate. **Table 3-6** summarizes historical and projected U.S. active pilots by certificate type. As shown, the FAA projects a slight decline in the active pilot population through 2020, but an overall increase throughout the planning period. Total active pilots are projected to increase from 611,046 in 2014 to 655,718 in 2035, representing a CAGR of 0.3 percent.

Active Hours Flown

Aircraft hours flown is another statistic used by the FAA to measure and project general aviation activity. Hours flown is a valuable measure because it captures a number of activity-related data including aircraft utilization, frequency of use, and duration of use. Total hours flown in general aviation aircraft have declined from 2000 to 2014 by a CAGR of 1.5 percent, as shown in **Table 3-7**.

As shown in **Table 3-7**, the FAA projects total active hours flown in the U.S. to increase from approximately 24.3 million in 2014 to 33.0 million in 2035, a CAGR of 1.5 percent.

Active Aircraft Fleet

The FAA tracks the number of active general aviation aircraft in the U.S. fleet annually. Active aircraft are those aircraft currently registered and flying at least one hour during the year. **Table 3-8** summarizes recent active aircraft trends as well as FAA projections of future active aircraft, by aircraft type.

General aviation active aircraft decreased slightly between 2000 and 2014 although there was significant growth in the number of turboprop, jet, and experimental aircraft. The FAA anticipates that these trends will continue throughout the planning period. Fueled by significant increases in jet and turboprop aircraft, the overall active fleet is projected to increase from approximately 207,000 aircraft in 2014 to 228,000 in 2035, a CAGR of 0.5 percent.

FAA Forecast Summary

The cyclical nature of general aviation activity is illustrated in the historical national data presented in this analysis. While national general aviation activity experienced rebounded growth during the mid and late-1990s, the terrorist attacks of 2001 and the economic downturn of 2008 dampened this nationwide activity. FAA projections of U.S. general aviation activity, including active pilots, active aircraft, and hours flown, all show varied levels of growth and decline through the FAA's forecast horizon of 2034 (the data presented in this chapter was extrapolated out to 2035). Though the FAA's national forecasts indicate that U.S. growth will be relatively stagnant, VBT is in a good position to grow in the future. The existing business climate and relatively high socioeconomic standing of the Bentonville area should ensure that general aviation activity at the Airport continues to grow.

Table 3-6. Historical and Projected U.S. Active Pilots

Certificate Type	Historical						Projected				CAGR 2000-2014	CAGR 2014-2035
	2000	2010	2011	2012	2013	2014	2015	2020	2030	2035		
Students	93,064	119,119	119,205	119,291	119,378	119,464	119,550	116,850	115,550	116,175	1.8%	-0.1%
Recreational	340	212	217	221	226	230	235	235	225	225	-2.7%	-0.1%
Sport	N/A	3,682	4,086	4,489	4,893	5,296	5,700	7,800	12,650	15,914	N/A	5.4%
Private	251,561	202,020	198,396	194,772	191,148	187,524	183,900	180,950	181,250	182,751	-2.1%	-0.1%
Commercial	121,858	123,705	121,154	118,603	116,052	113,501	110,950	112,800	118,100	122,994	-0.5%	0.4%
Transport	141,596	142,198	143,878	145,559	147,239	148,920	150,600	153,300	162,600	168,370	0.4%	0.6%
Rotorcraft	7,775	15,377	15,385	15,392	15,400	15,407	15,415	17,750	24,000	27,549	5.0%	2.8%
Glider	9,387	21,275	21,132	20,989	20,846	20,703	20,560	20,955	21,540	21,740	5.8%	0.2%
Total:	**625,581**	**627,588**	**623,452**	**619,317**	**615,181**	**611,046**	**606,910**	**610,640**	**635,915**	**655,718**	**-0.2%**	**0.3%**
Instrument Rated[1]	311,944	318,001	315,971	313,941	311,910	309,880	307,850	310,550	320,700	326,585	0.0%	0.3%

[1]Instrument rated pilots should not be added to other categories in deriving total.
Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034

Prepared: November 2014

Table 3-7. Historical and Projected U.S. Active Hours Flown (in thousands)

Certificate Type	Historical						Projected				CAGR 2000-2014	CAGR 2014-2035
	2000	2010	2011	2012	2013	2014	2015	2020	2030	2035		
Single-engine Piston	18,089	12,161	11,840	11,519	11,198	10,877	10,556	9,783	9,547	9,824	-3.6%	-0.5%
Multi-engine Piston	3,400	1,818	1,790	1,762	1,733	1,705	1,677	1,577	1,530	1,610	-4.8%	-0.3%
Turboprop	1,986	2,325	2,422	2,519	2,615	2,712	2,809	2,924	3,582	4,164	2.3%	2.1%
Jet	2,755	3,375	3,449	3,523	3,596	3,670	3,744	4,738	7,029	8,269	2.1%	3.9%
Rotorcraft	2,191	3,405	3,457	3,509	3,562	3,614	3,666	4,320	5,598	6,377	3.6%	2.7%
Experimental	1,307	1,226	1,238	1,250	1,263	1,275	1,287	1,526	1,882	2,059	-0.2%	2.3%
Sport	N/A	311	290	269	248	227	206	282	449	530	N/A	4.1%
Other	374	181	181	182	182	183	183	190	203	209	-5.0%	0.6%
Total:	**30,102**	**24,802**	**24,667**	**24,532**	**24,398**	**24,263**	**24,128**	**25,340**	**29,820**	**33,042**	**-1.5%**	**1.5%**

Sources: FAA Aerospace Forecasts, Fiscal Years 2014-2034 Prepared: November 2014

Table 3-8. Historical and Projected U.S. Active Aircraft Fleet

Certificate Type	Historical						Projected				CAGR 2000-2014	CAGR 2014-2035
	2000	2010	2011	2012	2013	2014	2015	2020	2030	2035		
Single-engine Piston	149,422	139,519	135,985	132,451	128,918	125,384	121,850	118,015	113,740	114,033	-1.2%	-0.5%
Multi-engine Piston	21,091	15,900	15,546	15,192	14,838	14,484	14,130	13,820	13,090	12,840	-2.6%	-0.6%
Turboprop	5,762	9,369	9,530	9,691	9,853	10,014	10,175	10,445	12,725	14,813	4.0%	1.9%
Jet	7,001	11,484	11,637	11,790	11,944	12,097	12,250	14,010	19,310	22,793	4.0%	3.1%
Rotorcraft	7,150	10,102	10,291	10,479	10,668	10,856	11,045	12,830	16,370	18,297	3.0%	2.5%
Experimental	20,407	24,784	25,110	25,436	25,763	26,089	26,415	28,500	32,715	34,885	1.8%	1.4%
Sport	N/A	6,528	5,696	4,865	4,033	3,202	2,370	3,080	4,445	4,995	N/A	2.1%
Other	6,700	5,684	5,554	5,424	5,295	5,165	5,035	5,080	5,165	5,208	-1.8%	0.0%
Total:	**217,533**	**223,370**	**219,350**	**215,330**	**211,310**	**207,290**	**203,270**	**205,780**	**217,560**	**227,864**	**-0.3%**	**0.5%**

*Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.
Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.
Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034

Prepared: November 2014

3.4 Based Aircraft Projections

The FAA maintains projections of aviation-related activity in its Terminal Area Forecasts (TAF). At smaller, non-towered general aviation airports such as VBT, the FAA forecasts do not always reflect accurate historical activity or projected levels of demand. The most recent TAF for VBT reports 31 existing based aircraft at the Airport, and projects 31 based aircraft throughout the projection period (see **Table 3-9**).

Table 3-9. VBT Based Aircraft Comparison

Historical	FAA TAF	Airport
2014	31	63
2015 (est.)	31	67
Projected		
2020	31	
2025	31	
2035	31	

Source: FAA TAF, Accessed 11/04/2014 Prepared: November 2014

In addition to reviewing the FAA's TAF forecast, previous based aircraft forecasts from the 2003 Master Plan Update and 2006 Arkansas State Airport System Plan were also reviewed. The 2003 Master Plan Update projected based aircraft to grow from 34 in 2002 to 51 in 2022. The 2006 Arkansas State Airport System Plan projected based aircraft to grow from 33 in 2005 to 40 in 2025. Based on records provided by Airport representatives, there were 63 aircraft based at VBT in 2014, with an additional four aircraft anticipated to join the based aircraft fleet in 2015 when hangar construction is expected to be complete.

Given the recent growth and current number of based aircraft at VBT, the TAF, 2003 Master Plan Update, and 2006 Arkansas State Airport System Plan's forecasts cannot be used as a basis for forecasting future demand at VBT. No other forecasts of VBT are known to exist. Therefore, other forecast methodologies were examined using the current 2014 and estimated number of based aircraft for 2015.

3.4.1 Based Aircraft Forecast Methodologies

The FAA TAF reports that there were 31 based aircraft at Bentonville Municipal Airport in 2014, and that this number has been constant since 2010. Based on conversations with Airport representatives and Airport users, and recently recorded updates to the based aircraft, this figure does not reflect an accurate count. Without accurate historical records, certain types of methodologies typically employed for forecasting are not useful for projections presented in this Master Plan Update. Methodologies such as regression or trend analysis utilize historical data to project future activity. Since these methodologies will not provide an accurate portrayal of aviation-related activity at VBT, based aircraft forecasts are derived from two types of forecasting methodologies: socioeconomic and market share.

Socioeconomic Methodology – Population Variable

Socioeconomic factors of a community do not always impact or reflect aviation-related activity at a nearby airport; however, they can often give direction to the overall health of the local economy and the potential type of aircraft activity that may be occurring at that airport. According to data obtained from Woods and Poole, an independent firm that specializes in long-

term county economic and demographic projections, the population of Benton County is anticipated to increase from 258,000 in 2014 to 443,000 in 2035, which reflects a CAGR of 2.6 percent. According to U.S. Census data, the population of Benton County is anticipated to increase at a higher rate than the State of Arkansas (2.6 percent versus 1.0 percent). Much of the population growth can be attributed to the County's low unemployment rate (4.2 percent versus State unemployment of 8.1 percent), strength of the local economy in terms of total retail sales, and numerous large employers in the area.

Based on conversations with Airport management, an estimate of the number of based aircraft anticipated at the Airport in 2015 has been made (67). The Socioeconomic-Population Variable Methodology for based aircraft forecasts assumes that between 2016 and 2035, the number of based aircraft at the Airport will increase at the same rate as the population of Benton County (see **Table 3-10**). Although the anticipated number of based aircraft at the Airport in 2015 has been estimated, the figure for 2014 is used as the base year. As shown, the number of based aircraft at VBT is projected to increase from 63 in 2014 to 111 in 2035.

Table 3-10. VBT Socioeconomic – Population Variable Based Aircraft Forecast

Historical	Benton County Population	VBT Based Aircraft
2014	258,000	63
2015 (est.)	267,000	67
Projected		
2020	311,000	78
2025	356,000	89
2035	443,000	111

Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, Kimley-Horn Prepared: November 2014

Socioeconomic Methodology – Employment Variable

As mentioned, the unemployment rate in Benton County is relatively low compared to the State as a whole. The County is home to a number of large employers including the corporate headquarters of Wal-Mart and JB Hunt Transport Services, as well as a distribution center for Tyson Foods. The number of employed individuals in Benton County is anticipated to increase from 137,000 in 2014 to 228,000 in 2035, a CAGR of 2.4 percent. Similar to the Socioeconomic-Population Variable Methodology, the Socioeconomic-Employment Variable Methodology assumes that between 2016 and 2035, the number of based aircraft at the Airport will increase at the same rate as the number of employed individuals in Benton County (see **Table 3-11**). As shown, the number of based aircraft at VBT is projected to increase from 63 in 2014 to 109 in 2035.

Table 3-11. VBT Socioeconomic – Employment Variable Based Aircraft Forecast

Historical	Benton County Employment	VBT Based Aircraft
2014	137,000	63
2015 (est.)	140,000	67
Projected		
2020	158,000	76
2025	178,000	85
2035	228,000	109

Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, Kimley-Horn Prepared: November 2014

Socioeconomic Methodology – Per Capita Personal Income Variable

Per capita personal income (PCPI) can be an indicator of a local population's propensity to travel or own an aircraft. Commercial service is not provided at Bentonville Municipal Airport; however, the Airport has experienced an increase in business travel and jet operations in recent years. Per capita personal income is examined to project based aircraft at the Airport and the result is depicted in **Table 3-12**. As shown, per capita income in Benton County is anticipated to increase from $30,800 in 2014 to $42,900 in 2035, a CAGR of 1.6 percent. This methodology projects the number of based aircraft at the Airport from 2016 to 2035 to increase at the same rate as per capita income in Benton County. According to the Socioeconomic-Per Capita Personal Income Variable Methodology, the number of based aircraft at VBT is projected to increase from 63 in 2014 to 94 in 2035. It should be noted that per capita data obtained from Woods and Poole is reported in constant dollars (year 2005) to adjust for inflation over time.

Table 3-12. VBT Socioeconomic – Per Capita Personal Income Variable ($2005) Based Aircraft Forecast

Historical	Benton County PCPI	VBT Based Aircraft
2014	30,800	63
2015 (est.)	30,700	67
Projected		
2020	32,500	71
2025	35,100	76
2035	42,900	94

Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, Kimley-Horn Prepared: November 2014

Socioeconomic Methodology – Total Retail Sales Variable

The fourth socioeconomic variable examined to project based aircraft at the Airport is Total Retail Sales. Retail sales indicate the spending strength of a given location and include motor vehicles, furniture and home furnishings, electronics and appliances, building materials, food and beverage, and other miscellaneous items. According to Woods and Poole Data, total retail sales in Benton County are projected to increase from 2,830 (in millions) to 6,060 in 2035, a CAGR of 3.7 percent. This methodology assumes that from 2016 to 2035, the number of based aircraft at VBT will increase at the same rate as total retail sales in Benton County (see **Table 3-13**). As shown, the number of based aircraft at the Airport is projected to increase from 63 in 2014 to 137

in 2035. As with per capita income, total retail sales are reported in constant dollars (year 2005) to adjust for inflation over time.

Table 3-13. VBT Socioeconomic – Total Retail Sales Variable ($2005)
Based Aircraft Forecast

Historical	Benton County Total Retail Sales (Millions)	VBT Based Aircraft
2014	2,830	63
2015 (est.)	2,970	67
Projected		
2020	3,620	82
2025	4,350	98
2035	6,060	137

Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, Kimley-Horn Prepared: November 2014

Socioeconomic Methodology – Summary of Results

A summary of the results of the socioeconomic methodologies used to project based aircraft at the Airport is shown in **Table 3-14**, including the CAGR for each methodology from 2014 through 2035.

Table 3-14. Socioeconomic Forecasts of VBT Based Aircraft

Historical	Population Methodology	Employment Methodology	Per Capita Income Methodology	Total Retail Sales Methodology
2014	63	63	63	63
2015 (est.)	67	67	67	67
Projected				
2020	78	76	71	82
2025	89	85	76	98
2035	111	109	94	137
CAGR				
	2.7%	2.6%	1.9%	3.8%

Note: CAGR 2014-2035 for socioeconomic variables and corresponding based aircraft projections vary slightly as variables were applied for 2016-2035 since the number of based aircraft in 2015 is estimated to be 67.
Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, Kimley-Horn Prepared: November 2014

Based Aircraft Forecast - Market Share Methodology

The second type of methodology used to project based aircraft at VBT is market share. Market share compares an individual component's share (based aircraft at VBT) with a larger market. The markets compared for based aircraft are the State of Arkansas, and the FAA Southwest Region (includes Arkansas, Louisiana, New Mexico, Oklahoma, and Texas).

As mentioned in previous sections of this Master Plan Update, there were 63 based aircraft at the Airport in 2014, and an estimate of 67 in 2015. According to the FAA TAF, there were 2,490 based aircraft in the State of Arkansas, and 21,900 in the Southwest Region. With the known change in based aircraft due to hangar construction, VBT will account for a 2.7 percent market share of based aircraft in Arkansas in 2015, and 0.3 percent market share in the Southwest Region. These figures are held constant throughout the projection period and compared with FAA TAF projections of based aircraft in Arkansas and the Southwest Region (see **Table 3-15**). As shown, the Arkansas Market Share Methodology projects an increase from 63 based aircraft

at VBT in 2014 to 81 in 2035 while the Southwest Region Market Share Methodology projects an increase from 63 based aircraft in 2014 to 81 based aircraft in 2035.

Table 3-15. VBT Market Share Methodology
Based Aircraft Forecast

Historical	VBT Based Aircraft	Arkansas Based Aircraft	VBT Market Share	SW Region Based Aircraft	VBT Market Share
2014	63	2,470	2.6%	21,700	0.3%
2015 (est.)	67	2,490	2.7%	21,900	0.3%
Projected					
2020	70	2,610	2.7%	22,900	0.3%
2025	74	2,740	2.7%	24,100	0.3%
2035	81	3,020	2.7%	26,600	0.3%
CAGR					
	1.2%	1.0%		1.0%	

Sources: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

Based Aircraft Forecast – Preferred Methodology

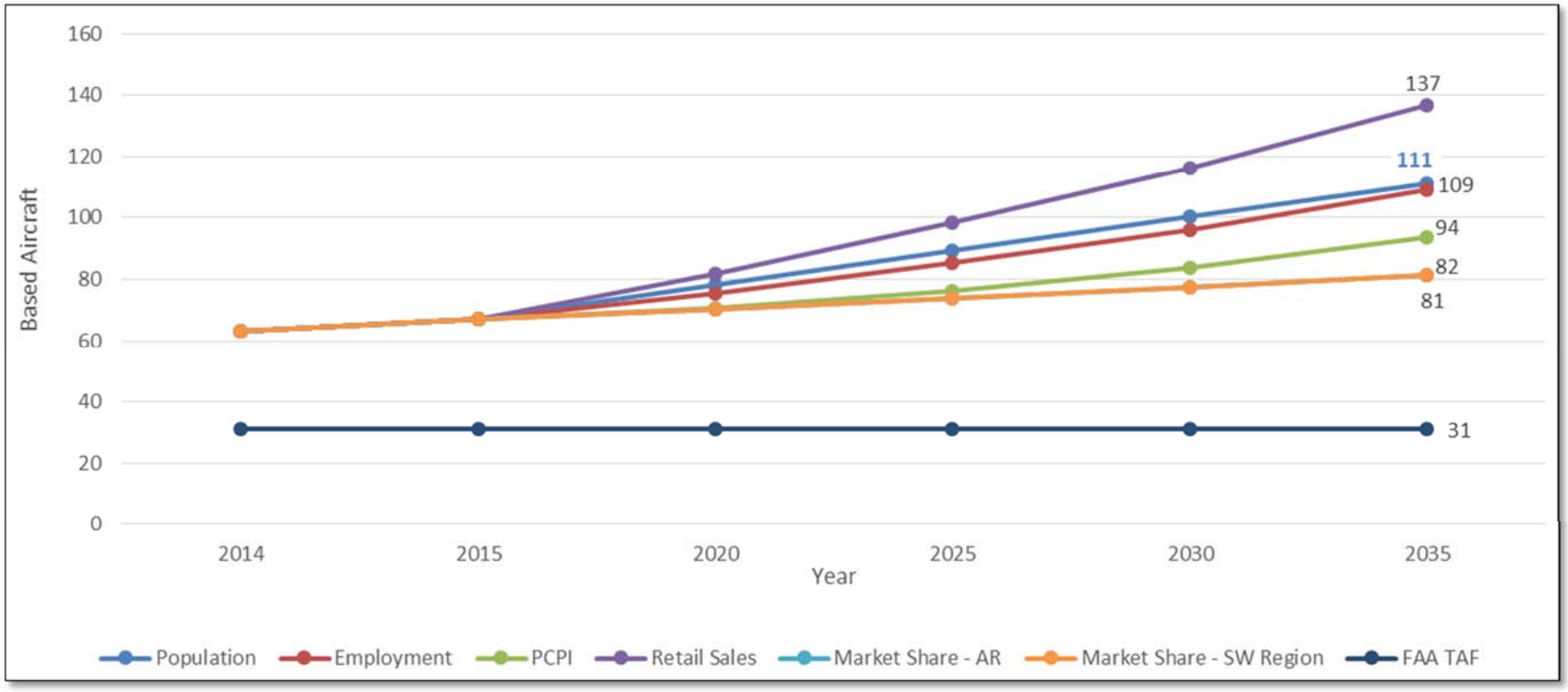
The majority of based aircraft at VBT are stored in T-hangars or executive hangars rather than on the ramp with tie-downs. This type of storage is anticipated to continue in the future. Preliminary designs of future Airport land use layouts depict a total of 112-115 total hangar spaces available by 2035. Although there has been a significant increase in the number of based aircraft at the Airport in recent years, it is not anticipated that demand for aircraft storage will exceed 115 hangar spaces through 2035.

Both the Arkansas and FAA Southwest Region market share methodologies project steady growth in the number of based aircraft at VBT throughout the projection period, however, economic and population projections indicate that Benton County will likely experience higher aviation-related activity levels than what the market share forecasts indicate.

It is reasonable to assume that the projected increase in the population of Benton County through 2035 is attributed at least in part to projected high levels of employment, increasing per capita personal income, and the strength of the local economy (total retail sales) that have been previously discussed and documented in **Tables 3-10** through **3-13**. In all of these factors, Benton County has historically outpaced State of Arkansas (see **Tables 3-1** through **3-3)** and the U.S.

Based on the assumption that all of these factors (employment, per capita personal income, and total retail sales) drive regional population growth, the Socioeconomic-Population Methodology is assumed to most accurately measure the strength of the local economy and workforce, as well as projected growth of based aircraft at Bentonville Municipal Airport. A summary of projected based aircraft by methodology is shown in **Exhibit 3-1**. Therefore, the Socioeconomic-Population Variable Methodology will be used as the preferred methodology to project future based aircraft at the Airport.

Exhibit 3-1. VBT Based Aircraft Forecast Summary



Sources: Woods and Poole Economics, Inc., 2012 CEDDS Vol. 1, FAA TAF, Accessed 11/04/2014, Kimley-Horn

Prepared: November 2014

Based Aircraft Fleet Mix Forecast

As with most general aviation airports, the majority of the based aircraft fleet at VBT is composed of single-engine piston aircraft. The national based aircraft fleet mix in 2015 is anticipated to remain fairly stable with little change throughout the projection period with one exception. National trends and FAA TAF forecasts indicate strong growth in the number of general aviation jet aircraft in operation in the U.S. through 2035. The number of jets in operation in the U.S. is anticipated to increase from 12,250 in 2015 to 22,050 in 2035, a CAGR of 2.9 percent. In 2014, there were no based jets at VBT, however, given the continued growth of jets in the national fleet, changes in local socioeconomic characteristics, and a recent increase in jet operations at the Airport, it is anticipated that there will be growth in based jets over the planning period.

Although an increase in the number of based jets at VBT is anticipated, jet aircraft are not projected to compose the same proportion of total based aircraft as the U.S. fleet. The reason for this is that nationally the growth in jet aircraft is anticipated to include all sizes of jet aircraft, from small to very large, many of which require much longer runways than anticipated to be provided at VBT. The Northwest Arkansas region is currently served by several airports that accommodate these larger jets including Northwest Arkansas Regional (XNA) and Rogers Municipal (ROG). Although some growth in based jet and multi-piston aircraft is anticipated at VBT, a significant change in the fleet mix composition is not expected. It is assumed that growth of jet aircraft based at the Airport will be about one-third that of the U.S. fleet given the likely conditions in the region and at VBT, and the percent of the overall jet fleet that are likely to be accommodated at VBT. Although single-engine piston aircraft are projected to decrease as a proportion of the total based aircraft fleet at the Airport, the number is anticipated to increase from 59 in 2015 to 93 in 2035, a CAGR of 2.4 percent. This increase in number also reflects the growth anticipated in recreational aircraft, including taildragger-style airplanes that will use the planned turf runway.

Based aircraft fleet mix projections are presented in **Table 3-16**.

Table 3-16. VBT Based Aircraft Fleet Mix Forecast

Historical	Single-Piston	%	Multi-Piston	%	Jet	%	Helicopter	%	Total
2014	56	88.9%	5	7.9%	0	0.0%	2	3.2%	63
2015 (est.)	59	88.1%	6	9.0%	0	0.0%	2	3.0%	67
Projected									
2020	67	85.1%	7	9.0%	2	2.9%	2	3.0%	78
2025	75	84.7%	8	9.0%	3	3.4%	3	3.0%	89
2035	93	83.7%	10	9.0%	5	4.4%	3	3.0%	111
CAGR									
	2.4%		3.3%		N/A		2.4%		2.7%

Sources: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

3.5 Aircraft Operations Projections

Aircraft operations projections are used to determine funding and design criteria at airports. At airports with air traffic control towers, aircraft operations are tracked and recorded by the air traffic controller. Most airports in the United States, including VBT do not have airport traffic control towers. These airports are referred to as non-towered airports, and they make up the vast majority of the airports open to the public for business. Accordingly, unlike with larger towered airports, these non-towered airports do not have readily available records on aircraft activity.

There are several factors that impact the number of aircraft operations that occur at a particular airport. The number of based aircraft, local demographics, national economic and aviation-related trends, proximity to other airports, capability and existing condition of facilities, business needs, and several other factors influence aircraft operations at an airport. At non-towered facilities such as VBT it is difficult to accurately measure historical aircraft operations.

To support the operations estimates, data were obtained on fuel sales at the Airport. Since 2009, fuel sales of both Jet A and 100LL have grown from nearly 67,700 gallons to almost 106,000 in 2013, representing a CAGR of 11.9 percent. In 2014, the Airport's runway had a five-month temporary closure during the construction of the runway safety area (RSA) project, resulting in a reduction from 106,000 gallons to 93,000 gallons sold. In 2015, the fuel sales numbers are rebounding, with an annualized estimate of nearly 123,000 gallons, which would result in a CAGR of 10.5 percent from 2009 through 2015.

In terms of the split in fuel sales between Jet A and 100LL, in 2009 jet fuel represented 35 percent of the total sales, however, in 2013 (the last full year's data), this increased to 43 percent of total fuel sales. Jet fuel is used by both turboprop and jet aircraft, therefore, this increasing sale of jet fuel indicates that larger, more sophisticated turboprop and jet aircraft are using VBT on a more frequent basis.

Due to the lack of historical operations data available, time-series or regression analysis methodologies would not accurately portray projected aviation-related activity. The methodologies utilized for purposes of this Master Plan Update examine operations per based aircraft (OPBA) to forecast future aircraft operations.

3.5.1 FAA TAF and Other Forecasts

As discussed as part of the based aircraft projections, the FAA reports available historical and projected aviation-related activity in its TAF. FAA TAF forecasts for VBT are depicted in **Table 3-17**. As shown, the FAA reports 23,100 estimated aircraft operations for 2014, and projects 23,100 annually throughout the projection period. The FAA uses this straight-line methodology when no recent forecasts are available and there is no means to accurately project activity given the lack of an air traffic control tower.

Table 3-17. FAA Terminal Area Forecasts for VBT

Year	Itinerant Operations			Local Operations	Total Operations
	Air Taxi	GA	Military	Civil	
2004	1,500	2,500	100	14,000	18,100
2005	1,500	2,500	100	14,000	18,100
2006	1,500	2,500	100	14,000	18,100
2007	1,500	2,500	100	14,000	18,100
2008	1,500	2,500	100	14,000	18,100
2009	0	6,000	100	12,000	18,100
2010	0	6,000	100	12,000	18,100
2011	0	6,000	100	12,000	18,100
2012	0	8,000	100	15,000	23,100
2013*	0	8,000	100	15,000	23,100
2014*	0	8,000	100	15,000	23,100
2015*	0	8,000	100	15,000	23,100
Projected					
2020*	0	8,000	100	15,000	23,100
2025*	0	8,000	100	15,000	23,100
2035*	0	8,000	100	15,000	23,100

*Denotes FAA projection
Source: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

In addition to the TAF, previous forecasts of annual VBT operations from the 2003 Master Plan Update and 2006 Arkansas State Airport System Plan were reviewed to determine their applicability. The 2003 Master Plan Update estimated 34,000 operations in 2002, a much higher number than is being reported by the TAF or by the Airport. The 2003 Master Plan Update projected annual operational activity to grow from 34,000 in 2002 to 41,486 in 2022. The 2006 Arkansas State Airport System Plan estimated 18,100 operations in 2005, the same as the TAF, but projected operational activity to grow at a minimal CAGR of less than 1.0 percent to 21,918 in 2025. The System Plan's estimate for 2025 is below the current estimate of 23,100 annual operations which has been steady since 2012 due to a lack of updated reporting with no actual counting mechanisms in place at VBT. Based on the review of the TAF, 2003 Master Plan Update, and 2006 Arkansas State Airport System Plan's operational forecasts, other methodologies were examined to project future operational activity at VBT.

3.5.2 Aircraft Operations Forecast – Baseline Estimate

As noted, it is difficult to estimate annual aircraft operations without accurate data. The TAF has reported the same number of operations for VBT (23,100) since 2012 and projects this in straight-line fashion through 2035. This estimate has been used but was evaluated further prior to developing forecasts of future aircraft operations for VBT.

The most accurate available data to develop an estimate of existing and future annual operations is the number of based aircraft. In order to establish a baseline to estimate the number of aircraft operations that occurred at the Airport in 2014, two separate figures were examined. Both figures are derived from the FAA TAF. The first figure is the number of operations per based aircraft (OPBA) in the State of Arkansas. This figure is determined by combining the total number of

local and itinerant aircraft operations conducted at Arkansas airports reported in the FAA TAF, and dividing that by the total number of based aircraft in the State. To determine 2014 aircraft operations at VBT, this figure is then multiplied by the number of based aircraft at the Airport (see **Table 3-18**). This methodology estimates 39,600 aircraft operations at Bentonville Municipal Airport in 2014. Given the estimation process used, all operations estimates have been rounded to the nearest 100.

The second methodology to project baseline aircraft operations at VBT compares operations per based aircraft in the FAA Southwest Region to based aircraft at the Airport. This methodology forecasts that 27,000 aircraft operations occurred at the Airport in 2014. As shown in **Table 3-18**, OPBA has declined in Arkansas as well as the FAA Southwest Region between 2010 and 2014. Since the actual number of based aircraft at VBT was not recorded previously, only year 2014 data is examined to determine the number of aircraft operations at the Airport in 2014.

Table 3-18. VBT Operations per Based Aircraft Forecast Baseline Analysis

Year	OPBA – Arkansas			OPBA SW Region		
	Arkansas OPBA	VBT Based Aircraft	VBT Operations Estimate	SW Region OPBA	VBT Based Aircraft	VBT Operations Estimate
2010	678	31	21,000	461	31	14,300
2011	665	31	20,600	464	31	14,400
2012	629	31	19,500	431	31	13,400
2013	629	31	19,500	428	31	13,300
2014	628	63	39,600	429	63	27,000

Source: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

The figure of 628 OPBA in the State of Arkansas is significantly higher than other states, both in the FAA Southwest Region, and the U.S. as a whole. This could be due to the high number of airports in the State that do not have airport traffic control towers, therefore more of the operational data in the TAF represents estimates made for each airport, many of which are also "straight-lined" by the FAA. The actual OPBA in Arkansas is likely lower than what is reported in the TAF, but it is difficult to determine.

The OPBA figure for the Southwest Region includes a greater number of towered facilities while still incorporating Arkansas's OPBA. This figure is assumed to be a more accurate estimation of OPBA for VBT. For purposes of this Master Plan Update, the OPBA Southwest Region Forecast is preferred to develop an estimate for 2014 aircraft operations at the Airport. Using this methodology, 2014 operations are estimated at 27,000 and this number is used in all subsequent analysis of aircraft operations forecasts. This estimate is close to the previously identified 23,100 annual aircraft operations reported in the TAF for the period 2012 through 2035.

3.5.3 Aircraft Operations Forecast – Operations per Based Aircraft Methodology

Three methodologies that project aircraft operations are presented in this section. The first two are extended forecasts of the OPBA estimate presented in the previous section. OPBA projections are derived from the FAA's TAF through 2035, and are applied to projected based

aircraft at VBT to forecast aircraft operations. As previously noted, the estimate of 27,000 operations for base year 2014 is used for all methodologies.

OPBA forecasts are presented in **Table 3-19**. As shown, the OPBA – Arkansas Methodology projects an increase from 27,000 operations in 2014 to 64,900 operations in 2035, a CAGR of 4.3 percent. The OPBA – Southwest Region projects an increase from 27,000 operations in 2014 to 43,400 operations in 2035, a CAGR of 2.3 percent.

Table 3-19. VBT Operations per Based Aircraft Forecast Methodologies

	OPBA - Arkansas			OPBA SW Region		
Historical	Arkansas OPBA	VBT Based Aircraft	VBT Operations	SW Region OPBA	VBT Based Aircraft	VBT Operations
2014	628	63	27,000*	429	63	27,000
2015 (est.)	627	67	42,000	427	67	28,600
Projected						
2020	615	78	48,000	418	78	32,600
2025	603	89	53,800	408	89	36,400
2035	585	111	64,900	391	111	43,400
CAGR						
	-0.3%	2.7%	4.3%	-0.4%	2.7%	2.3%

*OPBA – SW Region estimate 2014 applied to all base year forecasts.
Sources: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

3.5.4 Aircraft Operations Forecast – National General Aviation Operations Methodology

The third methodology used to forecast aircraft operations at VBT is the National General Aviation Operations Methodology. This methodology compares aircraft operations at VBT with general aviation operations at all FAA and contract-towered facilities in the U.S. All towered facilities are examined as they include only airports that have the capability to record and report accurate operations data. This methodology assumes that general aviation aircraft operations activity at VBT will mimic activity that occurs nationally. Total projected U.S. general aviation operations and projected VBT operations are shown in **Table 3-20**. As shown, this methodology forecasts an increase in operations at the Airport from 27,000 in 2014 to 29,700 in 2035, a CAGR of 0.5 percent.

Table 3-20. VBT National General Aviation Operations Forecast Methodology

Historical	Total U.S. GA Operations	Local Operations
2014	26,200,000	27,000
2015 (est.)	26,300,000	27,100
Projected		
2020	26,900,000	27,700
2025	27,500,000	28,300
2035	28,800,000	29,700
CAGR		
	0.5%	0.5%

VBT operations have been rounded for presentation.
Sources: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

3.5.5 Aircraft Operations Forecast – Preferred Methodology

All three of the aircraft operations methodologies presented in this Master Plan Update rely on FAA TAF data as a comparison to activity at VBT. As shown in **Table 3-18**, OPBAs in Arkansas and the FAA Southwest Region have declined in recent years; a trend that is expected to continue throughout the projection period. Countering this trend at VBT is an anticipated increase of nearly 50 based aircraft by 2035, representative of growth that is being experienced in socioeconomic conditions as well as recent growth in based aircraft at the Airport and the projected growth due to the proposed recreational aviation opportunities. Although national forecasts suggest that general aviation operations are anticipated to increase slightly over the 20-year forecast, the increase in the number of based aircraft at the Airport should result in more significant growth than is projected by the National General Aviation Operations Methodology.

As is the case with the establishment of a 2014 base year estimate for aircraft operations at VBT, it is assumed that historical and projected OPBA figures for the State of Arkansas do not measure actual operations activity as accurately as OPBA figures for the FAA Southwest Region. For the purposes of this Master Plan Update and for facility planning, the Operations per Based Aircraft – Southwest Region Methodology is the preferred methodology. The OPBA – Southwest Region projects an increase from 27,000 operations in 2014 to 43,400 operations in 2035, a CAGR of 2.3 percent.

3.5.6 Aircraft Operations Forecast – Local/Itinerant Operations

According to the FAA, local operations are defined as those conducted by aircraft that operate in the local traffic pattern or within sight of the Airport; are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the Airport; or execute simulated instrument approaches or low passes at the Airport. Itinerant operations are all aircraft operations other than local operations.

According to the FAA TAF, in 2014 approximately 65 percent of aircraft operations at VBT were identified as local operations. This is assumed to be the most accurate data available to determine the local/itinerant operations split at the Airport, therefore, this figure is applied to total projected operations and held constant throughout the projection period (see **Table 3-21**). It is important to note that while new recreational aviation activity is expected that would be primarily local in nature, this activity is not expected to change the overall nature of the Airport's operational activity split between local and itinerant.

Table 3-21. VBT Operations Forecast – Local/Itinerant Operations

Historical	Total Operations	Local Operations	% Local Ops	Itinerant Operations	% Itinerant Ops
2014	27,000	17,500	65%	9,470	35%
2015 (est.)	28,600	18,600	65%	10,000	35%
Projected					
2020	32,600	21,200	65%	11,400	35%
2025	36,400	23,700	65%	12,800	35%
2035	43,400	28,200	65%	15,200	35%

VBT operations have been rounded for presentation.
Sources: FAA TAF, Accessed 11/04/2014, Kimley-Horn Prepared: November 2014

3.5.7 Aircraft Operations Forecast – Daytime/Evening Operations

A specific component of this Master Plan Update is to forecast daytime/evening operations. This is an important element to include as noise impacts created by aircraft arriving or departing at night are greater than during the day.

Flight-specific operations data were obtained from the AirportIQ Data Center. These data consist of messages from the FAA Traffic Flow Management System (TFMS) from the Aircraft Situation Display to Industry (or ASDI) data. The ASDI data feed includes messages entered into the TFMS from the National Airspace System (NAS). These messages include aircraft departures, arrivals, tracking information, and flight management information.

According to data obtained by AirportIQ, approximately 3 percent of aircraft operations occur during evening hours, defined by the FAA as 10:00PM to 7:00AM. This figure is applied to total operations projections and is anticipated to remain constant throughout the projection period (see **Table 3-22**).

Table 3-22. VBT Operations Forecast – Daytime/Evening Operations

Historical	Total Operations	Daytime Operations	% Daytime	Evening Operations	% Evening
2014	27,000	26,200	97%	859	3%
2015	28,600	27,700	97%	910	3%
Projected					
2020	32,600	31,600	97%	1,040	3%
2025	36,400	35,300	97%	1,160	3%
2035	43,400	42,100	97%	1,380	3%

Operations have been rounded for presentation.
Sources: FAA TAF, Accessed 11/04/2014 and AirportIQ Data Oct. 2013-Sep. 2014, Kimley-Horn Prepared: November 2014

3.5.8 Aircraft Operations Forecast – Operational Fleet Mix

Operational fleet mix projections identify the type of aircraft that currently operate and are anticipated to operate at VBT. These forecasts are calculated based on data obtained from AirportIQ, as well as OPBA figures identified in Section 3.5.

Itinerant operations are based on projections of total general aviation hours flown by aircraft type reported in the *FAA Aerospace Forecasts 2014-2034*. Local operational fleet mix projections are anticipated to be the same as the projected percentages of based aircraft fleet mix at Bentonville Municipal Airport with one exception. It is assumed that zero percent of jet and turbo-prop operations are local operations. The results of operational fleet mix projections are described in **Table 3-23** to reflect total operational estimates by aircraft type.

It is important to note that as depicted in Table 3-23, over 900 jet aircraft operations were estimated for 2014 based on data from Airport IQ as well as discussions with NetJets, the primary operator of many of the jet aircraft on behalf of the fractional owners that reside in Bentonville.

Table 3-23. VBT Total Operational Fleet Mix Forecast

Year	Total Ops	Single Engine		Multi-Engine		Jet		Helicopter		Turbo-Prop	
2014	27,000	78%	21,100	12%	3,240	3%	911	2%	608	4%	1,170
2015 (est.)	28,600	78%	22,200	13%	3,620	3%	965	2%	608	4%	1,240
Projected											
2020	32,600	76%	24,700	12%	4,050	5%	1,640	2%	735	5%	1,460
2025	36,400	75%	27,100	12%	4,450	6%	2,340	2%	838	5%	1,660
2035	43,400	72%	31,400	12%	5,170	8%	3,590	2%	991	5%	2,240
CAGR											
	2.3%		1.9%		2.3%		6.7%		0.1%		3.1%

Operations have been rounded for presentation
Sources: FAA TAF Accessed 11/04/2014 and AirportIQ Data Oct. 2013-Sep. 2014, Kimley-Horn Prepared: November 2014

3.6 Peaking Characteristics and Peak Operations Projections

An important component in the development of forecasts of aviation demand is peak activity levels. Understanding peaking characteristics assists in facility and capacity planning. The following sections present peak operations forecasts.

Aircraft IQ data were analyzed to identify aircraft operations by month, as presented in **Table 3-24**. These estimates of monthly activity were applied to the 27,000 annual operations estimate to derive operations per month. As shown, October is the busiest month at VBT in terms of aircraft operations accounting for over 15 percent of total annual operations. Monthly aircraft operations are divided by the number of days in each month to identify peak month average day (PMAD) operations. Peak hour operations at general aviation airports like VBT typically account for between 10 and 20 percent of PMAD operations. For purposes of this Master Plan Update it is assumed that peak hour operations are 15 percent of PMAD activity. This results in the highest number of peak hour operations being 20 during October.

Table 3-24. VBT Operations Forecast – Peaking Characteristics

Month	% Operations	Operations/ Month	# of Days	PMAD	Peak Hour (15%)
Jan	6.7%	1,810	31	58	9
Feb	8.0%	2,164	28	77	12
Mar	5.8%	1,561	31	50	8
Apr	4.2%	1,144	30	38	6
May	5.5%	1,498	31	48	7
Jun	8.0%	2,164	30	72	11
Jul	5.5%	1,498	31	48	7
Aug	8.5%	2,289	31	74	11
Sep	14.2%	3,829	30	128	19
Oct	15.2%	4,099	31	132	20
Nov	10.8%	2,913	30	97	15
Dec	7.6%	2,039	31	66	10

Sources: AirportIQ Data Oct.2013-Sep.2014, Kimley-Horn Prepared: November 2014

Peaking characteristics described in the previous section are applied to annual operations forecasts and the results are presented in **Table 3-25**. Peak hour operations are estimated to increase from 20 to 32 from 2014 to 2035.

Table 3-25. VBT Peak Operations Forecast

Historical	2014	2015 (est)	Projected 2020	Projected 2025	Projected 2035
Annual Operations	27,000	28,600	32,600	36,400	43,400
Peak Month Operations	4,099	4,342	4,950	5,526	6,589
PMAD Operations	132	140	160	178	213
Peak Hour Operations	20	21	24	27	32

Sources: AirportIQ Data Oct.2013-Sep.2014, Kimley-Horn Prepared: November 2014

3.7 Critical Aircraft

Facility planning for general aviation airports is impacted by existing and anticipated levels of aviation-related demand, both based aircraft and annual aircraft operations, as well as the size and type of aircraft that currently operating and are projected to operate at an airport.

As defined in FAA Advisory Circular 150/5300-13A, Change 1, the FAA classifies airports by Airport Reference Code (ARC), which identifies the overall planning and design criteria for the Airport. The ARC is assigned based on the size of the largest aircraft that generally records at least 500 operations annually at an airport; this aircraft is known as the airport's "critical aircraft." The critical aircraft can consist of multiple aircraft that are considered collectively.

The ARC is based on the highest Runway Design Code (RDC) of a particular airport. The RDC is comprised of the Aircraft Approach Category (AAC), the Aircraft Design Group (ADG), and the approach visibility minimums. The AAC is based on the approach speed of the airport's critical aircraft, and the ADG is based on critical aircraft's wingspan and tail height. The approach visibility minimums expressed by runway visual range values in feet and relate to the lowest visibility minimums with the instrument approach procedure.

The ARC provides the guidelines for pavement surfaces, safety area dimensions, runway lengths, separation standards, and taxiway criteria in an attempt to ensure that the airfield layout and geometry provide a safe and efficient operating environment for the aircraft that typically use the airport. The ARC consists of a letter and a numeric identifier. The first is the letter, which represents the AAC; the second is the number which represents the ADG. The ARC classification omits the runway visibility identifier used in the RDC. **Table 3-26** summarizes the classifications for determining these components of the RDC and ARC.

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

Table 3-26. FAA Aircraft Categories and Design Standards

Aircraft Approach Category	Approach Speed	Airplane Design Group	Wing Span (feet)	Tail Height (feet)	Runway Visual Range (feet)
A	Less than 91	I	Less than 49	Less than 20	5000
B	91 to 120	II	49 to 78	21 to 29	4000
C	121 to 140	III	79 to 117	30 to 44	2400
D	141 to 165	IV	118 to 170	45 to 59	1600
E	166 or Greater	V	171 to 213	60 to 65	1200
		VI	214 up to but less than 262	66 up to but less than 80	

Source: FAA *Advisory Circular 150/5300-13A, Change 1, Airport Design*. Prepared: November 2014

Through discussions with Airport representatives, pilots operating at the Airport, and review of data from AirportIQ, the current critical aircraft at VBT is comprised of both the Cessna Citation Sovereign and Citation Excel, both B-II aircraft. The Citation Sovereign and Excel aircraft have approach speeds of approximately 104 knots and 117 knots, respectively; wingspans of 74 feet, 4 inches and 56 feet 4 inches, respectively; and tail heights of 20 feet, 4 inches and 17 feet, 2 inches, respectively.

These two aircraft are the primary aircraft used by NetJets in serving the fractional ownership needs of its Bentonville client and others that are destined for Bentonville. As discussed in Section 2.5.8, Aircraft Operations Forecast – Operational Fleet Mix, over 900 jet operations were estimated for 2014, including NetJets operations. In a letter from NetJets to the Airport (see Appendix A for a copy), NetJets indicated that while the fractional owner in Bentonville selected aircraft in the B-II family for their primary transportation, that "it is possible that an Owner when faced with a scheduling challenge could be upgraded from their contract aircraft to an aircraft of a larger cabin size in order to accomplish a timely departure." According to NetJets and other local pilots and businesses such as Summit Aviation, jet aircraft with a classification of B-II are anticipated to be the largest utilized on a regular basis, although larger corporate cabin class aircraft may also continue to use the Airport on an occasional basis.

Based on the criteria described in FAA AC 150/5300-13A, VBT currently has an ARC of B/II/5000. The performance characteristics of the critical aircraft family including the two Cessna jet aircraft, and the operational requirements of fleet operators/corporate flight departments including NetJets typically require runway lengths of 5,000 feet or more to effectively serve public travel demand. Specific runway length requirements and the ability of VBT to accommodate these operational requirements are discussed in Chapter 4 of this Master Plan Update.

As previously described, the proposed turf runway is being designed to serve small aircraft, defined as those with maximum certified takeoff weights of 12,500 pounds or less. Examples of these aircraft include the Carbon Cub, Citabria, Ercoupe, XA42, Stearman, and numerous Cessna aircraft (152, 172, 182, and 206). Based on an examination of the type of aircraft that are

anticipated to use the turf runway, its recommended length should accommodate small aircraft with approach speeds greater than 50 knots. The RDC for the turf runway will be A/I/5000. While an exact number of operations by these aircraft has not been estimated since the activity is growing and is expected to grow further with the establishment of the turf runway, it is anticipated that these aircraft operations are within the single-engine activity identified previously in Table 3-23. These operations will include both local and itinerant activity, although the majority are anticipated to be local aircraft that are based at the Airport and the based aircraft forecasts include these aircraft.

3.8 Forecast Summary

It is anticipated that VBT will see steady growth in based aircraft and annual aircraft operations throughout the 20-year projection period. This growth is propelled by a strong local economy and population base, as well as the unique nature of the Airport itself. While the general aviation industry has struggled in recent years faced with increasing fuel prices and a volatile national economy, Benton County is home to large local employment centers and aircraft enthusiasts that have seen increases. As previously discussed, fuel sales at the Airport have experienced steady growth from nearly 68,000 gallons in 2009 to almost 106,000 gallons in 2013, a CAGR of 11.9 percent. Of the fuel sales, the percent of jet fuel sold has also continued to increase from 35 percent of total fuel sales in 2009 to 43 percent in 2013. While data for 2014 is incomplete due to the five-month temporary runway closure during the RSA project, 2015 is showing growth, with an annualized estimate of nearly 123,000 gallons of fuel and 46 percent representing jet fuel sales. Summaries of projections of aviation demand are presented in **Table 3-27**.

Table 3-27. Summary of VBT Forecasts

Category	2014	2015 (est)	Projected		
			2020	2025	2035
General Aviation Operations	**27,000**	**28,600**	**32,600**	**36,400**	**43,400**
Itinerant	9,470	10,000	11,400	12,800	15,200
Local	17,500	18,600	21,200	23,700	28,200
Total Based Aircraft	**63**	**67**	**78**	**89**	**111**
Single-Engine Piston	56	59	67	75	93
Multi-Engine Piston	5	6	7	8	10
Jet	0	0	2	3	5
Helicopter	2	2	2	3	3

Operations have been rounded for presentation.
Sources: FAA TAF, Accessed 11/04/2014 and AirportIQ Data Oct. 2013-Sep.2014, Kimley-Horn Prepared: November 2014

3.9 FAA Forecast Review and Approval

FAA Airport District Offices (ADOs) or Regional Airports Divisions are responsible for forecast approvals. When reviewing a sponsor's forecast, FAA must ensure that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. Additional discussion on assumptions, data and methodologies can be found in the

APO report "Forecasting Aviation Activity by Airport." After a thorough review of the forecast, FAA then determines if the forecast is consistent with the TAF.

For all classes of airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet the following criterion: Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period.

If the forecast is not consistent with the TAF, differences must be resolved if the forecast is to be used in FAA decision-making. This may involve revisions to the airport sponsor's submitted forecasts, adjustments to the TAF, or both. A comparison of forecasts of aviation compared with TAF forecasts are presented in **Table 3-28**.

As discussed in this chapter, the differences with VBT's forecasts from the FAA's TAF are a result of the straight-line methodology used by FAA in forecasting activity at the Airport. This chapter has documented the methodologies and provided solid reasoning for the VBT forecasts that indicate that the TAF is not representative of anticipated activity at the Airport. The activity forecasts presented in **Table 3-28** were submitted to the FAA Airports Division Southwest Region and subsequently approved on July 28, 2015 (refer to **Exhibit 3-2**).

Table 3-28. Bentonville Municipal Airport FAA TAF Comparison

Based Aircraft	Year	VBT Forecast	TAF Forecast	VBT/TAF % Difference
Base yr.	2014	63	31	103.2%
Base yr. + 1	2015 (est.)	67	31	116.1%
Projected				
Base yr. + 5	2020	78	31	152.0%
Base yr. + 10	2025	89	31	187.7%
Base yr. + 20	2035	111	31	258.3%

Itinerant Operations	Year	VBT Forecast	TAF Forecast	VBT/TAF % Difference
Base yr.	2014	9,470	8,100	16.9%
Base yr. + 1	2015 (est.)	10,000	8,100	23.5%
Projected				
Base yr. + 5	2020	11,400	8,100	40.7%
Base yr. + 10	2025	12,800	8,100	58.0%
Base yr. + 20	2035	15,200	8,100	87.7%

Local Operations	Year	VBT Forecast	TAF Forecast	VBT/TAF % Difference
Base yr.	2014	17,500	15,000	16.7%
Base yr. + 1	2015 (est.)	18,600	15,000	24.0%
Projected				
Base yr. + 5	2020	21,200	15,000	41.3%
Base yr. + 10	2025	23,700	15,000	58.0%
Base yr. + 20	2035	28,200	15,000	88.0%

Total Operations	Year	VBT Forecast	TAF Forecast	VBT/TAF % Difference
Base yr.	2014	26,970	23,100	16.8%
Base yr. + 1	2015 (est.)	28,600	23,100	23.8%
Projected				
Base yr. + 5	2020	32,600	23,100	41.1%
Base yr. + 10	2025	36,500	23,100	58.0%
Base yr. + 20	2035	43,400	23,100	87.9%

Sources: FAA TAF, Issued February 2014, Kimley-Horn Prepared: November 2014

Exhibit 3-2. VBT Based Aircraft Forecast Summary

U.S. Department of Transportation
Federal Aviation Administration

Airports Division
Southwest Region
Arkansas, Louisiana, New Mexico, Oklahoma, Texas

10101 Hillwood Pkwy.
Fort Worth, Texas 76177

July 28, 2015

Mr. Ben Peters
City Engineer
City of Bentonville
117 W. Central Ave
Bentonville, AR 72712

Dear Mr. Peters:

Bentonville Municipal Airport Master Plan Update
Airport Improvement Program (AIP) Project Number 3-05-0006-010-2014

I have reviewed the Aviation Forecast recently submitted by your office as part of the Airport Master Plan Update and prepared by Morrison Shipley and Kimley-Horn. I find adequate justification exists for the figures cited in the forecast tables and the supporting narrative and hereby approve the Forecast Summary.

As always, please feel free to contact me with any questions.

Sincerely,

Patricia M. Brace
Community Planner
Arkansas/Oklahoma ADO

4 FACILITY REQUIREMENTS

This chapter provides a technical analysis of demand/capacity and facility requirements for the Bentonville Municipal Airport (VBT). The purpose of this analysis is to compare the Airport's existing facilities to the projected aviation-related activity levels and identify any enhancements that may be needed to meet user demand and/or FAA design standards. The following elements of the Airport are addressed:

- Planning Activity Levels
- Recent and Planned Development at VBT
- Operational Capacity
- Approach Capability
- Airport and Runway Classifications
- Runway Dimensional Standards
- Runway Orientation
- Physical Features of Runway 18-36
- Taxiway System
- General Aviation Facilities
- Support Facilities

4.1 Planning Activity Levels

For the purpose of the analysis in the remainder of this report, references to specific years will be minimized. Instead, Planning Activity Levels (PALs) will be emphasized to relate facility needs to the specific level of activity creating a specific facility requirement. The purpose of PALs is to help guide decision makers in determining the level of operational activity that triggers a capacity constraint that would be sufficient to support the need for some form of expansion or upgrade to airport facilities. It is recognized that actual demand could vary from the forecasts and that it is not a specific year or timeframe that triggers a facility requirement but the level of operational or other activity. Use of demand triggers is a standard practice in long range master planning and has been employed by airports throughout the U.S. By referencing decisions to activity levels and not specific dates, decisions related to airport facility improvements are driven by the actual level of demand and operators can be flexible and responsible as they evaluate development needs.

Typically, PALs are associated with short-term (5-year), mid-term (10-year), and long-term (20-year) planning horizons established within the aviation activity forecasts. **Table 4-1** presents the PALs established for VBT based on the forecasts previously presented.

Table 4-1. Planning Activity Levels (PALs)

Planning Activity Level	Estimated Planning Horizon	Total Annual Operations	Total Based Aircraft
PAL 1	2020	32,600	78
PAL 2	2025	36,500	89
PAL 3	2035	43,400	111

Source: Kimley-Horn and Associates Prepared: December 2014

4.2 Recent and Planned Development at VBT

As discussed in Chapter 1, Bentonville City officials have expressed interested in seeing VBT developed in a manner that supports all general aviation activities and the Mayor has advocated that the Airport Advisory Board seek to match or assimilate with the growth in the community, to be part of the community, and create an environment that generates interest in aviation. In addition to meeting the needs of personal, business and corporate aircraft operators, the ultimate intent of the City and VBT is to generate public engagement and interest in aviation and to develop facilities that would accommodate and attract vintage and unique aircraft.

4.2.1 West Side Aviation Facilities

Historically, aviation related development has occurred on the east-side of the airfield with facilities and services that accommodate both based and transient general aviation aircraft. As of mid-2015, the east-side is mostly built-out. At most, there are less than 2 acres on the northeast corner of the property that could potentially be developed. This site however is directly adjacent to multi-unit residential housing and is constrained by steep grades and Lake Bentonville. In 2007, with financial assistance from the FAA, a partial parallel taxiway was constructed on the northwest side of the airfield to support needed hangar and apron development. Construction of a new seven-unit T-hangar on the west-side was completed in mid-2015 and is anticipated to be 100-percent occupied by the end of 2015.

In addition to this recent T-hangar project, private investors are working with the Airport Board and have prepared preliminary plans for the development of additional general aviation facilities on the west side of the airfield. Development concepts include hangar and apron facilities for both based and transient aircraft, FBO and general aviation terminal buildings, public parking, and other aviation related amenities. Many of the facilities would be funded through private investment although FAA, state, and City funding may be sought for eligible components.

4.2.2 Planned Turf Runway

With VBT accommodating a large amount of activity from operators of recreational, vintage, experimental, and "taildragger" aircraft, the City is pursuing the development a turf runway. As identified by the Airport users, including those based at VBT, the turf runway is intended to accommodate A-I "small" aircraft such as the Carbon Cub, Citabria, Ercoupe, XA42, Waco, Stearman, Cessna 152, and Cessna 172.

With consideration of existing on- and off-airport infrastructure, the relatively narrow width of Airport property, and the goal of maximizing both airfield use and aviation-related development, there is somewhat limited space remaining for the placement of a turf runway. In June 2014 the City submitted a Form 7480 *Notice of Landing Area Proposal* to the FAA requesting approval

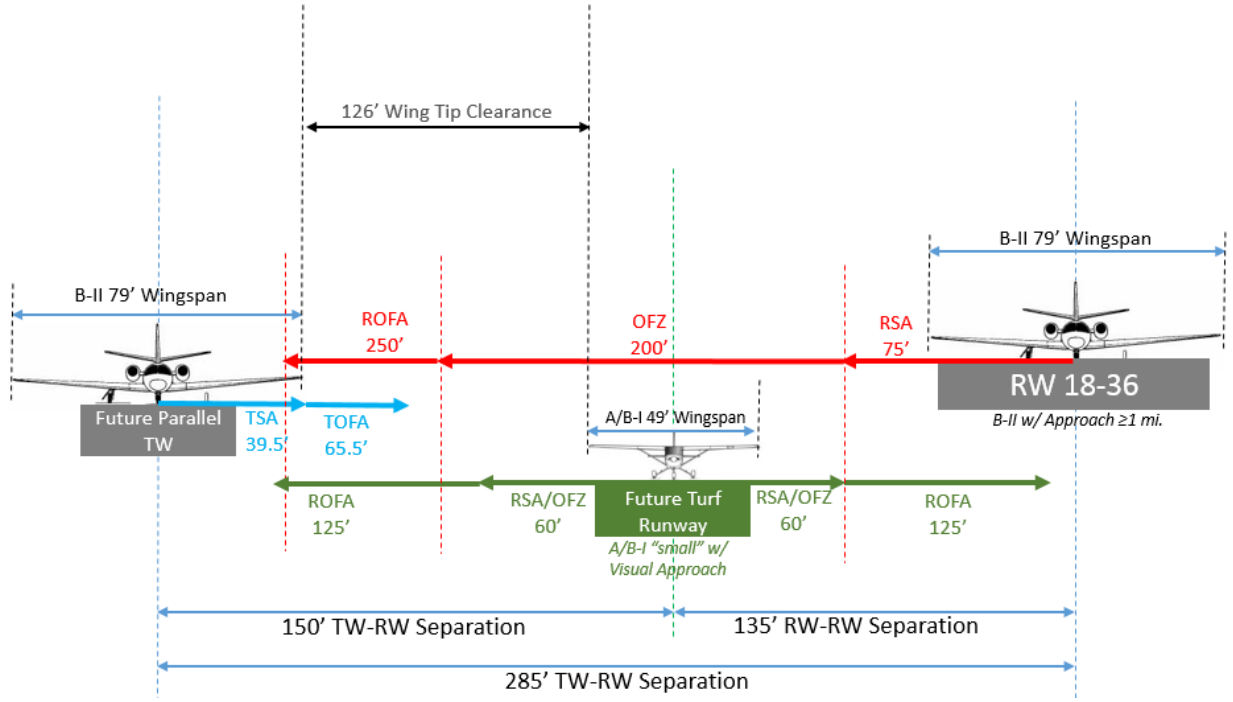
for the planned turf runway to be located west of Runway 18-36. A major consideration for the development and operation of the turf runway is that due to its proximity to Runway 18-36, simultaneous runway operations would not be allowed. In December 2014, the FAA issued a Final Determination on the 7480 feasibility study where they did not object to the proposed turf runway but stipulated that it must:

- be designed to meet the appropriate geometry standards contained in AC 150/5300-13A *Airport Design*, and that
- both the planned turf runway and any future western parallel taxiway are able to be utilized simultaneously.

In May 2015, ongoing coordination with the FAA Southwest Region included the submittal of preliminary design plans and two Modifications of Standard (MOS) that addressed runway to taxiway separation and grading standards. These modifications are needed to safely locate the runway within the site constraints and maintain positive surface drainage. Based on the FAA classification and design standards described in more detail throughout this chapter, the ongoing planning, design and FAA coordination has placed the turf runway 140 feet to the west of the Runway 18-36 centerline. This takes into account the fact that Runway 18-36's centerline will move west by five feet once the paved runway is widened 10 feet to the west. This separation distance is based on not overlapping the two Runway Safety Areas (RSAs). This location also provides for the development of a western parallel taxiway that will serve aviation-related development between the turf runway and Southwest I Street. Any western parallel taxiway would be capable of accommodating B-II aircraft and would be spaced a minimum of 145 feet from the turf runway centerline, however, through coordination with the FAA it is planned for a separation of 150 feet. This separation distance is predicated on not overlapping the turf runway RSA and parallel taxiway Object Free Area (TOFA). This results in a separation distance of 285 feet between Runway 18-36 and future western taxiway which is beyond the 240-foot standard for B-II aircraft. While the separation distance between the paved Runway 18-36 and the future western taxiway will be 285 feet, the actual placement from the current Runway 18-36 centerline will be 290 feet (again, accounting for the runway widening which will all occur to the west of the existing runway). This configuration is depicted in **Exhibit 4-1**.

Based on input from operators of aircraft that would use the turf runway, the previously submitted Form 7480 accounted for a minimum turf runway length of 2,300 feet. The subsequent preliminary design plans accounted for a 2,448 foot length which was established by aligning the southern RPZ limits with an adjacent property line in order to minimize the amount of land acquisition that would be needed. Consistent with the preliminary planning, this Master Plan Update accounts for a maximum turf runway length of 2,448 feet and a width of 75 feet. In accordance with FAA AC 150/5300-13A, the turf runway will be compacted to the RSA standards as described in FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*. The thresholds will be marked as appropriate with the landing areas identified using the latest approved FAA standards.

Exhibit 4-1. Planned Runway-Taxiway Separations



Source: Kimley-Horn and Associates

Prepared: July 2015

4.3 Operational Capacity

The ability of an airport to serve its role in the regional and national airspace systems, and to meet the current and future needs of the traveling public, is dependent on unconstrained access to its facilities. The operational capacity of the surrounding airspace and of the airfield were evaluated using guidance contained in FAA AC 150/5060-5, Airport Capacity and Delay. Calculating airfield capacity, relative to forecast activity levels, also provides an indication of when airfield improvements or additional infrastructure may be needed so as not to increase aircraft congestion or delay.

4.3.1 Airspace Capacity

The United States airspace system's classification scheme is to provide maximum pilot flexibility with acceptable levels of risk appropriate to the type of operation and traffic density within that class of airspace - in particular to provide separation and active control in areas of dense or high-speed flight operations. Airspace in the United States is divided into six classes; A, B, C, D, E, and G, as depicted in Chapter 2.

VBT is surrounded by Class E airspace, which is defined as controlled airspace that extends from 1,200 feet above ground level up to but not including 18,000 feet mean sea level, the lower limit of Class A airspace. There are areas where Class E airspace begins at either the surface or 700 feet above ground level; these areas are used to transition between the terminal and en-route environments around non-towered airports. Most airspace in the United States is Class E. No air traffic control clearance or radio communication is required for visual flight rule (VFR) flight in

Class E airspace. It should be noted that between 11:30 pm and 5:00 am the airspace surrounding VBT reverts to Class G airspace, which is uncontrolled.

Physical constraints on capacity include tall structures located in the vicinity of airports that have the potential to impact arrival and departure procedures by limiting arrival routes and requiring higher traffic pattern altitudes. According to the published aeronautical chart for VBT, the nearest delineated structure is a power transmission and telecommunications line approximately five miles west of the Airport. The nearest tall building that is noted on the chart is a grain elevator located approximately 12.5 miles west of the Airport. There are no tall structures located near the vicinity of VBT that affect the procedures. Based on the above airspace capacity factors, and the City and State land use and zoning policies described in Section 1.7, there should be minimal negative impacts to the capacity of the airspace surrounding the Airport throughout the planning period.

4.3.2 Airfield Capacity

Airfield capacity is the estimated number of total operations that an airfield configuration can facilitate in an established period of time and under a given set of assumptions regarding fleet mix, separation minima rules, weather conditions and technological aides. The calculations of airfield capacity and delay are the basis for evaluating the adequacy of the runway and taxiway system to meet existing and future airport activity levels. The following analysis was conducted using The Prototype Airfield Capacity Spreadsheet Model (Airfield Capacity Spreadsheet Model) that was developed and included in the Airport Cooperative Research Program's Report 79, "Evaluating Airfield Capacity." This is the most current available source since FAA's guidance has not been updated since 1989 and is consistent with the process outlined in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, which identifies specific inputs/factors that must be considered in the development of capacity calculations.

The capacity of the runway system is presented in terms of both hourly capacity and Annual Service Volume (ASV). Hourly capacity is a measure of the maximum number of aircraft operations that can be accommodated at the airport in an hour. Hourly capacity determines if an airport can accommodate the projected peak hour operations.

As defined by the FAA in its AC, ASV is a reasonable estimate of an airport's annual capacity, accounting for differences in runway use, aircraft mix, weather conditions, and other factors that would be encountered over a year's time. Hourly capacity is the number of aircraft operations (departures and arrivals) that can be accommodated in a one-hour time period, given a specific runway use strategy. The following assumptions have been made in the development of ASV and hourly capacity capabilities at VBT:

- A single runway operation is currently available with only a partial taxiway on the west side, two exits on the east side near the center of the runway, and a turnaround provided at Runway end 36.
- The proposed turf runway is proposed to be located west of the existing Runway 18-36, but will only be used when Runway 18-36 is not in operation. No simultaneous operations will occur on Runway 18-36 (paved) or the turf runway.

- The Airport has a non-precision approach but no precision approach and no air traffic control tower (ATCT), reducing the ability of the runway to be used during all weather conditions.
- Based on an analysis of meteorological observations reported at the Airport's Automated Airport Weather Station (AWOS), Visual Meteorological Conditions (VMC) conditions exist 93 percent of the time at VBT and Instrument Meteorological (IMC) conditions exist 7 percent of the time.
- Aircraft fleet mix by PAL 3 is assumed to consist of 80% Class A aircraft (defined as small single-engine aircraft with gross weights of 12,500 pounds or less), 12% Class B aircraft (defined as small multi-engine aircraft with gross weights of 12,500 pounds or less), and 8% small Class C aircraft (defined as large aircraft with gross weights over 12,500 pounds up to 30,000 pounds. The PAL 3 fleet mix is used as it incorporates an anticipated increase in corporate jet operations. This limits ASV slightly, but provides a better perspective of the operational capacity of the Airport in the future.
- It is assumed 40 percent of aircraft operations at VBT are touch-and-go or training operations. This figure was derived from Airport Management feedback provided in an Airport Inventory Survey and was compared to the percentage of local operations to confirm.
- An assumption was made that 50 percent of operations are Arrivals and 50% are Departures.

Based on the assumptions listed above, Bentonville Municipal Airport's capacity is estimated at 61 hourly operations during VMC, and 48 hourly operations during IMC.

ASV is calculated by multiplying weighted peak hour capacity (C_W) by daily ratio (D) by hourly ratio (H). Although peak aviation activity forecasts were developed for Chapter 3, Forecasts of Aviation Demand, they were based on sample data that accounted for approximately five percent of total aircraft operations. While weighted peak hour capacity is calculated by The Prototype Airfield Capacity Spreadsheet Model, values for daily ratio and hourly ratio must be inputted by the user. Weighted peak hour capacity (C_W) is calculated for VMC and IMC using the following formula:

$$C_W = (C*P*W) / (P*W)$$

C = Hourly Capacity, P = % of Occurrence, W = Weighting Factor (1 for VMC, 2 for IMC)

VMC C*P*W = 61*92.9%*1 = 56.7

IMC C*P*W = 48*7.1%*2 = 6.8

VMC (56.7) + IMC (6.8) = 63.5

VMC P*W = 92.9%, IMC P*W = 14.2%

VMC P*W (92.9%) + IMC P*W (14.2%) = 107.1%

C_W = 63.5/107.1% = 59.3

Peak forecasts developed for this MPU are reasonable for facility planning purposes, however, due to the small sample size of aircraft operations, the values for daily ratio (D) and hourly ratio (H) may not reflect actual activity at the Airport. Because of this, daily ratio and hourly ratio values have been selected based on an analysis of airports with similar characteristics as VBT (airport operations, runway length, and exit taxiways). As such, the calculation for ASV at the Airport is:

$$ASV = \{C_W * H * D\}$$

$$ASV = \{59.3 * 7 * 280\}$$

$$ASV = 116{,}200$$

Table 4-2 presents a comparison of the ASV to the projected annual operations at VBT.

Table 4-2. Airfield Demand/Capacity Summary

Year	Annual Operations[1]	Annual Service Volume[2]	Ratio of Annual Operations to ASV[3]
Historical			
2014	26,970	116,200	23%
Projected			
PAL 1	32,600	116,200	28%
PAL 2	36,500	116,200	31%
PAL 3	43,400	116,200	37%

[1]From Chapter 3, Forecasts
[2]Calculated by multiplying weighted peak hour capacity (C_W) times the daily ratio (D) times the hourly ratio (H).
[3]Ratio is calculated by dividing Projected Annual Operations by Annual Service Volume.
Source: Kimley-Horn and Associates Prepared: December 2014

FAA airport planning guidelines recommend planning for airfield capacity improvements when projected demand reaches 60 percent of capacity. As shown in Table 4-2, the ratio of annual operations to ASV is expected to approach 37 percent of capacity by PAL 3. The existing and proposed airfield configuration is anticipated to accommodate projected levels of aviation demand.

It should be noted that while the turf runway and Runway 18-36 will not be operated simultaneously, there can be a capacity effect from the operations on the turf runway. This effect cannot be calculated as the two runways are considered to be a single runway for purposes of capacity analysis since they cannot be operated simultaneously. However, the ability of aircraft to exit from the turf runway will impact the ability of aircraft to land or takeoff from the paved runway. Given that these aircraft are slower and there is the potential for aircraft to need to cross the paved runway to access facilities on the east side, there may be an impact on the airfield's overall capacity. As it pertains to ASV, any impact from the addition of a turf runway would be negligible. The only perceived impact that the turf runway may pose as it pertains to capacity would be in an extremely unique situation when the Airport experiences a high volume of aircraft operations in a short period of time.

4.4 Approach Capability

The ability of an approaching aircraft to land at an airport is predicated on the weather conditions, the level of pilot training, the type of navigation equipment both in the aircraft and on the ground, and the approach procedures established by the FAA. Under Visual Meteorological Conditions (VMC), which are defined as a cloud ceiling greater than 1,000 feet above ground level (AGL) and visibility conditions equal to or greater than 3 statute miles, pilots may approach an airport using only visual. These are basic flight maneuvers that can be performed by all pilots at all public-use airports. Instrument Meteorological Conditions (IMC) occur when cloud ceilings are lower than 1,000 feet above ground level (AGL) and visibility becomes less than 3 statute miles. Under these conditions, properly trained pilots with adequately equipped aircraft can follow FAA published Instrument Approach Procedures (IAPs) to land at an airport. The following evaluates the instrument approach capability and supporting infrastructure at the Bentonville Municipal Airport.

4.4.1 Instrument Approach Procedures

The FAA classifies standard instrument approach procedures, and the runways supporting those procedures, based on the type of electronic navigation guidance and the lowest approach minimums (visibility and decision height/HATh) provided by that procedure. The classifications include N*on-Precision*, P*recision*, and A*pproach Procedures with Vertical Guidance*. Non-Precision approaches provide only lateral guidance from either ground based or satellite based Global Positioning System (GPS) navigational aids (NAVAIDS). Precision instrument approaches provide both lateral and vertical guidance and are traditionally supported by multiple ground based NAVAIDS collectively called an Instrument Landing System (ILS). An ILS includes a Localizer (providing lateral guidance), a Glideslope (providing vertical guidance) and an approach lighting system (providing close-in visual guidance). Approach Procedures with Vertical Guidance are a relatively recent outcome of the FAA's Next Generation Air Transportation System (NextGen) program. These approach procedures use GPS technology to provide ILS-like approach capability without the need for traditional ground-based ILS NAVAID equipment. The various FAA classifications and approach procedure types are identified in **Table 4-3**.

Table 4-3. Instrument Approach Classifications

Approach Class	Guidance Provided	Navigation Methods	Lowest Minimums Supported
Non-Precision (NPI)	Lateral	• VHF Omnidirectional Range (VOR) • Non-Directional Beacon (NDB) • Area Navigation (RNAV) • Lateral Navigation (LNAV) • Localizer Performance (LP) • Localizer (LOC)	≥3/4 mile
Approach Procedure with Vertical Guidance (APV)	Lateral & Horizontal	• Instrument Landing System (ILS) • Lateral Navigation/Vertical Navigation (LNAV/VNAV) • Localizer Performance w/ Vertical Guidance (LPV) • Area Navigation /Required Navigation Performance (RNAV/RNP).	≥3/4 mile and ≥250 HATh
Precision (PA)	Lateral & Horizontal	• ILS • LPV • Global Navigation Satellite System (GNSS) Landing System (GLS).	<3/4 mile and <250 HATh

Source: FAA AC/150/5300-13A Airport Design Prepared: March 2015

As of mid-2015, Bentonville Municipal Airport has four Non-Precision IAPs; two that provide straight-in instrument approach procedures to the specific runway ends, and two that provide instrument guidance to the Airport with visual circling to land on either runway end. These are listed in **Table 4-4** which also identifies the lowest approach minimums provided by that procedure.

Table 4-4. Approach Procedures at VBT

Runway End	Approach Type	Approach Method	Lowest Minimums – Ceiling (HATh) / Visibility
18	APV	LPV (GPS)	250’ / 1 mile
36	APV	LPV (GPS)	250’ / 1 mile
18 or 36	Circle to Land	VOR/DME-B	562’ / 1 mile
18 or 36	Circle to Land	VOR-A	482’ / 1 mile

HATh = height above threshold/decision height, feet above ground level (AGL)
Source: FAA Instrument Approach Charts, VBT 074 January 2016 – 04 February 2016 Prepared: January 2016

The predominate nature of aircraft operations at VBT includes personal, business and corporate flight activities. Based on this, and the 250-foot decision height provided by the LPV approaches, the existing approach capability is anticipated to accommodate user needs over the planning horizon.

It should be noted that in April 2015, the FAA issued a Notice of Proposed Rulemaking in the Federal Register (Docket No.: FAA–2015–0783; Notice No. 15–02[1]) that proposed the cancelation of several instrument approach procedures throughout the nation that are considered by the FAA to be redundant or underutilized. The VOR DME-B approach to VBT is one of those proposed to be cancelled. The VOR-A approach is not affected. Both of these approaches are based on the Razorback VOR installation located approximately 7.5 miles to the southeast of VBT. The FAA was taking public comment on this proposal through May 28, 2015.

As will be discussed in other sections of this chapter, improving the visibility minimums to less than 1 mile, or providing Precision Approach capability, would significantly increase several of the FAA design, safety and setback standards. These standards would require substantial reconfiguration and/or relocation of infrastructure both on and off the airport property and would affect both the tenants and the surrounding community. For that reason, the long-term planning recommendations of this Master Plan Update will maintain the existing instrument approach minimums at VBT. Ongoing enhancements to navigation technology or future changes in FAA design standards may facilitate improved minimums without the adverse land use effects that would be associated with the current standards.

4.4.2 Navigational Aids and Lighting

Navigational aids (NAVAIDS) are any visual or electronic devices airborne or on the surface which provide point-to-point guidance information or position data to aircraft in flight. As described in Chapter 2, Runway 18-36 is equipped in Medium Intensity Runway Lighting (MIRL) and has Non-Precision Instrument Runway markings that are in good condition. These are consistent with the FAA standards for the existing LPV approaches with 1-mile visibility minimums and 250-foot HATh. Both runway ends are equipped with Runway End Identifier Lights (REILS). The runway has no other visual guidance NAVAIDS such as Visual Approach Slope Indicators (VASIs) or Precision Approach Path Indicators (PAPIs). The installation of PAPIs has been pursued in the past, but has been deferred until the displaced threshold to Runway 36 is returned to the end of pavement. It is recommended that PAPIs be installed to both ends of Runway 18-36 when the controlling obstacles are removed.

The airport is also equipped with a rotating beacon to help visually identify the Airport location, an Automated Weather Observation System (AWOS) that records and broadcasts airport specific weather information, and NOTAM-D service which broadcasts information on potential hazards to pilots in the area. There are also three nearby Very High Frequency Omni-Directional Range (VOR) navigation systems that provide directional and location guidance within the region (Razorback VORTAC, Drake VOR/DME, and NEOSHO VOR/DME).

With routine maintenance, the existing airfield lighting and NAVAIDS at the Bentonville Municipal Airport are expected to meet the user needs over the planning horizon.

4.5 Airspace Protection

The safe and efficient operation of aircraft requires that certain areas on and near an airport remain clear of objects that could present a hazard to air navigation. Airports that are listed in the National Plan of Integrated Airport System (NPIAS) and receive federal funding support

[1] http://www.gpo.gov/fdsys/pkg/FR-2015-04-13/pdf/2015-08098.pdf

through the Airport Improvement Program (AIP) are considered "federally obligated" and as such, are subject to FAA Grant Assurances 20 and 21 which require airport sponsors to take appropriate actions to protect the surrounding airspace from incompatible land uses and to prevent/mitigate hazardous obstacles to navigation.

The FAA has established two primary sets of airspace protection standards. These include Federal Aviation Regulation (FAR) Part 77 Safe, Efficient Use, and Preservation of The Navigable Airspace, and Order 8260.3 United States Standard for Terminal Instrument Procedures (TERPS). While similar in nature and purpose, these standards have specific applications relative to approach procedures and minimums, usable runway length, AIP funding, and compatible land use planning.

An analysis was conducted to identify any airspace obstructions or areas of concern relative to these standards. The analysis utilized FAA obstacle data dated May 2010, however it is acknowledged that since that time, several of the obstacles have already been addressed or removed. Where appropriate, the analysis was augmented with more current field observations and GoogleEarth aerial imagery. The following describes the various airspace standards and any areas of concern relative to the Bentonville Municipal Airport. More specific details of this analysis are documented on Sheets 3 through 8 of the Airport Layout Plan (ALP) Drawing Set.

4.5.1 Part 77 Requirements

As directed by FAR Part 77, *imaginary surfaces* around the airfield are established for determining obstructions to air navigation. These standards are most applicable to promoting compatible land use on and near the airport and are used predominately by the Airports Division of the FAA. 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 operational procedures.

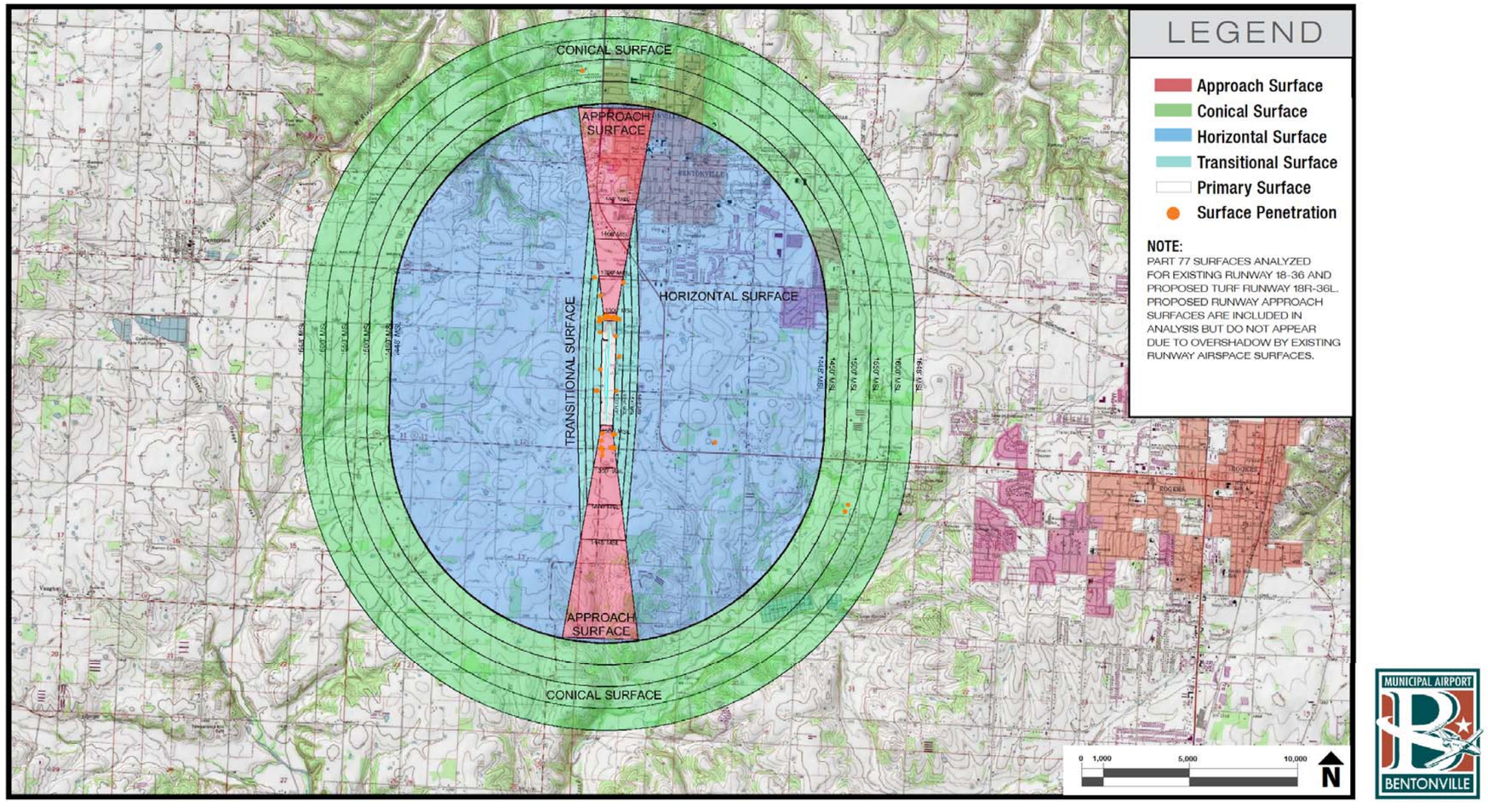
Based on the instrument approach capabilities described in Section 3.5 and the requirements of FAR Part 77, the following describes the imaginary surfaces as they apply to the existing Runway 18-36 and the planned turf runway at VBT. All references to a surface's *slope* is expressed in horizontal feet by vertical feet. For example, a 20:1 slope rises one foot vertically for every 20 feet horizontally. The various surfaces are also illustrated in **Exhibit 4-2**. Future changes in runway length or centerline alignment will shift these surfaces commensurately.

Primary Surface

This surface is longitudinally centered on the runway. The elevation of any point on the surface is the same as the elevation of the nearest point on the runway centerline. For Runway 18-36 this surface is 500 feet wide and extends 200 feet beyond the ends of pavement usable for takeoff and landing. For the turf runway, this surface is 250 feet wide and ends at the end of the runway. The Primary Surface for the turf runway will extend 10 feet further west than the Primary surface of Runway 18-36.

Exhibit 4-2. Part 77 Surfaces at VBT

AIRSPACE ANALYSIS
PART 77 SURFACES



There are no known obstacles to the Primary Surfaces, however they do extend beyond airport property to the southwest, onto adjacent parcels located along SW I Street. Fee-simple acquisition of at least portions of these parcels is recommended to maintain positive City control of the Primary Surface areas.

Approach Surface

This surface is longitudinally centered on the extended runway centerline and extends outward and upward from the end of the Primary Surface. An Approach Surface is applied to each end of each runway, 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 Runways 18 and 36 this surface begins 200 feet beyond the end of the runway, is 10,000 feet long, and rises at a slope of 34 to 1 to an outer width of 3,500 feet. For both ends of the turf runway, this surface begins at the runway end, is 5,000 feet long, and rises at a slope of 20:1 to an outer width of 1,250 feet.

Due to the alignment of the two runways these surfaces overlap, however, due to their classifications, the surfaces for Runway 18-36 are more stringent (i.e. lower elevation). The analysis indicates that portions of the private access road, along the north side of Lake Bentonville, may be considered an obstacle. To account for vehicles that would traverse this road, 10 feet of buffer space is added to the physical elevation of the road to represent the height of the structure. If it were a public use road, the height buffer would increase to 15 feet. It also appears that several trees on the north side of the Lake that were identified as obstructions to the Approach Surface in 2010 have since been removed. There may, however, be one or two trees remaining that would require field verification to determine if they are still considered a concern.

There were 12 power transmission poles were identified as obstructions to the southern Approach Surface for Runway 18-36. Five of the poles that penetrate the 20:1 approach surface are being removed in 2015 but seven remain as penetrations to Part 77 surfaces. The five poles are the cause of the 345-foot threshold displacement of Runway 36. Once completed, the threshold will be able to return to the end of pavement. In 2010, there were also several trees, located on and off airport property, that were identified as obstructions to the southern Approach Surface. These have also since been removed.

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.

Three utility poles located east of the airfield along SW Aviation Drive and SW F Street, were identified as obstacles. A fourth utility pole, located at the intersection of SW I Street and SW 14th Street, was also identified as an obstacle. If not already marked and lighted consistent with FAA standards, the City should coordinate with the local utility provider to install FAA approved obstruction lighting.

There were also approximately 20 individual trees previously identified as obstructions to the Transitional Surface. Based on field observations and current aerial imagery, the majority of these appear to have been removed. There does, however, appear to be at least one tree remaining on the City owned parcel adjacent to the southeast boundary of the Airport, near a

pond. It is understood that the City is in the process of developing this parcel for a Utility Complex that will house the City's water, street and electric departments as well as maintenance facilities. Coordination for removal of this tree is recommended.

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. At VBT, the Horizontal Surface extends 10,000 feet from the ends of Runway 18-36, at an elevation of 1,448 feet MSL. The Horizontal Surface established by the characteristics of the turf runway is completely encompassed within the surface for the paved runway and is therefore not recognized.

A communication tower, located approximately 0.9 miles to the southeast of the airfield, has been identified as an obstacle to the Horizontal Surface. It is assumed that this structure is appropriately marked and lighted.

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.

Three communication towers were identified as obstructions to this surface. Two are located approximately 2 miles to the southeast of the airfield, east of Interstate 49 and north of W Centre Court. The third is located approximately 2.1 miles north of the airfield, near the intersection of NW 10th Street and N Walton Boulevard. It is assumed that these structures are appropriately marked and lighted.

4.5.2 Runway End Siting Requirements

As outlined in Order 8260.3 *United States Standard for Terminal Instrument Procedures* (TERPS), the FAA has also established sloping Obstacle Clearance Surfaces (OCS) that are used in the design and approval of instrument flight procedures. They are intended to provide obstacle-free paths for aircraft descending on a glide path to landing or climbing in a departure or missed approach. These surfaces are also referenced in AC 150/5300-13A (Table 3-2) and are used to establish runway threshold and departure end of runway locations. Like the Part 77 surfaces, these surfaces can vary in shape, size and slope and are described below.

Threshold Siting Approach Surface

These surfaces are designed to protect the use of the runways for both day and night operations in both visual and instrument meteorological conditions. The approach surface is generally trapezoidal in shape and extends outward and upward from the runway, along the extended centerline at a specific slope. For both ends of Runway 18-36 this surface begins 200 feet in front of the threshold, at a width of 400 feet, and extends 10,000 feet at a slope of 20 to 1, to an outer width of 3,800 feet.[2] For both ends of the turf runway, this surface begins at the thresholds

[2] FAA AC150/5300-13A *Airport Design*, Table 3-2, #4 "Approach end of runways expected to support instrument night operations, serving approach Category A and B aircraft only".

with an inner width of 250 feet, and extends 5,000 feet at a slope of 20:1 to an outer width of 700 feet.[3]

As these surfaces are less restrictive than the Part 77 Approach Surfaces, the north threshold siting surfaces are free of obstacles. As previously described, the southern threshold siting surface is currently used to establish the displaced threshold to Runway 36 which is needed to mitigate the effects of the existing utility poles. The southern threshold siting surfaces are also free of obstructions and once the utility poles are removed, the threshold will likely be able to shift back to the end of the runway pavement.

Glide Path Qualification Surface (GQS)

In addition to the Threshold Siting Approach Surface, the GQS surface is an imaginary surface extending from the runway threshold along the runway centerline extended to the Decision Altitude (DA) point. It is applied to runway ends that support instrument approaches with vertical guidance and reflects a standard 3-degree glide path angle and 50-foot threshold crossing height. At VBT, this surface applies to both ends of Runway 18-36; it does not apply to the turf runway. This surface begins at the threshold with an inner width of 260 feet (runway width + 200 feet), and extends 10,000 feet at a slope of 30 to 1 to an outer width of 1,520 feet.[4] When the runway is widened to meet the standard of 75 feet, this width will increase to 275 feet.

As this surface is narrower and represents a steeper slope than the Part 77 Approach Surface, if the Part 77 surface is free of obstructions the GQS surface will also be free of obstructions. For the southern approach, this surface will shift with the threshold of Runway 36 when the utility pole removal project is complete.

Departure Surface

These surfaces, when clear, allow pilots to follow standard departure procedures. They are required for runways that have established instrument departure procedures and recommended for all other instrument runways. The surface begins at the departure end of the runway with an inner width of 1,000 feet, and extends 10,200 feet at a slope of 40:1, to an outer width of 6,466 feet. According to FAA AC 150/5300-13A, obstacles frequently penetrate the departure surface which may require non-standard rates of climb, higher departure minimums, or reduction in runway length available for takeoff. As of mid-2015, VBT has the published "Benton Three Departure" procedure available for both runway ends of Runway 18-36.

These surfaces are wider and more stringent than the Part 77 Approach Surfaces. Due to obstacles located north of the Airport, instrument departures from Runway 36 have both higher minimums (300-foot ceiling and 2¼- mile visibility) and higher climb rate (311 feet per nautical mile as compared to the standard 200 feet per nautical mile).[5]

4.5.3 Hazardous Wildlife Attractants

Lake Bentonville is within airport property, but is operated and maintained through a partnership between the City of Bentonville and the Arkansas Fish and Game. While many airports across

[3] FAA AC150/5300-13A *Airport Design*, Table 3-2, #2 "Approach end of runways expected to serve small airplanes with approach speeds of 50 knots or more. (Visual runways only, day/night)"
[4] FAA AC 150/5300-13A Airport Design, Table 3-2, #8 "Approach end of runways expected to accommodate approaches with vertical guidance"
[5] FAA Terminal Procedures, Effective June25-July 22, 2015

the country are located adjacent to bodies of water, open ponds, streams and stormwater management facilities can pose a threat to aircraft safety. Wildlife and waterfowl that are attracted to these bodies of water as a source of food, water and shelter, can cause serious damage to aircraft and injury to persons both on the ground and in the air. Hazardous wildlife attractants within the immediate approach and departure areas of a runways are of particular concern. FAA AC 150/5200-33B *Hazardous Wildlife Attractants on or Near Airports*, strongly recommends that for runways serving turbine powered aircraft, a minimum 10,000 feet separation be maintained between wildlife attractants and the airfield. It further recommends that within the approach and departure areas, a 5-mile separation be provided. For those attractants that cannot be relocated, or must remain closer than desired to the airfield, the development of a *Wildlife Hazard Management Plan* is recommended for any public use airport and required for any public commercial service airport. These plans are prepared by a certified wildlife biologist in accordance with guidelines established by the FAA and US Department of Agriculture. They identify methods of altering and/or maintaining facilities so they are not as attractive to the local and transient wildlife.

Arkansas is part of the Mississippi Flyway where each year, millions of waterfowl fly south to, and through, Arkansas to over-winter. The Mississippi Flyway merges with the Central Flyway over the western edge of the state. Birds traveling these routes are looking for open lakes, sloughs, marshes, ponds, rivers and agricultural fields that provide and food and shelter. According to the Arkansas Game and Fish Commission, during this time "Duck hunters harvest more mallards in Arkansas each season than in any other state"[6]. Due to the proximity of Lake Bentonville to the physical end of Runway 18-36, ongoing coordination with the Arkansas Game and Fish Commission is recommended to minimize the attractiveness of the lake for wildlife that could cause serious mishap to aircraft and persons.

[6] Arkansas Game and Fish Commission, http://www.agfc.com/resources/publications/ar_waterfowl.pdf

4.6 Airport and Runway Classifications

The FAA classifies airports and runways by 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.

4.6.1 Airport Reference Code (ARC)

ARC is an airport designation that represents the AAC and ADG of the most demanding aircraft that the airfield is intended to accommodate on a regular basis. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at the airport.

As described in previous sections of this report, the Airport accommodates a variety of aircraft types including smaller personal and vintage aircraft along with modern corporate jets. Consistent with FAA guidance, the critical aircraft anticipated to use the facilities over the planning horizon are those with an AAC-ADG of B-II which includes the Citation Excel and Citation Sovereign. Based on this, the ARC for VBT is anticipated to remain B-II over the planning horizon. Please note, that for all practical purposes, both an airport and an aircraft can be referred to by their ARC.

4.6.2 Runway Design Code (RDC)

RDC is used to signify the design standards to which each specific runway is to be planned and built. This classification has three components: AAC, ADG and the highest approach visibility minimums that either end of the runway is planned to provide. Within these classifications, instrument approach visibility minimums are expressed in RVR values of 1200, 1600, 2400, 4000 and 5000 feet, as described in **Table 4-5**. An airport's ARC will be consistent with the highest RDC of any of its runways. The RDC for VBT's paved Runway 18-36 was previously identified in Chapter 3 as B-II-5000, which correlates to visibility minimums of not lower than one mile. The RDC for the turf runway is A-I(S)-VIS and intended for use by small aircraft only (i.e. ≤ 12,500 lbs. MTOW).

Table 4-5. Instrument Approach Visibility Minimums

RVR (ft)	Corresponding Visibility Category (statute mile)
VIS	Visual Conditions (including instrument circling)
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than ¾ mile
2400	Lower than ¾ mile but not lower than ½ mile (CAT-I ILS)
1600	Lower than ½ mile but not lower than ¼ mile (CAT-II ILS)
1200	Lower than ¼ mile (CAT-III ILS)

Source: FAA AC 150/5300-13A, *Airport Design* Prepared: April 2015

4.6.3 Approach and Departure Reference Codes

Approach and Departure Reference Codes (APRC and DPRC) describe the *current* operational capabilities of a runway and adjacent taxiways where no special operating procedures are

necessary. In contrast, the RDC is based on *planned* development and has no operational application.

Like the RDC, the APRC is composed of three components: AAC, ADG, and visibility minimums. The APRC indicates which aircraft can operate on taxiways adjacent to a runway under particular meteorological conditions. The APRC classification is also used to identify several critical design standards including runway lighting and marking, threshold siting criteria, obstacle free zones, and other FAA obstacle identification surfaces. The APRC for Runway 18-36 is B/II/5000 and the APRC for the turf runway is A/I(S)/VIS.

The DPRC represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary. It is similar to the APRC, but is composed of two components, AAC and ADG. The DPRC for Runway 18-36 is B/II and the DPRC for the turf runway is A/I(S).

The APRC and DPRC may change over time as improvements are made to the runway, taxiways, and NAVAIDs.

4.7 Runway Dimensional Standards

FAA AC 150/5300-13A *Airport Design,* identifies dimensional standards pertaining to runways and runway-related separations that are essential to provide clearance from potential hazards affecting routine aircraft movements on the airfield. Application of these standards is determined by the Runway Design Code (RDC) and relate to separation distances for parallel runways, hold lines, parallel taxiways, aircraft parking areas, obstacle free areas, and safety areas. The following describes the specific safety or runway protection areas as they apply to both the paved and proposed turf runway at VBT. The FAA design standards are summarized in **Table 4-6** and **e**xisting conditions for Runway 18-36 that do not meet the current and future RDC standards (i.e. B-II-5000) are highlighted in red. The various protection areas for the two runways are also depicted in **Exhibit 4-3**.

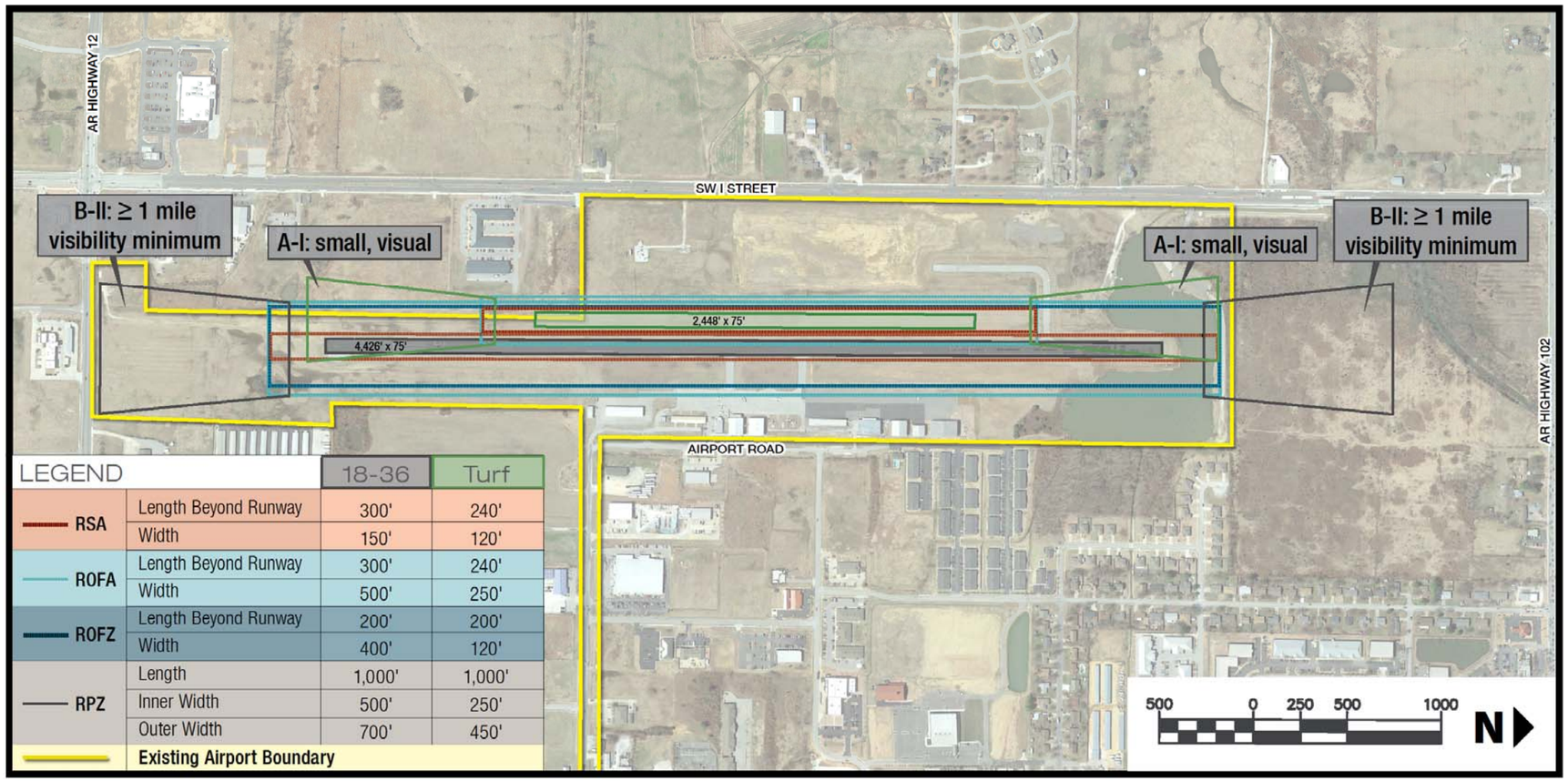
Table 4-6. Runway Dimensional Standards

Design Criteria	Runway 18-36			Turf Runway
	Existing Conditions	**B-II-5000** (Not Lower than 1 mi.)	**B-II-4000** (Not Lower than ¾ mi.)	**A-I-VIS** (small aircraft w/ approach speeds < 50 kts.)
Runway Design:				
Width	65	75		60
Shoulder Width	10	10		10
Blast Pad Width	N/A	95		N/A
Blast Pad Length	N/A	150		N/A
Runway Protection:				
RSA Length beyond departure end	300[1]	300		240
RSA Length prior to threshold	300[1]	300		240
RSA Width	150	150		120
ROFA Length beyond departure end	300	300		240
ROFA Length prior to threshold	300	300		240
ROFA Width	500[2]	500		250
ROFZ Length beyond runway end	200	200		200
ROFZ Width	400	400		120
RPZ Length	1000	1000	1700	1000
RPZ Inner Width	500	500	1000	250
RPZ Outer Width	700	700	1510	450
Runway Separation:				
Holding Position	200	200		125
Aircraft Parking	250	250		125
West Parallel Taxiway Centerline	435	240		150

Sources: FAA Advisory Circular 150/5300-13A, 2010 Approved Airport Layout Drawing Prepared: May 2015
Notes: [1] With consideration of the Runway 18 threshold displacement and application of Declared Distances
[2] Potential vegetation within ROFA near the west side of Lake Bentonville, approximately 200 feet from runway centerline

Exhibit 4-3. Existing Runway Protection Area

RUNWAY 18-36
RUNWAY PROTECTION AREAS



LEGEND		18-36	Turf
RSA	Length Beyond Runway	300'	240'
	Width	150'	120'
ROFA	Length Beyond Runway	300'	240'
	Width	500'	250'
ROFZ	Length Beyond Runway	200'	200'
	Width	400'	120'
RPZ	Length	1,000'	1,000'
	Inner Width	500'	250'
	Outer Width	700'	450'
Existing Airport Boundary			

Runway Safety Area (RSA)

Described by FAA as "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, an overshoot, or excursion from the runway."

For Runway 18-36, this surface is 150 feet wide and extends 300 feet prior to the landing threshold and 300 feet beyond the departure end of the runway. In 2014, an RSA improvement project was completed that stabilized and graded all areas of the RSA thereby bringing it into compliance with FAA standards. At that time, due to the location of Lake Bentonville, achieving the required 300-foot distance resulted in a 230-foot displacement of the Runway 18 landing threshold. This effectively reduced the southern flow landing distance to 4,196 feet. While not available for landing operations, the pavement north of the displaced threshold can still be used for southerly departures. The southern portion of the RSA provides the required 150-foot by 300-foot dimensions beyond the end of pavement.

For the future turf runway, this surface is 120 feet wide and extends 240 feet prior to the landing threshold and 240 feet beyond the departure end of the runway. Preliminary design of the turf runway, and corresponding Modifications of Standards for the planned separation distances and transverse grading, were submitted to the FAA in April 2015. These plans have taken into account the RSA requirements, the associated grading standards, and future parallel taxiway requirements.

Runway Object Free Area (ROFA)

An area centered on the runway centerline that is provided to enhance the safety of aircraft operations by clearing all above ground objects that protrude above the RSA edge elevation, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. Object that must remain on the ROFA are constructed on frangible mounts, to minimize potential damage to aircraft in the event of an errant mishap.

For Runway 18-36, this surface is 500 feet wide and extends 300 feet prior to the landing threshold and 300 feet beyond the departure end of the runway. The southwestern portion of the ROFA for Runway 18-36 extends beyond airport property, onto three adjacent parcels located along SW I Street. Based on aerial photography, there also appears to be a small stand of vegetation located approximately 200 feet to the west of the Runway 18-36 centerline, near Lake Bentonville, that may protrude within the ROFA. Further field inspection would be needed to confirm and if so, removal is recommended.

For the turf runway, this surface 250 feet wide and extends 240 feet prior to the landing threshold and 240 feet beyond the departure end of the runway. The southwestern portion of this ROFA also extends off airport property onto the adjacent parcels. It is recommended that property containing the ROFA be acquired in fee-simple.

Runway Protection Zone (RPZ)

A trapezoidal area beginning 200 feet beyond the runway end and centered on the extended runway centerline. The RPZ is a compatible land use measure meant to enhance the protection of people and property on the ground. Airports should maintain positive control of the RPZs through fee simple acquisition, easement or use restrictions/agreements. Such control includes

clearing of RPZ areas of incompatible objects and activities. Displaced thresholds and declared distances require the application of separate approach and departure RPZs.

For both ends of Runway 18-36, with approach minimums not lower 1 mile, the inner width of the RPZ is 500 feet, the outer width is 700 feet and the length is 1000 feet. This equates to approximately 14 acres of land area. For comparison, to support instrument approach minimums of less than 1 mile but not lower than ¾ mile, the required RPZ dimensions would increase to 1,000 feet, 1,510 feet and 1,700 feet which is approximately 49 acres in size. Based on the existing runway length of 4,426 feet, and the displaced Runway 36 threshold, the northern approach and departure RPZs are collocated and extend beyond airport property (refer to **Exhibit 4-3**). The RPZs encompass portions of Lake Bentonville, the public unpaved road along the lake, and the undeveloped parcel between the Airport and SW 14th Street. Once the utility poles are removed along SW Regional Airport Blvd. and the Runway 18 threshold is relocated back to the end of pavement (anticipated Summer 2015), the associated RPZ will be mostly within airport property except for approximately 2 acres that extends onto adjacent property located west of the runway (refer to Exhibit 4-3).

For the turf runway, with visual approaches, the inner width of the RPZ is 250 feet, the outer width is 450 feet and the length is 1000 feet. This equates to approximately eight acres of land area. The northern RPZ remains on airport property but extends over the public parking lot and a fishing pier serving Lake Bentonville. A portion of the southern RPZ extends off airport property to the west and onto adjacent parcels located along SW I Street.

To promote the highest level of public safety near the airfield, it is recommended that the City pursue fee simple acquisition of all off-airport RPZ areas or at the minimum – an easement that provides sufficient control of the property's use and development. While the current land uses within the RPZs do not include buildings or large congregations of people, the northern RPZs do encompass the public amenities associated with Lake Bentonville. Reconfiguration of these facilities, or possibly closing or relocating these facilities warrants further consideration by the Authority and Arkansas Game and Fish Commission (the owner/operator of Lake Bentonville). This would be consistent with the objective of reducing wildlife attractants near the airfield that was discussed in Section 3.6.4.

Runway Obstacle Free Zone (OFZ)

Defined by FAA as a 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. For Runway 18-36 the OFZ is 400 feet wide and for the turf runway it is 120 feet wide. The OFZ for Runway 18-36 encompass the turf runway which is one factor why the paved and turf runways may not be used at the same time. Like the ROFAs and RPZ for the turf runway, the OFZs for both runways extend beyond airport property onto adjacent parcels located along SW I Street. It is recommended that property containing the OFZ be acquired in fee-simple.

Runway Separation Standards

Defined as the distance between the runway centerline and other airport facilities established to ensure operational safety of the airport

- Runway Centerline to Parallel Taxiway Centerline – To accommodate B-II aircraft on any parallel taxiway at VBT, the standard separation distance is 240 feet from the centerline of either the paved or turf runways. There is a partial parallel taxiway located 435 feet to the west of Runway 18-36 which is well beyond this standard. The previously described Modifications of Standards for the planned turf runway accounts for the development of a future full-length, west side parallel taxiway located 285 feet from the paved runway and 150 feet from the turf runway. This maintains the taxiway OFA outside of the turf runway OFZ so the turf runway and parallel taxiway can be used at the same time.
- Runway Centerline to Holding Position – For Runway 18-36, the standard distance is 200 feet which corresponds with the width of the OFZ. The marking on the existing taxiway connectors meet this standard. For the turf runway, the standard distance is 125. Future development of parallel taxiways on either the east or west sides of the airfield will need to be marked appropriately.
- Runway Centerline to Edge of Aircraft Parking Area – For Runway 18-36, the standard distance is 250 feet. Existing tie-downs on the east-side apron comply with this standard. For the turf runway the standard separation is 125 feet. Future development on both the east and west sides of the airfield should accommodate this standard.

4.8 Runway Orientation

Ideally a runway is oriented with the prevailing wind, as taking off and landing into the wind enhances aircraft performance. The FAA recommends that the primary runway have at least 95 percent wind coverage, which means that 95 percent of the time, the wind at an airport is within acceptable crosswind limitations. Crosswind coverage is calculated using the highest crosswind component that is acceptable for the types of aircraft expected to use the runway system. Larger aircraft have a higher tolerance for crosswind than smaller aircraft due to their size, weight and operational speed. If 95 percent coverage cannot be met by the primary runway, an additional "crosswind runway" may be needed to safely accommodate the aircraft needing the additional crosswind coverage. **Table 4-7** provides the standard crosswind component by aircraft size.

Table 4-7. Standard Crosswind Components

Aircraft Category	Maximum Crosswind Component
A-I and B-I	10.5 knots
A-II and B-II	13.0 knots
A-III, B-III, C-I through C-III D-I through D-III	16.0 knots
A-IV, B-IV, C-IV through C-VI, D-IV through D-VI E-I through E-VI	20.0 knots

Source: FAA AC150/5300-13A *Airport Design* Prepared: May 2015

The FAA considers three weather classifications: all weather, visual flight rule (VFR) conditions, and instrument flight rule (IFR) conditions. According to wind data obtained from the FAA's Airports Geographic Information System (AGIS) website which utilizes 10-years of data from the Airport's AWOS, VFR conditions occur approximately 90.3 percent of the time and IFR conditions occur approximately 9.7 percent of the time. **Table 4-8** outlines the weather classification criteria and the number of recorded observations at VBT between 2004 and 2014.

Table 4-8. Weather Observations at VBT

Weather Class	Criteria	Recorded Observations at VBT (2004-2013)
All Weather	All ceiling and visibility weather conditions	249,526 (100%)
VFR Conditions	Ceiling ≥ 1,000' and visibility ≥ 3 miles	224,675 (90.3%)
IFR Conditions	Ceiling ≥ 200' and < 1,000' and Visibility ≥ ½ mile and < 3 miles	24,116 (9.7%)

Source: VBT AWOS (Station#723444) Wind Data 2004-2014, FAA AGIS Website, https://airports-gis.faa.gov/public/windrose_help.html accessed May 2015 Prepared: May 2015

As stated previously, VBT predominately accommodates aircraft up to the B-II classification, with occasional use by larger aircraft being possible. With this in mind, the calculation of crosswind coverage provided by Runway 18-36 for the 10.5, 13 and 16 knot components is presented in **Table 4-9.**

Table 4-9. Runway 18-36 Wind Coverage

	10.5 kt	13 kt	16 kt
All Weather	96.6%	98.4%	99.7%
VFR	96.6%	98.4%	99.7%
IFR	95.6%	97.8%	99.7%

Source: FAA AGIS Website, https://airports-gis.faa.gov/public/windrose_help.html, accessed May 2015 Prepared: May 2015

Runway 18-36 is aligned in a north-south direction and the prevailing winds at VBT are predominantly from the south-southwest. According to the wind data analysis for the Airport as available from the FAA's Airports Geographic Information System (AGIS) website which utilizes data from the Airport's AWOS, the existing runway orientation at VBT provides more than 95 percent coverage for all aircraft types under both VFR and IFR conditions.

4.9 Physical Features of Runway 18-36

As described in Chapter 2, the paved runway surface is 4,426 feet in length and 65 feet in width with a turn-around at the southern end. As of mid-2015, the thresholds of both runway ends are displaced thereby reducing operational distances in both directions (i.e. declared distances). The following evaluates the infrastructure of Runway 18-36 and its ability to meet the growing needs of the flying public and the critical aircraft described previously.

4.9.1 Runway 18-36 Length

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length. Factors that affect needed runway length include temperature, airport elevation, runway gradient, critical aircraft expected to use the airport, and the stage length or distance of the longest nonstop destination. Specific aircraft performance is a key factor in determining the runway length needed for takeoff and landing.

According to the FAA AC, the following criteria are identified for critical aircraft:

> "The recommended length for the primary runway is determined by considering either the family of airplanes having similar performance characteristics or a specific airplane needing the longest runway. In either case, the choice should be based on airplanes that are forecast to use the runway on a regular basis. A regular basis is considered to be at least 250 takeoffs a year."

AC 150/5325-4B contains exhibits that calculate runway length requirements based on families of airplanes having similar performance characteristics and utilizing inputs from the airport regarding temperature and elevation. The runway length requirement results are categorized for small aircraft less than or equal to 12,500 pounds, aircraft weighing over 12,500 pounds but less than 60,000 pounds, and large aircraft more than 60,000 pounds. The 12,500 to 60,000 pound category or less is further subdivided into groups that compose 75 percent of aircraft within that fleet category, and 100 percent of aircraft within that category.

As noted in previous sections of this report, the B-II critical aircraft family for VBT includes the Cessna Citation Sovereign and Citation Excel, which fall into the category the FAA describes as 75 percent of the operational fleet. The recommended runway length for this category is contingent on either a 60 percent useful load or a 90 percent useful load. Based on the aircraft types that operate at the Airport and typical stage lengths, the recommended minimum runway length at VBT should accommodate 75 percent of the fleet at 60 percent useful load.

AC 150/5325-4B also identifies runway length adjustments for Effective Runway Gradient (takeoff only) and Wet and Slippery Runways (landing turbojet-powered airplanes only). Landing length requirements are typically shorter than takeoff length requirements, even when adjusted for wet and slippery conditions, therefore, the recommended runway length at VBT is based on takeoff distance. Takeoff lengths interpolated from the FAA tables are increased at a rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline. For VBT this results in an increase of 90 feet. With consideration of the Airport elevation (1,298 above mean sea level or MSL), mean maximum temperature of the hottest month in Bentonville (89 degrees Fahrenheit), and effective runway gradient (9-foot elevation difference), the calculated runway lengths for various *percent of fleet* and *useful load* factors are presented in **Table 4-10**.

Table 4-10. Runway 18-36 Length Requirements

Airport Data		
Airport elevation	1,298 feet MSL	
Mean daily maximum temperature of the hottest month	89 degrees F	
Maximum difference in runway centerline elevation	9 feet	
Runway Length Recommended for Airport Design		
Large airplanes of 60,000 pounds or less:	Unadjusted	Adjusted for Gradient
75 percent of fleet at 60 percent useful load	**4,925 feet**	**5,015 feet**
75 percent of fleet at 90 percent useful load	6,750 feet	6,840 feet
100 percent of fleet at 60 percent useful load	5,825 feet	5,915 feet
100 percent of fleet at 90 percent useful load	8,750 feet	8,840 feet

Sources: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, 2010 Approved Airport Layout Drawing
Prepared: December 2014

Based on this evaluation, the minimum recommended length for Runway 18-36 is 5,015 feet. This is 589 feet greater than the existing pavement length of Runway 18-36, which is 4,426 feet long. This recommendation is consistent with previous planning efforts, including the 2010 FAA approved Airport Layout Drawing which depicted an ultimate paved runway length of 5,002 feet.

4.9.2 Runway Width

The width of the paved runway is 65 feet. The FAA design standard for runway width is based on the AAC and approach visibility minimums to the runway. As indicated in **Table 4-6**, the standard runway width for a B-II airport with approach visibility minimums of not lower than one mile is 75 feet. Both the 2003 Master Plan and the 2010 Airport Layout Drawing recommended that the runway ultimately be widened to 75 feet. Based on the current and projected activity by corporate type aircraft, including the identified critical Citation Sovereign and Excel, it is recommended that runway widening be pursued.

Runway widening can be accomplished by constructing additional pavement to one side of the runway centerline or to both sides. If widened to one side, the runway centerline and will shift accordingly. This will, in turn, also shift the corresponding RSA, ROFA, OFZ, RPZ and airspace protections surfaces. Due to the existing airport infrastructure on the east side of the airfield, it is further recommended that Runway 18-36 be widened to the west where the required separation distances can be more readily accommodated. The RSA grading project in 2014 also accounted for widening the runway 10 feet to the west. Preliminary planning and design for the turf runway, including the Modification of Standards requests, has taken this runway centerline shift into account.

4.9.3 Runway Shoulders and Blast Pads

Shoulder areas adjacent to the runway pavement are designed to prevent jet-blast erosion and support the occasional passage of aircraft, maintenance equipment, or emergency equipment under dry conditions. Paved shoulders are required for airfield pavements that accommodate Airplane Design Group (ADG) IV and higher aircraft, and are recommended for pavements supporting ADG-III aircraft. Turf, aggregate-turf, soil cement, lime or bituminous stabilized soil

are acceptable for airfield pavements accommodating ADG-I and II aircraft. Per FAA AC 150/5300-13A, the standard runway shoulder width for B-II runways is 10 feet.

Similar to the function of shoulders, blast pads are paved surface areas beyond the ends of a runway that can also be provided to reduce the erosive effect of jet blast and propeller wash. Though not required for B-II runways, under certain site conditions they may be desired to prevent soil erosion or Foreign Object Debris (FOD) being propelled at high velocities and causing property damage or injury to persons.

Runway 18-36 has turf shoulders and no blast pads which is consistent with current FAA standards. Future enhancements to the runway width or length should be designed in accordance with the FAA shoulder, compaction and grading standards in effect at that time. Although the Airport is anticipated to operate as a B-II facility throughout the planning period, shoulder areas and areas near the runway ends should be monitored for signs of erosion due to jet blast. If significant erosion does occur, additional mitigation measures as described in FAA AC 150-5300-13A may become warranted.

4.9.4 Runway Pavement Strength

Pavement design strength is related to three primary factors:

- The operating weight of aircraft anticipated to use the airport;
- The landing gear type and geometry; and
- The volume of annual aircraft operations, by type.

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

According to the 2010 Approved Airport Layout Drawing, Runway 18-36 has a pavement design strength of 12,500 pounds for single-wheel configuration aircraft and 21,500 pounds for dual-wheel configuration aircraft, however, the actual strength may be greater based on overlays that have been made to the runway but have not been confirmed. The Airport's critical aircraft, the Cessna Citation Sovereign is the heaviest aircraft that regularly operates at VBT. The aircraft has a dual-wheel configuration with a maximum takeoff weight of 30,300 pounds, although an aircraft such as the Sovereign does not typically take off at maximum weight. A summary of the jet aircraft recorded at VBT in 2014, with maximum takeoff weights greater than 12,500 pounds, and their gear configurations, is provided in **Table 4-11**. This represents the types of jet aircraft that regularly operate at Bentonville Municipal Airport. As indicated by red text, six of these aircraft exceed the existing pavement design strength.

Table 4-11. VBT Aircraft Weights & Gear Configuration

Aircraft Type	Estimated Operations in 2014	Gear Configuration	Maximum Takeoff Weight (lbs.)
Citation Sovereign	73	Dual	30,300
Gulfstream 150	109	Dual	23,500
Lear 60	36	Dual	21,500
Citation Excel	321	Single	20,200
Lear 35	15	Dual	18,300
Citation V	87	Single	15,900
Beech Jet	15	Single	15,780
Citation II	44	Single	15,100
Lear 25	7	Dual	15,000
Citation CJ3	29	Single	13,870
TOTAL	**736**		

Sources: Airport IQ Data. www.airliners.net, Kimley-Horn and Associates Prepared: May 2015

According to Arkansas Department of Aeronautics grant history,[7] a pavement overlay was performed in 1995/1996. It was also noted that a pavement overlay was performed in 2010. Upon visual inspection in 2014, Runway 18-36 appears in good condition. Depending on use and weather, asphalt pavements are typically designed for a 20-year lifespan. With that in mind, increasing the runway strength to accommodate the anticipated growth in corporate aircraft activity should be pursued – possibly in conjunction with the recommended widening of the runway to 75 feet.

4.9.5 Declared Distances

As of mid-2015, the northern threshold is displaced 230 feet to provide the standard RSA length prior to the threshold and beyond the departure end of the runway. The southern threshold is displaced 345 feet to meet the 20:1 TERPS Threshold Siting Approach Surface requirements. This results in reduced operational distances, for both takeoff and landing, in both directions. To support enhanced operational safety for turbine powered aircraft in situations like these, Declared Distances can be published that identify what distances are available for takeoff, landing and rejected-takeoff aircraft performance requirements. These distances may differ from the physical length of pavement.

As of mid-2015, the City is underway with a project to remove the utility poles causing the displacement of the Runway 36 threshold. The removal is based on providing a clear 20:1 TERPS approach surface to the existing physical end of pavement. Once completed, and pending a successful inspection and "flight check" by the FAA, the 345 feet of southern pavement will become available for use and any declared distances would change. Based on the existing and anticipated future threshold locations, the Declared Distances for VBT are identified in **Table 4-12** and **Exhibit 4-4**. Changes based on relocating the southern threshold are indicated

[7] Arkansas Department of Aeronautics, accessed 5/29/15, http://www.fly.arkansas.gov/Airports/Bentonville/Bentonville.pdf

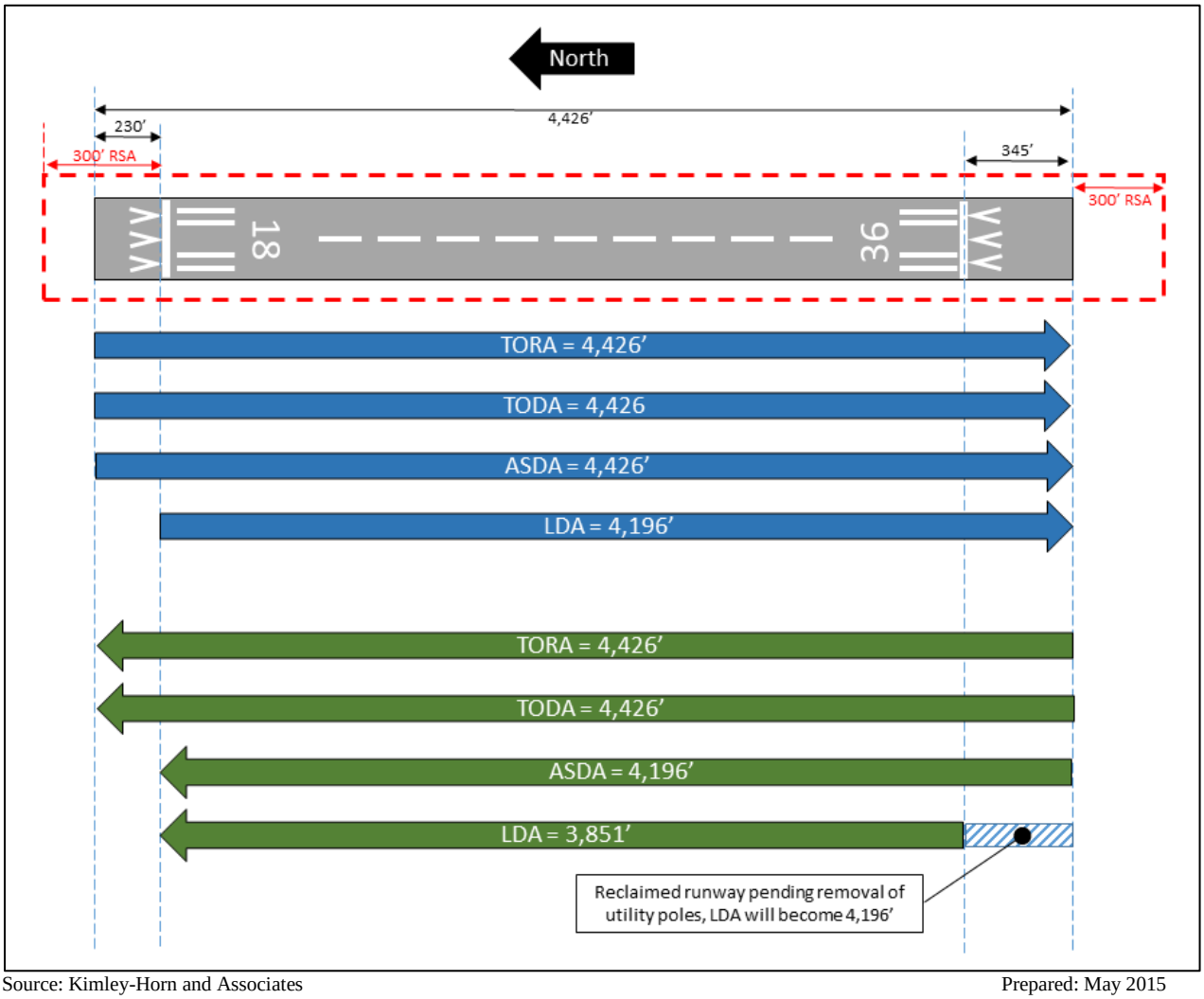
by blue text. Regaining the northern 230 feet of existing runway pavement would require filling and grading of Lake Bentonville.

Table 4-12. Declared Distances (feet)

Operational Distance	As of Mid-2015		After Utility Pole Removal	
	18	36	18	36
Takeoff Run Available (TORA)	4,426	4,426	4,426	4,426
Takeoff Distance Available (TODA)	4,426	4,426	4,426	4,426
Accelerate-Stop Distance Available (ASDA)	4,426	4,196	4,426	4,196
Landing Distance Available (LDA)	4,196	3,851	4,196	4,196

Sources: FAA AC 150/5300-13A *Airport Design*, Kimley-Horn and Associates Prepared: May 2015

Exhibit 4-4. Declared Distances



Source: Kimley-Horn and Associates Prepared: May 2015

4.10 Taxiway System

The taxiway system links the runway and other operational areas at an airport. An effective taxiway system allows for the orderly movement of aircraft and enhances operational efficiency and safety by reducing the potential for congestion, runway crossings and pilot confusion. The following evaluates the taxiway infrastructure at VBT and identifies recommended enhancements to meet the circulation needs of the various based and transient aircraft operators.

4.10.1 Taxiway Configuration

The Bentonville Municipal Airport has two connector taxiways leading from the eastern apron directly to Runway 18-36 and one partial parallel taxiway leading to the western aviation development area. There are no full-length parallel taxiways on either side of the runway which results in aircraft having to back-taxi on the runway to reach the thresholds.

Parallel taxiways improve circulation and safety and reduce runway occupancy time. Parallel taxiways should span the full length of the runway to maximize use of available runway length. AC 150/5300-13A recommends that runways supporting straight-in instrument approach minimums greater than or equal to 1 mile have a full-length parallel taxiway. For approach minimums less than 1 mile, a parallel taxiway is required. For these reasons, development of parallel taxiways at VBT is recommended. With public aviation facilities occurring on both sides of the airfield, parallel taxiways on both sides of Runway 18-36 would be ideal. Due to existing infrastructure and terrain constraints, as well as potential financial considerations, development of two, full length parallel taxiways may need to be phased.

While the existing taxiway connectors may provide convenient access to the runway from the eastern apron and hangar area, they do not meet FAA design standards and could pose an increased risk of runway incursion especially as activity levels increase in the future. According to AC 150/5300-13A, taxiways should not lead directly from an apron to a runway without requiring a turn. "Indirect access" should be provided to reduce potential confusion when a pilot typically expects to encounter a parallel taxiway but instead accidently enters a runway. Additionally, these connectors are located in the middle third of the runway which is considered the "high energy" intersection area. Intersections should be located in the outer third of the runway where pilots have more room to maneuver and a greater ability to avoid collision. For these reasons, it is recommended that the two existing connectors be relocated and reconfigured.

The taxiway system should be designed to maintain a uniform traffic flow, with a minimum number of points necessitating a change in aircraft taxiing speed. With consideration of the recent and recommended airport development, including the planned turf runway, recommended taxiway configurations and areas of prioritization, will be evaluated in Chapter 5.

4.10.2 Taxiway Dimensional Standards

Like the runway design standards described in Section 3.8, FAA AC 150/5300-13A identifies dimensional standards pertaining to taxiways and taxiway-related separations that are intended to provide adequate operational clearance between other aircraft and fixed and moveable objects.

These standards are based on both the ADG and the Taxiway Design Group (TDG) of the aircraft intended to use the facilities. The TDG is established by the overall Main Gear Width (MGW) and the Cockpit to Main Gear Distance (CMG) of the Airport's critical aircraft. The

Cessna Citation Sovereign is classified as TDG-1B with a MGW of 10 feet and a CMG of 27 feet, 10 inches. The Citation Excel is classified as a TDG-2 with a MGW is 16 feet and a CMG of 18 feet. Many of the smaller personal and recreational aircraft in the ADG-I group are classified as TDG-1A. The FAA design standards for these various aircraft classifications are summarized in **Tables 4-13** and **4-14.**

Not all taxiways on an airport may necessarily need to be designed to the same critical aircraft standards. For example, taxiways or taxilanes leading to hangar areas capable of accommodating only smaller aircraft may be designed to smaller standards whereas the main parallel taxiway, which supports all aircraft types, should be designed to the larger aircraft standards.

Table 4-13. Taxiway Design Standards Based on ADG

Item	ADG I (ft.)	ADG II (ft.)
Safety Area Width	49	79
Taxiway OFA Width	89	131
Taxilane OFA Width	79	115
Taxiway Centerline to:		
Parallel Taxiway/Taxilane Centerline	70	105
Fixed or Moveable Object	44.5	65.5
Taxilane Centerline to:		
Parallel Taxiway/Taxilane Centerline	64	97
Fixed or Moveable Object	39.5	57.5

Source: FAA Advisory Circular 150/5300-13A, Change 1 Prepared: December 2014

Table 4-14. Taxiway Design Standards based on TDG

Item	TDG 1A (ft.)	TDG 1B (ft.)	TDG 2 (ft.)
Taxiway Width	25	25	35
Taxiway Edge Safety Margin	5	5	7.5
Taxiway Shoulder Width	10	10	15

Source: FAA Advisory Circular 150/5300-13A, Change 1 Prepared: December 2014

Based on these standards, the existing 35-foot wide partial parallel taxiway on the western side of the airfield is established to support the critical, corporate jet type aircraft. Any future runway entrance/exit taxiways and parallel taxiway development, on either side of the airfield, should meet these same ADG-II and TDG-2 standards. Taxiway/taxilane segments leading to specific apron or hangar storage areas should be designed to the standards corresponding with the aircraft that can be accommodated in those facilities. As with the runway, taxilane shoulders for ADG-I and ADG-II aircraft can be constructed of turf, aggregate-turf, soil cement, or lime or bituminous stabilized soil.

4.11 General Aviation Facilities

The purpose of this evaluation is to determine the capacity of the existing general aviation facilities and their ability to meet forecast levels of demand during the planning period. The term

"General Aviation Facility" refers to a facility that provides aviation services to airport users and aircraft operators such as hangar space, terminal space, fuel sales, and aircraft apron space. In this analysis, the following facilities were evaluated:

- General Aviation Administrative/Terminal Facilities
- Aircraft Storage Hangars
- Based and Transient Apron Areas
- Vehicular Parking Facilities

4.11.1 General Aviation Administrative/Terminal

The existing general aviation terminal is located adjacent to the eastern apron. It provides amenities and services for the traveling public and houses the Airports' single Fixed Base Operator (FBO) – Summit Aviation. The 2,400 square foot terminal includes a flight planning/testing room, reception area, restrooms, office space, vending area, and lounge area. According to the Bentonville Airport Terminal Drawing (approved 10/11/2007), the terminal building was designed to accommodate 56 occupants (tenants, pilots, and staff). **Table 4-15** shows the interior square footage calculations used for design and construction of the existing building.

Table 4-15. Terminal Design Criteria

Operational Use	(SF/Occupant)
Lounge	15
Reception	100
Reception Office	100
Storage	300
Vending	15
Office	100
Conference Room	15
Closet	300
Pilot's Rest Area	15
Planning/Testing	100
Mechanical	300

Source: Bentonville Airport Terminal Layout, Approved 10/12/2007 Prepared: December 2014

According to Airport staff, the existing terminal layout is adequate for current activity levels. It is assumed that future terminal space requirements are contingent on itinerant operations and that the number of occupants to be accommodated in the terminal will grow at the same rate as projections of itinerant operations. The estimated number of average hourly itinerant operations for the peak month in 2014 was 3. Assuming this figure increases at the same rate as annual itinerant operations presented in Chapter 3, peak hourly itinerant operations are expected to increase to 5 by PAL 3. The square footage design criteria described in **Table 4-15** were applied to the projected number of hourly itinerant operations during the peak month to forecast future terminal spatial needs. It should be noted that particular areas such as entryways, corridors and restrooms will not need to increase in size unless user demand significantly exceeds projected

levels of activity. As shown in **Table 4-16**, an additional 909 square feet of passenger terminal space would be needed to accommodate PAL 3 activity levels. It should be noted, that as of mid-2015 the City and Airport Advisory Board are in discussions for the potential development of a new general aviation flight center on the west side of the field. This new flight center would accommodate this demand and likely more.

Table 4-16. Terminal Facility Requirements

Historical			Projected		
Description	FAPO*	2014	PAL 1	PAL 2	PAL 3
Lounge	15	176	212	238	282
Reception	100	202	243	273	324
Reception Office	100	113	136	153	181
Storage	300	88	106	119	141
Vending	15	168	202	227	270
Office	100	154	185	208	247
Conference Room	15	178	214	241	286
Closet	300	16	19	22	26
Pilot's Rest Area	15	237	285	320	380
Planning/Testing	100	90	108	122	144
Mechanical	300	80	96	108	128
Night Access Corridor		38	38	38	38
Entry		362	362	362	362
Women's Bath		63	63	63	63
Men's Bath		69	69	69	69
Corridor		149	149	149	149
Total SF.		**2,182**	**2,489**	**2,711**	**3,092**
Deficiency		*0*	*-306*	*-528*	*-909*

*FAPO = Floor Area per Occupant
Note – reflects interior space dimensions and may not equate to total building footprint
Source: Airport Terminal Layout Prepared: December 2014

4.11.2 Aircraft Storage

As noted in previous sections of this MPU, there were 63 based aircraft in 2014, and it is projected that this number will increase to 111 by 2035. Throughout the MPU, additional based aircraft have located at VBT, and new storage facilities continue to be constructed and planned. This analysis uses information available as of December 2014, recognizing that the conditions continue to change.

Based aircraft are stored in conventional hangars (both FBO and non-FBO), T-hangars, and on the apron (aircraft tie-downs and designated aircraft apron parking spaces). These storage types are explained below and described in **Table 4-17**.

- Conventional FBO Hangar - This type of hangar is a large building which can house multiple aircraft in protective storage, and usually contains a large door through which aircraft can pass. The “FBO” designation of this type of hangar indicates it is operated by a provider of public aviation services, and can store multiple itinerant and based aircraft.
- Conventional Non-FBO Hangar - This type of hangar is structurally similar to a Conventional FBO Hangar, but only houses aircraft operated by or in conjunction with the owner/operator of the hangar. Examples of operators of this type of hangar space

include governmental aviation divisions, private aviation companies, or corporate aviation departments. These operators would only house their own aircraft in these hangars, not itinerant aircraft.

- T-hangar - This type of hangar is an individual storage unit for a small aircraft, usually a single-engine or light twin aircraft classified under ADG I. The "T" designation corresponds to the overall shape of the unit, which is similar to a T. These individual hangars are generally grouped into linear buildings containing multiple units in a row.
- Aircraft Tie-down - An aircraft tie-down is typically an on-apron parking space that includes fixed points, typically concrete, where an aircraft can be secured using straps or cables. There can also be tie-downs on grass or non-apron areas. Although tie-downs do not provide covered protection from weather elements, they do prevent an aircraft from moving and minimize damage attributed to high winds.
- Designated Aircraft Parking Space - These parking spaces essentially provide the same level of service as an aircraft tie-down with the exception that they are not directly on the apron. Rather, they are on the airfield but there is grass in between spaces rather than paved apron, which requires less maintenance and construction over time.

Table 4-17. Existing Aircraft Storage

Historical	Based Aircraft Tie-downs	Itinerant Tie-downs	Aircraft Parking Spaces	Conventional Hangars (sf.)	T-hangar Spaces
2014	6	12	6	48,250	19
2015	6	22	3	52,450	26

Sources: 2010 Airport Layout Drawing, Kimley-Horn and Associates — Prepared: December 2014

4.11.3 On-Apron Aircraft Storage Requirements

On-apron based aircraft parking demand by facility type is shown in **Table 4-18**. This includes aircraft that are on apron tie-downs and designated aircraft parking spaces. In 2014, 10 percent of available based aircraft parking were stored as tie-downs, and 10 percent were stored on designated apron spaces. In 2015, three of the six designated aircraft parking spaces were eliminated to accommodate a new 4,200 square foot box hangar. It is assumed that 10 percent of based aircraft at the Airport will continue to be stored on apron tie-downs, but that the three existing designated apron spaces will remain constant throughout the projection period.

Table 4-18. On-Apron Based Aircraft Facility Requirements

Historical	Based Aircraft	Aircraft On-Apron	Apron Spaces (Existing)	Apron Spaces (Required)	Tie-Downs (Existing)	Tie-Downs (Required)	Net Surplus/ (Deficiency)
2014	63	12	6	6	6	6	0
2015	67	9	3	3	6	6	0
Projected							
PAL 1	78	10	3	3	6	7	(1)
PAL 2	89	11	3	3	6	8	(2)
PAL 3	111	14	3	3	6	11	(5)

Sources: 2010 Airport Layout Drawing, Kimley-Horn and Associates — Prepared: December 2014

As shown, a deficiency of five on-apron spaces is projected by PAL 3. Since the number of designated apron spaces is anticipated to remain constant throughout the projection period, an additional five tie-downs for based aircraft are recommended.

4.11.4 Aircraft Hangar Storage Requirements

The demand for storage hangars is dependent upon the number and type of aircraft based at an airport, as well as local climate conditions, airport security, availability, rates and charges, and owner preferences. The percentage of based aircraft stored in hangars varies from state to state, and from airport to airport, but is usually greatest in regions subject to extreme weather conditions.

In 2014, 30 percent of based aircraft at VBT were stored in T-hangars. To project future T-hangar requirements, this percentage is held constant throughout the projection period and applied to the number of forecasted based aircraft. This assumes that T-hangar demand was at capacity in 2014. A 7-unit T-hangar was constructed on the west side of the airfield in 2015, which accounts for a projected surplus in PAL 1 (see **Table 4-19**). At the time this Master Plan Update was written, there were 3 aircraft stored in this T-hangar. Although the T-hangar is incorporated into the existing inventory, required T-hangar units are still calculated as 30 percent of based aircraft forecasts rather than the number of aircraft stored in T-hangars in 2015. It is assumed that between PAL 1 and PAL 2, this hangar will be at capacity.

Conventional/Box hangar demand for based aircraft is determined by subtracting the projected number of aircraft stored on the apron and in T-hangars from total projected based aircraft. As noted, a 4,200 square foot conventional/box hangar was constructed in 2015 that is estimated to potentially accommodate three additional aircraft. This is included in the 2015 estimate of existing box hangar units, however, a deficiency of three units is shown because the required number is based on the entire calendar year, rather than at the time facility requirements were calculated.

Table 4-19. Aircraft Storage Hangar Facility Requirements

Historical	Total Aircraft Stored in Hangars	T-hangar Units			Conventional Hangar Units		
		Existing	Required	Net Surplus/ (Deficiency)	Existing	Required	Net Surplus/ (Deficiency)
2014	51	19	19	0	32	32	0
2015 (est.)	58	26	20	6	35	38	(3)
Projected							
PAL 1	68	26	24	2	35	44	(9)
PAL 2	78	26	27	(1)	35	51	(16)
PAL 3	97	26	33	(7)	35	64	(29)

Sources: 2010 Airport Layout Drawing, Kimley-Horn and Associates Prepared: December 2014

As shown in **Table 4-19**, by PAL 3, it is projected that the Airport will need an additional seven T-hangar units, and enough conventional hangars to accommodate an additional 29 aircraft. Conventional aircraft hangar square footage requirements are described in the subsequent sections. As of mid-2015, the City and Airport Advisory Board are in preliminary discussions with tenants for the potential development of two to three new conventional hangars and possibly some replacement T-hangars.

4.11.5 Area Required

As noted in Chapter 3, Forecasts of Aviation Demand, the based aircraft fleet at VBT is anticipated to incorporate more ADG II aircraft over time. While the existing square footage of hangar space is adequate to meet current based aircraft fleet needs, with a projected increase in based aircraft, future demand will require additional space especially for larger aircraft.

To determine the required conventional hangar area per aircraft, a safety clearance was added to the aircraft wingspan and length to calculate an average hangar area required. A weighted average was then calculated based on the average fleet mix assumed for 2035:

- 90% single-engine aircraft and smaller multi-engine piston aircraft (ADG I)
- 7% larger multi-engine piston aircraft, small turboprops, and small business jets (ADG II)
- 3% helicopters

A weighted average of 1,970 square feet per aircraft was calculated for conventional hangar storage and is summarized in **Table 4-20**. It should be noted that this square footage requirement is based on the future fleet mix of the Airport and does not apply to the existing fleet.

Table 4-20. Conventional Hangar Square Footage Requirements

ADG	Average Aircraft Length (ft)	Average Wingspan (ft)	Additional Clearance around Aircraft (ft)[1]	Average Hangar Area Required (SF)[2]	Fleet Mix	Weighted Average Area by ADG (SF)[3]
I	26	35	5	1,620	90%	1,460
II	55	60	10	6,000	7%	430
Helicopter	35	30	10	2,750	3%	80
				Weighted Average		**1,970**

[1]Operational safety area around aircraft.
[2]Aircraft area plus additional clearances on all four sides of the aircraft (5 ft for ADG I, 10 ft for ADG II, and helicopters).
[3]Calculated by multiplying fleet mix percentages and associated area requirement by ADG type, then summing the three ADG requirements. All numbers rounded to nearest 10 SF.
Source: Kimley-Horn and Associates
Prepared: December 2014

Conventional hangar requirements depicted in **Table 4-19** indicate that, by number, an additional 29 aircraft are anticipated to be stored in conventional hangars by PAL 3 (64 projected based aircraft in PAL 3 minus 35 based aircraft in 2015). Additional conventional storage for each aircraft in PAL 1, PAL, 2, and PAL 3 was multiplied by the weighted average area to determine the overall square feet of additional conventional hangar storage that will be needed. Based on the analysis, the existing hangar capacity does not meet existing demand. By PAL 3, an additional 57,130 square feet of conventional hangar space will be required.

4.11.6 Summary of Hangar Requirements

A summary of overall aircraft storage hangar requirements by hangar type is shown in **Table 4-21**. As shown, it is anticipated that VBT will need an additional 7 T-hangar spaces for based aircraft and an additional 73,630 square feet of conventional aircraft hangar space for based aircraft.

Table 4-21. Summary of Aircraft Hangar Requirements

Year	T- hangars		
	Required (Units)[1]	Existing Units	Net Surplus/(Deficiency)[2] Number
PAL 1	24	26	2
PAL 2	27	26	(1)
PAL 3	33	26	(7)
Year	**Conventional Hangars**		
	Required Area (SF)[3]	Existing Area (SF)	Net Surplus / (Deficiency) Area (SF)[4]
PAL 1	86,680	52,450	(34,230)
PAL 2	100,470	52,450	(48,020)
PAL 3	126,080	52,450	(73,630)

[1]Data presented in Table 4-11.
[2]Additional T-hangar number requirements calculated by subtracting required number of units from existing facilities.
[3]Required Conventional hangar area calculated by multiplying the additional respective hangar demand by 1,970 square feet (as presented in Table 4-19).
[4]Additional hangar area requirement calculated by subtracting required hangar area from existing hangar area.
Source: Kimley-Horn and Associates Prepared: July 2015

4.11.7 Apron Requirements

Apron areas are intended to accommodate based and transient aircraft parking. Itinerant aircraft typically require a greater area for shorter amounts of time (usually less than 24 hours). Based aircraft require a smaller area for longer amounts of time as this represents their storage or base location at the airport. Since parking configurations and spatial requirements for itinerant and based aircraft can vary, they have been analyzed separately. Existing apron area and circulation areas, as determined by the Approved 2010 Bentonville Municipal Airport Layout Drawing and updated surveyed improvements are shown in **Table 4-22**.

Table 4-22. Existing Aircraft Apron and Movement Areas

Facility	Square Footage
General Aviation Apron	137,500
Itinerant Apron	93,800
Circulation Area	73,000
Total Apron/Circulation Area	**304,300**

Source: 2010 Approved Airport Layout Drawing Prepared: December 2014

4.11.8 Itinerant Apron Requirements

For itinerant aircraft, consideration must be made for the aircraft parking area, taxilanes leading into and out of the parking positions, and circulation areas. Typically, itinerant apron requirements are contingent on the number and type of aircraft that will use the facility. Because accurate historical itinerant operations data are not available for analysis, it is assumed that the existing ratio of itinerant apron space and circulation areas to annual itinerant operations is suitable for projecting future demand. The assumption that VBT will remain a B-II facility throughout the projection period also supports this assumption.

In 2014, there were 12 itinerant aircraft tie-downs at VBT. The number of itinerant aircraft tie-downs required at the Airport are assumed to increase at the same rate as the square footage of the itinerant apron. In 2015, an additional 10 itinerant tie-downs were constructed, bringing the total number of itinerant tie-downs to 22, which is anticipated to meet future demand. Itinerant apron facility requirements are shown in **Table 4-23**.

Table 4-23. Itinerant Apron Facility Requirements

Historical	Itinerant Operations	Itinerant Apron (SF)	Circulation Area (SF)	Total Apron/ Circulation Area	Itinerant Tie-Downs (Existing)	Itinerant Tie-Downs (Required)
2014	9,470	93,800	73,000	166,800	12	12
Projected						
PAL 1	11,400	112,900	87,900	200,800	22	14
PAL 2	12,800	126,700	98,700	225,400	22	16
PAL 3	15,200	150,500	117,000	267,700	22	19

Sources: 2010 Approved Airport Layout Drawing, Kimley-Horn and Associates Prepared: December 2014

Projected itinerant apron requirements assume that the existing size of the apron and circulation areas meet current demand and that future demand will increase at the same rate as projected itinerant operations. Because of increasing demand, development has already begun on the west side of the airfield. It is anticipated that majority of general aviation related development that has already started or that is recommended in this MPU will occur on the west side of Runway 18-36. The additional itinerant apron and circulation areas identified in Table 4-14 will likely be needed on the west side of the airfield, especially as FBO facilities and services expand on that side of the field.

4.11.9 General Aviation Apron Requirements

General aviation based aircraft parking apron requirements are contingent on the number of based aircraft that are expected to be stored on tie-downs. **Table 4-24** shows the projected based aircraft apron storage demand. These calculations include the elimination of 3 designated apron spaces in 2015.

Table 4-24. Based Aircraft Parking Apron Demand

Historical	Based Aircraft	Aircraft Stored on Apron
2014	63	12
Projected		
PAL 1	78	10
PAL 2	89	11
PAL 3	111	14
CAGR		
2014-PAL 3	2.7%	0.6%

Sources: 2014 Airport Layout Drawing, Kimley-Horn and Associates Prepared: December 2014

Although the based aircraft fleet is anticipated to include larger multi-engine piston and jet aircraft in the future, these types of aircraft are typically stored in hangars rather than on the apron. Therefore, the existing proportion of general aviation apron square footage to based aircraft stored on the apron is anticipated to remain constant throughout the projection period.

The existing configuration of the general aviation apron allows for 11,460 square feet of parking/movement area per based aircraft stored on the apron. General aviation apron requirements are shown in **Table 4-25**.

Table 4-25. Based Aircraft Parking Apron Demand

Historical	Aircraft Stored on Apron	General Aviation Apron Required (SF)	Net Surplus / (Deficiency) Area (SF)
2014	12	137,500	
Projected			
PAL 1	10	119,700	17,800
PAL 2	11	131,700	5800
PAL 3	14	155,600	(18,100)

Sources: 2010 Approved Airport Layout Drawing, Kimley-Horn and Associates — Prepared: December 2014

As shown, the short-term reduction in the number of based aircraft on the apron results in a surplus of apron space, but the Airport will need an additional 18,100 square feet of parking apron for based aircraft by PAL 3.

4.11.10 Summary of Hangar Requirements

A summary of aircraft apron requirements is shown in **Table 4-26**. The methodologies used in the projections of apron and circulation area demand assume that the Airport is currently at or near capacity. This assumption is based on increased number of based aircraft and itinerant operations at the VBT in recent years, as well as recent and near-term construction projects planned at the Airport.

Table 4-26. Apron Facility Requirements

Historical	GA Apron	Itinerant Apron (SF)	Circulation Area (SF)	Total Apron/Circulation	Net Surplus / (Deficiency) Area (SF)
2014	137,500	93,800	73,000	304,300	0
Projected					
PAL 1	119,700	112,900	87,900	320,500	(16,200)
PAL 2	131,700	126,700	98,700	357,100	(52,800)
PAL 3	155,600	150,500	117,000	423,100	(118,800)
CAGR					
2014-PAL 3	0.6%	2.3%	2.3%	1.6%	

Sources: 2010 Approved Airport Layout Drawing, Kimley-Horn and Associates — Prepared: December 2014

4.11.11 Automobile Parking Facilities

There are currently 35 striped automobile parking spaces designated for general airport parking; 30 on the east side of the airfield, and 5 on the west side of the airfield. These spaces are used by airport staff, tenants, and visitors. Airport management has indicated that 35 spaces are not adequate to meet existing parking demand. To determine vehicle parking requirements, a planning metric of 1 space per 1,000 square feet of aircraft storage hangar space was applied. It was also assumed each vehicle parking space would be 19 feet deep by 9 feet wide, and include half of a 24-foot wide drive aisle for circulation. These assumptions result in an area planning metric of roughly 270 square feet per parking space. **Table 4-27** summarizes the results of the

vehicular parking analysis, which indicates existing parking facilities at the Airport are insufficient to meet anticipated demand. By the end of the planning period an additional 24,570 square feet of vehicular parking areas are necessary to accommodate anticipated demand, or 91 spaces.

Table 4-27. Automobile Parking Requirements

Historical	Required Hangar Area (SF)	Required Vehicle Stalls	Existing Vehicle Stalls	Additional Stalls Required	Additional Parking Area Required (SF)
2014	52,450	52	35	17	4,710
Projected					
PAL 1	86,680	87	35	52	14,040
PAL 2	100,470	100	35	65	17,550
PAL 3	126,080	126	35	91	24,570

Sources: 2010 Approved Airport Layout Drawing, Kimley-Horn and Associates Prepared: July 2015

4.11.12 Summary of General Aviation Facility Requirements

Table 4-28 presents the overall summary for general aviation facilities throughout the planning period.

Table 4-28. Summary of General Aviation Facility Requirements

Year	Hangar Area Requirements				
	Existing T-hangars	Additional Required T-hangars	Existing Conventional Hangar Area	Required Conventional Hangar Area	Additional Conventional Hangar Area Required
PAL 1	26		52,450	86,680	34,230
PAL 2	26	1	52,450	100,470	48,020
PAL 3	26	7	52,450	126,080	73,630

Apron Area Requirements			
Year	Existing Apron Area	Required Apron Area	Additional Apron Area Required
PAL 1	304,300	320,500	16,200
PAL 2	304,300	357,100	52,800
PAL 3	304,300	423,100	118,800

	Vehicle Parking Requirements		
Year	Existing Spaces	Required Spaces	Additional Spaces Required
PAL 1	35	87	52
PAL 2	35	100	65
PAL 3	35	126	91

Sources: 2010 Approved Airport Layout Drawing, Kimley-Horn and Associates Prepared: July 2015

4.12 Support Facilities

This section examines the requirements of airport support facilities essential to the daily operation of the Airport. These facilities include airport access and circulation, airport maintenance facilities, and fuel storage facilities.

4.12.1 Airport Access and Circulation

The Airport is currently accessed by Airport Road, and has three public connecting access points near the terminal parking lot. There is also one controlled access road (SW 28th Street) on the north end of the airfield, and one controlled access road on the south end of the airfield. There is a 3rd controlled access point located west of the parking lot between the FBO building and the T hangar just to the south. These access points are depicted in **Exhibit 4-5**. A significant amount of general aviation development is anticipated to occur on the west side of Runway 18-36. Multiple access points (controlled and public) and proper signage will be required along SW I Street to access the west side. A full airfield perimeter road is also recommended in order to provide safe and efficient movement of maintenance and safety vehicles.

4.12.2 Aviation Fuel Storage Facilities

Bentonville Municipal Airport offers a 24-hour, self-fueling facility with one 10,000-gallon above-ground tank of AvGas and one 10,000-gallon above-ground tank of Jet A fuel. VBT also has one fueling truck that serves the Airport.

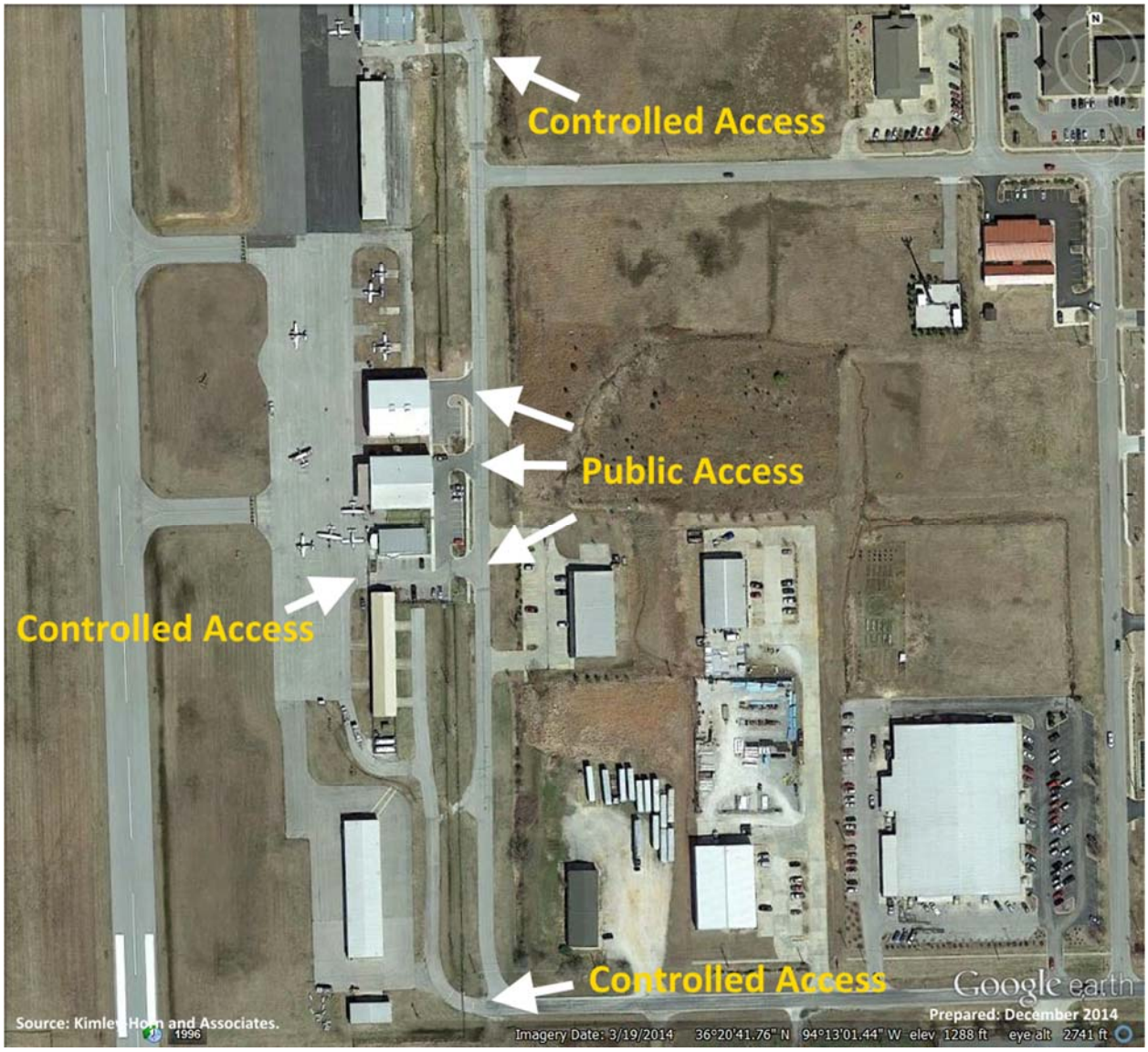
It is recommended that aviation fuel providers maintain a 30-day supply of fuel. Based on projected aircraft operations throughout the planning period, it is recommended that as jet-powered aircraft operations increase at the Airport, the FBOs replenish their supply more frequently or acquire additional storage capacity. In the event a new, additional FBO facility locates at the Airport, that facility should be planned with space for fuel storage capacity.

4.12.3 Airport Maintenance Facilities

Maintenance facilities include equipment pertaining to the safety and operational capability of an airport. VBT does not currently have a maintenance facility hangar, and maintenance equipment consists of a storage shed with lighting equipment and a lawn mower. Typical maintenance equipment at a general aviation facility such as Bentonville Municipal Airport might include vehicles and support equipment for snow removal, pavement sweeping, and grass cutting. Although the City of Bentonville provides snow removal and general maintenance services at the Airport, locating these facilities on-site would enhance the safety and functionality of the Airport.

As based aircraft and aircraft operations are anticipated to increase throughout the projection period, a maintenance storage facility sized to accommodate typical equipment is recommended.

Exhibit 4-5. Airport Landside Access



4.13 Summary of Facility Requirements

Based on the facility requirements identified in this section, the following is a summary of recommended improvements to the Airport's existing facilities throughout the planning period.

Airfield & Airspace Protection:

- Acquire controlling interest in portions of four adjacent parcels located along SW I Street to accommodate OFZ, ROFA, RPZ, Part 77 Primary Surface, and future parallel taxiway TOFA requirements.
- Maintain an ongoing obstruction removal program, including acquisition of avigation easements beyond airport property that focuses on threshold siting requirements, maximizing available runway length and protection of the Part 77 Approach and Transition surfaces.

- Continue development of the planned turf runway.
- Relocate eastern taxiway connectors and develop cross-field taxiway circulation in conjunction with the phased development of parallel taxiways.
- Ensure that any airfield improvements adhere to ADG II and TDG 2 design standards.
- Widen Runway 18-36 to 75 feet and strengthen the pavement to accommodate dual-gear aircraft of at least 30,300 lbs.
- Install PAPIs to both ends of Runway 18-36 when displaced threshold to Runway 36 is removed
- Pursue extension of Runway 18-36 to a minimum length of 5,015 feet, including northern property acquisition and the relocation of Lake Bentonville.

General Aviation Administrative/Terminal Facilities:

- Provide an additional 909 square feet of terminal space for a total of 3,092 square feet by PAL 3.

Hangar Facilities:

- Develop additional T-hangars to accommodate a projected deficiency of 7 units throughout the planning period.
- Develop additional conventional hangars to accommodate a projected deficiency of approximately 52,900 square feet throughout the planning period.

Apron Facilities:

- Provide a minimum additional apron area of approximately 118,800 square feet throughout the planning period.

Automobile Parking Facilities:

- Provide additional general aviation public vehicular parking of approximately 70 stalls or 19,000 square feet.

Support Facilities:

- Identify potential areas on Airport property for a maintenance facility.
- Improve west side airfield vehicle access and signage as general aviation development occurs.
- Construct a full airfield access perimeter road.
- Complete perimeter/security fencing

5 ALTERNATIVES ANALYSIS

To satisfy the user needs and facility requirements identified in the previous chapters, numerous development options and site configurations were considered. For many of the Airport's functional areas, like the turf runway and instrument approach capability, the logical recommendations were distinctly apparent as they are driven largely by FAA design standards and the somewhat constrained nature of the Airport's property. The recommended runway extension and parallel taxiway configuration, however, have more variability in their ultimate configuration. Due to aircraft circulation concerns, large land requirements, implementation costs and effect on the surrounding community, these are major components of the long-term development strategy for the Airport and warrant further evaluation. In order to compare alternative developments concepts and identify the preferred strategy, this chapter addresses the following:

- Review previous Airport planning recommendations
- Identify on- and off-airport land use considerations
- Identify runway extension and parallel taxiway alternatives that meet the projected aviation demand as well as maintain a safe aviation environment in and around VBT
- Compare the various alternatives based on evaluation criteria that reflect the priorities and concerns of the City, Airport Advisory Board, and surrounding community
- Identify the preferred development concept

5.1 Review of Previous Airport Plans

The 2003 Master Plan Update[1] for VBT evaluated facility requirements through the 2022 planning horizon and identified the following recommended improvements:

- Extension of Runway 18-36 from the previous 4,082 feet to the current 4,426 feet
- Widening of Runway 18-36 from 65 feet to 75 feet – which has not yet been accomplished
- Strengthening of Runway 18-36 to accommodate dual-gear aircraft of 30,000 lbs. – which has been overlaid but the current strength is not confirmed
- West side parallel taxiway – a portion of which has been completed
- Additional aviation-related development on the west side of the airfield including hangars, aprons, general aviation terminal, maintenance hangar, and public automobile parking – of which a new seven unit T-hangar was constructed in 2015
- Instrument approaches for B-II aircraft with minimums of not less than 1 mile – which has been accomplished
- Property acquisitions to the southeast and southwest of the Airport boundary – of which the southeastern part has been acquired

[1] Prepared by Delta Airport Consultants, Inc., October 2003

The preliminary 2010 Airport Layout Plan[2] for VBT maintained many of the previous recommendations, with the following additions and revisions:

- Draining and filling of Lake Bentonville
- Northward extension of Runway 18-36 to a length of 5,002 feet
- Additional development of hangars on the northeastern side of the airfield
- Revised western parallel taxiway development
- Revised west side apron and hangar configuration
- Additional east side connector taxiway

This ALP was reviewed with FAA staff but was not approved.

5.2 Land Use Considerations

The Airport encompasses approximately 140 acres of land that is generally bound by SW 14th Street (AR Highway 102) to the north, SW Regional Airport Boulevard (AR Highway 12) to the south, SW Aviation Drive/SW Ruby Drive and residential development to the east, and SW I Street and commercial development to the west. Adjacent to the Airport, SW Regional Airport Boulevard was recently expanded to 5 lanes and the Arkansas State Highway and Transportation Department has plans to continue the widening eastward to SE Walton Boulevard. This project will be an important consideration in the evaluation of potential expansion to VBT.

As described in **Chapter 4**, Lake Bentonville is within Airport property and could be considered a hazardous wildlife attractant, particularly for large migrating waterfowl, if not managed properly. There is undeveloped property to the north of the Airport, residential development has occurred adjacent to the northeast of the Airport, and commercial development has occurred to the south and southwest of the Airport. The Bentonville Community Recreation Center was built southwest of the Airport, southwest of the SW I and AR Highway 12 intersection. As described in **Chapter 2**, the 2007 *City of Bentonville General Plan* adopted future land use plans aimed at limiting residential development adjacent to the Airport and promoting long-term compatible land uses in the vicinity of the airfield.

Historically, aviation related development has occurred on the east-side of the airfield with facilities and services that accommodate both based and transient general aviation aircraft. As of mid-2015, the east-side is mostly built-out. At most, there is less than 2 acres on the northeast corner of the property that could potentially be developed. A new hangar has already been proposed north of the northeastern-most hangar and other hangars are being constructed where there were empty pads from previous hangar that were destroyed by a tornado. The northeastern-most site is directly adjacent to multi-unit residential housing and the site is constrained by steep grades and Lake Bentonville. In 2007, a partial parallel taxiway was constructed on the northwest side of the airfield to support needed hangars and apron. Construction of a new seven-unit T-hangar on the west-side was completed in mid-2015 which is anticipated to be 100-percent occupied by the end of 2015. With VBT accommodating a large amount of activity from operators of recreational, vintage, experimental, and "taildragger" aircraft, the City is pursuing the development a turf runway. Ongoing coordination with the FAA has included the submittal

[2] Prepared by CEI Engineering Associates, Inc., December 2010

of 7480 Form *Notice of Landing Area Proposal* that received favorable support from the FAA in December 2014, and the submittal of preliminary turf runway design plans and associated taxiway Modification of Standards requests in May 2015.

The City recently purchased an approximate 19-acre parcel of land that abuts the eastern edge of Airport property, south of Airport Road. As of mid-2015, the City is in the process of developing this parcel for a Utility Complex that will house the City's water, sewer, street and electric departments as well as maintenance facilities. Discussion between the Airport Advisory Board and City staff indicate that some amount of Airport expansion into this parcel might be possible as long as it aligns with City's planned development. At a minimum, the Airport Advisory Board should continue coordination with the City to ensure that development of the parcel observes airspace protection concerns and that the uses are compatible with the long-term needs of the Airport.

Due to the constraints of the existing on- and off-airport infrastructure, the recent taxiway and hangar construction, and the planned turf runway, it is evident that the majority of future aviation-related development will occur on the west side of Airport property. There are approximately 18-20 acres of land available on the west side between Lake Bentonville and the AWOS installation, immediately adjacent to SW I Street. Planning for the turf runway has accounted for a parallel west-side taxiway and private investors have already prepared a preliminary development plan for this area. The development plan includes an additional terminal, hangar and apron space to accommodate the growth in personal, business and corporate traffic as forecast in **Chapter 3** of this report.

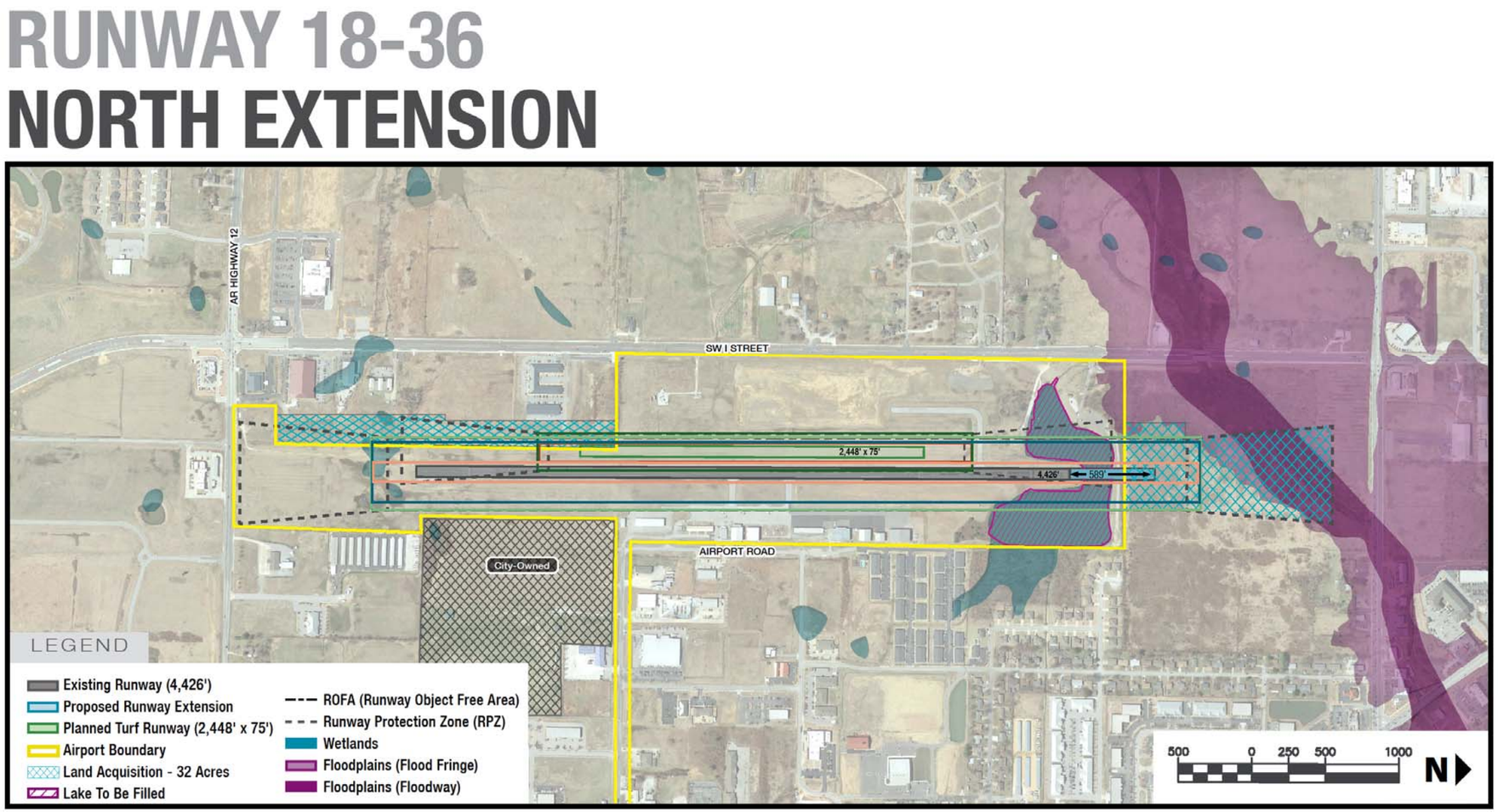
5.3 Runway Extension Alternatives

The existing length of Runway 18-36 is 4,426 feet. As described in **Chapter 4**, to accommodate the operational requirements of the existing and projected critical aircraft, the recommended length of the runway is 5,015 feet. Development alternatives for the runway include a 589-foot long northerly extension to Runway End 18, and a 589-foot long southerly extension to Runway End 36. Due to the existing infrastructure and terrain constraints, an alternative that includes shorter extensions to both runway ends (e.g. 294.5 feet or any split extension) would provide no distinct advantages and nominal difference in impacts as compared to a 589-foot extension in either direction. Construction on both runway ends also introduces additional construction cost and operational impacts due to construction phasing. Finally, any runway extension to the south would move the existing runway protection zone (RPZ) beyond AR Highway 12. Therefore any extension to the south should consider the full length, not a partial extension beyond the current location. It should be noted that both runway extension alternatives described herein, include widening the runway to the west by 10 feet.

5.3.1 Alternative 1. 589' North Extension

This alternative extends the runway pavement 589 feet to the north and is depicted in **Exhibit 5-1**. All required safety and clearance areas (RSA, ROFA, OFZ, RPZ) would also shift northward. The pavement and safety areas would extend beyond property and would require the minimum acquisition of approximately 22 acres. This property is zoned "agricultural" and is currently undeveloped. While 22 acres is the minimum amount of property required, it may be more practical to purchase the entire parcel (approximately 50 acres) which would further ensure compatible land use and provide additional property for Airport-related development.

Exhibit 5-1. Alternative 1 – 589’ North Extension



Prepared By:
Morrison-Shipley Engineers
Kimley-Horn and Associates

There is sufficient space available on the undeveloped parcel that the RPZ (supporting B-II aircraft with approach minimums not lower than 1 mile) would not cross SW 14th Street. The location of the road could actually accommodate a northward extension of up to 830 feet for a total potential runway length of 5,256 feet, providing additional flexibility should a longer runway be needed in the future beyond what is being examined in this MPU.

This alternative would, however, require the draining and filling of Lake Bentonville. This lake is almost entirely located within Airport property and the City allowed development of the property into the current park as an amenity, with the intent to keep it as a lake and park until such time that the area was needed for future Airport development. The City coordinated with the Arkansas Game and Fish Commission to have the lake stocked with fish and made agreements with the Commission regarding the lake. These agreements continue to be researched as records are not readily available from the City or the Commission.

While technically the entire 11.5 acres of the lake would not have to be filled, for all practical purposes removing the lake would provide adequate space for parallel taxiways on both sides of the runway and additional on-airport developable land. Draining the lake also removes the hazardous wildlife concern described in the previous chapter. For this alternative, it is assumed that Lake Bentonville and its amenities would be relocated within the region, preferably in accordance with the FAA separation standards and definitely not within the approach and departure areas of the runway.

Relocating the lake would take significant planning and coordination with state and federal agencies including the FAA, U.S. Army Corps of Engineers (COE), Federal Emergency Management Agency (FEMA), Arkansas Game and Fish Commission, Arkansas Natural Resources Commission, Arkansas Department of Environmental Quality, and the City of Bentonville. Approximately 20 acres of property would have to be acquired to accommodate the relocated lake and its amenities, the new lake would have to be constructed (through a combination of excavation and dams), and the old lake would have to be drained and filled. Challenging aspects of the project include maintaining stormwater management functions for both the Airport and the residential properties located east of Airport property along SW Ruby Drive and SW D Street. It appears that Lake Bentonville may also be part of a larger stormwater system that connects to several ponds located as far east as SE C Street.

Currently vacant property located along the west side of SW I Street may be an opportune location for the relocated lake. While still relatively close to Airport property, it is not within the immediate approach/departure area for the runway. These parcels are within the floodplain of Little Osage Creek where the existing hydrology, and existing ponds, may readily accommodate development of a new lake. The proximity to the Airport also allows for any suitable material excavated from the new lake site to be placed as fill in the old lake. Cursory review indicates that the needed RSA grading and stabilization associated with a 589-foot runway extension could be accomplished without impacting this flood area. Should any modification to the floodway be needed, overall program coordination with the COE and FEMA would include permitting and mitigation for both Lake Bentonville and modifications to the floodway.

Extending the runway to the north would shift all of the associated airspace protection surfaces further north. The Part 77 Approach Surface would provide less clearance over the buildings north of SW 14th Street, however, it appears that the clearance would still be adequate to meet

standards. Adequate clearance over the roadway (i.e. road elevation plus 15 feet public road buffer) would also be maintained. The 40:1 TERPS Departure Surface to Runway 36 would shift closer to the utility pole located approximately 0.4 miles northwest of the runway end at the intersection of SW I Street and SW 14th Street. This could potentially affect instrument departure procedures to the north.

A preliminary estimate of program costs for this alternative are summarized in **Table 5-1**.

Table 5-1. Alternative 1 Program Cost Estimate

Item	Cost ($)	Basis
Program Definition/Feasibility Study	$100,000	Comparable Study
NEPA Environmental Assessment	$400,000	Comparable Study
Land Acquisition		
Minimum for Airfield Needs	$3,200,000	32 ac. @ $100,000 per acre
Lake and Park Relocation	$3,400,000	20 ac. @ $170,000 per acre
Fees and Services	$660,000	Assume 10% of Cost
Business Relocation	$ 0	None needed
Construction		
Lake Relocation & Mitigation	$7,500,000	185,400 CY @ $40 CY
Runway Extension	$3,000,000	5,000 SY @ $600 SY
Design/Bid/Construction Management		
Lake Relocation/Mitigation	$1,350,000	Assume 18% of Construction
Runway Extension	$540,000	Assume 18% of Construction
Lake/Wetland Monitoring and Maintenance	$150,000	3 yrs. @ $50,000 ea.
Total Estimated Program Costs	**$20,300,000**	

Sources: Morrison-Shipley Engineers, Kimley-Horn and Associates. Prepared: August 2015

5.3.2 Alternative 2. 589' South Extension

This alternative extends the runway pavement 589 feet to the south and is depicted in **Exhibit 5-2**. The corresponding shift of the RSA would remain on current Airport property, however, the ROFA and OFZ would extend off Airport property to the west. This property acquisition is within the same footprint for Alternative 1, so property needs in this area are the same for both alternatives (approximately 10 acres). Property for the protection of the northern RPZ would still be needed, but the minimum amount would be 9 acres as compared to the 22 acres for Alternative 1. The southern RPZ (supporting B-II aircraft with approach minimums not lower than 1 mile) would extend across SW Regional Airport Boulevard and require a minimum property acquisition of 9 acres. This in turn would necessitate the relocation of a Shell gas station (corner of SW H Street and SW Regional Airport Boulevard) and adjacent commercial spaces which would require an additional 4 acres of land for the new site. In addition, there are other developments underway west of the gas station (a pediatric dental clinic on the west side of SW H Street). Construction is also underway as of August 2015 of an apartment complex with approximately 490 units east and south of the gas station off of SW F Street. While the apartment complex would not require relocation, it would be impacted by the development.

If the southerly runway extension were to receive funding assistance from the FAA, relocation of the commercial businesses would need to be carried out in accordance with 49 CFR Part 24 *Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs* which ensures consideration of fair market value and provides for compensatory relocation assistance.

In the interest of public safety, the FAA discourages public roadways being located within an RPZ. Both SW Regional Airport Boulevard (a five-lane road) and SW H Street (a two-lane road) would be within the relocated RPZ. As of mid-2015, the FAA is updating its guidance concerning incompatible land uses within an RPZ. For this alternative, it is assumed that these roads would require relocation out of the RPZ limits. It is believed that neither the City nor Arkansas State Highway and Transportation Department would support a realignment of SW Regional Airport Boulevard/AR Highway 12 especially considering the ongoing widening and the proximity of its intersection with SW I Street (another five-lane road). This project was just funded at approximately $35 million including both SW I Street intersection and expansion as well as SW Regional Airport Boulevard/AR Highway 12 expansion. The land along SW Regional Airport Boulevard/AR Highway 12 has high value as commercial frontage property with current estimates of $9/SF for raw land on this roadway. There is additional commercial development currently underway on this frontage property including the pediatric dental clinic previously noted among other plans in the area. SW H Street would require closure from the current intersection of SW Regional Airport Boulevard/AR Highway 12 to the relocated stretch of roadway, reducing access to the properties south of SW Regional Airport Boulevard/AR Highway 12. There is currently a McDonald's at the intersection of the existing Regional Airport Boulevard/AR Highway 12 and SW I Street whose access would be impacted by the realignment as well as its value since it would no longer be on the frontage of Regional Airport Boulevard/AR Highway 12.

Extending the runway to the south would shift all of the airspace protection surfaces further south as well. If SW Regional Airport Boulevard were to remain in its exiting alignment, the shifted 34:1 Part 77 Approach Surface would not provide adequate clearance over the roadway

(i.e. roadway elevation plus 15 feet public road buffer). It is likely that existing buildings and additional utility poles located to the southeast and southwest of Airport property, along SW Regional Airport Boulevard, could also impact the 40:1 TERPS Departure Surface to Runway 18. These surfaces would also extend over the new apartment complex and as aircraft turn to the west off of the approach, they would overfly the Community Recreation Center.

As described in **Chapter 2**, the National Wetland Inventory identified pockets of wetlands on Airport property directly south of the runway. These wetlands appear to be approximately one acre in size and would have to be filled and property mitigated through the COE Section 404 permitting process.

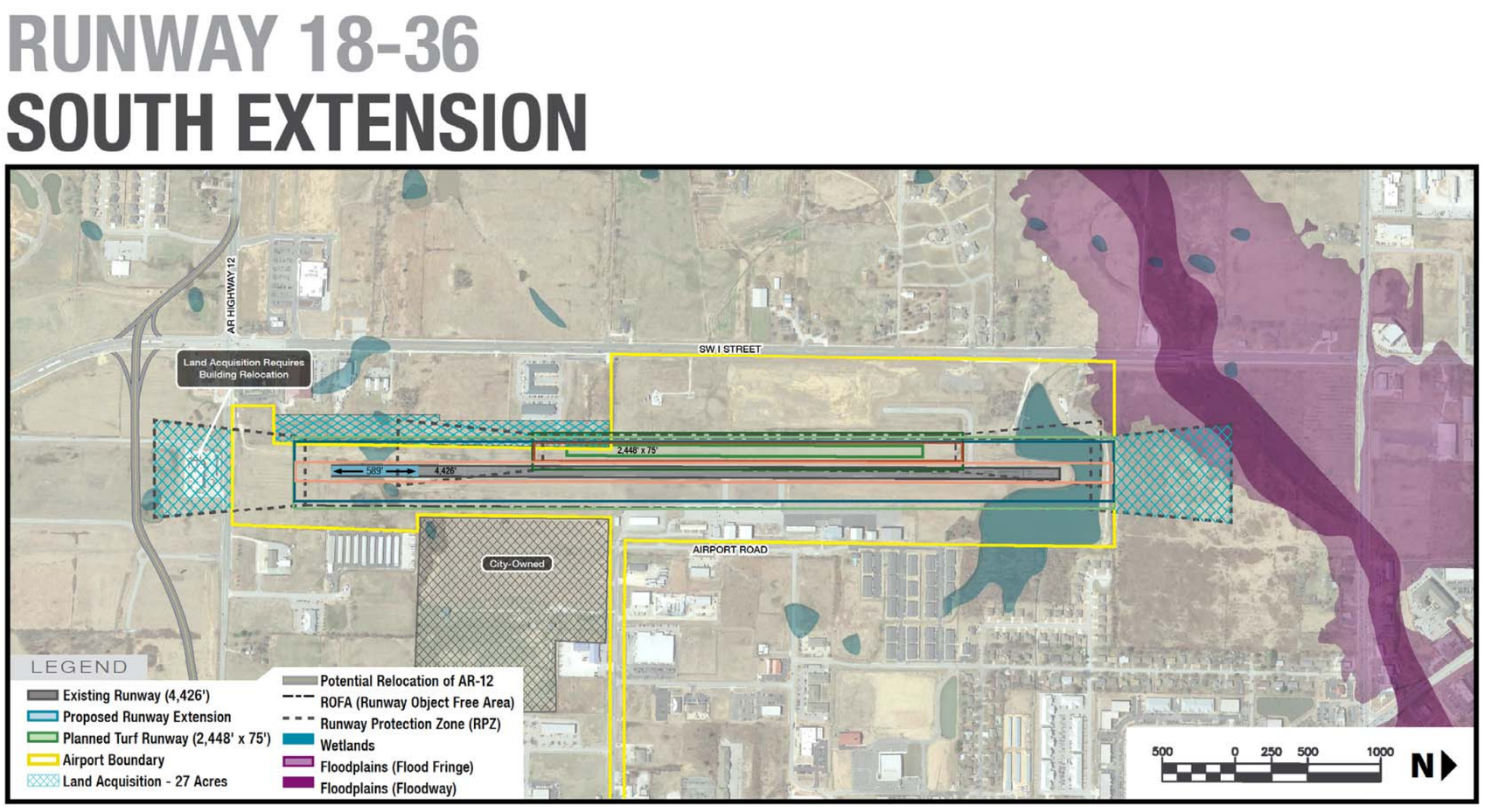
A preliminary estimate of program costs for this alternative are summarized in **Table 5-2**.

Table 5-2. Alternative 2 Program Cost Estimate

Item	Cost ($)	Basis
Program Definition/Feasibility Study	$100,000	Comparable Study
NEPA Environmental Assessment	$400,000	Comparable Study
Land Acquisition for Airfield Needs		
South RPZ (minimum)	$1,530,000	9 ac. @ $170,000 per acre
North RPZ and Southwest (minimum)	$1,900,000	19 ac. @ $100,000 per acre
Fees and Services	$343,000	Assume 10% of Cost
Business Relocations (4)		4 businesses
Property Acquisition (relocation site)	$748,000	4 ac. @ $170,000 per acre + 10% fees
Relocation Assistance	$260,000	4 business @ 65,000 ea.
Design/Bid/Construction Management	$1,328,400	Assume 18% of Construction
Site Construction	$7,380,000	12,300 SF of building @ $600 SF
Demolition of Old Site	$738,000	Assume 10% of Construction
Road Relocation (3,800 LF - 5 lanes)		
Property Acquisition (including ROW)	$3,740,000	20 ac. @ $170,000 per acre + 10% fees
Construction (including intersection)	$2,280,000	3,800 LF @ $600LF
Design/Bid/Construction Management	$410,400	Assume 18% of Construction
Wetland Mitigation	$40,000	1 ac. @ $40,000 per acre
Runway Extension		
Design/Bid/Construction Management	$540,000	Assume 18% of Construction
Runway Extension	$3,000,000	5,000 SY @ $600 SY
Total Estimated Program Costs	**$24,737,800**	

Sources: Morrison-Shipley Engineers, Kimley-Horn and Associates. Prepared: August 2015

Exhibit 5-2. Alternative 2 – 589’ South Extension



5.3.3 Comparison and Recommendation

It is assumed that both alternatives equally accommodate the existing and projected Airport activity levels and equally support the City's and Airport Advisory Board's goals and vision for the Airport. The alternatives were evaluated on several quantitative and qualitative aspects that are considered important to the various Airport stakeholders including the owners, operators, tenants, pilots and surrounding community. Relevant evaluation criteria were identified from:

- City, Airport Advisory Board and FAA input throughout the duration of the project
- Tenant and user input during the inventory process
- User and public input during the community outreach process
- Professional experience from master planning efforts at similar airports

In a side-by-side comparison of the two runway extension alternatives, it becomes evident that:

- Both extensions would require approximately 52 acres of land acquisition, however, the northern property is undeveloped except for the lake and generally more compatible.
- A southerly extension would require the relocation of a commercial development and at least three existing businesses, as well as impacts to ongoing construction of an apartment complex and another business. To meet current FAA standards, SW Regional Airport Boulevard/AR Highway 12 would require realignment and/or relocation to maintain a clear RPZ to the south. This road was just realigned by the City and the Arkansas State Highway and Transportation Department at a cost of more than $35 million. These relocations and realignments would add community disruption and financial complexity to the program.
- An extension to the north would require at least partial filling of Lake Bentonville which could add environmental and engineering complexity to the project. With the lake being a public amenity, its relocation could result in some level of community disruption. Filling the lake, however, would reduce a hazardous wildlife attractant and could result in additional on-airport developable land. This land could become a source of additional revenue to be used for the ongoing maintenance and operation of the Airport.
- The northern extension is roughly $4 million less than a southern extension, primarily due to the need to relocate SW Regional Airport Boulevard/AR Highway 12 and the businesses along that major roadway.

The evaluation criteria and these differences are summarized in **Table 5-3**. A ✚ indicates which alternative exhibits the more favorable characteristics within each criteria. The alternative with the more positive characteristics becomes the *preferred alternative*. Both alternatives have their challenges. Going north has environmental complications and going south has community and business complications. However considering the operational safety benefits of the northerly extension, for both aircraft and persons on the ground, and the fact that the relocation of Lake Bentonville has been previously explored by the City and state agencies, Alternative 1 is recommended as the preferred alternative. This is also consistent with the previously FAA-reviewed 2010 ALP.

Table 5-3. Comparison of Alternatives

Evaluation Criteria	Alt. 1 North Extension	Alt. 2 South Extension
Community Disruption Quantitative and qualitative impacts related to the displacement and/or relocation of residences, businesses or public amenities. The more facilities/tenants displaced, the higher the chance of increased project complexity, inconvenience and duration.	✚ No business relocations	
Implementation Cost Estimated total program cost including land/easement acquisition, design, NEPA approval, permitting, construction, wetland mitigation, lake relocation, airspace protection, demolition and replacement of relocated facilities, and construction services.	✚ 18% less expensive	
Environmental Complexity Includes potential long-term impacts to natural resources such as water quality, habitats, and hydrology (e.g. wetland conversion and lake relocation).		✚ Less impact to waters of the U.S
Operational & Safety Concerns Includes wildlife hazard mitigation, compatible land use and airspace protection. Also includes potential impacts to pilot situation awareness.	✚ Removes a wildlife attractant, compliant RPZs	
Development Flexibility & Expandability Includes ability to accommodate changing market demands and any areas gained that are suitable for additional revenue generating development or to accommodate unforeseen user demands.	✚ Additional runway length and developable space	
Constructability / Ease of Implementation Reflects the relative ease of which the facilities can be constructed with standard methods and materials. Community disruption and environmental concerns can also affect the ease of implementation.	✚ Historical planning and agency coordination	

Sources: Kimley-Horn and Associates. Prepared: August 2015

5.4 Taxiway System Alternatives

As described in **Chapter 4**, the existing runway connector taxiways at VBT do not meet current FAA design standards. The taxiway evaluation also recommended that full length parallel taxiways be developed to improve circulation and safety while reducing runway occupancy time from aircraft that must currently back-taxi along the runway. Currently, over 60 aircraft are based in facilities on the east side of the airfield. Recent and planned facilities for the west side of the airfield are projected to accommodate approximately 50 additional aircraft over the planning horizon. Amenities for transient aircraft operators will likely be provided on both sides of the airfield as well. With the various tenants and users being distributed somewhat equally on both sides of the Airport, parallel taxiways on both sides of Runway 18-36 would be ideal. Compared to having a parallel taxiway on just one side, this would reduce the need to cross the runway to access the parallel taxiway to access the runway thresholds.

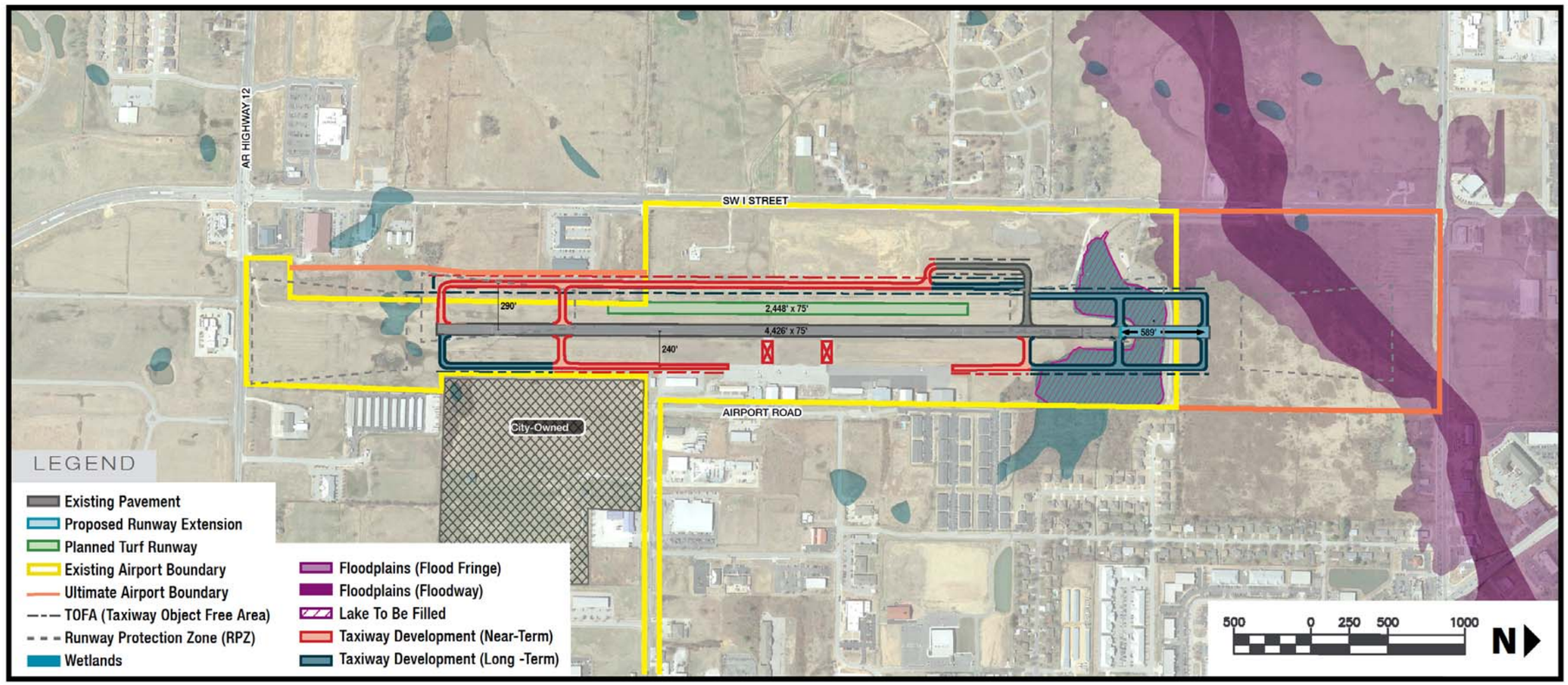
Constructing a full length parallel taxiway on the west side of the airfield would require at least partial filling of Lake Bentonville and approximately 10 acres of property acquisition along the southwest side of the airfield to accommodate the FAA required taxiway object free area (TOFA). For VBT, the FAA standard runway to taxiway separation distance is 240 feet. As previously described, the preliminary design of the turf runway and associated Modification of Standards account for a western parallel taxiway located 285 feet from Runway 18-36 and 150 feet from the turf runway. This distance is less than that of the existing, western partial parallel taxiway. To protect the investment in the partial parallel taxiway, and to provide additional by-pass capability in this area (which is also where a future FBO, transient apron and general aviation terminal is planned to be located), the existing partial parallel taxiway will likely remain and be tied into any future full parallel taxiway.

Constructing a full length parallel taxiway on the east side of the airfield would also require at least partial filling of Lake Bentonville. With a standard 240-foot separation, and a standard 131-foot TOFA, approximately 65 percent of the existing east side apron area would become unusable. This would include the tie-downs near the existing FBO/terminal building. Currently, the eastern apron has no designated taxiways or taxilanes and the pilots are responsible for maintaining safe maneuvering clearance. In lieu of placing a taxilane or taxiway along the existing apron edge, partial parallel taxiways to the north and south of the apron could be developed to provide access to the runway thresholds. At some point in the future, if activity levels reach the point where a continuous parallel taxiway is needed on this side of the airfield, the tie-downs would need to be relocated and the taxiway portion of the apron pavement marked accordingly. An initial phase of the partial parallel taxiways could be accomplished with the relocation of the existing connector taxiways, which need to be removed as they do not meet current FAA taxiway design standards. The location of the new connectors would need to be coordinated with the turf runway in order to establish cross-field circulation corridors and logical exit taxiways for Runway 18-36. This initial phase could likely be accomplished without any filling of Lake Bentonville.

With consideration of existing Airport infrastructure, the planned turf runway and the somewhat constrained nature of the Airport site, the planning become more a question of which taxiway segments to build first. Constructing partial parallel taxiways on both the east and west sides of the airfield will mitigate the existing non-standard connectors and facilitate the west side hangar and apron development needed to meet the growing demand for aviation facilities. This will also

alleviate some of the back-taxiing on the runway. Pending land acquisition to the west of the Runway 36 threshold, the western parallel taxiway could also be extended to southern end of the runway pavement. The closure and filling of Lake Bentonville, and acquisition of property to the north of existing boundary, would accommodate both the recommended northerly extension of Runway 18-36 and development of parallel taxiways to the new northern end of pavement. The western segment would likely be a higher priority than the eastern segment due to the location of the planned transient aircraft facilities and general aviation terminal. Ultimately, as warranted, completion of the full length eastern parallel taxiway segments could be pursued. Development of the taxiway system in this manner is depicted in **Exhibit 5-3**.

Exhibit 5-3. Taxiway Development Recommendations



5.5 Environmental Overview

In 1969, U.S. Congress passed the National Environmental Policy Act (NEPA) that requires the "federal government to use practicable means to create and maintain conditions under which man and nature can exist in productive harmony." Section 102 of the Act requires federal agencies to incorporate environmental considerations in their planning and decision-making by using a systematic interdisciplinary approach. Additionally, the Council on Environmental Quality regulation 1501.2 states that, "Agencies shall integrate the NEPA process with other planning at the earliest possible time to ensure planning and decisions reflect environmental values, emphasize cooperative consultation among agencies before the environmental assessment is prepared; and identify significant environmental issues deserving of further study."

Due to the FAA's participation in airport planning and development projects, airport sponsors are thereby obligated to incorporate the NEPA process into their development programs. Consistent with FAA AC 150/5070-6B *Airport Master Plans*, environmental factors have been considered throughout the preparation of this MPU. Known environmental resources and concerns were inventoried at the beginning of the study and environmental considerations and land use compatibility were then incorporated into the evaluation of alternative development concepts.

The purpose of this environmental overview is to:

- Identify what future NEPA environmental processes and approvals may be needed to implement the development program described in this MPU, and
- Provide a cursory review of the local environmental conditions and identify what environmental factors could potentially be affected from the recommended Airport development

5.5.1 NEPA Environmental Review Process

NEPA requires all federal agencies to assess and disclose – to the public – significant environmental impacts relating to federally funded or federally approved actions. Much of the recommended Airport development program would be considered a "federal action" and would require compliance with the FAA environmental process. The FAA provides guidance for such evaluation through FAA Order 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* and FAA Order 1050.1E *Environmental Impacts: Policies and Procedures*. As described in these orders, proposed airport development projects subject to NEPA guidelines are evaluated, based on their potential to result in significant environmental impact. There are three levels of NEPA processing:

- Categorical Exclusion (CATEX) – This applies to those actions that have been found by the FAA (under normal circumstances) to have no potential for significant environmental impacts.
- Environmental Assessment (EA) – For actions that do not qualify as a CATEX, an EA is prepared to determine whether a proposed action has the potential to significantly affect the environment. If an EA indicates that a proposed action will not result in significant impacts, a Finding of No Significant Impact (FONSI) would be prepared by the FAA. If through the EA process it is determined that further study is needed, or that the action has

the potential for significant environmental impacts, an Environmental Impact Statement would then be prepared.

- Environmental Impact Statement (EIS) – An EIS is prepared for major federal actions that are likely to have significant environmental impacts. While similar in structure to an EA, an EIS includes mandatory agency coordination and community outreach that is used to inform and educate the public of the proposed action and potential environmental effects. The public participation is a key component of the agencies' decision making process. Major airport actions can include new airports, new runways, and runway extensions or other projects that have significant environmental or community impacts.

Pending further coordination with the FAA and barring any unforeseen extraordinary circumstances, it is anticipated that several recommended improvements will be able to be pursued under the CATEX designation, while others are likely to require an EA. Development of the turf runway, taxiway development, and associated property acquisitions are likely to require an EA, while hangar and apron development could likely be pursued under a CATEX. The runway extension, or any development that includes filling or alteration of Lake Bentonville, will likely require an EA, but potentially an EIS depending upon the agency coordination that is conducted and the public input. It is possible that the FAA may prefer to prepare an EA that collectively evaluates all projects anticipated during the near-term (±5 year) planning horizon. For that reason, the implementation and funding plan presented in **Chapter 6** includes provisions for performing a comprehensive EA for all projects recommended in the near-term planning horizon. The runway extension is not likely to occur in the near-term and would be evaluated separately to determine the appropriate level of environmental analysis that is required.

5.5.2 Environmental Factors

FAA Order 1050.1E and *Environmental Desk Reference for Airport Actions* describe the resource/impact categories that must be considered in an FAA environmental review. Though not evaluated to the level of detail required for official NEPA processing, the following explores the potential for impacts resulting from the recommended Airport development program within the various environmental categories.

Air Quality

The United States Environmental Protection Agency (USEPA) is the federal agency that has jurisdiction over air quality issues and regulations. The Federal Clean Air Act (CAA) (42 U.S.C. §§ 7401-7671q) has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. These six pollutants are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$) and sulfur dioxide (SO_2). Geographic areas where these standards are not met for the preceding criteria pollutants are designated as "nonattainment areas." A nonattainment area is defined by the CAA as a locality where air pollution levels persistently exceed NAAQS or contributes to ambient air quality in a nearby area that fails to meet standards. The CAA Amendments of 1990 require federal agencies to ensure their actions conform to the appropriate State Implementation Plan (SIP).

The SIP provides for the implementation, maintenance, and enforcement of the NAAQS, and includes emission limitations and control measures to attain and maintain the NAAQS. Conformity is defined as demonstrating that a project conforms to the SIP's purpose of eliminating or reducing the severity and number of violations of the ambient air quality standards

and achieving expeditious attainment of such standards. Individual states containing nonattainment areas must prepare a SIP to meet or exceed NAAQS for the pollutants within the timeframe established by the CAA.

The State of Arkansas contains one nonattainment area, located in Crittenden County.[3] VBT is located in Benton County which is approximately 200 miles west of Crittenden County. While a temporary increase in emissions from construction activities may occur, the recommended Airport improvements are not anticipated to result in any significant impacts on air quality within the region or state. Additionally, according to FAA guidance[4], an air quality analysis for NEPA purposes would only be required if the airport experienced more than 1.3 million annual enplanements, more than 180,000 general aviation operations or if the action would increase automobile traffic congestion at off-airport road intersections to a level of service of D, E or F. According to the activity forecasts presented in **Chapter 3**, VBT will remain below these activity levels throughout the 20-year planning horizon.

Noise

Aircraft noise is generally one of the most prominent and controversial environmental issues associated with airport development and operation. The FAA requires the use of a decibel (dB) based measure of noise exposure, called the Day-Night Average Sound Level (DNL), to describe community exposure to airport-related noise when conducting any federal planning or environmental study. In simple terms, DNL is the average noise level over any number of days. To reflect the added intrusiveness of nighttime noise events that result from community background noise levels decreasing at night – defined as 10 p.m.-7 a.m. – those aircraft operations are artificially increased by 10 dB. The extents of noise exposure have historically been modeled using a computer-based program—the Integrated Noise Model (INM). Using aircraft operation counts; as well as the flight paths and profiles, and noise and performance information, the INM identifies contours of the forecasted daily sound levels around the airfield. Generally speaking, all land uses are acceptable in areas with noise exposure less than 65 DNL (i.e. beyond the limits of the 65 DNL contour). Residences, schools, churches and other noise-sensitive land uses are considered non-compatible within the 65 greater DNL contour.

In May 2015, the FAA released the Aviation Environmental Design Tool (AEDT), Version 2b to replace the INM, the Emissions and Dispersion Modeling System (EDMS), and AEDT 2a (a regional noise analysis model). The new AEDT 2b is now the single required model for evaluating environmental compliance of airport actions. This system will be required to be used for future noise and air quality modeling, although it was not implemented for the VBT MPU due to timing and exclusion of modeling from the scope of work.

Noise contours for 2002 and 2022 were developed as part of the 2003 Master Plan. This analysis was based on a 2022 activity level of 41,400 annual aircraft operations with approximately 4,100 of those being by jet aircraft. The 2003 Plan identified the future 65 DNL contour to remain mostly on Airport property and that surrounding land uses were compatible with future Airport development. The 2003 Plan did, however, note two churches located in the vicinity of the Airport but beyond the future 65 DNL. One church is located southwest the airfield at the intersection of SW I Street and SW Regional Airport Boulevard. The other is located northeast

[3] USEPA Green Book, http://www.epa.gov/air/oaqps/greenbk/anayo_ar.html, accessed 6/22/15
[4] FAA *Environmental Desk Reference for Airport Actions*, 2007

of the airfield at the intersection of SW D Street and SW 18th Street. Since 2003 there are numerous additional churches that have located around the Airport including another near the intersection of SW I Street and SW Regional Airport Boulevard that would be impacted by a runway extension to the south.

This MPU forecasted 43,400 total annual aircraft operations for 2035, with approximately 3,600 by jet aircraft. While no updated noise contours were prepared as part of this study, considering the new forecast activity levels, it is believed that any new analysis would turn out similar results to the 2003 Plan. Development of the turf runway would likely shift the noise contours slightly wider to the west and closer to SW I Street. Development of parallel taxiways could also widen the contours slightly as aircraft would no longer taxi solely along the runway. One area of possible concern is the residential development to the east of the airfield along SW Ruby Road, however, additional study would be needed to determine any impacts. Extension of Runway 18-36 to the north would extend the 65 DNL contour further onto the undeveloped, agricultural zoned property which is considered a compatible use. Extending the runway to the south would shift the 65 DNL contour closer to the existing church located southwest of the airfield, as well as the underway apartment complex, which could be considered an adverse community impact.

Coastal Resources

The National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management (OCRM) administers the Coastal Zone Management Act (CZMA). Coastal zones are waters and bordering areas in states along the coastlines of the Atlantic Ocean, Pacific Ocean, Gulf of Mexico and the Great Lakes.

The United States Department of the Interior, through the United States Fish and Wildlife Service (Service), has primary authority in the implementation of Coastal Barriers Resources Act (CBRA). Coastal barriers are geologically-unstable islands that cannot support development, but protect the mainland, fish, wildlife, human life and property along the coastline.

The CZMA and the CBRA govern federal activities involving or affecting coastal resources. The Airport is located in Bentonville, Arkansas, which is not located within the vicinity of a coastal zone or coastal barrier. Therefore, these requirements do not apply to the Airport.

Compatible Land Use

As noted in **Chapter 2**, existing and future land uses surrounding VBT are comprised mostly of low and medium density residential, commercial, agricultural, and mixed-use development. The western border of the Airport is comprised of commercial, mixed-use, and medium density residential land. While the northern border is entirely agricultural land, the eastern border is comprised of residential, commercial, and office. The southern boundary is mixed-use, commercial, and office.

In accordance with FAA Order 1050.1E, the compatibility of existing and planned land uses in the vicinity of an airport is focused on two main issues: noise in the community and the safety of persons and property both on the ground and in the air. The FAA requires that airport sponsors seek compatible uses for the land surrounding an airport through appropriate positive control (fee-simple or easement acquisition) and coordinated zoning and municipal planning efforts.

For that reason, this MPU recommends fee-simple property acquisition to the southwest and north of the airfield to accommodate the OFZ, ROFA, RPZ and Part 77 Primary Surface requirements for the existing Runway 18-36 and the planned turf runway. The preferred northern extension of the paved runway would increase the amount of property required to the north. As discussed previously, that property is undeveloped and zoned for agricultural uses. Conversely, if the runway were extended to the south, the RPZ would extend across a 5-lane public road and require the relocation of gas station/convenience store and other commercial developments.

Portions of the public amenities associated with Lake Bentonville are within the RPZ to the planned turf runway. Lake Bentonville also has the potential to attract wildlife, including large waterfowl, to the immediate northern approach and departure area. With this in mind, the northern runway extension that includes relocating the lake has the added benefiting of removing a potentially hazardous wildlife attractant.

Considering these issues and the community noise issues described previously, the ongoing and recommended Airport improvements, including the runway extension to the north, appear compatible with the surrounding land uses. The one area of concern is the residential units that were allowed to be developed directly adjacent to the Airport property along SW Ruby Road. As aircraft activity increases over time, the Airport Advisory Board and City should strive to maintain an amenable working relationship with these neighbors.

Construction Impacts

Construction related environmental impacts are temporary in nature and cease once construction is complete. Common impacts resulting from airport construction projects include increased vehicular traffic on roadways, noise from construction equipment, noise and dust from delivery of material through local streets, air pollution from construction equipment exhaust and dust, and erosion that may have effects on surrounding water bodies. To mitigate these potential impacts, construction activities will need to be conducted in accordance with FAA Advisory Circular 150/5370-10, *Standards for Specifying Construction of Airports*. In particular, "Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control" and Stormwater Best Management Practices (BMPs) will need to be incorporated into the various project plans.

During construction of the recommended Airport improvements, regardless of the alternatives selected, there would be an increase in roadway traffic associated with construction-related activities, particularly along SW I St. The majority of the traffic would be associated with delivery of construction materials and grading/earthmoving. The effects on traffic would be temporary in nature, and would not be significant when compared with total traffic volumes in the area. There are residential areas to the northeast and northwest of the airfield within which construction related noise may be heard. This will also be temporary in nature and can be mitigated through managing the time of day that construction occurs.

Sections 4(F) and 6(F) Resources

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

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

Lake Bentonville is located on Airport property and is managed by the Arkansas Game and Fish Commission. Lake Bentonville Park is open to the public, used for recreational fishing, and includes a playground and picnic area. It was constructed in the 1960's and according to City staff "may" have been developed with federal funding assistance.

As described previously, the RPZ for the planned turf runway will encompass a portion of the park including the parking lot and one of the fishing piers. The preferred northern runway extension and any associated full-length parallel taxiway development would impact both the lake and the park. Further research into the funding sources for the development of Lake Bentonville Park would be needed during any future environmental evaluations. All development within this area will require coordination with the City's Parks and Recreation Department, the U.S. Army Corps of Engineers, the Arkansas Game and Fish Commission, and the United States Department of Agriculture (USDA) – National Resources Conservation Service (NRCS). The most important issue is the determination of "significance" of this resource to its owner, the City, and to the Commission that is managing the facility.

Prime Farmlands

The Farmland Protection Policy Act (FPPA) of 1981 authorizes the USDA to minimize federal programs' contribution to unnecessary and irreversible conversion of farmland to nonagricultural uses. Prime farmland, as defined by the USDA, is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. According to the FPPA (PL 90-542), lands already committed to urban development or water storage do not meet the definition of prime or unique farmland. In conjunction with the Arkansas Natural Resource Commission, the USDA-NRCS has jurisdiction over farmlands in Arkansas.

As described in **Chapter 2**, much of the property surrounding the Airport is zoned for a mix of commercial and residential uses. The undeveloped parcel immediately north of the airfield, which is recommended for acquisition to protect the existing and future RPZs to Runway 18-36, is zoned for agricultural uses but is not currently in crop production. A northern extension of the runway would convert portions of this parcel to airfield use, including new runway pavement and RSA grading, and would require the filling/relocation of Lake Bentonville. During any future formal NEPA process, coordination should be undertaken with the NRCS to identify the presence of soils or land that could be considered prime farmland. If so, a Farmland Conversion Impact Rating Form (AD-1006) may need to be completed.

Biotic Resources and Endangered Species

Biotic resources include the various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, marine mammals, coral reefs, etc.) in a particular area. Biotic resources also include rivers, lakes, wetlands, forests, upland communities and other habitat types supporting the identified flora and fauna.

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

The U.S. Fish and Wildlife Service (USFWS), in conjunction with the Arkansas Game and Fish Commission, has jurisdiction over federal and state listed endangered and threatened species in Arkansas. According to the USFWS[5] there are 32 threatened and endangered (T&E) species, 27 animals and five plants, known to exist in the State. Of these, the 11 species listed in **Table 5-4** have been inventoried in Benton County. The proposed Airport improvements will occur mostly on developed and maintained portions of Airport property, which have very little potential to support significant biotic habitats. The exception would be the northerly runway extension which would affect Lake Bentonville which has the potential to support aquatic species. The nearby Little Osage Creek and associated floodplain also have the potential to support biotic communities. The relocation of Lake Bentonville closer to the Little Osage Creek has the potential to improve any habitats in that area.

Table 5-4. Threatened & Endangered Species Inventoried in Benton County

Species
Ozark Cavefish (Troglichthys rosae)
Cave Crayfish (Cambarus aculabrum)
Bald Eagle (Haliaeetus leucocephalus)
Gray Bat (Myotis grisescens)
Indiana Bat (Myotis sodalis)
Ozark Big-Eared Bat (Corynorhinus townsendii ingens)
Neosho Mucket (Lampsilis rafinesqueana)
Arkansas darter (Etheostoma cragini)
Rabbitsfoot (Quadrula cylindrica cylindrica)
Piping Plover (Charadrius melodus)
Northern Long-eared Bat (Myotis septentrionalis)

Sources: USFWS, Arkansas Ecological Field Service Office. Prepared: August 2015

Floodplains

Executive Order 11988 directs federal agencies to "take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains". Department of Transportation (DOT) Order 5650.2, Floodplain Management and Protection, contains DOT's policies and procedures for implementing the Executive Order. The Executive Order and the DOT order establish a policy to avoid taking action within a 100-year floodplain, where practicable. The Federal

[5] USFWS Arkansas Ecological Field Service Office, http://www.fws.gov/arkansas-es/te.html, accessed 6-24-2105

Emergency Management Agency (FEMA) has published Flood Insurance Rate Maps (FIRM) in support of the National Flood Insurance Program for the U.S.

As identified in **Chapter 2**, there are areas designated as Floodways and Flood Fringes on the very northwest corner of Airport property and adjacent properties. FEMA notes that floodways include the channel of a river/watercourse and adjacent land areas which in an unobstructed condition can discharge a 100 year flood/Base Flood without any increase in water surface elevations. The area between the floodway boundary and limit of the 100 year floodplain is termed Flood Fringe. The Flood Fringe encompasses the portion of a floodplain that could be completely obstructed without increasing the water surface elevation of a 100 year flood event more than 1 foot at any point.

The recommended on-airport development would not impact the Floodway or Flood Fringe areas. The recommended north runway extension and any associated full-length western parallel taxiway would, however, be near the limits of the Flood Fringe. As defined, such limited development on or near the Flood Fringe would likely have little to no impact in the event of a 100-year flood. Additional field delineation would be needed during future NEPA or design efforts to confirm the actual extents of the Fringe area and possible impacts. Any relocation of Lake Bentonville closer to the Floodway would need to be designed to appropriately manage stream and Floodway elevations and flows.

Hazardous Materials

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

According to the U.S. Environmental Protection Agency (USEPA) Envirofacts website[6], there are six facilities or sites in the vicinity of the Airport that could contain hazardous material concerns. These include two facilities, located east of the Airport along Interstate 71/South Walton Boulevard, that generate or transport hazardous wastes. One is an auto dealership and the other is a farm implement dealership. Both are categorized as *conditionally exempt small quantity generators*, generating less than 100kg of hazardous waste per month. There are also four facilities with expired National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits can be temporary or ongoing in nature and are to help control water pollution by regulating *point sources* that discharge pollutants into waters of the United States. Point sources are commercial, industrial or municipal facilities with discrete conveyances such as pipes or man-made ditches. Three of these sites are also along South Walton Boulevard, and the other is located immediately west of the Airport along SW I Street (Vintage Estates). The proposed on-

[6] USEPA Envirofacts, http://www.epa.gov/enviro/, accessed 6-24-15

airport development and land acquisition, including that needed for the northerly runway extension, would not impact any of these sites.

There is also a gas station located immediately south of the airfield, along SW Regional Airport Boulevard. Though highly monitored and regulated, gas stations sites have the potential to become contaminated through the handling and storage of petroleum products. According to the USEPA Enforcement and Compliance History Online (ECHO) database[7], this gas station has had no violations or concerns to date. The proposed airport improvements will not affect this site, however, the alternative of extending Runway 18-36 to the south would require the closing and demolition of the gas station and associated commercial buildings.

Prior to any FAA funded land acquisition, an Environmental Due Diligence Audit (EDDA) would need to be performed on the prospective property. An EDDA is a systematic investigation of real property to determine if activities involving hazardous materials have occurred at a site or resulted in environmental contamination. Guidance on EDDA requirements are contained in FAA Order 1050.19, *Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions*.

Solid Waste

The Solid Waste Disposal Act (42 USC Section 6903(27)) describes that solid waste includes garbage, refuse or sludge from a waste treatment plant, water supply treatment plant or an air pollution control facility and can also include solid, liquid, semisolid or contained gaseous material resulting from industrial, commercial, mining, agricultural or community activities.

For the most part, solid waste generated at the Airport includes materials and refuse associated with aircraft and tenant operations. The amount of material generated will increase over time, commensurate with increased airport activity. This material can be readily disposed of through existing local collection channels. Construction activities will also generate additional waste on a temporary basis during the project duration. This additional waste is not anticipated to create any capacity problems within the local landfills.

Wetlands/Waters of the U.S.

Wetlands and the jurisdictional "Waters of the U.S." are protected under Sections 401 and 404 of the Clean Water Act (CWA) and Executive Order (EO) 11990, Protection of Wetlands. Agencies that regulate impacts on water resources within Arkansas include the U.S. Army Corps of Engineers (USACE), the USEPA, and the USFWS. The USACE is the primary regulatory authority enforcing Section 404 requirements.

Section 404 of the CWA regulates the discharge of dredge and fill material into U.S. waters and wetlands. This includes: fill for development; water resource projects – such as dams and levees; infrastructure development – such as highways and airports; and conversion of wetlands to uplands for farming and forestry. According the USEPA's Section 404(b) 1 guidelines, project proponents must avoid and minimize impacts to U.S. waters and wetlands at the project site to the maximum extent practicable. For those impacts that are determined to be unavoidable – compensatory mitigation may be required either through regional conditioning or on a case-by-

[7] USEPA ECHO database, http://echo.epa.gov/?redirect=echo, accessed 6-24-15

case basis. Mitigation could include replacement, purchasing credits in a wetland mitigation bank, or in-lieu fee.

As noted in **Chapter 2**, there are several wetlands identified on Airport property. These include:

- Lake Bentonville – Freshwater Pond, 10.5 acres, located north of Runway End 18 (there is one acre of lake that is beyond Airport property)
- Freshwater Forested/Shrub Wetland, 4.3 acres, located immediately east of Lake Bentonville
- Freshwater Emergent Wetland, 1.1 acres, located immediately south of Runway End 36
- Freshwater Emergent Wetland, 0.2 acres, located immediately south of Runway End 36
- Freshwater Pond, 0.2 acres, located immediately southwest of Runway End 36

The wetlands ecosystem includes those areas that affect or are affected by the wetland area itself (e.g., adjacent uplands or regions up and down stream). An activity may affect the wetlands indirectly by impacting regions above or below the wetland or by disturbing the water table of the area in which the wetland lies.

It is believed that the majority of recommended Airport improvements could be developed without impacting wetland or waterway resources. The proposed northern extension of Runway 18-36 would impact Lake Bentonville and its associated wetland areas. A southerly extension would also affect known wetland areas, although to a lesser quantity. Further field delineation of the wetlands, by a qualified wetland specialist, would be needed during any future NEPA evaluation or design process.

Light Emissions and Visual Effects

Light emissions associated with the operation of an airport typically include glare or flashing of airfield and terminal area lighting, aircraft lights, NAVAIDs, obstruction lighting, and parking and roadway facilities. Many of these lighting systems are needed to ensure the safe operation of aircraft in the air and on the ground. Others are needed to support the public use of the airport facilities and amenities. These emissions can have the potential to disturb surrounding residences, businesses, parks or recreational areas. To promote good relationships within the surrounding community, design and construction of airport facilities should give consideration to the potential impact of light emissions on nearby sensitive receptors.

Lighting associated with the recommended Airport improvements includes taxiway and runway lighting and signage, and hangar, apron and terminal area lighting. The proposed northerly extension of Runway 18-36 would place runway and taxiway lighting, as well as aircraft activity, closer to the residential areas located northeast of the airfield along SW D Street, SW E Street and SE F Street. Other than this area, there is little potential for adverse visual impacts considering the commercial land uses and major roadways adjacent to the Airport.

Natural Resources, Energy Supply, and Sustainable Design

FAA Order 1050.1E describes that adverse environmental impacts may occur when energy and natural resource consumption associated with airport development, both direct and indirect, exceeds available supply. This includes energy use by new structures and facilities, as well as changes in the operation of ground vehicles and/or aircraft.

The proposed Airport projects will not involve the use of any unusual or scarce materials and will not cause a demand for the use of any unusual natural resources or any resources that are in short supply. A northerly extension of Runway 18-36 would require the filling of Lake Bentonville which could take up to 185,000 cubic yards of fill. Ideally, relocation of the lake would provide a significant amount of suitable fill from the new site. Additionally, there are no known deposits of valuable natural resources located in or in the vicinity of the Airport that would be affected by the recommended improvements. The City of Bentonville provides the Airport with electrical power and natural gas is provided by SourceGas. Any new or expanded facilities will increase energy demand for these utilities, however, the increase is expected to be readily accommodated by local supplies.

Aircraft fuel is delivered to the Airport for storage prior to distribution. Fuel demands will increase commensurate with project increases in aviation activity. The proposed airport improvements are in response to the projected demand and any increase in fuel consumption is also expected to be accommodated by available supplies.

Executive Order 13123, Greening the Government through Efficient Energy Management (1999), encourages each federal agency to expand the use of renewable energy in its facilities and for its actions. Through the implementation of Leadership in Energy and Environmental Design (LEED) principles and practices, and other best management practices contained in the Sustainable Aviation Guidance Alliance (SAG) database[8], airports can support this Order. These practices also have the potential to reduce operating costs for the airport owner and tenants.

Induced Socioeconomic Impacts

Airport development actions can have both positive and adverse socioeconomic impacts on surrounding areas. According to FAA Order 1050.1E, primary socioeconomic impacts to be considered are those associated with the relocation of residences and businesses within the community and the disruption of transportation, planned development, or employment. The proposed Airport improvements are in response to projected demand and are not anticipated to cause any shifts in population or adverse impacts on public services or economic activity in the area. The ongoing Airport development will likely have a positive effect on the local employment and tax base. Though property acquisition is recommended, the preferred northerly extension of Runway 18-36 would not require the relocation of any residences or businesses. Conversely, a southern runway extension would require the relocation of at least three businesses to satisfy FAA RPZ and RSA standards. Any federally funded property acquisitions would need to be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, amended, which ensures fair market value and relocation assistance is provided without discrimination. Additionally, the State of Arkansas Property Code, §21.046 provides for relocation payments and advisory assistance to people who are displaced for projects undertaken by a state agency or political subdivision of the State.

Environmental Justice, and Safety Risks

Executive Order (EO) 12898 (U.S., 1994) requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. In July 1997, the U.S. Department of Transportation (DOT) issued its Final Order on environmental justice as

[8] SAGA, http://www.airportsustainability.org/

Executive Order 5610.2 (updated in 2012). This order is specific to the DOT, outlining their commitment to environmental justice principals and defining a program specifically created to implement these principals department-wide – including the FAA.

Order 5610.2 defines a minority population as "any readily identifiable group of minority persons who live in geographic proximity who would be similarly affected by a proposed program, policy or activity." The Council on Environmental Quality (CEQ) Environmental Justice Guidance under NEPA states that minority or low-income populations should be identified where either: the minority or low-income population of the affected area exceeds 50 percent; or the minority or low-income population percentage of the affected area is meaningfully greater than the minority or low-income population percentage in the general population.

Using the latest data from the U.S. Census Bureau American Fact Finder website[9], the census tract containing the Airport property (#206.04) and the surrounding tracts were evaluated for minority and low income populations. As identified in **Table 5-5**, all tracts have less than 50 percent concentrations of minority or low-income persons. Additionally, the tract containing the Airport has lower concentrations than Benton County as a whole. Adjacent tracts, however, appear to contain larger concentrations of minority and low-income populations. Considering the extent of proposed Airport improvements, the projected aviation activity levels, the land uses surrounding the Airport, and the fact that none of development alternatives require the relocation of any residences, it is believed that the ongoing Airport development will not disproportionately affect the demographic groups in question.

Table 5-5. Minority and Low-Income Populations by Census Tract

Census Tract / Area	Total Population (2010)	Minority Persons	Percent Minority	Percent Families Below Poverty Level (2013 Estimate)
206.03	5,519	1,327	24.0	2.1
206.04*	4,054	600	14.8	5.7
206.05	4,151	463	1.2	2.9
206.06	4,019	314	7.8	0.0
205.01	5,073	862	17.0	4.4
205.03	4,045	1,488	36.8	12.9
205.04	3,146	702	22.3	23.6
Benton County	221,339	38,522	17.4	8.7

*Census Tract the Airport is located in
Sources: US Census Bureau, Arkansas Geography Maps, http://www.census.gov/geo/maps-data/maps/2010ref/st05_tract.html
US Census Bureau, American Fact Finder, http://factfinder.census.gov Prepared: August 2015

Water Quality

Water quality guidelines are set forth in Section 401 of the Clean Water Act (CWA). The USEPA has authority to regulate water quality and require permits for actions that could adversely affect water quality. This is achieved primarily by issuing permits through the National Pollutant Discharge Elimination System (NPDES) under Section 401 of the CWA and

[9] US Census Bureau, American Fact Finder, http://factfinder.census.gov

for dredge and fill permitting under Section 404 of the CWA. The Arkansas Department of Environmental Quality (ADEQ) Water Division manages the NPDES process within the State.

NPDES permits are required for all point-source stormwater runoff from industrial activities. This includes airport activities such as deicing, fueling and maintaining aircraft. The City of Bentonville has obtained an NPDES Industrial Stormwater General Permit (ARR00C404)[10] that covers activities at VBT. All best management practices and monitoring requirements to be performed by the City and Airport are outlined in the permit. If the Airport were classified as "primary" commercial service airport with more than 10,000 annual enplanements and more than 1,000 annual jet departures, the facility would likely require its own NPDES permit.

Construction activities that loosen soil could potentially cause sedimentation in downstream water bodies during precipitation. This could result in increased water temperature and lower concentrations of dissolved oxygen, which could be detrimental to aquatic life. For development projects that disturb more than one acre of land, an NPDES Construction Site Stormwater Permit (OHC 000004) must be obtained from the ADEQ under the State's General Construction (ARR150000). This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP) specifically for construction-related impacts.

All of the proposed development, regardless of the various alternatives considered, will create new impervious surfaces that will result in increased stormwater runoff. Coordination with the ADEQ and the City's Engineering Department will be required prior to, and during construction. NPDES permits will need to be obtained or updated as appropriate. With sound design and construction practices, and the implementation of current stormwater BMPs, it is unlikely that the recommended Airport improvements will have any adverse impact to local or regional water quality.

Cultural Resources

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

The U.S. National Park Service is responsible for maintaining the NRHP and the Department of Arkansas Heritage[11] is responsible for implementing the NHPA within the state. These two agencies have listed 36 properties in Bentonville on the NRHP.[12] The two nearest properties are approximately one nautical mile to the northeast of the Airport. These include the Morris House (407 SW 4th Street) and the Bentonville Train Station (414 S. Main Street). There are also three historic districts in Bentonville, with the closest one to the Airport being the Third Street Historic

[10] Arkansas Dept. Of Environmental Quality, Water Division, http://www2.adeq.state.ar.us/water/branch_permits/individual_permits/finalpermits/finalpermits.aspx, accessed 6-25-15
[11] Arkansas Heritage Department, http://www.arkansasheritage.com/, accessed 6-25-15
[12] U.S. National Park Service, National Register of Historic Places, http://nationalregisterofhistoricplaces.com/AR/Benton/state.html, accessed April 2015

District.[13] This district is also located approximately one nautical mile to the northeast. While the proposed northern runway extension would move the runway end 589 feet closer to these resources, none of the proposed Airport improvements are anticipated to have any impact on these cultural resources.

Wild and Scenic Rivers

Wild and scenic rivers are defined as having "remarkable scenic, recreational, geologic, fish, wildlife, historic or cultural value." The U.S. Department of the Interior and Department of Agriculture implement the Wild and Scenic Rivers Act (Act), which strives to balance river development with permanent protection of the country's most outstanding, free-flowing rivers. In conjunction with the National Park Service, these agencies manage the Wild and Scenic Rivers System (WSRS)[14] and the National River Inventory (NRI).[15] There are eight segments of various Arkansas rivers listed in the WSRS with Buffalo River being the closest one to the Airport. The Buffalo River is located over 100 miles to the east of Bentonville, in Marion County. Additionally, there are no rivers listed in the NRI within Benton County. Listing on the NRI means the federal government is protecting these rivers and streams while agencies are considering the river for designation to the WSRS. The proposed airport improvements will have no impact on designated wild and scenic rivers nor any currently being considered for designation.

5.6 Preferred Development Strategy

Facility requirements and alternative development concepts for key functional areas of the Airport have been evaluated. Recommended facility improvements, preferred configurations, and potential environmental impacts have been identified. With consideration of a 20-year planning horizon, the approved activity forecasts, the Planning Activity Levels (PALs) and the interests of the City and Airport Advisory Board, the recommended facility improvements would likely be pursued as near-term (±5 years), intermediate-term (±10 years), and long-term (±20 years) improvement projects. Cumulatively, these projects make up the *preferred development strategy* for VBT.

Generally speaking, the strategy in the near term would be to continue pursuing development of the planned turf runway which includes land acquisition to the southwest. Obstruction removal within the Runway 36 approach will be completed in 2015 thus allowing the threshold to be relocated to the end of pavement. The initial phases of the extended westside parallel taxiway development would be pursued. Continuing development of west side aviation facilities and amenities would also progress. Accomplishing these efforts in a timely fashion will require early environmental coordination and agency approvals. While some specific projects may be eligible for CATEX determinations from the FAA, a comprehensive EA study covering all the near-term projects is accounted for in the early part of this development phase.

Future improvement projects would focus on the widening and strengthening of Runway 18-36. Continued development of taxiways and west side facilities would be pursued commensurate

[13] U.S. National Park Service, National Register of historic Places, http://nationalregisterofhistoricplaces.com/AR/Benton/districts.html, accessed 6-25-15
[14] National Wild and Scenic River System, http://www.rivers.gov/arkansas.php, accessed 6-25-15
[15] U.S. National Park Service, National Rivers Inventory, http://www.nps.gov/ncrc/programs/rtca/nri/index.html, accessed 6-25-15

with experienced demand. Maintenance storage facilities and a perimeter access road would also be included in proposes plans. Ongoing acquisition of avigation easements and protection of Part 77 surfaces would be pursued. A feasibility study and land acquisition for the extension of Runway 18-36 would most likely be performed in this time frame as well. At some point in the seven to ten-year period, a master plan update study may be needed to confirm or adjust the recommendations and strategy described in this MPU. The long-term improvement program is focused on the extension of Runway 18-36 to the north. This would include the needed agency and public coordination, environmental approvals, design and any remaining land acquisition needs. This overall strategy, including the generalized phasing, is depicted in **Exhibit 5-4**.

Table 5-6 lists the various recommended improvement projects and development programs by phase. From this, the approximate 10-year horizon forms the basis of the Airport Capital Improvement Program (ACIP) described in **Chapter 6**.

Table 5-6. Preferred Development Strategy by Phase

Near-Term (±0-5 Years)		
Environmental Assessment	5 Year Development Program	$250,000
Acquire Southwest Property	±10 acres	$1,100,000
Construct Turf Runway (Design and Construction)	2,448’ x 75’ facility	$500,000*
Install PAPIs for Runway 18-36	Two 4-box PAPIs	$150,000*
Taxiway Improvements (Phase 1)	23,200 SY	$3,944,000
West Side Hangars & Apron (Phase 1 Design and Construction)	14,000 sf conventional hangar 16,200 sf apron	$2,380,000 $540,000
Remove Existing Connector Taxiways	±2,000 SY of pavement	$30,000
West Side General Aviation Terminal and Public Parking	±3,500 SF building ±12,000 SF parking	$2,500,000* $165,000*
Maintenance Equipment Storage Building	±3,600 SF building	$540,000
Runway Pavement Rejuvenation and Striping		$250,000*
Fuel Farm		$250,000*
Airport Lighting Improvements		$500,000*
	Phase Subtotal	**$13,099,000**

*Note: Obtained from the VBT 5-Year Airports Capital Improvement Plan
Source: Kimley-Horn & Associates and Morrison-Shipley Engineers. Prepared: August 2015

Table 5-6. Preferred Development Strategy by Phase - Continued

Intermediate-Term (±6-10 Years)		
Perimeter Fencing	6,500 LF	$260,000
West Side Hangars & Apron (Phase 2)	13,000 sf conventional hangar 7 unit T-hangar 36,600 sf apron	$2,210,000 $800,000 $813,500
Acquire North RPZ Property (entire parcel)	±50 acres	$5,500,000
Runway Widening & Strengthening	10'x4,426' plus overlay	$2,375,000
Master Plan Update		$300,000
	Phase Subtotal	**$12,258,500**
Long-Term (±11-20 Years)		
West Side Hangars & Apron (Phase 3)	24,000 sf conventional hangar 66,600 sf apron 7,000 sf auto parking	$4,080,000 $1,850,000 $155,500
Extend Runway 18-36 589 Feet North	Feasibility & NEPA Studies	$500,000
	Land Acquisition for Lake Relocation	$3,740,000
	Design & Construct Lake Relocation	$8,770,000
	Design & Construct Runway Extension	$3,420,000
Airfield Perimeter Road	15,000 LF	1,500,000
Taxiway Improvements (Phase 2)	15,160 SY	$2,577,200
Taxiway Improvements (Phase 3)	4,080 SY	$693,600
	Phase Subtotal	**27,286,300**
	Total Estimated Program Cost	**52,643,800**

Source: Kimley-Horn & Associates and Morrison-Shipley Engineers. Prepared: August 2015

Exhibit 5-4. Preferred Development Strategy

PREFERRED DEVELOPMENT STRATEGY

DEVELOPMENT PHASES/FEATURES:

PHASE 1: NEAR-TERM

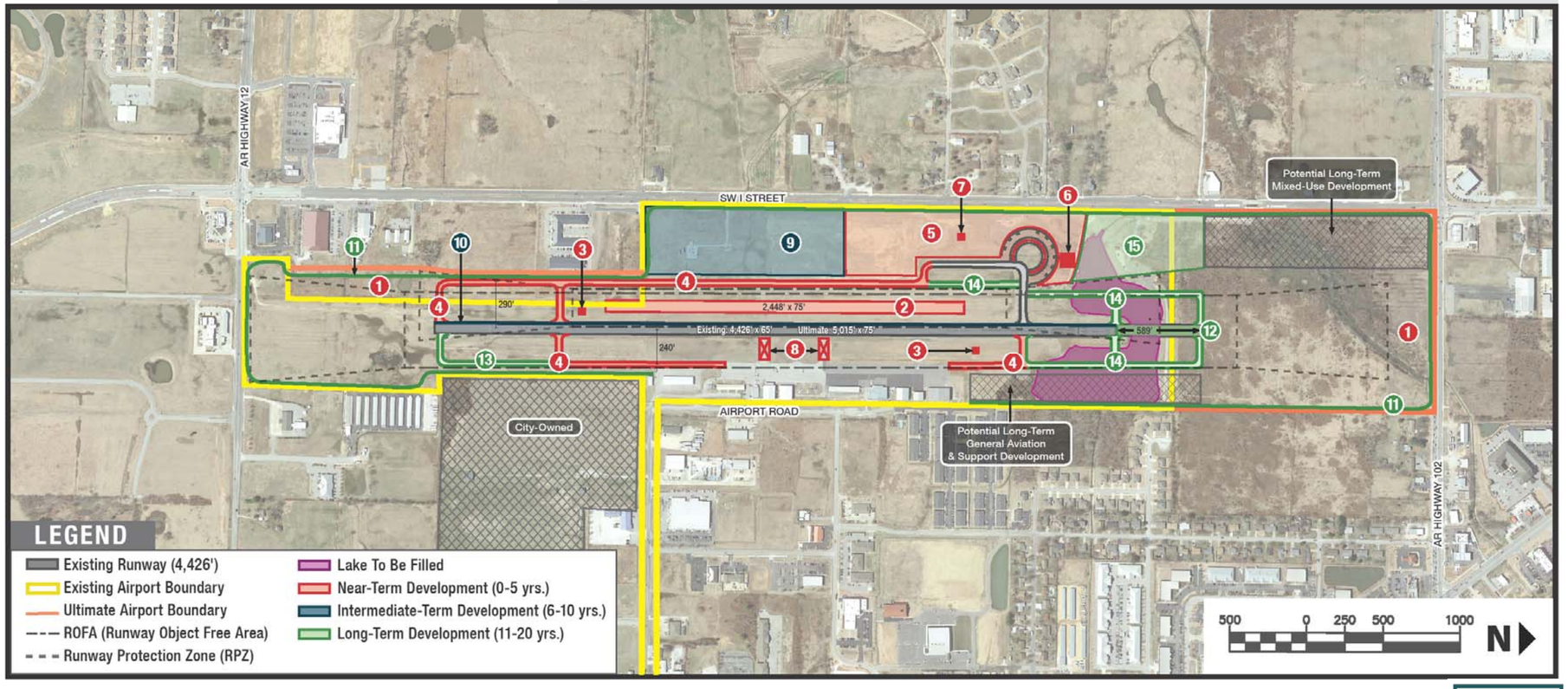
1. Land Acquisition
2. Construct Turf Runway
3. Install PAPIs for Runway 18-36
4. Taxiway Improvements (Phase I)
5. West Side Hangars & Aprons (Phase I)
6. West Side General Aviation Terminal
7. Maintenance Equipment Storage Building
8. Connecting Taxiway Removal

PHASE 2: INTERMEDIATE-TERM

9. West Side Hangars & Apron (Phase 2)
10. Runway Widening & Strengthening

PHASE 3: LONG-TERM

11. Airfield Perimeter Road
12. Extend Runway 18-36 (589' North)
13. Taxiway Improvements (Phase 2)
14. Taxiway Improvements (Phase 3)
15. West Side Hangars & Apron (Phase 3)



6 AIRPORT CAPITAL IMPROVEMENT PLAN (ACIP)

All airports receiving federal Airport Improvement Program (AIP) funding are required to maintain a current Airport Capital Improvement Plan (ACIP) with the FAA. The ACIP identifies specific projects intended to be undertaken at an airport over a specified period of time – typically a 10-year horizon. This plan further estimates the order of implementation as well as total project costs and anticipated funding sources. The actual timing or phasing of specific projects, or project elements, may change in response to tenant/user demands, unforeseen business opportunities, changes in the regulatory environment and availability of federal/state/local funds. Actual project costs may also vary from initial ACIP estimates as project designs progress and detailed engineering estimates are developed. For these reasons, airport sponsors coordinate updated ACIPs with the FAA on an annual basis.

In developing the ACIP, care must also be taken to provide adequate lead-time for detailed planning, permitting, and construction to ensure that the proposed facilities are operational when warranted by the user demands. It is also important to minimize any disruptive scheduling where a portion of one facility may become inoperative due to construction of another, and to prevent extra costs resulting from improper project scheduling.

6.1 Sources of Funding

Potential funding sources for any proposed improvements at VBT come in the form of federal and state grants (should the project meet eligibility requirements), City funds and Airport revenue, and third party investment. The amount of funding available from these sources will depend primarily on future levels of aviation activity at VBT and future federal and state funding reauthorizations. The following is a brief description of these sources.

6.1.1 Federal Grants

AIP grants, administered by the FAA, are a critical capital funding source to implement the projects recommended in this Master Plan Update. Although the future status of the AIP is somewhat uncertain, for the purpose of this Master Plan, it is assumed that the AIP will continue to be authorized and appropriated at levels consistent with H.R. 658, the FAA Modernization and Reform Act of 2012.

As a public-use, general aviation airport in the FAA's National Plan of Integrated Airport Systems (NPIAS), VBT is eligible to receive AIP funding in the form of Non-Primary Entitlements and Discretionary Grants. Non-Primary Entitlements are currently allocated to eligible airports at $150,000 per year. These can be accumulated, or saved, for up to three years in order to support a larger overall project. Discretionary Grants are also available based on a competitive priority rating system with most other airports in the NPIAS. Safety related projects receive the highest priority. Under the current AIP formula, the City is able to receive up to 90 percent funding for AIP-eligible projects. AIP funds can be used for most Airport improvement needs, but not operating costs, and typically not for revenue-generating projects.

6.1.2 State Grants

The Arkansas Department of Aeronautics maintains the State Airport Aid Grant (SAAG) program. The program is funded by revenue derived from the Gross Receipts Tax on aircraft, aviation fuel, and aircraft services, parts and accessories. Per State Act 499 (1967), these revenues are to be used solely for constructing airports, civil airways and other navigational facilities in the State. Available grant funds are dependent on annual budget appropriations. The four grant classifications primarily available to VBT include:

- 90-10% MATCH (FAA-State) FAA Airport Improvement Program
  - Limited to 10% of total project cost – State share not to exceed $400,000
- 50-50% MATCH (State - Local)
  - Limited to 50% of total project cost - State share not to exceed $400,000
  - Limit of one 50% grant per airport per fiscal year
- 80-20% MATCH (State - Local)
  - Limited to 80% of total project cost - State share not to exceed $400,000
  - Limit of one 80% grant per airport per fiscal year
- 90-10% MATCH (State - Local)
  - Limited to 90% of total project cost - State share not to exceed $200,000
  - Limit of one 90% grant per airport per fiscal year

6.1.3 Local City and Airport Funds

The City generates Airport revenue primarily through ground and facility leases and fuel flowage fees. Typically, such revenues are used to cover operating and maintenance expenses, however, any surplus revenues can be applied directly to the ACIP. While the Airport strives to be financially self-sufficient, as needed, the City can also support Airport expenses with allocations from its General Fund.

6.1.4 Third Party Investment

Many airports use private third party investment when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, fixed-based operator facilities, fuel storage, exclusive-use aircraft parking aprons, industrial aviation-use facilities, non-aviation office/commercial/industrial developments and other similar projects. Private development proposals at VBT are considered on a case-by-case basis and coordinated directly with the City. Often, airport funds for enabling infrastructure, preliminary site work and site access are required to facilitate private development projects on airport property. Even if the project is not funded by the FAA, the development must be in accordance with the approved Airport Layout Plan (ALP) and be consistent with FAA airport design and airspace protection criteria. Within the Preferred Development Strategy, the turf runway and much of the west side hangar development will likely require significant third party investment.

6.2 Proposed ACIP

For VBT, the 10-year ACIP resulting from this Master Plan Update includes the near-term and intermediate-term of the Preferred Development Strategy presented in **Chapter 4**. This includes several projects from the Airport's current ACIP that was prepared in January 2015. **Table 6-1** presents those projects, further divided into design and construction elements as appropriate, and their anticipated funding sources. The funding distribution assumes maximum FAA and State participation which represents a "best case" funding scenario. As shown, out of the 10-year, $25.3 million budget, approximately $13.2 million could be funded by the AIP, $2.5 million by the State, and $9.4 by third party investment. The remaining $250,000 balance of needed funds would be provided by the City/Airport.

Table 6-1. Proposed 10-Year ACIP

Project Component	Cost ($)	FAA Entitlement	FAA Discretionary	State Share	City Share	Other
Year 1						
Environmental Assessment - 5 Yr. Development Plan	250,000	150,000	18,750	25,000		56,250
Subtotal	**250,000**	**150,000**	**18,750**	**25,000**		**56,250**
Year 2						
Acquire Southwest Property	1,100,000		990,000	110,000		
*Construct Turf Runway (Design and Construction)	500,000					500,000
West Apron (Phase 1) - Design	64,800			32,400	32,400	
West Side Hangars (Phase 1) - Design & Construct	2,380,000					2,380,000
Taxiway Improvements (Phase 1) - Design	473,280	150,000	275,952	47,328		
West Side GA Terminal and Public Parking - Design & Construct	2,665,000				15,000	2,650,000
Maintenance Equipment Storage Building - Design & Construct	540,000				140,000	
Subtotal	**7,723,080**	**150,000**	**1,265,952**	**589,728**	**187,400**	**5,530,000**
Year 3						
West Apron (Phase 1) - Construction	475,200		427,680	47,520		
Taxiway Improvements (Phase 1) - Construction	3,470,720	150,000	2,973,648	347,072		
Remove Existing Connector Taxiways	30,000		27,000	3,000		
*Install PAPIs for Runway 18-36 - Design & Construct	150,000			135,000	15,000	
Subtotal	**4,125,920**	**150,000**	**3,428,328**	**532,592**	**15,000**	**0**
Year 4						
*Runway Pavement Rejuvenation and Striping (Design & Construct)	250,000			225,000	25,000	
Airport Lighting Improvements	500,000	150,000	300,000	50,000		
Subtotal	**750,000**	**150,000**	**300,000**	**275,000**	**25,000**	**0**
Year 5						
Fuel Farm	250,000			225,000	25,000	
Subtotal	**250,000**	**0**	**0**	**225,000**	**25,000**	**0**
SUBTOTAL YEARS 1-5	**13,099,00**	**600,000**	**5,013,030**	**1,647,320**	**252,400**	**5,586,250**

Prepared By:
Morrison-Shipley Engineers
Kimley-Horn and Associates

Table 6-1. Proposed 10-Year ACIP (continued)

Project Component	Cost ($)	FAA Entitlement	FAA Discretionary	State Share	City Share	Other
Year 6						
Perimeter Fencing - Design & Construct	260,000	234,000		26,000		
Subtotal	**260,000**	**234,000**		**26,000**	**0**	**0**
Year 7						
Acquire North RPZ Property	5,500,000	216,000	4,734,000	550,000		
Subtotal	**5,500,000**	**216,000**	**4,734,000**	**550,000**	**0**	**0**
Year 8						
Runway Widening & Strengthening - Design	285,000	150,000	106,500	28,500		
Subtotal	**285,000**	**150,000**	**106,500**	**28,500**	**0**	**0**
Year 9						
Runway Widening & Strengthening - Construct	2,090,000	150,000	1,731,000	209,000		
Subtotal	**2,090,000**	**150,000**	**1,731,000**	**209,000**	**0**	**0**
Year 10						
Master Plan Update	300,000	150,000	120,000	30,000		
West Side Hangars & Apron (Phase 2) - Design & Construct	3,823,500					3,823,500
Subtotal	**4,123,500**	**150,000**	**120,000**	**30,000**	**0**	**3,823,500**
SUBTOTAL YEARS 6-10	**12,258,500**	**900,000**	**6,691,500**	**843,500**	**0**	**3,823,500**
TOTAL 10 YEAR PROGRAM ESTIMATES	**25,357,500**	**1,500,000**	**11,704,530**	**2,490,820**	**252,400**	**9,409,750**

*Note: Obtained from the VBT 5-Year Airports Capital Improvement Plan (Dec, 2015)
Source: Kimley-Horn & Associates and Morrison-Shipley Engineers. Prepared: January 2016

APPENDIX A

Airport Layout Plan (ALP) Drawing Set

1. **Cover Sheet**
2. **Airport Layout Drawing**
3. **Airspace Plan Drawing**
4. **Airspace Profile Drawing**
5. **Inner Portion of the Approach Surface Drawing – Existing Runway 18-36 (Paved)**
6. **Inner Portion of the Approach Surface Drawing – Future Runway 18-36 (Turf)**
7. **Inner Portion of the Approach Surface Drawing – Ultimate Runway 18R-36L (Paved)**
8. **Departure Surface Drawing – Existing and Ultimate Runway 18R-36L (Paved)**
9. **Terminal Area Drawing – North Half**
10. **Terminal Area Drawing – South Half**
11. **Land Use Drawing**
12. **Airport Property Map**

July 2016

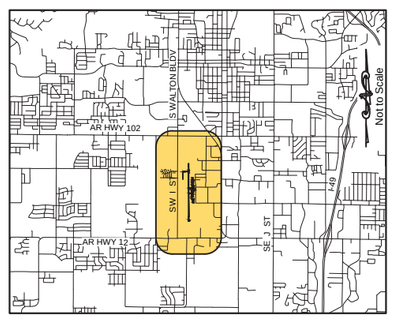
AIRPORT LAYOUT PLAN

for

Bentonville Municipal Airport (KVBT)

(Louise M. Thaden Field)

STATE MAP
Not to Scale



LOCATION/VICINITY MAP
Not to Scale

INDEX OF SHEETS

FEDERAL AVIATION ADMINISTRATION
APPROVED / DATE

CITY OF BENTONVILLE, AR (SPONSOR)		
APPROVED		DATE
NAME	TITLE	

ARKANSAS DEPARTMENT OF AERONAUTICS		
APPROVED		DATE
NAME	TITLE	

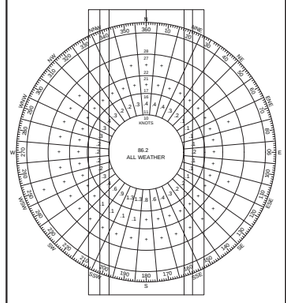
NO.	REVISIONS	BY	DATE	APPROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cotterwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2269 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

ALL WEATHER WIND ROSE



RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
18-36	96.6%	98.4%	99.7%

WIND DATA PERIOD: 2004-2014
SOURCE: VBT AWOS, FAA AGIS WEBSITE
STATION: #723444

AIRPORT DATA TABLE

	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE (ARC)	B-II	SAME
AIRPORT ELEVATION (MSL)	1298'	SAME
AIRPORT REFERENCE POINT LAT/LONG (NAD 83)	N 36° 20' 42.9026" W 94° 13' 09.6061"	N 36° 20' 45.1400" W 94° 13' 10.1881"
MEAN DAILY MAX TEMPERATURE	89°	SAME
HOTTEST MONTH	AUGUST	SAME
NPIAS SERVICE LEVEL	GENERAL AVIATION	SAME
STATE EQUIVALENT SERVICE ROLE	LEVEL 2	SAME
TAXIWAY WIDTH	35' & 40'	SAME
TAXIWAY OBJECT FREE AREA (TOFA)	131'	SAME
TAXIWAY SAFETY AREA (TSA)	79'	SAME
TAXIWAY SHOULDER WIDTH	15'	SAME
TAXIWAY EDGE SAFETY MARGIN (TESM)	7.5'	SAME
TAXIWAY LIGHTING	MITL AT FILLETS	MITL
TAXIWAY MARKING	CENTERLINE,HOLD LINES	SAME
MAGNETIC VARIATION	1°46' E	N/A
DATE OF MAGNETIC VARIATION	2015	N/A
AIRPORT NAVAIDS	ROTATING BEACON, WIND SOCK, AWOS	ROTATING BEACON, WIND SOCK, AWOS, WIND TEE

LEGEND

	EXISTING	ULTIMATE
RUNWAY OBJECT FREE AREA	ROFA	ROFA
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBSTACLE FREE ZONE	ROFZ	ROFZ
TAXIWAY OBJECT FREE AREA	TOFA	TOFA
APPROXIMATE BUILDING RESTRICTION LINE (BRL)	BRL	BRL
RUNWAY PROTECTION ZONE	RPZ	RPZ
TURF RUNWAY PROTECTION ZONE	N/A	RPZ
PART 77 RUNWAY APPROACH SURFACE	APP	APP
PART 77 TURF RUNWAY APPROACH SURFACE	N/A	APP
RWY GLIDE PATH QUALIFICATION SURFACE	GQS	GQS
RUNWAY THRESHOLD SITING SURFACE	TSS	TSS
TURF RUNWAY THRESHOLD SITING SURFACE	N/A	TSS
RUNWAY DEPARTURE SURFACE	DEP	DEP
TURF RUNWAY	N/A	
PAVEMENTS (ON AIRPORT)		
AIRPORT PROPERTY LINE		
BUILDINGS (ON AIRPORT)		
DEMOLITION	N/A	

	EXISTING	ULTIMATE
AIRPORT SURVEY MONUMENTS		
ROTATING BEACON		SAME
AIRPORT REFERENCE POINT		
WIND CONE		SAME
WIND TEE	N/A	
AWOS (LIGHTED)		
RTR FACILITY		
PAPI	N/A	
REILS		
THRESHOLD LIGHTS		
TIE DOWN LOCATIONS		
AVIGATION EASEMENT	N/A	
TREE LINE		SAME
EDGE OF WATER FEATURE / WETLAND		SAME
FENCE		
EXISTING PAVED ROADWAY		N/A
SURFACE CONTOUR	1290	SAME
APPROXIMATE LIMITS OF DEVELOPMENT		SAME

CITY OF BENTONVILLE, AR (SPONSOR)

APPROVED		DATE
NAME	TITLE	

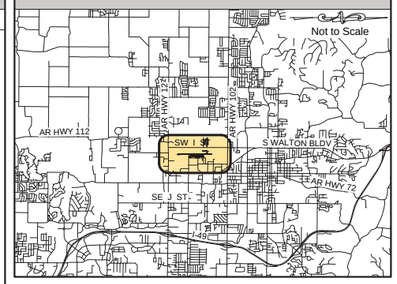
ARKANSAS DEPARTMENT OF AERONAUTICS

APPROVED		DATE
NAME	TITLE	

FEDERAL AVIATION ADMINISTRATION

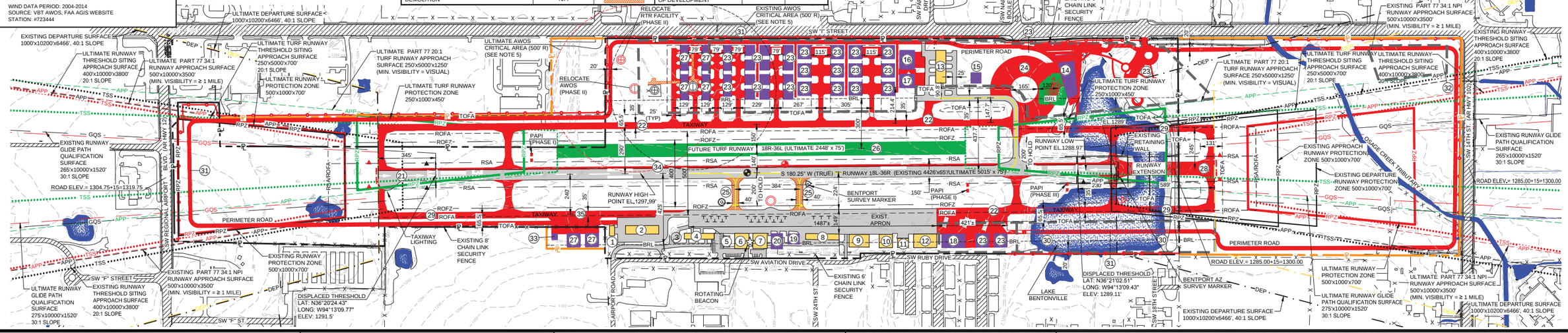
APPROVED / DATE

VICINITY MAP



300 0 300 600 feet
SCALE: 1"=300'

MAGNETIC DEC.
1° 46' E (2015)



RUNWAY 18L-36R (PAVED) DECLARED DISTANCES

	RUNWAY 18L		RUNWAY 36R	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
TAKEOFF RUN AVAILABLE (TORA)	4426'	5015'	4426'	5015'
TAKEOFF DISTANCE AVAILABLE (TODA)	4426'	5015'	4426'	5015'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	4426'	5015'	4196'	5015'
LANDING DISTANCE AVAILABLE (LDA)	4196'	5015'	3851'	5015'

NOTES

1. FAA'S APPROVAL OF THIS AIRPORT LAYOUT PLAN (ALP) REPRESENTS ACCEPTANCE OF THE GENERAL LOCATION OF THE FUTURE FACILITIES DEPICTED. DURING THE PRELIMINARY DESIGN PHASE, THE AIRPORT OWNER IS REQUIRED TO SUBMIT FOR APPROVAL THE FINAL LOCATIONS, HEIGHTS AND EXTERIOR FINISHES OF STRUCTURES. FAA'S CONCERNS ARE OBSTRUCTIONS, IMPACT ON ELECTRONIC AIDS AND ADVERSE EFFECT ON CONTROLLER VIEW OF AIRCRAFT APPROACHES AND GROUND MOVEMENTS, WHICH COULD ADVERSELY AFFECT THE SAFETY, EFFICIENCY OR UTILITY OF THE AIRPORT.
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. GROUND SURVEYS ARE RECOMMENDED TO VERIFY ACCURACY. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (NAVD 88). NO SURVEYS WERE OBTAINED FOR THIS UPDATE.
4. FOR CLARITY, THE RSA, ROFZ & ROFA NOTED ON THE DRAWING FOR RUNWAY 18L-36R (PAVED) ARE BASED ON EXISTING RUNWAY CENTERLINE, NOT THE ULTIMATE CENTERLINE SHIFTED FIVE FEET WEST. THE FUTURE TURF RUNWAY RSA, ROFZ & ROFA ARE NOT SHOWN FOR CLARITY.
5. ADDITIONAL DEVELOPMENT RESTRICTIONS APPLY WITHIN 500' OF THE AWOS STRUCTURE TO PRESERVE THE PERFORMANCE OF THE VARIOUS WEATHER SENSORS. THESE RESTRICTIONS INCLUDE LIMITING OF STRUCTURE/BUILDING HEIGHTS RELATIVE TO THE ANEMOMETER HEIGHT AND VISIBILITY SENSOR. REFER TO FAA ORDER 6560-20B *SITING CRITERIA FOR AUTOMATED WEATHER OBSERVING SYSTEMS* (AWOS) FOR SPECIFICS.
6. THE POSITION OF THE BRL IS APPROXIMATE ONLY AND BASED ON A 25' BUILDING HEIGHT. ACTUAL BUILDING PLACEMENT AND HEIGHTS SHALL BE DICTATED BY PART 77 SURFACES, TOFA'S, AND NAVAID CRITICAL AREAS.
7. LAYOUT OF ULTIMATE HANGARS IS CONCEPTUAL AND MAY CHANGE PENDING TENANT NEEDS AND FINAL DESIGN.
8. TREE PENETRATIONS EXISTING IN THE EXIST. RUNWAY 18L TSS. SEE SHEET 5.
   POWER POLE PENETRATIONS EXIST IN THE ULTIMATE RUNWAY 36R TSS. SEE SHEET 7.
9. CITY OF BENTONVILLE ZONING ORDINANCES:
   A. POLICY PF-39: THE CITY SHALL PROTECT THE FUNCTION OF THE MUNICIPAL AIRPORT BY LIMITING RESIDENTIAL ENCROACHMENT INTO APPROACH ZONES.
   B. POLICY PF-40: THE CITY SHALL REGULATE LAND USES, INTENSITIES, AND STRUCTURAL HEIGHTS TO PROTECT THE FUNCTIONALITY AND SAFETY OF LONG-TERM AIRPORT OPERATIONS.

BUILDING / FACILITIES INDEX TABLE

NO.	EXISTING	NO.	ULTIMATE	PHASE
1	STORAGE HANGAR	14	FLIGHT CENTER (FBO)	I
2	T-HANGAR	15	MAINTENANCE/FUELING BLDG	I
3	FUEL FARM	16	CORPORATE HANGAR	I
4	T-HANGAR	17	BOX HANGAR	I
5	TERMINAL / FBO	18	CORPORATE HANGAR	I
6	CORPORATE HANGAR	19	BOX HANGAR	I
7	CORPORATE HANGAR	20	BOX HANGAR	I
8	T-HANGAR	21	THRESHOLD RELOCATION & PAPIS	I
9	CORPORATE HANGAR	22	TAXIWAY IMPROVEMENTS	I
10	CORPORATE HANGAR	23	HANGAR/ APRON/ FBO DVLP. (BOX/CORPORATE OR T-HANGARS)	I (SEE NOTE 5)
11	CORPORATE HANGAR	24	CIRCULAR APRON	I
12	CORPORATE HANGAR	25	TAXIWAY DEMOLITION	I
13	T-HANGAR	26	TURF RUNWAY	I
		27	HANGAR/ APRON DEVELOPMENT (BOX/CORPORATE OR T-HANGARS)	II (SEE NOTE 5)
		28	RUNWAY EXTENSION/ LAND ACQUISITION / MITIGATE LAKE	III
		29	TAXIWAY IMPROVEMENTS	III
		30	LONG-TERM AERONAUTICAL USE	III
		31	PERIMETER ROAD	III
		32	LONG TERM NON-AERONAUTICAL DEVELOPMENT	III
		33	MAINTENANCE BUILDING	II
		34	RUNWAY WIDENING/ LIGHTING IMPROVEMENTS	II
		35	TAXIWAY IMPROVEMENTS	II

PHASING PROGRAM	
I	0-5 YEARS
II	5-10 YEARS
III	10-20 YEARS

RUNWAY 18L-36R (PAVED) DATA TABLE

DESCRIPTION	EXISTING		ULTIMATE	
	RW 18L	RW 36R	RW 18L	RW 36R
APPROACH VISIBILITY MINIMUMS	1 MILE	1 MILE	SAME	SAME
FAR PART 77 APPROACH SLOPE	34:1	34:1	SAME	SAME
RUNWAY MARKINGS	NPI	NPI	SAME	SAME
VISUAL APPROACH AIDS	MIRLS/REILS	MIRLS/REILS	MIRLS/REILS,PAPI	MIRLS/REILS,PAPI
INSTRUMENT APPROACH AIDS	VOR/DME,GPS	VOR/DME,GPS	SAME	SAME
RUNWAY END COORDINATES (NAD 83) LATITUDE LONGITUDE	N36°21'04.78" W94°13'09.41"	N36°20'21.02" W94°13'09.81"	N36°21'10.61" W94°13'09.41"	N36°20'21.02" W94°13'09.87"
DISPLACED THRESHOLD COORDINATES (NAD 83) LATITUDE LONGITUDE	N36°21'02.51" W94°13'09.43"	N36°20'24.43" W94°13'09.77"	N/A N/A	N/A N/A
RUNWAY END ELEVATION (MSL)	1289.13'	1292.54'	1289.00±	SAME
RUNWAY HIGH POINT/LOW POINT ELEVATION (MSL)	1297.99' / 1288.97'		SAME	
DISPLACED THRESHOLD ELEV. (MSL)	1289.11'	1291.5±	N/A	N/A
RUNWAY DESIGN CODE (RDC)	B-II-5000		SAME	
APPROACH REFERENCE CODE (APRC)	B-II-5000		SAME	
DEPARTURE REFERENCE CODE (DPRC)	B-II		SAME	
TRUE BEARING	180.25	.25	SAME	SAME
DIMENSIONS (LENGTH x WIDTH)	4426' x 65'		5015' x 75'	
SURFACE TYPE	ASPHALT		SAME	
PAVEMENT DESIGN STRENGTH (LBS)	S-54,000, D-73,000		SAME	
PAVEMENT CLASSIFICATION NUMBER (PCN)	21		SAME	
LIGHTING / SIGNAGE	MIRL		SAME	
MAXIMUM GRADE	0.99%		0.99%	
RUNWAY PROTECTION ZONE (RPZ)	500' x 1000' x 700'		SAME	
ROFZ DIMENSIONS	4826' x 400'		5415' x 400'	
RSA DIMENSIONS	4796' x 150'		5615' x 150'	
ROFA DIMENSIONS	4796' x 500'		5615' x 500'	
CRITICAL AIRCRAFT	CITATION SOVEREIGN		SAME	
WIND COVERAGE (ALL WEATHER)	98.4%		SAME	
CROSSWIND COMPONENT	13 KNOTS		SAME	
USABLE RUNWAY LENGTH	4426'	4196'	5015'	5015'
DISPLACED THRESHOLD	230'	345'	N/A	N/A
AERONAUTICAL SURVEY REQUIRED	NVGS + VGAS		SAME	

FUTURE RUNWAY 18R-36L (TURF) DATA TABLE

DESCRIPTION	ULTIMATE	
	RW 18R	RW 36L
APPROACH VISIBILITY MINIMUMS	VISUAL	VISUAL
FAR PART 77 APPROACH SLOPE	20:1	20:1
RUNWAY MARKINGS	N/A	N/A
VISUAL APPROACH AIDS	N/A	N/A
INSTRUMENT APPROACH AIDS	N/A	N/A
RUNWAY END COORDINATES (NAD 83) LATITUDE LONGITUDE	N36°20'55.86" W94°13'11.20"	N36°20'31.65" W94°13'11.42"
DISPLACED THRESHOLD COORDINATES (NAD 83) LATITUDE LONGITUDE	N/A N/A	N/A N/A
RUNWAY END ELEVATION (MSL)	1288.75'	1292.47'
RUNWAY HIGH POINT/LOW POINT ELEVATION (MSL)	1294.73' / 1288.75'	
DISPLACED THRESHOLD ELEV. (MSL)	N/A	
RUNWAY DESIGN CODE (RDC)	A-I(S)-VIS	
APPROACH REFERENCE CODE (APRC)	A-I(S)-VIS	
DEPARTURE REFERENCE CODE (DPRC)	A-I(S)	
TRUE BEARING	180.25	.25
DIMENSIONS (LENGTH x WIDTH)	2448' x 75'	
SURFACE TYPE	TURF	
PAVEMENT DESIGN STRENGTH (LBS)	N/A	
PAVEMENT CLASSIFICATION NUMBER (PCN)	N/A	
LIGHTING / SIGNAGE	N/A	
MAXIMUM GRADE	1.16%	
RUNWAY PROTECTION ZONE (RPZ)	250' x 1000' x 450'	
ROFZ DIMENSIONS	2848' x 120'	
RSA DIMENSIONS	2928' x 120'	
ROFA DIMENSIONS	2928' x 250'	
CRITICAL AIRCRAFT	CARBON CUB, STEARMAN	
WIND COVERAGE (ALL WEATHER)	96.6%	
CROSSWIND COMPONENT	10.5 KNOTS	
USABLE RUNWAY LENGTH	2448'	2448'
DISPLACED THRESHOLD	N/A	N/A
AERONAUTICAL SURVEY REQUIRED	NVGS	NVGS

MODIFICATIONS OF STANDARDS

NO.	STANDARD MODIFIED	PROPOSED ACTION	FAA CASE NO.	DATE APPROVED
1.	AC 150/5300-13A, FIGURE 23, TRANSVERSE GRADE LIMITATIONS FOR RUNWAYS/ RSA'S.	GRADE A NEW TURF RUNWAY AND RSA AT A CONTINUOUS TRANSVERSE CROSS SLOPE EQUAL TO 2% WITH NO CROWN.	--	6/25/15

NO.	REVISIONS	BY	DATE	APPROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2497 SE Cotterwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2269 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	DRC
Approved By:	BSM
Date:	7.6.16
Project No.:	VBT-17
Vertical Scale:	–
Horizontal Scale:	1"=300'
Plotting Scale:	1
Drawing Name:	ALD

AIRPORT LAYOUT PLAN

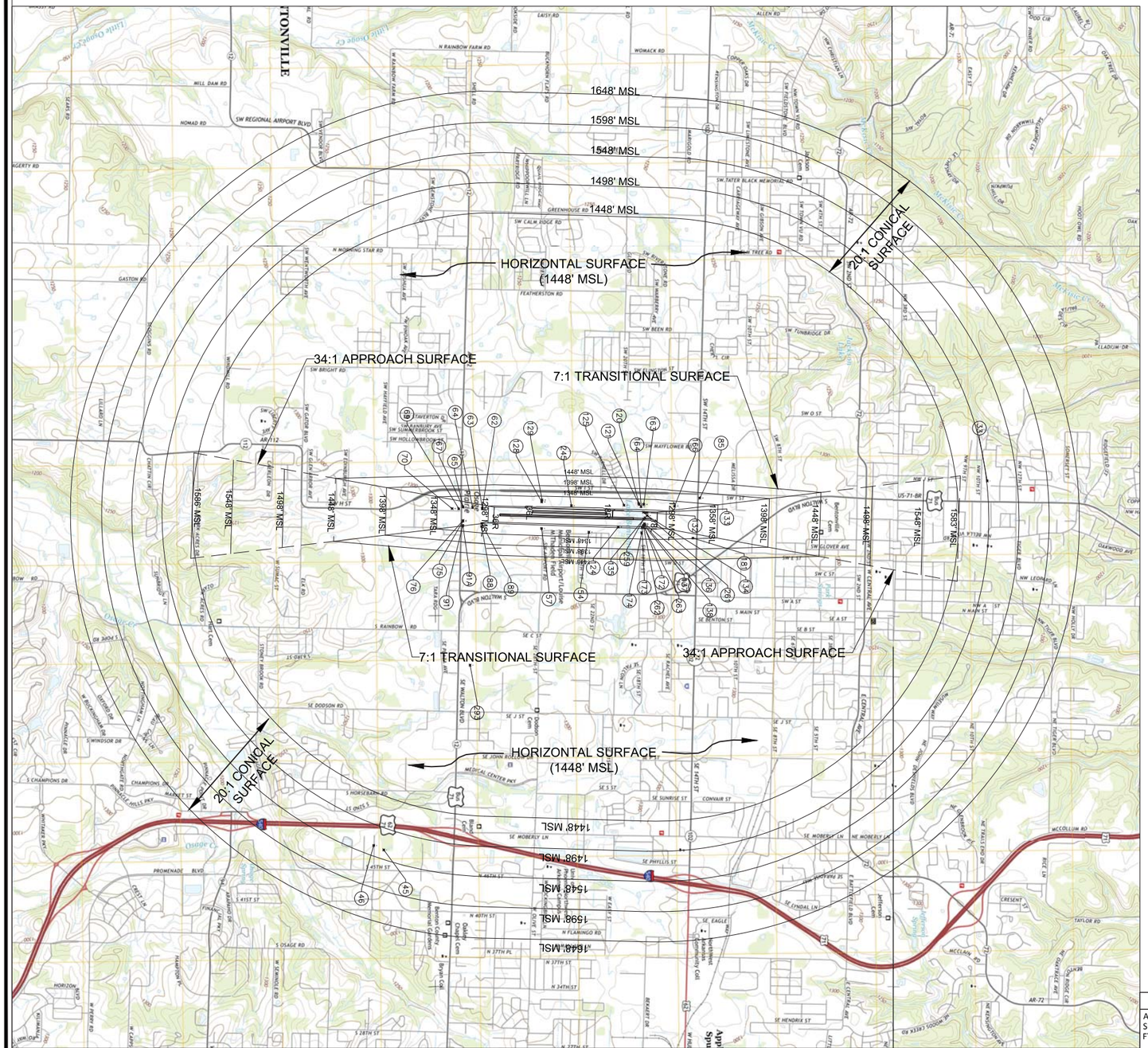
Bentonville Municipal Airport (KVBT)

AIRPORT LAYOUT DRAWING

Final – 7.6.16

Sheet No.: 2 of 12

Drawing Name: M:\BDK\PROJ\VBT-17\DWG\VBT-17 ALP 7-15-16.dwg Last Modified: Jul 06, 2016 - 2:45pm Plotted on: Jul 06, 2016 - 2:47pm by dcarrera



PART 77 OBSTRUCTION DATA							
OID	DESCRIPTION	GROUND ELEV. (MSL)	OBJECT HEIGHT (MSL)	PENETRATION	SURFACE	DISPOSITION	FAA STUDY/ID NUMBER
33	COMMUNICATION TOWER	1254 (EST.)	1607.73	79.5	CONICAL	OBSTRUCTION LIGHTED	1999ASW04761OE
45	COMMUNICATION TOWER	1303 (EST.)	1552.76	21.4	CONICAL	OBSTRUCTION LIGHTED	
46	COMMUNICATION TOWER	1303 (EST.)	1550.94	18.1	CONICAL	OBSTRUCTION LIGHTED	1998ASW04636OE
293	COMMUNICATION TOWER	1299 (EST.)	1471.3	23.3	HORIZONTAL	OBSTRUCTION LIGHTED	2006ASW07380OE
245	NATURAL HIGH POINT	1309.21	1309.21	3.4	TRANSITIONAL	REMOVAL	
259	UNPAVED LAKE ACCESS ROAD	1284.96 (EST.)	1299.96	6.4	APPROACH	NONE	
261	UNPAVED LAKE ACCESS ROAD	1283.57 (EST.)	1298.57	5.5	APPROACH	NONE	
262	UNPAVED LAKE ACCESS ROAD	1285.21 (EST.)	1300.21	6.9	APPROACH	NONE	
263	UNPAVED LAKE ACCESS ROAD	1285.18 (EST.)	1300.18	6.9	APPROACH	NONE	
54	POWER TRANSMISSION POLE	1292 (EST.)	1328.37	4.1	TRANSITIONAL	OBSTRUCTION LIGHT	
57	POWER TRANSMISSION POLE	1298 (EST.)	1328.06	13.6	TRANSITIONAL	OBSTRUCTION LIGHT	
62	POWER TRANSMISSION POLE	1288 (EST.)	1322.15*	18.1	APPROACH	REMOVAL	
63	POWER TRANSMISSION POLE	1288 (EST.)	1321.4*	17.4	APPROACH	REMOVAL	KVBTT0196
64	POWER TRANSMISSION POLE	1290 (EST.)	1324.71*	11.1	APPROACH	REMOVAL	KVBTT0188
65	POWER TRANSMISSION POLE	1290 (EST.)	1330.06*	7.3	APPROACH	REMOVAL	KVBTT0178
67	POWER TRANSMISSION POLE	1290 (EST.)	1332.04	8.9	APPROACH	REMOVAL	
69	POWER TRANSMISSION POLE	1292 (EST.)	1335.4*	8.4	APPROACH	REMOVAL	KVBTT0165
70	POWER TRANSMISSION POLE	1294 (EST.)	1336.18*	2.7	APPROACH	REMOVAL	KVBTT0155
75	POWER TRANSMISSION POLE	1298 (EST.)	1342.32*	19.7	APPROACH	REMOVAL	KVBTT0180
76	POWER TRANSMISSION POLE	1298 (EST.)	1336.62*	14	APPROACH	REMOVAL	KVBTT0181
85	POWER TRANSMISSION POLE	1280 (EST.)	1378.57	1.43	TRANSITIONAL	REMOVAL	
88	POWER TRANSMISSION POLE	1288 (EST.)	1322.59*	4.7	TRANSITIONAL	REMOVAL	
89	POWER TRANSMISSION POLE	1288 (EST.)	1321.57*	17.1	APPROACH	REMOVAL	KVBTT0194
91	POWER TRANSMISSION POLE	1300 (EST.)	1342.97*	20.2	APPROACH	REMOVAL	KVBTT0179
91A	POWER TRANSMISSION POLE	1300 (EST.)	1337.59*	15.1	APPROACH	REMOVAL	
120	TREE	1280 (EST.)	1340.25	18	TRANSITIONAL	TRIM	
121	TREE	1280 (EST.)	1347.18	20	TRANSITIONAL	TRIM	
124	TREE	1276 (EST.)	1324.35	28.8	TRANSITIONAL	TRIM	
125	TREE	1282 (EST.)	1336.26	19.4	TRANSITIONAL	TRIM	
128	TREE	1294 (EST.)	1343.6	22.4	TRANSITIONAL	TRIM	
129	TREE	1294 (EST.)	1339.5	9.8	TRANSITIONAL	TRIM	
132	TREE	1280 (EST.)	1318.42	23.7	APPROACH	TRIM	
133	TREE	1280 (EST.)	1297.26	0.8	APPROACH	TRIM	
134	TREE	1280 (EST.)	1298.97	2.4	APPROACH	TRIM	
135	TREE	1280 (EST.)	1298.82	4.2	APPROACH	TRIM	
136	TREE	1280 (EST.)	1296.51	2.3	APPROACH	TRIM	
137	TREE	1280 (EST.)	1316.56	22.5	APPROACH	TRIM	
138	TREE	1280 (EST.)	1301.28	6.6	APPROACH	TRIM	
163	TREE	1280 (EST.)	1352.73	28.8	TRANSITIONAL	TRIM	
164	TREE	1280 (EST.)	1337.38	25.3	TRANSITIONAL	TRIM	
166	TREE	1270 (EST.)	1335.14	6.1	TRANSITIONAL	TRIM	
172	TREE	1280 (EST.)	1329.3	33.8	TRANSITIONAL	TRIM	
173	TREE	1280 (EST.)	1314.64	22.5	APPROACH	TRIM	
174	TREE	1280 (EST.)	1319.47	0.8	TRANSITIONAL	TRIM	
181	TREE	1280 (EST.)	1354.12	3.5	TRANSITIONAL	TRIM	

OBSTACLE DATA FROM AGIS SURVEY DATED MAY 2010 (FAA/NGS PROJECT #108834)
*TOP ELEVATIONS UPDATED FROM FIELD SURVEY MARCH 2015

ZONING ORDINANCE NOTES:

CITY OF BENTONVILLE GENERAL PLAN

POLICY PF-39: THE CITY SHALL PROTECT THE FUNCTION OF THE MUNICIPAL AIRPORT BY LIMITING RESIDENTIAL ENCROACHMENT INTO APPROACH ZONES.
POLICY PF-40: THE CITY SHALL REGULATE LAND USES, INTENSITIES, AND STRUCTURAL HEIGHTS TO PROTECT THE FUNCTIONALITY AND SAFETY OF LONG-TERM AIRPORT OPERATIONS.

ARKANSAS STATUTES

SS 27-117-103 STIPULATES THAT NO WIRES OF ANY KIND OR DESCRIPTION, INCLUDING, BUT NOT LIMITED TO, THOSE OVER WHICH ELECTRICITY OR MESSAGES ARE TRANSMITTED SHALL BE CONSTRUCTED, OPERATED, OR MAINTAINED WITHIN THE APPROACH ZONE OF ANY AIRPORT IN THE STATE.
SS 27-117-105 STIPULATES THAT NO STRUCTURE IN EXCESS OF ONE HUNDRED FEET (100') IN HEIGHT MAY BE CONSTRUCTED WITHIN TWENTY-FIVE HUNDRED FEET (2,500') FROM EITHER SIDE OF A RUNWAY CENTERLINE RUNNING THE FULL LENGTH OF THAT RUNWAY, INCLUDING THE RUNWAY PROTECTION ZONE AND RUNWAY SAFETY AREA, EXTENDING OUTWARD FROM THE APPROACH END OF ANY RUNWAY FOR SEVEN (7) NAUTICAL MILES, AND RISING UPWARD FROM THAT RUNWAY END SURFACE AT A SLOPE OF SIXTY-FIVE FEET (65') HORIZONTALLY TO ONE FOOT (1') VERTICALLY FOR THE SEVEN (7) NAUTICAL MILES OF ANY AERONAUTICAL FACILITY USED BY THE PUBLIC UNLESS A PERMIT FOR SUCH CONSTRUCTION HAS BEEN ISSUED BY THE GOVERNING BODY RESPONSIBLE FOR OPERATIONS AT THE AERONAUTICAL FACILITY.

OTHER NOTES:

ANALYSIS BASED ON ULTIMATE PART 77 SURFACES INCLUDING TURF RUNWAY AND 5015 FT RUNWAY 18L-36R

DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE

MAGNETIC DEC.
1° 46' E (2015)

2000 0 2000
SCALE: 1"=2000'

NOTES	NO.	REVISIONS	BY	DATE	APROVALS		
					SPONSOR/DATE	FAA/DATE	ADA/DATE
ANALYSIS BASED ON ULTIMATE PART 77 SURFACES INCLUDING TURF RUNWAY AND 5015 FT RUNWAY 18L-36R							
DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE							

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2209 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944–5500

Drawn By:	Vertical Scale:
JB/AS	–
Approved By:	**Horizontal Scale:**
KSC	1"=2000'
Date:	**Plotting Scale:**
7.6.16	1
Project No.:	**Drawing Name:**
VBT–17	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

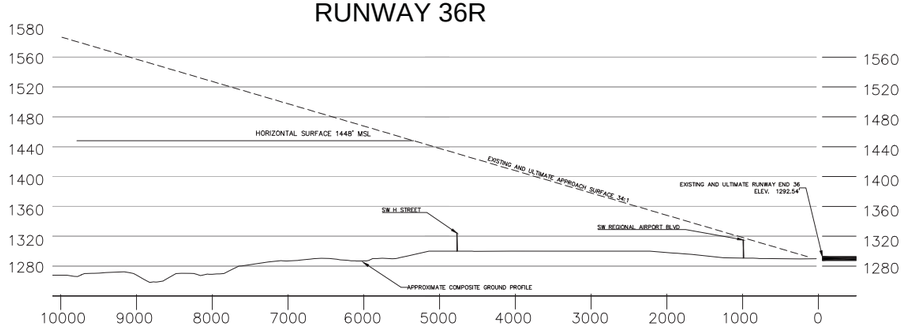
AIRSPACE PLAN DRAWING

Final – 7.6.16

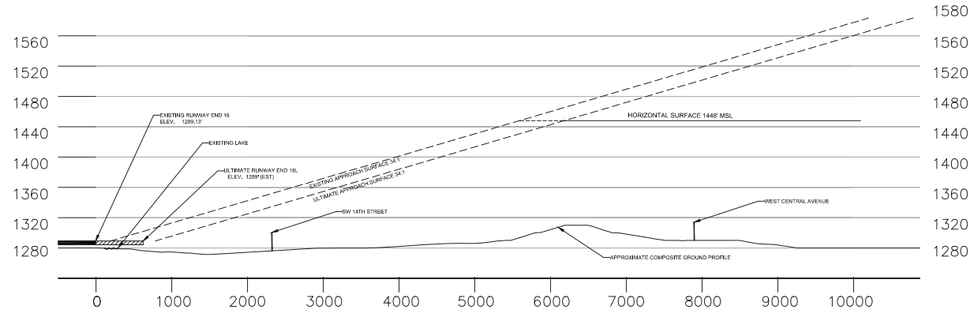
Sheet No.: 3 of 12

RUNWAY 18L-36R (PAVED)

RUNWAY 36R



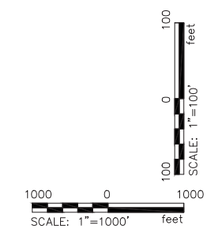
RUNWAY 18L



RUNWAY 18R-36L (TURF)

RUNWAY 36L

RUNWAY 18R



NOTES	NO.	REVISIONS	BY	DATE	APROVALS		
					SPONSOR/DATE	FAA/DATE	ADA/DATE
AIRPORT ELEVATION: 1298' MSL							
SEE INNER PORTION OF APPROACH SURFACE SHEETS FOR OBSTRUCTIONS IN INNER APPROACH							
DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE							

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ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2309 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	Vertical Scale:
JB/AS	–
Approved By:	**Horizontal Scale:**
KSC	1"=1000'
Date:	**Plotting Scale:**
7.6.16	1
Project No.:	**Drawing Name:**
VBT-17	ALD

AIRPORT LAYOUT PLAN

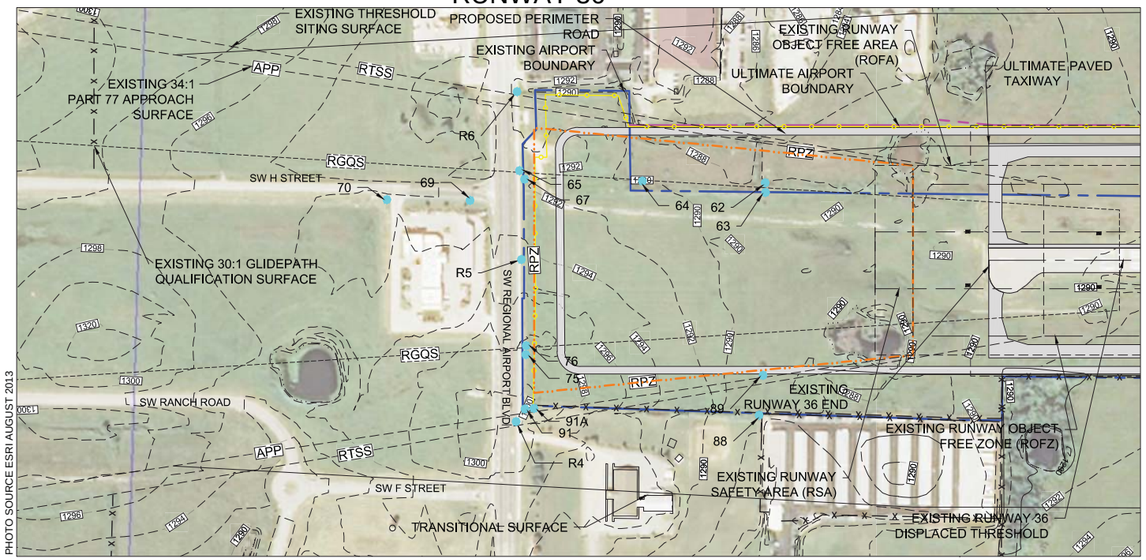
Bentonville Municipal Airport (KVBT)

AIRSPACE PROFILE DRAWING

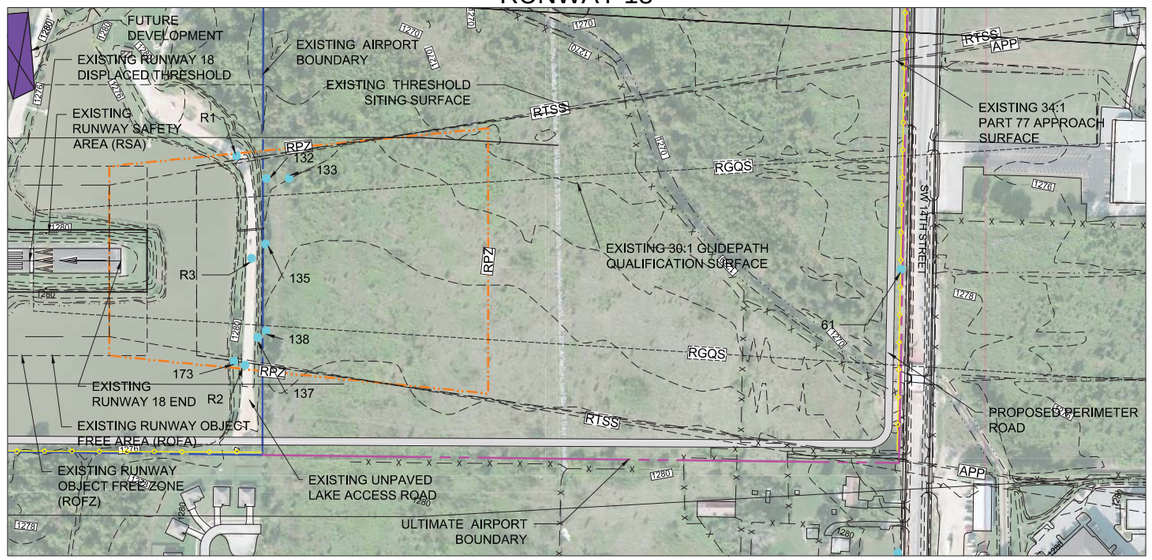
Final - 7.6.16

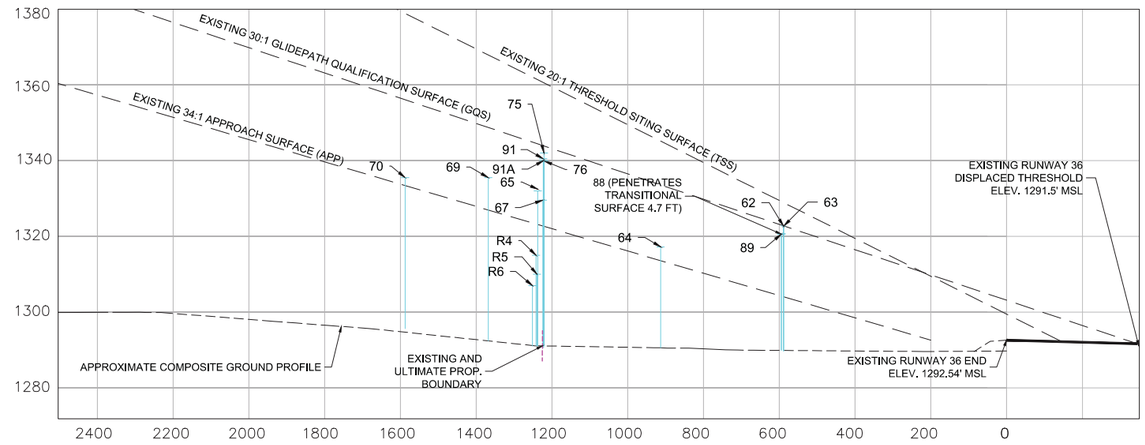
Sheet No.: 4 of 12

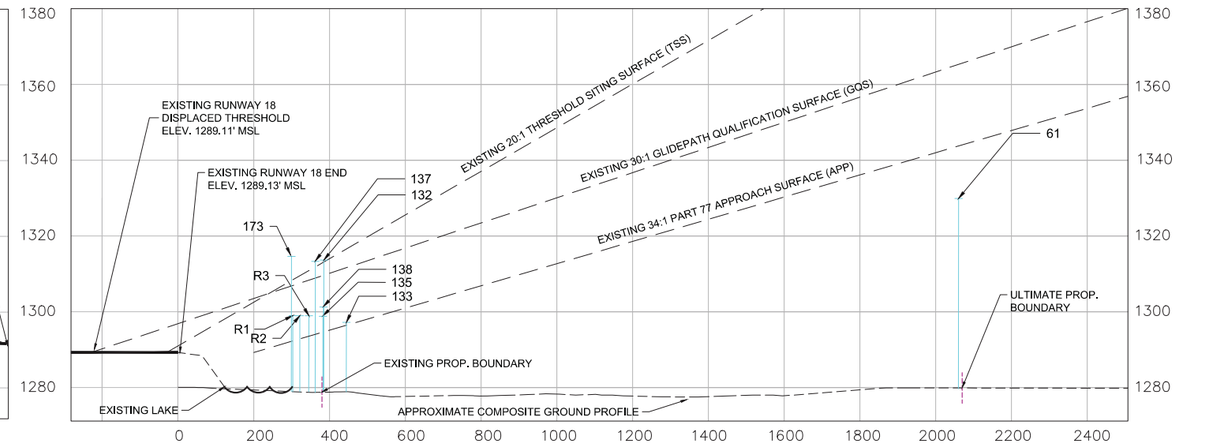
RUNWAY 36



RUNWAY 18







INNER PORTION OF THE APPROACH OBSTRUCTION DATA - RUNWAY 36

OID	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (GQS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
63	TRANSMISSION POLE	1321.4*	NONE	1.6	17.4	TO BE REMOVED	KVBTT0196
62	TRANSMISSION POLE	1322.2*	NONE	.9	18.1	TO BE REMOVED	
90	TRANSMISSION POLE	1319.6*	NONE	NONE	16.8	TO BE REMOVED	
64	TRANSMISSION POLE	1324.7*	NONE	NONE	11.1	TO BE REMOVED	KVBTT0188
91	TRANSMISSION POLE	1343.0*	NONE	NONE	20.3	TO BE REMOVED	KVBTT0179
91A	TRANSMISSION POLE	1337.6*	NONE	NONE	14.9	TO BE REMOVED	
75	TRANSMISSION POLE	1342.3*	NONE	NONE	19.7	TO BE REMOVED	KVBTT0180
76	TRANSMISSION POLE	1336.6*	NONE	NONE	14	TO BE REMOVED	KVBTT0181
65	TRANSMISSION POLE	1330.1*	NONE	NONE	7.3	TO BE REMOVED	KVBTT0178
67	TRANSMISSION POLE	1332.0*	NONE	NONE	9.2	TO BE REMOVED	
69	TRANSMISSION POLE	1335.4*	NONE	NONE	8.4	TO BE REMOVED	KVBTT0165
70	TRANSMISSION POLE	1336.6*	NONE	NONE	4.3	TO BE REMOVED	KVBTT0155
89	TRANSMISSION POLE	1321.6*	NONE	NONE	17.3	TO BE REMOVED	KVBTT0194
R4	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	
R5	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	
R6	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET
*TOP ELEVATIONS UPDATED FROM FIELD SURVEY MARCH 2015

INNER PORTION OF THE APPROACH OBSTRUCTION DATA - RUNWAY 18

OID	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (GQS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
137	TREE	1316.6	5.7	6.9	19.4	TRIM/REMOVE	
132	TREE	1318.4	4.2	6.0	22.2	TRIM/REMOVE	
133	TREE	1297.3	NONE	NONE	0.8	TRIM/REMOVE	
135	TREE	1298.9	NONE	NONE	4.1	TRIM/REMOVE	
138	TREE	1301.3	NONE	NONE	6.7	TRIM/REMOVE	
173	TREE	1314.6	6.4	7.8	22.4	TRIM/REMOVE	
61	TRANSMISSION POLE	1330.7	NONE	NONE	NONE	NONE	
R1	LAKE ACCESS ROAD	1300 (EST.)	NONE	NONE	6.7	RUNWAY EXT. WILL REMOVE ROAD	
R2	LAKE ACCESS ROAD	1300 (EST.)	NONE	NONE	6.1	RUNWAY EXT. WILL REMOVE ROAD	
R3	LAKE ACCESS ROAD	1300 (EST.)	NONE	NONE	5.4	RUNWAY EXT. WILL REMOVE ROAD	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

SCALE: 1"=20' feet
MAGNETIC DEC. 1° 46' E (2015)
SCALE: 1"=200' feet

NOTES

DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE

OBSTACLE DATA FROM FAA AGIS SURVEY 2010

NO.	REVISIONS	BY	DATE	APROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2209 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	Vertical Scale:
JB/AS	–
Approved By:	**Horizontal Scale:**
KSC	1"=200'
Date:	**Plotting Scale:**
7.6.16	1
Project No.:	**Drawing Name:**
VBT-17	ALD

AIRPORT LAYOUT PLAN

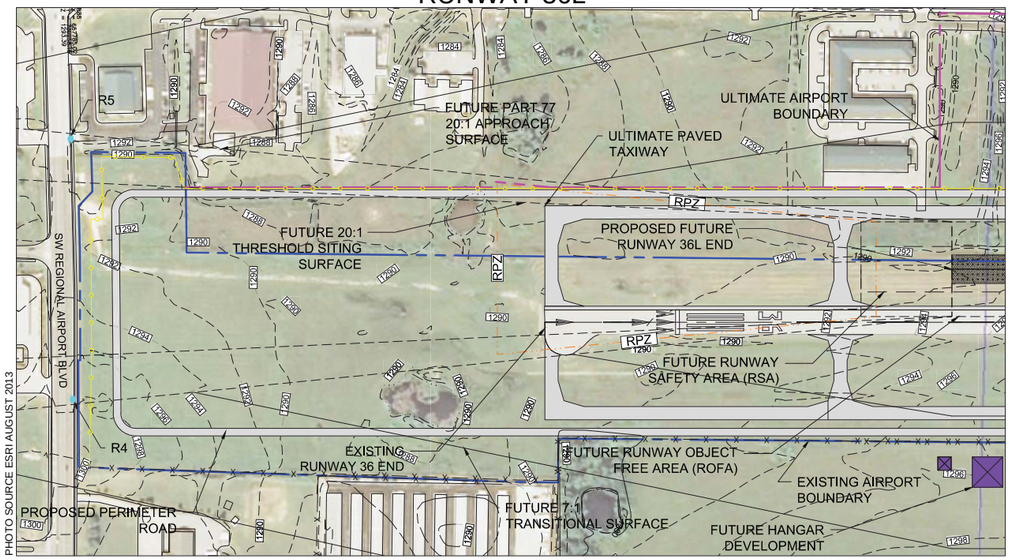
Bentonville Municipal Airport (KVBT)

INNER PORTION OF THE APPROACH SURFACE
EXISTING RUNWAY 18-36 (PAVED)

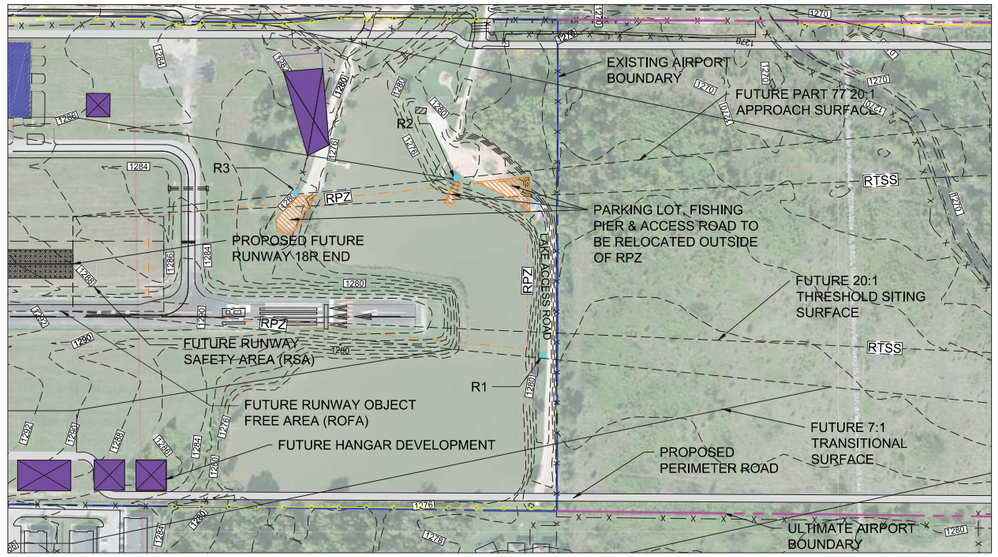
Final - 7.6.16

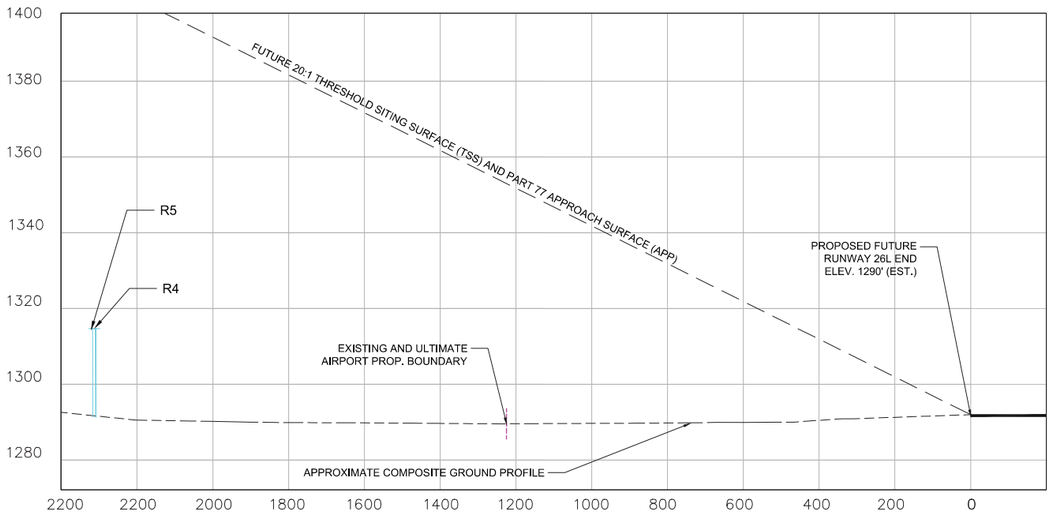
Sheet No.: 5 of 12

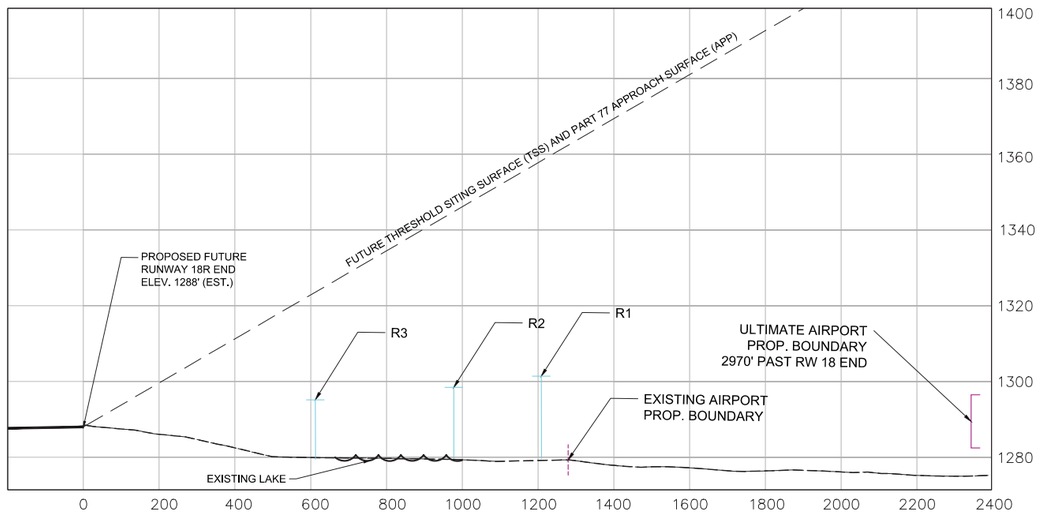
RUNWAY 36L

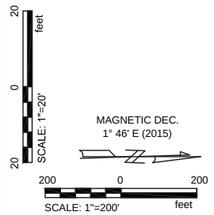


RUNWAY 18R









INNER PORTION OF THE APPROACH OBSTRUCTION DATA - RUNWAY 36L						
NO.	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
R4	SW REG'L AIRPORT BLVD	1315 (EST.)	NONE	NONE	NONE	
R5	SW REG'L AIRPORT BLVD	1315 (EST.)	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

INNER PORTION OF THE APPROACH OBSTRUCTION DATA - RUNWAY 18R						
NO.	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
R1	LAKE ACCESS ROAD	1301 (EST.)	NONE	NONE	NONE	
R2	LAKE ACCESS ROAD	1298 (EST.)	NONE	NONE	NONE	
R3	LAKE ACCESS ROAD	1295 (EST.)	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

NOTES

DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE

OBSTACLE DATA FROM FAA AGIS SURVEY 2010

NO.	REVISIONS	BY	DATE	APROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2209 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944–5500

Drawn By:	JB/AS
Approved By:	KSC
Date:	7.6.16
Project No.:	VBT–17
Vertical Scale:	–
Horizontal Scale:	1"=200'
Plotting Scale:	1
Drawing Name:	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

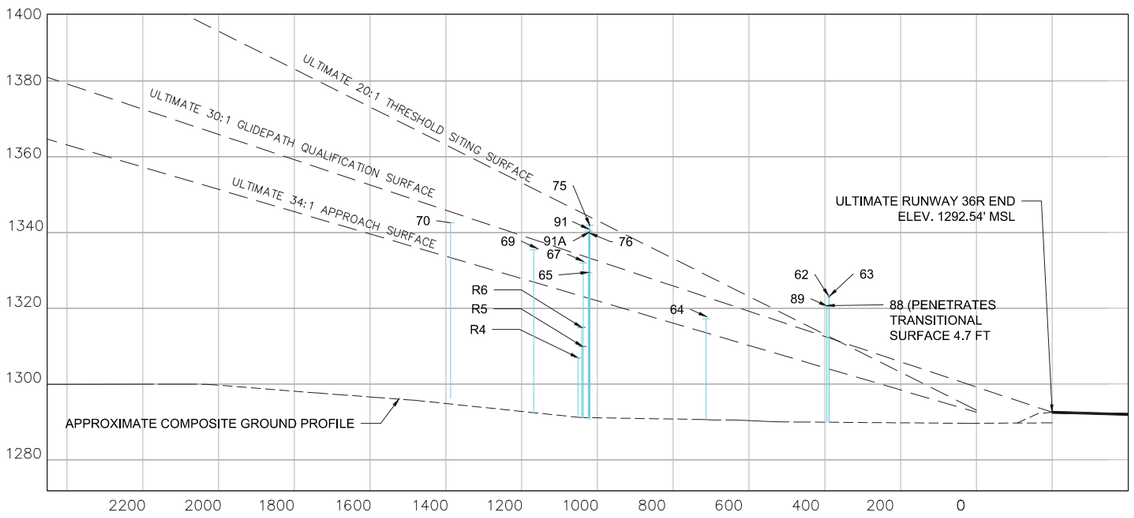
INNER PORTION OF THE APPROACH SURFACE FUTURE RUNWAY 18R–36L (TURF)

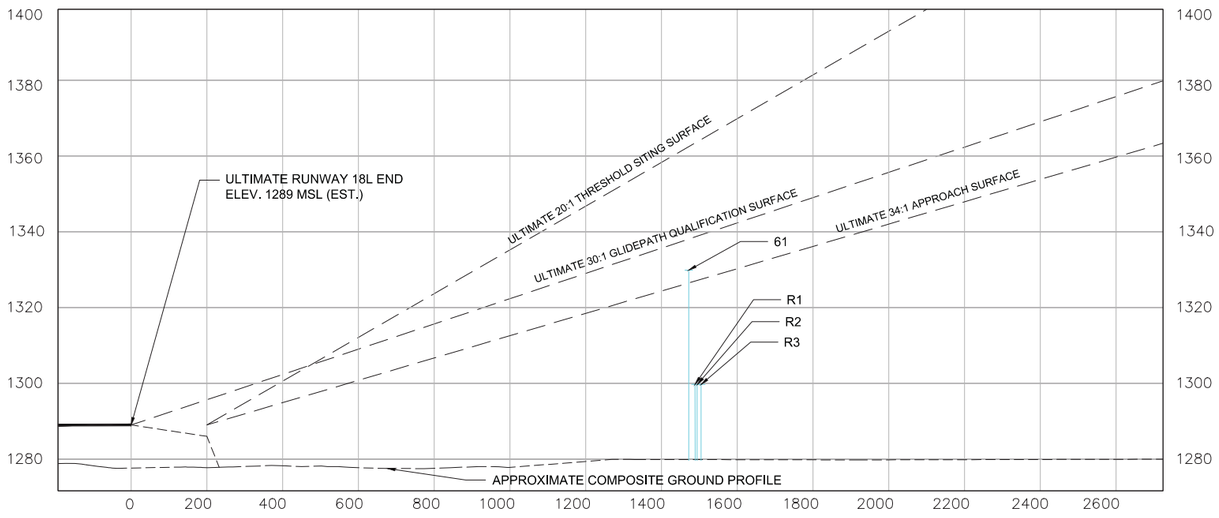
Final – 7.6.16

Sheet No.: 6 of 12

RUNWAY 36R

RUNWAY 18L





20 0 20 feet
SCALE: 1"=20'

MAGNETIC DEC.
1° 46' E (2015)

200 0 200
SCALE: 1"=200' feet

INNER PORTION OF THE APPROACH OBSTRUCTION DATA - RUNWAY 36R

OID	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (GQS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
91	TRANSMISSION POLE	1343.0	NONE	9.6	20.3	TO BE REMOVED	KVBTT0179
91A	TRANSMISSION POLE	1337.6	NONE	4.15	14.9	TO BE REMOVED	
75	TRANSMISSION POLE	1342.3	NONE	9.0	19.7	TO BE REMOVED	KVBTT0180
76	TRANSMISSION POLE	1336.6	NONE	3.3	14	TO BE REMOVED	KVBTT0181
67	TRANSMISSION POLE	1332	NONE	NONE	8.9	TO BE REMOVED	
65	TRANSMISSION POLE	1330.1	NONE	NONE	7.3	TO BE REMOVED	KVBTT0178
69	TRANSMISSION POLE	1335.4	NONE	NONE	8.4	TO BE REMOVED	KVBTT0165
70	TRANSMISSION POLE	1336.2	NONE	NONE	4.3	TO BE REMOVED	KVBTT0155
63	TRANSMISSION POLE	1321.4	8.9	9.2	17.4	TO BE REMOVED	KVBTT0196
62	TRANSMISSION POLE	1322.2	9.7	10	18.2	TO BE REMOVED	
64	TRANSMISSION POLE	1324.7	NONE	NONE	11.2	TO BE REMOVED	KVBTT0188
89	TRANSMISSION POLE	1321.6	9.1	9.7	18.0	TO BE REMOVED	KVBTT0194
R4	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	
R5	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	
R6	SW REG'L AIRPORT BLVD	1319.8 (EST.)	NONE	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

INNER PORTION OF THE APPROACH OBSTRUCTION DATA - ULTIMATE RUNWAY 18L

OID	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION (TSS)	PENETRATION (GQS)	PENETRATION (APP)	DISPOSITION	FAA STUDY/ID #
61	TRANSMISSION POLE	1330.65 (EST.)	NONE	NONE	3.4	NONE	
R1	SW 14TH ST	1300.00 (EST.)	NONE	NONE	NONE	NONE	
R2	SW 14TH ST	1300.00 (EST.)	NONE	NONE	NONE	NONE	
R3	SW 14TH ST	1300.00 (EST.)	NONE	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

NOTES

DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE

OBSTACLE DATA FROM FAA AGIS SURVEY 2010

NO.	REVISIONS	BY	DATE	APROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

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ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2269 ▪ morrisonshipley.com

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	Vertical Scale:
JB/AS	–
Approved By:	**Horizontal Scale:**
KSC	1"=200'
Date:	**Plotting Scale:**
7.6.16	1
Project No.:	**Drawing Name:**
VBT-17	ALD

AIRPORT LAYOUT PLAN

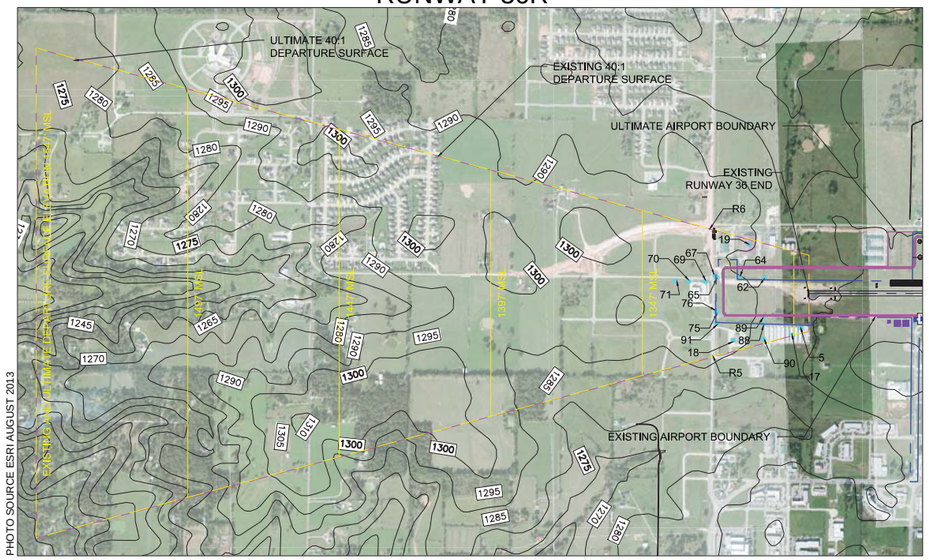
Bentonville Municipal Airport (KVBT)

INNER PORTION OF THE APPROACH SURFACE ULTIMATE RUNWAY 18L-36R (PAVED)

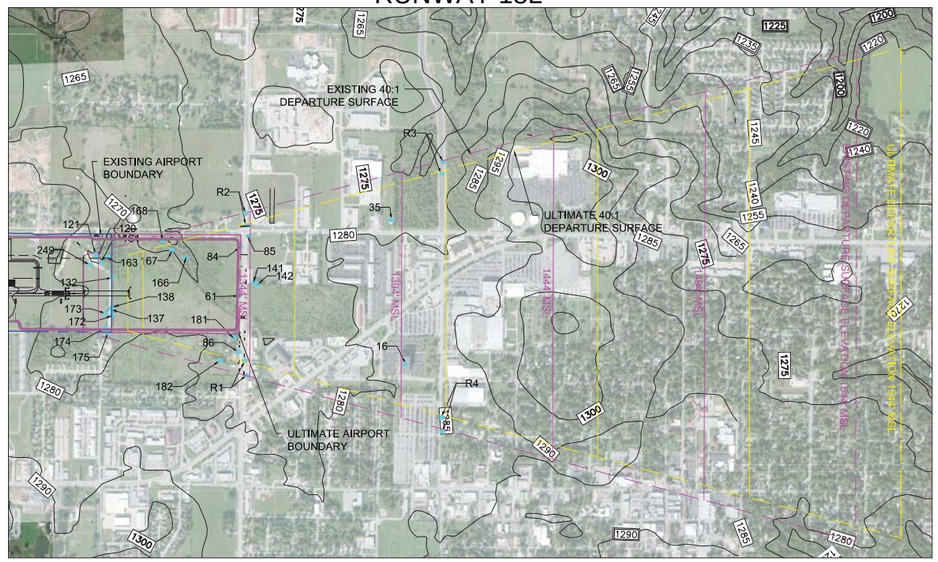
Final - 7.6.16

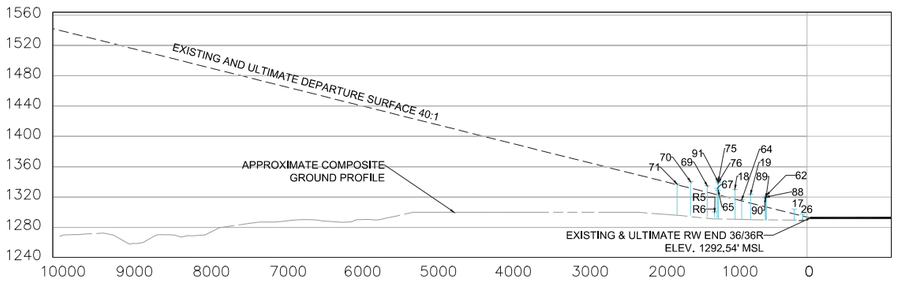
Sheet No.: 7 of 12

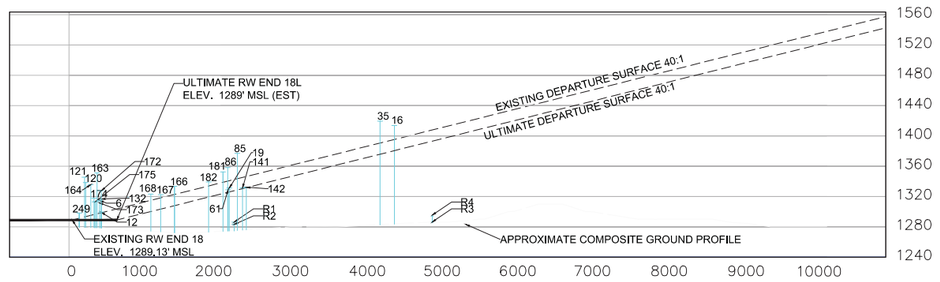
RUNWAY 36R



RUNWAY 18L







DEPARTURE SURFACE OBSTRUCTION DATA - RUNWAY 36R

OID	DESCRIPTION	OBJECT HEIGHT (MSL)	PENETRATION	DISPOSITION	FAA STUDY/ID #
5	BUILDING	1298.0	2.4	TO BE DETERMINED	
17	BUILDING	1304.8	6.4	TO BE DETERMINED	
62	TRANSMISSION POLE	1322.2	14.6	REMOVAL	
89	TRANSMISSION POLE	1321.6	13.8	REMOVAL	KVBTT0194
88	TRANSMISSION POLE	1327.6	14.8	REMOVAL	
90	TRANSMISSION POLE	1319.6	11.7	REMOVAL	
19	BUILDING	1324.6	11.7	TO BE DETERMINED	
64	TRANSMISSION POLE	1324.7	9	REMOVAL	KVBTT0188
18	BUILDING	1330.7	12.8	TO BE DETERMINED	
91	TRANSMISSION POLE	1343.0	19.7	REMOVAL	KVBTT0179
75	TRANSMISSION POLE	1342.3	18.9	REMOVAL	KVBTT0180
76	TRANSMISSION POLE	1336.6	13.2	REMOVAL	KVBTT0181
65	TRANSMISSION POLE	1330.1	6.6	REMOVAL	KVBTT0178
67	TRANSMISSION POLE	1332.0	8.2	REMOVAL	
69	TRANSMISSION POLE	1335.4	8.3	REMOVAL	KVBTT0165
70	TRANSMISSION POLE	1336.2	3.6	REMOVAL	KVBTT0155
71	TRANSMISSION POLE	1337.9	0.8	REMOVAL	
R5	SW REG'L AIRPORT BLVD	1305.0	NONE	N/A	
R6	SW REG'L AIRPORT BLVD	1305.0	NONE	N/A	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

DEPARTURE SURFACE OBSTRUCTION DATA - RUNWAY 18L

OID	DESCRIPTION	OBJECT HEIGHT	PENETRATION (EX)	PENETRATION (ULT)	DISPOSITION	FAA STUDY/ID #
249	ROAD	1299.8	6.9	N/A	RUNWAY EXTENSION	
121	TREE	1347.2	52.4	N/A	RUNWAY EXTENSION	
120	TREE	1340.3	45.0	N/A	RUNWAY EXTENSION	
164	TREE	1337.4	40.5	N/A	RUNWAY EXTENSION	
163	TREE	1352.7	28.1	N/A	RUNWAY EXTENSION	
6	TREE	1308.2	9.9	N/A	RUNWAY EXTENSION	
174	TREE	1319.5	20.0	N/A	RUNWAY EXTENSION	
173	TREE	1314.6	16.4	N/A	RUNWAY EXTENSION	
175	TREE	1318.4	16.7	N/A	RUNWAY EXTENSION	
132	TREE	1318.4	18.7	N/A	RUNWAY EXTENSION	
172	TREE	1329.3	29	N/A	RUNWAY EXTENSION	
138	TREE	1301.3	1.9	N/A	RUNWAY EXTENSION	
168	TREE	1324.9	18.3	N/A	RUNWAY EXTENSION	
167	TREE	1324.3	8.2	14.7	TRIM	
166	TREE	1335.1	10.7	25.4	TRIM	
182	TREE	1340.9	5.1	19.8	TRIM	
181	TREE	1354.1	13.6	28.4	TRIM	
86	TREE	1360.0	18.0	32.7	TRIM	
84	TRANSMISSION POLE	1343.1	NONE	5.2	TO BE DETERMINED	
61	TRANSMISSION POLE	1330.7	NONE	3.2	TO BE DETERMINED	
85	TRANSMISSION POLE	1378.6	33.4	48.1	TO BE DETERMINED	
141	TREE	1330.1	NONE	0.8	TRIM	
142	TREE	1334.1	NONE	0.6	TRIM	
35	COMM TOWER	1421.0	28.7	43.5	TO BE DETERMINED	
16	BUILDING	1415.3	18.3	33.0	TO BE DETERMINED	
R1	SW 8TH STREET	1285.0	NONE	NONE	NONE	
R2	SW 8TH STREET	1285.0	NONE	NONE	NONE	
R3	SW 14TH STREET	1288.0	NONE	NONE	NONE	
R4	SW 14TH STREET	1296.0	NONE	NONE	NONE	

ALL HEIGHTS AND PENETRATIONS SHOWN IN FEET

MAGNETIC DEC.
1° 46' E (2015)

SCALE: 1"=100' feet

SCALE: 1"=1000' feet

NOTES

DEPICTED ROADWAY ELEVATIONS EQUAL TO ACTUAL GROUND ELEVATIONS PLUS FAR PART 77 15' CLEARANCE

OBSTACLE DATA FROM FAA AGIS SURVEY 2010

NO.	REVISIONS	BY	DATE	APROVALS		
				SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cottonwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2209 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	Vertical Scale:
JB/AS	–
Approved By:	**Horizontal Scale:**
KSC	1"=1000'
Date:	**Plotting Scale:**
7.6.16	1
Project No.:	**Drawing Name:**
VBT-17	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

DEPARTURE SURFACE DRAWING
EXISTING AND ULTIMATE RUNWAY
18L-36R (PAVED)

Final - 7.6.16

Sheet No.: 8 of 12

MAGNETIC DEC.
1° 46' E (2015)

100 0 100 200
SCALE: 1"=100' feet

NOTES

1. THE POSITION OF THE BRL IS APPROXIMATE ONLY AND BASED ON A 25' BUILDING HEIGHT. ACTUAL BUILDING PLACEMENT AND HEIGHTS SHALL BE DICTATED BY PART 77 SURFACES, TOFA'S, AND NAVAID CRITICAL AREAS.
2. BUILDING ELEVATIONS ARE UNKNOWN. NO FIELD SURVEYS WERE PERFORMED DURING THE ALP PROCESS.
3. PHASING PROGRAM:
   PHASE I: 0-5 YEARS
   PHASE II: 5-10 YEARS
   PHASE III: 10-20 YEARS
4. LAYOUT OF ULTIMATE HANGARS IS CONCEPTUAL AND MAY CHANGE PENDING TENANT NEEDS AND FINAL DESIGN.
5. NOT USED
6. ADDITIONAL DEVELOPMENT RESTRICTIONS APPLY WITHIN 500' OF THE AWOS STRUCTURE TO PRESERVE THE PERFORMANCE OF THE VARIOUS WEATHER SENSORS. THESE RESTRICTIONS INCLUDE LIMITING OF STRUCTURE/BUILDING HEIGHTS RELATIVE TO THE ANEMOMETER HEIGHT AND VISIBILITY SENSOR. REFER TO FAA ORDER 6560-20B *SITING CRITERIA FOR AUTOMATED WEATHER OBSERVING SYSTEMS* (AWOS) FOR SPECIFICS.
7. CITY OF BENTONVILLE ZONING ORDINANCES:
   A. POLICY PF-39: THE CITY SHALL PROTECT THE FUNCTION OF THE MUNICIPAL AIRPORT BY LIMITING RESIDENTIAL ENCROACHMENT INTO APPROACH ZONES.
   B. POLICY PF-40: THE CITY SHALL REGULATE LAND USES, INTENSITIES, AND STRUCTURAL HEIGHTS TO PROTECT THE FUNCTIONALITY AND SAFETY OF LONG-TERM AIRPORT OPERATIONS.

FACILITIES INDEX TABLE

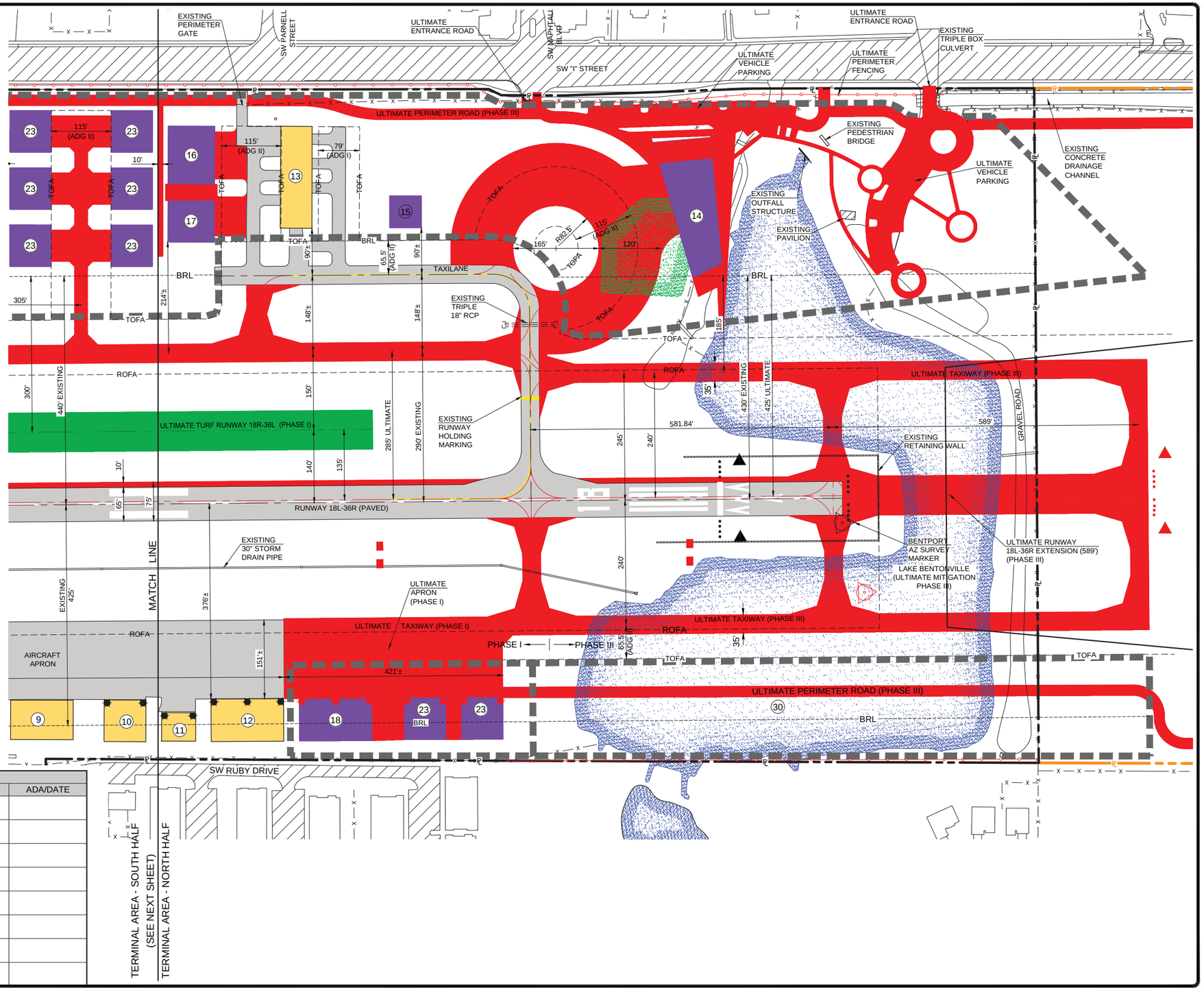
NO.	EXISTING	ELEVATION (MSL)	NO.	ULTIMATE	ELEVATION (MSL)	PHASE
1	CORPORATE HANGAR	TBD	14	FLIGHT CENTER (FBO)	TBD	I
2	T-HANGAR	TBD	15	MAINTENANCE/FUELING BLDG	TBD	I
3	FUEL FARM	TBD	16	CORPORATE HANGAR	TBD	I
4	T-HANGAR	TBD	17	BOX HANGAR	TBD	I
5	TERMINAL / FBO	TBD	18	CORPORATE HANGAR	TBD	I
6	CORPORATE HANGAR	TBD	19	BOX HANGAR	TBD	I
7	CORPORATE HANGAR	TBD	20	BOX HANGAR	TBD	I
8	T-HANGAR	TBD	23	HANGAR/ APRON FBO DVLP. (BOX/CORPORATE OR T-HANGARS)	TBD	I
9	CORPORATE HANGAR	TBD	27	HANGAR/ APRON DEVELOPMENT (BOX/CORPORATE OR T-HANGARS)	TBD	II
10	CORPORATE HANGAR	TBD	30	LONG TERM AERONAUTICAL USE	TBD	III
11	CORPORATE HANGAR	TBD	33	MAINTENANCE BUILDING	TBD	II
12	CORPORATE HANGAR	TBD				
13	T-HANGAR	TBD				

LEGEND

	EXISTING	ULTIMATE
RUNWAY OBJECT FREE AREA	ROFA	ROFA
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBSTACLE FREE ZONE	ROFZ	ROFZ
TAXIWAY OBJECT FREE AREA	TOFA	TOFA
APPROXIMATE BUILDING RESTRICTION LINE (BRL)	BRL	BRL
CENTERLINE		
TURF RUNWAY	N/A	
PAVEMENTS (ON AIRPORT)		
AIRPORT PROPERTY LINE		
OBSTRUCTION LIGHTS		
BUILDINGS (ON AIRPORT)		
DEMOLITION	N/A	
AIRPORT SURVEY MONUMENTS		

	EXISTING	ULTIMATE
ROTATING BEACON		SAME
AIRPORT REFERENCE POINT		SAME
WIND CONE		SAME
WIND TEE	N/A	
AWOS (LIGHTED)		
RTR FACILITY		
PAPI	N/A	
REILS		
THRESHOLD LIGHTS		
TIE DOWN LOCATIONS	T	T
TREE LINE		SAME
EDGE OF WATER FEATURE / WETLAND		SAME
FENCE		
EXISTING PAVED ROADWAY		N/A
APPROXIMATE LIMITS OF DEVELOPMENT		SAME

NO.	REVISIONS	BY	DATE	APPROVALS SPONSOR/DATE	FAA/DATE	ADA/DATE



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2407 SE Cotterwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2269 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	Vertical Scale:
DRC	–
Approved By:	Horizontal Scale:
BSM	1"=100'
Date:	Plotting Scale:
7.6.16	1
Project No.:	Drawing Name:
VBT-17	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

TERMINAL AREA DRAWING
NORTH HALF

Final - 7.6.16

Sheet No.: 9 of 12

Drawing Name: M:\BDS\PROJ\VBT-17\DWG\VBT-17 ALD 7-15-16.dwg Last Modified: Jul 06, 2016 - 2:45pm Plotted on: Jul 06, 2016 - 2:45pm by dcarrera

MAGNETIC DEC.
1° 46' E (2015)

100 0 100 200
SCALE: 1"=100' feet

NOTES

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	EXISTING	ULTIMATE
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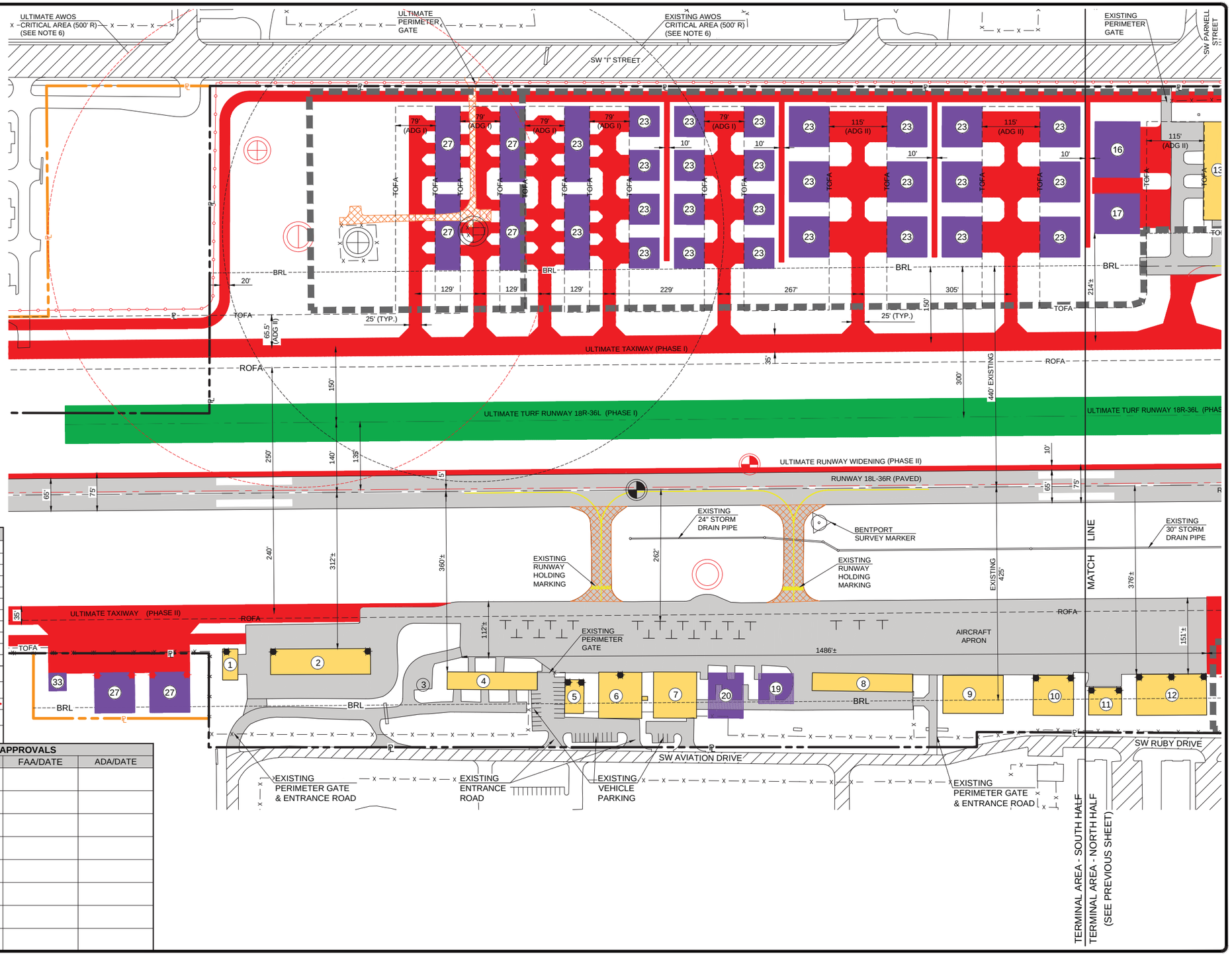
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBSTACLE FREE ZONE	ROFZ	ROFZ
TAXIWAY OBJECT FREE AREA	TOFA	TOFA
APPROXIMATE BUILDING RESTRICTION LINE (BRL)	BRL	BRL
CENTERLINE		
TURF RUNWAY	N/A	
PAVEMENTS (ON AIRPORT)		
AIRPORT PROPERTY LINE	P	P
OBSTRUCTION LIGHTS		
BUILDINGS (ON AIRPORT)		
DEMOLITION	N/A	
AIRPORT SURVEY MONUMENTS		

	EXISTING	ULTIMATE
ROTATING BEACON		SAME
AIRPORT REFERENCE POINT		SAME
WIND CONE		SAME
WIND TEE	N/A	
AWOS (LIGHTED)		
RTR FACILITY		
PAPI	N/A	
REILS		
THRESHOLD LIGHTS		
TIE DOWN LOCATIONS		
TREE LINE		SAME
EDGE OF WATER FEATURE / WETLAND		SAME
FENCE		
EXISTING PAVED ROADWAY		N/A
APPROXIMATE LIMITS OF DEVELOPMENT		SAME

NO.	REVISIONS	BY	DATE	APPROVALS SPONSOR/DATE	FAA/DATE	ADA/DATE



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7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

Drawn By:	DRC
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Date:	7.6.16
Project No.:	VBT-17

Vertical Scale:	–
Horizontal Scale:	1"=100'
Plotting Scale:	1
Drawing Name:	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

TERMINAL AREA DRAWING
SOUTH HALF

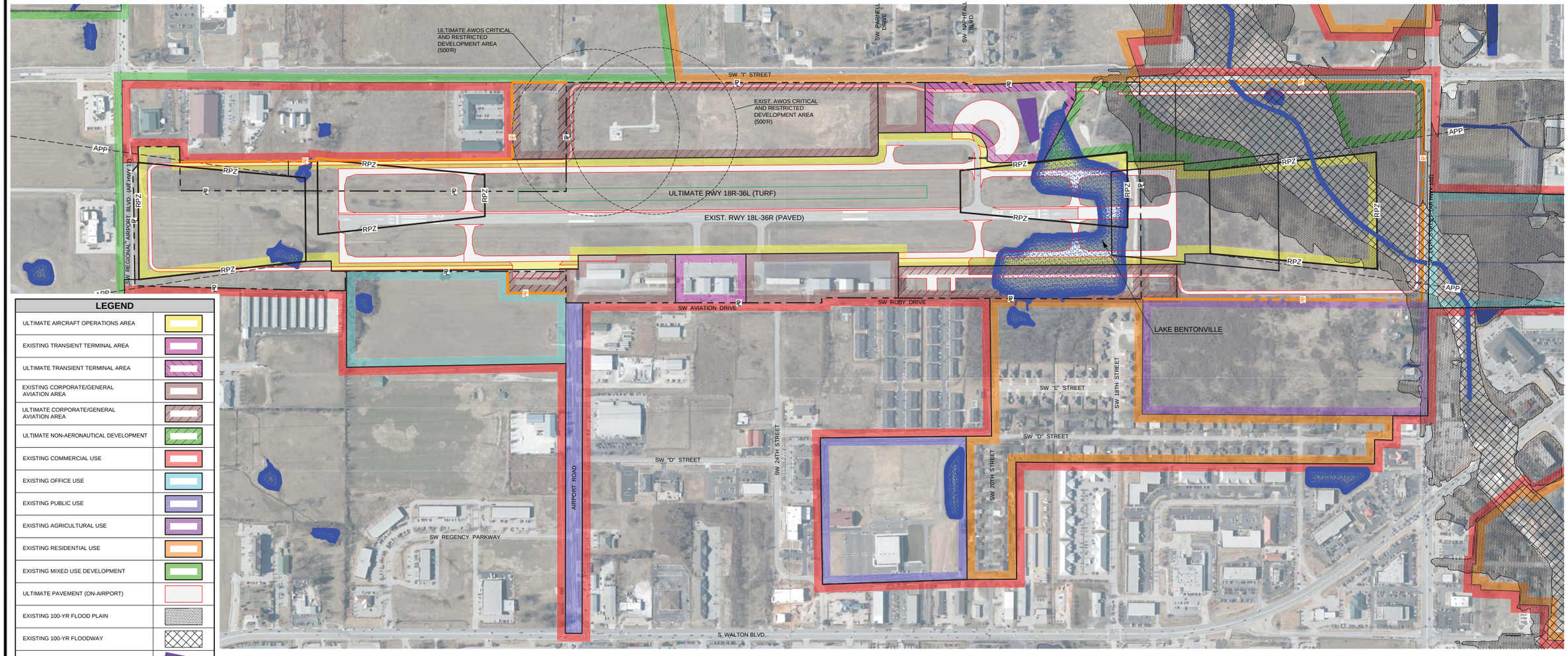
Final – 7.6.16

Sheet No.: 10 of 12

Drawing Name: H:\SDSK\PROJ\VBT-17\DWG\VBT-17 ALD 1-15-15.dwg Last Modified: Jul 06, 2016 - 2:44pm Plotted on: Jul 06, 2016 - 2:47pm by dcervera

MAGNETIC DEC.
1° 46' E (2015)

300 0 300 600
SCALE: 1"=300' feet



LEGEND

ULTIMATE AIRCRAFT OPERATIONS AREA	
EXISTING TRANSIENT TERMINAL AREA	
ULTIMATE TRANSIENT TERMINAL AREA	
EXISTING CORPORATE/GENERAL AVIATION AREA	
ULTIMATE CORPORATE/GENERAL AVIATION AREA	
ULTIMATE NON-AERONAUTICAL DEVELOPMENT	
EXISTING COMMERCIAL USE	
EXISTING OFFICE USE	
EXISTING PUBLIC USE	
EXISTING AGRICULTURAL USE	
EXISTING RESIDENTIAL USE	
EXISTING MIXED USE DEVELOPMENT	
ULTIMATE PAVEMENT (ON-AIRPORT)	
EXISTING 100-YR FLOOD PLAIN	
EXISTING 100-YR FLOODWAY	
ULTIMATE FBO	
EXISTING PROPERTY LINE	-P-
ULTIMATE PROPERTY LINE	-P-
EXISTING WATER FEATURE	
ULTIMATE RUNWAY PROTECTION ZONE	RPZ
ULTIMATE PART 77 RUNWAY APPROACH SURFACE	APP

NOTES

1. NAVIGATION AIDS NOT SHOWN FOR CLARITY. SEE AIRPORT LAYOUT DRAWING.
2. LAND USE DESIGNATION PER: http://geo.bentonvillear.com, DATE 12-14-15.
3. REFER TO CITY OF BENTONVILLE ZONING MAP AT: http://geo.bentonvillear.com, DATE 12-14-15.
7. CITY OF BENTONVILLE ZONING ORDINANCES:
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Drawn By:	Vertical Scale:
DRC	–
Approved By:	Horizontal Scale:
BSM	1"=300'
Date:	Plotting Scale:
7.6.16	1
Project No.:	Drawing Name:
VBT-17	ALD

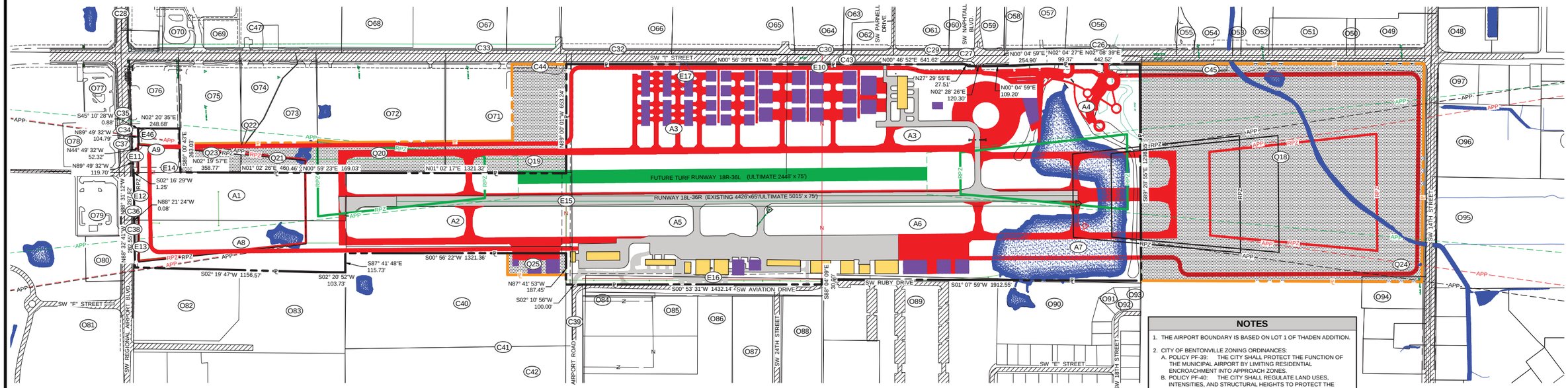
AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

LAND USE DRAWING

Final - 7.6.16

11 of 12



MAGNETIC DEC.
1° 46' E (2015)

300 0 300 600
SCALE: 1"=300' feet

NOTES

1. THE AIRPORT BOUNDARY IS BASED ON LOT 1 OF THADEN ADDITION.
2. CITY OF BENTONVILLE ZONING ORDINANCES:
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AIRPORT PROPERTY

TRACT NO.	TOTAL ACREAGE	AIRPORT OWNED ACREAGE	EASEMENT ACREAGE	DOCUMENT ID NUMBER	OWNER	DATE ACQUIRED	METHOD ACQUIRED
A1	**8.75**	LOT 1 OF THADEN ADDITION	N/A	BK 96 PG 76675	CITY OF BENTONVILLE	09/18/96	FEE
A2	**14.61**		N/A	BK 91 PG 28120	CITY OF BENTONVILLE	07/02/91	FEE
A3	43.19		N/A	BK 257 PG 116	CITY OF BENTONVILLE	02/20/45	FEE
A4	13.03		N/A	BK 257 PG 116	CITY OF BENTONVILLE	02/20/45	FEE
A5	20.79		N/A	BK 255 PG 618	CITY OF BENTONVILLE	02/20/45	FEE
A6	19.16		N/A	BK 2009 PG 59843	CITY OF BENTONVILLE	02/20/45	FEE
A7	11.71		N/A	BK 257 PG 116	CITY OF BENTONVILLE	02/20/45	FEE
A8	8.60		N/A	BK 2009 PG 50964	CITY OF BENTONVILLE	05/07/10	FEE
A9	1.73		N/A	BK 2005 PG 33872	CITY OF BENTONVILLE	05/07/10	FEE
TOTAL	141.57 (R)	136.04 (M)	N/A	01-16535-000	AIRPORT PROPERTY	05/07/10	PLAT

ENCUMBRANCES

E10	2.6±	2.6±	2.6±	BK 2009 PG 56924	VARIABLE WIDTH GRADING, UTILITY, AND DRAINAGE ESMT.	11/05/09	EASEMENT
E11	0.13	0.13	0.13	BK 2009 PG 56945	20' GRADING, UTILITY, AND DRAINAGE EASEMENT	N/A	EASEMENT
E12	0.13	0.13	0.13	BK 2009 PG 56935	20' GRADING, UTILITY, AND DRAINAGE EASEMENT	N/A	EASEMENT
E13	0.13	0.10	0.10	BK 2009 PG 46487	GRADING, UTILITY, AND DRAINAGE EASEMENT	N/A	EASEMENT
E14	0.25	0.25	0.25	BK 2010 PG 194	EASEMENT AND BUILDING SETBACK	05/07/10	PLAT
E15	1.03	1.03	1.03	BK 2010 PG 192	VARIABLE WIDTH WATER LINE EASEMENT	05/07/10	PLAT
E16	2.46	2.46	2.46	BK 2009 PG 56916	VARIABLE WIDTH GENERAL UTILITY EASEMENT	05/07/10	PLAT
E17	0.20	0.19	0.19	BK 2010 PG 192	WETLAND AREA	05/07/10	PLAT
E46	0.01±	0.01±	0.01±	BK 2010 PG 194	12' X 12' MONUMENT EASEMENT	05/07/10	PLAT
TOTAL	6.93	6.89	6.89		ENCUMBRANCES		

ULTIMATE AIRPORT ACQUISITION TRACT

Q18	71.78	50.55±	N/A	01-00088-000	BENTONVILLE P&R FUND LLC	N/A	N/A
Q19	10.93	6.7±	N/A	01-05274-000	AGRACEL, INC.	TBD	TBD
Q20	11.38	3.3±	N/A	01-05274-001	LONESOME TREE PROPERTIES LLC	TBD	TBD
Q21	4.96	1.9±	N/A	01-05275-000	THE SALVATION ARMY	TBD	TBD
Q22	2.27	0.01±	N/A	01-05275-003	CATB PROPERTIES LLC	TBD	TBD
Q23	5.94	1.5±	N/A	01-05275-001	CEI ENGINEERING ASSOCIATES INC	TBD	TBD
Q24	1.80	1.8±	N/A	01-00088-001	MICHAEL LIVING TRUST, IRENE I	TBD	TBD
Q25	17.09±	1.04±	N/A	01-00128-000	CITY OF BENTONVILLE	TBD	TBD
TOTAL	126.15±	88.03	N/A		ULTIMATE AIRPORT ACQUISITION TRACT		

CITY TRACT

TRACT NO.	TOTAL ACREAGE	OWNER
C26	3.21	CITY OF BENTONVILLE
C27	0.27	CITY OF BENTONVILLE
C28	8.56	ARKANSAS STATE HIGHWAY COMMISSION
C29	0.27	CITY OF BENTONVILLE
C30	0.24	CITY OF BENTONVILLE
C31	4.00	CITY OF BENTONVILLE
C32	1.49	CITY OF BENTONVILLE
C33	4.86	CITY OF BENTONVILLE
C34	0.23	CITY OF BENTONVILLE
C35	1.56	CITY OF BENTONVILLE
C36	0.13	ARKANSAS STATE HIGHWAY COMMISSION
C37	6.17	CITY OF BENTONVILLE
C38	0.03	ARKANSAS STATE HIGHWAY COMMISSION
C39	4.57	CITY OF BENTONVILLE (AIRPORT ROAD)
C40	18.05	CITY OF BENTONVILLE
C41	0.18	CITY OF BENTONVILLE
C42	19.01	CITY OF BENTONVILLE
C43	4.35±	VARIABLE WIDTH DEDICATED SW "I" STREET RIGHT-OF-WAY
C44	0.2±	VARIABLE WIDTH DEDICATED SW "I" STREET RIGHT-OF-WAY
C45	1.8±	VARIABLE WIDTH DEDICATED SW "I" STREET RIGHT-OF-WAY
C47	1.8±	CITY OF BENTONVILLE

FACILITIES INDEX TABLE

TRACT NO.	PARCEL NUMBER	OWNER	TRACT NO.	PARCEL NUMBER	OWNER
O48	01-09667-000	PINNACLE HIGHWAY 102 LLC	O73	01-05275-000	THE SALVATION ARMY
O49	01-03325-000	RONE FAMILY TRUST, RONE, DONALD A & MONICA L	O74	01-05275-003	CATB PROPERTIES LLC
O50	01-03326-000	MILES, DONOVAN JR & CATHY	O75	01-05275-001	CEI ENGINEERING ASSOCIATES INC
O51	01-04102-000	MILES, DONOVAN JR & CATHY	O76	01-05275-002	CORNERSTONE BAPTIST CHURCH/BMAA
O52	01-04103-000	MILES, DONOVAN JR & CATHY	O77	01-16607-000	MCDONALDS REAL ESTATE
O53	01-07433-000	BOYS & GIRLS CLUB OF BENTON COUNTY	O78	01-16608-000	FARM TEETH LLC
O54	01-07432-000	BOYS & GIRLS CLUB OF BENTON COUNTY	O79	01-14937-005	PETROMARK INC.
O55	01-07432-001	1710 I STREET LLC	O80	01-14937-006	STEARMAN REVOCABLE TRUST, GARY E
O56	01-00810-000	WILSON REVOCABLE TRUST ET AL-LARRY A & SANDRA K	O81	01-14932-000	TOLLETT WOOD LLC
O57	01-00811-000	MORRELL, CLIFTA DANISE	O82	01-05277-000	WORD OF LIFE FELLOWSHIP
O58	01-00809-000	AYRES, DALE & DIANE	O83	01-05277-004	3B STORAGE LLC
O59	01-14550-000	PINNACLE BANK	O84	01-00089-000	Philip Owens
O60	01-14549-007	CASEY, JOLEY & PARNELL, LINDA	O85	01-07969-002	CONAN PROPERTIES LLC
O61	01-00828-000	WRONA, JEFFREY D	O86	01-00089-004	HELPING HANDS, INC.
O62	01-07805-000	SCOTT, DOUGLAS C JR & KIMBERLY K	O87	01-09420-001	2M INVESTMENTS
O63	01-07806-000	PITTMAN, JOHN STEPHEN & HELEN A	O88	01-09421-001	BUZIK REVOCABLE TRUST, YEFIM ET AL
O64	01-00826-000	MCDOWELL, VAUGHAN D & JAMIE S	O89	01-09128-000	TOUCHSTONE LIMITED PARTNERSHIP OF BENTONVILLE
O65	01-09590-000	PARNELL, SARA LEE	O90	01-12034-000	GGE LLC
O66	01-09591-000	REACH CHURCH INC	O91	01-12026-000	BRACE BOOM LLC
O67	01-15866-000	UPTOWN VILLAGE LLC	O92	01-12025-000	GGE LLC
O68	01-15865-000	UPTOWN VILLAGE LLC	O93	01-12024-000	PATRICK, MELANIE
O69	01-15863-000	WAL-MART REAL ESTATE BUSINESS TRUST	O94	01-00088-001	MICHAEL LIVING TRUST, IRENE I
O70	01-15856-000	WAL-MART REAL ESTATE BUSINESS TRUST	O95	01-05072-000	MICHAEL FAMILY LIMITED PARTNERSHIP, DONALD ET AL
O71	01-05274-000	AGRACEL, INC.	O96	01-05278-000	WORD OF LIFE FELLOWSHIP
O72	01-05274-001	LONESOME TREE PROPERTIES LLC	O97	01-05278-001	CASEYS MARKETING COMPANY

LEGEND

EXISTING AIRPORT PROPERTY LINE		EXISTING BUILDINGS (ON AIRPORT)	
ULTIMATE AIRPORT PROPERTY LINE		ULTIMATE BUILDINGS (ON AIRPORT)	
ULTIMATE AIRPORT ACQUISITION TRACT	Q18	EXISTING AIRPORT SURVEY MONUMENTS	
AIRPORT TRACT	A12	ULTIMATE AIRPORT SURVEY MONUMENTS	
ENCUMBRANCES	E13	EXISTING RUNWAY PROTECTION ZONE	RPZ
CITY TRACT	C15	ULTIMATE RUNWAY PROTECTION ZONE	RPZ
OTHER ADJACENT TRACT	O16	ULTIMATE TURF RUNWAY PROTECTION ZONE	RPZ
EDGE OF WATER FEATURE / WETLAND		EXISTING PART 77 RUNWAY APPROACH SURFACE	APP
EXISTING PAVEMENT (ON AIRPORT)		ULTIMATE PART 77 RUNWAY APPROACH SURFACE	APP
ULTIMATE PAVEMENT		ULTIMATE PART 77 TURF RUNWAY APPROACH SURFACE	APP
ULTIMATE TURF RUNWAY		LAND HOOK	Z
		EXISTING PAVEMENT (OFF AIRPORT)	

NO.	REVISIONS	BY	DATE	APPROVALS SPONSOR/DATE	FAA/DATE	ADA/DATE

MORRISON SHIPLEY
ENGINEERS ▪ SURVEYORS
2407 SE Cotterwood Street ▪ Bentonville, AR 72712 ▪ 479.273.2269 ▪ morrisonshipley.com

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944–5500

Drawn By:	DRC
Approved By:	BSM
Date:	7.6.16
Project No.:	VBT–17

Vertical Scale:	–
Horizontal Scale:	1"=300'
Plotting Scale:	1
Drawing Name:	ALD

AIRPORT LAYOUT PLAN

Bentonville Municipal Airport (KVBT)

AIRPORT PROPERTY MAP

Final – 7.6.16

Sheet No.: 12 of 12

Drawing Name: M:\BDS\PROJ\VBT-17\DWG\VBT-17 ALD 1-18-18.dwg Last Modified: Jul 06, 2016 - 2:46pm Plotted on: Jul 06, 2016 - 2:46pm by dcervera

Bentonville
MUNICIPAL AIRPORT

2500 SW Aviation Dr,
Bentonville, AR 72712

http://www.bentonvillear.com/departments/bentonville-municipal-airport

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