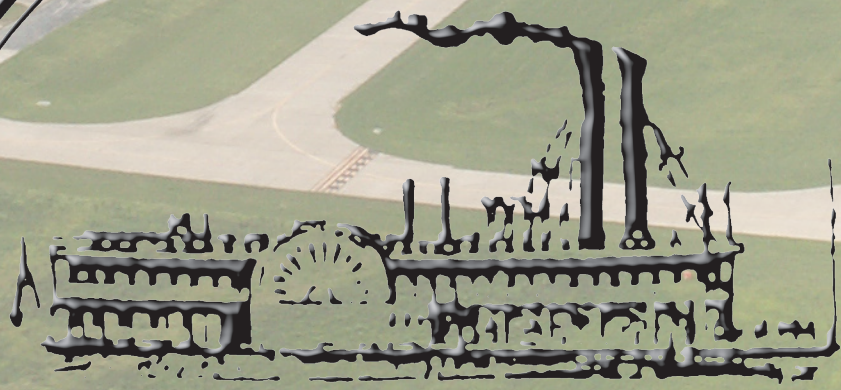


Boonville-Jesse Viertel Memorial Airport

Master Plan Update



BOONVILLE
MISSOURI



BOONVILLE-JESSE VIERTEL MEMORIAL AIRPORT

Master Plan Update

MoDOT Project Number:
08-039A-1

MoDOT DISCLAIMER

The preparation of this document was financed, in part, through a State Block Planning Grant from the Missouri Department of Transportation (MoDOT), Aviation Section. The contents of this document do not necessarily reflect the views or policy of the MoDOT, Aviation Section or the U.S. Department of Transportation, Federal Aviation Administration (FAA). Acceptance of this document by the MoDOT, Aviation Section does not in any way constitute a commitment on the part of the State of Missouri to participate in any development concept depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws.

**“The airport runway is the most
important main street in any town.”**

— Norm Crabtree, former aviation director of Ohio(!)

1. Terwilliger, B. J. (Producer & Director). (2005). *One Six Right- The Romance of Flying* [DVD]. VNY Documentary, LLC.



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CHAPTER ONE

AIRPORT INVENTORY

INTRODUCTION

As the initial step in the master plan process, the airport inventory is a systematic and comprehensive data collection process that provides background information regarding the airport's physical, operational and functional characteristics and provides further understanding of past and present aviation factors and activity demand. The inventory data collected as part of this chapter provides the basis for evaluating existing facilities and subsequently determining future demand forecasts and facility needs at the Boonville-Jesse Viertel Memorial Airport (VER).



BACKGROUND INFORMATION

Airport Location

VER is situated on 197 acres approximately three miles southeast of the central business district of the City of Boonville, Cooper County, MO. The main access route to/from the Airport is via Pearre Rd. which connects the facility with Missouri State Highway 87 (MO 87) to the west, as well as Interstate 70 (I-70) which is located immediately south of the Airport. **Exhibit 1.1** illustrates the general location of VER.

Airport Role

VER is a National Plan of Integrated Airport Systems (NPIAS) airport. VER is classified within the NPIAS and Missouri State Airport System Plan (MoSASP) as a General Aviation facility. VER's current runway length allows the Airport to accommodate 100 percent of the general aviation fleet of small aircraft with a maximum takeoff weight of 12,500 pounds or less which is intended to serve a relatively large population base remote from a metropolitan area.

The MoSASP system role of VER has been identified as one of 27 Regional facilities in the state. MoSASP Regional airports accommodate a wide range of general aviation aircraft for large service areas outside of major metropolitan areas throughout the state and typically have locally based turbine and business jet aircraft as well as substantial levels of itinerant/transient turbine aircraft activity. Additionally, Regional airports are capable of accommodating 100 percent of transient general aviation users typically operating aircraft weighing less than 12,500 pounds and/or 75 percent of the general aviation fleet weighing from 12,500 to 60,000 pounds.

Ownership and Management

VER is a public owned, public use facility that is owned and operated by the City of Boonville which is governed by a mayor and eight-member council. The City administers the Airport through the appointment of a five-member Airport Advisory Committee (AAC) by the mayor with city council approval. The AAC also includes a chairman and a city

council representative. The City employs a full-time airport manager who coordinates and directs administrative and contractual functions including preparation of an annual budget, coordination of capital improvement projects, lease negotiations and agreements as well as public relations.

On-Airport Businesses

Currently, there are four businesses based at VER that provide aviation-related goods and services and conduct regular operational activity.

TigAir Flight Training, LLC

Fixed based operation (FBO) services at VER include 100LL and Jet A fuel, hangar rental, tie-downs, aircraft rental, basic and advanced fixed-wing flight instruction, pilot supplies, covered overnight aircraft storage, restroom, vending, courtesy car transportation and computer weather/flight planning service. TigAir employs two full-time employees including the airport manager who is responsible for line service duties, maintenance and operations, as well as one additional employee who serves in an administrative capacity.

Gallop Aviation

According to the company's website, Gallop Aviation is Central Missouri's only flight training and commercial helicopter operator offering Private, Commercial, Certified Flight Instructor-Instrument, and Instrument Training in Schweizer 300C helicopters. Additional services offered by Gallop include aerial photography and survey operations. The company employs two full-time employees.

Lamine Aviation, LLC

Lamine Aviation, along with Gallop, provides basic and advanced rotorwing and fixed wing flight training and consists of a single employee.

G & J Aircraft Services

G & J provides major airframe and powerplant maintenance for piston aircraft as well as general aviation parts and supplies including aircraft restoration. G & J currently employs two full-time employees.

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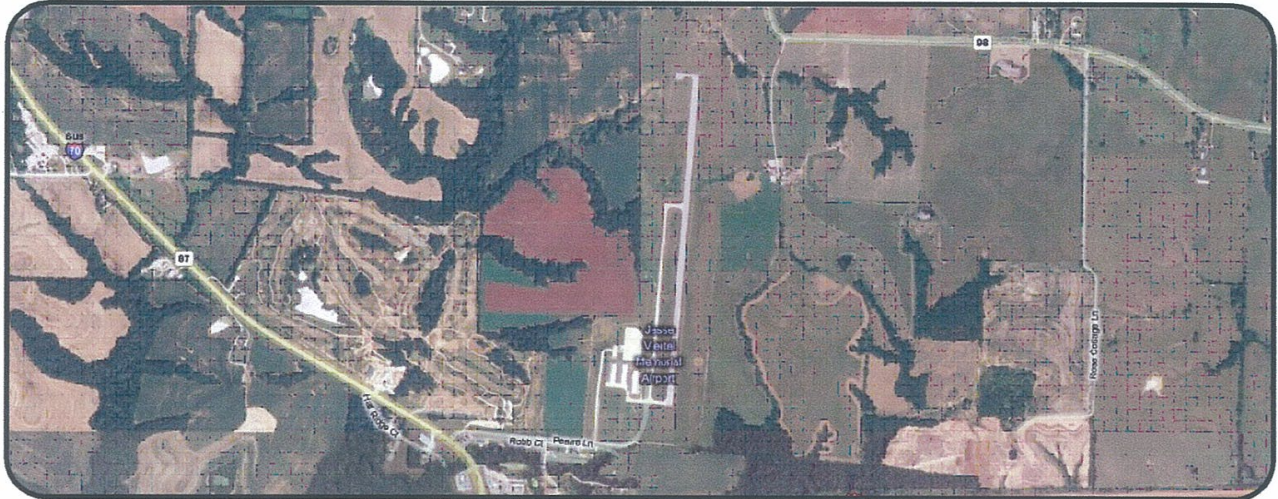
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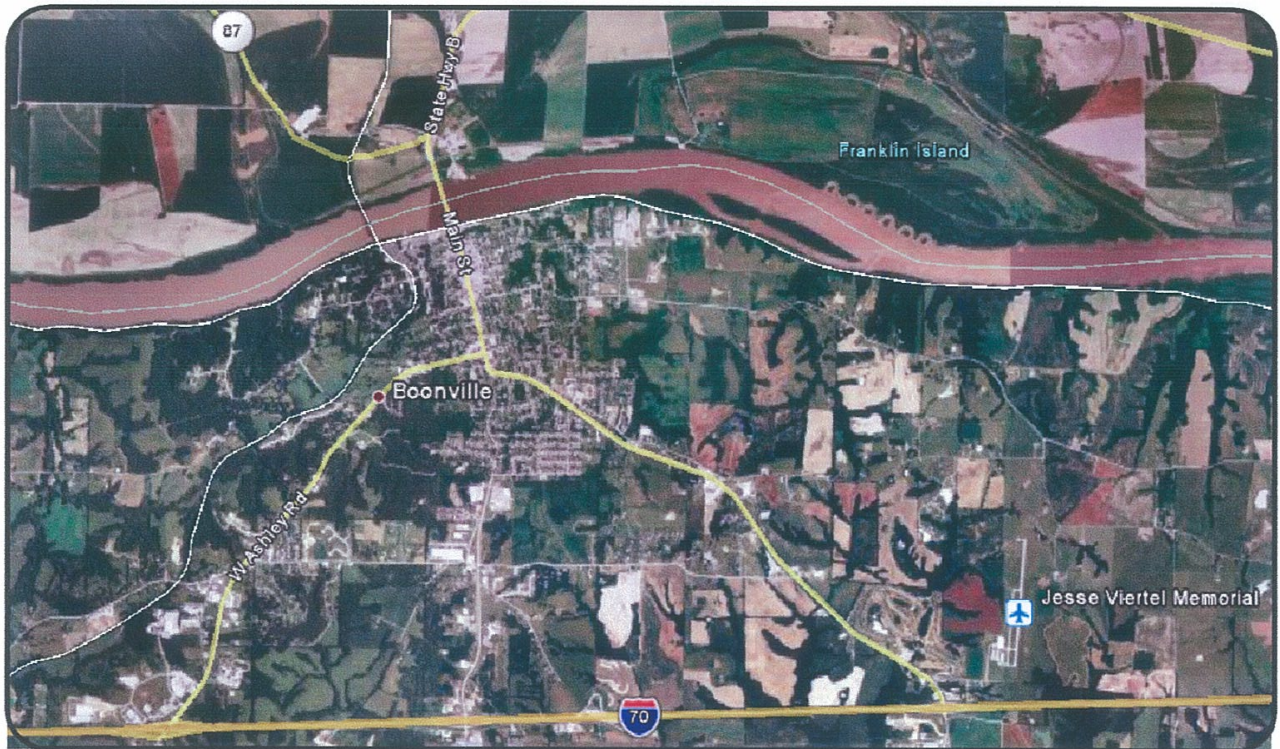
BOONVILLE-JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri

Exhibit 1.1
Vicinity and Location Maps

Vicinity Map



Location Map



Source: www.mappoint.com; Google Earth.



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Services and Operating Conditions

VER is attended continuously throughout the year from 8:00 a.m. to 8:00 p.m. In addition to those already mentioned, services and activities at VER include air ambulance, transient corporate, military, state agency and aircraft maintenance flight operations.

AIRFIELD FACILITIES

The published field elevation is 715.0 feet above mean sea level (MSL) while the Airport's geographic location is 38° 56' 48.20" N latitude and 92° 40' 57." W longitude. The current magnetic declination for the airport location is 1° 2' E and changing by 0° 7' W per year (Epoch Year 2010). **Exhibit 1.2** illustrates the airfield facilities and layout of VER.

Runway

VER's airfield layout consists of a 4,000' x 75' single runway, designated 18-36. Runway 18-36's asphalt surface has a weight bearing capacity of 12,500 pounds to accommodate single wheel gear (SWG) aircraft and is in good physical condition. Runway 18-36 is equipped with non-precision instrument (NPI) runway markings and currently accommodates straight-in RNAV⁽¹⁾ (GPS) approach procedures utilizing WAAS⁽²⁾, LNAV⁽³⁾, LPV⁽⁴⁾ to the Runway 18 and 36 thresholds, as well as a circling VOR⁽⁵⁾ approach to the Airport.



VER's Airfield Environment



Runway 18 Threshold



Runway 36 Threshold

1. RNAV-Area Navigation

2. WAAS- Wide Area Augmentation System

3. LNAV- Refers to a non-precision approach procedure which uses GPS and/or WAAS for Lateral Navigation (LNAV). On an LNAV approach, the pilot flies the final approach lateral course, but does not receive vertical guidance for a controlled descent to the runway. Typically, LNAV procedures achieve a minimum descent altitude of 400 feet height above the runway.

4. LPV (Localizer Performance with Vertical guidance) is similar to LNAV/VNAV except it is much more precise and enables descent to 200-250 feet above the runway and can only be flown with a WAAS receiver.

5. A VOR-DME and VOR are very high frequency omni-directional radio range (VOR) facility with distance measuring equipment (DME) in which the ground-based NAVAID transmits very high frequency (VHF) signals 360 degrees oriented from magnetic north, allowing aircraft to track to and from the facility, located on or near an airport. The VOR-DME and VOR broadcast range is typically 200 nautical miles and is restricted by line-of-sight (VHF signals do not follow the curvature of the earth), and periodically identifies itself by Morse code while some facilities are equipped with a voice identification feature.

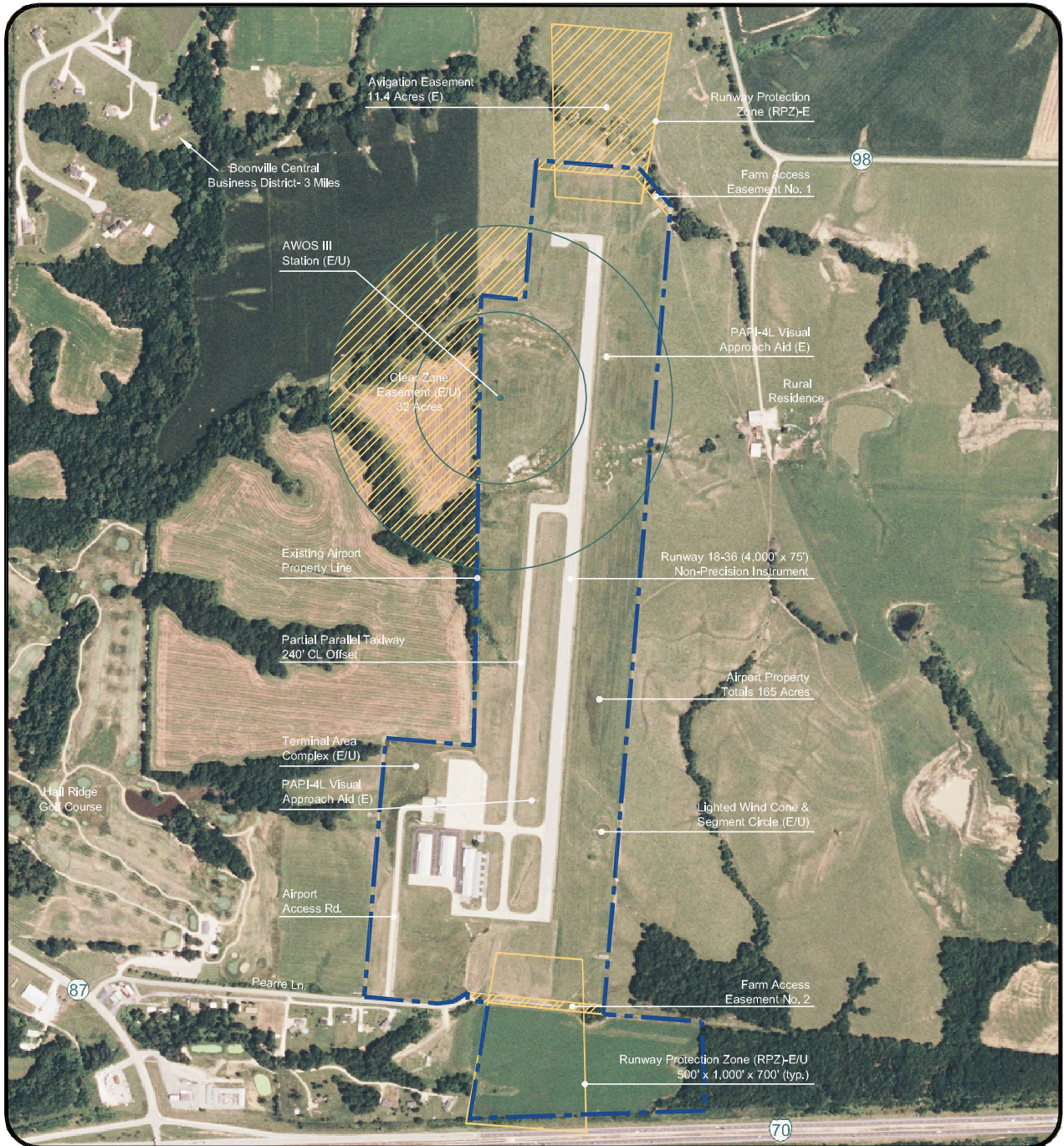
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Exhibit 1.2 Airfield Facilities and Airport Layout



Source: National Agricultural Imagery Program (NAIP), Cooper County.



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Taxiways

VER's taxiway system consists of a 35 foot wide partial-parallel Portland Cement Concrete (PCC) taxiway which provides direct access between the Runway 36 threshold and the midfield portion of the runway, as well as the Airport's apron and terminal area complex. The taxiway system also includes one connector taxiway near the Runway 36 threshold providing direct access to the main terminal area and an aircraft turnaround to accommodate aircraft departing from Runway 18. VER's taxiway system has a weight bearing capacity of 12,500 pounds SWG.

Airfield Lighting

Runway 18-36 is equipped with pilot controlled, white, stake mounted, medium intensity runway lighting (MIRL), red and green omni-directional threshold lights, as well as Runway End Indicator Lighting (REIL) for rapid identification of the thresholds during night and inclement weather conditions. Lastly, the taxiway system at VER is equipped with blue stake-mounted reflectors.

Weather Reporting System

VER is served by an automated weather observing system (AWOS-III) which is a suite of sensors which measure, collect and disseminate weather data to help meteorologists, pilots and flight dispatchers prepare and monitor weather forecasts, plan flight routes, and provide necessary information for correct takeoffs and landings. An AWOS-III transmits wind speed, peak gust, wind direction, temperature, dew point, altimeter setting, density altitude, visibility, as well as sky condition, cloud height and cloud type, and provides a minute-to-minute update that is transmitted to pilots by a VHF radio frequency between 118 and 136 MHz. VER's AWOS is located approximately 0.4 miles north of the area complex and west of the parallel taxiway and does interface with the National Weather Service (NWS).

NAVAIDS/Communications

NAVAIDs are classified as either an enroute or terminal area facility. Enroute NAVAIDs provide point-to-point navigational services within the enroute airspace environment while a terminal area NAVAID is one which



Parallel Taxiway-Looking North



Parallel Taxiway-Looking South



Apron Connector Taxiway

provides direct navigation to/from an airport. The nearest enroute NAVAIDS to VER are the COLUMBIA VOR-DME which is located approximately 23 nautical miles (Nm) southeast of the Airport, as well as the HALLSVILLE VORTAC⁽⁶⁾ station located approximately 28 Nm northeast of VER.

Another enroute and more prevalent terminal area NAVAID is GPS. GPS is a highly accurate worldwide

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satellite navigational system that is unaffected by weather and provides point-to-point navigation by encoding transmissions from multiple satellites and ground-based datalink stations using an airborne receiver. GPS currently supports the published straight-in RNAV (GPS) instrument approach procedures (IAP) to Runway 18 and 36.

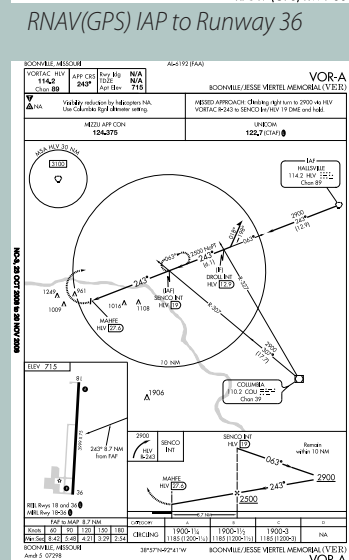
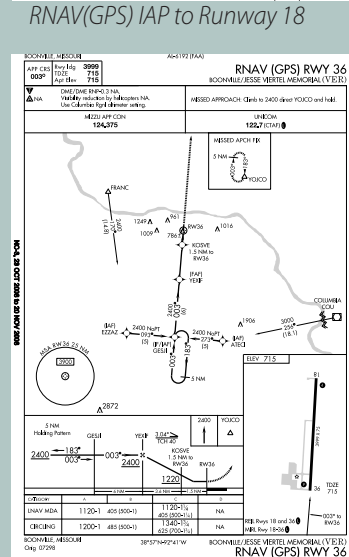
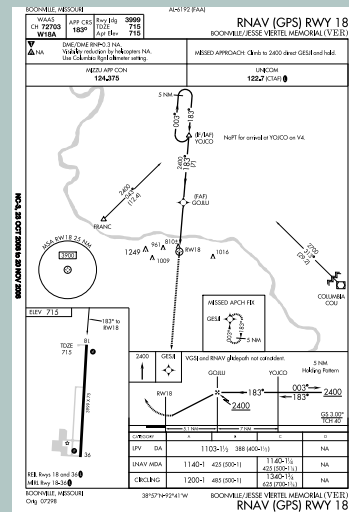
Visual Approach Aids

Visual approach aids assist aircraft on final approach by providing vertical situational awareness in relation to the runway threshold. The most common visual aid includes a precision approach path indicator (PAPI)⁽⁷⁾, which are in service at VER. Runways 18 and 36 are equipped with PAPI-4Ls.

Instrument Approach Procedures (IAP)

Table 1.1 discloses information regarding the published IAPs in place at VER. IAPs permit operations during instrument meteorological conditions and further increase access, capacity, and overall safety and efficiency of the Airport.

- A VORTAC is a very high frequency omni-directional radio range facility with tactical air navigation (TACAN) in which the ground-based NAVAID transmits very high frequency (VHF) signals 360 degrees oriented from magnetic north, allowing aircraft to track to and from the facility, located on or near an airport. The VORTAC broadcast range is typically 200 nautical miles and is restricted by line-of-sight (VHF signals do not follow the curvature of the earth), and periodically identifies itself by Morse code while some facilities are equipped with a voice identification feature.
- The PAPI is a system of lights located on the side of a runway that provides visual descent guidance information during the approach to a runway. These lights are visible from 3-5 miles during the day and up to 20 miles or more at night. Each set of lights for both systems are designed so that viewing it from above a specific angle it shows white lights and below that angle red lights. If flight crews see two white and two red indications, then the aircraft is on the glide slope. If each of the four lamps are white, it means the aircraft is too high and four red lights indicates the aircraft is below glidepath.





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**Table 1.1
Published IAPs**

Runway End	Approach	Approach Minimums/Category	Approach Minimums
RNAV (GPS) RWY 18	LPV DA	1-mile (A, B and C); n/a (D)	1,103' MSL/400' AGL
	LNAV MDA	1-mile (A & B); 1¼ -mile (C), n/a (D)	1,140' MSL/500' AGL
	Circling	1-mile (A & B); 1¼ -mile (C), n/a (D)	1,200' MSL/500' AGL
RNAV (GPS) RWY 36	LNAV MDA	1-mile (A & B); 1¼ -mile (C), n/a (D)	1,120' MSL/500' AGL
	Circling	1-mile (A & B); 1¾ -mile (C), n/a (D)	1,200' MSL/700' AGL
VOR-A	Circling	1¼-mile (A); 1½ -mile (B), 3-miles (C), n/a (D)	1,900' MSL/1,200' AGL

Source: U.S. Terminal Procedures- North Central (NC-3).

Airfield Facilities Summary

Table 1.2 highlights and denotes the pertinent airfield facilities and equipment at VER.

**Table 1.2
Airfield Facilities Summary**

Airfield Item	Physical Description
Runway 18-36	
Runway Dimensions	4,000' x 75'
Runway Surface	Asphalt
Pavement Strength	12,500 lbs. SWG
True Runway Bearing	4.67° true bearing
Pavement Markings	NPI
Runway Lighting	MIRL/Threshold Lighting/REIL
Visual Approach Aids	PAPI-4Ls (Rwy 18 & 36)
Taxiway System	
Partial-Parallel Taxiway	Stake-Mounted Blue Reflectors; 12,500 lbs. SWG
Connector Taxiways	Stake-Mounted Blue Reflectors; 12,500 lbs. SWG
Other Airfield Items	
NAVAIDs/Communications	Enroute (GPS)
Weather Reporting	AWOS-III
Airport Beacon	Located 260 feet WNW of Terminal Building (SW of Apron)
Instrument Approaches	RNAV(GPS) (18 & 36)

Source: BWR; VER Site Visit.

TERMINAL AREA FACILITIES

VER's general aviation facilities include the airport's terminal building, terminal area auto parking, T-hangars, clear span hangars, local and transient apron areas, tie-downs. **Exhibit 1.3** illustrates the terminal area facilities and layout of VER.

Terminal Building

VER's terminal building consists of a 900 square foot structure located immediately south of and adjacent to the aircraft apron and accommodates local airport patrons and transient pilots and passengers. This 30' x 30' structure provides space for administrative offices, as well as amenities for local and transient users including flight planning facilities, public restrooms and conference area. It should be noted that the terminal building is insufficient to accommodate passenger demand during peak periods due to the age and interior floor space for public circulation. The location of the terminal building also is not ideal and presents a safety hazard with respect to passengers having to walk across the apron to access the terminal building. This issue not only is a potential incursion hazard but may encourage unlawful or unauthorized access to the terminal area and airfield.



Auto Parking Lot (9,000 sq. ft.)

Terminal Building (900 sq. ft.)

VER's Terminal Area Complex





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Exhibit 1.3 Terminal Area Facilities



Source: National Agricultural Imagery Program (NAIP), Cooper County.



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Auto Parking

The auto parking facilities at VER include a 9,000 square foot Portland Cement Concrete (PCC) public auto parking lot, measuring 136' x 66', located adjacent to and west of the terminal area complex and accommodates 20 parking spaces. The auto parking facilities at VER appear to be in good physical condition and are considered to be capable of accommodating peak period auto parking demand.

Aircraft Hangars

Table 1.3 identifies the aircraft hangars currently in use at VER by size (square footage), type and capacity. Presently, the total available hangar area is estimated to be nearly 46,700 square feet and capable of hosting nearly 33 based aircraft which includes 26 enclosed and shaded T-hangar units and five attached clear span hangars.

Table 1.3
Hangar Facilities Summary

Hangar Designation	Stored Aircraft	Hangar Type	Size (Sq. Ft.)/ Dimensions
n/a	6	Shaded T-Hangar	10,300/ 282' x 44'
100	7	Clear Spans*	13,500/ 270' x 50'
200	10	T-Hangar	11,700/ 234' x 50'
300	10	T-Hangar	11,700/ 234' x 50'
VER Hangar Accommodations	33	-	46,700

Note: Square footage and hangar dimensions are estimated figures based on on-site inspection and measurement and are rounded to the nearest thousand for planning purposes.

(*) Hangar 100 includes five attached, modified rectangular hangars. Four of the hangars measure 50' x 50' and the fifth measures 50' x 70'.

Source: BWR; VER Site Visit.



Hangar 200-Looking From Apron



Hangar 100 (L) and T-Hangar 200 (R)



(L-R) Shade Hangars, Hangars 100, 200 and 300



Hangar 300-Looking from Auto Parking

Aircraft Apron

The aircraft apron at VER occupies approximately 9,800 square yards (88,200 square feet) of paved area, is comprised of a concrete surface, hosts a total of 18 tie-downs and has a weight bearing capacity of 12,500 lbs. SWG. Based on visual inspection, the apron area appears to be in good condition.

SUPPORT FACILITIES

VER's support facilities include the fuel storage, aircraft maintenance and utility service providers.

Fuel Farm

Fueling operations at VER are conducted via a 24-hour fuel pump/meter and fuel farm facility located immediately adjacent to the western portion of the aircraft apron. VER's fuel storage capability includes a total of 21,000 gallons of 100LL, JetA and MOGAS. Each of the Airport's fuel tanks are situated aboveground and equipped with spill containment systems. **Table 1.4** identifies VER's fuel storage capabilities and facilities.

Table 1.4
Fuel Farm Facilities

Fuel Type	Storage Capacity (Gal.)	Number of Tanks/ Units	Containment
100LL	10,000	One	Aboveground-Contained
Jet A	10,000	One	Aboveground-Contained
MOGAS	1,000	One	Aboveground-Contained
Total Storage Capacity	21,000		

Source: BWR; VER Site Visit.

Aircraft Maintenance

G & J Aircraft Services provides major airframe and powerplant maintenance for piston aircraft as well as general aviation parts and supplies including aircraft restoration. G & J is currently located within hangar 100 and conducts maintenance operations within a 3,500 square foot (50' x 70') rectangular hangar.



Aircraft Apron (9,800 sq. yds.)-Looking East



Aircraft Apron- Looking West



Fuel Farm- 22,500 Gal. Storage Capacity

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Utility Service Providers

Table 1.5 describes the utilities utilized at VER, as well as the providers of utility services for the Airport.

Table 1.5
Utilities and Service Providers

Utility	Service Provider
Electric Service	Ameren UE
Water Service	Cooper County Public Water District No. 2
Telephone Service/Wireless/Internet Provider	AT&T
Aviation Fuel Provider	Phillips 66
Waste Water/Sewer	Septic System
Fire Protection	City of Boonville; Cooper County Fire Protection District (CCFPD)
Law Enforcement	City of Boonville, Cooper County Sheriffs Department

Source: BWR; VER site visit.

INTERMODAL ACCESS

The intermodal transportation network in the vicinity of VER includes local interstates, U.S. highways, state highways, as well as county routes and local roads within the vicinity of the airport.

Interstates

I-70 is located approximately 0.25 miles south of VER and is the primary east-west interstate route through Missouri and links Boonville with Kansas City located 86 Nm to the west, as well as Columbia and St. Louis located approximately 20 Nm and 121 Nm to the east, respectively. Business Loop 70 is also located to the immediate west of Airport and is also designated MO 87 (see below).

U.S. Highways

U.S. Highway 40 (U.S. 60) is located approximately three Nm north of VER and serves as the major east-west access route through southern Howard and northern Cooper County.

State Highways

MO 87 located immediately west of VER is the primary north-south access route through Boonville, as well as Howard and Cooper counties, and provides direct access between Boonville and small rural communities to the north and south of the Airport.

MO 98 is another state highway located immediately north of VER and serves a major east-west access route through Cooper County linking Boonville with Pettis County to the east.

County Routes and Local Roadways

VER is accessed via Pearre Road located to the southeast which links the Airport with MO 87 to the west and I-70 situated immediately south of the facility.

LOCAL AIRPORTS AND AIRSPACE CHARACTERISTICS

The airspace characteristics evaluation for VER will include an assessment of local area airports, airspace classifications, charted airways and special use airspace.

Local Airports

Exhibit 1.4 illustrates the airspace structure surrounding VER, as well as public and private airports located within a 25-27 NM radius of the airport. **Table 1.6** lists local airports including information regarding each facility's physical characteristics and facilities, as well as distance and direction from VER. Currently, there are four publicly owned facilities and seven privately owned airports in the vicinity of Boonville.



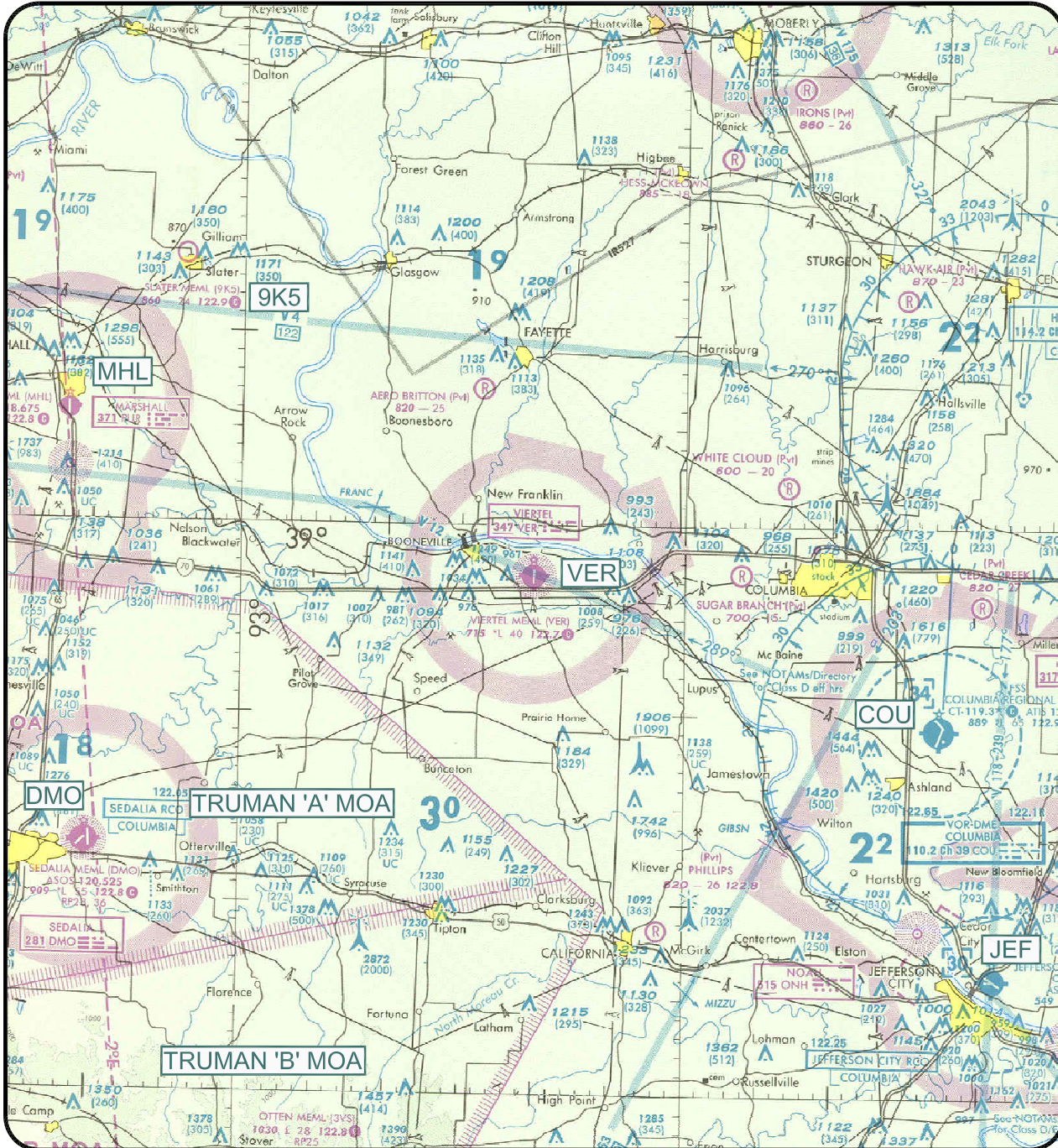
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Exhibit 1.4 Local Airports & Airspace Characteristics



Source: NOAA/FAA Missouri Sectional Aeronautical Chart.



Township 48 N, Range 16 W
Boonville Township
Sections 4, 8 and 9
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Table 1.6
Local Airports

Airport Name, Associated City	Airport Identifier	Primary Runway Characteristics	Airport Role	Distance/Direction from VER
Jesse Viertel Memorial, Boonville	VER	18-36: 3,999' x 75'	GA	-
Aero Britton Airport	-	2,500'- Turf	Private	10 NNW
Sugar Branch Airport	-	1,500'- Turf	Private	11 E
White Cloud Flying Field	-	2,000'- Turf	Private	14 ENE
Phillips Field	-	2,600'- Turf	Private	20 SSE
Columbia Regional, Columbia	COU	2-20: 6,501' x 150'	CS	23 ESE
Cedar Creek Airport	-	2,700'- Turf	Private	24 E
Hawk Air Field	-	2,300'- Turf	Private	25 NE
Hess-McKeown Airport	-	1,800'- Turf	Private	25 NNE
Slater Memorial, Slater	9K5	4-22*: 2,455' x 132'	GA	25 NW
Marshall Memorial, Marshall	MHL	18-36: 5,006' x 75'	GA	26 WNW
Sedalia Memorial, Sedalia	DMO	18-36: 5,500' x 100'	GA	27 WSW

GA- General Aviation; CS- Commercial Service; (*) Turf

Source: NOAA/FAA Kansas City Sectional Aeronautical Chart.

Airspace Classifications⁽⁸⁾

The airspace above VER is classified as controlled Class E Airspace. **Exhibit 1.4** depicts the Class E airspace classifications in the vicinity of VER.

Charted Airways⁽⁹⁾

Exhibit 1.4 depicts the 088° radial, Victor Airway V12, off the NAPOLEON VORTAC and the 289° radial, also designated Victor Airway V12, off the COLUMBIA VOR-DME, situated directly abeam VER's Class E airspace surfaces from the west to the east-southeast. Also, the FRANC intersection is located approximately nine Nm west-northwest of the Airport. Additionally, the 270° radial, Victor Airway V4,

off the HALLSVILLE VORTAC is situated in an east to west manner and located approximately 12 Nm north of the facility.

Special Use Airspace⁽¹⁰⁾

As depicted in **Exhibit 1.3**, VER is located approximately 11 Nm northeast of the TRUMAN MOA complex, in particular the TRUMAN A MOA. The TRUMAN MOA is comprised of three sectors, A, B and C. Primarily utilized by Whiteman Air Force Base, located in Knob Noster, the TRUMAN MOA's controlling ATC agency is the Kansas City Air Route Traffic Control Center (ARTCC-ZKC) located in Olathe, Kansas, while WHITEMAN APPROACH typically routes air traffic through and around the MOA.

8. Class E airspace extends upward from either the surface or a designated altitude, which in this case is down to the surface five Nm from the airport and 700 feet above ground level (AGL) 10 Nm from the facility, to the overlying or adjacent controlled airspace (Class G). Class E airspace is also the airspace used by aircraft transitioning to and from the terminal or en route environment normally beginning at 14,500 feet to 18,000 feet. Class E airspace ensures IFR aircraft remain in controlled airspace when approaching airports without Class D airspace or when flying on Victor airways--federal airways that are below 18,000 feet. Class E airspace exists everywhere from 1,200 feet above mean sea level (AMSL) up to 18,000 feet MSL. Aircrew and aircraft are not required to be in contact with air traffic control (ATC) services and are recommended to follow traffic advisory practices while maintaining an aircraft speed of 250 knots or less when operating below 10,000 feet MSL.

9. Established air routes, also known as Victor Airways, are charted and published routes linking VOR/VOR-DME/VORTAC stations throughout the contiguous United States. Victor Airways are low level (below 18,000 feet AMSL- Flight Level (FL) 180) Class E airspace corridors which are approximately 10 NM wide and whose airspace begins at 1,200 feet AMSL and extends up to but not including FL 180 (17,999 feet AMSL).

10. A Military Operations Areas (MOA) is established outside of Class A airspace to separate or segregate certain non-hazardous military activities from IFR traffic and to identify for VFR traffic where these activities are being conducted.



AIRPORT ENVIRONS & LAND USE

This section will address and examine the regional setting of VER and the land uses that surround it. This task is critical to the future development of the Airport given that planning decisions will most likely extend beyond the Airport's physical property boundary while local land use patterns will ultimately affect the potential for airport expansion and capital development.

County/City/Airport Geography

Cooper County, named after Sarshall Cooper, a frontier settler, was organized in 1818 and incorporated in 1821 has a population of approximately 17,500 residents and totals approximately 570 square miles, or 364,800 acres of land.

The City of Boonville, named for the famed pioneer Daniel Boone and incorporated in 1839, is located inside the Boonville Township, has a population of approximately 8,800 residents and covers an area of nearly 7.3 square miles.

VER is located on approximately 163 acres of land consisting of fee simple property and easements and is situated within three different map sections including sections 4, 8 and 9. The township and range of VER is T 48 N and R 16 W, respectively.

Land Use Ordinances and Zoning

VER is not codified as having a specified zoning or land use designation for city planning purposes and is located outside of the city's established zoning limits. Additionally, the county does not have a legislatively enacted land use/zoning ordinance to govern land uses in the rural portions of Cooper County.

Adjacent Land Use

Given the limited local and county land use controls, this evaluation will rely heavily on information and observations noted during the airport site visit to determine the existing land uses adjacent to VER.

The land use within the immediate vicinity is almost exclusively agricultural in nature and is defined by open fields and gently rolling hills and fields containing low yield

cropland. Low density residential use exists primarily to the northwest, east and southwest of the facility.

Limited commercial use was noted to the southwest of the Airport adjacent to MO 87 and I-70. It should be noted that a Boonville-based real estate and land developer, RHD Consultants, in association with The Business Exchange, LLC, are in the process of planning and developing plat plans for a retail and commercial development known as The Commons at Arthur's Ridge which is to be located to the north and immediate east of MO 87, includes 24 lots for development and is located approximately 0.25 miles west of VER.

The Hail Ridge Golf Course, a Section 4(f) resource, is also located immediately to the west of VER and is opened year round.

Land Uses Affecting Expansion

Based on this evaluation, future airport expansion is not expected to be adversely affected by local area land uses given the rural setting of VER coupled with agriculturally-based land uses in the immediate vicinity. Although residential use occurs adjacent to the Airport, the number and location of existing residences are not expected to be significantly impacted by potential capital development.

With regard to potential natural terrain and/or manmade features in the immediate vicinity affecting potential airport expansion, the alignment of I-70 and residential use located south of the airport are expected to potentially influence planning considerations with respect to expanding Runway 18-36 to the south as well as any terminal area expansion. Likewise, the alignment of MO 98 to the north of VER will potentially impact extension of the runway to the north with regard to available land on which to expand the runway, taxiway and accommodate runway safety areas south of MO 98.

Lastly, steep terrain and stands of tress located immediately north and west of the runway midfield and parallel taxiway intersection will most likely present design, financial and potential environmental challenges with respect to extending the taxiway to the future Runway 36 threshold.

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SOCIOECONOMIC CONDITIONS

Population, income data including per capita income (PCI) and median household income (MHI) as well as labor force participation information has been collected to understand and evaluate current socioeconomic conditions in the Cooper, Howard, and Boone County region that will assist in making assumptions and projections regarding the future level of aviation demand at VER.

Because VER's airport environs includes portions of both Cooper and Howard counties, in addition to providing valuable air transportation services to each, as well as drawing a significant portion of the Airport's flight training, aircraft charter and based aircraft users from Boone County and Columbia, in particular, the socioeconomic condition of the tri-county area will be evaluated and considered as part of the demand forecast element of the master plan update.

Population

Cooper, Howard, and Boone counties are located within the Missouri Department of Economic Development, Missouri Economic Research and Information Center's (MERIC) Central Region. Of the 19 counties that comprise this region, Cooper, Howard, and Boone counties rank 13th and 18th and

1st, in terms of population, respectively. **Table 1.7** illustrates the population trends for these counties since 1990.

Over the past 18 years, Cooper County's population, currently ranked 63rd in the state, has increased approximately 15.5 percent, or 2,700 new residents, and experienced an average annual population growth of nearly one percent. Howard County's population, currently ranked 89th in the state, has increased a mere three percent since 1990 averaging a nominal population growth of 0.2 percent annually. Lastly, Boone County's population, currently ranked 8th in the state, has increased nearly 30 percent since 1990 averaging a population growth of nearly two (1.5) percent annually. Combined, the counties have averaged nearly 1.3 percent annual population growth equaling a total of 36,700 new residents to the tri-county area.

According to **Table 1.8**, moderate population growth within the tri-county area is expected thru 2030 with Cooper County averaging approximately one percent population growth, or nearly 3,500 new residents. Howard County is expected to grow as well by 0.2 percent over the next two decades while Boone County is anticipated to increase its population by 1.5 percent annually over the same period. In 2030, the Boonville/tri-county region is expected to host a total of nearly 235,600 residents while averaging a respectable 1.4 percent annual growth over the next 22-year period.

Table 1.7
Historic Population Statistics

Place Name	1990	2000	2007-08	Percent Change 1990-Present	Annual Growth Rate 1990-Present
Cooper County	14,835	16,670	17,543	15.4%	0.9%
Howard County	9,631	10,212	9,949	3.2%	0.2%
Boone County	112,379	135,454	146,048	29.9%	1.5%
State of Missouri	5,116,901	5,595,211	5,878,415	14.8%	0.8%

Source: MERIC; U.S. Census Bureau; Bureau of Economic Analysis (BEA), U.S. Department of Commerce.

Table 1.8
Projected Population Statistics

Place Name	2007-08	2010	2015	2020	2025	2030	Annual Growth Rate Present-2030
Cooper County	17,543	17,900	18,800	19,600	20,300	21,000	0.8%
Howard County	9,949	9,900	9,900	10,100	10,200	10,300	0.2%
Boone County	146,048	158,400	170,800	183,100	194,500	204,300	1.5%
State of Missouri	5,878,415	5,979,300	6,184,400	6,389,900	6,580,900	6,746,800	0.7%

Note: Population projects have been rounded to the nearest hundred for planning purposes.

Source: MERIC; U.S. Census Bureau; Bureau of Economic Analysis (BEA), U.S. Department of Commerce.



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Per Capita and Median Household Income

Per Capita Income (PCI) and Median Household Income (MHI) are widely used indicators for gauging the economic performance of local economies. PCI serves as an indicator of the economic well-being of a community being defined as the total personal income of all people in an area, divided by the total number of people. MHI, on the other hand, includes the income of the householder and all other persons 15 years and older in the household, whether related to the householder or not, and represents the value in the middle when all incomes in a given geographical area are arranged highest to lowest. **Table 1.9** illustrates the PCI and MHI for the state and the Boonville/tri-county region since 1990.

In 2006-07, Cooper County's PCI ranked 66th in the state and was 75 percent of the state's PCI levels while Howard County's PCI levels ranked 23rd in the state and was 86 percent of the state average. Additionally, Boone County's PCI ranked 8th in the state and was 96 percent of the state average. Since 1990, Cooper, Howard and Boone counties' PCI have averaged an annual growth of nearly 5.1, , six and 5.2 and six percent, respectively. Combined the Boonville/tri-county region's PCI level has increase 5.4 percent annually since 1990.

Table 1.9
Per Capita and Median Household Income

Place Name/ Variable	1990	2000	2007-08	Annual Growth Rate 1990-Present
Per Capita Income (PCI)				
Cooper County	\$10,006	\$15,648	\$24,543	5.1%
Howard County	\$9,854	\$15,198	\$28,320	6.0%
Boone County	\$12,707	\$19,844	\$31,2524	5.2%
State of Missouri	\$12,989	\$19,936	\$33,984	5.5%
Median Household Income (MHI)				
Cooper County	\$22,785	\$35,313	\$37,327	2.8%
Howard County	\$21,378	\$31,614	\$33,518	2.5%
Boone County	\$25,647	\$37,485	\$41,417	2.7%
State of Missouri	\$26,362	\$37,934	\$40,885	2.5%

Source: MERIC; U.S. Census Bureau; Bureau of Economic Analysis (BEA), U.S. Department of Commerce.

Table 1.10
Labor Force Statistics

Place Name	Civilian Labor Force	Employment	Unemployment	Unemployment Rate
Cooper County	9,228	8,645	583	6.3%
Howard County	5,396	5,064	332	6.2%
Boone County	86,435	82,640	3,795	4.4%
State of Missouri	3,006,657	2,807,241	199,416	6.6%

Source: MERIC.

Regarding MHI, Cooper and Howard counties, since 1990, have experienced an annual average growth of 2.8 and 2.5 percent, respectively, while Boone County's MHI has risen 2.7 percent annually. Combined, since 1990, the Boonville/tri-county region's MHI level has increased nearly 2.7 percent annually.

Labor Force

Table 1.10 illustrates the labor force in terms of unemployment for the Boonville/tri-county region as of July 2008. Within MERIC's central region, of 19 counties, Cooper ranks a respectable 15th, Howard County ranks 14th in unemployment while Boone County boasts the lowest unemployment rate in the region at 4.4 percent. The overall unemployment rate for the Boonville area is approximately 5.6 percent which is lower than the state average and slightly lower than MERIC's central region average of 5.8 percent.

Industry Sectors

According to MERIC, the central Missouri region's three highest growing industries in terms of employment and wages are 1) health care and social services, 2) finance and insurance and 3) other services, except public administration. These three top professional industry sectors employ nearly

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42,800 residents and have experienced a combined average growth of approximately 2.5 percent annually in terms of total wages in recent years.

More specifically, Cooper County's highest and fastest industry wage and employment growth include 1) Federal, state and local government which employs nearly 1,400 residents; 2) manufacturing with 18 firms located within the county; and 3) retail trade totaling 69 employers. Combined these three industries employ nearly 3,100 County residents.

Howard County's emerging industries in terms of wage and employment growth include 1) Federal, state and local government, 2) health care and social assistance and 3) accommodation and food services. These three industries employ 1,200 residents.

Lastly, Boone County's primary industries pertaining to wage and employment growth include 1) state government which employs 16,800 residents; 2) retail trade with approximately 10,000 employees; and 3) accommodation and food services which employs nearly 8,200 residents. Combined these industry sectors employ approximately 35,000 residents within the region.

GENERAL AVIATION ACTIVITY

The FAA recognizes three broad categories of aviation which include general aviation, certificated air carrier, and military. General Aviation is defined as all aviation activity except that of air carriers and military aircraft.

Table 1.11
Operational Activity Summary

Year	Based Aircraft	Single Engine	Multi Engine	Business Jets	Rotocraft	Local Operations	Itinerant Operations	Air Taxi Operations	Total Operations
1990	38	38	0	0	0	10,000	4,400	-	14,400
1995	37	37	0	0	0	3,800	5,900	-	9,700
2000	36	34	2*	0	0	3,600	3,600	400	7,600
2005	43	41	2	0	0	4,400	4,000	400	8,800
2007-08	41	36	3**	0	2	4,400	4,000	400	8,800

Note: Military operations account for nearly 300 annual operations.
 Note: Figures rounded to the nearest hundred for planning purposes.
 (*) Includes a based multi-engine turbo-prop.
 (**) Includes a based Beechcraft B90 turbo-prop.

Source: MoDOT Aviation Section; FAA 5010 Inspection Form.

Based Aircraft and Annual Operations

A tabulation of VER's historical aviation activity from 1990 to 2008, as provided by the MoDOT Aviation Section and the FAA, is presented in **Table 1.11**. This table presents a summary of activity at the Airport including the total annual operations including local versus itinerant operations, as well as number of based aircraft throughout the period.

Since 1990, VER's annual operational total, according to MoDOT information, has decreased from approximately 14,400 annual operations to slightly less than 9,000 yearly operations, yielding an average annual decrease of approximately (2.7) percent. However, during the same time, itinerant aircraft activity has remained relatively stable averaging approximately 4,400 transient operations per year.

Regarding air taxi operations, the airport currently experiences approximately 400 annual Part 135 operations by Airplane Design Group (ADG) I and II turbo-prop and business jet aircraft weighing from 12,500 pounds up to approximately 25,000 pounds. Part 135 operations at VER represent nearly five percent of the airport's current operational activity.

Regular business/corporate users of VER include Isle of Capri Casino, Inc., St. Louis, MO; Love's Travel Stops and Country Stores, Oklahoma City, OK; Caterpillar, Inc., Peoria, IL; Casey's General Stores, Ankeny, IA; Ameren UE, St. Louis, MO; Choice Hotels International, Silver Springs, MD; Glen Martin Engineering, Boonville; Indeco Electrical Heating and Controls, Inc., Boonville; Interstate Bakery Corporation, Kansas City, MO; Mellor Trailers and Manufacturing, Inc., Boonville; Nordyne, Inc., O'Fallon, IL; and Wal-Mart, Bentonville, AR. Beechcraft King Air C90B, 200/300 and 350,

as well as Cessna Citation II, V (560 series) and Encores are a fair representation of the aircraft types the aforementioned companies operate at VER on a regular basis. It should be noted that not all businesses noted here own and operate a cabin class aircraft, but do require periodic on-demand air charter service to/from VER for business purposes.

Lastly, the based aircraft total has increased from 38 to 45 based airplanes yielding an annual growth of 0.9 percent which is similar to the population trends within the county over the same period.

Existing Critical Aircraft

The critical aircraft is the largest airplane within a composite family of aircraft conducting at least 500 itinerant operations (combination of 250 takeoffs and landings) per year at the airport. The critical aircraft is evaluated with respect to size, speed and weight, and is important for determining airport design and safety area standards, as well as structural and equipment needs for the airfield and terminal area facilities. **Table 1.12** provides information regarding the existing critical aircraft for VER.

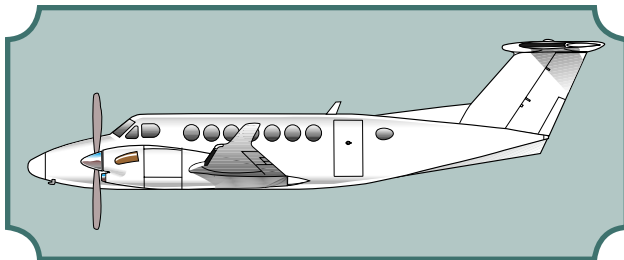


Table 1.12
Existing Critical Aircraft-Beech King Air 350 (ARC B-II)

Characteristic	Specifications/ Performance
Wing Span	57 ft. 11 in.
Length	46 ft. 8 in.
Height	14 ft. 4 in.
Seating (Crew + Pax)	1-2 + 9
Maximum Takeoff Weight (MTOW)	15,000 lb.
Normal Approach Speed	105 knots
Takeoff Field Length*	3,300 feet
Landing Distance**	2,700 feet
Max. Range Performance***	1,670 NM

(*) MTOW, sea level, standard temperature.

(**) Max. landing weight, sea level, standard temperature.

(***) Max. fuel, IFR Reserves

Source: Hawker Beechcraft, Wichita, Kansas.

The Beech King Air 350, or an aircraft with similar operational and physical characteristics, was identified as the critical aircraft for VER due to its prevalence within the general aviation air taxi, private and fractional ownership market segments. Also, the King Air 350 is capable of operating from a 4,000 foot runway during extreme (hot) weather conditions while carrying nearly a full compliment of payload including passengers, baggage and fuel.

Fuel Flowage

Fuel flowage estimates can be a useful tool in realizing the overall operational trends of an airport in terms of annual operational activity and fleet mix. During the past five year period (2003-08), VER has dispensed an annual average of 30,900 total gallons of fuel including approximately 22,000 gallons of 100LL and nearly 8,900 gallons of Jet A annually.

CLIMATIC CONDITIONS

Climatic characteristics are utilized in determining runway dimensional requirements, crosswind runway wind coverage, navigational and lighting aids to accommodate instrument approaches, as well as the necessary snow removal and airport maintenance equipment needed to cope with varying weather occurrences.

The climate analysis for VER is derived from information provided by the National Oceanic and Atmospheric Administration (NOAA), Midwestern Regional Climate Center (MRCC). This analysis will include a summary of local area temperature, precipitation, snowfall and sunshine data for the Boonville and Cooper County area.

Temperature

During winter, the average daily temperature is 23° F with the lowest recorded temperature being -22° F recorded at Boonville in 1989. During the summer months the average daily temperature is 81° F and the average daily maximum temperature is 89° F during the month of July. The highest recorded temperature of 110° F for Cooper County was recorded in 1954.

Precipitation

The total annual precipitation for Cooper County is approximately 43 inches, of which nearly 26 inches, or 62 per cent of the total county rainfall, falls from April through September. The heaviest one day rain event occurred in

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1993 at Boonville and totaled approximately six inches. Thunderstorms occur on nearly 52 days annually in Cooper County with a majority occurring during May and June.

Snowfall

Average seasonal snowfall is approximately 22 inches annually. The greatest recorded snowfall in Cooper County was 13 inches occurring in February, 1975. On average, approximately eight days per year, at least one inch of snow cover will blanket the ground.

Sunshine, Prevailing Wind and Humidity

The sun shines nearly 66 percent of the time in Cooper County during the summer months and 49 per cent during the winter. The prevailing wind through the county is from the south-southeast while the average highest wind speed is approximately 12 miles per hour and most often occurs during the month of March. Lastly, the average relative humidity during the daytime hours is nearly 60 percent while, at night and at dawn, the average humidity reaches 83 percent.

WIND ANALYSIS

Local wind patterns were collected and analyzed to determine the impacts of all-weather, visual meteorological conditions (VMC) and instrument meteorological conditions (IMC) on the existing runway configuration. Yearly wind observations were obtained from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), as reported hourly at the Columbia Regional Airport (COU) during the period from 1996 to 2005. Combined, the recorded wind data included 81,567 all-weather, 74,361 VMC and 3,943 IMC observations.

For planning standards, the desirable wind coverage is 95 percent for the primary runway, and is computed based on the crosswind component not exceeding 10.5 knots for

airport reference code (ARC) A-I and B-I category aircraft, 13.0 knots for ARC A-II to B-II aircraft, and 16.0 knots for ARC A-III, B-III and C-I to D-III general aviation aircraft. By design, a small aircraft (weighing less than 12,500 pounds) is recommended to be able to operate approximately 95 percent of a given period without experiencing a crosswind component greater than 10.5 knots.

All Weather Wind Conditions

Table 1.13 illustrates the percent of all-weather wind coverage for the 10.5, 13.0 and 16.0-knot wind velocities. Runway 18-36 provides 90.3 percent wind coverage at 10.5 knots for ARC A-I and B-I aircraft; 94.6 percent wind coverage at 13.0 knots for A-II and B-II aircraft; and 98.4 percent wind coverage for ARC C-I to D-III aircraft at 16.0 knots.

Based on the prevailing wind patterns and wind coverage provided by Runway 18-36, planning considerations regarding the development of a potential crosswind runway are recommended and will require further analysis.

VMC Wind Conditions

Table 1.13 also illustrates the percent wind coverage during VMC conditions. Runway 18-36 provides 90.6 and 94.8 percent wind coverage during VMC conditions for Category A and B aircraft at 10.5 and 13.0 knots, respectively. Runway 18-36 also provides 98.4 percent wind coverage for ARC C-I to D-III aircraft at 16.0 knots.

IMC Wind Conditions

Table 1.13 illustrates the percent wind coverage during IMC conditions at VER as well. Runway 18-36 provides 88.4 and 93.8 percent wind coverage during IMC conditions for Category A and B aircraft at 10.5 and 13.0 knots, respectively. Likewise, Runway 18-36 provides 98.7 percent wind coverage for ARC C-I to D-III aircraft at 16.0 knots.

Table 1.13
All-Weather, VFR and IFR Wind Coverage

Runway Alignment (True Bearing)	Crosswind Component Wind Speed & Corresponding ARC	Percent All-Weather Wind Coverage	Percent VMC Wind Coverage	Percent IMC Wind Coverage
Runway 18-36 (4.67° True Bearing)	10.5 knots (A-I and B-I)	90.3%	90.6%	88.4%
	13.0 knots (A-II and B-II)	94.6%	94.8%	93.8%
	16.0 knots (A-III; B-III, C-I to D-III)	98.4%	98.4%	98.7%
Total Calm and Light Winds (0-10.5 Knots)		75.9%	76.3%	74.9%
Total Strong Winds (Greater Than 10.5 Knots)		24.1%	23.7%	25.1%

(ARC) Airport Reference Code

Note: Wind coverage figures rounded to the nearest tenth of a percent for planning purposes.

Source: NOAA, NCDC, Asheville, NC; Columbia Regional Airport (COU).



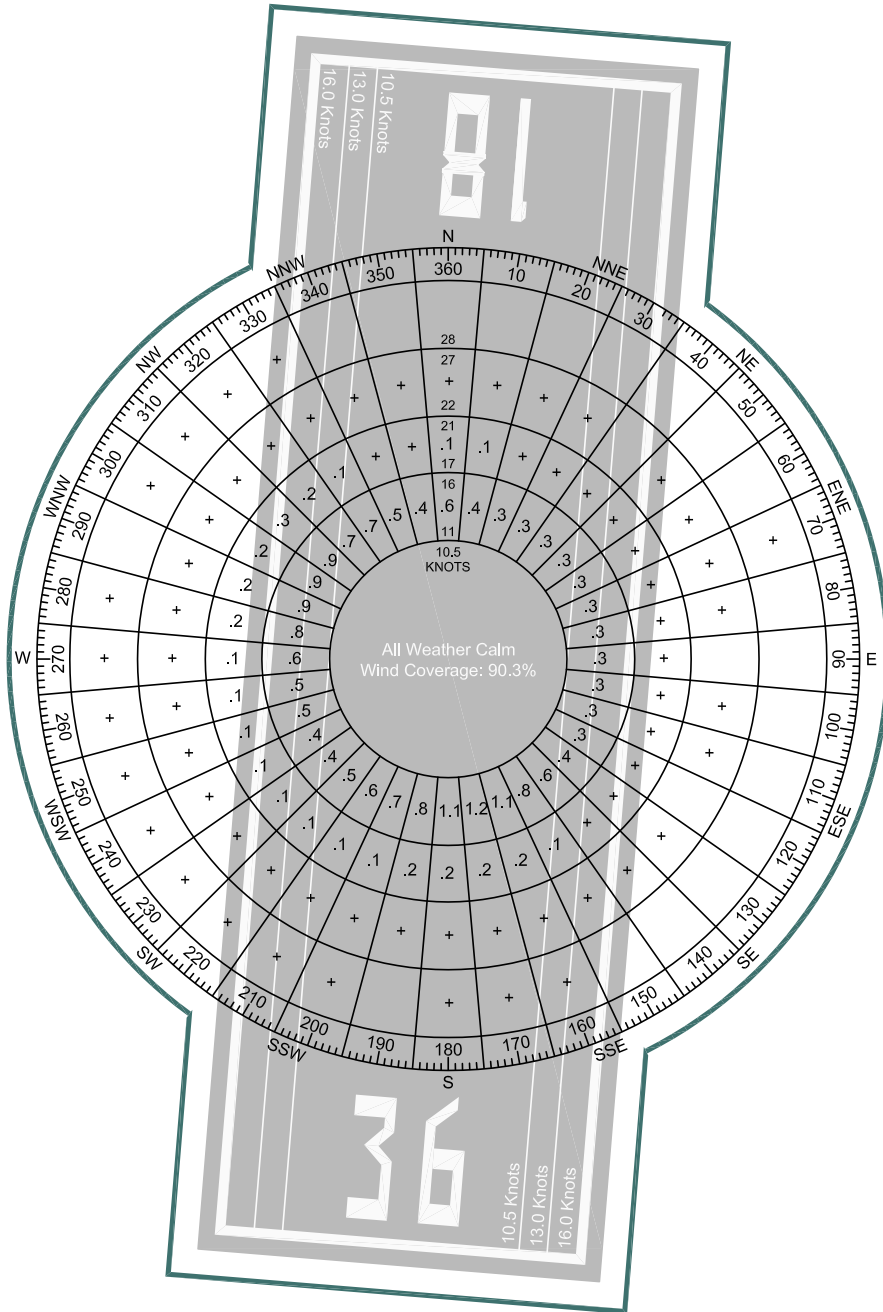
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Exhibit 1.5
All Weather Windrose



Source: NOAA, NCDC, Asheville, NC; Columbia Regional Airport (COU)



Township 48 N, Range 16 W
Boonville Township
Sections 4, 8 and 9
NOT TO SCALE



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Strong Wind Conditions

Table 1.13 notes strong wind characteristics during all-weather conditions at VER. Approximately 24 percent of all-weather and VMC wind observations occur as strong winds that exceed 10.5 knots. During IMC conditions, nearly 25 percent of IMC observations occur as strong winds.

Exhibit 1.5 illustrates the Airport's wind rose which depicts the predominant wind directions and velocities occurring at VER during all-weather conditions.

AIRPORT ECONOMIC BENEFIT

In 2004-05 the MoDOT, Aviation Section completed The Economic Benefit of Missouri's Airport System to determine the overall benefits of Missouri's system of public-use airports to the statewide economy. The total economic benefit of aviation activity in Missouri was quantified in terms of employment, payroll and output (economic activity).

The airports were surveyed to measure the direct benefits associated with on-airport businesses and indirect benefits related to visitor expenditures. Direct benefits include the economic activity associated not only with on-airport businesses but airport tenants and governmental entities which support general aviation. Indirect benefits generally occur off-airport and can be attributed to visitor expenditures. Secondary benefits consist of the induced impact of the recirculation of direct and indirect benefits which results in a 'multiplier effect.' The multiplier effect attributed to both direct and indirect economic benefits is calculated to determine the overall economic impact of each airport.

The following discussion highlights each benefit measured for VER in terms of employment, payroll and total economic output to the local community.

Employment

Measures the number of people employed as a result of the operation and maintenance of the Airport. This also includes citizens employed in the aviation industry and those jobs that support aviation activity. VER is responsible for employing approximately 15 citizens.

Payroll

Measures the annual wages and benefits paid to employees whose salaries are directly or indirectly attributed to the Airport. The total payroll attributed to the operation of VER is estimated to be approximately \$318,400.

Total Economic Impact

Measures the dollar value of all aviation and non-aviation-related goods and services that exist within the Boonville area as a direct result of VER providing general aviation good and services to local and transient airport users. The total economic benefit is approximately \$2,800,300 which is assumed to be the sum of annual gross sales of aviation and non-aviation related activity occurring within the community.

Table 1.14 provides information regarding the economic impacts of VER to the local and regional economy.

Table 1.14
VER Economic Benefits Summary

Total Employment	Total Payroll	VER's Total Economic Output
15	\$318,400	\$2,800,300

Source: *The Economic Benefit of Missouri's Airport System, MoDOT, Aviation Section.*

INVENTORY SUMMARY

The information provided in the airport inventory establishes the foundation on which the remaining elements of the master plan update will be based. Aviation demand forecasts, facility requirements, alternatives analysis, environmental overview, 20-year phased airport capital improvement program (ACIP) and development costs, update to the airport layout plan (ALP) set of drawings, as well as a financial program will be addressed in subsequent chapters of this study.





CHAPTER TWO

DEMAND FORECASTS

INTRODUCTION

The demand forecast element of the master plan process is utilized as a method to determine the need for possible future capital development, as well as investment in the overall facility. Essential to this determination is the generation of forecasts and projected facility growth and increases in airport activity. Demand forecasts provide a means for determining the type, extent, size, location, timing, and financial feasibility of capital development. Consequently, demand forecasts influence virtually all remaining phases of the layout plan process.

Forecasting aviation activity requires more than an extrapolation of past trends and the application of statistical measures to relate the future aviation demand to the forecast projections of population, economic activity, socioeconomic data and the demand for general aviation services. Demand forecasting requires the application of professional judgment and experience, as well as an understanding of the market forces that will

tend to promote or limit aviation activity. In the case of VER, the market forces that directly relate to activity at the Airport are represented by 1) historic socioeconomic and demographic growth within the City of Boonville as well as within Cooper, Howard, and Boone counties and 2) the historic and projected growth rates of the general aviation sector of the air transportation system.

Forecasts of aviation demand have been prepared and are presented in this chapter to assist the City of Boonville in the evaluation of the performance-based needs of VER during the next 20 years. The forecasts of local general aviation demand are organized in the following manner including 1) based aircraft and fleet mix, 2) annual operations, 3) local versus itinerant operational activity, 4) based turbine aircraft operations, 5) operational fleet mix, 6) air taxi operations, 7) annual instrument approach demand and 8) ultimate critical aircraft.



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DATA SOURCES

The demand forecasting process initiates by obtaining recorded data pertinent to the operation and administration of the airport. When necessary, this information is supplemented with historical trends which evolve from a thorough examination of records, statistics, historic data and planning documents relative to the airport. For instance, data sources used to generate the demand forecasts for VER include the *FAA Aerospace Forecasts Fiscal Years 2008-2025*; FAA Form 5010-1, *Airport Master Record* data inspection forms; Cooper, Howard, and Boone County socioeconomic characteristics as provided by the U.S. Census Bureau; and the Missouri Economic Research and Information Center (MERIC); FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*; and the Missouri State Airport System Plan (MOSASP).

CONDITIONS AND ASSUMPTIONS

Prior to projecting demand activity at VER, several conditions and assumptions that are considered to impact the basis or foundation of the demand projections are discussed in the following passages. These discussions involve a wide range of physical, operational, socioeconomic and industry-related topics and are not necessarily listed in any order of priority.

Cooper, Howard, and Boone County Socioeconomic Conditions

General aviation operations and based aircraft are more directly tied to local economic conditions than any other segment of the aviation industry. Population trends also play a role in determining airport activity. Given this fact, the forecast of general aviation demand at VER will reflect historic socioeconomic trends for these three counties. This is due to VER's airport environs including portions of both Cooper and Howard counties while providing valuable air transportation services to each. Also, VER draws a significant portion of the Airport's flight training and based aircraft users from Boone County and in particular the Columbia Regional Airport.

In particular, since 1990, the combined population of Cooper, Howard, and Boone counties has increased approximately 1.3 percent annually resulting in a total population of nearly 173,600 residents in 2007-08 up from 136,800 residents in 1990. In addition to population, per

capita income (PCI) and median household income (MHI) are widely used indicators for gauging the economic performance of local communities as well. The Boonville/tri-county area PCI levels have increased an impressive 5.4 percent annually (\$32,600,-\$84,400) from 1990-2007. Also, the counties' MHI has increased approximately 2.7 percent annually (\$69,800-\$112,300) during the same period. Combined, the PCI and MHI for the Boonville/tri-county area increased, on average, approximately four percent throughout the historic 18-year period.

Given this information, the total based aircraft projections are based on analyses which compared and correlated primarily the Boonville/tri-county area's population and MHI, as well as PCI, to based aircraft estimates over the historic 18-year period. The sustained socioeconomic growth within the tri-county area is expected to contribute to the total based aircraft at the facility growing by 3.3 percent annually throughout the 20-year planning period from 41 to 78 aircraft.

Airport Role and Expansion Potential

VER is expected to remain a NPIAS general aviation facility throughout the planning period while at the same time remaining classified as a Regional Airport according to the MOSASP. Ultimately, considering existing operational activity and fleet mix at the facility, VER is expected to accommodate 75 percent of the general aviation (GA) aircraft fleet weighing between 12,500 and 60,000 pounds at 60 percent useful load based on the airport's ultimate critical aircraft.

Location and Economic Development Potential

Given Boonville's location adjacent to both I-70 and the Missouri River, coupled with the close proximity of VER to the central business district and the presence of the Union Pacific Railroad line to the north and west of the City, Boonville can be considered a true multi-modal hub for business and commerce. VER serves three distinct market segments including interstate travelers, local consumers, as well as locally-based and national industrial, manufacturing and agricultural corporations.

It is expected that the Boonville Industrial Development Authority, which markets and maintains two industrial parks in the area including the 86 acre Mid-America Industrial Centre and the Charles R. Persinger (Boonville) Industrial Park, will continue to successfully attract business and corporate enterprises to the local area. This will require long-term and suitable airport facilities to further increase VER's role of providing adequate access to local and regional air transportation needs. For this reason, coupled with the strong socioeconomic condition of the Boonville/

TWO: DEMAND FORECASTS

tri-county area and far-reaching service area of the airport, the demand forecasts for VER assume two future based business jets and two based multi-engine turbo-prop airplanes at the conclusion of the planning period.

Based Aircraft and Operational Fleet Mix

Based single engine airplanes are estimated to increase at a rate of three percent which reflect local area socioeconomic growth. Multi-engine piston airplanes are forecasted to remain stagnant over the period due to attrition of the aging twin-piston fleet. Introduction of highly efficient, affordable and newly redesigned single engine airplanes and light sport aircraft (LSA) are expected to dilute the twin-engine market. A renewed reliance on twin turbo-prop aircraft and demand for new very light jets (VLJ) for personal business and leisure travel is expected throughout the planning period. Future based turbo-prop, business jet and rotorcraft based fleet projections will reflect *FAA Aerospace Forecast* expectation of market and fleet growth.

Regarding the airport's operational fleet mix, single and twin-engine airplane annual operations are expected to increase at approximately 3.5 percent which coincide with local area socioeconomic conditions as well as current and future market demand. Annual multi-engine turbo-prop and business jet operational activity (utilization) is expected to increase at approximately 1.3 and 9.3 percent, respectively, according to FAA projections. Lastly, rotorcraft operations are also expected to fall in line with FAA projections, or 6.3 percent annual growth, throughout the 20-year planning period.

DEMAND FORECAST APPROACH

The development of the demand forecasts for VER were generated by conducting a series of analytical, statistical, arithmetic, and judgmental processes. These analytical and statistical processes compare mathematical relationships to analyze historic data and define their relationship to the operational parameters (i.e. aircraft operations per based aircraft) at the airport. The following discussion offers explanations of three methodologies that were used as part of the process to generate demand forecasts for VER.

Single/Multiple Regression Analysis

The regression model projects the forecast of aviation demand parameters (dependent variable—i.e. based aircraft and annual operations) on the basis of one or more external factors or indicators (independent variable—i.e. PCI, MHI and population). Historic and forecast values for

both are analyzed and compared to determine the degree of correlation between the independent and dependent variables, or a correlation coefficient. The correlation coefficient (Pearson 'r') measure the association between the two variables. If the 'r' value is equal to approximately 0.90 or greater, this indicates a high level of correlation and/or a favorable level of reliability. Whereas, an 'r' value of less than 0.90 indicates a lower level of predictive reliability and/or correlation. This relationship is then used to forecast the dependent variable based on the selected independent variable.

Linear Trend Line Analysis

Among the simplest and most familiar forecasting techniques, linear trend analysis is one of the most frequently used models in the industry. Simply put, historic data is projected into the future providing an estimate of the aviation demand throughout the planning period. The basic assumption of the linear trend line method is that historic levels of aviation activity will continue to exert a similar influence on future demand levels. As broad and presumptive as this method might be, it is often a reliable benchmark against which other forecasting models may be compared.

Time Series Analysis

This method is one of the oldest and in some cases still the most used method of forecasting aviation demand. Time-series methodologies show the dependent variable (time) and is utilized quite frequently where both time and data are limited such as forecasting a single variable where historical data is obtained for that particular variable.

FAA Aerospace Forecast Growth Rates

Although not a statistical or analytical forecast methodology, relying on FAA forecasts to project future based aircraft and operational demand as part of the master plan process is an important planning tool. FAA projected average annual growth of a particular fleet of aircraft (i.e. piston, turbine or jet) can be applied to the local forecasts to project future based aircraft at the facility. Likewise, by applying FAA projected aircraft utilization rates (i.e. flight hours) to the demand forecasts, a reasonable expectation of future annual operational activity (total operations) can be determined for based aircraft and transient users. Additionally, future aircraft utilization projections provided by the FAA can be a valuable tool in estimating the airport's ultimate annual operational fleet mix (i.e. annual operations by a particular aircraft category).

Smoothing

This method of forecasting is a statistical technique applied to historic data, giving greater weight to latest trends and



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conditions at the airport and can be effective in generating short-term forecasts. For VER, smoothing was utilized primarily as a tool for checking short-term regressions and linear trend forecasts for purposes of projecting based aircraft at VER during the short-term (Phase I) planning period. Smoothing was not utilized nor was it intended to serve as a long-term based aircraft planning tool for VER.

Judgment and Professional Experience

Following the completion of the demand forecast analysis by utilizing several statistical methodologies, judgment or professional experience is applied to the forecast projections. Intangible factors such as specific information regarding the airport, operating environment, industry trends or local area economic or socio-economic information generally are taken into account when formulating a judgmental or professional opinion in arriving at a preferred forecast.

GENERAL AVIATION FORECASTS

As discussed in the airport inventory, the FAA recognizes three broad categories of aviation which include general aviation, certificated air carrier and military. General Aviation is defined as all aviation activity except that of air carrier and military aircraft operations.

The following sections of the demand forecasts will specifically

concentrate on the activity generated by the airport's total based aircraft and fleet mix, including annual operations, local versus itinerant operational activity, air taxi and annual instrument approach (AIA) flight activity estimates.

FORECAST OF BASED AIRCRAFT

Table 2.1 illustrates the forecast of based aircraft for VER as a result of the methodologies employed, as highlighted above, to project based aircraft demand throughout the 20-year master planning period.

The single regression analysis, in comparing PCI, MHI and population to future based aircraft, netted an overall increase of 21 to 25 additional based aircraft over the 20-year planning period. This methodology yielded a correlation of the socioeconomic condition of the tri-county region to based aircraft ranging from 0.64 to 0.77 which indicated a lower level of reliability.

The multiple regression analysis compared the socioeconomics of the tri-county region and yielded an additional 17 to 38 based aircraft during the planning period to total between 58 and 78 units in 2029. Comparing the tri-county population and MHI resulted in a high level of correlation (0.89) and netted the highest total number of based airplanes at VER. Accordingly, this methodology and

Table 2.1
Forecast of Based Aircraft Summary, 2009-2029

Forecast Methodology	Existing	2009	2014	2019	2024	2029
Single Regression Analysis (Based Aircraft*)						
vs. County Population** (Pearson 'r'= 0.69)	40	47	51	55	58	61
vs. County PCI** (Pearson 'r'= 0.77)	40	46	49	53	56	59
vs. County MHI** (Pearson 'r'= 0.64)	40	45	48	50	53	56
Multiple Regression Analysis (Based Aircraft*)						
vs. County PCI & MHI** (Pearson 'r'= 0.89)	40	46	49	52	55	58
vs. County Population & PCI** (Pearson 'r'= 0.94)	40	45	48	51	54	57
vs. County Population & MHI** (Pearson 'r'= 0.89)	40	50	68	74	75	78
Linear Trend Line Analysis	40	46	49	52	55	58
Time Series Analysis	40	46	48	50	52	54
FAA Growth Rate Analysis	40	40	41	42	43	44
MOSASP	40	41 ('07)	42 ('12)	-	45 ('22)	-

Note: Each independent variable includes socioeconomic data from the tri-county region including Cooper, Howard and Boone Counties.

Note: Bold text indicates the selected, or preferred, based aircraft forecasts for VER.

(*) Dependent Variable

(**) Independent Variable

Source: BWR.

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corresponding projections were selected as the preferred based aircraft forecasts for the airport.

The linear trend line and time series analyses yielded a growth of approximately 18 and 14 future based aircraft, respectively, totaling between 54 and 58 total airplanes. The FAA growth rates for the general aviation fleet, given the conservative and even declining trend in fleet size on a national scale, resulted in a mere 44 based airplanes at VER at the conclusion of the planning period. Lastly, the Missouri State Airport System Plan (MOSASP) projections were used as a comparison tool to the current master plan’s projections. MOSASP’s forecasts indicated five additional airplanes to total 45 based aircraft at VER in 2022. The FAA and MOSASP’s forecasts were similar in that they both considered the state and national trends of fleet growth which usually are far more conservative estimates than what is predicted by the master plan. This is due to the master plan considering conditions, settings and economics of the local area and evaluating how these conditions influence based aircraft and operational growth, as well as potential airport expansion. Lastly, as indicated above, the smoothing technique was used to check short-term regression and linear trend forecasts rather than projecting long-term based aircraft for VER.

PREFERRED BASED AIRCRAFT DEMAND AND FLEET MIX

In accordance with the principle that shows based general aviation aircraft are directly tied to local economic conditions, the projected total based aircraft for VER will coincide with historic and future Boonville/tri-county population and

MHI levels. The preferred total based aircraft are expected to increase at an above average rate of approximately 3.3 percent annually and result in the addition of 37 aircraft to total 78 piston, turbine, jet powered and helicopters based at the airport in 2029.

Table 2.2 and **Exhibit 2.1** summarize the preferred forecast of total based aircraft for VER. The single engine fleet is expected to increase from 36 existing units to 68 units totaling an additional 32 traditional single engine and the new light sport aircraft (LSA) in 2029. In 2009, the airport is expected to attract 10 new based aircraft. This influx of aircraft will be due to the City and airport investing in the development and construction of 20 new T-hangar units. The multi-engine piston fleet is expected to remain steady at two units throughout the planning period.

Exhibit 2.1: Preferred Based Aircraft Projections 2009-2029

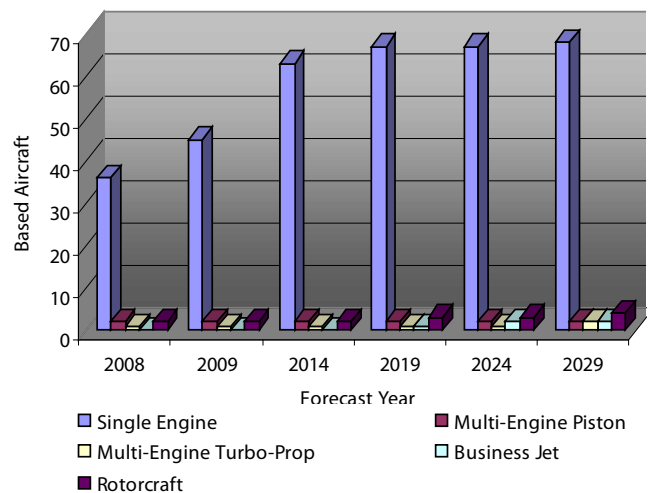


Table 2.2
Preferred Total Based Aircraft and Fleet Mix Summary, 2009-2029

Year	Total Based Aircraft	Single Engine	Multi-Engine Piston	Multi-Engine Turbine Turbo-Prop	Business Jet	Helicopter
Existing	40	36	2	0	0	2
2009	50 (100%)	45 (90%)	2 (4%)	1 (2%)	0 (0%)	2 (4%)
2014	68 (100%)	63 (92%)	2 (3%)	1 (2%)	0 (0%)	2 (3%)
2019	74 (100%)	67 (92%)	2 (3%)	1 (1%)	1 (1%)	2 (3%)
2024	75 (100%)	67 (89%)	2 (3%)	1 (1%)	2 (3%)	3 (4%)
2029	78 (100%)	68 (86%)	2 (3%)	2 (3%)	2 (3%)	4 (5%)

Note: Fleet mix percentages rounded to the nearest whole number.

Source: BWR.



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In 2029, the Airport is expected to host two based multi-engine turbo-props and two based business jets. VER's turbine aircraft projections are a reasonable expectation of demand given the anticipated economic growth of the tri-county area. Boonville's industrial and corporate markets and unique status as a multi-modal transportation hub for the Central Missouri region are also expected to contribute to the airport's increased turbine aircraft demand.

Gallop and Lamine Aviation, the rotorcraft operators at VER, have business plans which entail expanding their respective operations to include two additional helicopters to total four rotorwing aircraft at the conclusion of the 20-year planning period.

Table 2.2 and **Exhibit 2.1** also summarize the forecast based aircraft fleet mix for VER through 2029. Fleet mix is the relative percentage of a particular category of the based aircraft population and is dependant on specific operational and physical characteristics.

ANNUAL OPERATIONAL DEMAND

Most generally, there is a direct relationship between based aircraft and annual operations to the condition of the local economy. Because based aircraft and annual operations have historically followed similar population, MHI as well as PCI growth rates, this analysis will compare the three and draw conclusions as to the potential estimated activity at the facility. **Table 2.3** and **Exhibit 2.2** summarize the forecast of annual operations for VER throughout the 20-year planning period.

Overall, the airport's annual operations activity (takeoffs and landings) are expected to increase at a rate of approximately 3.7 percent per year through 2029. The total annual operations at VER are expected to total an additional 9,400 operations throughout the planning period. This projection coincides with the historic and current socioeconomic condition of the Boonville/tri-county region.

Local versus Itinerant Operations

In 2007-08, the relationship between local versus itinerant operations for the airport was approximately 53 percent local—most likely attributed to local flight training activity—and 47 percent itinerant in nature. The relationship of local

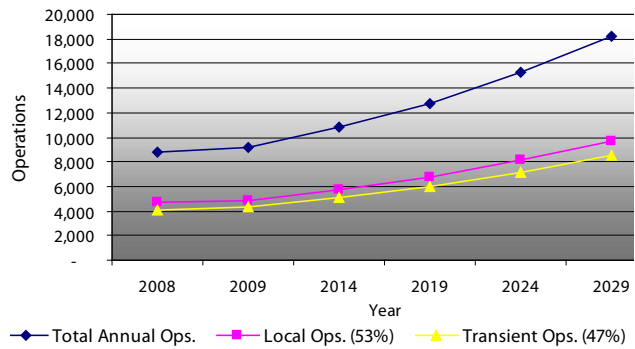
Table 2.3
Annual Operational Summary, 2009-2029

Year	Projected Annual Operations	Local Operations	Itinerant/Transient Operations
Existing	8,800	4,700 (53%)	4,100 (47%)
2009	9,200	4,900 (53%)	4,300 (47%)
2014	10,800	5,700 (53%)	5,100 (47%)
2019	12,800	6,800 (53%)	6,000 (47%)
2024	15,300	8,100 (53%)	7,200 (47%)
2029	18,200	9,600 (53%)	8,600 (47%)

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR.

Exhibit 2.2: Operational Summary 2009-2029



versus itinerant operations is expected to be maintained throughout the planning period. Local and itinerant operations are expected to increase at an average annual rate of 3.6 percent and 3.8 percent, respectively. This will likely be due to VER's enhanced service capabilities within the tri-county region. VER's ease of access to I-70; airfield and terminal area expansion potential; favorable economics associated with competitive fuel prices and land lease rates; and the airport's general aviation friendly environment are expected to increase the Airport's annual operational activity as well. **Table 2.3** and **Exhibit 2.2** summarize the share of local versus itinerant operations expected to be conducted at VER throughout the planning period.

Air Taxi Operations

Table 2.4 and **Exhibit 2.3** summarize the total projected Part 91 and 135 air taxi operations conducted at VER throughout the planning period. Annual air taxi operational

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activity for turbo-prop and business jet aircraft at VER is expected to increase in lock-step with the FAA’s projected operational growth rates of approximately 1.3 and 9.3 percent, respectively, throughout the planning period. Combined, air taxi operations at VER can be expected to increase at a rate of nearly five percent per year.

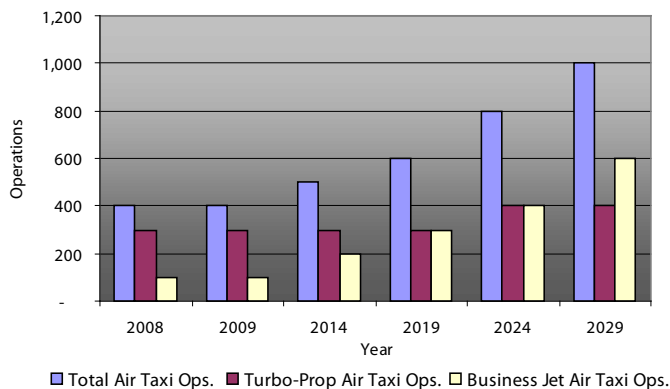
Table 2.4
Air Taxi Operations, 2009-2029

Year	Projected Annual Air Taxi Operations	Turbo-Prop Air Taxi Operations	Business Jet Air Taxi Operations
Existing	400	300	100
2009	400	300	100
2014	500	300	200
2019	600	300	300
2024	800	400	400
2029	1,000	400	600

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR.

Exhibit 2.3: Air Taxi Summary 2009-2029



Air taxi operations by turbo-prop aircraft are expected to increase at a relatively slow pace resulting in an additional 100 operations by turbo-prop aircraft to total 400 annual operations. This will mostly likely be due to stagnant utilization and fleet growth estimates of the multi-engine turbo-prop market segment throughout the planning period.

Business jet air taxi operations, however, are forecast by the FAA to grow at a robust 9.3 percent annually over the 20-year planning period to total nearly 600 annual operations

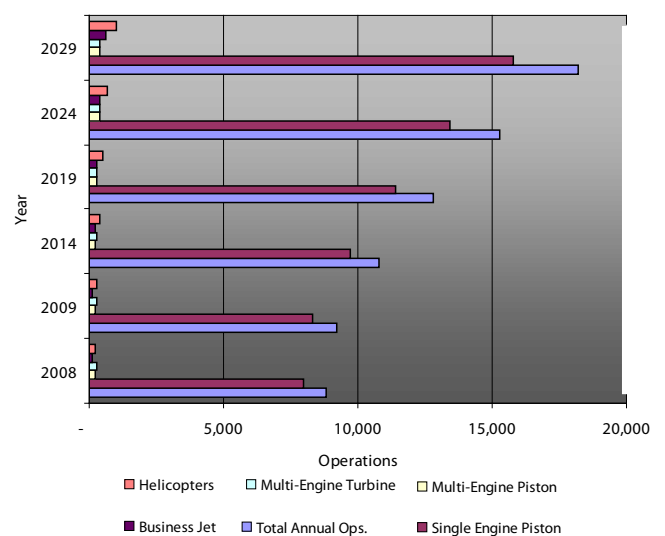
at VER in 2029. This projected growth can be attributed to the continued success of the fractional ownership turbo-jet market and increased reliance on point-to-point general aviation transportation rather than travel by commercial airlines. Increased business jet activity at VER is further supported by current and anticipated corporate interests within the Boonville area, as well as ever increasing demand for air transportation within the Cooper, Howard, and Boone County region.

OPERATIONAL FLEET MIX DEMAND

By evaluating the close relationship of based aircraft to annual operational activity, a correlation between the two can be identified and evaluated to determine an ultimate level of activity (operations) conducted at VER by a particular aircraft category.

As indicated within the *Conditions and Assumptions* section of this chapter, VER’s operational fleet mix of single and twin-engine airplane annual operations are expected to increase at approximately 3.5 percent annually which coincide with expected Boonville/tri-county economic growth. Annual multi-engine turbo-prop and business jet operations are expected to increase at approximately 1.3 and 9.3 percent, respectively, according to FAA projections. Rotorcraft operations are also expected to fall in line with FAA projections, or experience approximately 6.3 percent annual growth at VER. **Table 2.5** and **Exhibit 2.4** summarize the operational fleet mix for VER throughout the planning period.

Exhibit 2.4: Fleet Mix Summary 2009-2029





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Table 2.5
Operational Fleet Mix Summary, 2009-2029

Year	Total Annual Operations	Single Engine	Multi-Engine Piston	Multi-Engine Turbine		
				Turbo-Prop	Business Jet	Helicopter
Existing	8,800	8,000	200	300	100	200
2009	9,200	8,300	200	300	100	300
2014	10,800	9,700	200	300	200	400
2019	12,800	11,400	300	300	300	500
2024	15,300	13,400	400	400	400	700
2029	18,200	15,800	400	400	600	1,000

Note: Fleet mix percentages rounded to the nearest whole number.

Note: Refer to the *Conditions and Assumptions* section for fleet mix methodology and percentage of operations.

Source: BWR.

Ultimately, single engine aircraft are expected to contribute approximately 15,800 total operations or roughly 86 percent of the annual activity at VER. Multi-engine piston aircraft are expected to contribute approximately two percent of the operational activity or 400 annual operations. Multi-engine turbo-prop airplanes will conduct nearly 400 operations and account for approximately two percent of the yearly activity. Business jets, while providing a respectable 600 annual operations at VER throughout the planning period, will account for three percent of the annual activity in 2029. Lastly, helicopters are expected to contribute a total of 1,000 annual operations, or nearly five percent of the yearly activity at the facility.

instrument approaches for VER throughout the 20-year planning period. Forecasts of annual instrument approaches (AIA) are generated to provide guidance in determining requirements for installation of NAVAID equipment. Based on the volume of 1) approaches conducted in instrument conditions (AIAs) and 2) operations (arrivals and departures) conducted during IMC conditions, the type and timing of future NAVAIDs can be determined. Technological and equipment improvements (airborne as well as ground based) will also affect NAVAID installation and instrument approach procedures.

The AIA forecast considers the existing and projected total IMC operations at the Airport compared to the percentage of instrument rated pilots, as well as percent of instrument flight conditions in the area. This analysis will determine a projected annual instrument approach estimate at VER. According to the National Business Aircraft Association (NBAA), approximately 25 percent of all AIAs are conducted by air taxi and/or itinerant turbine aircraft operating in

ANNUAL INSTRUMENT APPROACH DEMAND

Table 2.6 summarizes the forecast of annual civilian

Table 2.6
Annual Instrument Approaches (AIA), 2009-2029

Forecast Year	Air Taxi Ops.	Military Ops.	Itinerant/Transient Ops.	Total Itinerant Ops.	Percent IFR Pilots	Percent IMC Conditions	Total IMC Ops.*	Total AIAs**
Existing	400	300	3,400	4,100	53%	9.4%	300	150
2009	400	300	3,600	4,300	53%	9.4%	400	200
2014	500	300	4,300	5,100	54%	9.4%	400	200
2019	600	300	5,100	6,000	54%	9.4%	500	300
2024	800	300	6,100	7,200	54%	9.4%	600	300
2029	1,000	300	7,300	8,600	54%	9.4%	700	400

Note: Figures rounded to the nearest hundred for planning purposes.

(*) Total IMC operations include arrivals and departures in instrument weather conditions.

(**) Total AIAs represents the projected number of annual approaches in instrument weather conditions.

Source: BWR.

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accordance with Part 91 and/or Part 135 regulations. Of the approximate 700 annual IMC arrivals and departures projected in 2029, nearly 200 of those are estimated to be conducted by turbine powered airplanes. In 2029, the airport is expected to experience approximately 400 AIAs. Approximately 100 of these AIAs will be conducted by turbine airplanes.

FUTURE CRITICAL AIRCRAFT

Table 2.7 provides information regarding the ultimate critical aircraft for VER.

The critical aircraft is the largest airplane within a composite family of aircraft conducting at least 500 itinerant operations (combination of 250 takeoffs and landings) per year at the airport. The critical aircraft is evaluated with respect to size, speed and weight, and is important for determining airport design and safety area standards, as well as structural and equipment needs for the airfield and terminal area facilities.

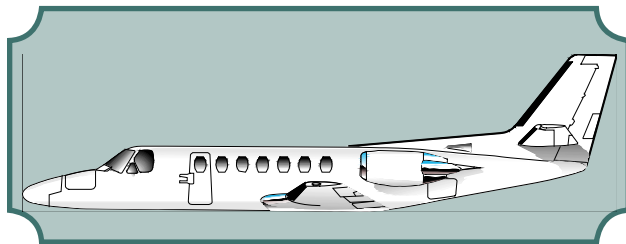


Table 2.7
Future Critical Aircraft-Cessna Citation Encore (ARC B-II)

Characteristic	Specifications/ Performance
Wing Span	54 ft. 1 in.
Length	48 ft. 11 in.
Height	15 ft. 2 in.
Seating (Crew + Pax)	2 + 7
Maximum Takeoff Weight (MTOW)	16,830 lb.
Normal Approach Speed	98 knots
Takeoff Field Length*	3,500 feet
Landing Distance**	2,800 feet
Max. Range Performance***	1,778 Nm

(*) MTOW, sea level, standard temperature, 15° flaps.

(**) Max. landing weight, sea level, standard temperature, landing distance over 50 foot obstacle.

(***) Max. fuel, MTOW, IFR Reserves (100 Nm alternate).

Source: Cessna Aircraft Corporation, Wichita, Kansas.

The Cessna Citation Encore, or a business jet aircraft with similar operational and physical characteristics, was chosen as the aircraft around which future terminal area and runway safety area parameters will be based. Due to its sophistication, operational capabilities, passenger capacity and range, the Citation Encore represents a reasonable cross-section of a family of jet aircraft that are anticipated to continue to conduct regular operations at VER throughout the planning period. The Encore, or a similar cabin class aircraft, is highly prevalent within the private, air taxi and fractional ownership general aviation market segments.

DEMAND FORECAST SUMMARY

Table 2.8 summarizes the demand forecast elements of the projected activity at the Jesse Viertel Memorial Airport throughout the 20-year planning period.

VER is expected to witness an increase in based aircraft by approximately 37 units and average approximately 3.3 percent annual growth throughout the planning period. The ultimate fleet mix at the airport includes 68 single engine, two twin engine piston, two multi-engine turbo-prop, and two business jet aircraft, as well as four helicopters.

Annual operations are anticipated to increase at nearly four (3.7%) percent. This upward trend represents an overall increase in operational activity by nearly 9,400 operations to total approximately 18,200 annual operations in 2029. Local operations will comprise 53 percent of the overall 2029 activity and increase at a rate of nearly 3.4 percent annually totaling approximately 9,600 annual operations. In 2029, transient operations are expected to total nearly 47 percent of the overall activity at the facility equaling nearly 8,600 annual operations. Air taxi operations are anticipated to increase from 400 operations per year to 1,000 operations in 2029 resulting in an increase of approximately five percent per year. At the conclusion of the 20-year time frame, VER is expected to experience approximately 700 IMC arrivals and departures and nearly 400 AIAs per year.

The demand forecasts, combined with the inventory data, will be used to identify the 20-year facility requirements for VER. The next chapter, *Facility Requirements*, identifies the types and extent of airside/airfield facilities needed to adequately accommodate the demand levels identified in this chapter.



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Table 2.8
Demand Forecast Summary, 2009-2029

Forecast Element	2009	2014	2019	2024	2029
Based Aircraft					
Single-Engine Aircraft (A-I & B-I)	45	63	67	67	68
Multi Engine Piston Aircraft (B-I)	2	2	2	2	2
Multi-Engine Turbine Aircraft (B-II)	1	1	1	1	2
Business Jet Aircraft (B-II/C-II)	0	0	1	2	2
Rotocraft	2	2	3	3	4
Total Based Aircraft	50	68	74	75	78
Annual Operations					
Local Operations	4,900	5,700	6,800	8,100	9,600
Itinerant/Transient Operations	3,600	4,300	5,100	6,100	7,300
Air Taxi Operations	400	500	600	800	1,000
Military Operations	300	300	300	300	300
Total Annual Operations	9,200	10,800	12,800	15,300	18,200
Annual Instrument Approaches					
Total AIAs	200	200	300	300	400

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR.



CHAPTER THREE

FACILITY REQUIREMENTS

INTRODUCTION

This chapter identifies the long-range airfield and terminal area facilities needed to satisfy the 20-year forecast of aviation demand at Boonville-Jesse Viertel Memorial Airport (VER). Facility needs have been identified based on the accumulation of inventory information, forecast aviation demand, and peak period activity analyses and planned in accordance with FAA airport design criteria. The identification of needed facilities does not constitute a requirement, but rather an option for facility improvements to resolve facility, operational or safety inadequacies, or to make improvements to the airside or landside components as aviation demands warrant.



PEAKING CHARACTERISTICS

The traffic demands imposed on an airport exhibit variations based on an annual, monthly, daily and hourly basis. These fluctuations result in periods of activity, known as peaks, which place the greatest amount of demand on airport facilities to accommodate aircraft and passengers. As the need for aviation services increases so, too, does the demand for individual facilities to accommodate peak periods of aviation activity. Peak periods must be considered when determining future facilities so that airfield and terminal area components are effectively utilized in order to accommodate projected demand.

The airport peaking characteristics analysis will forecast peak period demand for aircraft operations, as well as passenger activity at VER. This peaking analysis takes into account normal periods of airport activity. This analysis will also be organized into peak month/average day and peak hour passenger estimates for the short (0-5 year), intermediate (6-10 year) and long-term (11-20 year) phases throughout the 20-year airport development period.

Peak Month/Average Day (PMAD) Demand

Historical operational activity at VER was evaluated to identify trends of the average day of the peak month. Typically, peak operations at general aviation airports such as VER occur during the months of July or August. Some airports, like VER, may have peak hour operations as high as 12 to 20 percent of daily total operations. Due to regular operation by locally based piston and transient turbine powered aircraft, it is assumed that approximately 1,600 operations, or nearly 18 percent of the total current activity, occurs during the peak months. This monthly activity also considers the high level of fixed and rotor wing flight training taking place at VER. This peak hour operational trend is expected to continue throughout the 20-year planning period.

To arrive at the average day of peak month (Design Day) operational total, the PMAD activity was divided by the number of days in the peak month (30). Peak Hour operational projections are the result of the Design Day compared to the ratio of activity occurring during the peak month (18 percent). **Table 3.1** summarizes the peak operational estimates for VER.

Table 3.1
PMAD Operational Demand, 2009-2029

Peaking Elements	2009	2014	2019	2024	2029
Annual Operational Demand	9,200	10,800	12,800	15,300	18,200
Peak Month Operations	1,700	1,900	2,300	2,800	3,300
Design Day Operations	57	63	77	93	110
Peak Hour Operations	10	11	14	17	20

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR; VER Demand Forecasts.

Peak month operations at VER are projected to increase from approximately 1,700 to nearly 3,300 monthly operations in 2029. In 2009, VER is expected to experience approximately 57 design day operations. This activity level translates into 10 operations during peak hour periods and five departures per peak hour. In 2029, the Airport is expected to experience as many as 110 design day operations and 20 peak hour operations totaling 10 departures per peak hour. Ultimately, operational peaking characteristics will have the most influence on apron area needs and the number of tie-down spaces to accommodate peak hourly demand at the facility.

Peak Hourly Passenger Activity

Planning for the proper spatial requirements needed for terminal building facilities requires hourly volumes of traffic consistent with the average daily baseline of activity at the Airport. Peak hourly passenger activity forecasts are generated by determining peak monthly passenger activity based on accurate enplanement estimates. In the case of VER, assumptions were made as to what the reasonable level of passenger traffic would be during peak periods of operational activity. **Table 3.2** summarizes the peak hour passenger activity estimates for VER throughout the planning period.

Table 3.2
Peak Hour Passenger Demand, 2009-2029

Peaking Elements	2009	2014	2019	2024	2029
Annual Operational Demand	9,200	10,800	12,800	15,300	18,200
Peak Month Operations	1,700	1,900	2,300	2,800	3,300
Design Day Operations	57	63	77	93	110
Peak Hour Operations	10	11	14	17	20

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR; VER Demand Forecasts.

THREE: FACILITY REQUIREMENTS

To determine the peak hourly passenger activity at VER, it was assumed that passenger activity would be similar to that of the operational peaking activity, or 18 percent of average day activity. In terms of passenger and operational activity, as airport activity increases, the peak of activity tends to spread out throughout the day. This fact shows that as aircraft operations increase so, too, does the level of passenger traffic. Absent historic passenger activity, the projected peak hour passenger totals are expected to reflect design day or peak operational trends at the facility. In 2009, VER is expected to experience approximately 10 peak hour passengers. Ultimately, the Airport is anticipated to accommodate 20 peak hour passengers during normal operating conditions.

AIRFIELD AND AIRSPACE REQUIREMENTS

The determination of airfield and airspace requirements includes an assessment of the Airport's ability to accommodate projected activity levels throughout the planning period. Additionally, this requires an analysis of its compliance with design and safety standards. Lastly, a determination of design standards for new facilities and/or the improvement of existing facilities will be completed as part of this evaluation. Airfield and airspace components include runway requirements such as dimensional criteria, length, width, pavement strength, taxiway requirements, markings, lighting and AWOS needs, as well as airspace needs to accommodate future instrument approaches to the Airport.

Runway Requirements

Existing and future runway needs will be examined with respect to dimensional criteria, orientation, length, width and pavement strength. Ultimate runway requirements for VER were prepared pursuant to FAA Advisory Circular (AC) 150/5300-13, Airport Design, Change 13 and FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

Dimensional Criteria

The existing Airport Reference Code (ARC) for Runway 18-36, considering the existing length and safety area dimensions, is B-II. This ARC is expected to accommodate 100 percent

of the general aviation (GA) fleet of small aircraft with a maximum takeoff weight of 12,500 pounds or less. The current and ultimate critical aircraft for VER is a Beechcraft King Air 350 and a Cessna Citation Encore (both ARC B-II), respectively. Accordingly, given the ultimate critical aircraft is a jet, it is recommended that the ultimate safety dimensional criteria for VER be capable of safely accommodating 75 percent of the GA fleet weighing 12,500 to 60,000 lbs at 60 percent useful load, or ARC B-II. Table 3.3 illustrates the dimensional standards including those required for existing and ultimate ARC B-II classification for Runway 18-36.

Orientation

The desirable wind coverage is 95 percent for the primary runway and is computed based on the crosswind component not exceeding 10.5 knots for ARC A-I small aircraft. Small aircraft (weighing less than 12,500 lbs) are recommended to be able to operate approximately 95 percent of a given period without experiencing a crosswind component greater than 10.5 knots.

As indicated in Chapter 1, *Wind Analysis*, Runway 18-36 provides a mere 90.3 percent wind coverage for small aircraft at 10.5 knots of crosswind. **Therefore, according to FAA planning criteria, determination of a preferred alignment for an ultimate crosswind runway is recommended to provide the necessary wind coverage.**

Annual wind observations from the Columbia Regional Airport (COU), during the period from 1996 to 2005, were utilized to formulate an all weather wind rose depicting the wind coverage for Runway 18-36 as well as a proposed crosswind runway. **Based on prevailing winds in the area, it was determined that the crosswind runway with a true alignment of 332 degrees and designated 15-33 would allow exactly 95.0 percent wind coverage at 10.5 knots. However, considering topography and local area residential and commercial development potential, a runway with a true bearing of 310 degrees and designated 13-31 would be the most feasible alternative.**

A future crosswind Runway 13-31 would provide 90.1 percent wind coverage at 10.5-knots for ARC A-I and B-I aircraft; 95.2 percent wind coverage at 13.0 knots for A-II and B-II aircraft; and 98.6 percent wind coverage for ARC C-I to D-III aircraft. Combined, both runways would provide 97.3 percent wind coverage for ARC A-I and B-I aircraft; 99.0 percent wind coverage at 13.0 knots for ARC B-II aircraft; and 99.7 percent wind coverage for ARC C-I/II aircraft. **Exhibit 3.1** illustrates the Airport's future all weather wind rose which depicts the predominant wind directions and velocities occurring at VER with an intersecting runway



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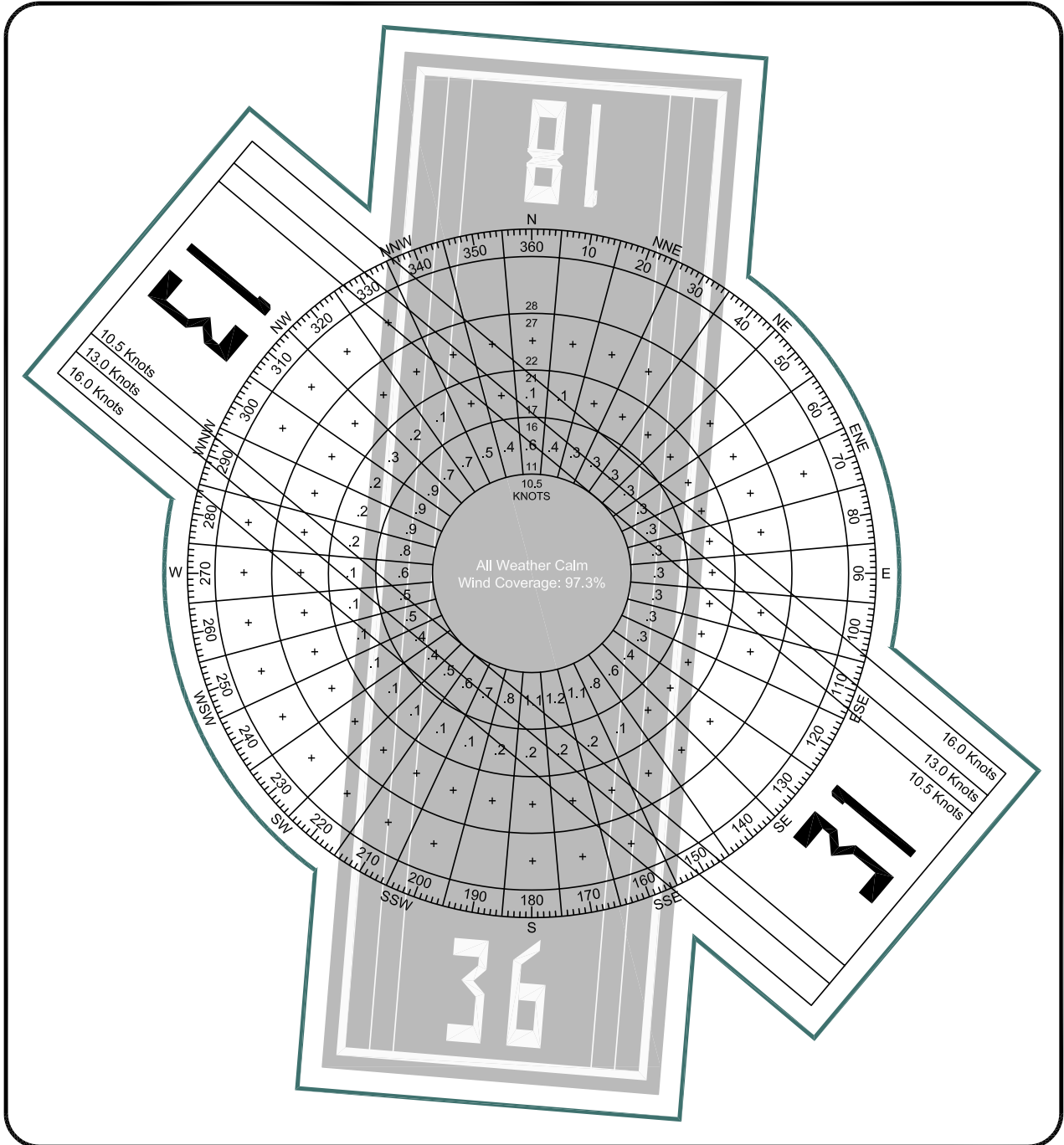


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Exhibit 3.1

All Weather Windrose-Runway 18-36 & Proposed Runway 13-31



Source: NOAA, NCDC, Asheville, NC; Columbia Regional Airport (COU)



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system. **Table 3.3** also illustrates the dimensional standards for the crosswind Runway 13-31 including those required for ARC B-I classification.

Length

The determination of runway length requirements for general aviation airports such as VER is derived from FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

Runway lengths for small aircraft (less than 12,500 lbs.) consider performance curves of propeller and some turbo-prop aircraft including maximum takeoff and landing weights; headwind component; optimal flap settings for normal operations; elevation above mean sea level; and mean maximum daily temperature for the airport. The recommended runway

length for small aircraft at VER should accommodate 95 percent of the small GA aircraft fleet with less than 10 passenger seats.

Table 3.3
Existing and Ultimate Runway Dimensional Standards

Runway Item	Runway 18-36 (E/U) Standards (Ft.) ARC B-II	Proposed Runway 13-31 (U) Standards (Ft.) ARC B-I
Runway Width	75	60
Runway Safety Area (RSA):		
RSA Width	150	120
RSA length beyond runway end	300	240
Object Free Area (OFA):		
OFA Width	500	400
OFA length beyond runway end	300	240
Obstacle Free Zone (ROFZ):		
ROFZ Width	400	400
ROFZ length beyond runway end	200	200
Runway Protection Zone (RPZ):		
Primary Runway End		
Inner Width	500	500
Outer width	700	700
Length	1,000	1,000
Runway Protection Zone (RPZ):		
Other Runway End		
Inner Width	500	500
Outer width	700	700
Length	1,000	1,000
Runway to Parallel Taxiway CL	240	225
Runway CL to Aircraft Parking	250	200
Runway to Taxiway Hold Line	200	200

Runway Safety Area (RSA): The RSA is a two-dimensional surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of undershoot, overshoot or excursion from the runway.

Object Free Area (OFA): The OFA is a two-dimensional area on the ground centered on the runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for those that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

Runway Obstacle Free Zone (ROFZ): The OFZ is the airspace below 150 feet above the a established airport elevation and centered on the runway centerline that is required to be clear of all objects, except for frangible visual post mounted NAVAIDS expressly located in the OFZ by function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches.

Runway Protection Zone (RPZ): The purpose of the RPZ is to enhance the protection of people and property on the ground, and to prevent obstructions to aircraft. The RPZ is a two-dimensional trapezoid area beginning 200 feet beyond the paved runway end, and extends along the runway centerline. The RPZ size is determined by the aircraft approach category of airplanes expected to utilize the airport, as well as the type of instrument approach or minimum visibility to the runway ends. The FAA recommends that airport sponsor own the RPZ property in fee simple, and that the RPZ be clear of any non-aeronautical structure of public assembly or object that would interfere with the arrival and departure of aircraft.

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



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Runway lengths for large aircraft (12,500 lbs. up to 60,000 lbs.) consider performance curves derived from FAA-approved flight manuals for turbo-prop and business jet aircraft developed in accordance with provisions of Federal Aviation Regulation (FAR) Part 25, Airworthiness Standards: Transport Category Airplanes and Part 91, General Operating and Flight Rules. Landing and takeoff operational adjustments such as load factor, runway gradient and pavement conditions are those variables which have the most influence on runway length requirements for large aircraft. Runway length for large aircraft at VER is recommended to accommodate 75 percent of the GA aircraft fleet at 60 percent useful load on takeoff. **Table 3.4** illustrates the runway length requirements for VER taking into consideration varying operational variables.

Ultimately, considering runway grade and VER's future critical aircraft, which is expected to be an ARC B-II aircraft, the usable length of Runway 18-36 is recommended to be 4,900 feet. The proposed crosswind Runway 13-31 would be recommended to have a usable length of 3,400 feet.

Width

The required runway width is a function of approach visibility minimums and the facility's ARC. The ARC is a combination of the critical airplane's approach category (approach speed) and airplane design group (wingspan). **Runway 18-36's current 75-foot width will be sufficient to safely accommodate projected demand and is recommended to remain unchanged throughout the planning period. The proposed Runway 13-31 is recommended to have a 60-foot wide surface.**

Pavement Design Strength

The required pavement design strength is an estimate based on average levels of activity and is expressed in terms of aircraft landing gear type and geometry (i.e., load distribution). The pavement design strength is not the maximum allowable weight. Limited operations by heavier aircraft than the critical aircraft may be permissible.

VER's ultimate critical aircraft, the Citation Encore, has a maximum takeoff weight of nearly 16,800 pounds. **For Runway 18-36, the current weight bearing capacity of 12,500 pounds for single wheel gear (SWG) aircraft is recommended to be upgraded to 30,000 SWG to accommodate the ultimate critical aircraft. The proposed Runway 13-31 is recommended to have a weight bearing capacity of 12,500 pounds for SWG airplanes.**

Taxiway Requirements

The taxiway system exists expressly to serve as a defined area to accommodate the movement of aircraft to and from the runway, as well as to serve as a transit system between the airside and terminal area. This section will evaluate the capability of the future taxiway system at VER to accommodate ultimate demand activity.

VER's taxiway system was previously described in Chapter 1, Table 1.2 and depicted on Exhibit 1.3. **Based on projected operational demand, the existing taxiway width of 35 feet for ARC B-II aircraft is sufficient to accommodate projected demand. Ultimately, the runway centerline to**

**Table 3.4
Runway Length Requirements, 2009-2029**

Airport and Runway Data	Variable
Airport elevation (mean sea level- MSL)	715 feet
Mean daily maximum temperature of the hottest month	89° F
Critical Aircraft	Cessna Citation Encore (ARC B-II)
Maximum difference in runway centerline elevation	3 feet
Percent of Fleet/Useful Load (%)	75/60
Runway Lengths for Small Airplanes w/ MTOW of 12,500 lbs. or Less	Length (Feet)
Proposed Runway 13-31 (95% of GA Fleet)	3,400
Runway Lengths for Airplanes w/ MTOW of ≥12,500 lbs. up to 60,000 lbs.	Length (Feet)
Runway 18-36 Existing length	4,000
Runway 18-36 (75% of GA Fleet at 60% Useful Load)	4,800
Runway 18-36 (Runway Gradient-.08%)	4,900
Runway 18-36 (Wet Pavement Condition)*	5,500*

MTOW- Maximum Takeoff Weight

(*) Runway length requirements for jet powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet, whichever is less.

Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

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taxiway centerline separation distance is recommended to remain at its current distance of 240 feet for the parallel taxiway. The proposed Runway 13-31 is recommended to have 25-foot wide taxiways and a runway/taxiway centerline separation distance of 225 feet.

Navigational Aid (NAVAID) Requirements

NAVAIDs are installed on or near airports to increase the reliability and efficiency to accommodate aircraft operations during night and inclement weather conditions. NAVAIDs utilized at VER were described in Chapter 1, Airfield Facilities. **Ultimately, VER is recommended to be served by its existing RNAV(GPS) and LPV approaches utilizing Wide Area Augmentation System (WAAS) technology.**

WAAS

Emerging technologies including WAAS, as well as Local Area Augmentation System (LAAS), are expected to replace the ILS as the primary means of establishing precision instrument approaches. LAAS is an augmentation to GPS signals that is focused on a 20 to 30 mile radius around an airport with LAAS capabilities. LAAS is broadcast via a VHF radio data link from a ground based transmitter yielding highly accurate information to accommodate ½-mile visibility minimum instrument approaches. WAAS utilizes the same technology as that of LAAS but affords an even larger operational area providing enhanced GPS services to airports within a 200 to 300 mile area.

Because future precision instrument approach capabilities are expected to be accommodated by satellite-based GPS applications, traditional instrument landing system (ILS) components such as the localizer antenna (LOC), glide slope antenna (GS), marker beacons (outer marker- OM, middle marker- MM and inner marker- IM), with the exception of the approach lighting system, are expected to be obsolete for establishing precision instrument approach capabilities. However, because precision capabilities require stringent safety area and structure clearance criteria, WAAS procedures will exhibit the same standards associated with airfield dimensional guidelines as those associated with an ILS. (RNAV)GPS procedures such as LPV and lateral and vertical navigation (LNAV/VNAV) approaches utilize WAAS technology to accommodate published instrument approaches.

Markings, Lighting and AWOS

Airfield Markings

Airfield markings were previously described in Chapter 1, Table 1.2. **Runway 18-36 is recommended to remain**

marked as a non-precision instrument (NPI) runway given existing and future VOR, (RNAV)GPS and lateral precision with vertical guidance (LPV) instrument approach procedures to the Airport. The proposed Runway 13-31 is recommended to be marked as a visual runway. Taxiways, taxilanes and apron areas are recommended to be marked in accordance with FAA AC 150/ 5340-1J, *Standards for Airport Markings*.

Airfield Lighting

Airfield lighting at VER was described in Chapter 1, *Airfield Facilities*. This section will offer additional information and explanation regarding lighting systems utilized at the Airport.

Runway and Taxiway Lighting:

Runway 18-36 is recommended to maintain the pilot-controlled, white, stake mounted, medium intensity runway lighting (MIRL), as well as the red and green omni-directional threshold lights. Proposed Runway 13-31 will not be required to be served by MIRL or threshold lighting as it will be designated as a visual runway.

Ultimately, the taxiway system serving Runway 18-36 is recommended to be continuously equipped with blue medium intensity taxiway lighting (MITL). The taxiway system serving proposed Runway 13-31 will not be required to be equipped with MITL or blue stake-mounted reflectors.

Runway End Indicator Lights (REILs):

REILs include high intensity, photo strobe lights used for rapid identification of the thresholds during night and inclement weather conditions. **Ultimately, Runway 18-36 is recommended to retain the REILs servicing the runway throughout the planning period. The proposed Runway 13-31 will not be required to be served by REILs.**

Visual Guidance Indicators:

Precision Approach Path Indicators (PAPI) emit a sequence of colored light beams providing continuous visual descent guidance information along the desired final approach descent path (normally at 3 degrees for 3 nautical miles during daytime, and up to 5 nautical miles at night) to the runway touchdown point. **Runway 18-36 is recommended to be continuously served by a PAPI-4L system throughout the planning period. The proposed Runway 13-31, given its future role as a visual runway, is not required to be equipped with visual approach aids.**



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Airport Beacon:

VER's airport beacon provides visual airport identification and location during night-time operations, as well as during inclement weather conditions. **It is recommended that the current airport beacon be maintained in its current location for the foreseeable future and replaced when necessary during the planning period.**

AWOS (Automated Weather Observation System)

An AWOS is a suite of sensors which measures, collects and disseminates weather data on a minute-to-minute basis to assist pilots with monitoring weather conditions and flight planning. An AWOS measures weather parameters such as airport identifier, time of observation, wind speed and direction, temperature and dew point, visibility, cloud ceilings and types, precipitation and barometric pressure.

Ultimately, VER's AWOS-III system is recommended to be maintained in its current location for the foreseeable future and upgraded when necessary during the planning period.

Airspace Requirements

Exhibit 3.2 depicts typical FAR Part 77 imaginary airspace surfaces including the primary surface, horizontal surface, transitional surfaces, and approach surfaces. Most importantly, the approach surface is a three-dimensional trapezoidal-shaped imaginary surface beyond each runway end having a defined slope. The three slopes for an approach are 20:1, 34:1 and 50:1. The purpose of the approach surface is to provide proper clearance over structures and objects beyond the runway threshold for the safe approach and landing of aircraft based on a specified approach path.

VER's published approach procedures were described in Chapter 1, Table 1.1. Currently, Runway 18-36 has published 20:1 non-precision approaches to the Runway 18 and 36 thresholds. **Ultimately, VER is recommended to enhance its 20:1 (RNAV)GPS approaches to 34:1 approach slope surfaces. It is also recommended that a lateral precision with vertical guidance (LPV) approach procedure to the Runway 36 threshold be established. Lastly, the existing and future (RNAV)GPS LPV approaches are recommended to be enhanced with lateral and vertical navigation (LNAV/VNAV) to increase the safety and accessibility during low visibility conditions. The proposed Runway 13-31 is recommended to be accommodated by visual approaches with 20:1 approach slope surfaces.**

Potential establishment of additional instrument approaches and/or upgrades to those procedures to Runway 18-36 require consideration of the wind conditions during instrument meteorological conditions (IMC). **Exhibit 3.3** illustrates the Airport's IMC wind rose which depicts the predominant wind directions and velocities occurring at VER. **Based on the IMC wind analysis, it is recommended that future 34:1 non-precision LNAV/VNAV and LPV approach instrument approach procedure improvements be established primarily to the Runway 36 threshold.**

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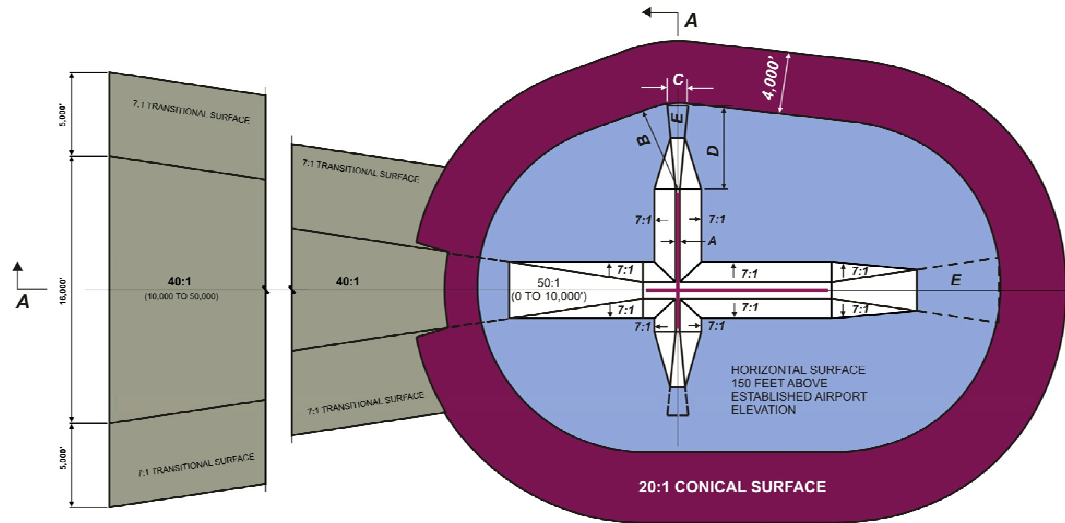


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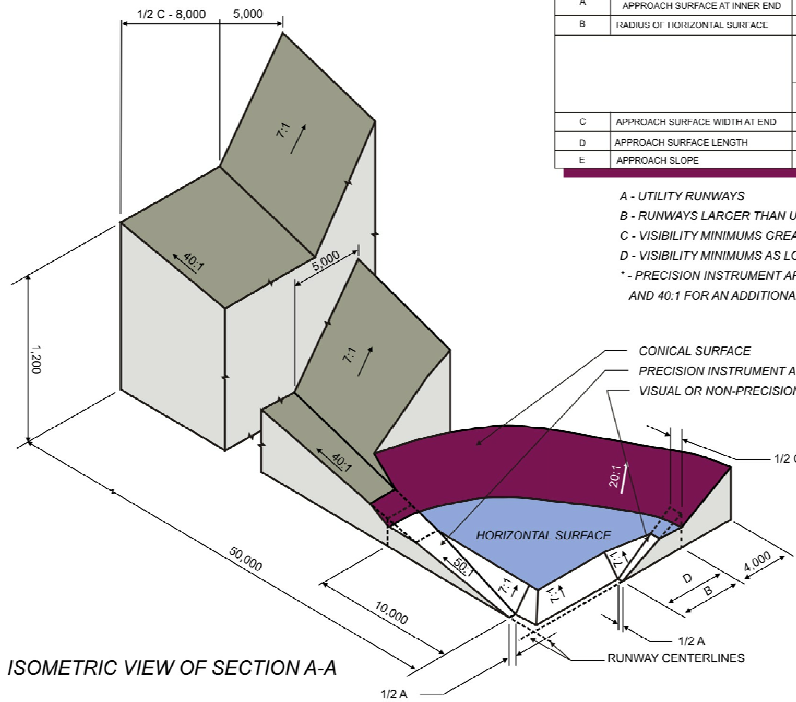
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Exhibit 3.2 Part 77 Imaginary Airspace Surfaces



PLAN VIEW



ISOMETRIC VIEW OF SECTION A-A

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH		PRECISION INSTRUMENT RUNWAY	
		A	B	A	B		
A	WIDTH OF PRIMARY SURFACE & APPROACH SURFACE AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	15,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	-
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	-

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

Source: NOAA, NCD, Asheville, NC; Columbia Regional Airport (COU)



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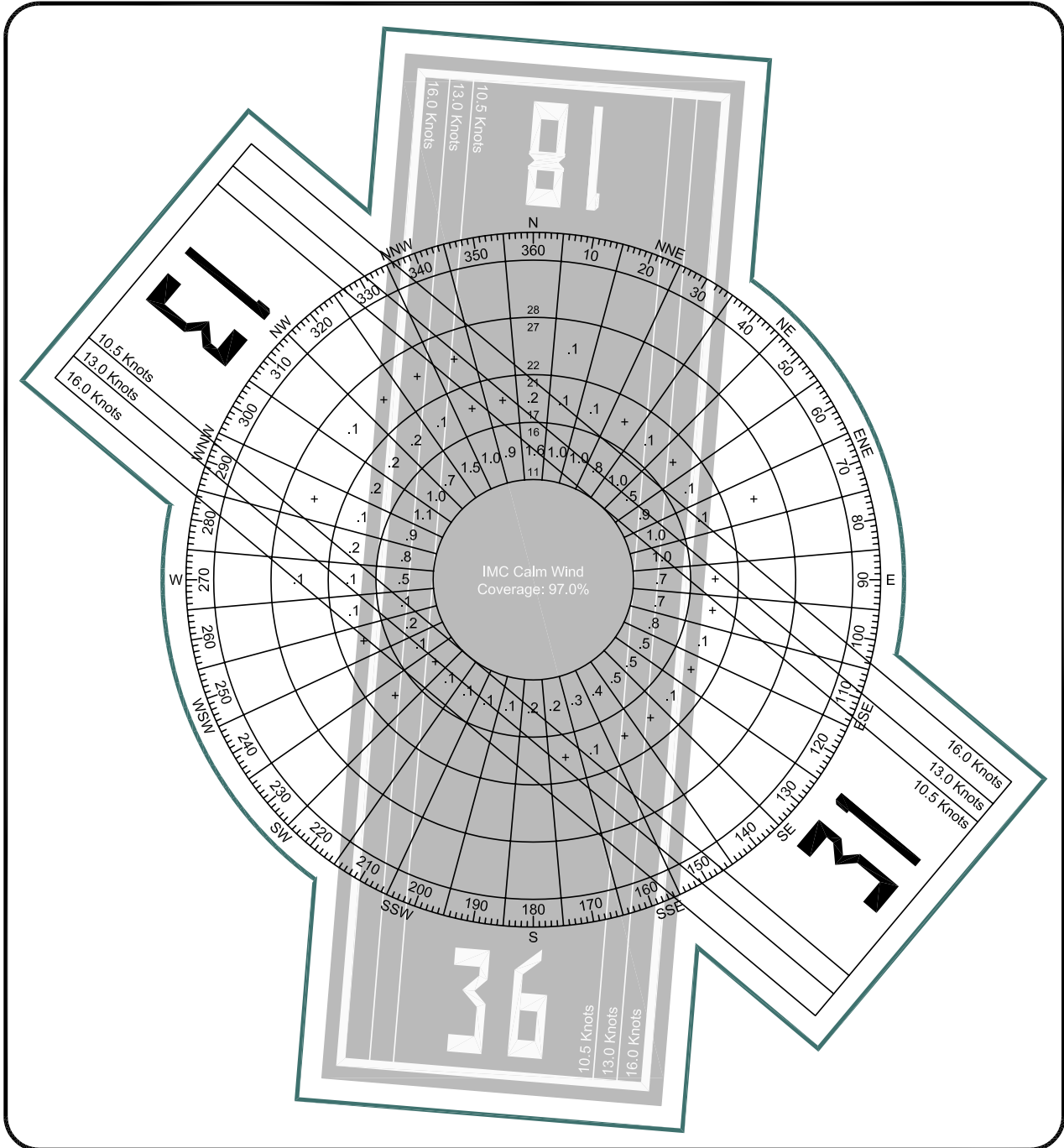


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Exhibit 3.3

IMC Windrose-Runway 18-36 & Proposed Runway 13-31



Source: NOAA, NCDC, Asheville, NC; Columbia Regional Airport (COU)



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AIRFIELD AND AIRSPACE FACILITY REQUIREMENTS SUMMARY

Table 3.5 summarizes the airfield/airspace facility requirements for VER throughout the planning period. Items identified within **Table 3.5** are those that require upgrade or expansion according to design criteria and are based on projected aviation demand.

Table 3.5
Airfield/Airspace Facility Requirements Summary, 2009-2029

Facility Type	Recommendations
Airfield Dimensional Criteria	
Runway 18-36	Maintain ARC B-II design standards
Proposed Runway 13-31	ARC B-I design standards
Runway Dimensions (Length and width)	
Runway 18-36	Expand from 4,000' to 4,900'; maintain 75-foot width
Proposed Runway 13-31	3,400' x 60' (ARB B-I)
Pavement Design Strength	
Runway 18-36	Strengthen from 12,500 lbs. to 30,000 lbs. SWG
Proposed Runway 13-31	12,500 lbs. SWG
Taxiway Requirements	
Runway 18-36 Taxiway System	Maintain 35-foot width; 240 foot runway/taxiway centerline separation distance
Proposed Runway 13-31 Twy System	25-foot width; 225 foot runway to taxiway centerline separation distance
Airfield Markings	
Runway 18-36	Maintain non-precision instrument (NPI) markings
Proposed Runway 13-31	Basic Visual
Airspace Requirements	
Runway 18-36	Establish ultimate 34:1 non-precision approach surfaces; Establish an LPV approach to the Runway 36 threshold; Establish vertically guided approach procedures (VNAV) to both runway thresholds
Proposed Runway 13-31	Establish 20:1 visual approach surfaces

Source: BWR; VER Airfield/Airspace Facility Requirements.

TERMINAL AREA REQUIREMENTS

Terminal area facility components are comprised of the passenger terminal building, auto parking, aircraft hangars, aircraft parking apron, as well as support facilities including fuel storage capabilities, snow removal and equipment (SRE) structures and aircraft maintenance.

Passenger Terminal Building

The primary objective of the terminal building is to achieve an acceptable balance between passenger convenience, facility operational efficiency, facility investment and aesthetics. A

well conceived terminal building should allow passengers to transition from the surface transportation mode to the air transportation mode with a minimum of inconvenience. Potential expansion of the terminal building should be developed and constructed within allowable funding levels that take into consideration the capital investment costs, as well as operational and maintenance costs.

VER's passenger terminal building was discussed in Chapter 1, Terminal Area Facilities. The existing structure is not adequate to accommodate current or projected peak hour passenger activity. Also, the structure, constructed in 1974,



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is unsightly and increasingly expensive to maintain and operate. Most importantly, the location of the terminal building requires airport patrons to walk across the aircraft apron to access the terminal building. This condition creates a potential incursion hazard and may lead to potential unauthorized access to the terminal area and airfield.

The recommended terminal functional areas including square footage and parking facilities were determined by referring to FAA Advisory Circular (AC) 150/5360-13, Planning and Design for Airport Terminal Facilities, as well as FAA AC 150/5390-9, Planning and Design of Terminal Facilities at Non-Hub Locations. **Table 3.6** summarizes the ultimate passenger terminal spatial needs for VER throughout the 20-year planning period.

Ultimately, the exiting VER terminal building is expected to have a 2,100 square foot deficit of terminal building floor space at the conclusion of the planning period. Currently, the terminal building has a deficit of 600 square feet of floor space. From a spatial standpoint, the terminal building is not considered conducive to supporting necessary administrative and passenger processes including accommodations such as flight planning, pilot lounge and passenger circulation areas due to its layout, age and overall physical condition. **Development and construction of a new 3,000 square foot terminal building is recommended during the 20-year planning period. Initial building design is recommended to commence within the 0-5 year planning period. Final construction of the new terminal building is also recommended to occur within the short-term (0-5 year) timeframe, if feasible. Lastly, the new terminal building**

is recommended to be located to the west of the existing aircraft apron.

Auto Parking

The existing auto parking facilities at VER are described in Chapter 1, *Terminal Area Facilities*. Public auto parking space requirements are based on FAA AC 150/5360-13. In determining the future auto parking needs, 1.5 spaces are allotted per peak hour passenger while 400 square feet per parking space, including maneuvering area, is provided. **Table 3.7** summarizes the ultimate auto parking needs during normal airport operating conditions.

**Table 3.7
Auto Parking Requirements, 2009-2029**

Operational Activity/Factors	2009	2014	2019	2024	2029
Peak Hour Passengers	10	11	14	17	20
Parking Spaces/Peak Hour Passenger	1.5 parking spaces				
Total Parking Demand (Spaces)	15	17	21	26	30
Square Footage/Parking Space	400 square feet				
Total Parking Area Demand (sq. ft.)	6,000	6,800	8,400	10,400	12,000
Existing Auto Parking Facilities	20 parking spaces/9,000 square feet				
Parking Space Surplus/(Deficit) (Spaces)	5	3	(1)	(6)	(10)
Parking Area Surplus/(Deficit) (sq. ft.)	3,000	2,200	600	(1,400)	(3,000)

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR; FAA AC 150/5360-13.

**Table 3.6
Terminal Building Requirements, 2009-2029**

Operational Activity/Factors	2009	2014	2019	2024	2029
Annual Operational Demand (Operations)	9,200	10,800	12,800	15,300	18,200
Peak Month (PMAD) Operations	1,700	1,900	2,300	2,800	3,300
Design Day Operations	57	63	77	93	110
Peak Hour Passengers	10	11	14	17	20
Square Feet/Peak Hour Passenger	150 sq. ft.				
Terminal Bldg. Spatial Needs (sq. ft.)	1,500	1,700	2,100	2,600	3,000
Existing Passenger Terminal Space Available	900 sq. ft.				
Terminal Building Space (Deficit) (sq. ft.)	(600)	(800)	(1,200)	(1,700)	(2,100)

Note: Figures rounded to the nearest hundred for planning purposes.

Note: Peak month and peak hour passenger activity is assumed to be 18 percent of the annual activity for VER.

Source: BWR; FAA AC 150/5360-13 and FAA AC 150/5390-9.

THREE: FACILITY REQUIREMENTS

Currently, the VER terminal building auto parking facilities have a surplus of nearly 3,000 square feet of parking area and five parking stalls. However, the Airport’s auto parking facilities are expected to have a deficit of approximately 3,000 square feet of parking area and 10 parking stalls at the conclusion of the 20-year planning period. **Expansion of the parking area is recommended to occur during the long-term planning phase, or 2019-2024. This expansion would initially include the construction of six additional parking stalls totaling approximately 1,400 square feet of space.**

Aircraft Hangars

T-hangar facilities located at VER and corresponding square footage estimates were discussed in Chapter 1, Table 1.3. Hangar storage requirements will include a determination of recommended number of future hangar spaces and spatial requirements for T-hangars and clear span or box hangars. The VER demand forecasts project 78 total based aircraft including 68 single engine, two twin-piston, two multi-engine turbo-props, two business jets and four helicopters in 2029.

T-Hangars

In determining the T-hangar storage requirements for VER, it was assumed that 95 percent of the based single and multi-engine piston powered aircraft would be provided enclosed T-hangar space in the future. However, this assumption may differ from actual future hangar arrangements. Single engine aircraft generally require approximately 1,250 square feet of storage space. **Table**

3.8 summarizes the T-hangar storage requirements for VER throughout the planning period.

By 2029, it is recommended that an additional 50,100 square feet and 40 T-hangar units be developed to accommodate projected single and twin-piston based aircraft demand. Ultimately, VER is expected to accommodate approximately 67 total T-hangar storage spaces totaling nearly 83,800 square feet of space. **To meet this demand, the Airport is recommended to develop four additional 10-unit T-hangar structures totaling approximately 50,000 square feet of space.**

Clear Span Hangars

Clear span hangars located at VER and corresponding square footage estimates were discussed in Chapter 1, Table 1.3. Considering current square footage estimates, the existing clear span hangars are more suited to accommodate single and twin-piston airplanes and rotorcraft rather than multi-engine turbine airplanes. That is not to say that the existing hangar facilities couldn’t accommodate turbine airplanes. This analysis will specify the recommended square footage needs for future based aircraft in addition to the Airport’s existing clear span hangar accommodations.

In determining the ultimate clear span storage requirements for VER, it was assumed that the future based turbine aircraft would be stored in privately-owned clear span hangars. However, this assumption may differ from actual future hangar arrangements. A generously equipped clear span hangar totals approximately 5,000 square feet of space and/or measuring 71’ x 71’. **Table 3.9** summarizes the clear span hangar storage requirements for VER throughout the planning period.

By 2029, it is recommended that an additional 20,000 square feet and four new clear span hangars

**Table 3.8
T-Hangar Requirements, 2009-2029**

Operational Activity/Factors	2009	2014	2019	2024	2029
Based Aircraft*	47	65	69	69	70
Square Footage/Aircraft	1,250 square feet				
T-Hangar Demand (Spaces)**	45	62	66	66	67
T-Hangar Area Demand (sq. ft.)	56,300	77,500	82,500	82,500	83,800
Existing T-Hangar Facilities	26 T-hangar units/33,700 square feet				
T-Hangar Space (Deficit)	(19)	(36)	(40)	(40)	(41)
T-Hangar Area (Deficit) (sq. ft.)	(22,600)	(43,800)	(48,800)	(48,800)	(50,100)

Note: Figures rounded to the nearest hundred for planning purposes.

(*) Includes single and multi-engine piston aircraft and excludes multi-engine turbine aircraft and helicopters as they will most likely be stored in clear span or box hangars.

(**) Indicates 95 percent of local single and multi-engine piston based aircraft. Two to three piston powered aircraft per planning phase will most likely be stored on the apron.

Source: BWR.



be developed to accommodate projected turbine demand at the facility. This recommendation includes constructing four additional hangars in addition to the 13,500 square feet of storage space provided within Hangar 100. At the conclusion of the 20-year planning period, the Airport would have a deficit of approximately 6,500 square feet in the event that no additional clear span hangars are developed.

Table 3.9
Clear Span Hangar Requirements, 2009-2029

Operational Activity/Factors	2009	2014	2019	2024	2029
Turbine Aircraft Demand	1	1	2	3	4
Square Footage/ Aircraft and/or Hangar	5,000 square feet				
Clear Span Hangar Demand (Spaces)	1	1	2	3	4
Clear Span Hangar Demand (sq. ft.)	5,000	5,000	10,000	15,000	20,000
Existing Clear Span Hangar Facilities	Five/13,500 square feet				
Clear Span Hangar Surplus/(Deficit)	4	4	3	2	1
Clear Span Hangar Area Surplus/(Deficit) (sq. ft.)	8,500	8,500	3,500	(1,500)	(6,500)

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR.

Apron Areas and Tie-Downs

Apron facilities and corresponding square yardage estimates located at VER were discussed in Chapter 1, *Terminal Area Facilities*.

The apron area requirements for VER include spatial needs for based aircraft, as well as apron areas utilized for transient aircraft. Spatial requirements for based single and multi-engine piston aircraft require approximately 755 square yards of apron area taking into account taxiway dimensions for Airplane Design Group (ADG) I aircraft (wingspan up to but not including 49 feet) and 10 feet clearance between wingtips. Additionally, per planning guidelines, approximately five percent of the based ADG I aircraft will be provided with apron space for storage equaling approximately 755 square yards of apron area per ADG I aircraft tie-down space. **Table 3.10** summarizes the based aircraft apron area requirements for VER.

Transient aircraft apron and tie-down space demands for VER were calculated by relying on the Airport's historic and projected Design Day operational activity. For single and multi-engine ADG I aircraft (wingspan up to but not including 49 feet), 755 square yards of apron will be provided. Multi-engine turbo-prop and business jet ADG II aircraft (wingspan of 49 feet up to but not including 79 feet) will be provided approximately 1,055 square yards of apron space per aircraft plus 10 feet of clearance between wingtips. **Table 3.10** also summarizes the transient aircraft apron calculations for VER throughout the planning period.

Future apron area and tie-down space for local and transient aircraft at VER in 2029 is expected to consist of approximately 13,400 square yards and will include 15 small and two large aircraft tie-downs. With its current facilities, VER will have a deficit of approximately 3,600 square yards of apron area and a surplus of one tie-down at the conclusion of the 20-year planning period. In 2019, the initial stage of the long-term (11-20 year) planning period, the Airport is expected to start to experience this deficit. The future apron at VER is also recommended to have a single wheel gear pavement strength of 45,000 pounds to match the weight bearing capacity of Runway 18-36 and the taxiway system.

THREE: FACILITY REQUIREMENTS

**Table 3.10
Public Apron Area/Tie-Down Requirements, 2009-2029**

Item/Facility	2009	2014	2019	2024	2029
Based Aircraft Apron Area/Tie-Down Demand					
Total Based Piston Powered Aircraft	47	65	69	69	70
5% of Total Based Piston Powered Aircraft	2	3	3	3	4
Square Yardage/Aircraft	755 square yards				
Based Aircraft Tie-Down Demand (Spaces)	2	3	3	3	4
Based Aircraft Apron Area Demand (sq. yd.)	1,500	2,300	2,300	2,300	3,000
Transient Aircraft Apron Area/Tie-Down Demand					
Annual Transient Demand (Operations)	4,300	5,100	6,000	7,200	8,600
Peak Month Transient Operations*	800	900	1,100	1,300	1,500
Design Day (PMAD) Operations	27	30	37	43	50
Peak Day Arrivals	14	15	19	22	25
Peak Hour Transient Demand (Tie-Downs)**	7	8	10	11	13
Transient Apron Area Demand (sq. yds.)	5,600	6,400	8,200	8,900	10,400
ADG I (wingspan up to but not including 49 feet) Transient Aircraft Apron/Tie-Down Demand					
ADG I Transient Tie-Down Demand (Spaces)	6	7	8	9	11
Square Yardage/Aircraft	755 square yards				
ADG I Transient Apron Area Demand (sq. yd.)	4,500	5,300	6,100	6,800	8,300
ADG II (wingspan of 49 feet up to but not including 79 feet) Transient Aircraft Apron/Tie-Down Demand					
ADG II Transient Tie-Down Demand (Spaces)	1	1	2	2	2
Square Yardage/Aircraft	1,055 square yards				
ADG II Transient Apron Area Demand (sq. yd.)	1,100	1,100	2,100	2,100	2,100
Existing Tie-Down Facilities (Spaces)	18 tie-downs				
Existing Apron Facilities (sq. yd.)	9,800 square yards				
Total Tie-Down Space Surplus	9	7	5	4	1
Total Apron Area Surplus/(Deficit) (sq. yd.)	2,700	1,100	(700)	(1,400)	(3,600)

Note: Facility demand estimates rounded to the nearest hundred for planning purposes.

(*) Peak month transient operational activity is assumed to be 18 percent of the annual activity for VER.

(**) During approximate hours of airport operation, or 12 hours per day.

Source: BWR.



TERMINAL AREA FACILITY REQUIREMENTS SUMMARY

Table 3.11 summarizes the terminal area facility requirements for VER throughout the planning period. Items identified within **Table 3.11** are those that require upgrade or expansion according to design criteria and are based on projected aviation demand.

Table 3.11
Terminal Area Facility Requirements Summary, 2009-2029

Facility	2009	2014	2019	2024	2029
Peaking Characteristics					
Annual Operational Demand	9,200	10,800	12,800	15,300	18,200
Peak Month Operations	1,700	1,900	2,300	2,800	3,300
Design Day Operations	57	63	77	93	110
Peak Hour Operational/Passenger Activity	10	11	14	17	20
Terminal Building Spatial Requirements					
Spatial Needs (sq. ft.)	1,500	1,700	2,100	2,600	3,000
Parking Requirements					
Auto Parking Space Demand	15	17	21	26	30
Auto Parking Area Needs (sq. ft.)	6,000	6,800	8,400	10,400	12,000
T-Hangar Requirements					
T-Hangar Demand (Units)	45	62	66	66	67
T-Hangar Spatial Needs (sq. ft.)	56,300	77,500	82,500	82,500	83,800
Clear Span Hangar Requirements					
Clear Span Hangar Demand (Spaces)	1	1	2	3	4
Clear Span Hangar Area Needs (sq. ft.)	5,000	5,000	10,000	15,000	20,000
Apron Area/Tie-Down Requirements					
Based Aircraft Tie-Down Demand (Spaces)	2	3	3	3	4
Based Aircraft Apron Area Demand (sq. yd.)	1,500	2,300	2,300	2,300	3,000
Peak Hour Transient Demand (Tie-Downs)	7	8	10	11	13
Transient Apron Area Demand (sq. yd.)	5,600	6,400	8,200	8,900	10,400
Total Tie-Down Demand (Spaces)	9	11	13	14	17
Total Apron Area Demand (sq. yd.)	7,100	8,700	10,500	11,200	13,400

Note: Figures rounded to the nearest hundred for planning purposes.

Source: BWR.

SUPPORT FACILITY REQUIREMENTS

Support facilities at VER include fueling facilities, aviation maintenance facilities, snow removal and equipment (SRE) storage facilities and utilities.

Fuel Storage

During the past five year period VER has dispensed an average of approximately 29,700 total gallons of fuel including 21,000 gallons of 100LL and nearly 8,700 gallons of Jet A annually. **Table 3.12** summarizes peak fueling levels for 100LL as well as recommended fuel reserves throughout the planning period.

THREE: FACILITY REQUIREMENTS

Projected fuel flowage and recommended reserves for 100LL were determined by applying anticipated growth rates in annual activity for piston aircraft to the base case fuel flowage figures. 100LL fuel demand is expected to increase at a rate of 4.9 percent throughout the period which is reflective of overall piston powered airplane and rotorcraft fleet operational growth estimates. Jet A fuel demand was projected to increase at a rate of approximately 5.3 percent which is reflective of VER’s anticipated turbine aircraft operational growth.

As a result of the fuel storage needs analysis, VER is recommended to have no less than 400 gallons of 100LL and 400 gallons of Jet A fuel on hand to accommodate existing peak day operational activity. Ultimately, the Airport is recommended to have no less than 1,600 gallons of 100LL and 800 gallons of Jet A fuel on hand to accommodate projected peak day activity. Once peak day fuel demand, plus reserves, for 100LL and/or Jet A reaches 50 percent capacity, consideration should be given to increasing fuel storage capacity. However, taking into account fuel storage and peak month fueling activity throughout the planning period, the existing fuel farm is adequate to meet the VER’s long-term fueling demands.

Aircraft Maintenance

VER’s maintenance capabilities were discussed in Chapter 1, *Support Facilities*. G & J Aircraft Services provide maintenance for piston powered aircraft as well as general aviation parts and supplies. G & J currently operates from a 3,500 square foot rectangular unit within Hangar 100. **Should the opportunity and/or demand arise, a 10,000 square foot, at minimum, clear span hangar would be recommended for major and/or minor airframe and powerplant maintenance for piston and turbine airplanes.**

Snow Removal and Equipment (SRE) Facilities

VER does not currently have any SRE facilities located on the Airport. FAA AC 150/5220-20, *Airport Snow and Ice Control Equipment*, identifies the minimum SRE equipment standards for non-commercial service airports experiencing, on average, greater than 10,000 annual operations and receiving approximately 13 inches of snow per year. **For VER, one high-speed rotary snow plow supported by two displacement plows of equal capacity is recommended for snow removal operations throughout the planning period.**

**Table 3.12
Fuel Storage Requirements, 2009-2029**

Fuel Flowage/Factors	2009	2014	2019	2024	2029
100LL Fueling Operations					
Annual Fueling Demand-100LL (Gal.)	22,000	28,000	35,500	45,100	57,300
Peak Monthly Fueling Demand-100LL (Gal.)	4,000	5,000	6,400	8,100	10,300
Peak Day 100LL Flowage (Gal.)	100	200	200	300	400
100LL Demand + Reserves (Gal.)*	400	800	800	1,200	1,600
Existing 100LL Storage Capacity	10,000 gallons				
Jet A Fueling Operations					
Annual Fueling Demand-Jet A (Gal.)	9,200	11,900	15,400	19,900	25,700
Peak Monthly Fueling Demand-Jet A (Gal.)	1,700	2,100	2,800	3,600	4,600
Peak Day Jet A Flowage (Gal.)	100	100	100	100	200
Jet A Demand + Reserves (Gal.)*	400	400	400	400	800
Existing Jet A Storage Capacity	10,000 gallons				

Note: Figures rounded to the nearest hundred for planning purposes.

Note: Peak month fueling operations are assumed to be 18 percent of the annual fueling activity for VER.

Note: Peak day fueling operations consider the peak month activity and divides that figure by 30 days.

Note: VER has dispensed an average of approximately 700 gallons of auto gas annually from 2004 thru 2008.

(*) Recommended fuel reserves equal Peak Day plus three days (3x).

Source: Airport Fuel Flow Estimates; BWR Fuel Flowage Extrapolation and Projections.



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FAA AC 150/5220-18, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, identifies the necessary square footage requirements to store and maintain snow and ice control equipment and material. **Ultimately, a back-in design storage structure capable of accommodating 1,800 square feet for parking area and an additional 400 square feet to store abrasives, deicers and salt is recommended, should the need arise and/or as demand would warrant.** The future SRE facility is recommended to be located along the terminal area flight line adjacent to the aircraft parking apron.

SUPPORT FACILITY REQUIREMENTS SUMMARY

Table 3.13 summarizes the support facility requirements for VER throughout the planning period.

UTILITY REQUIREMENTS

VER's utility service and providers were discussed in Chapter 1, *Support Facilities*. According to airport officials, the existing utilities and utility service providers for VER are sufficient to meet existing demand levels. However, it is recommended that these services and providers be reevaluated on a regular basis to ensure the Airport's utility needs are consistently being met.

Table 3.13
Support Facility Requirements Summary, 2009-2029

Facility	2009	2014	2019	2024	2029
Fuel Storage Requirements					
100LL Peak Day Demand (Gal.)	100	200	200	300	400
100LL Peak Day + Reserves (Gal.)	400	800	800	1,200	1,600
Jet A Peak Day Demand (Gal.)	100	100	100	100	200
Jet A Peak Day + Reserves (Gal.)	400	400	400	400	800
Total Peak Day Demand (Gal.)	200	300	300	400	600
Total Peak Day + Reserves (Gal.)	800	1,200	1,200	1,600	2,400
Aircraft Maintenance Facility Requirements					
Maintenance Hangar Needs	At minimum, 10,000 square foot clear span hangar				
Snow Removal and Equipment (SRE) Facility Requirements					
Equipment Needs	(1) Rotary snow plow; (2) Displacement plows				
Facility Needs	2,200 square foot structure				
Note: Figures rounded to the nearest hundred for planning purposes.					

Source: BWR.

OTHER FACILITY REQUIREMENTS

Other facility requirements are those associated with recommended requirements designed to enhance the Airport's level of environmental compliance and/or improvements dedicated to aviation or non-aeronautical uses, such as future industrial, commercial or potential revenue support areas.

Land Acquisition Requirements

VER's property consists of 12 tracts totaling nearly 197 acres. This includes approximately 11 acres of avigation easement within the Runway 18 inner approach area plus another 33 acre clear zone easement to the west of the airport to accommodate the AWOS clear areas.

The preferred development alternatives is expected to require the acquisition of approximately 52 acres in addition to the existing acreage. Additionally, a residence located to the northeast of the Airport and situated immediately adjacent to MO Highway 98 is recommended for acquisition. Ultimate property is expected to be acquired in fee-simple interest.

Aircraft/Vehicle Wash Rack

Compliance with federal, state and local wastewater regulations may be enhanced by implementing a closed-loop wash water recycling system. NPDES permits,

THREE: FACILITY REQUIREMENTS

monitoring programs, laboratory analyses, and efforts to meet compliance schedules may be reduced or avoided by integrating this technology into existing or future wash rack facilities. Recycling of wash water and cleaning agents reduces water and detergent usage, as well as the cost of wastewater discharge/treatment.

Wash rack wastewater typically contains petroleum hydrocarbons, heavy metals, solids, cleaning fluids, and detergents that drain into a sump. Upon receiving wastewater, a submersible pump would then draw the contaminated waste water from the sump and circulate it through the recycling system directly through an oil/water/sludge separator. This system is composed of a self-contained unit composed of systematically arranged processes including filtration, ozone treatment, and a series of filtration and absorption processes. Once vehicle or aircraft washing operations cease, the wastewater is ready for either wash rack reuse or discharge to the sanitary sewer.

Ultimately, consideration of a closed-loop wash water recycling system consisting of a concrete slab measuring 50' x 50' and totaling 2,500 square feet for use as an aircraft/vehicle wash rack is recommended. Ideally, this wash rack system will be located within the main terminal complex and immediately adjacent to the aircraft parking apron.

TRIGGER POINTS FOR FACILITY EXPANSION

The timing and need for particular capital improvements recommended for VER is dependent on projections of future aviation demand or 'trigger points,' rather than years. **Table 3.14** summarizes the trigger points that will most likely dictate initiation of capital improvements at VER throughout the planning period. As the overall operational environment of the Airport fluctuates, such as demand activity, the triggers which encourage development at the Airport might also change. Therefore, it is crucial that the airport sponsor monitor actual conditions and demand activity levels at the Airport on a regular basis.

The facility requirement analysis for VER is recommended to be periodically revisited to confirm trigger points and

operational demand in an attempt to accurately gauge the appropriate timing of facility needs. Capital improvement and facility expansion is recommended only when actual demand justifies and as long as the improvements are environmentally sound, as well as operationally and financially feasible.

The trigger points contained within **Table 3.14** are suggested to be coordinated with **Table 3.5, Airfield/Airspace Facility Requirements Summary, 2009-2029, Table 3.11, Terminal Area Facility Requirements Summary, 2009-2029** and **Table 3.13, Support Facility Requirements Summary, 2009-2029** when determining appropriate timing and development of recommended airfield and terminal area facilities at VER.



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Table 3.14
Facility Development Trigger Point Summary, 2009-2029

Facility Type	Trigger	Trigger Point (As Demand Warrants)
Airfield/Airspace Facilities		
Runway 18-36 Dimensional Criteria	Existing Activity	Phase I (2009-2013)
Runway 18-36 Extension to 4,900 (ARC B-II)	Existing Activity	Phase II (2014-2018)
Construct Runway 13-31 (ARC B-I)*	Existing Activity	Phase III (2019-2029)
Pavement Strength Upgrade*	Based ARC B-II Aircraft	Phase II (2014-2018)
Runway 18-36 Parallel Taxiway Extension	Runway 18-36 Extension	Phase II (2014-2018)
Establish New LPV IAP (Rwy36)	Existing Activity	Phase I (2009-2013)
Establish VNAV IAPs to Runway 18-36	Existing Activity	Phase I (2009-2013)
Terminal Area Facilities		
Terminal Building Improvements	Existing Activity	Phase I (2009-2013)
Auto Parking Improvements	14 Peak Hour Passengers	Phase II (2014-2018)
T-Hangar Development	Existing Activity	Phase I/II/III (2009-2029)
Clear Span Hangar Development	Existing Activity	Phase I/II/III (2009-2029)
Apron Area/Tie-Down Expansion	19 Peak Day Aircraft Arrivals	Phase III (2019-2029)
Support Facilities		
Maintenance Hangar Development	Based ARC B-II Aircraft	Phase II/III (2014-2029)
SRE Facility Improvements	Existing Activity	Phase I/II/III (2009-2029)
Other Facility Requirements		
Land Acquisition	Existing Activity (TBD)	Phase I/II (2009-2018)
Aircraft/Vehicle Wash Rack	Existing Activity	Phase I (2009-2013)
(*) Includes dimensional criteria, orientation, pavement strength and taxiway development for proposed Runway 13-31.	(***) Includes the approach lighting system and runway lighting.	
(**) Includes runway, taxiway system and apron areas.	IAP-Instrument Approach Procedure	
	VNAV-Vertical Navigation	
	SRE-Snow Removal Equipment	

Source: BWR; VER Facility Requirements.



CHAPTER FOUR

DEVELOPMENT ALTERNATIVES

INTRODUCTION

The previous section of the master plan, *Facility Requirements*, was completed to determine the airside, landside, and support facility needs of VER throughout the 20-year planning horizon. This chapter is intended to identify those development alternatives that will allow VER to accommodate projected aircraft and aviation demand activity. In addition, the focus of this chapter is to evaluate the merits and deficiencies of potential capital development for landside and airside alternatives proposed for the airport. The airport development alternatives analysis for VER will examine two conceptual development alternatives including 1) no action and 2) expand the existing airport site.

The development alternatives proposed for VER are intended to serve as the formulation of a development concept rather than the presentation of a final design recommendation. While the assessment of runway and terminal area

development alternatives are based on economical, operational and practical judgment, the most favorable airfield and terminal area development option should be the one most compatible with the city's goals and objectives regarding planning initiatives, as well as social, political and environmental considerations pertaining to the Boonville, Cooper County and north-central Missouri region.

Lastly, the preferred development alternatives, based on a judgmental assessment of pertinent factors involved with airport expansion, should be the alternative having the greatest potential for implementation.



GOALS AND OBJECTIVES FOR FUTURE DEVELOPMENT

The goals for future expansion of VER are established to serve as an understanding and purpose for ensuring continuity for future development and improvements at VER. These goals and objectives take into account the projected 20-year aviation demand, current and future land use compatibility, public interest and awareness, as well as safety, political, economic, financial and operational conditions specific to VER.

The following goals for future implementation of improvements at VER are intended to serve as a guide for the preparation of this master plan update including the future development of the Jesse Viertel Memorial Airport.

- Provide an effective and rational course of action, considering conditions specific to VER, for the recommended improvements through the preparation of a capital improvement program that is capable of being implemented and a reasonable expectation of future development potential.
- The City of Boonville is committed to the development of a safe and efficient facility for public use aviation activity. The city also intends to acquire property, when available, that is required per FAA planning criteria in an effort to ensure compatible land use in the vicinity of VER.
- Mitigation of any known non-standard airfield and/or terminal area conditions that will enhance the safety and efficiency of the airport. This includes the mitigation of man-made and natural obstructions of the airport's airspace surfaces, particularly the approach surfaces to the runway.
- The selected airfield and terminal area development alternatives recognize the importance of the airport's service role within the Cooper County and north-central Missouri region. The preferred development alternatives also propose airfield and terminal area expansion options that best fit the needs of the city and users of VER.
- The current instrument approach capabilities for Runway 18-36 are recommended to be maintained and maximized to the extent feasible, particularly to the Runway 36 threshold.
- The existing paved facilities for Runway 18-36

are recommended to be expanded to the extent feasible. This includes the lengthening of Runway 18-36 and enhancement of the runway's safety areas to accommodate regular use by turbine aircraft, particularly those weighing from 12,500 to 60,000 pounds and having less than 10 passenger seats.

- Expansion of the terminal area complex includes the development of T-hangars, clear span hangars, aircraft apron, enhanced auto parking facilities and the construction of a new terminal building. These improvements will ensure that VER's terminal complex accommodates existing and projected demand throughout the 20-year planning period.

ALTERNATIVE DEVELOPMENT CONCEPTS

The alternative development concepts for VER resulted from examining the demand forecasts, as well as the facility needs required to accommodate projected aviation activity throughout the planning period. Additionally, goals and objectives of the city pertaining to airfield and terminal area improvements, future land acquisition, runway expansion and the reconfiguration and expansion of the terminal area were also considered.

The VER Airport Board was presented with a total of five alternative development options which included a 'no action' option; two options to expand the airfield portion of VER; and two options involving the expansion and reconfiguration of the terminal area complex.

The following discussion will highlight the development alternatives intended to meet the long-term aviation demand for VER, the City of Boonville as well as the Cooper, Howard and Boone tri-county area.

'No Action' Alternative

The No Action alternative essentially involves maintaining the existing airport site in its current condition while not intending to and/or not providing for future developments based on projected demand at the facility. Obviously, this alternative would result in the inability of VER to provide enhanced levels of aviation safety and services to based aircraft owners and potential airport users throughout the 20-year planning period.

FOUR: DEVELOPMENT ALTERNATIVES

Since the early to mid 1990s, the tri-county region has experienced population and socioeconomic growth, particularly per capita income and median household income. The demand forecasts for VER indicate this trend is likely to continue throughout the planning period. These positive trends are expected to further advance the overall service area of the airport within north-central Missouri. Expansion of VER's service area is expected to provide aviation services to a broader percentage of the local area population which is anticipated to further increase the operational activity at the facility. Increased operational tempo is expected to further influence the future need for expanded airfield and terminal area facilities at VER.

Given its role within the Missouri state system of airports as a regional airport, the recommended improvements for VER will concentrate on expanding the runway and taxiway system as well as property acquisition. These improvements are intended to increase VER's level of safety, efficiency and operational capabilities for existing and future users. In addition to small piston-powered aircraft, VER also serves more sophisticated multi-engine turbo-prop and business jet aircraft as well. Not only is this trend expected to continue, the operational activity by turbine powered is expected to increase at a steady pace throughout the planning period. This increased demand will require the need to consider runway expansion to accommodate both projected leisure and business aircraft activity by piston and turbine airplanes.

Terminal area needs throughout the next 20 years are expected to include additional hangar space, aircraft apron space and tie-downs, expansion of the airport auto parking facilities, as well as the development of a new terminal building to accommodate projected passenger activity. These improvements are based on projected demand which further shows a need to expand VER's terminal area to meet the needs of existing and future airport users.

Given these reasons and a clear intent of the city to invest in expanding VER's airfield and terminal area, in addition to considering potential safety, operational, political and funding alternatives, the 'no action' alternative is not considered a reasonable and/or prudent alternative for Jesse Viertel Memorial.

Expand the Existing Airport Site

Expanding the existing airport involves investing in the current facility and expanding the airfield and terminal area to accommodate the projected 20-year operational and based aircraft demand discussed in Chapter 2.

The airport development alternatives evaluated by the Airport Board for further consideration present a broad range of expansion options and are discussed in the following passages. The airport expansion alternatives are those that are viewed as the development options most viable to serve the future demand for services at VER.

Airport Expansion Considerations

In evaluating the feasibility of expanding VER, several airfield and terminal area and/or landside considerations are important in determining the need and practicality of expanding the airport.

Pertinent airfield considerations for VER include:

- Maintaining ARC B-II planning standards for runway safety areas and taxiway dimensional requirements
- Expanding Runway 18-36 to accommodate 75 percent of the general aviation aircraft fleet weighing from 12,500 to 60,00 pounds at 60 percent useful load with less than 10 passenger seats
- Acquisition of land in fee simple, as well as easements, to the north, south and west of the airport to allow for expansion of the runway and the weather reporting system
- Establishment of enhanced GPS instrument approach procedures to both Runway 18 and 36

Pertinent terminal area/landside considerations for VER include:

- Expansion of the T-hangar facilities
- Expansion of clear span hangar facilities
- Expansion of the auto parking area for peak passenger activity
- Construction of a new terminal building
- Development of a new aircraft maintenance/FBO



hangar for piston and turbine aircraft storage and maintenance

- Acquisition of land to provide for future terminal expansion

AIRFIELD EXPANSION ALTERNATIVES

The proposed alternative expansion options took into account each of the noted development considerations and were presented to the VER Airport Board for consideration. The following discussion highlights the critical elements of each of the airfield development alternatives as submitted to the Board.

Airfield Alternative 'A'

Alternative A included extending Runway 18-36 approximately 900 feet to the north to total a useable length of 4,900 feet. Additionally, a 2,480 foot extension of the parallel taxiway was proposed to provide access to the Runway 18 threshold. Acquisition of approximately 50 acres (including one residence) to the north, south and west of the airport was also proposed as part of option A. This alternative was eliminated from further consideration by the city in favor of an option which would extend the runway to the north as well as the south.

Airfield Alternative 'B'

Alternative B involved extending Runway 18-36 approximately 730 feet to the north and 170 feet to the south to total a useable length of 4,900 feet. Alternative B also proposed an extension of the parallel taxiway and acquisition of nearly 52 acres adjacent to the airport. This alternative was eliminated from further consideration in favor of an option which would expand the runway to a future length of 5,000 feet.

Airfield Alternative 'B'_Revised

The revised alternative B depicts Runway 18-36 being expanded to 5,000 feet. This involves relocating the Runway 18 threshold 830 feet to the north and the Runway 35 threshold 170 feet to the south. Taxiway expansion and acquisition of 52 acres are also proposed as part of revised option B.

Citing various operational, social, environmental and financial considerations, the city and airport Board selected Revised Airfield Alternative B as the preferred development alternative to accommodate demand at VER throughout

the planning period. Accordingly, the following description provides an in-depth evaluation of pertinent elements associated with the implementation of this long-term development option.

Airfield Alternative 'B'_Revised

The proposed airport expansion option and recommended ultimate airfield layout, designated **Exhibit 4.1: Preferred Airfield Alternative**, involves expanding the existing runway and taxiway system as well as expanding the airport's property interests.

The following items are attributes of the VER preferred airfield development alternative:

- Extend Runway 18-36 830 feet to the north and 170 feet to the south while maintaining the runway's 75-foot width. The ultimate usable length will be 5,000 feet.
- Acquire approximately 52 acres in fee simple to the north and south of the airport. This acquisition is expected to include relocation of one residence located to the north of the airport and immediately west of MO Highway 98.
- Extend the existing parallel taxiway an additional 2,582 feet to a total dimension of 5,000' x 35'.
- Maintain the 34:1 non-precision instrument approach surfaces to the runway thresholds.
- Establish lateral performance with vertical guidance (LPV) approach procedures to the Runway 36 threshold. Additionally, enhancement of both existing and future LPV approaches to Runway 18 and 36 are recommended to include vertical navigation (VNAV) procedures and visibility minima.

Additional Airfield Considerations

69kV power transmission lines, owned and maintained by Ameren UE, are located approximately 1/2-mile north of the Runway 18 threshold. The top elevation of these powerlines is estimated to be approximately 777 feet above mean sea level-MSL (49 feet above ground level-AGL) at the runway's extended centerline. In order for the future FAR Part 77 34:1 approach surfaces to have clearance over these facilities, the powerlines must be lowered or the ultimate Runway 18 threshold is recommended to have a future end elevation of 728 feet MSL. If neither of these options are feasible, the FAA will have to perform an aeronautical evaluation to determine if the powerlines pose a potential hazard to air navigation. The preferred

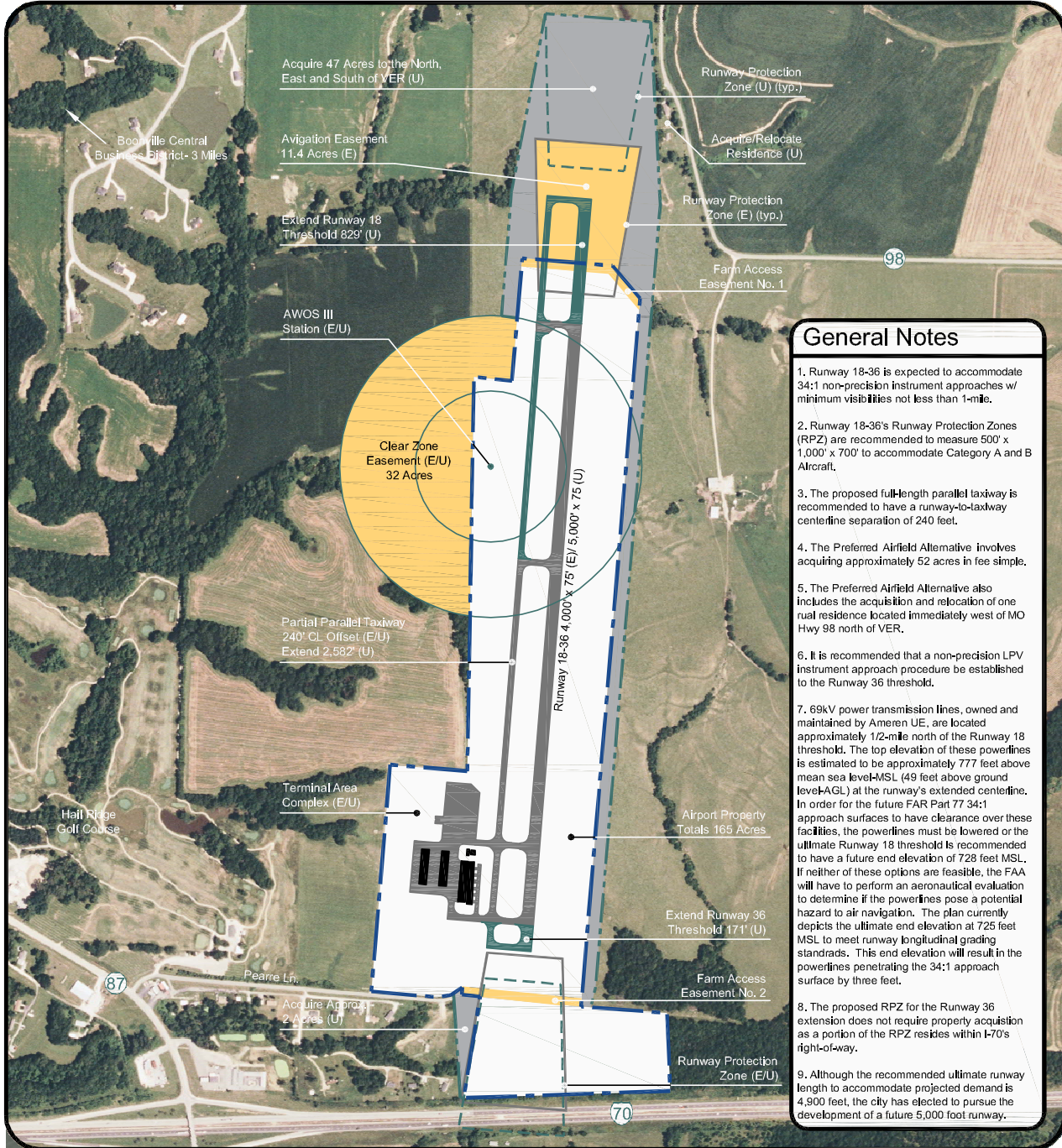
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BOONVILLE-JESSE VIERTEL MEMORIAL AIRPORT (VER) City of Boonville, Missouri

Exhibit 4.1: Preferred Airfield Alternative Expand Rwy 18-36 to 5,000' x 75' (ARC B-II); North-South Extension



- #### General Notes
- Runway 18-36 is expected to accommodate 34:1 non-precision instrument approaches w/ minimum visibilities not less than 1-mile.
 - Runway 18-36's Runway Protection Zones (RPZ) are recommended to measure 500' x 1,000' x 700' to accommodate Category A and B Aircraft.
 - The proposed full-length parallel taxiway is recommended to have a runway-to-taxiway centerline separation of 240 feet.
 - The Preferred Airfield Alternative involves acquiring approximately 52 acres in fee simple.
 - The Preferred Airfield Alternative also includes the acquisition and relocation of one rural residence located immediately west of MO Hwy 98 north of VER.
 - It is recommended that a non-precision LPV instrument approach procedure be established to the Runway 36 threshold.
 - 69kV power transmission lines, owned and maintained by Ameren UE, are located approximately 1/2-mile north of the Runway 18 threshold. The top elevation of these powerlines is estimated to be approximately 777 feet above mean sea level-MSL (49 feet above ground level-AGL) at the runway's extended centerline. In order for the future FAR Part 77 34:1 approach surfaces to have clearance over these facilities, the powerlines must be lowered or the ultimate Runway 18 threshold is recommended to have a future end elevation of 728 feet MSL. If neither of these options are feasible, the FAA will have to perform an aeronautical evaluation to determine if the powerlines pose a potential hazard to air navigation. The plan currently depicts the ultimate end elevation at 725 feet MSL to meet runway longitudinal grading standards. This end elevation will result in the powerlines penetrating the 34:1 approach surface by three feet.
 - The proposed RPZ for the Runway 36 extension does not require property acquisition as a portion of the RPZ resides within I-70's right-of-way.
 - Although the recommended ultimate runway length to accommodate projected demand is 4,900 feet, the city has elected to pursue the development of a future 5,000 foot runway.

Source: National Agricultural Imagery Program (NAIP), Cooper County, MO.



Township 48 N, Range 16 W
Boonville Township
Sections 4, 8 and 9
NOT TO SCALE

Legend

- Existing Property Line - ---
- Ultimate Property Line - ---
- Ultimate Paved Surfaces - ---
- Existing Structures - ---
- Future Airport Property - ---





development plan currently depicts the ultimate end elevation at 725 feet MSL to meet runway longitudinal grading standards. This end elevation will result in the powerlines penetrating the 34:1 approach surface by three feet.

TERMINAL AREA EXPANSION ALTERNATIVES

The proposed terminal area development options took into account each of the developmental considerations and presented to the VER Airport Board for consideration. The following discussion highlights the critical elements of the terminal area development option submitted to the Board.

Terminal Area Alternative 'A'

Alternative A considered the future siting of the Runway 36 threshold and involved the development of a new T-hangar area to the south of the existing terminal area complex adjacent to the airport's access road. To the north of the terminal complex, option A proposed a new clear span hangar development area and apron expansion which included acquisition of three acres for future expansion. Finally, a new maintenance/ FBO hangar and terminal building were to be located to the west of the existing apron. Alternative A was eliminated from further consideration given the siting of the future FBO hangar and terminal building.

Terminal Area Alternative 'A'_Revised

Revised alternative A is very similar to the original alternative in that the siting of proposed terminal area facilities and land acquisition are the same with the exception of the FBO hangar and terminal building. The revised option A proposes that the future terminal building be located 50 feet south of the fuel storage tanks adjacent to the existing T-hangar area. The FBO hangar will be located approximately 50 feet north of the fuel tanks. Both structures will require that modifications be made to the existing and future auto parking area.

Terminal Area Alternative 'B'

Alternative B assumed that the Runway 36 threshold would remain in place and thereby influence the development of the T-hangar area to be located south of the terminal area complex. The existing runway threshold location and the corresponding Departure Surface for the runway would allow only three T-hangars to be built in this area. The fourth would be located to the north and west of the aircraft apron. The remaining attributes of alternative B are similar to that of option A. Alternative B was eliminated

from further consideration in favor of the revised alternative A which would allow future T-hangars to be developed to the south of the terminal complex.

Citing operational, environmental and financial considerations, the city and Airport Board selected Revised Terminal Area Alternative A as the preferred development alternative to accommodate ultimate terminal/landside demand at VER. The following description provides a summary of the elements associated with the implementation of this terminal area development option.

Terminal Area Alternative 'A'_Revised

The proposed landside expansion option and recommended ultimate terminal area layout, designated **Exhibit 4.2: Preferred Terminal Area Alternative**, involves expanding the terminal area to the north and south of the existing terminal area complex.

The following items are attributes of the VER preferred terminal area development alternative:

- Acquire three acres of property to the north and west of the terminal area complex to accommodate future terminal area growth.
- Construct 40 new T-hangar units totaling approximately 50,000 square feet of storage space.
- Construct four 71' x 71' clear span hangars totaling nearly 20,000 square feet of storage space for piston and/or turbine aircraft.
- Relocate the existing terminal building and develop a new 3,000 square foot facility.
- Construct a new 10,000 square foot maintenance/FBO hangar to the west of the aircraft apron.
- Expand and reconfigure the auto parking lot to accommodate peak passenger demand for the FBO hangar and future terminal building.
- Reconfigure the aircraft tie-downs and expand the parking apron by approximately 8,100 square yards.

Additional Terminal Area Considerations

The future terminal configuration presented as part of the terminal area alternative analysis was dependent upon the siting and location of the Runway 36 threshold. This was due to the fact that the 40:1 Departure Surface (DS) to the

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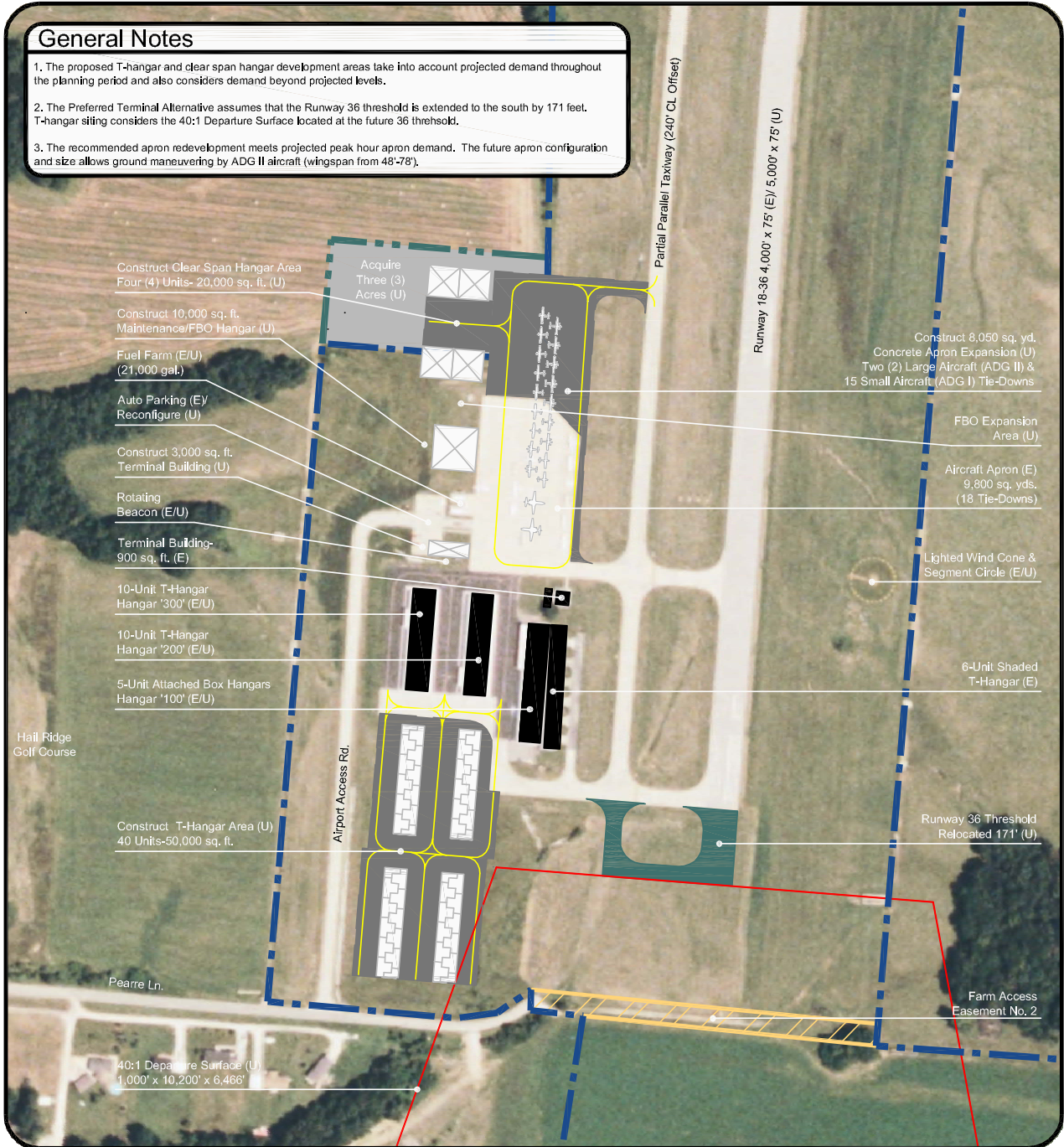
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Exhibit 4.2: Preferred Terminal Area Alternative Terminal Expansion Based on Siting of Runway 36 Threshold

General Notes

1. The proposed T-hangar and clear span hangar development areas take into account projected demand throughout the planning period and also considers demand beyond projected levels.
2. The Preferred Terminal Alternative assumes that the Runway 36 threshold is extended to the south by 171 feet. T-hangar siting considers the 40:1 Departure Surface located at the future 36 threshold.
3. The recommended apron redevelopment meets projected peak hour apron demand. The future apron configuration and size allows ground maneuvering by ADG II aircraft (wingspan from 48'-78').



Source: National Agricultural Imagery Program (NAIP), Cooper County.



Township 48 N, Range 16 W
Boonville Township
Sections 4, 8 and 9
NOT TO SCALE

Legend

- Existing Property Line - [Blue dashed line]
- Ultimate Property Line - [Green dashed line]
- Ultimate Paved Surfaces - [Grey shaded area]
- Existing Structures - [Black solid rectangle]
- Future Airport Property - [Grey solid rectangle]





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runway end can influence the location of structures so that they remain clear of the DS. The DS for instrument runways allows aircraft departures without restrictions during inclement weather conditions. If the DS is penetrated by obstacles, departure minimums can be increased thereby reducing the operational capability and efficiency of the airport during instrument flight rule (IFR) conditions. Accordingly, the placement of T-hangars within the terminal area included appropriate siting considerations so they would remain clear of the existing and future DS.

DEVELOPMENT ALTERNATIVES SUMMARY

The following chapter of the master plan update, the Environmental Overview, will be conducted in accordance with the National Environmental Protection Act (NEPA). Both the airfield and terminal area development options will be evaluated from an environmental standpoint by coordinating with specific Federal, state and local agencies to determine any potential significant impacts posed by the preferred alternatives. Environmental coordination will also ascertain potential compliance and permitting requirements for potential capital improvements to take place at VER over the planning period.



ENVIRONMENTAL

OVERVIEW

INTRODUCTION

This evaluation has been prepared pursuant to Section 102 (2) of the *National Environmental Policy Act (NEPA)* of 1969, as well as Title V of the *Airport and Airway Improvement Act* of 1982, as amended. In addition, the subject matter discussed within the body of the narrative text is completed in accordance with Federal Aviation Administration (FAA) Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and FAA Order 1050.1E, *Environmental Impact: Policies and Procedures*.



ENVIRONMENTAL IMPACT CATEGORIES

The main purpose of the environmental overview is to evaluate the potential significant environmental impacts posed by the future improvements associated with the preferred airfield and terminal area alternatives. Additionally, this review will examine 20 separate environmental consequences as they pertain to capital airport improvements and highlight potential permitting and regulatory requirements associated with each impact category.

Noise

Noise can be broadly defined as any sound that is unwanted. Accurately identifying particular noise that is unwanted or intrusive is difficult due to the subjective nature of judgment on the part of the listener. Also, it may be just as difficult to measure the intrusiveness of the sound effects. In most cases, individual attitudes regarding airports are more important in determining reactions to airport noise rather than actual noise exposure. Aircraft arrivals and departures are generally considered intrusive and unwanted noise in the opinion of the listener. These facts alone constitute aircraft and airport sound emissions as the most notable environmental impact to the local community.

For purposes of determining noise exposure at the Boonville-Jesse Viertel Memorial Airport (VER), the demand forecasts were utilized to generate a baseline of activity of approximately 18,200 annual operations for the year 2029. This includes 16,200 operations by piston airplanes, 400 turbo-prop operations, 600 jet operations and 1,000 helicopter operations. According to the forecasted projections, as well as FAA and Environmental Protection Agency (EPA) guidelines, the anticipated operational activity at VER is well below the threshold of 90,000 annual piston operations and/or 700 annual jet operations requiring the need to create a Noise Exposure Map (NEM). Accordingly, based upon projected activity at VER, the preferred airfield alternative is not expected to create adverse cumulative noise impacts within the immediate vicinity of the Airport.

Compatible Land Use

Existing and planned land uses in and around VER were discussed in Chapter 1, *Airport Environs and Land Use*. The land use surrounding the Airport is primarily agricultural in nature. Scattered low density residential use exists within the general area as well. Limited commercial and retail use occurs to the south and west of the Airport. Hail Ridge Golf Course, a section 4(f) resource which will be discussed later in this chapter, is located to the west of VER.

Based on projected aviation demand, coupled with existing and proposed land uses in the area, VER is expected to be compatible with current and future land uses from a noise compatibility standpoint. Additionally, those parcels of land recommended for acquisition to allow for airfield expansion are recommended to be converted to aviation related uses (i.e. agricultural and/or aviation operations) once acquired.

Ultimately, the City of Boonville and Cooper County are recommended to enact a height and hazard zoning ordinance to preserve the Airport's airspace infrastructure. A height and hazard zoning ordinance would also not only regulate the land use to control the height of objects within the immediate vicinity of VER, but would ensure land use compatibility adjacent to the Airport.

Social Impacts

Examination of potential social impacts related to airport development and expansion generally include acquisition of property; relocation of residences or businesses; alteration of surface transportation routes; disruption to established communities; and altered planned development.

The preferred airfield development alternative involves acquisition of approximately 49 acres in fee simple to the north, east and south of the Airport. The land to be acquired consists primarily of open fields and gently rolling hills containing low yield cropland and one residence. Given that residential structures are expected to be acquired, the City is recommended to abide by provisions found in the *Uniform Relocation Assistance and Real Property Acquisition Policies Act*, as well as FAA Order 5100.37B, *Land Acquisition and Relocation Assistance for Airport Projects*.

FIVE: ENVIRONMENTAL OVERVIEW

Because VER's future capital improvement plan will include minimum residential acquisition and acquisition of cropland, significant social impacts are not anticipated. This assessment is further supported by the fact that VER's airfield expansion is not expected to include any road closures or realignments nor is it expected to disrupt or alter established residential or commercial developments.

Induced Socioeconomic Impacts

Induced socioeconomic impacts address those impacts on the local and surrounding communities that relate to the preferred airport development alternatives including overall population increases or fluctuations, increased public service demands and influenced changes to the local business, political, or economic conditions to the extent brought about by airport expansion.

The preferred airfield and terminal area development alternatives, although expected to potentially pose minor social impacts during construction, is not expected to produce significant fluctuations in population trends or growth. Nor are they expected to place undue burden on public service demands or overly influence changes in business or political conditions. It is generally believed that induced social impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts. However, these assumptions are recommended to be confirmed by an Environmental Assessment (EA) completed during the short-term phase of the Airport's capital improvement program.

Air Quality

The *Clean Air Act of 1970 (CAA)* was enacted to protect the nation's air quality, as well as the public health. Amendments in 1970, 1977, and 1990 established federal standards to control air pollution emissions and to delegate the implementation of such standards to the states. The CAA Amendments of 1977 stated that any federally-funded project shall conform to State Implementation Plan (SIP) criteria in order to assure that airport development projects conform to mandates for controlling potential air pollution impacts by meeting federal air quality standards.

According to FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, as well as FAA Handbook entitled, *Air Quality Procedures for Civilian Airports and Air Force Bases*, Report No. FAA EE 82-21, no air quality analysis is required for general aviation airports if the level of forecast demand activity at the airport is less than 180,000 annual operations. The forecast of aviation demand for VER is well below the required annual operational activity to warrant an air quality analysis. Therefore, it is expected that no potential for significant air quality impacts will exist in the future.

After reviewing the preferred development alternative, EPA's Region 7 did not indicate any opposition to the proposed capital improvements to occur at VER.

In regards to the preferred alternatives, the Missouri Department of Natural Resources (MoDNR) indicated that if any residential buildings are demolished or renovated, the City must ensure compliance with National Emissions Standards for Hazardous Air Pollutants (NESHAPs) and state standards addressing asbestos mitigation and disposal. Secondly, MoDNR noted that if any open air burning operations are conducted, the City must contact DNR's Northeast Regional Office in Macon to ensure permitting compliance.

Water Quality

The *Federal Water Pollution Control Act of 1972 (FWPCA)* sought to restore the nation's navigable waterways and lakes so that they provide safe conditions to humans and wildlife. The FWPCA, as amended by the Clean Water Act of 1977 (CWA), provided for the establishment of water quality standards, control of discharges into surface and subsurface waters, development of waste treatment management plans and practices, as well as issuance of permits for discharges and for dredged or fill material.

Coordination with the U.S. Army Corps of Engineers (USACE), the EPA, and MoDNR is recommended so that the preferred airfield and terminal area development alternatives can be evaluated with respect to their potential impact on groundwater aquifers and jurisdictional waters of the United States and wetlands, as well as state water quality issues.



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During the construction of the preferred development alternatives, the City will be required to complete a National Pollutant Discharge Elimination System (NPDES) Permit, as well as a Spill Prevention Control, and Countermeasure (SPCC) Program. These permits are intended to demonstrate that state, Federal and local permit requirements can be met by the City. Additionally, in preventing storm water runoff and soil erosion during construction of the preferred development alternatives, exercise of Best Management Practices (BMP) are encouraged. BMPs reduce erosion, minimize sedimentation, and control non-storm water discharges in order to maintain water quality on and off the airport premises. Also, because the preferred development alternatives will involve disturbance of greater than one acre, a land disturbance permit from the MoDNR will be required. The permit involves the utilization of BMPs to minimize off-site erosion into nearby waters.

Finally, the USACE indicated in their response that the preferred airfield alternative potentially impacts an unnamed tributary of the Petite Saline Creek located approximately 6650 feet north of the Runway 18 threshold. If the extension of Runway 18 involves the discharge or dredged of fill material into jurisdictional waters of the U.S., Department of the Army (DA) permit authorization and/or a Section 404 Water Quality Certification may be required.

Department of Transportation Act, Section 4(f) and Section 6(f)

The U.S. Department of Transportation's Section 4(f) law (49 USC 303) states that Federal funds may not be approved for projects that use land from a significant publicly-owned park, recreation area, wildlife or waterfowl refuge, or any significant historic site unless it is determined that there is no feasible and prudent alternative to the use of land from such properties and the action includes all possible planning to minimize harm to the property resulting from such use.

Section 6(f) of the Land and Water Conservation Fund (L&WCF) Act states that property purchased or developed with funds under the Act may not be converted to other than outdoor public recreation uses. The Act also states that land required from such properties must be replaced with property of at least equal fair market value and of

reasonably equivalent usefulness and location, or be compensated through other means in consultation with DNR, the agency responsible for administering L&WCF funds and other aspects of the Act.

The Hail Ridge Golf Course, located immediately west of VER, is considered a Section 4(f) resource according to Federal Law. Given that VER's capital improvement plans do not impact the golf course and given the absence of additional Section 4(f) lands in the vicinity of VER, the preferred development alternatives are not expected to impact any 4(f) resources in the area. Additionally, due to the lack of Section 6(f) lands adjacent to VER, the preferred alternatives are also not expected to impact this classification of publicly owned lands.

Historic, Architectural, Archeological, and Cultural Resources

The *National Historic Preservation Act of 1966* states that if any properties in or eligible for inclusion into the National Register of Historic Places are within the area of the Proposed Action's potential environmental impact, and if so, what impacts, direct and indirect, could be expected to affect the cultural, historic, archeological or architectural qualities of the property. Another piece of legislation, the Archeological and Historic Preservation Act of 1974, provides for the recovery, survey, and preservation of scientific, prehistoric, historical, archeological, and paleontologic data where the data may be adversely affected by a federal, federally funded, or federally licensed project.

The State Historic Preservation Officer (SHPO) for the MoDNR, State Historical Preservation Office, after reviewing the preferred development alternatives and performing a review in accordance with Title 36, Code of Federal Regulations (CFR) 800, found that there will be no historic property affected by the preferred airfield alternative.

Biotic Communities (Including both Flora and Fauna)

The *Fish and Wildlife Coordination Act of 1934* authorizes the Departments of Agriculture and Commerce to provide assistance to and cooperate with Federal and state agencies to protect and increase the supply of game and fur-bearing animals, as well as to study the effects of polluting substances

FIVE: ENVIRONMENTAL OVERVIEW

on wildlife. The Act also authorizes the preparation of plans to protect wildlife resources and the completion of wildlife surveys on public lands in an effort to prevent loss of and damage to wildlife resources. The amendments enacted in 1946 require consultation with the U.S. Fish and Wildlife Service (USFWS), as well as state fish and wildlife agencies where the waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted or otherwise controlled or modified by any agency under a Federal permit or license.

The U.S. Fish and Wildlife Service (USFWS) and the Missouri Department of Conservation were consulted to provide input on potential impacts posed by the preferred development alternatives on biotic communities in the vicinity of VER. The USFWS reviewed the proposal and determined that there were no critical habitats located within the project area. Also, Missouri Conservation indicated that there were no wildlife preserves, designated wilderness areas, or critical habitats within one mile of VER. Accordingly, the preferred development alternatives proposed for VER are not expected to significantly impact any biotic communities in the area.

Endangered and Threatened Species of Flora and Fauna

The *Endangered Species Act of 1973* provides for the preservation of threatened and endangered species of fish, wildlife and plants in their respective biotic communities which refers to the flora and fauna habitats (vegetation and wildlife) that might be present in the locality of proposed construction projects. In addition, should a construction project affect water resources including wetlands, groundwater, impoundment, diversion, deepening, controlling, modifying, polluting, dredging, or filling of any stream or other body of water, provisions of the Endangered Species Act make the Fish and Wildlife Coordination Act applicable as well.

The USFWS and Missouri Conservation were consulted to provide input on potential impacts posed by the preferred development alternative on endangered and threatened species. Both agencies determined that no Federal or state-listed endangered or candidate species occur within the project site or within one mile of VER. Therefore, the

preferred development alternatives proposed for VER are not expected to significantly impact any endangered or threatened species.

Wetlands

The importance of wetlands is emphasized in Executive Order (EO) 11990, issued May 24, 1977, as well as Section 404 of the *Clean Water Act of 1977*. E.O. 11990 is implemented by DOT Order 5660.1A, *Preservation of the Nation's Wetlands*. Wetlands are defined in E.O. 11990, *Protection of Wetlands*, as "...those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, or similar areas..." The intent of the Clean Water Act, Section 404, as well as E.O. 11990, is to avoid short and long-term adverse impacts associated with damaging or modifying wetlands area, as well as to avoid construction in wetlands where there is a reasonable alternative.

The USACE was consulted to provide input on potential impacts posed by the preferred development alternative to wetlands in the proposed project area. In their correspondence, the USACE, Kansas City District, State Regulatory Program Office-Missouri, indicated that a Section 404 permit may be required if the preferred airfield alternative involves the discharge of dredged or fill material into jurisdictional waters of the U.S., including wetlands and/or tributaries of the Petite Saline Creek located north of VER.

Floodplains

Floodplains are characterized as low lying flatlands adjoining inland and coastal waters where the possibility of flooding in any given year is approximately one percent or greater. These inland and coastal waters susceptible to flooding are most likely within the 100-year floodplain. Knowledge of floodplains in the vicinity of an airport is important in reducing the risk of flood loss, restoration and preservation of natural beneficial values of floodplains including groundwater recharge to aquaculture and forestry, and protection of human health and welfare.



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Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Cooper County (Panel No. 290794-0075 A) were researched to determine the potential impacts of proposed expansion on existing floodplains. Although floodplains occur to the west of VER, future airfield expansion is not expected to be impacted nor are floodplains expected to adversely influence future capital development. However, prior to airfield expansion construction activities being initiated, it is recommended that coordination with the city's floodplain manager be undertaken to ensure that floodplains will not be impacted by airport development.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System is a classification of certain selected rivers of the U.S. which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

The national inventory for the Wild and Scenic Rivers System (<http://www.rivers.gov>) does not list any rivers of this classification within the vicinity of VER and does not warrant further consideration or investigation.

Prime and Unique Farmland

The *Farmland Protection Policy Act of 1984* (FPPA) authorizes the U.S. Department of Agriculture (USDA) to develop criteria for evaluating the potential effects of federally-funded transportation projects on the conversion of farmland to nonagricultural uses. This evaluation includes determining the adverse impacts to prime farmland, mitigating or minimizing adverse effects, and ensuring that transportation projects are compatible with local, state, and private programs aimed at preserving farmland areas.

The USDA, Natural Resources Conservation Service (NRCS), in accordance with the FPPA, is recommended to be provided with an AD-1006 Form to be completed in an effort to determine what impacts, if any, to prime farmland are posed by the preferred development alternative. For VER, the NRCS did indicate that the airfield and terminal

area expansion and property acquisition does not appear to cause a loss of prime or statewide important farmland.

Energy Supply and Natural Resources

The preferred development alternative will be evaluated to determine any significant impacts on local energy resources including construction of additional buildings or aviation-related facilities such as airfield and runway lighting or those energy requirements associated with the movement of air and ground vehicles.

The preferred alternatives will result in an increase in energy demand related to the installation of airfield lighting improvements including runway lighting and visual approach aids as well as the construction of T-hangars, clear span hangars and new terminal building within the terminal area complex. However, this increase in energy demand is not considered to have a measurable affect on local energy supplies and is expected to be accommodated by current utility facilities and providers.

The overall aircraft operational activity of the Airport is expected to increase as a result of the implementation of the preferred alternatives. However, the preferred alternative is not expected to significantly increase aircraft ground operations or movement times nor is it expected to have an appreciable affect on existing flight patterns or en route flight times. With a minimal increase in local airport activity, the surface transportation activity is expected to increase at a nominal rate as well. Motor vehicle fuel consumption is not expected to increase significantly because airport access routes are not expected to be adversely influenced by the development of the preferred alternatives.

With regard to natural resources, with the exception of automobile gasoline and aviation fuel, the preferred development alternative is not anticipated to impact rare materials that are in short supply. Also, the proposed alternatives are not expected to result in demand for natural resources or energy reserves exceeding supplies. Therefore, the preferred alternative is not expected to significantly impact energy supplies or natural resources of the Cooper County or Boonville area.

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Light Emissions

Light emissions created by the preferred airfield alternative require consideration to determine whether or not runway lighting would create an annoyance to the population residing in the vicinity of VER. The preferred alternatives will include the installation or upgrade of the following runway lighting systems:

- **Medium Intensity Runway Lighting (MIRL):** MIRL is a steady burning lighting system classified by the system's intensity or brightness. The brightness of the system is classified by a series of "steps" varying from low (15 watts) to medium (40 watts) intensity depending on the visibility conditions, as well as 10, 30, and 100 percent of the required level of brightness. Runway 18-36 is currently equipped with MIRL and is recommended to be maintained throughout the planning period.
- **Threshold Lighting and Runway End Indicator Lights (REILs):** This low to medium intensity, pole mounted, frangible, and steady burning lighting system marks the end of the runway by utilizing colored split lenses. The REIL lighting system provides rapid and positive identification of the runway approach end, consisting of a pair of white synchronized high-intensity (200 watt) photo-strobe lights located laterally along the runway threshold and angled 15 degrees from the extended runway centerline. Runway 18-36 is recommended to remain equipped with REILs at both runway ends throughout the planning period.
- **Visual Guidance Indicators:** The Precision Approach Path Indicators (PAPI-4L) system consists of a four lamp housing unit, emitting red and white light beams, which is installed 600-800 feet from the runway threshold and offset 50 feet to the left side. Runways 18 and 36 are recommended to remain equipped with PAPIs throughout the planning period.

Given the lighting systems currently utilized and proposed for use at VER, the preferred development alternative is not expected to contribute significant light emissions. However, should these lighting systems prove to result in excess ambient light, particular adjustments and engineered solutions can be made to the systems during or after installation. Optical baffles can be installed and angular tolerances be made in order to channel the light emitted from the lamps, thereby reducing the likelihood of objectionable light emissions from either runway end.

Solid Waste Impacts

FAA Order 5200.5, *FAA Guidance Concerning Sanitary Landfills On or Near Airports*, provides guidance with respect to the establishment, elimination, or monitoring of sanitary landfills, transfer facilities, and solid waste facilities on or in the vicinity of airports. Assessing the potential impacts of the preferred development alternative on the generation of solid waste is necessary to determine potential available disposal capability and capacity of waste facilities in the region.

The MoDNR, Solid Waste Management Program was consulted to determine the location of the nearest sanitary landfill to VER. According to MoDNR, there are no sanitary landfills within a two mile radius of VER. However, the City of Boonville Transfer Station (permit no. 0405301) is located within the city limits of Boonville and situated approximately three miles northwest of VER.

Airport development projects associated with expansion of runways and taxiways, except for construction, rarely include any direct relationship to solid waste collection facilities. Coupled with the location of the nearest landfill and/or transfer station to VER, the preferred development alternatives will not generate excessive solid waste nor will it be adversely affected by potential wildlife hazards associated with sanitary and/or waste disposal facilities.

The MoDNR did comment that during the implementation of the preferred airfield and terminal area alternatives, the city is recommended to dispose of waste from demolition and/or construction activities at a permitted sanitary landfill or transfer station. This waste cannot be stockpiled at an alternate site for separation at a later time. MoDNR also commented that should any asbestos containing material from demolition of residential and/or commercial structures be identified, a registered asbestos contractor should be contacted to remove and properly dispose of the material.

Lastly, MoDNR indicated that no waste may be buried on-site except for certified clean fill. Certified clean fill includes uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinder blocks and unpainted brick. Clean fill must not contain extruding material and/or demolition debris.



AIRPORT MASTER PLAN REPORT

Construction Impacts

Temporary environmental effects resulting from construction operations include noise of construction equipment on the site; noise and dust from delivery of materials through local roadways; creation of borrow pits and disposal of raw materials; air pollution from burning debris; and water pollution from erosion. Although environmental effects resulting from construction are of lesser magnitude than long-term impacts, they can be minimized through implementation of control measures and utilization of BMPs. Additionally, construction operations are recommended to be conducted in accordance with FAA Advisory Circular (AC) 150/ 5370-10A, Standards for Specifying Construction of Airports, Item P 156- Temporary Air and Water Pollution, Soil Erosion and Siltation Control, as well as an established NPDES permit and SPCC program.

Hazardous Waste

Regulatory law affecting airports includes the Resource Conservation and Recover Act of 1976 (RCRA). Through this legislation, the U.S Congress directed the EPA to develop and implement programs meant to protect human health and welfare, as well as the environment, from improper hazardous waste management practices. The RCRA is applicable to any party who transports or generates hazardous waste, as well as those parties who own or operate a facility for the storage, treatment, or disposal of hazardous wastes. Other pertinent legislation regarding this matter includes legislation that was a national campaign aimed at toxic waste cleanup efforts which included The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), a.k.a. Superfund Act, as well as The Superfund Amendments and Reauthorization Act of 1986 (SARA).

Hazardous wastes are those materials that can cause injury or death, or that can damage or pollute the air, land and water. Material waste might also be considered hazardous if the material exhibits any one or all of the following characteristics, including ignitibility (flammable or combustible), reactivity (rapid, violent chemical reaction with H₂O or other element), toxicity (high concentrations of heavy metals or pesticides), or corrosiveness (burns or dissolves other elements or various materials). In the

event that a reportable amount of hazardous wastes are released into the environment, as established by the EPA, the City must contact the National Response Center (NRC), Washington, D.C., at 800.424.8802 and abide by proper reporting requirements and procedures. VER is not located in the vicinity of any Superfund Sites as listed on the National Priority List nor will airfield and terminal area development result in creation of hazardous waste.

In their correspondence, MoDNR commented that any household hazardous waste generated from and/or by acquired residences must be properly managed. This includes waste consistent with the operation of a business out of a home which would not be exempt and would be subject to a hazardous waste determination including management, storage and disposal per applicable regulations. Additionally, MoDNR indicated that construction of hangars is considered a commercial endeavor and requires that all waste from these operations be properly characterized for hazardous waste constituents. All hazardous waste must be managed, stored, transported and disposed of in accordance with applicable guidelines and requirements.

Also, MoDNR noted that if during excavation activities any contaminated soil that could be classified as a hazardous waste is discovered, the MoDNR spill line should be notified immediately.

Environmental Justice

In accordance with Executive Order 12988, Federal Action to Address Environmental Justice in Minority Populations and Low Income Population (1994), the preferred development alternative must not pose a disproportional impact on low income or minority communities in the vicinity of the Airport.

It is recommended that during the completion of the future EA the preferred development alternatives be examined to determine if the project poses a potential disproportionate affect on low income and/or minority populations. It is expected that in the course of determining the social and induced socioeconomic impacts of implementing the preferred alternatives, significant impacts, if any, related to environmental justices will be determined.

FIVE: ENVIRONMENTAL OVERVIEW

ENVIRONMENTAL OVERVIEW SUMMARY

Table 5.1 details the potential impacts and recommendations to address the environmental impact categories for the preferred airfield and terminal area alternatives at VER.

Table 5.1
Environmental Impact Categories Summary

Environmental Categories	Preferred Development Alternatives	
	Impact(s)	Mitigation
Noise	None	None Required
Compatible Land Use	None	Enact Airport Zoning Ordinance
Social Impacts	Not Significant	None Required
Induced Socioeconomic Impacts	None	None Required
Air Quality	None	None Required
Water Quality	Not Significant	Complete NPDES and SPCC Plans
Section 4(f) and Section 6(f) Lands	None	None Required
Historic, Architectural, Archeological, and Cultural Resources	None	None Required
Biotic Communities (Including Flora and Fauna)	None	None Required
Endangered and Threatened Species of Flora and Fauna	None	None Required
Wetlands	None	None Required
Floodplains	None	None Required
Wild and Scenic Rivers	None	None Required
Prime and Unique Farmland	Not Significant	Abide by FPPA/NRCS Guidelines
Energy Supply and Natural Resources	None	None Required
Light Emissions	None	None Required
Solid Waste Impacts	None	None Required
Construction Impacts	Not Significant	None Required
Hazardous Waste	None	Abide by CERCLA/SARA Guidelines
Environmental Justice	None	None Required

Source: BWR.





AIRPORT LAYOUT PLAN DRAWINGS

INTRODUCTION

The Airport Layout Plan (ALP) set of drawings for VER graphically depicts the current and proposed facility expansion at the Airport necessary for the continued safe and efficient utilization of the facility while accommodating projected aviation demand. Additionally, the proposed capital improvements depicted within the ALP are derived from the master plan's review of the aviation activity forecasts, facility requirements and alternatives analysis.

The primary functions of the ALP that define its purpose include:

- An approved ALP is necessary for the airport to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP) and/or grants from the State Aviation Trust Fund. An airport sponsor is required to keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP.
- An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the City can ensure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.

- The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
- The approved ALP enables the airport sponsor, MoDOT and the FAA to plan for facility improvements at the airport. It also allows MoDOT and the FAA to anticipate budgetary and procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.
- The ALP can be a working tool for the airport sponsor, including city personnel as well as airport management staff.

Lastly, the approved ALP provides detailed information for the airport sponsor regarding applicable Federal Aviation Regulations (FAR), airport design criteria, airfield and terminal area facilities, airspace structure and land use, terminal area characteristics, obstructions to air navigation, and property interests.



AIRPORT LAYOUT DRAWING

The **Airport Layout Drawing** (ALD) depicts existing and ultimate airfield and terminal area development based on proposed capital improvement recommendations for the short, intermediate and long-term planning periods. The ALD illustrates those capital improvements that are intended to maintain a safe and efficient facility while at the same time capable of accommodating the current and projected aviation demand of the Airport throughout the 20-year planning period. The ALD includes required facility information, description labels, imaginary airspace and approach surfaces, runway protection zones, runway safety areas and basic airport and runway data tables.

The ALD and associated discussion included below describes the major elements of the preferred airport development concept. The **Title Sheet** is also included for reference as to the number and name of each sheet within the ALP set.

Runway System

The current layout consists of a single 4,000' x 75' north-south runway designated 18-36. Long-term airfield improvements at VER include extending the runway an additional 1,000 feet while adhering to Airport Reference Code (ARC) B-II planning criteria. Future runway dimensions will be 5,000' x 75'. VER will continue to accommodate 75 percent of the general aviation aircraft fleet weighing 12,500 to 60,000 pounds at 60 percent useful load on takeoff.

Taxiway System

The taxiway system at VER consists of a partial parallel taxiway serving Runway 18-36, as well as numerous access and connector taxiways. The Runway 18 threshold is served by an aircraft turnaround. The taxiway system serving 18-36 is 35 feet wide and is expected to remain so throughout the planning period. Ultimately, the existing partial parallel taxiway serving 18-36 is recommended to be extended approximately 2,400 feet to the north providing direct access to the 18 threshold. The future parallel taxiway centerline is recommended to be located 240 feet from the runway centerline.

NAVAIDS and Airfield Lighting

Runway 18-36 is a non-precision runway capable of accommodating (RNAV) GPS approach procedures to both runway thresholds. The GPS approaches to 18 and 36 allow lateral navigation (LNAV) while Runway 18 has established LPV approach procedures to accommodate large and small piston and turbine aircraft. Ultimately,

Runway 36 is expected to sustain vertically guided (VNAV) non-precision LPV (WAAS) approach procedures. However, the existing approach procedures are sufficient for continued operational use and are expected to be retained throughout the 20-year planning period.

The pilot-controlled, medium intensity runway lighting (MIRL), threshold lighting and runway end indicator lights (REIL) serving Runway 18-36 are programmed to remain in place throughout the planning period.

The four-box PAPI-4L visual guidance systems serving Runway 18-36 are recommended to remain in service throughout the planning period. The Runway 18 PAPI is anticipated to be relocated to the north upon extension and relocation of the 18 threshold.

Landside/Terminal Area Development

Ultimately, VER's current terminal area will experience vast changes and operational improvements. These changes are expected to include expansion of the T-hangar accommodations by 40 units consisting of approximately 50,000 square feet of storage space. New T-hangar development is expected to occur to the south of the existing terminal area complex.

Future clear span hangar accommodations are expected to consist of approximately 33,500 square feet of space by the end of the 20-year planning period. VER's clear span accommodations are expected to include four new units by 2029 to total nine units. These new facilities will be located to the north of the existing aircraft apron. Along with new clear span hangars, a new 10,000 square foot FBO/maintenance hangar is anticipated during the planning period. Like the new clear span hangars, the FBO hangar will be located to the north and west of the aircraft apron.

In order to increase the operational efficiency and address spatial limitations and location of the existing terminal building, VER's 900 square foot terminal building is recommended to be expanded to 3,000 square feet and relocated to the west of the aircraft apron. Expanded auto parking facilities will accompany the construction of the new terminal building.

Land Acquisition

The preferred development concept, as depicted on the ALD, is expected to require the fee simple acquisition of approximately 52 acres in addition to the Airport's existing acreage of nearly 197 acres of obligated airport property. Fee simple acquisition is expected to involve the acquisition and relocation of one residence located to the northeast of the Airport and adjacent to MO Highway 98.

SIX: AIRPORT LAYOUT PLAN DRAWINGS

AIRSPACE DRAWING

VER's airspace drawing is based on Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*. The provisions of FAR Part 77 have been enacted to protect the Airport's airspace infrastructure from objects and structures that represent an obstruction to air navigation by establishing imaginary airspace surfaces to provide guidance in an attempt to control the heights of objects in the vicinity of the Airport. When penetrated, these imaginary surfaces identify an object as an obstruction or hazard to air navigation. The **Airspace Drawing** depicts VER's Part 77 surfaces and provides plan and profile views as they relate to the Airport and the surrounding area. The airspace drawing is based specifically on the planned runway lengths, as well as planned instrument approach procedures for each runway end. Runway 18-36 is depicted as retaining its current 34:1 1-mile visibility non-precision approach capabilities.

VER's Part 77 airspace surfaces, primarily the horizontal and conical surfaces, are currently penetrated by towers in two separate locations. Mitigation for these obstructions includes marking and lighting of each tower if these measures have not already been taken.

INNER PORTION OF THE APPROACH SURFACE DRAWING(S)

These drawings are intended to provide a detailed view of the inner portion of the Part 77 approach surfaces. The Inner Portion of the Approach Surface Drawings provides a large scale profile and plan view of the inner approach surfaces for all runway ends and facilitate identification of roadways, utilities, railroads, structures, as well as existing and potential property interests. Also, the inner approach drawings detail the size and location of the Runway Safety Areas (RSA), Object Free Area (OFA), Runway Protection Zones (RPZ), Obstacle Free Zones (OFZ), as well as illustrate the current and future location of the runway ends. The **Inner Portion of the Approach Surface Drawing(s)** detail the inner approach surfaces for the runway system and are based on the planned runway length and the type of approach established to each runway end.

RUNWAY CENTERLINE PROFILE DRAWING

The **Runway Centerline Profile Drawing** includes a plan and profile view of the existing and ultimate runway alignment which delineates the runway's line-of-sight attributes including runway end elevations, effective runway gradient, section gradient, touchdown zone elevations (TDZ), as well as runway high and low point elevations.

TERMINAL AREA DRAWING

The **Terminal Area Drawing** presents the landside/terminal area's existing and future configuration at VER.

Passenger Terminal Building

The existing 900 square foot passenger terminal area is located immediately adjacent to the aircraft apron approximately 230 feet from the public auto parking area. Given its size and age, the terminal building is not considered conducive to supporting necessary passenger processes including flight planning, pilot lounge and passenger circulation areas due to its layout and overall physical condition. Most importantly, the location of the terminal requires airport patrons to walk across the aircraft apron to access the terminal building. This condition creates a potential incursion hazard and may lead to potential unauthorized access to the terminal area and airfield.

The preferred terminal area development concept recommends the relocation of the existing structure and construction of a new 3,000 square foot terminal building. Ultimately, the terminal building is anticipated to be located adjacent to the southwest portion of the aircraft apron and south of VER's fuel farm. Expanded auto parking facilities are expected to accompany the construction of the new terminal building.

Aircraft Apron

From an operational and spatial standpoint, the current 9,800 square yard concrete parking apron is insufficient to accommodate peak hour transient, as well as local, demand throughout the planning period. Ultimately, the apron is recommended to be expanded by approximately 8,100 square yards to accommodate large turbine aircraft with wingspans from 48 feet up to 78 feet. A reconfiguration of the aircraft tiedown area is expected to accompany this apron expansion project.



AIRPORT MASTER PLAN REPORT

Aircraft Hangar Facilities

Ultimately, given the projected based aircraft demand, approximately 40 nested T-hangars totaling nearly 50,000 square feet of space are programmed for construction throughout the planning period. New T-hangar construction will take place to the south of the existing terminal area complex. Additionally, given the projected based aircraft demand for large turbine aircraft, four new 5,000 square foot clear span hangars will be programmed for development to the north of the existing and future apron area.

Support and Other Facilities

The Airport's fuel farm is located immediately west of the aircraft apron. The fuel storage facility consists of above-ground tanks capable of storing 21,000 gallons of 100 LL, Jet A and MoGas. The existing fuel farm is expected to remain at its current location while the storage facility is not expected to require additional capacity during the planning period.

Should the opportunity and/or demand arise, a 10,000 square foot clear span FBO/ maintenance hangar is recommended for airframe and powerplant maintenance for piston and turbine airplanes. This new facility is recommended to be located to the north of the fuel farm and adjacent to the expanded aircraft apron.

LAND USE DRAWING

The **Land Use Drawing** depicts the existing and recommended land uses within the existing and ultimate airport property boundary. The main purpose of the Land Use Drawing is to provide the airport sponsor a plan to coordinate land uses conducive to airside development and those landside areas available to be leased for revenue producing purposes. Lastly, the Land Use Drawing provides guidance to local community and county authorities for establishing compatible land use and zoning regulations in the vicinity of VER.

According to the forecasted projections, the anticipated operational activity at VER is well below the threshold of 90,000 annual piston operations and/or 700 annual jet operations requiring the need to create a Noise Exposure Map (NEM). Accordingly, based upon projected activity at VER, the preferred airfield alternative is not expected to create adverse cumulative noise impacts within the immediate vicinity of the Airport. Therefore, the 65 DNL noise contour is not depicted on the VER land use drawing.

AIRPORT PROPERTY MAP

The **Airport Property Map** presents the existing and ultimate relevant property tracts including the acreage of each parcel, how the airport property was acquired (i.e., Federal AIP funds, military/ government surplus, local funding, etc.), when each tract of land was acquired, and the existing ownership status of proposed property acquisitions. The property map serves as a guide for the airport sponsor to analyze the current and future utilization of land acquired with Federal funding grants.

VER's property includes 12 tracts consisting of approximately 197 total acres. Of this, fee simple ownership by the City accounts for nearly 153 acres. The remaining property consists of aviation and clear zone easements totaling nearly 44 acres. As noted above, the preferred development concept is expected to require the acquisition of approximately 52 acres in addition to the existing acreage. Fee simple acquisition is expected to involve the acquisition and relocation of one residence located to the northeast of the Airport and adjacent to MO Highway 98.

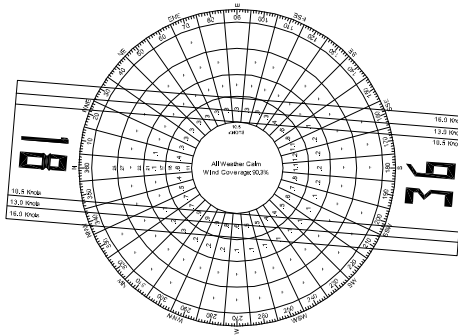
40:1 DEPARTURE SURFACE DRAWING

The **40:1 Departure Surface Drawing** depicts the plan and profile view of the current and ultimate 40:1 departure surfaces to provide information on existing and potential obstructions to the engine-out departures on instrument procedure runways such as 18-36.

The existing Runway 18 departure surface (DS) is penetrated by 13 obstacles which includes one power pole. Ultimately, the 18 DS is expected to be penetrated by eight trees and one power pole.

The Runway 36 DS is currently penetrated by five trees being located to the north and south of I-70. The ultimate DS for Runway 36 is also expected to be penetrated by the same obstructions if not mitigated in the short (0-5 year) or intermediate (6-10 year) planning periods.

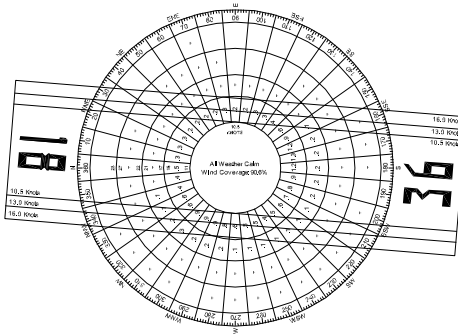
All Weather Wind Rose



Runway	Crosswind Component/ Corresponding ARC	13.0 Knots (A-I & B-II)	16.0 Knots (A-II, B-III, C-I to D-III)
Runway 18-36	90.3%	94.6%	98.4%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2005).

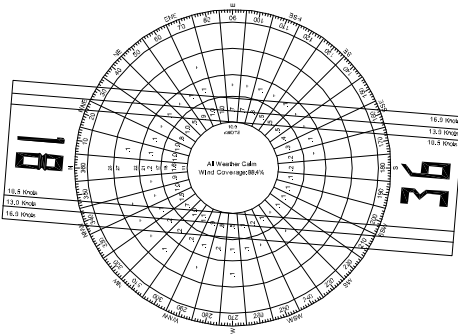
VFR Wind Rose



Runway	Crosswind Component/ Corresponding ARC	13.0 Knots (A-I & B-II)	16.0 Knots (A-II, B-III, C-I to D-III)
Runway 18-36	90.6%	94.8%	98.4%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2005).

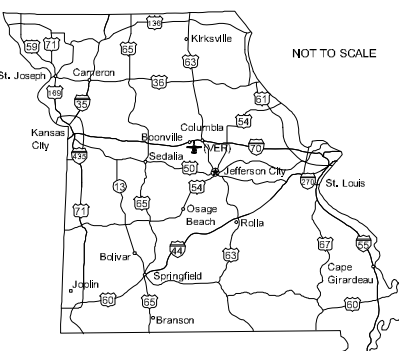
IFR Wind Rose



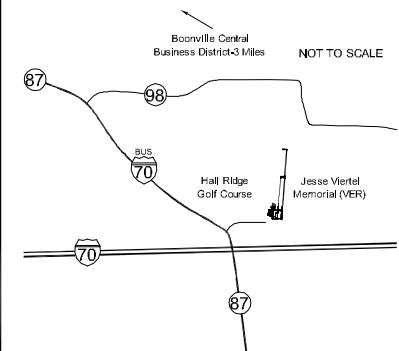
Runway	Crosswind Component/ Corresponding ARC	13.0 Knots (A-I & B-II)	16.0 Knots (A-II, B-III, C-I to D-III)
Runway 18-36	88.4%	93.8%	98.7%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2005).

Location Map

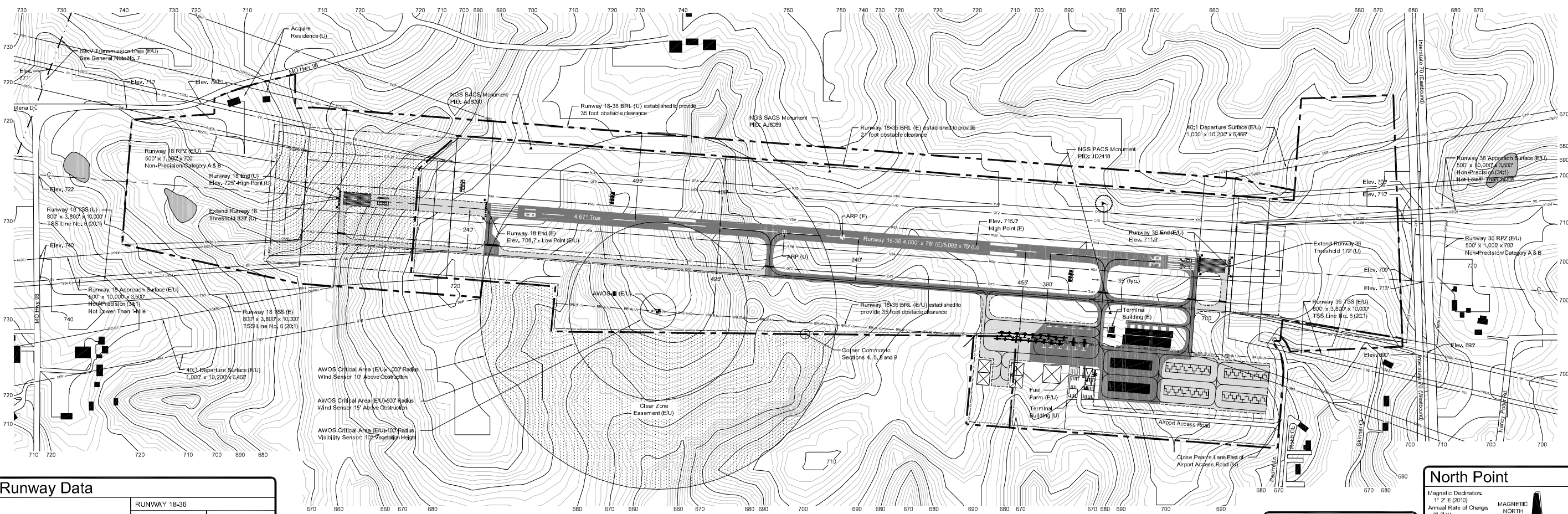


Vicinity Map



General Notes

- See the inner portion of the approach surface drawings (APSD) and airspace drawing for construction/significant object location and clearance information for the FAR Part 77 airspace, approach and threshold sitting surfaces (TSS).
- The proposed alternative airfield development option involves acquisition of approximately 52 acres in fee simple.
- The proposed alternative airfield development alternative involves the acquisition and relocation of one rural residence located immediately west of MO Hwy 98 north of VER.
- The proposed T-hanger and clear span hangar development takes into account projected demand throughout the planning period and considers demand beyond projected levels.
- Although the recommended ultimate runway length to accommodate projected demand is 4,800 feet, the city has elected to pursue the development of a future 5,000 foot runway.
- The proposed RPZ for the Runway 36 threshold extension does not require property acquisition due to a small portion of the RPZ residing within the right-of-way for Interstate 70.
- 60kV power transmission lines, owned and maintained by Ameren UE, are located approximately 1/2-mile north of the Runway 18 threshold. The top elevation of these powerlines is estimated to be approximately 777 feet above mean sea level (MSL). In order for the future FAR Part 77 34:1 approach surfaces to have clearance over these facilities, the powerlines must be lowered or the ultimate Runway 18 threshold is recommended to have a future end elevation of 725 feet MSL. If neither of these options are feasible, the FAA will have to perform an aeronautical evaluation to determine if the powerlines pose a potential hazard to air navigation. The plan currently depicts the ultimate end elevation at 725 feet MSL to meet runway longitudinal grading standards. This end elevation will result in the powerlines penetrating the 34:1 approach surface by three feet.



Runway Data

RUNWAY DETAILS	RUNWAY 18-36	
	EXISTING	ULTIMATE
Runway Reference Code (ARC)	18 36	18 36
Runway Azimuth	184.87° True	4.67° True
Runway Dimensions	4,000' x 75'	5,000' x 75'
FAR Part 77 Approach Use Type	NP	NP
Aeronautical Survey Required for Approach	NVG	NVG
Approach Visibility Minimums	1-Mile	1-Mile
Approach Slope	34:1	34:1
Runway Safety Area (RSA)	4,600' x 150'	5,600' x 150'
Runway Object Free Area (OFA)	4,600' x 500'	5,600' x 500'
Runway Obstacle Free Zone (OFZ)	4,400' x 400'	5,400' x 400'
Runway Pavement Strength (Thousands of lbs.)	12,500 (SW)	30,000 (SW)
Runway Pavement Material	Asphalt	Same
Runway Markings	NP	NP
Runway Gradient	-.08%	-0.3%
Runway Lighting	M/RU/REIL	Same
Taxiway Lighting	Reflectors	M/TL
Taxiway Width	35'	Same
NAVAIDS	GPS/VOR	GPS
Approach Visual Aids	PAPI/ML	PAPI/ML
Touchdown Zone Elevation (TDZE)	715.0'	725.0'
Takeoff Run Available (TORA)	n/a	Same
Accelerate-Stop Distance Available (ASDA)	n/a	Same
Landing Distance Available (LDA)	n/a	Same
Takeoff Distance Available (TODA)	n/a	Same

Runway End Coordinates

THRESHOLD	EXISTING	ULTIMATE
Runway 18	38-57-07.92 N, 92-40-55.95 W	38-57-16.08 N, 92-40-54.70 W
Runway 36	38-56-28.52 N, 92-40-59.67 W	38-56-26.82 N, 92-40-59.85 W

Airport Data

AIRPORT INFORMATION	EXISTING	ULTIMATE
Airport Elevation- Mean Sea Level (MSL)	715.0'	725.0'
Airport Reference Code (ARC)	B-I	Same
Critical Aircraft	Beechcraft Super King Air 350	Cessna Citation Encore (Model 580)
Airport Reference Point (ARP)	38-56-48.20 N, 92-40-57.50 W	38-56-51.45 N, 92-40-57.28 W
Instrument Approach Procedures	(RNAV)GPS-VOR	(RNAV)GPS-4LPV
Mean Maximum Air Temperature	80° F	Same
Weather Reporting System	AWOS-III	Same
Airport Electronic Aids	Rotating Beacon	Same
NPIAS Category	General Aviation	Same
Range and Townships/ Sections	T48N, R16W/ 4, 8 and 9	T48N, R16W/ 4, 5, 8 and 9
FAA Site Number	11561,01A	Same
County	Cooper (MO)	Same
Total Acreage (Fee Simple & Easements)	206.611	259.231 (See Sheet 10 of 11)
1. Datum: Coordinate System-FIPS MO053 (Cooper Co.); NAD83 State Plane Zone = 2402 (Transverse Mercator) Central Zone); FIPS State Code=MO 28 NAVD83.		

NGS Survey Monuments

PID NO.	DESIGNATION	GEODETIC COORDINATES	MARKER	ELEV.
PACS JD2418	X 330	38-56-33.42 N, 92-41-03.19 W	SR	715.66 feet
SACS AJ 8089	VER A	38-56-48.96 N, 92-40-52.57 W	HCD	737.10 feet
SACS AJ 8020	VER B	38-57-05.52 N, 92-40-50.86 W	HCD	709.90 feet

Source: NOAA Aeronautical Survey Program (<https://www.ngs.noaa.gov/AERO/aero.html>)
PACS-Primary Airport Control Station; SACS-Secondary Airport Control Station; SR-Steel Rod; HCD-Horizontal Control Disk

Modifications to Airport Design Standards

None Required

Threshold Siting Surface Object Penetrations

There are existing TSS object penetrations. See Sheets 4, 5 and 6 for further details.

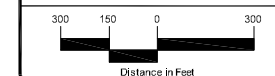
Obstacle Free Zone (OFZ) Object Penetrations

There are no existing OFZ object penetrations.

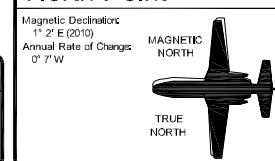
Legend

EXISTING	ULTIMATE	DESCRIPTION
--- BRL (E-U) ---	--- Same ---	Airport Pavement Areas
--- RSA ---	--- RSA(U) ---	Structures
--- OFA ---	--- OFA(U) ---	Airport Property Line
--- RPZ ---	--- RPZ(U) ---	Building Restriction Line (BRL)
--- OFZ ---	--- OFZ(U) ---	Runway Safety Area (RSA)
--- DEP ---	--- DEP(U) ---	Runway Protection Zone (RPZ)
--- AS ---	--- AS(U) ---	Obstacle Free Zone (OFZ)
★	★	4:1 Departure Surface
○	○	Part 77 Approach Slope Surface
○	○	Rotating Beacon
○	○	Precision Approach Path Indicators (PAPI)
○	○	Lighted Wind Cone/Segmented Circle
○	○	Runway Threshold Lighting
○	○	Runway End Indicator Lights (REIL)
○	○	Fence Line
○	○	AWOS-III Station
○	○	Ultimate Property Acquisition
○	○	Easement

Scale



North Point



Sponsor Approval Stamp

For Approval by:
The City of Boonville, Missouri
Signed by: _____ Dated: _____
The Honorable Dave Nicholas
Mayor

ALP Revisions

NO.	DESCRIPTION	DATE	REVISED BY	APPROVED BY

Drawing Name: S:\2008-0352-Boonville Muni Master Plan\Master Plan\ACD\ALP Update\VER_13.dwg Feb 13, 2010 - 8:22am

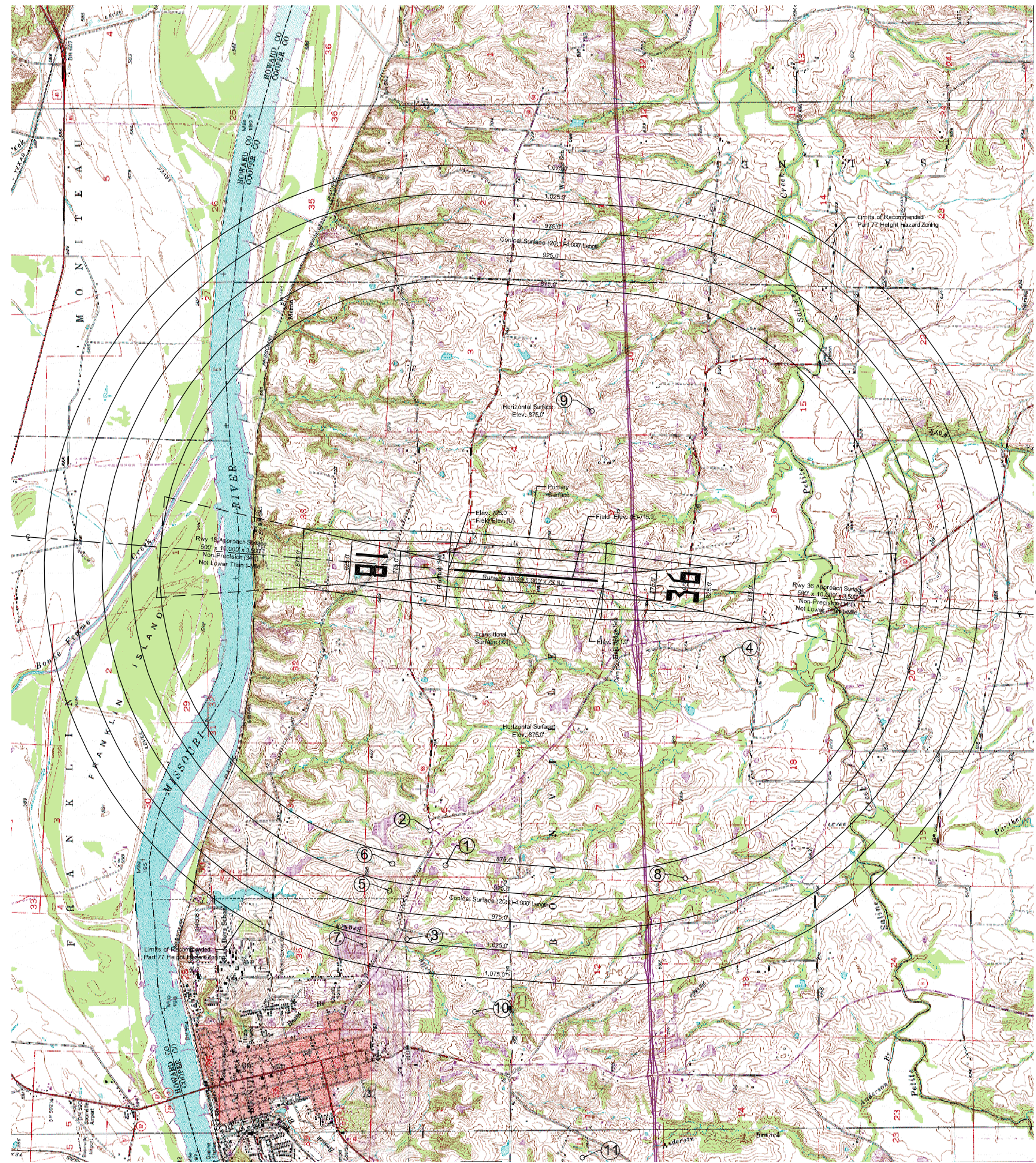


JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri
AIRPORT LAYOUT DRAWING

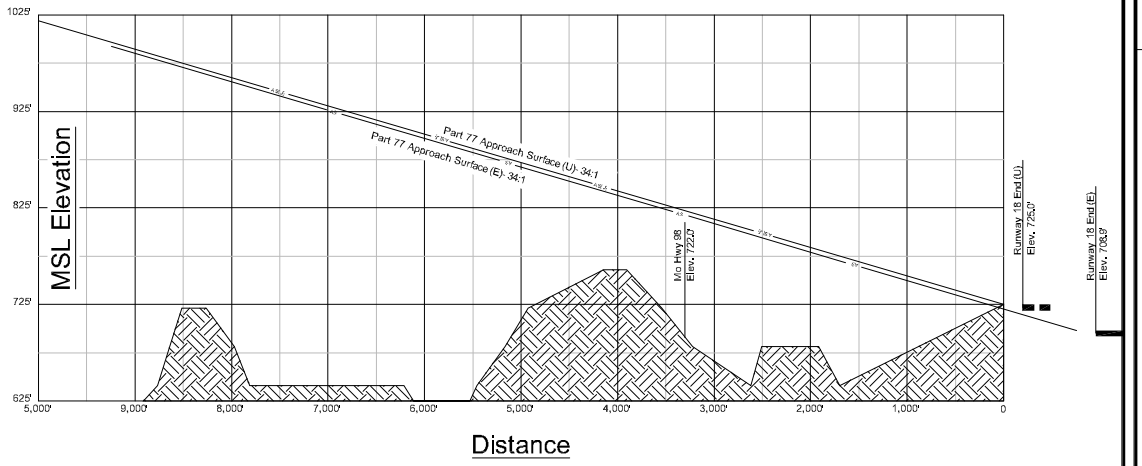
BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
DRAWN BY MAW
CHECKED BY MAW
DESIGNED BY MAW
REVISIONS DATE

SUBMITTAL DATE 02/16/2010

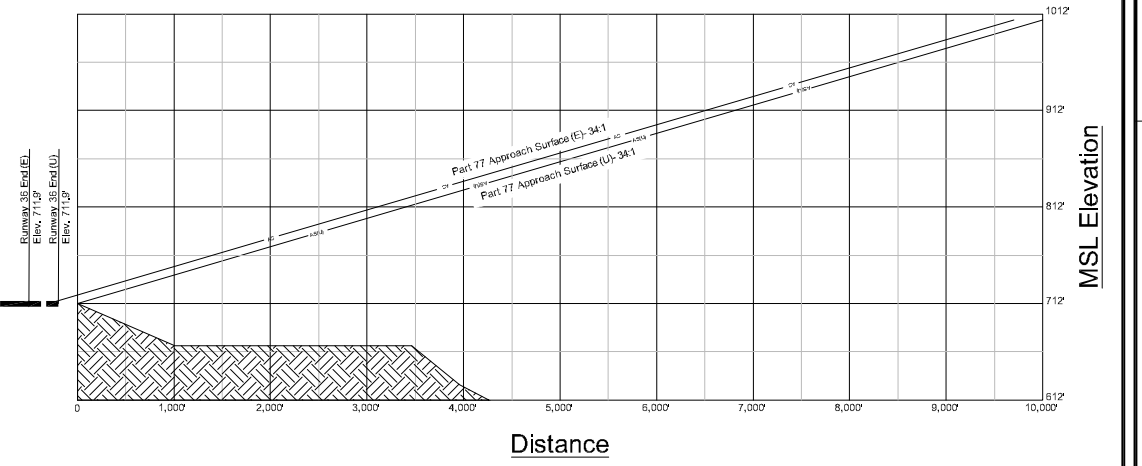
Drawing Name: S:\2008-0352-Boonville Muni Master Plan\Master Plan\ACAD\VER ALP_Change 13.dwg Feb 13, 2010 - 8:49am



Runway 18 Approach Profile View



Runway 36 Approach Profile View



North Point

Magnetic Declination:
1° 2' E (2010)
Annual Rate of Change:
0° 7' W

MAGNETIC NORTH

TRUE NORTH

General Notes

- Contour elevation information derived from the following Missouri USGS 7.5 minute topographic quadrangle maps: Rocheport, Boonville, Billingsville, Hilldale, Franklin and New Franklin.
- The City of Boonville in cooperation with Cooper and Howard Counties are recommended to enact height and hazard zoning ordinances to preserve the airport's airspace infrastructure and regulate the land use to control the height of objects within the immediate vicinity of VER.
- Refer to the Inner Portion of the Approach Surface Drawings for obstruction information located within the inner 3,400 feet of the inner approach surface and beyond the RPZs for Runway 18/36.

Scale

2,000 1,000 0 2,000

Distance in Feet
Horizontal Scale 1"=1,000'
Vertical Scale 1"=100'

FAR Part 77 Airspace Surface Obstruction Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	SURFACE	FAA STUDY NO.	DISPOSITION
1	Tower	38-57-21 N	92-43-05 W	-	10,218 feet R	961' MSL	83 feet	Conical	02CE0331	TBD
2	Tower	38-57-26 N	92-43-49 W	-	9,058 feet R	911' MSL	33 feet	Horizontal	78CE0410	TBD

DEND= Distance from Runway End; DCL= Distance from Runway Centerline.

FAR Part 77, Subpart C, § 77.23 Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	TOP ELEV.	PENETRATION	FAA STUDY NO.	DISPOSITION
3	Tower	38-57-21.24 N	92-43-04.80 W	961' MSL	123 feet	2002-ACE-331-OE	TBD
4	Tower	38-55-56.00 N	92-41-26.00 W	904' MSL	142 feet	2007-ACE-1793-OE	TBD
5	Tower	38-57-26.00 N	92-42-48.00 W	913' MSL	91 feet	2007-ACE-3008-OE	TBD
6	Tower	38-57-25.20 N	92-42-36.50 W	904' MSL	91 feet	2008-ACE-2467-OE	TBD
7	Tower	38-57-32.80 N	92-43-07.10 W	904' MSL	62 feet	2008-ACE-2468-OE	TBD
8	Tower	38-56-05.00 N	92-42-44.00 W	849' MSL	30 feet	2008-ACE-3412-OE	TBD
9	Tower	38-56-30.00 N	92-40-00.00 W	910' MSL	139 feet	2008-ACE-80-OE	TBD
10	Tower	38-57-02.80 N	92-43-30.50 W	914' MSL	47 feet	2008-ACE-2468-OE	TBD
11	Tower	38-56-33.47 N	92-44-21.86 W	959' MSL	50 feet	2008-ACE-1537-OE	TBD

Section 77.23 (Subpart C) of FAR Part 77 establishes criteria for determining whether a natural or man-made object is an obstruction to air navigation. The towers listed in this table have been identified by the FAA as obstructions to air navigation. It is important for the airport sponsor to be aware of and monitor these structures to ensure that modification to the structures does not pose an adverse impact to VER's imaginary airspace surfaces or current or future instrument approach capabilities.

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AIRSPACE DRAWING

BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1

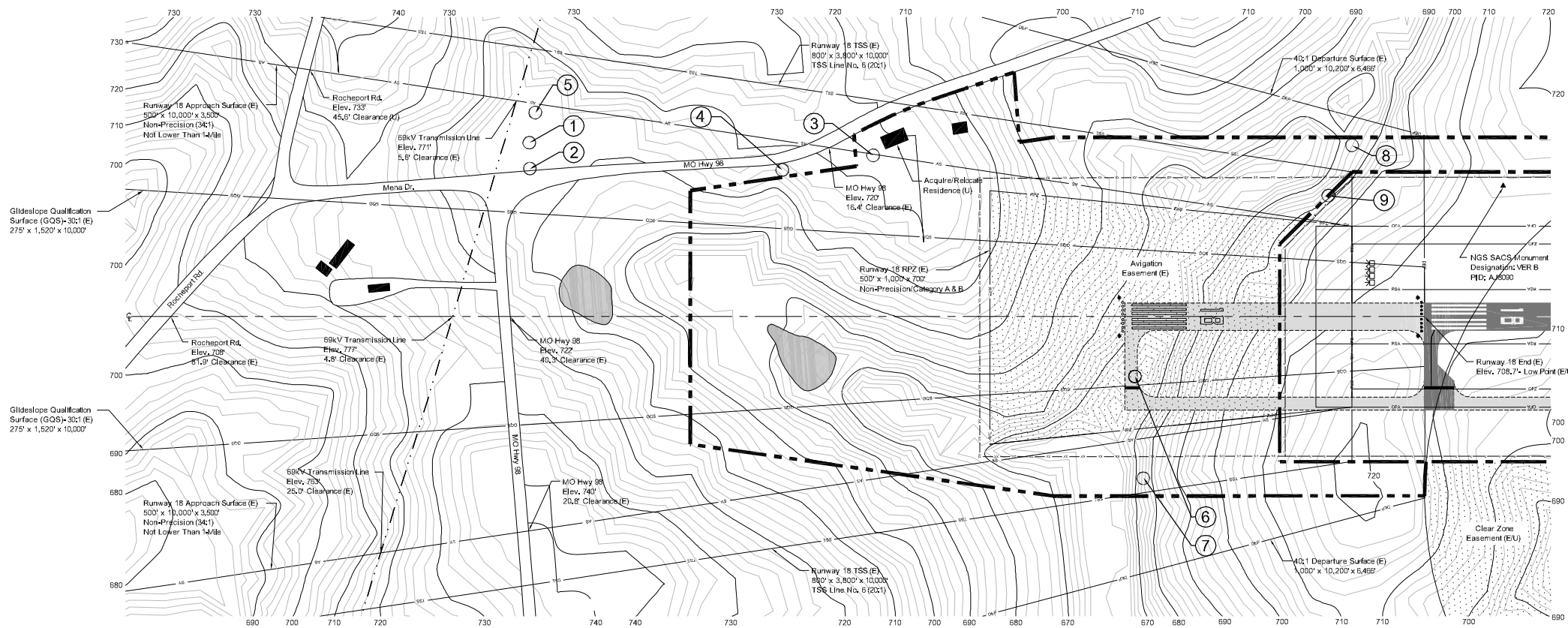
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REVISIONS DATE

SUBMITTAL DATE 02/16/2010

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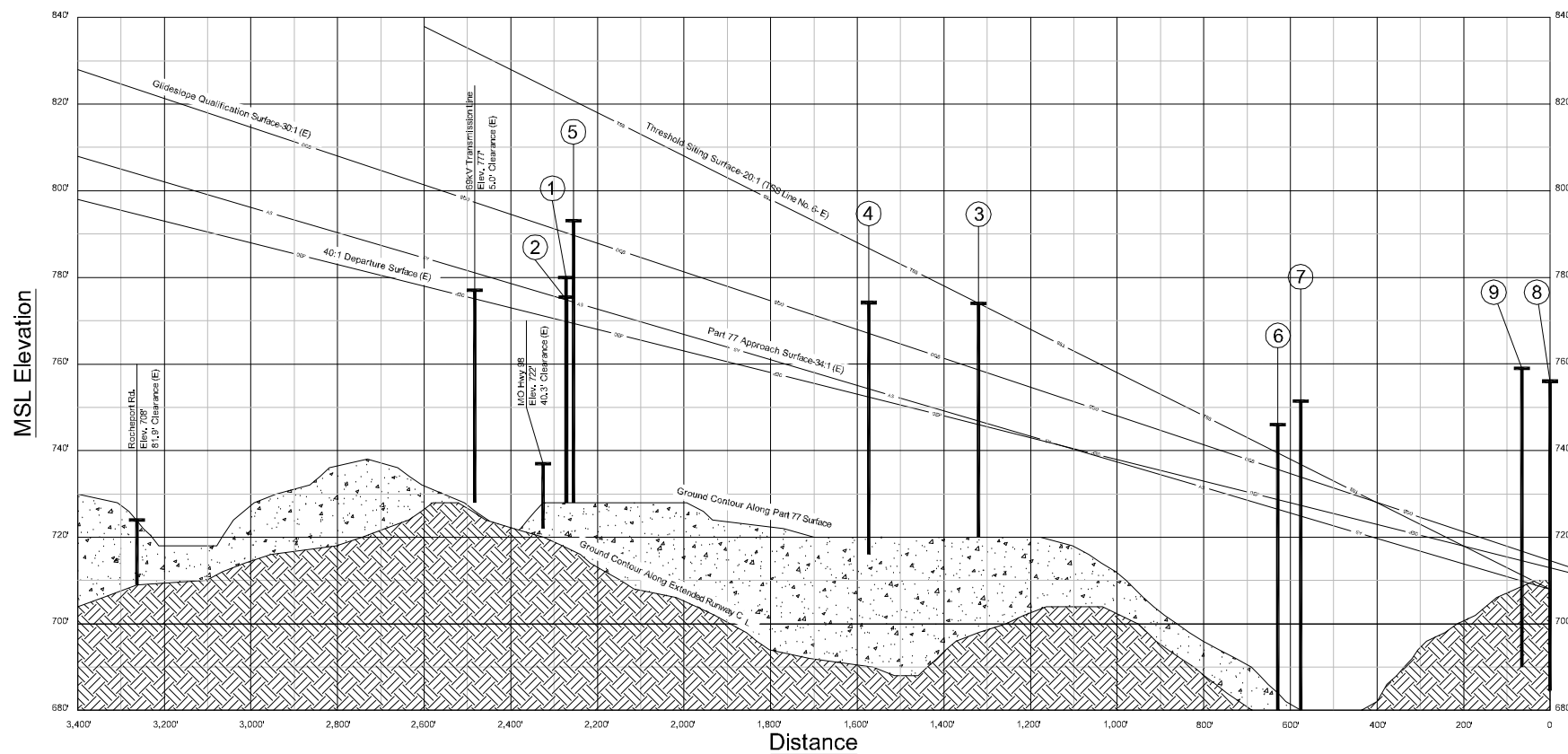
SHEET 3 OF 11

Runway 18 End Plan View



EXISTING	ULTIMATE	DESCRIPTION
		Pavement Areas
		Structures
		Airport Property Line
		Runway Safety Area (RSA)
		Object Free Area (OFA)
		Runway Protection Zone (RPZ)
		Obstacle Free Zone (OFZ)
		Approach Slope Surface
		Glideslope Qualification Surface
		Threshold Siting Surface
		40:1 Departure Surface
		Runway Threshold Lighting
		Runway End Indicator Lights (REIL)
		Fenceline
		Significant Object

Runway 18 End Profile View



General Notes

- Refer to sheet 11 of 11 for obstruction information and penetrations to the 40:1 Departure Surface.
- The recommended FAR Part 77 minimum adjusted approach surface clearances over a public roadway is 15 feet. The existing calculated clearances over MO Hwy 98 and Rocheport Rd reflect the clearance over the approximate centerline of the road at ground level plus the 15 foot penalty height.
- The IPASD is a general representation of existing runway conditions within the inner portion of the approach slope surface pertaining to traverse ways, safety area dimensions, terrain relief and structure locations. Any deviations from existing conditions compared to conditions detailed in this drawing are unintentional.

North Point

Magnetic Declination
1° 2' E (2010)
Annual Rate of Change
0° 7' W

MAGNETIC NORTH

TRUE NORTH

Scale

200 100 0 200

Distance in Feet
Horizontal Scale: 1"=200'
Vertical Scale: 1"=20'

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	SURFACE	MITIGATION
1	Tree	38-57-31.88 N	92-40-46.94 W	2,470 feet	481 feet L	780' MSL	4.5 feet	Approach	Top/Remove
2	Tree	38-57-31.93 N	92-40-47.86 W	2,469 feet	408 feet L	775' MSL	0.5 feet	Approach	Top/Remove
3	Tree	38-57-22.56 N	92-40-48.36 W	1,522 feet	446 feet R	774' MSL	26.4 feet	Approach	Top/Remove
4	Tree	38-57-25.36 N	92-40-48.51 W	1,772 feet	405 feet R	774' MSL	19.0 feet	Approach	Top/Remove
5	Tree	38-57-31.85 N	92-40-45.91 W	2,454 feet	562 feet R	794' MSL	19.0 feet	Approach	Top/Remove
6	Tree	38-57-15.94 N	92-40-58.15 W	701 feet	257 feet R	746' MSL	22.0 feet	Approach/TSS	Top/Remove
7	Tree	38-57-15.93 N	92-41-00.38 W	776 feet	441 feet R	752' MSL	26.3 feet	Approach/TSS	Top/Remove
8	Tree	38-57-09.51 N	92-40-49.38 W	200 feet	473 feet L	759' MSL	15.4 feet	Transitional/TSS	Top/Remove
9	Tree	38-57-10.27 N	92-40-51.06 W	266 feet	334 feet L	759' MSL	38.3 feet	Transitional/TSS	Top/Remove

DEND= Distance from Runway End; DCL= Distance from Runway Centerline.
Note: The figure listed in the "Penetration" column is the number of feet the obstacle penetrates the FAR Part 77 approach surface. Obstructions 6 thru 9 also penetrate the Runway 18 Threshold Siting Surface (TSS).

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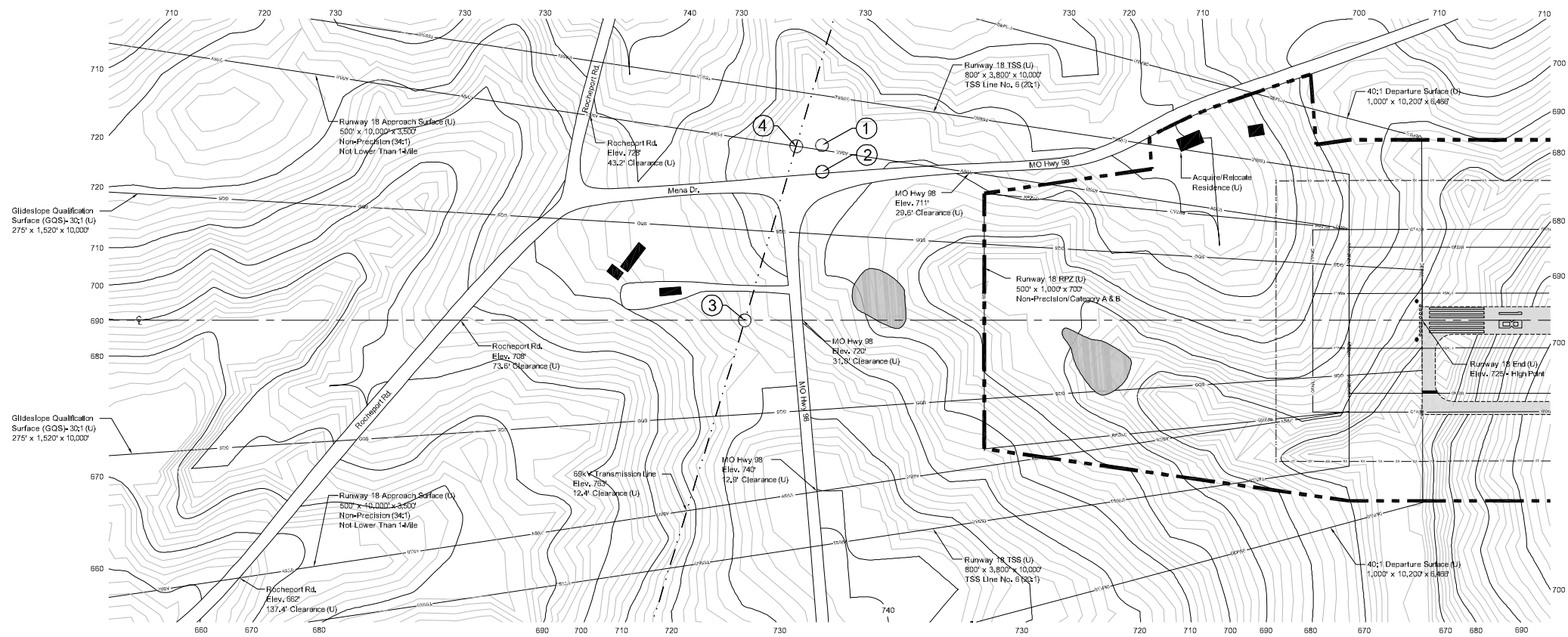
RUNWAY 18 INNER PORTION OF THE APPROACH SURFACE DRAWING_EXISTING

BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
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DESIGNED BY MAW
REVISIONS DATE

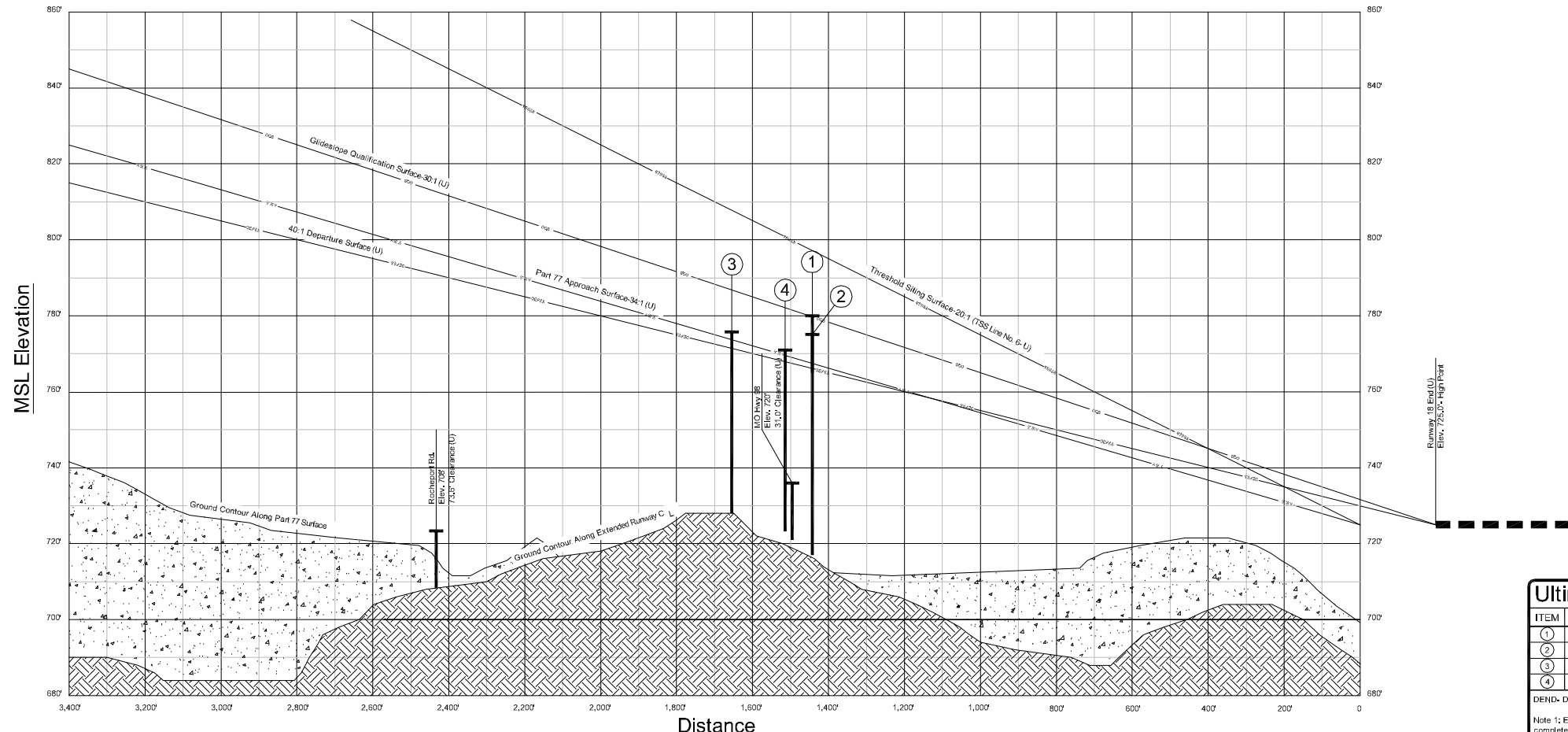
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Runway 18 End Plan View



Runway 18 End Profile View



Legend		DESCRIPTION
EXISTING	ULTIMATE	Pavement Areas
---	---	Structures
---	---	Airport Property Line
---	---	Runway Safety Area (RSA)
---	---	Object Free Area (OFA)
---	---	Runway Protection Zone (RPZ)
---	---	Obstacle Free Zone (OFZ)
---	---	Approach Slope Surface
---	---	Glideslope Qualification Surface
---	---	Threshold Sill Surface
---	---	40:1 Departure Surface
---	---	Runway Threshold Lighting
---	---	Runway End Indicator Lights (REIL)
---	---	Fence/Line
---	---	Significant Object

General Notes

- Refer to sheet 11 of 11 for obstruction information and penetrations to the 40:1 Departure Surface.
- The recommended FAR Part 77 minimum adjusted approach surface clearance over a public roadway is 15 feet. The ultimate calculated clearances over MO Hwy 98 and Rocheport Rd. reflect the clearance over the approximate centerline of the road at ground level plus the 15 foot penalty height.
- The IPASD is a general representation of existing runway conditions within the inner portion of the approach slope surface pertaining to traverse ways, safety area dimensions, terrain relief and structure location. Any deviations from existing conditions compared to conditions detailed in this drawing are unintentional.
- 69kV power transmission lines, owned and maintained by Ameren UE, are located approximately 1/2-mile north of the Runway 18 threshold. The top elevation of these powerlines is estimated to be approximately 777 feet above mean sea level (MSL) (46 feet above ground level - AGL) at the runway's extended centerline. In order for the future FAR Part 77 34:1 approach surfaces to have clearance over these facilities, the powerlines must be lowered or the ultimate Runway 18 threshold is recommended to have a future end elevation of 728 feet MSL. If neither of these options are feasible, the FAA will have to perform an aeronautical evaluation to determine if the powerlines pose a potential hazard to air navigation. The plan currently depicts the ultimate end elevation at 725 feet MSL, to meet runway longitudinal grading standards. This end elevation will result in the powerlines penetrating the 34:1 approach surface by three feet.

North Point

Magnetic Declination
1° 2' E (2010)
Annual Rate of Change
0' 7" W

MAGNETIC NORTH
TRUE NORTH

Scale

200 100 0 200

Distance in Feet
Horizontal Scale: 1"=200'
Vertical Scale: 1"=20'

Ultimate Obstruction Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	SURFACE	MITIGATION
1	Tree	38-57-31.88 N	92-40-46.94 W	1,445 feet	481 feet L	780' MSL	12.5 feet	Approach	Top/Remove
2	Tree	38-57-31.93 N	92-40-47.86 W	1,445 feet	408 feet L	775' MSL	7.5 feet	Approach	Top/Remove
3	Powerline	38-57-34.36 N	92-40-52.79 W	1,855 feet	0 feet	777' MSL	3.0 feet	Approach	Light/Mark
4	Powerline	38-57-32.50 N	92-40-46.91 W	1,780 feet	477 feet L	771' MSL	1.4 feet	Approach	Light/Mark

DEND= Distance from Runway End; DCL= Distance from Runway Centerline.

Note 1: Existing obstructions are expected to be mitigated within the 0-5 year (Phase I) planning period. However, an FAR Part 77 obstruction survey is recommended to be completed to identify and mitigate potential obstructions that might exist.



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RUNWAY 18 INNER PORTION OF THE APPROACH SURFACE DRAWING_ULTIMATE

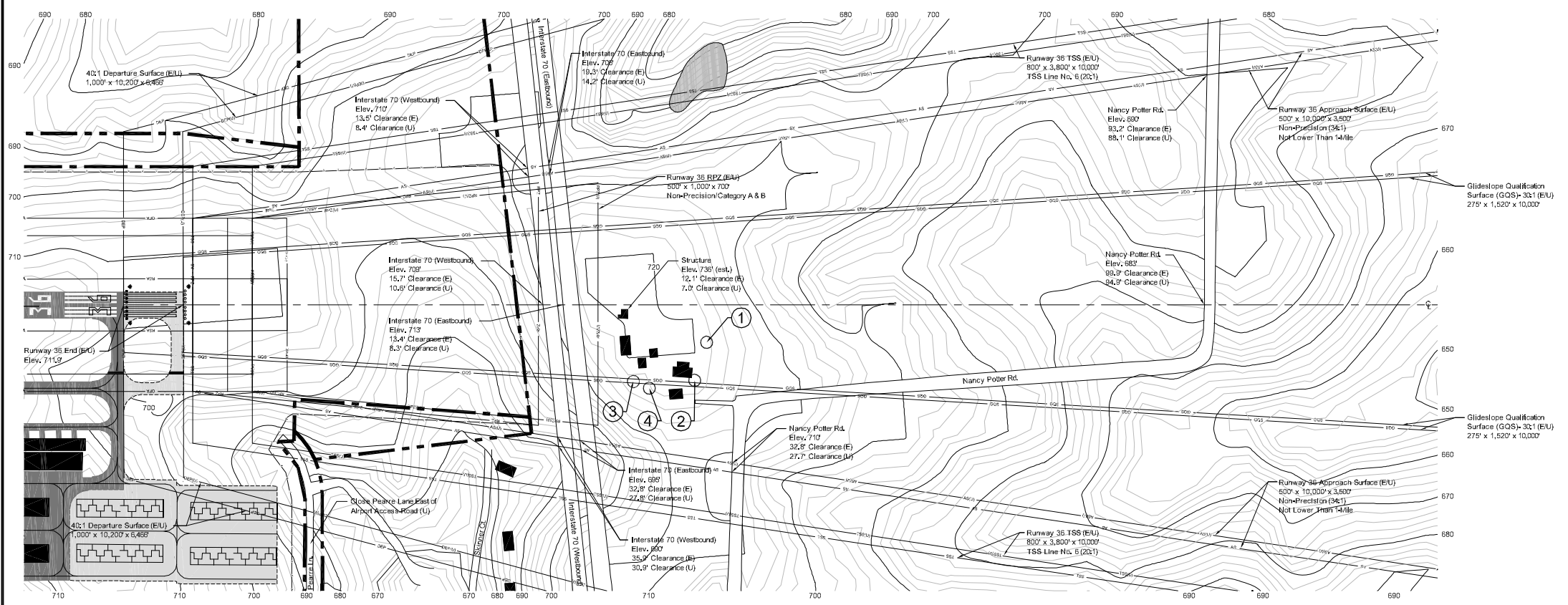
BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
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REVISIONS DATE

SUBMITTAL DATE 02/16/2010

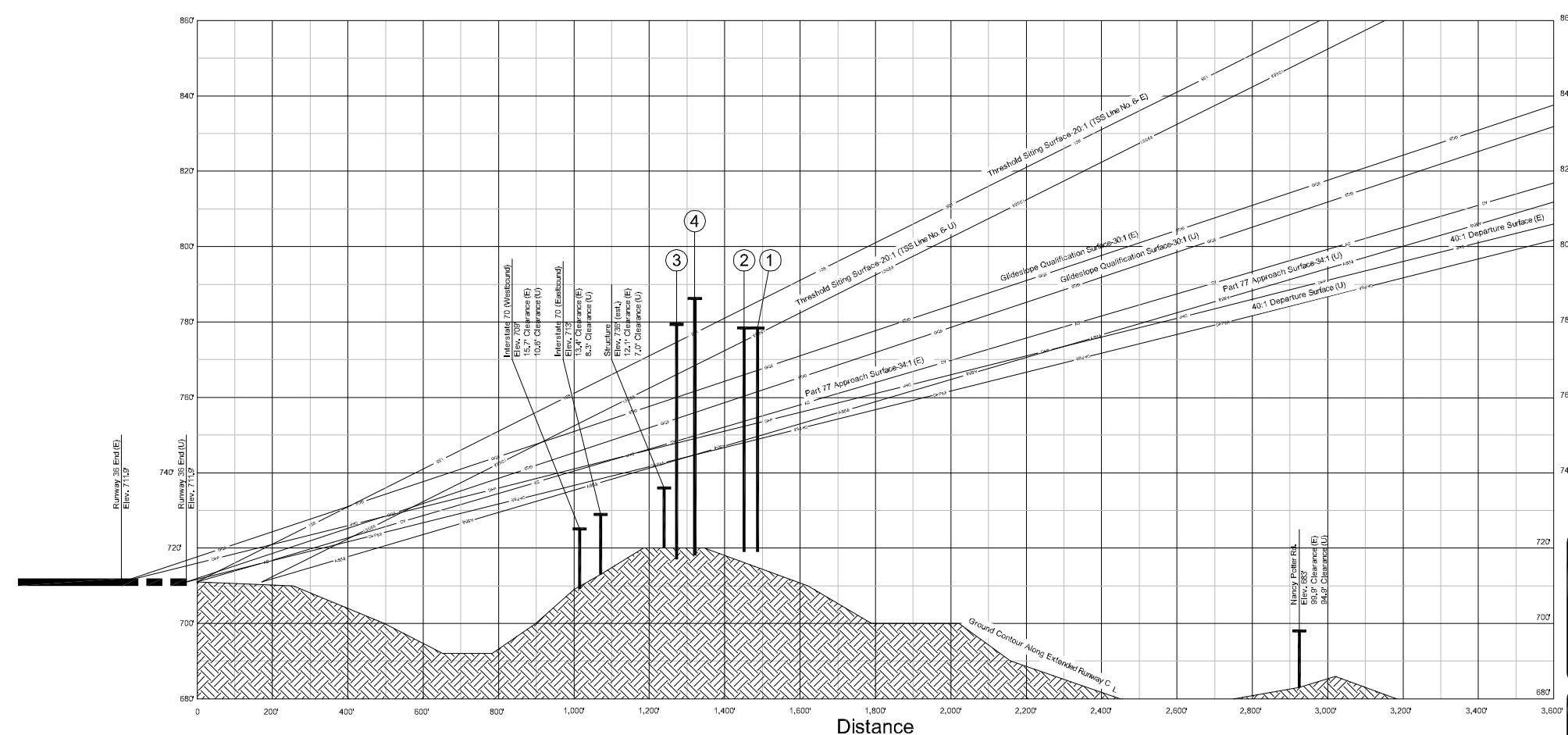
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SHEET 5 OF 11

Runway 36 End Plan View



Runway 36 End Profile View



Legend		
EXISTING	ULTIMATE	DESCRIPTION
[Symbol]	[Symbol]	Pavement Areas
[Symbol]	[Symbol]	Structures
[Symbol]	[Symbol]	Airport Property Line
[Symbol]	[Symbol]	Runway Safety Area (RSA)
[Symbol]	[Symbol]	Object Free Area (OFA)
[Symbol]	[Symbol]	Runway Protection Zone (RPZ)
[Symbol]	[Symbol]	Obstacle Free Zone (OFZ)
[Symbol]	[Symbol]	Approach Slope Surface
[Symbol]	[Symbol]	Glideslope Qualification Surface
[Symbol]	[Symbol]	Threshold Siting Surface
[Symbol]	[Symbol]	40:1 Departure Surface
[Symbol]	[Symbol]	Runway Threshold Lighting
[Symbol]	[Symbol]	Runway End Indicator Lights (REIL)
[Symbol]	[Symbol]	Fence/Line
[Symbol]	[Symbol]	Significant Object

General Notes

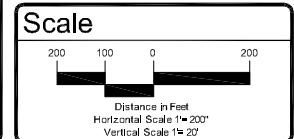
- Refer to sheet 11 of 11 for obstruction information and penetrations to the 40:1 Departure Surface.
- The recommended FAR Part 77 minimum adjusted approach surface clearance over an interstate highway is 17 feet. The calculated clearances over I-70 reflect the clearance over the approximate centerline of the interstate at ground level plus the 17 foot penalty height.
- The recommended FAR Part 77 minimum adjusted approach surface clearance over a public roadway is 15 feet. The calculated clearances over Nancy Potter Rd. reflect the clearance over the approximate centerline of the road at ground level plus the 15 foot penalty height.
- The IPASD is a general representation of existing runway conditions within the inner portion of the approach slope surface pertaining to traverse ways, safety area dimensions, terrain relief and structure location. Any deviations from existing conditions compared to conditions detailed in this drawing are unintentional.

North Point

Magnetic Declination:
1° 2' E (2010)
Annual Rate of Change:
0° 7' W

MAGNETIC NORTH

TRUE NORTH



Existing Obstruction Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	SURFACE	MITIGATION
1	Tree	38-55-12.01 N	92-41-02.78 W	1,685 feet	108 feet L	778' MSL	22.4 feet	Approach/TSS	Top/Remove
2	Tree	38-55-12.44 N	92-41-04.13 W	1,650 feet	218 feet L	778' MSL	23.5 feet	Approach/TSS	Top/Remove
3	Tree	38-55-14.19 N	92-41-03.99 W	1,473 feet	241 feet L	779' MSL	25.7 feet	Approach/TSS	Top/Remove
4	Tree	38-55-13.75 N	92-41-04.28 W	1,519 feet	221 feet L	786' MSL	35.3 feet	Approach/TSS	Top/Remove

DEND= Distance from Runway End; DCL= Distance from Runway Centerline.
Note: The figure listed in the "Penetration" column is the number of feet the obstacle penetrates the FAR Part 77 approach surface. Obstructions 1 thru 4 also penetrate the Runway 36 Threshold Siting Surface (TSS).

Ultimate Obstruction Data Table

Existing obstructions are expected to be mitigated within the O-S year (Phase I) planning period. Accordingly, there are no known future obstructions. However, an FAR Part 77 obstruction survey is recommended to be completed to identify and mitigate potential obstructions that might exist.

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RUNWAY 36 INNER PORTION OF THE APPROACH SURFACE DRAWING

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MODOT PROJECT NO. 08-039A-1
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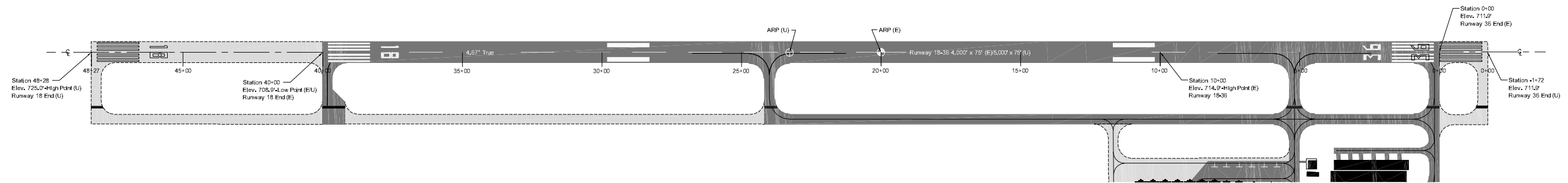
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RUNWAY 18-36 CENTERLINE PROFILE
DRAWING

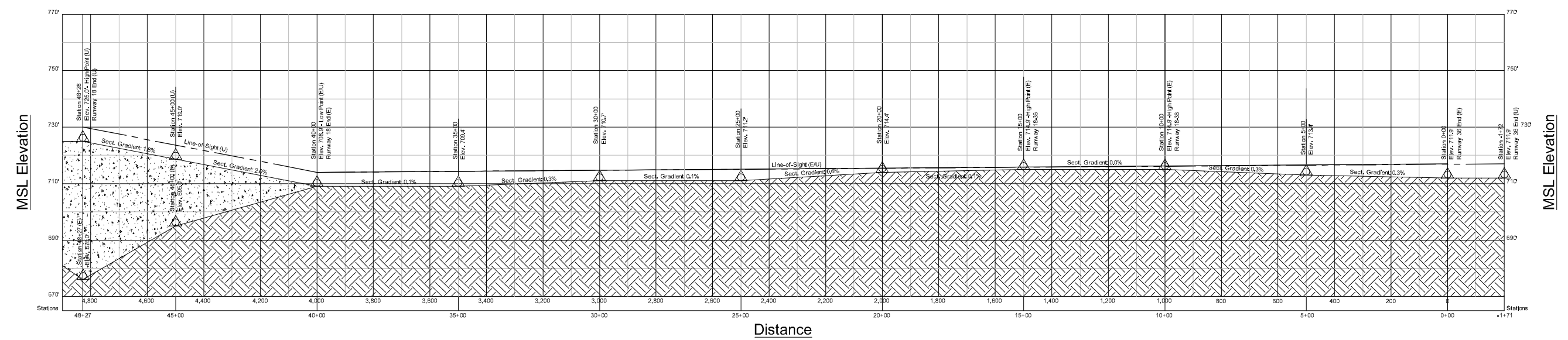
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MODOT PROJECT NO.	08-039A-1
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DESIGNED BY	MAW
REVISIONS	DATE

SUBMITTAL DATE 02/16/2010

Runway 18-36 Plan View



Runway 18-36 Profile View



Effective Gradient
Existing Grade: 0.8%
Ultimate Grade: 0.3%

North Point

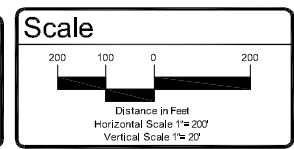
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1° 2' E (2010)
Annual Rate of Change:
0' 7" W

MAGNETIC NORTH

TRUE NORTH

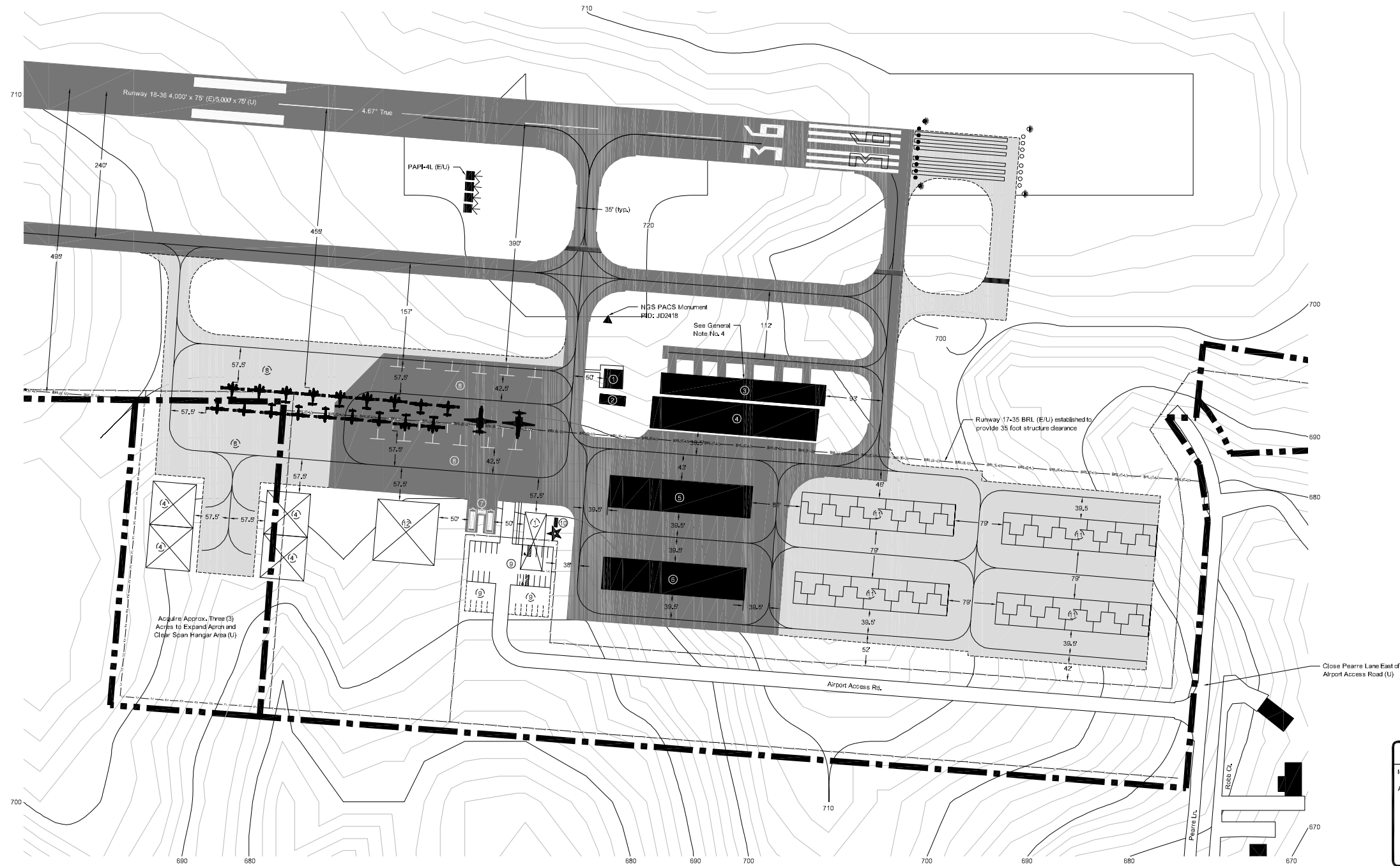
General Notes

- Runway centerline elevations derived from the Runway 18-36 design and construction documents produced by BWR (1999-2000) in North American Datum (NAD 83) and North American Vertical Datum (NAVD 88).
- The centerline profile is a general representation of existing runway conditions pertaining to grade changes, elevations and terrain contours. Any deviations from existing conditions compared to conditions detailed in this drawing are unintentional.



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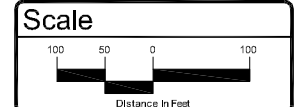
EXISTING	ULTIMATE	DESCRIPTION
		Pavement Areas
		Structures
		Property Line
		Paved Roadways
		Same
		Same
		Same
		Rotating Beacon
		Fence/Line

North Point

Magnetic Declination
1° 2' E (2010)
Annual Rate of Change
0° 7' W

MAGNETIC NORTH

TRUE NORTH



General Notes

- The proposed T-hanger and clear span hangar development takes into account projected demand throughout the planning period and considers demand beyond projected levels as well.
- The preferred terminal area alternative assumes that the Runway 36 threshold is extended to the south by approximately 171 feet. T-hanger siting considers the 421 Departure Surface located at the future 36 threshold.
- The recommended apron redevelopment meets projected peak hour demand. The future apron configuration and size will also allow ground maneuvering by ADG II aircraft (wingspan from 48'-78').
- Due to its proximity to Runway 18-36, the shade T-hanger penetrates the airport's FAR Part 77 transitional airspace surface by seven feet and will require installation of red obstruction lighting.

NGS Survey Monuments

PID NO.	DESIGNATION	GEODETTIC COORDINATES	MARKER	ELEV.
PACS JD2418	X 330	38-55-33.42 N, 92-41-03.19 W	SR	715.06 feet
PACS - Primary Airport Control Station SR - Steel Rod				

Buildings/Facilities

EXISTING	ULTIMATE	DESCRIPTION	FUTURE ACTION	TOP ELEV. (MSL)
1	1	Terminal Building	Relocate	729' (est.)
2	2	Office Trailer	Relocate	732' (est.)
3	3	Shade T-Hanger	Retain	738' (est.)
4	4	Clear Span Hangars (Hangar 100)	Retain	733' (est.)
5	5	T-Hangers (Hangar 200)	Retain	733' (est.)
6	6	T-Hangers (Hangar 300)	Retain	730' (est.)
7	7	Fuel Farm	Retain	708' (est.)
8	8	Aircraft Apron	Retain/Expand	712' (est.)
9	9	Auto Parking	Retain/Expand	704' (est.)
10	10	Airport Electrical Vault	Retain	714' (est.)
11	11	T-Hanger	Construct	730' (est.)
12	12	FRO/Maintenance Hangar	Construct	738' (est.)

Terminal Area Design Criteria

	AIRPLANE DESIGN GROUP (ADG)	
	GROUP I	GROUP II
TERMINAL AREA STANDARD		
Runway Q to Parallel Taxiway Q Separation	225'	240'
Taxiway Q to Fixed or Movable Object	44.5'	65.5'
Taxiway Q to Parallel Taxiway Q Separation	69'	105'
Taxiway Object Free Area Width	89'	131'
Taxiway Safety Area Width	49'	79'
Taxiway Wingtip Clearance	10'	25'
Taxiway Width	25'	35'
Taxiway Object Free Area Width	79'	115'
Taxiway Q to Parallel Taxiway Q Separation	64'	97'
Taxiway Q to Fixed or Movable Object	38.5'	57.5'



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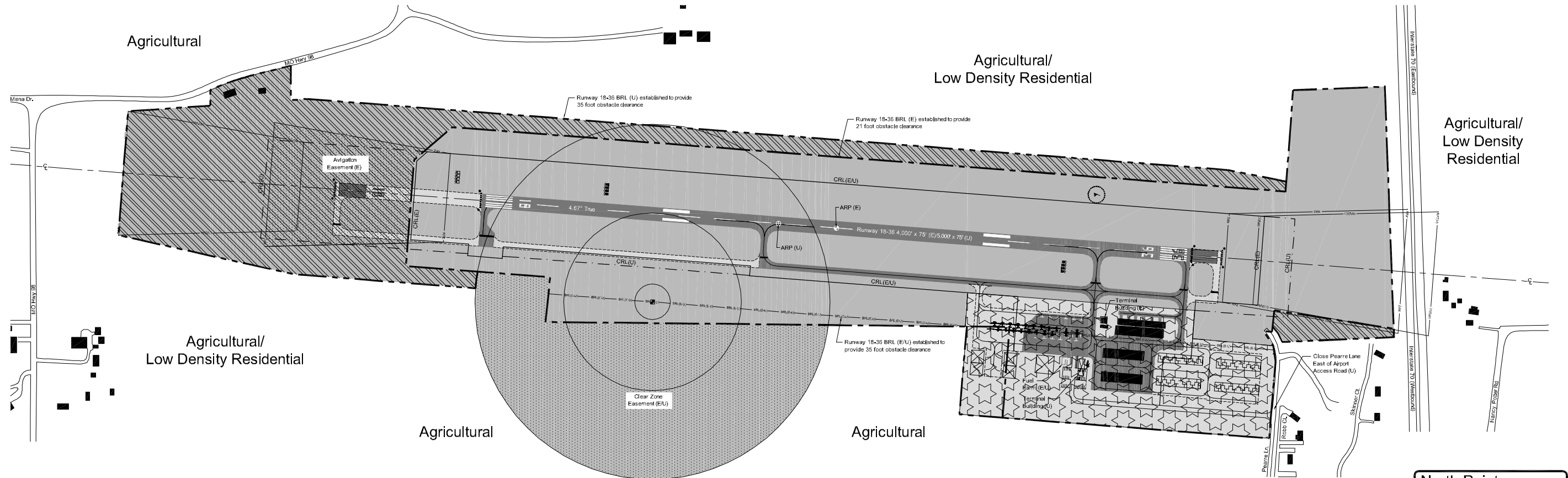
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TERMINAL AREA DRAWING

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Drawing Name: S:\2008-0352-Boonville Muni Master Plan\Master Plan\ACAD\ALP Update\VER ALP_Change_13.dwg Feb 13, 2010 - 8:27pm

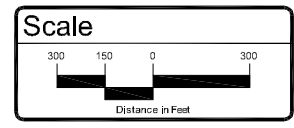


North Point

Magnetic Declination
1° 2' E (2010)
Annual Rate of Change
0° 7' W

MAGNETIC NORTH

TRUE NORTH



Land Use Legend

HATCH TYPE	LAND USE DESCRIPTION
	Existing Aviation Operations Area
	Existing/Ultimate Landside & Terminal Area
	Ultimate Aviation Operations Area

General Notes

- Given that there are no land use controls and/or zoning within Cooper County, current land use information in the vicinity of VER was based on visual observations.
- Existing and future aviation operational activity does not rise to the threshold required to complete an ultimate noise exposure map (NEM) as recommended by the FAA. Accordingly, no significant airport/aircraft noise impacts are anticipated.

Crop Restriction Line Criteria

CRL STANDARD	AIRCRAFT APPROACH CATEGORY and AIRPLANE DESIGN GROUP	
	GROUP I	GROUP II
Distance in Feet from Runway \hat{C} to Crop (Visual > 3/4-mile)	200'	250'
Distance in Feet from Runway End to Crop (Visual > 3/4-mile)	300'	400'
Distance in Feet from Runway \hat{C} to Crop (< 3/4-mile)	400'	400'
Distance in Feet from Runway End to Crop (< 3/4-mile)	600'	600'
Distance in Feet from \hat{C} of Taxiway to Crop	40'	50'
Distance in Feet from Edge of Apron to Crop	40'	50'

Note: Due to the limited space available to conduct agricultural activities on-airport and/or lack of agricultural leases, the CRL is not depicted in the plan view of this drawing.

Legend

EXISTING	ULTIMATE	DESCRIPTION
		Pavement Areas
		Structures
		Airport Property Line
		Building Restriction Line (BRL)
		Runway Protection Zone (RPZ)
		Crop Restriction Line (CRL)
		Rotating Beacon
		Precision Approach Path Indicators (PAPI)
		Lighted Wind Cone/Segmented Circle
		Runway Threshold Lighting
		Runway End Indicator Lights (REIL)
		Easement
		Ultimate Property Acquisition



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JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri

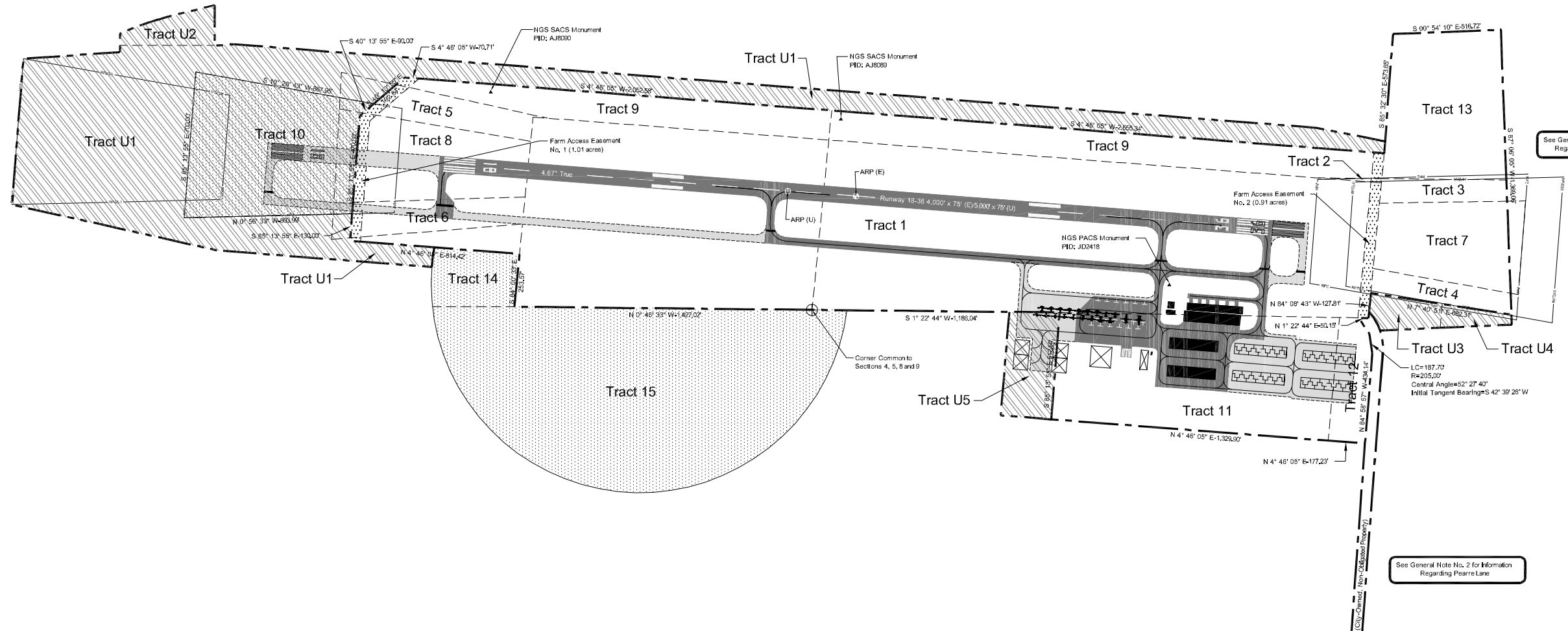
LAND USE DRAWING

BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
DRAWN BY MAW
CHECKED BY MAW
DESIGNED BY MAW
REVISIONS DATE

SUBMITTAL DATE 02/16/2010

Drawing Name: S:\2008-0352-Boonville Muni Master Plan\Master Plan\ACAD\ALP\Update\VER_ALP_Change 13.dwg Feb 02 2010 - 11:43am

EXISTING	ULTIMATE	DESCRIPTION
		Pavement Areas
		Airport Property Line
		Tract Boundaries
		Land Acquisition-Ultimate
		Runway Protection Zone (RPZ)
		Structures



See General Note No. 1 for Information Regarding Tracts 3, 4, 7 and 13

See General Note No. 2 for Information Regarding Pearre Lane

General Notes

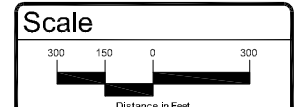
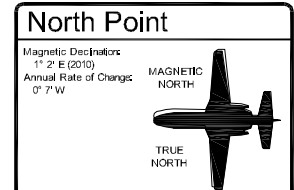
1, Tracts 3 (1,518 acres) and 4 (1,688 acres), as well as a portion of Tract 7 (5,11 acres), each being aviation easements, were coviated with the fee simple acquisition of those tracts as well as an additional 3,704 acres in 1998. Each of the tracts were combined into a single tract (no. 13) which consists of 19,02 acres. Tracts 3 and 4 were purchased with Federal AIP funds (AIP 3-29-0005-01) while Tract 7 was acquired with Federal funds (AIP 7-29-0005-01) as well. The combined Tract 13, including aviation easement Tracts 3, 4 and 7, were acquired fee simple with Federal AIP funds (AIR 925-39A).

2, Pearre Lane was acquired by the city in July 1973 with non-Federal funds from S, A, and Goldie PEARRE. Total property interest is 2,53 acres.

TRACT	ACREAGE	PROPERTY INTEREST	INTEREST	FEDERAL AID PROJECT NUMBER
1	72.68	Fee-Simple	City of Boonville	AIP 7-29-0005-01
2	0.080	Fee-Simple	City of Boonville	AIP 3-29-0005-01
3	See General Note No. 1			
4	See General Note No. 1			
5	3,212	Fee-Simple	City of Boonville	AIP 3-29-0005-01
6	3,175	Fee-Simple	City of Boonville	AIP 3-29-0005-01
7	See General Note No. 1			
8	7.51	Fee-Simple	City of Boonville	AIP 7-29-0005-01
9	27,961	Fee-Simple	City of Boonville	AIR 925-39A
10	11,438	Aviation Easement	VERTEL, Jesse P., Jr.	AIR 925-39A
11	16,910	Fee-Simple	City of Boonville	AIR 925-39A
12	2,290	Fee-Simple	City of Boonville	AIR 925-39A
13	19,02	Fee-Simple	City of Boonville	AIR 925-39A/See General Note No. 1
14	2.49	Clear Zone Easement	VERTEL, Jesse P., Jr.	-
15	30,529	Clear Zone Easement	GROSS, Barney & James	-
Total	197,296			

PARCEL	ACREAGE	PROPERTY INTEREST	CURRENT OWNER	BOOK & PAGE NO.	PARCEL ID NUMBER
U1	45.80	Fee-Simple	VERTEL, Jesse P., Jr.	Book 308, p. 296	09-2,0-04-000-000-006-000
U2	1.28	Fee-Simple	INNES, James & Mary T.	Book 163, p. 537	09-2,0-04-000-000-007-000
U3	1.03	Fee-Simple	BMJ Properties, LLC	Book 539, p. 171	09-3,0-8-4-3-20,018
U4	0.63	Fee-Simple	BOSMA, Robert & Joan K.	Book 530, p. 532	09-3,0-8-4-3-20,020
U5	2.79	Fee-Simple	GROSS, James J., et al	Book 354, p. 748	09-3,0-8-4-3-1
Total	51.53				

PID NO.	DESIGNATION	GEODETIC COORDINATES	MARKER	ELEV.
PACS JD2418	X 330	38-56-33.42 N, 92-4-1-03.19 W	SR	715.66 feet
SACS AJ 8089	VER A	38-56-48.96 N, 92-40-52.57 W	HCD	737.10 feet
SACS AJ 8090	VER B	38-57-05.52 N, 92-40-50.86 W	HCD	709.90 feet



BWR
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903 East 104th Street | Suite 900 | Kansas City, Missouri 64131-3451
P 816.363.2696 | F 816.363.0027

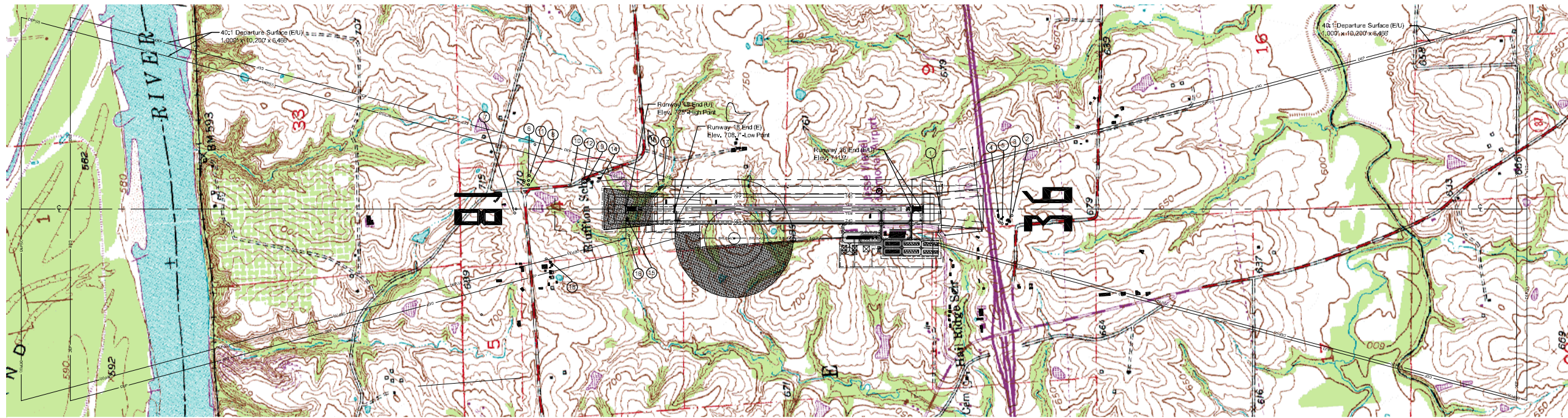
JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri

AIRPORT PROPERTY MAP

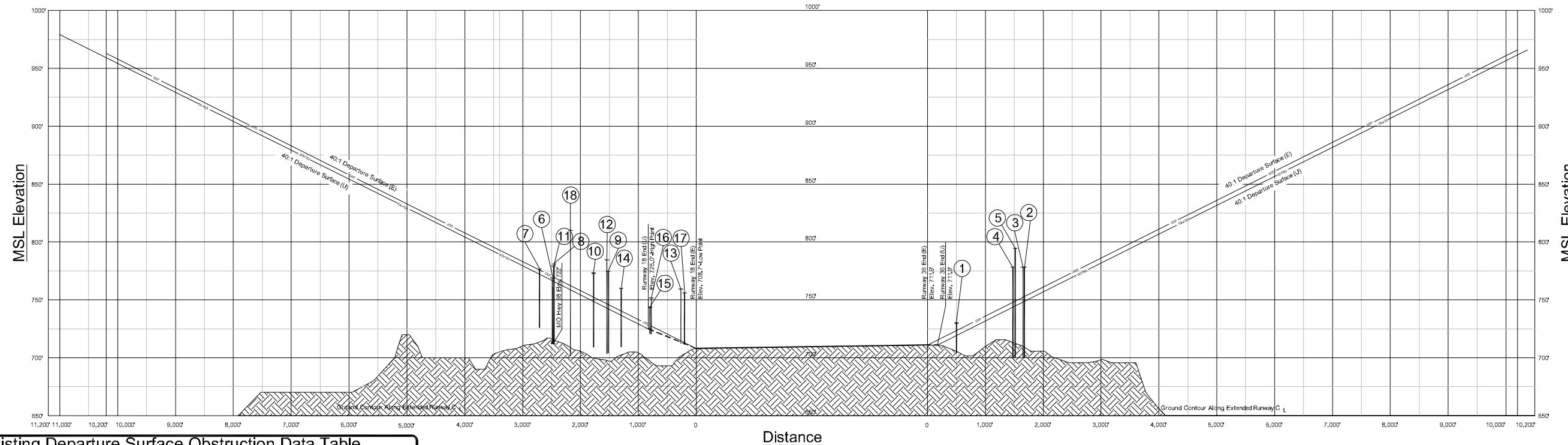
BWR PROJECT NO.	2008-0352.01
MODOT PROJECT NO.	08-039A-1
DRAWN BY	MAW
CHECKED BY	MAW
DESIGNED BY	MAW
REVISIONS	DATE

SUBMITTAL DATE: 02/16/2010

40:1 Departure Surface Plan View



40:1 Departure Surface Profile View



Existing Departure Surface Obstruction Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	MITIGATION
1	Tree	38-56-23.72 N	92-41-01.95 W	499 feet	139 feet R	732' MSL	8 feet	Top/Remove
2	Tree	38-56-12.01 N	92-41-02.78 W	1,685 feet	108 feet R	778' MSL	24 feet	Top/Remove
3	Tree	38-56-12.44 N	92-41-04.13 W	1,650 feet	218 feet R	778' MSL	25 feet	Top/Remove
4	Tree	38-56-14.19 N	92-41-03.89 W	1,473 feet	241 feet R	778' MSL	29 feet	Top/Remove
5	Tree	38-56-13.75 N	92-41-04.28 W	1,519 feet	221 feet R	786' MSL	36 feet	Top/Remove
6	Tree	38-57-31.88 N	92-40-46.94 W	2,470 feet	481 feet L	780' MSL	10 feet	Top/Remove
7	Pole	38-57-34.80 N	92-40-53.61 W	2,702 feet	67 feet L	777' MSL	1 feet	Aeronautical Eval.
8	Tree	38-57-31.93 N	92-40-47.86 W	2,469 feet	407 feet L	775' MSL	4 feet	Top/Remove
9	Tree	38-57-22.56 N	92-40-48.36 W	1,522 feet	446 feet L	774' MSL	27 feet	Top/Remove
10	Tree	38-57-25.06 N	92-40-48.51 W	1,772 feet	406 feet L	774' MSL	21 feet	Top/Remove
11	Tree	38-57-31.88 N	92-40-46.94 W	2,470 feet	481 feet L	780' MSL	14 feet	Top/Remove
12	Tree	38-57-31.88 N	92-40-45.01 W	2,454 feet	562 feet L	794' MSL	24 feet	Top/Remove
13	Tree	38-57-22.71 N	92-40-47.56 W	1,542 feet	509 feet L	784' MSL	37 feet	Top/Remove
14	Tree	38-57-10.27 N	92-40-51.06 W	266 feet	334 feet L	759' MSL	44 feet	Top/Remove
15	Tree	38-57-20.32 N	92-40-48.36 W	1,296 feet	464 feet L	760' MSL	19 feet	Top/Remove
16	Tree	38-57-15.04 N	92-40-58.15 W	701 feet	257 feet R	746' MSL	20 feet	Top/Remove
17	Tree	38-57-15.93 N	92-41-00.38 W	776 feet	441 feet R	752' MSL	42 feet	Top/Remove
18	Tree	38-57-09.51 N	92-40-49.38 W	200 feet	472 feet L	750' MSL	29 feet	Top/Remove
19	Tree	38-57-30.00 N	92-41-03.91 W	2,172 feet	840 feet R	810' MSL	47 feet	Top/Remove

Ultimate Departure Surface Obstruction Data Table

ITEM	DESCRIPTION	LATITUDE	LONGITUDE	DEND	DCL	TOP ELEV.	PENETRATION	MITIGATION
1	Tree	38-56-23.72 N	92-41-01.95 W	499 feet	139 feet R	732' MSL	15 feet	Top/Remove
2	Tree	38-56-12.01 N	92-41-02.78 W	1,685 feet	108 feet R	778' MSL	31 feet	Top/Remove
3	Tree	38-56-12.44 N	92-41-04.13 W	1,650 feet	218 feet R	778' MSL	32 feet	Top/Remove
4	Tree	38-56-14.19 N	92-41-03.89 W	1,473 feet	241 feet R	778' MSL	37 feet	Top/Remove
5	Tree	38-56-13.75 N	92-41-04.28 W	1,519 feet	221 feet R	786' MSL	43 feet	Top/Remove
6	Tree	38-57-31.88 N	92-40-46.94 W	2,470 feet	481 feet L	780' MSL	14 feet	Top/Remove
7	Pole	38-57-34.80 N	92-40-53.61 W	2,701 feet	67 feet L	777' MSL	6 feet	Aeronautical Eval.
8	Tree	38-57-31.93 N	92-40-47.86 W	2,469 feet	407 feet L	775' MSL	5 feet	Top/Remove
9	Tree	38-57-22.56 N	92-40-48.36 W	1,522 feet	446 feet L	774' MSL	23 feet	Top/Remove
10	Tree	38-57-25.06 N	92-40-48.51 W	1,772 feet	406 feet L	774' MSL	25 feet	Top/Remove
11	Tree	38-57-31.88 N	92-40-45.91 W	2,454 feet	562 feet L	794' MSL	28 feet	Top/Remove
12	Tree	38-57-22.71 N	92-40-47.56 W	1,542 feet	509 feet L	784' MSL	41 feet	Top/Remove
13	Tree	38-57-20.32 N	92-40-48.36 W	1,296 feet	464 feet L	760' MSL	23 feet	Top/Remove
14	Tree	38-57-30.00 N	92-41-03.91 W	2,172 feet	840 feet R	810' MSL	12 feet	Top/Remove

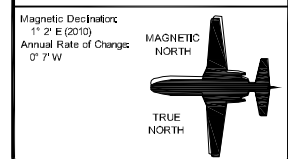
General Notes

1. Departure Surface penetrations which will require one of two actions and/or mitigations including removal or lowering of the obstruction and/or raising instrument departure minimums.

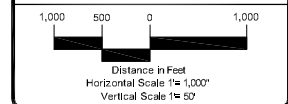
Legend

EXISTING	ULTIMATE	DESCRIPTION
[Symbol]	[Symbol]	Airport Pavement Areas
[Symbol]	[Symbol]	Structures
[Symbol]	[Symbol]	Airport Property Line
[Symbol]	[Symbol]	Significant Object

North Point



Scale



BWR
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JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri

40:1 DEPARTURE SURFACE DRAWING

BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
DRAWN BY MAW
CHECKED BY MAW
DESIGNED BY MAW
REVISIONS DATE

SUBMITTAL DATE 02/16/2010



CAPITAL IMPROVEMENT PROGRAM

INTRODUCTION

The Airport's Capital Improvement Program (ACIP) involves the compilation of a schedule of recommended capital development projects, as well as their associated probable costs, that are based on the findings of the demand forecast and facility requirements analyses. The ACIP for VER identifies the improvements necessary to accommodate the projected aviation demand throughout the 20-year planning period.

CAPITAL IMPROVEMENT PROGRAM PHASING

The capital improvement program for VER will be based on short (0-5 year), intermediate (6-10 year), and long-term (11-20 year) development requirements. The short term development phase ideally serves as an immediate action program which recognizes Federal funding capabilities. For this reason, the 0-5 year phase of development is given special attention in that projects are outlined by year due to the critical nature of the improvements and the necessary financial investments that accompany each improvement item.



AIRPORT MASTER PLAN REPORT

The short-term improvement plan also plays a key role in formulating the ACIP submitted to MoDOT, Aviation Section, and the FAA indicating development priorities and development costs for the Airport. Aside from assisting with the development of the ACIP, the short-term implementation plan should allow for additional capital improvement items which contribute to the overall operational safety and efficiency of the facility. This includes pavement maintenance and rehabilitation as well as terminal area improvements.

The intermediate development plan consists of improvements that will affect the overall geometry and layout of the facility on the airfield and terminal area. Lastly, the long-range development phase is developed in an effort to identify the ultimate role of the Airport including a planning concept that will eventually accommodate the ultimate facility requirements.

PROJECT SCHEDULING

Decisions regarding project scheduling will evolve from numerous considerations involved with implementation of the ACIP. For instance, care must be given to the amount of time and effort that will be needed to acquire land and develop engineering and construction design documents in an effort to satisfy aviation demand. For this reason, the timing of particular capital development projects presented in this chapter are merely suggested planning schedules and may require some variance and reprioritizing, particularly during the 11-20 year phase of airport development. Demand for certain airfield or terminal area facilities and the accompanying economic feasibility are considered prime factors in determining the timing and construction of individual projects throughout the 20-year planning period.

MODOT CAPITAL IMPROVEMENT PROGRAM

The overall purpose of the ACIP is to provide a reasonable expectation of projected capital improvements that will be utilized by MoDOT for purposes of project prioritization and financial programming. Upon publication, the ACIP presented in this chapter, due to variances in past capital

development priorities, will differ to some degree from the five-year ACIP worksheets currently maintained by MoDOT.

CAPITAL IMPROVEMENT PROGRAM COST ESTIMATES

The ACIP cost estimates are based on the current dollar value (2009) without consideration being given to inflation in the latter development phases. Facility development and construction costs are generated based on unit prices which correspond to the breadth and size of the particular capital improvement item. Likewise, the cost estimates for improvements take into consideration the unit costs as they relate to the central Missouri and Cooper County area. As with project scheduling, financial considerations such as the availability and timing of Federal or state funding have the ability to impact the scheduling priority of certain improvements.

The ACIP cost estimates are presented by development phase within **Table 7.1** (Phase I ACIP Cost Summary) and **Table 7.2** (Phase II & Phase III ACIP Cost Summary). The 0-5 year planning period is categorized by year showing capital improvements for each respective year from 2009 to 2013. Each year of Phase I includes engineering, inspection, legal and administrative costs, which total 25 percent of the total cost for each year of the development period. Phases II and III of the ACIP include contingent costs added to the sum of the costs for the entire development phase.

The ACIP presented for airfield and terminal area facilities were derived from engineering cost estimates and engineering bid tabs taken from recent engineering projects similar to those recommended for VER. Absent an appraised value, costs associated with property acquisition are not included as part of the ACIP. Lastly, the ACIP cost estimates are intended to be utilized for planning purposes only and are recommended not to be considered an engineer's opinion of probable construction costs.

SEVEN: CAPITAL IMPROVEMENT PROGRAM

Table 7.1
Phase I (0-5 Year) AICP Cost Summary

Project Description	Projected Local Share (5%)	Projected MoDOT/Federal Share (95/100%)	Projected Total Cost (100%)
Year 1 (2009)			
1A Design T-Hangar Taxilanes	\$ 6,000	\$ 104,000	\$ 110,000
Year 1 Cost	\$ 6,000	\$ 104,000	\$ 110,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 1,000	\$ 26,000	\$ 27,000
Year 1 Total Cost	\$ 7,000	\$ 130,000	\$ 137,000
Year 2 (2010)			
2A Construct T-Hangar Taxilanes	\$ 23,000	\$ 427,000	\$ 450,000
3A Construct 10-Unit T-Hangars (2)	\$ 80,000	\$ 0.00	\$ 800,000
4A Establish LPV Approach to Runway 36 Threshold	n/a	n/a	n/a
Year 2 Cost	\$ 823,000	\$ 427,000	\$ 1,250,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 206,000	\$ 107,000	\$ 313,000
Year 2 Total Cost	\$ 1,029,000	\$ 534,000	\$ 1,563,000
Year 3 (2011)			
5A Perform Environmental Assessment (EA)	\$ 3,000	\$ 47,000	\$ 50,000
6A Obstruction Removal / Tree Clearing	\$ 2,000	\$ 28,000	\$ 30,000
7A Rehabilitate Runway 18-36	\$ 9,000	\$ 171,000	\$ 180,000
8A Rehab. Taxiway System and Expand Parallel Taxiway	\$ 20,000	\$ 380,000	\$ 400,000
Year 3 Cost	\$ 34,000	\$ 626,000	\$ 660,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 9,000	\$ 156,000	\$ 165,000
Year 3 Total Cost	\$ 43,000	\$ 782,000	\$ 825,000
Year 4 (2012)			
9A Rehabilitate Aircraft Apron and T-Hangar Taxilanes	\$ 5,000	\$ 100,000	\$ 105,000
10A Acquire Tracts U-1 thru U-4 (49.83 acres)	Absent Appraised Value These Costs are Not Available		
11A Design New Terminal Building*	\$ 8,000	\$ 67,000	\$ 75,000
Year 4 Cost	\$ 13,000	\$ 167,000	\$ 180,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 3,000	\$ 42,000	\$ 45,000
Year 4 Total Cost	\$ 16,000	\$ 209,000	\$ 225,000
Year 5 (2013)			
12A Rehabilitate Auto Parking and Airport Access Road	\$ 1,000	\$ 19,000	\$ 20,000
13A Construct New 3,000 sq. ft. Terminal Building	\$ 30,000	\$ 570,000	\$ 600,000
14A Design Runway 18-36 Expansion	\$ 8,000	\$ 142,000	\$ 150,000
Year 5 Cost	\$ 39,000	\$ 731,000	\$ 770,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 10,000	\$ 183,000	\$ 193,000
Year 5 Total Cost	\$ 49,000	\$ 914,000	\$ 963,000
Total Phase I Capital Development Cost	\$ 1,144,000	\$ 2,569,000	\$ 3,173,000

(*) Funded through the Missouri State Aviation Trust Fend. Funding share is 90% state and 10% local match.

Note: All costs are rounded to the nearest thousand for planning purposes and are based on current dollar value.

Note: Cost projections are intended for planning purposes only and should not be used as actual construction cost estimates.

Source: BWR.



AIRPORT MASTER PLAN REPORT

Table 7.2
Phase II & Phase III AICP Cost Summary

Project Description	Projected Local Share (5%)	Projected MoDOT/Federal Share (95/100%)	Projected Total Cost (100%)
PHASE II (6-10 Year) ACIP COSTS			
1B Reconstruct Runway 18-36 (5,000' x 75')	\$ 600,000	\$ 9,500,000	\$ 10,000,000
2B Install/Improve Perimeter Fence	\$ 1,000	\$ 24,000	\$ 25,000
3B Rehab. and Expand Parallel Taxiway (5,000' x 35')	\$ 18,000	\$ 332,000	\$ 350,000
4B Rehabilitate and Expand Aircraft Apron (1,400 sq. yd.)	\$ 6,000	\$ 119,000	\$125,000
5B Reconstruct Asphalt T-Hangar Taxilanes	\$ 16,000	\$ 294,000	\$ 310,000
6B Rehabilitate T-Hangar Taxilanes	\$ 3,000	\$ 62,000	\$ 65,000
7B Rehabilitate/Expand Auto Parking Area (1,400 sq. ft.)	\$1,000	\$ 19,000	\$ 20,000
8B Rehabilitate Airport Access Road	\$ 1,000	\$ 14,000	\$ 15,000
9B Construct 10-Unit T-Hangar and Taxilanes	\$ 26,000	\$ 499,000	\$ 525,000
10B Construct 10,000 sq. ft. FBO Hangar	\$ 1,500,000	\$ -	\$ 1,500,000
11B Acquire Tract U-5 (2.79 acres)	Absent Appraised Value These Costs are Not Available		
12B Construct 5,000 sq. ft. Clear Span Hangar (2)	\$ 500,000	\$ -	\$ 500,000
13B Construct 50' x 50' Aircraft/Vehicle Wash Rack	\$ 20,000	\$ -	\$ 20,000
14B Update Airport Master Plan	\$ 9,000	\$ 166,000	\$ 175,000
Phase II Development Cost	\$ 2,601,000	\$ 11,029,000	\$ 13,630,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 650,000	\$ 2,757,000	\$ 3,407,000
Total Phase II Development Cost	\$ 3,251,000	\$ 13,786,000	\$ 17,037,000
PHASE III (11-20 Year) ACIP COSTS			
1C Rehabilitate Runway 18-36 (5,000' x 75')	\$ 8,000	\$ 142,000	\$ 150,000
2C Rehabilitate Taxiway System	\$ 5,000	\$ 95,000	\$ 100,000
3C Rehabilitate/Expand Aircraft Apron (2,200 sq. yd.)	\$ 8,000	\$ 142,000	\$ 150,000
4C Rehabilitate T-Hangar Taxilanes	\$ 4,000	\$ 71,000	\$ 75,000
5C Construct 10-Unit T-Hangar and T-Hangar Taxilanes	\$ 26,000	\$ 499,000	\$ 525,000
6C Rehabilitate/Expand Auto Parking Area (1,600 sq.ft)	\$1,000	\$ 19,000	\$ 20,000
7C Rehabilitate Airport Access Road	\$ 1,000	\$ 14,000	\$ 15,000
8C Construct 5,000 sq. ft. Clear Span Hangar (2)	\$ 500,000	\$ -	\$ 500,000
Phase III Development Cost	\$ 553,000	\$ 982,000	\$ 1,535,000
Engineering, Legal and Administrative Fees (25% of Cost)	\$ 138,000	\$ 246,000	\$ 384,000
Total Phase III Development Cost	\$ 691,000	\$ 1,228,000	\$ 1,919,000
20-YEAR ACIP TOTAL DEVELOPMENT COSTS			
Phase I (0-5 Year) Short-Term Costs	\$ 1,144,000	\$ 2,569,000	\$ 3,173,000
Phase II (6-10 Year) Intermediate Costs	\$ 3,251,000	\$ 13,786,000	\$ 17,037,000
Phase III (11-20 Year) Long-Term Costs	\$ 691,000	\$ 1,228,000	\$ 1,919,000
Grand Total VER ACIP Cost Estimate	\$ 5,086,000	\$ 17,583,000	\$ 22,669,000

Note: All costs are rounded to the nearest thousand for planning purposes and are based on current dollar value.

Note: Cost projections are intended for planning purposes only and should not be used as actual construction cost estimates.

Source: BWR.

SEVEN: CAPITAL IMPROVEMENT PROGRAM

CAPITAL IMPROVEMENT PROGRAM SUMMARY

The 20-year ACIP cost projections for VER, not including direct operational and maintenance expenses, are expected to total approximately \$22.7 million. The anticipated MoDOT/Federal share of capital improvements is expected to total approximately \$17.6 million, while the City's share is estimated to equal nearly \$5.1 million. Of the total ACIP, approximately \$3.3 million in improvements, excluding contingency costs, are ineligible for Federal Airport Improvement Program (AIP) grants and will be fully financed by the City and local investors.

Those projects ineligible for Federal funding include improvements associated with clear span hangar development and FBO/maintenance hangar construction, as well as the construction of the aircraft/vehicle wash rack. Until recently, development projects associated with terminal building and T-hangar design and construction had been ineligible for AIP funds. Currently, AIP funds are eligible to be expended on these revenue generating projects provided that all airfield facility needs are met and in compliance with MoDOT and FAA criteria. Otherwise, these specific capital improvement items will be ineligible due to low prioritization and available AIP funds will be expended on higher priority airfield facility improvements.

The City is expected to expend approximately \$1.1 million during the short-term period, nearly \$3.3 million during the mid-term period, and an additional \$690,000 during the long-term phase of airport development. **Table 7.2** presents the total expected ACIP expenditures during the short, intermediate and long-term planning periods. The recommended financing method (i.e. MoDOT/Federal versus local funding) for ACIP projects is also included within **Table 7.2**.

The following list of capital improvement items coincide with **Exhibit 7.1** in which the 20-year ACIP is presented in a phased format depicting development within the 0-5, 6-10 and 11-20-year planning periods.

Phase I (2009-2013) Capital Improvements

- 1A Design T-Hangar Taxilanes
- 2A Construct T-Hangar Taxilanes
- 3A Construct 10-Unit T-Hangars (2)
- 4A Establish LPV Approach to Runway 36 Threshold
- 5A Perform Environmental Assessment (EA)
- 6A Obstruction Removal / Tree Clearing
- 7A Rehabilitate Runway 18-36
- 8A Rehab. Taxiway System and Expand Parallel Taxiway
- 9A Rehabilitate Aircraft Apron and T-Hangar Taxilanes
- 10A Acquire Tracts U-1 thru U-4 (49.83 acres)
- 11A Design New Terminal Building*
- 12A Rehabilitate Auto Parking and Airport Access Road
- 13A Construct New 3,000 sq. ft. Terminal Building
- 14A Design Runway 18-36 Expansion

Phase II (2014-2018) Capital Improvements

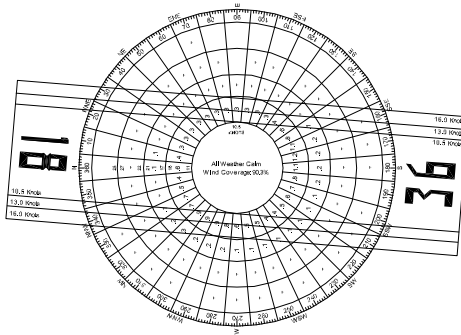
- 1B Reconstruct Runway 18-36 (5,000' x 75')
- 2B Install/Improve Perimeter Fence
- 3B Rehab. and Expand Parallel Taxiway (5,000' x 35')
- 4B Rehabilitate and Expand Aircraft Apron (1,400 sq. yd.)
- 5B Reconstruct Asphalt T-Hangar Taxilanes
- 6B Rehabilitate T-Hangar Taxilanes
- 7B Rehabilitate/Expand Auto Parking Area (1,400 sq. ft.)
- 8B Rehabilitate Airport Access Road
- 9B Construct 10-Unit T-Hangar and Taxilanes
- 10B Construct 10,000 sq. ft. FBO Hangar
- 11B Acquire Tract U-5 (2.79 acres)
- 12B Construct 5,000 sq. ft. Clear Span Hangar (2)
- 13B Construct 50' x 50' Aircraft/Vehicle Wash Rack
- 14B Update Airport Master Plan

PHASE III (11-20 Year) ACIP COSTS

- 1C Rehabilitate Runway 18-36 (5,000' x 75')
- 2C Rehabilitate Taxiway System
- 3C Rehabilitate/Expand Aircraft Apron (2,200 sq. yd.)
- 4C Rehabilitate T-Hangar Taxilanes
- 5C Construct 10-Unit T-Hangar and T-Hangar Taxilanes
- 6C Rehabilitate/Expand Auto Parking Area (1,600 sq.ft)
- 7C Rehabilitate Airport Access Road
- 8C Construct 5,000 sq. ft. Clear Span Hangar (2)



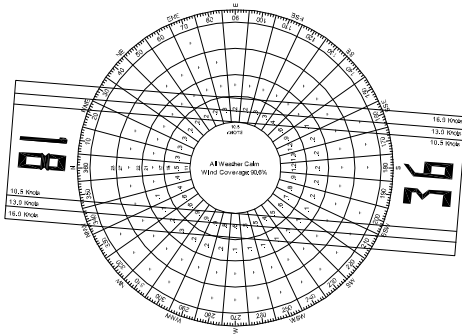
All Weather Wind Rose



Runway	Crosswind Component/ Corresponding ARC	10.5 Knots (A-I & B-I)	13.0 Knots (A-II & B-II)	16.0 Knots (A-III, B-III, C-I to D-III)
Runway 18-36		90.3%	94.6%	98.4%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2025).

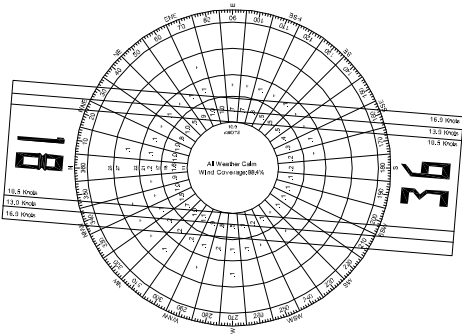
VFR Wind Rose



Runway	Crosswind Component/ Corresponding ARC	10.5 Knots (A-I & B-I)	13.0 Knots (A-II & B-II)	16.0 Knots (A-III, B-III, C-I to D-III)
Runway 18-36		90.6%	94.8%	98.4%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2025).

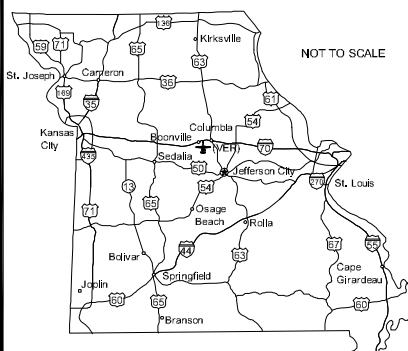
IFR Wind Rose



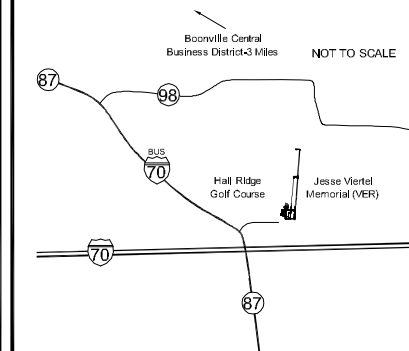
Runway	Crosswind Component/ Corresponding ARC	10.5 Knots (A-I & B-I)	13.0 Knots (A-II & B-II)	16.0 Knots (A-III, B-III, C-I to D-III)
Runway 18-36		88.4%	93.8%	98.7%

Source: National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), Asheville, NC; Columbia Regional Airport (COU), Columbia, Missouri (1985-2025).

Location Map

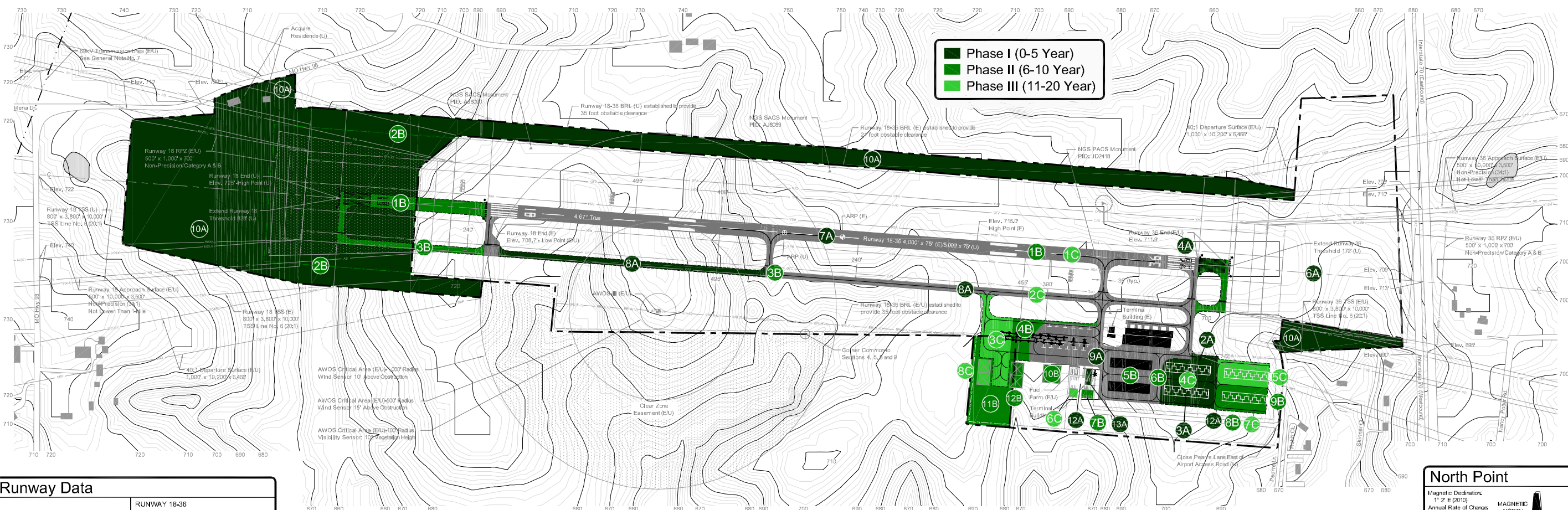


Vicinity Map



General Notes

- See the inner portion of the approach surface drawings (APSD) and airspace drawing for construction/obstacle location and clearance information for the FAR Part 77 airspace, approach and threshold sitting surfaces (TSS).
- The proposed alternative airfield development option involves acquisition of approximately 52 acres in fee simple.
- The proposed alternative airfield development alternative involves the acquisition and relocation of one rural residence located immediately west of MO Hwy 98 north of VER.
- The proposed T-hanger and clear span hangar development takes into account projected demand throughout the planning period and considers demand beyond projected levels.
- Although the recommended ultimate runway length to accommodate projected demand is 4,800 feet, the city has elected to pursue the development of a future 5,000 foot runway.
- The proposed RPZ for the Runway 36 threshold extension does not require property acquisition due to a small portion of the RPZ residing within the right-of-way for Interstate 70.
- 60kV power transmission lines, owned and maintained by Ameren UE, are located approximately 1/2-mile north of the Runway 18 threshold. The top elevation of these powerlines is estimated to be approximately 777 feet above mean sea level (MSL). In order for the future FAR Part 77 34:1 approach surfaces to have clearance over these facilities, the powerlines must be lowered or the ultimate Runway 18 threshold is recommended to have a future end elevation of 725 feet MSL. If neither of these options are feasible, the FAA will have to perform an aeronautical evaluation to determine if the powerlines pose a potential hazard to air navigation. The plan currently depicts the ultimate end elevation at 725 feet MSL to meet runway longitudinal grading standards. This end elevation will result in the powerlines penetrating the 34:1 approach surface by three feet.



Phase I (0-5 Year)
Phase II (6-10 Year)
Phase III (11-20 Year)

Runway Data

RUNWAY DETAILS	RUNWAY 18-36	
	EXISTING	ULTIMATE
Runway Reference Code (ARC)	18 36	18 36
Runway Azimuth	184.87° True, 4.67° True	Same
Runway Dimensions	4,000' x 75'	5,000' x 75'
FAR Part 77 Approach Use Type	NP	NP
Aeronautical Survey Required for Approach	NVG	NVG
Approach Visibility Minimums	1-Mile	1-Mile
Approach Slope	34:1	34:1
Runway Safety Area (RSA)	4,600' x 150'	5,600' x 150'
Runway Object Free Area (OFA)	4,600' x 500'	5,600' x 500'
Runway Obstacle Free Zone (OFZ)	4,400' x 400'	5,400' x 400'
Runway Pavement Strength (Thousands of lbs.)	12,500 (SW)	30,000 (SW)
Runway Pavement Material	Asphalt	Same
Runway Markings	NP	NP
Runway Gradient	-.08%	-.08%
Runway Lighting	M/RU/REIL	Same
Taxiway Lighting	Reflectors	M/TL
Taxiway Width	35'	Same
NAVAIDS	GPS/VOR	GPS/VOR
Approach Visual Aids	PAPI/ML	PAPI/ML
Touchdown Zone Elevation (TDZE)	715.0'	725.0'
Takeoff Run Available (TORA)	n/a	Same
Accelerate-Stop Distance Available (ASDA)	n/a	Same
Landing Distance Available (LDA)	n/a	Same
Takeoff Distance Available (TODA)	n/a	Same

Runway End Coordinates

THRESHOLD	EXISTING	ULTIMATE
Runway 18	38-57-07.92 N, 92-40-55.95 W	38-57-16.08 N, 92-40-54.70 W
Runway 36	38-56-28.52 N, 92-40-59.67 W	38-56-26.82 N, 92-40-59.85 W

Airport Data

AIRPORT INFORMATION	EXISTING	ULTIMATE
Airport Elevation- Mean Sea Level (MSL)	715.0'	725.0'
Airport Reference Code (ARC)	B-I	Same
Critical Aircraft	Boeingcraft Super King Air 350	Cessna Citation Encore (Model 580)
Airport Reference Point (ARP)	38-56-48.20 N, 92-40-57.50 W	38-56-51.45 N, 92-40-57.28 W
Instrument Approach Procedures	(RNAV)GPS-VOR	(RNAV)GPS-LPV
Mean Maximum Air Temperature	80° F	Same
Weather Reporting System	AWOS-III	Same
Airport Electronic Aids	Rotating Beacon	Same
NPIAS Category	General Aviation	Same
Range and Township/ Sections	T48N, R16W/ 4, 8 and 9	T48N, R16W/ 4, 5, 8 and 9
FAA Site Number	11561, 01A	Same
County	Cooper (MO)	Same
Total Acreage (Fee Simple & Easements)	206.611	259.231 (See Sheet 10 of 11)
1. Datum: Coordinate System-FIPS M0053 (Cooper Co.); NAD83 State Plane Zone = 2402 (Transverse Mercator) Central Zone); FIPS State Code MO 28 NAVD83.		

NGS Survey Monuments

PID NO.	DESIGNATION	GEODETIC COORDINATES	MARKER	ELEV.
PACS JD2418	X 330	38-56-33.42 N, 92-41-03.19 W	SR	715.66 feet
SACS AJ 8089	VER A	38-56-48.96 N, 92-40-52.57 W	HCD	737.10 feet
SACS AJ 8030	VER B	38-57-05.52 N, 92-40-50.86 W	HCD	709.90 feet

Modifications to Airport Design Standards

None Required

Threshold Siting Surface Object Penetrations

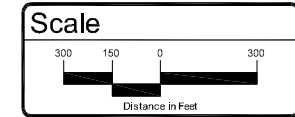
There are existing TSS object penetrations. See Sheets 4, 5 and 6 for further details.

Obstacle Free Zone (OFZ) Object Penetrations

There are no existing OFZ object penetrations.

Legend

EXISTING	ULTIMATE	DESCRIPTION
--- BRL (E-U) ---	--- BRL (E-U) ---	Airport Pavement Areas
--- RSA ---	--- RSA(U) ---	Structures
--- OFA ---	--- OFA(U) ---	Airport Property Line
--- RPZ ---	--- RPZ(U) ---	Building Restriction Line (BRL)
--- OFZ ---	--- OFZ(U) ---	Runway Safety Area (RSA)
--- DEP ---	--- DEP(U) ---	Object Free Area (OFA)
--- AS ---	--- AS(U) ---	Runway Protection Zone (RPZ)
★	★	Obstacle Free Zone (OFZ)
--- AS ---	--- AS(U) ---	4:1 Departure Surface
--- AS ---	--- AS(U) ---	Part 77 Approach Slope Surface
★	★	Rotating Beacon
--- PAPI ---	--- PAPI(U) ---	Precision Approach Path Indicators (PAPI)
--- REIL ---	--- REIL(U) ---	Lighted Wind Cone/Segmented Circle
--- REIL ---	--- REIL(U) ---	Runway Threshold Lighting
--- REIL ---	--- REIL(U) ---	Runway End Indicator Lights (REIL)
--- FENCE ---	--- FENCE ---	Fence
--- AWOS ---	--- AWOS ---	AWOS-III Station
--- EASEMENT ---	--- EASEMENT ---	Ultimate Property Acquisition
--- EASEMENT ---	--- EASEMENT ---	Easement



North Point
Magnetic Declination: 11° 2' E (2010)
Annual Rate of Change: 0° 7' W
MAGNETIC NORTH
TRUE NORTH

Sponsor Approval Stamp

For Approval by:
The City of Boonville, Missouri
Signed by: _____ Dated: _____
The Honorable Dave Nicholas
Mayor

ALP Revisions

NO.	DESCRIPTION	DATE	REVISED BY	APPROVED BY

BWR
Right in the Center
903 East 104th Street | Suite 900 | Kansas City, Missouri 64113-3451
P 816.363.2596 | F 816.363.0027

JESSE VIERTEL MEMORIAL AIRPORT (VER)
City of Boonville, Missouri
AIRPORT LAYOUT DRAWING
Exhibit 7.1-Phased Development Plan

BWR PROJECT NO. 2008-0352.01
MODOT PROJECT NO. 08-039A-1
DRAWN BY MAW
CHECKED BY MAW
DESIGNED BY MAW
REVISIONS DATE
SUBMITTAL DATE 02/16/2010
SHEET 1 OF 1



CHAPTER EIGHT

FINANCIAL PROGRAM

INTRODUCTION

Financing VER's 20-year capital improvement program can be accomplished through a variety of resources and by utilizing a combination of Federal, state and local funding methods. These include the FAA's Airport Improvement Program (AIP); MoDOT, Aviation Sections, State Aviation Trust Fund; State Transportation Assistance Revolving (STAR) Fund loan program; as well as revenue bonds, private investments, airport revenues, and budgeted allocations from the City. This chapter will discuss these alternative methods, highlight options and guidelines in generating revenue at the Airport, as well as provide an evaluation of the Airport's revenues and expenditures.



CAPITAL IMPROVEMENT FUNDING SOURCES

Federal Airport Improvement Program (AIP)

Originally authorized by the Airport and Airway Improvement Act of 1982, the AIP program is funded through the Airport and Airway Trust Fund (enacted by legislation in 1970), which receives 100 percent of its funding from aviation-generated user fees including passenger and facility fees, as well as cargo and fuel taxes. The AIP provides Federal entitlement and discretionary funding grants to be used for AIP eligible projects at public use airports that serve primarily general aviation.

Non-Primary Entitlement Funds

Alternative A considered the Non-primary entitlement (NPE) funds are specifically for general aviation airports listed within the latest published National Plan of Integrated Airport Systems (NPIAS) that show a justified need for airfield and terminal area improvements. During any fiscal year in which the total amount of system-wide apportionments from the AIP and Aviation Trust Fund exceeds \$3.2 billion dollars, the current reauthorization act allots non-primary entitlement funds to be allocated to VER in the amount of \$150,000 per fiscal year, or 20 percent of the total five-year NPIAS improvements, whichever is less. NPE funds are available during the initial year of allocation, as well as the next three fiscal years. Unused entitlement funds will expire if not obligated under a grant after four years.

The Federal portion of AIP grants eligible to fund capital improvements is currently 95 percent with the remaining five percent of development costs to be funded through local sources and/or third-party investments.

Table 8.1 lists eligible and ineligible improvement projects as they relate to Federal AIP funding guidelines.

Table 8.1

AIP Eligible and Ineligible Projects

Eligible AIP Projects

- Runway Improvements
- Taxiway Improvements
- Apron Improvements
- Airfield Pavement Maintenance
- Airfield Lighting / Signage
- Airport Master / Layout Plans
- Environmental Studies
- Access Roads Located on Airport Property
- Mitigating Obstructions / Hazards to Navigation
- Drainage Improvements
- AWOS Facilities
- Land Acquisition for Eligible Development
- Tree Clearing in Approach Surfaces
- NAVAIDs
- Hangar Development*
- Terminal Building Development*
- Fuel Farms*

Ineligible AIP Projects

- Mower, Sweepers, Trucks, Office Equipment
- Automobile Parking Lots
- Industrial Park Infrastructure and Buildings
- Business and Marketing Plans
- Training of any Kind

(*) These items are eligible for AIP funds only when all airfield facility needs are met and in compliance with FAA planning criteria. Otherwise, they are ineligible AIP projects due to low prioritization.

Source: BWR.

Discretionary Funds

There are two types of Discretionary funds. The first, Set-Aside Funds, are reserved for noise compatibility planning and implementing noise compatibility programs. The second type of discretionary funds includes those that are remaining after the apportionments are made and set-asides are accommodated. Of these remaining funds, 75 percent is reserved for preserving and enhancing capacity, safety, security, and carrying out noise compatibility planning and programs at primary and reliever airports. The remaining 25 percent of the funds are known as remaining, or pure discretionary, and may be used at any airport for any AIP eligible improvement project.

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State Aviation Trust Fund

The Missouri State Aviation Trust Fund is the primary state-funded source for capital improvement and maintenance projects on public-use general aviation airports in Missouri. Eligible projects include airfield and terminal area improvements, which exclude revenue producing facilities and vertical structures, that are included within the current five-year State Transportation Improvement Program (STIP). The Trust Fund is funded with state 100LL and Jet A fuel taxes and has an annual cap of \$10 million. The Trust Fund portion of grants for eligible improvement projects is 90 percent while the remaining 10 percent of improvement costs are to be funded through local revenue sources.

State Transportation Assistance Revolving (STAR) Fund

The STAR Fund was created by the Missouri General Assembly and is administered by the Missouri Transportation Finance Corporation (MTFC) in an effort to assist with the planning, development and construction of non-highway transportation facilities. The MTFC provides STAR loans at a maximum of \$500,000 to \$550,000 per grant depending on the fund's reserve. Additionally, the MTFC will fund up to 50 percent of the airport sponsor's share toward an AIP funding grant, or 2.5 percent. STAR loans received from the MTFC are to be amortized over a period of 10 years or less and offer competitive interest rates. The typical interest rate for a 10-year STAR loan is approximately three percent.

Third-Party Development

Third party financing may be appropriate in the case where the City would use a third party developer or tenant to finance construction projects. In this case, the third party would lease the structure for a period of years to the tenant paying the airport ground leases. According to the terms of the agreement, the City receives ownership of the asset upon expiration of the lease. This method of financing preserves the City's cash to fund higher priority projects. Examples of projects that are funded in this manner include the development of T-hangars, private and/or corporate clear span and FBO/maintenance hangars.

Bonds

A variety of bonds can be issued to support airport development projects.

General Obligation (GO) Bonds

GO Bonds are backed by the creditworthiness and taxing power of the municipality operating the airport. They usually bear low interest rates because of their high degree of security. However, state laws may limit a municipality's overall debt, and competition from other community financing requirements may preclude their use for an airport project. Some states have an exemption from the debt limitation rule for general obligation bonds because they are used for a revenue producing enterprise.

Revenue Bonds

Revenue bonds pledge the revenues of an airport sponsor to the repayment of debt service. These are the most common sources of funding at larger commercial service airports. Revenue bonds are popular because they do not burden the taxpayer or affect the bonding capacity of the municipality. However, their use is limited to airports with a sufficient operating surplus to cover the debt service. Projected Net Revenues must exceed debt service requirements by at least 1.25 times and up to 2.0 times, depending on the strength of the bond issuer and the underlying assumptions with respect to the market risk for the bonds. Interest rates are dependent on the coverage ratio, but in any case will be higher than for general obligation bonds. Other factors that may affect the interest rates on revenue bonds are the strength of the local passenger market and the financial condition of the airlines serving the market.

Special Facility Revenue Bonds

Special Facility Revenue Bonds are normally issued by the airport sponsor for the construction of a facility for a third party and backed by the revenues generated from that facility. This method of funding can be used for such facilities as maintenance hangars, airline reservation centers, terminal buildings, and air cargo terminals.

Industrial Development Bonds (IDB)

IDBs can be issued by states, local government, or an airport authority to fund the construction of an airport industrial park or other facilities that may attract business and increase non-aeronautical leasing revenues at the airport.



AIRPORT MASTER PLAN REPORT

Local Funds

The remaining portion of project costs must be funded largely from local sources including airport revenue. The local share of project costs can come from the annual cash flow at the Airport or with cash balances available to the airport sponsor. The City may also provide funding for improvement projects for the local share from its annual cash flow or available cash reserves.

AIRPORT REVENUE SOURCES TO FUND CAPITAL IMPROVEMENTS

As a condition of accepting Federal AIP funds, VER is required to maintain a fee structure that, in the circumstances of the Airport, allows it to be as financially self-sustaining as possible. Therefore, the City and Airport are required to abide by accepted principles applicable to airport rates and charges. This also includes the ability and willingness to assess fair and reasonable fees for use of the facility and prohibit unjust discrimination against any class of user or aircraft type. Lastly, exercising good faith in governing revenue collection and use is important.

VER benefits the community through rapid, accessible and convenient transportation including emergency services availability, as well as economic activity generated by the Airport. These benefits are diffused throughout the region, thereby providing a common welfare to the local community. At the same time, the facility encourages the exchange of goods and services supporting the notion that the Airport is a business enterprise and should be self-sustaining. With the assistance of AIP funds, coupled with fair and equitable rates and charges reflective of realities of supply and demand, VER's ACIP can be carried out in a feasible and reasonable manner that will benefit the Airport and the local community.

The following discussion concentrates on established practices regarding administering a rates and charges program to optimize the return on VER's revenue centers. These revenue centers, or services, are those in which VER will, or currently do, provide to current and potential airport users. These services include T-hangar and clear span hangar rental space; tie-down aircraft storage;

terminal building rental space for a Fixed Based Operator (FBO) or aviation related on-airport businesses; potential commercial/industrial/business lease rates; aircraft landing fees; and fuel flowage fees.

City or Private Owned T-Hangar Revenue

Rental rates for T-hangars can be established based on an appraisal rate or rate per square foot. The appraisal rate formula involves appraising the value of the land at the facility. The rate would be a percentage of the appraised value of that portion of land supporting the structure sufficient to equal the appraised value and to allow debt service obligations. Conversely, a rate per square foot can be a fixed rate or tied to the value of the land appraisal. For both methods, regular appraisals are recommended so that rates can reflect the increase in the value of the land as the facility grows. Additionally, as maintenance and operational costs increase, lease agreements are recommended to include escalation clauses to recover these costs for improvements and amortization. Where the structure is owned by a private entity, the tenant is recommended to be responsible for maintenance of the structure, as well as a specific amount of land adjacent to the structure.

Clear Span Hangar Revenue

The rental rate for these facilities can be based on an appraisal rate or rate per square foot. Additionally, various hangar rental rates can be based on the structure's locational advantages and its rental rates adjusted accordingly. Escalation clauses within the lease agreements are recommended in order to recover maintenance and operational costs as well as amortization. Maintenance clauses, as discussed above, are also recommended as part of these lease agreements.

On-Airport Industrial /Commercial Business Revenue

Airport property is not to be released, transferred or sold for private, industrial or commercial uses. The Airport is recommended to lease land for such uses to desirable tenants in order to provide continuous income for the Airport. As is common for most general aviation airports, commercial/industrial facilities charges include a fixed rate (appraisal or rate per square foot) plus a percentage of sales. Percentage of sales most generally applies to commercial business, including restaurants or aircraft maintenance providers, that deal in sales while industrial establishments, not relying on local sales for revenue, provide fixed rate fees plus operational and maintenance costs through escalation clauses as part of the lease agreement. These rate structures allow the Airport to benefit from the success of the businesses located there. The businesses

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realize revenues due to the Airport providing the necessary facilities which enable their business to exist and prosper. Additional improvements to the Airport, as provided by the City, will only enhance each firm's business outlook. In essence, the businesses are sharing in the cost of improvements in proportion to the financial success they experience as a result of the City's investment in the Airport. Maintenance clauses, as well as insurance clauses (if applicable), are also recommended as part of these lease agreements.

Businesses located at VER now and in the future are recommended to abide by established minimum performance standards, included as part of the lease agreement, which ensure that necessary services are provided and that the quality of services adequately promotes the Airport's image.

Terminal Building Lease Revenue

Potential FBO and aviation service providers that might occupy space in the terminal building are recommended to be charged a fixed rate (rate per square foot) plus a percentage of sales fee structure, as is common for general aviation airports. Maintenance and escalation clauses, as well as minimum performance standards, are recommended to be included as part of a lease agreement.

Landing Fee Revenue

It is recommended that the City establish landing fees by utilizing a compensatory model of rates and charges determination. In this approach the user (large aircraft weighing in excess of 12,500 pounds maximum gross weight) is charged based on their actual use of the facility from which they derive a benefit. A fee is levied against the user to cover the corresponding expenses to maintain and operate the facility. The rate of the landing fee is based on the aircraft operator's prorated share of occupancy or usage. This share of usage may be based on the total weight of the aircraft or annual operational activity. A landing fee for large aircraft operators might be classified under an alternative term such as a ramp fee. In the event that the aircraft operator purchases a minimum amount of fuel, the FBO may elect to waive a landing fee.

Fuel Flowage Revenue

As is common for most general aviation airports, fuel flowage revenue includes either a fixed fee per gallon of fuel dispensed or a percentage of total sales. This percentage may be quarterly, bi-annually or annually. An alternative method for determining an appropriate fuel royalty/flowage fee might include instituting a graduated percentage of gross fuel revenue collection method

in lieu of a fixed fuel flowage fee to allow for seasonal fluctuations, economic conditions, or principles of supply and demand. As with any other commercial businesses based at the airport, fuel flowage fees are necessary because the proprietor derives a benefit from airport operation and should compensate the City accordingly. Escalation clauses for a fixed rate fee, as well as minimum performance standards, are recommended to be included as part of the lease agreement.

Equipment Use Revenue

Just as landing fees are levied against aircraft for utilization of the runway facilities, so, too, should aircraft operators and airport users be charged a fee for use of airport equipment. In particular, ground power units (GPU) are often required for larger, more sophisticated aircraft that do not have an auxiliary power unit (APU) to power electrical components while the aircraft is shut down but still requires electrical power. Additionally, portable heaters used to pre-heat the aircraft during periods of cold weather before startup, as well as other items such as aircraft tugs, can be assigned specific costs for each use by aircraft operators.

Aircraft Parking/Tie-Down Revenue

A fixed fee for aircraft tie-downs is recommended to be administered on a daily, weekly, monthly and annual basis. The fixed fee may take into account the size of aircraft based on its prorated share or occupancy of the aircraft apron.

The locally funded share of VER's 20-year ACIP is expected to total approximately \$5.1 million provided it is adopted and carried out as illustrated within this master plan. Of that amount, approximately \$3.3 million will be expended with local-only funds that will most likely be funded through the use of third private investments, airport revenues derived from the Airport's highlighted revenue centers, and/or revenue bonds. The remaining \$1.8 million, or an average of approximately \$90,000 per year throughout the 20-year period, will be financed through a combination of local and Federal AIP funding grants.

CASH FLOW ANALYSIS

An analysis of Airport revenues and operating and maintenance (O&M) expenses for the prior five fiscal years (FY2005-FY2009) was completed in an effort to highlight and evaluate financial trends at VER. It should be noted, the City's fiscal year runs from April 1 through March 31.



AIRPORT MASTER PLAN REPORT

Operating Revenues

Table 8.2 indicates that revenues from FY2005-FY09 have exceeded expenses, on average, by approximately \$22,300. From FY07 to FY09 revenues outpaced expenses by an average of \$36,200. During this timeframe VER had net revenues slightly more than \$694,000.

The largest revenue centers for VER are fuel sales and hangar rental which is common for most general aviation airports. During FY 08 and FY09 these revenue centers accounted for nearly \$348,100 annually, which totals approximately 98 percent of annual revenues. Overall, revenues at VER have increased at an aggressive rate of approximately 17 percent annually and averaged \$138,800.

Operating Expenses

As indicated in **Table 8.2**, Airport expenses over the five fiscal years have increased, on average, by approximately 12.5 percent and averaged approximately \$116,500. During this timeframe VER had expenses totaling slightly more than \$582,600. As is typical with many general aviation airports, salaries, utilities, fuel supply contracts and insurance premiums account for the bulk of financial liabilities, as is the case at VER.

Net Airport Income from Operations

By comparing VER's revenues and expenditures, the Airport's overall financial condition can be determined in the form of net revenues or negative net incomes.

During fiscal years 2005 through 2009, VER's net income from airport operation resulted in, on average, a surplus of approximately \$22,300, or \$111,500 throughout the period. During the same timeframe, revenues outpaced expenses by approximately 4.7 percent annually as indicated in **Table 8.2**.

CASH FLOW RECOMMENDATIONS

The following general recommendations are provided as a guide to assist the city with maximizing revenues and decreasing expenses in an effort to ensure the Airport continues to operate as a financially self-sustaining facility.

VER's revenues are expected to increase throughout the planning period in relation to the facility's projected aviation demand. Additional based aircraft, local and transient operational activity and lease revenues from development of and T-hangars and clear span hangars will translate into additional revenues for the Airport. Increased flight activity and based aircraft, both piston and turbine, will also translate into additional fuel sales.

Revenues, through collection of fees, rates and charges, are anticipated to increase proportionately with the consumer price index (CPI), historical trends and conditions at the time. Additionally, for fees that are considered so low as to be unable to contribute to the Airport's financial self-sufficiency, actions are recommended to be undertaken to bring these fees and charges up to current market standards so that

Table 8.2
Operational Revenues and Expenditures Summary, FY2005-FY2009

Budget Item	FY05	FY06	FY07	FY08	FY09
Operating Revenues*	\$ 86,859	\$ 88,000	\$ 165,698	\$ 160,937	\$ 192,649
Operating Expenses**	\$ 89,992	\$ 82,000	\$ 107,992	\$ 107,992	\$ 162,626
Net Airport Income	(\$3,133)	\$ 6,000	\$ 57,706	\$ 57,706	\$ 30,023

(*) Includes hangar rent, tie-down rent, fuel sales and FBO services.

(**) Includes, among other expenses, salaries and workers compensation; operating, janitorial and office supplies; building, grounds, auto and equipment maintenance; fuel supply contract; and insurance.

Source: BWR.

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both the Airport and user derive a benefit from airport operation.

Lease rates for existing and future clear span, FBO/ maintenance and T-hangars are recommended to range from \$0.12, \$0.18 or \$0.24 per square foot per year and be based on factors such as availability of and proximity to utilities, location within the terminal area adjacent to a taxiway/taxilane or apron, and/ or lease rates within the region that are considered competitive.

As with airport revenues, airport expenses are also expected to increase proportionally with current costs and will largely be based on fluctuating CPI levels, competition from other airports located in the region as well as availability and level of aviation services from those facilities throughout the planning period.

The costs of fuel supply contracts, debt service on construction of both T-hangars and clear span hangars, runway reconstruction, as well as the development of a new passenger terminal building, will pose the greatest financial burden on the City over the next 20 years. By practicing sound financial planning practices, the City will be in the position to plan for allocating appropriate city funds to meet Federal and state grant matches involved with airfield and terminal area development. This will help ensure airport general fund budgets are allotted the required dollar amounts so that VER's expense center budgets are not exceeded.

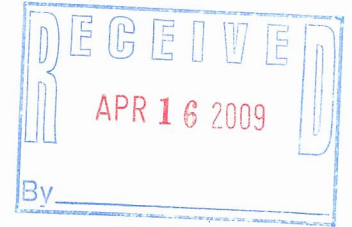




APPENDIX A

***ENVIRONMENTAL
OVERVIEW AGENCY
RESPONSES***



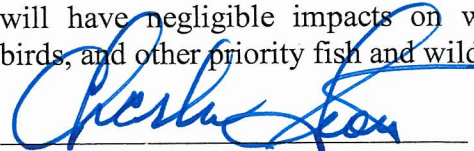


April 10, 2009

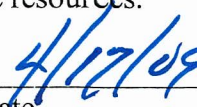
Mr. Charles Scott, Field Supervisor
U.S. Fish & Wildlife Service
Columbia Field Office
101 Park De Ville Drive #A
Columbia, MO 65203-0007

Re: Jesse Viertel Memorial Airport Master Plan Update
City of Boonville, MO
Environmental Overview
MoDOT No. 08-039A-1/BWR No. 2008-0352.01

“The U.S. Fish and Wildlife Service (Service) has reviewed the proposed action and determined that no federally listed species, candidate species, or designated critical habitat occurs within the project area. Furthermore, the Service has determined that this action will have negligible impacts on wetlands, migratory birds, and other priority fish and wildlife resources.”



Field Supervisor



Date

Dear Mr. Scott:

An environmental overview is being prepared for the City of Boonville as part of that city's airport master plan update which includes airfield and terminal area expansion and property acquisition for the Jesse Viertel Memorial Airport (VER). Additional information pertinent to the project site includes the following:

- Airport Reference Point (ARP): 38-56-48.2 N, 92-40-57.6 W
- County: Cooper
- USGS 1:24,000 Topo Quad Name: Boonville
- Township/Township & Range/Section: Boonville Township/T48N, R16W/ Sections 4, 8 and 9
- Exhibit Nos. (enclosed) 4.1 and 4.2

To further assess and evaluate the preferred development alternative and proposed airport improvements, environmental coordination is being assembled based on the ultimate design concept as depicted in the enclosed exhibits. The major capital development projects submitted for purposes of assessing the existing site include:

- Extend Runway 18-36 1,000 feet to the north and south to total a usable length of 5,000' x 75'
- Expand terminal area to the north and south of the existing terminal area complex
- Acquire 49 acres in fee simple and 32 acres of easement to the north, south and west of the airport
- Acquire one residence to the north of the airport and adjacent to MO Highway 98

An assessment of your analysis regarding compliance and permitting requirements pertaining to the above stated capital improvements would be greatly appreciated at your earliest possible convenience, preferably within thirty (30) days of receipt of this letter. Thank you in advance for your assistance and attention in this matter. Should you have any questions, comments, or require additional information please feel free to contact us at 800.748.8276.

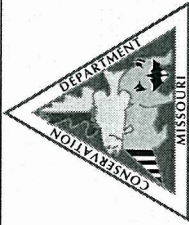
Best regards,

BUCHER, WILLIS & RATLIFF CORPORATION


Mike Waller, CM
Project Manager, Airport Planning Group

Enclosure(s)

BUCHER, WILLIS & RATLIFF CORPORATION
903 East 104th Street, Suite 900 | Kansas City, Missouri 64131-3451 | P 816.363.2696 | F 816.363.0027 | www.bwrcorp.com



Missouri Department of Conservation Heritage Review Report

April 20, 2009; page 1 of 2

Policy Coordination Unit
P. O. Box 180
Jefferson City, MO 65102
Prepared by: Shannon Cave
shannon.cave@mdc.mo.gov
573-522-4115X3250

Mike Waller, CM
Bucher, Willis & Ratliff Corp
903 East 104th St Suite 900
Kansas City, MO 64131-3451

Project type: Airfield and Terminal Area Expansion
Location/Scope: Township 48 N, Range 16 W, Sections 4, 8 and 9
County: Cooper
Query reference: MoDOT No. 08-039A-1/BWR No. 2008-0352.01
Query received: April 16, 2009

[Handwritten signature]
4-20-2009

This NATURAL HERITAGE REVIEW is not a site clearance letter. Rather, it indicates whether or not public lands and sensitive resources are known to be located close to and potentially affected by the proposed project.

FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act. Consult with the U.S. Fish and Wildlife Service (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132), STATE ENDANGERED species are listed in and protected under the Wildlife Code of Missouri (3CSR10-4.111).

Records of federal-listed or state-listed (endangered) species or critical habitats near the project site:
Heritage records identify no wildlife preserves, no designated wilderness areas or critical habitats, and no state- or federal-listed endangered species records within one mile of the site, or in the public land survey sections listed above, or in sections touching them. The nearest records are species in the Missouri River and unlikely to be affected.

Heritage records were identified at some date and at a more or less precise location. This report includes information about records near but not necessarily on the project site. Animals move and, over time, so do plant communities. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean the project will not encounter something not recorded. On-site verification is the responsibility of the project. Incorporating information from Heritage records into plans can help reduce adverse impacts to sensitive natural resources. However, these records only provide one reference and other information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Compare biological and habitat needs of records listed to planned project activities to avoid or minimize impacts. More information may be found at www.mdc.mo.gov/nathis/endangered/ and www.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx. Find contact information on the department's nearest Natural History Biologist at <http://www.mdc.mo.gov/nathis/contacts/>.

Records of unlisted species/habitats of conservation concern near the project site:
There are also no records of sites with species of concern that are tracked due to their rarity but not listed as endangered.

The state tracks many species not listed as endangered, but sufficiently rare or challenged that special efforts to conserve them may be important to their survival and to avoid future listing.

Recommendations related to this project or site (not to specific heritage records):

- The project area is in region with known karst geologic features (e.g. caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are species of conservation concern) are influenced by changes to water quality, so check your project site for any karst features and make every effort to protect groundwater in the project area. See http://mdc.mo.gov/nathis/caves/manag_construc.htm for best management information.
- Indiana bats (*myotis sodalis*, federally and state listed "endangered") hibernate during winter months, in caves primarily in the southern half of Missouri. They spend summer months, primarily north of the Missouri River, roosting and raising young under the bark of trees in riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats,

especially from September to April. If large trees with loose bark need to be removed by your project, that should be done between October and March. Additional information to incorporate in planning documents is available at <http://mdc.mo.gov/110>.

- Construction should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any "Clean Water Permit" conditions. Project design should include stormwater management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza.
- Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats. Best management recommendations relating to streams and rivers may be found at <http://mdc.mo.gov/79>.
- Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment, so inspect and clean equipment thoroughly before moving between project sites. Especially important at this time is the zebra mussel, known in the Missouri and Mississippi Rivers and Lake of the Ozarks, but missing from many inland streams and most lakes.
- ◆ Remove any mud, soil, trash, plants or animals before leaving any water body or work area.
- ◆ Before leaving a project site, drain water from boats and machinery (that has operated in the water), checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- ◆ When possible, wash and rinse equipment thoroughly with hard spray or HOT (104° F or more) water, like that found at a do-it-yourself carwash and dry in the hot sun before using again. Please help prevent the spread of invasive species by inspecting and cleaning equipment thoroughly before moving between project sites.

These recommendations are ones project managers might prudently consider based on a general understanding of species needs and landscape conditions. Heritage records largely reflect only sites visited by specialists in the last 30 years. This means that many privately owned tracts could host remnants of species once but no longer common.

Project managers can pre-screen heritage review requests at <http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm>. A "level 1 response" will result in a printable document that will make further submission to MDC or USFWS unnecessary.

RECEIVED
APR 22 2009
MDC/WR
MANAGEMENT

United States Department of Agriculture



Natural Resources Conservation Service
6465 Highway 168 Suite C
Palmyra, MO 63461

April 21, 2009

Mike Waller
Butcher, Willis, & Ratliff Corp.
903 East 104th Street, Suite 900
Kansas City, MO 64131-3451

As requested, I have reviewed the plans for the air field and terminal area expansion and property acquisition at the Jesse Viertei Memorial Airport for the city of Boonville, MO. This project does not appear to cause a loss of Prime or Statewide Important Farmland. I offer the following information for consideration:

1. Background Information-In 1981, the U.S. Congress passed the Farmland Protection Policy Act (FPPA) which directs USDA through NRCS to provide technical assistance to Federal agencies, and State and local governments or organizations that desire to develop programs or policies to limit the conversion of productive farmlands to non-agricultural uses.
2. The Goal of FPPA is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of important farmland to nonagricultural uses.
3. Review of the Proposed Project-The hangar and taxi lanes repairs will be done on existing airport area and will not cause a conversion of productive farmlands to non agricultural uses. This determination is based on the design information in the report that you mailed with your request. If you need a detailed farmland conversion impact rating, I will need more detailed information. Contact me for more information.
4. Other Considerations-The NRCS is also concerned about negative impacts to wetlands. Our agency works with USDA program participants to minimize project impacts to wetlands. The U.S. Army Corps of Engineers (COE) regulates activities in all wetlands under the provisions of the Clean Water Act. This project may require a permit from the COE.

If you have any questions, please call me (573) 769-3512 ext. #133.

Sincerely,

A handwritten signature in cursive script that reads "Gary M. Noel".

Gary M. Noel
Area Soil Scientist

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APR 24 2009

BWR
KANSAS CITY, MISSOURI

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.



Jeremiah W. (Jay) Nixon, Governor • Mark N. Templeton, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

APR 24 2009

Mr. Mike Waller, CM
Project Manager
Airport Planning Group
Bucher, Willis & Ratliff Corporation
903 East 104th Street
Suite 900
Kansas City, MO 64131-3451

Re: Jesse Viertel Memorial Airport Master Plan Update

Dear Mr. Waller:

After review of your letter of April 10, 2009, the Missouri Department of Natural Resources' Air Pollution Control Program would like to for you to beware of two areas of interest.

First, if any buildings are to be demolished or renovated during this project, you will need to ensure that these activities are in compliance with federal and state rules regarding asbestos.

Second, if any burning is to be conducted, it must be permitted through the Department's Northeast Regional Office located at 1709 Prospect, Macon, MO 63552.

If you have any questions, please contact me at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in blue ink that reads "Steven Feeler".

Steven Feeler
Compliance/Enforcement Section Chief

SSF:smf



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
STATE REGULATORY PROGRAM OFFICE - MISSOURI
221 BOLIVAR STREET, SUITE 103
JEFFERSON CITY, MISSOURI 65101

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MAY 14 2009

BWR
KANSAS CITY, MISSOURI

REPLY TO
ATTENTION OF:

May 11, 2009

Missouri State Regulatory Office
(2009-00571)

Mr. Mike Waller, CM
Airport Planning Group
Bucher, Willis & Ratliff Corporation
903 East 104th Street, Suite 900
Kansas City, Missouri 64131-3451

Dear Mr. Waller:

This letter is in response to your inquiry, submitted on behalf of the City of Boonville, received April 16, 2009, requesting a Department of the Army (DA) permit determination regarding the acquisition of property adjacent to the Jesse Viertel Memorial Airport for the extension of runway 18-36 1,000 feet to the north and south to a total usable length of 5,000-feet by 75-feet. The improvements also consist of expanding the terminal area to the north and south of the existing terminal area complex. The project is located in Section 5, Township 48 North, Range 16 West, in Cooper County, Missouri.

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (Title 33 United States Code Section 1344). The implementing regulation for this Act is found at Title 33 Code of Federal Regulations Parts 320-332.

According to U.S.G.S. 7.5 Minute Topographic Map (Boonville, MO Quadrangle), there is a blue line stream with intermittent hydrology that crosses the existing runway within the identified radius. Should the proposed improvements require the discharge of dredged or fill material in the unnamed tributary of Petite Saline Creek, including wetlands, a (DA) permit may be required. However, if the proposed improvements do not require the discharge of dredged or fill material in the unnamed tributary of Petite Saline Creek, including wetlands, a DA permit will not be required.

Should the proposed work require a DA permit, the following information is needed to process your application:

- 1.) Provide a dimensioned plan view and cross section of the proposed work, being sure to label any areas of proposed excavation.

- 2.) Provide information regarding the nature of the activity and overall project purpose.
- 3.) Provide information on the type and amount of fill materials that may be discharged within the unnamed tributary of Petite Saline Creek.
- 4.) Dimension the length and width of any proposed fill in the unnamed tributary of Petite Saline Creek.

Federal regulations require that a DA permit be issued by the Corps of Engineers prior to the initiation of any construction on the portion of a proposed activity which is within the Corps' regulatory jurisdiction.

Enclosed is a copy of our brochure entitled "Activities Requiring Permits."

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. We have placed an automated version of our Customer Service Survey form at: <http://per2.nwp.usace.army.mil/survey.html>. At your request, we will mail you a paper copy that you may complete and return to us by mail or fax.

If you have any questions concerning this matter, please feel free to contact Ms. Valerie L. Schofield, Regulatory Specialist at 816-389-3824 (FAX 573-634-7960). Please reference Permit No. 2009-00571 in all comments and/or inquiries relating to this project.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

14 MAY 2009

Mike Waller
Bucher, Willis and Ratliff Corporation
903 E. 104th Street, Suite 900
Kansas City, MO 64131

Mr. Waller:

RE: Jesse Viertel Memorial Airport Master Plan Update

This letter responds to your correspondence, dated April 10, 2009, concerning the proposed expansion of the Boonville airport in Boonville, Missouri. Thank you for the opportunity to comment on the project at this early stage.

Based on the information offered in your correspondence, the U.S. Environmental Protection Agency's most likely concern relates to potential wetlands impacts in or near what appears to be a lake just west of the runway of the airport. If the final project includes the discharge of dredged or fill material into a Water of the United States, then a permit under Section 404 of the Clean Water Act may be required from the U.S. Army Corps of Engineers. The Section 404 permit process also includes an evaluation of the alternatives to address whether an alternative exists that is less damaging to the aquatic ecosystem, and is logistically and technically possible of being implemented. If you have not already contacted the Corps, we would urge you to do so.

If you have any questions, you may contact me at 913-551-7656, or via email at smith.stephenk@epa.gov.

Sincerely,

Stephen Smith
NEPA Reviewer
Environmental Services Division

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MAY 15 2009

BWR
KANSAS CITY, MISSOURI





Jeremiah W. (Jay) Nixon, Governor • Mark N. Templeton, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

4.000 Solid Waste General
1.000 Air Pollution General
2.000 Hazardous Waste General
5.000 Water Pollution General
Cooper County

June 1, 2009

Mr. Mike Waller, Project Manager
Bucher, Willis, & Ratliff Corporation
903 East 104th Street, Suite 900
Kansas City, Missouri 64131-3451

Dear Mr. Waller:

On May 5, 2009, the Missouri Department of Natural Resources' Northeast Regional Office received your letter dated April 10, 2009, requesting comments regarding any potential environmental impacts resulting from the airfield and terminal area expansion and property acquisition for the Jesse Viertel Memorial Airport in Cooper County, Missouri.

I would like to take this opportunity to provide information on the environmental requirements associated with this type of project.

AIR POLLUTION ISSUES:

1. No burning of construction, demolition or trade wastes is allowed. Brush from land clearing activities may be burned if greater than 200 yards from the nearest residence and outside city limits. Otherwise, a burn permit is required.
2. Any industrial or commercial structure being renovated is considered a regulated structure under the Federal NESHAP asbestos requirements and must be inspected for the presence of asbestos containing materials prior to demolition. The inspection must be conducted by a Missouri-certified asbestos inspector. A list of Missouri-certified building inspectors is enclosed.
3. If any industrial or commercial structure, or if more than one residential structure is being demolished in the project, the structures are regulated structures under the Federal NESHAP asbestos requirements and must be inspected for the presence of asbestos containing materials prior to renovation. The inspection must be conducted by a Missouri-certified asbestos inspector.

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JUN 03 2009

BWR
KANSAS CITY, MISSOURI

4. A demolition notification is required for all regulated structures, including multiple residential structures, or industrial and commercial structures, as specified in subparagraph 3. above. Notification is required regardless of asbestos content and must be submitted at least 10 working days prior to the proposed start date. The Asbestos NESHAP Notification of Demolition and Renovation form is enclosed. The notification must be submitted to the Air Pollution Control Program in Jefferson City. An approval letter will be issued prior to the start of the project.
5. If friable asbestos containing material is identified that will be disturbed during renovation or demolition that exceeds threshold quantities (160 square feet, 260 linear feet or 35 cubic feet) a Missouri-registered asbestos abatement contractor is required to conduct removal of the friable asbestos. All friable asbestos containing material must be removed prior to the renovation or prior to the start of demolition.

HAZARDOUS WASTE ISSUES:

1. Any household hazardous wastes that are generated from the acquired residence must be properly managed.
2. Any unusual waste, consistent with the operation of a business out of a home, would not be exempt and would be subject to a hazardous waste determination and in management, storage and disposal per the Hazardous Waste regulations, as would anything from a business.
3. If during excavation activities any contaminated soil that would be classified as a hazardous waste is discovered, workers should withdraw to a safe distance and notify the Missouri Department of Natural Resources' spill line at (573) 634-2436. Enclosed is a technical bulletin – *Managing Solid Waste Encountered During Excavation Activities* for more information.
4. Construction of terminal buildings and hangars is considered a commercial endeavor and requires that all wastes be properly characterized for hazardous waste constituents. All hazardous wastes must be managed, stored, transported, and disposed in accordance with hazardous waste requirements.

SOLID WASTE ISSUES:

1. All the waste generated from demolition and construction activities must be taken for proper disposal at a permitted sanitary landfill or transfer station. The waste cannot be stockpiled at an alternate site for separation at a later time.
2. Any asbestos containing material that has been identified and determined to be nonfriable, which would not require a registered asbestos contractor for removal, must be taken to a permitted landfill or transfer station for disposal. The landfill or transfer station will require prior notification before disposal.

Mr. Mike Waller
June 1, 2009
Page 3

3. No waste may be buried on-site except for certified clean fill. Certified clean fill includes: uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinder blocks, and unpainted brick. Clean fill must not contain extruding metals or demolition debris.

WATER POLLUTION ISSUES:

1. A storm water permit is required when construction activity disturbs land by grubbing, grading, excavating or otherwise destroying or disturbing the root zone, and the surface area disturbed is one acre or more.

Enclosed are technical bulletins that cover many aspects of the environmental requirements outlined above. Please provide copies of this information to all parties associated with the project. It is imperative that all regulatory requirements be followed to protect human health and the environment.

Your cooperation in this matter is greatly appreciated. If you have further questions, or if you need assistance, please do not hesitate to contact my staff or me at (660) 385-8000 in the Northeast Regional Office, 1709 Prospect Drive, Macon, MO 63552.

Sincerely,

NORTHEAST REGIONAL OFFICE



Irene Crawford
Regional Director

IC/jbt

Enclosures: Managing Household Hazardous Waste
Managing Solid Waste Encountered During Excavation Activities
Managing Construction and Demolition Waste
Using Painted Block and Brick as Clean Fill
Storm Water Permit Requirements for Land Disturbance Activities
Facts on Open Burning Under Missouri Regulations
Asbestos Requirements for Demolition and Renovation Projects
List of Missouri-Certified Building Inspectors
Asbestos NESHAP Notification of Demolition and Renovation form

c: Air Pollution Control Program
Hazardous Waste Program
Solid Waste Management Program
Ms. Jane Beetem, Director's Office, MDNR

CULTURAL RESOURCE ASSESSMENT
Section 106 Review

CONTACT PERSON/ADDRESS

C:

Mike Waller, CM
Bucher, Willis & Ratliff Corp.
903 East 104th Street, Suite 900
Kansas City, Missouri 64131-3451

Peggy Casey, FHWA
Bob Reeder, MoDOT

PROJECT:

Jesse Viertel Memorial Airport Masterplan Update, Boonville

FEDERAL AGENCY

FHWA

COUNTY:

COOPER

The State Historic Preservation Office has reviewed the information submitted on the above referenced project. Based on this review, we have made the following determination:

After review of initial submission, the project area has a low potential for the occurrence of cultural resources. A cultural resource survey, therefore, is not warranted.

Adequate documentation has been provided (36 CFR Section 800.11). There will be "no historic properties affected" by the current project.

An adequate cultural resource survey of the project area has been previously conducted. It has been determined that for the proposed undertaking there will be "no historic properties affected".

For the above checked reason, the State Historic Preservation Office has no objection to the initiation of project activities. PLEASE BE ADVISED THAT, IF THE CURRENT PROJECT AREA OR SCOPE OF WORK ARE CHANGED, A BORROW AREA IS INCLUDED IN THE PROJECT, OR CULTURAL MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, APPROPRIATE INFORMATION MUST BE PROVIDED TO THIS OFFICE FOR FURTHER REVIEW AND COMMENT. Please retain this documentation as evidence of compliance with Section 106 of the National Historic Preservation Act, as amended.

By:



Mark A. Miles, Deputy State Historic Preservation Officer

July 16, 2009

Date

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
P.O. Box 176, Jefferson City, Missouri 65102

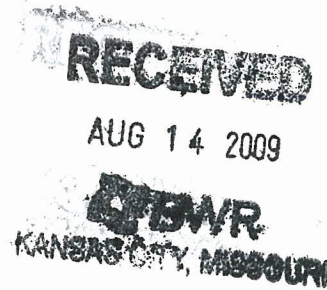
For additional information, please contact Judith Deel, (573) 751-7862. Please be sure to refer to the project number:
006-CP-09



6465 Highway 168, Suite B, Palmyra, MO 63461-9604

August 11, 2009

Mike Waller
Bucher, Willis & Ratliff Corporation
903 East 104th Street, Suite 900
Kansas City, MO 64131-3451



Dear Mr. Waller,

Attached is a Farmland Conversion Impact Rating (form AD-1006) for the proposed expansion of the Jesse Viertel Memorial Airport in Cooper County, Missouri. After you complete the form, please return one copy for our records.

Please note that if the Total Points (Parts V & VI) in Part VII exceeds 160, alternative sites should be considered. Two alternatives are required if the score is between 160-220, and three alternatives are required if the score is over 220.

If you have any questions, please call me (573) 769-3512 ext. 133.

Sincerely,

A handwritten signature in cursive script that reads "Scott Larsen".

Scott Larsen
Area Resource Soil Scientist

Attachment

cc: Allen Voss, DC, NRCS, Boonville, MO

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)	Date Of Land Evaluation Request
---	---------------------------------

Name Of Project Boonville City Airport expansion	Federal Agency Involved
---	-------------------------

Proposed Land Use	County And State Cooper County Missouri
-------------------	--

PART II (To be completed by NRCS)	Date Request Received By NRCS
--	-------------------------------

Does the site contain prime, unique, statewide or local important farmland? <i>(If no, the FPPA does not apply -- do not complete additional parts of this form).</i>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Acres Irrigated 0	Average Farm Size 343
--	---	----------------------	--------------------------

Major Crop(s) Corn, Soybeans	Farmable Land In Govt. Jurisdiction Acres: 360975 % 99	Amount Of Farmland As Defined in FPPA Acres: 307530 % 84
--	---	---

Name Of Land Evaluation System Used LESA	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS 8/11/09
--	--------------------------------------	---

PART III (To be completed by Federal Agency)	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	49.0			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	49.0	0.0	0.0	0.0

PART IV (To be completed by NRCS) Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	12.6			
B. Total Acres Statewide And Local Important Farmland	36.4			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	54.2			

PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)				
	83	0	0	0

PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0

PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100	83	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
TOTAL POINTS (Total of above 2 lines)	260	83	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>
----------------	-------------------	---

Reason For Selection:

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 – Federal agencies involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form.

Step 2 – Originator will send copies A, B and C together with maps indicating locations of site(s), to the Natural Resources Conservation Service (NRCS) local field office and retain copy D for their files. (Note: NRCS has a field office in most counties in the U.S. The field office is usually located in the county seat. A list of field office locations are available from the NRCS State Conservationist in each state).

Step 3 – NRCS will, within 45 calendar days after receipt of form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland.

Step 4 – In cases where farmland covered by the FPPA will be converted by the proposed project, NRCS field offices will complete Parts II, IV and V of the form.

Step 5 – NRCS will return copy A and B of the form to the Federal agency involved in the project. (Copy C will be retained for NRCS records).

Step 6 – The Federal agency involved in the proposed project will complete Parts VI and VII of the form.

Step 7 – The Federal agency involved in the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA and the agency's internal policies.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

Part I: In completing the "County And State" questions list all the local governments that are responsible for local land controls where site(s) are to be evaluated.

Part III: In completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities) that will cause a direct conversion.

Part VI: Do not complete Part VI if a local site assessment is used.

Assign the maximum points for each site assessment criterion as shown in § 658.5 (b) of CFR. In cases of corridor-type projects such as transportation, powerline and flood control, criteria #5 and #6 will not apply and will, be weighed zero, however, criterion #8 will be weighed a maximum of 25 points, and criterion #11 a maximum of 25 points.

Individual Federal agencies at the national level, may assign relative weights among the 12 site assessment criteria other than those shown in the FPPA rule. In all cases where other weights are assigned relative adjustments must be made to maintain the maximum total weight points at 160.

In rating alternative sites, Federal agencies shall consider each of the criteria and assign points within the limits established in the FPPA rule. Sites most suitable for protection under these criteria will receive the highest total scores, and sites least suitable, the lowest scores.

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, adjust the site assessment points to a base of 160. Example: if the Site Assessment maximum is 200 points, and alternative Site "A" is rated 180 points:

Total points assigned Site A = $\frac{180}{200} \times 160 = 144$ points for Site "A."

Maximum points possible 200



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