MidAmerica
ST. LOUIS AIRPORT

Mascoutah-Belleville, Illinois

Airport Master Plan Update

November 2021

PREPARED BY:

CMT

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Chapter One

Existing Conditions - Inventory

1.1 Introduction

An Airport Master Plan is a planning document that provides guidelines and direction to an airport, based on the present and future aviation needs of the community and region it serves. An Airport Master Plan is also a communication document that expresses an airport's future to regulatory and funding agencies, land use oversight organizations and most importantly, to the public. There are many parts and facets of an Airport Master Plan, and the documentation guidance is contained in the Federal Aviation Administration's (FAA) Advisory Circulars (AC's), specifically AC 150/5070-6B, Change 2, "*Airport Master Plans*"[1].

Using the guidelines contained in AC 150/5070-6B, this Chapter One of the MidAmerica St. Louis Airport's (BLV)[2] Master Plan is organized as follows:

1. Introduction. This section includes a brief description of an Airport Master Plan and defines the purpose and needs it will serve. Additionally, this section provides an overview of how this section of the report will be written, and also the various subsections that will make up the Airport Master Plan.
2. Public Involvement Program. The FAA Advisory Circular encourages airports to consider as the first element of the Airport Master Plan, the preparation of a Public Involvement Program. This program provides an avenue of communication between the Airport, users, stakeholders and the public. Public information meetings, focused planning discussions and the potential use of a web site are all methods of public dialog.
3. Background. This section includes a brief history of the Airport including a discussion on governance; review and discussion of reports identifying the Airport's economic benefit to the region; and a brief description of major airport milestones (facilities/airlines, etc.). This step helps formulate the Airport Service Area.
4. Inventory and Description of Existing Facilities. As the title notes, this chapter of the Airport Master Plan will: review and inventory the BLV Airfield and Airspace Structure; inventory the Air Passenger Terminal Building; inventory facilities for Air Cargo and General Aviation; inventory Support Facilities such as the Aircraft Rescue and Fire Fighting (ARFF) and Airport Traffic Control Tower (ATCT); inventory access, circulation and parking; inventory utilities and identify areas of non-aeronautical land uses.

1 https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5070-6B-Change-2-Consolidated.pdf
2 http://www.flymidamerica.com/Pages/default.aspx

5. Regional Setting and Land Use. This portion of the chapter will examine BLV in the context of the Greater St. Louis metropolitan area. The report will also graphically depict political jurisdictions, incorporate comprehensive plans and land uses within the Airport's environ, identify areas that may affect air navigation such as hazardous wildlife attractants and pinpoint on and off airport drainage and flood control areas. Most of this section will be created and depicted within the BLV Airport Geographic Information System (AGIS).

6. Environmental Overview. A review of recently approved environmental actions for BLV airport development will be conducted. These recent approvals will help create a holistic list of environmental impact categories. The environmental impact categories will be compared to guidance contained in the following documents: FAA Order 1050.1F, "*Environmental Impacts: Policies and Procedures*".[3] and FAA Order 5050.4B "*National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*"..[4] This comparison will be used in vetting airport development alternatives.

7. Socioeconomic Data. This section includes the collation of socioeconomic data (population, demographics, income, etc.) to provide a focus of the customers and users of BLV. Data sources will include but not be limited to: US Bureau of the Census, State of Illinois, St. Clair County and East-West Gateway Council of Governments.

8. Financial Data Review. The Airport's Business Model includes its Operating Revenues and Expenses, and its Capital Improvement Program and is summarized in this chapter.

Documentation, the final element of the Existing Condition / Inventory guidance from the Advisory Circular, includes all graphical maps, charts, drawings, aerial photography and geographic information systems for use in Chapter One and all subsequent chapters of the BLV Airport Master Plan.

3 https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf

4 https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/

The following are the chapters of the BLV Airport Master Plan Report, as specified by the FAA Advisory Circular:

- Chapter Two - Forecasts of Aeronautical Activity
- Chapter Three - Facilities Requirements
- Chapter Four - Alternatives Development and Evaluation
- Chapter Five - Environmental Considerations
- Chapter Six - Facilities Implementation Plan
- Chapter Seven - Financial Feasibility Analysis

The Airport Master Plan Report will culminate in the preparation of the BLV Airport Layout Plan (ALP). Much like the Airport Master Plan Report is a communication instrument between the Airport, numerous agencies and the public, the ALP is a technical resource document that expresses the Airport Master Plan's future expectations in a graphic depiction. The ALP is the primary planning document created in the MidAmerica St. Louis Airport Master Plan. Finally, and most importantly the FAA Airport Master Plan Advisory Circular places great emphasis on coordination with the public. The FAA Advisory Circular directs airports to create a Public Involvement Program as the Airport Master Plan's initial step. That program is discussed in the following section.

1.2 Public Involvement Program

MidAmerica St. Louis Airport is owned and operated by the County of St. Clair, Illinois through its Public Building Commission (PBC). BLV is a civilian Primary Commercial Service Airport that is adjacent to and operated in conjunction with Scott Air Force Base (SAFB), as a joint-use airfield facility. Stakeholder input for the BLV Airport Master Plan is critical in defining future airport development needs.

BLV Public Information Program Stakeholders can be subdivided into three categories: Regulatory Airport Master Plan Stakeholders (Federal/State agencies project oversight); Aeronautical (Airside) Airport Master Plan Stakeholders (primary stakeholders plus the airlines, fixed based operator, air cargo operators, public safety); and Landside Airport Master Plan Stakeholders (primary and aeronautical stakeholders (except SAFB) plus surface transportation organizations). Potential member organizations for each category are listed below:

1.2.1 Regulatory Airport Master Plan Stakeholders

- MidAmerica St. Louis Airport
- Federal Aviation Administration-Great Lakes Region-Chicago Airports District Office
- Illinois Department of Transportation, Aeronautics
- United States Department of Defense, Department of the Air Force
- Public

1.2.2 Aeronautical (Airside) Airport Master Plan Stakeholders

- MidAmerica St. Louis Airport
- Federal Aviation Administration-Great Lakes Region-Chicago Airports District Office
- Illinois Department of Transportation, Aeronautics
- United States Department of Defense, Department of the Air Force
- Illinois Army National Guard
- Airlines (Allegiant)
- Boeing
- North Bay Produce
- AVMATS
- Airport Terminal Services (ATS)
- Illinois State Police
- Public

1.2.3 Landside Airport Master Plan Stakeholders Airport

- MidAmerica St. Louis Airport
- Federal Aviation Administration-Great Lakes Region-Chicago Airports District Office
- Illinois Department of Transportation, Aeronautics
- Illinois Department of Transportation, Highways, District 8
- Illinois Army National Guard
- Airlines (Allegiant)
- Boeing
- North Bay Produce
- AVMATS
- On-site Aircraft Services, Inc.
- Illinois State Police
- Bi-State Development (Metro)
- St. Clair County Transit District
- Illinois Pipeline
- Republic Parking
- Local Communities (Mascoutah, Shiloh, O'Fallon, Lebanon and Belleville
- United States Customs and Border Protection (CBP)
- Transportation Security Administration (TSA)
- Public

As a part of the BLV Public Information Program, the Airport will solicit stakeholder facility needs and future airfield expectations through focused discussions at Public Information Workshops. This will give the BLV Airport Master Plan Team insight on the future direction the Airport should consider and help develop key issues to be addressed. Most stakeholders and the public will review and comment on the BLV Airport Master Plan through public meetings and its dedicated website. This website can be accessed at *http://www.BLVAirportMasterPlan.com*. Presentations of the BLV Airport Master Plan will also be made to the Public Building Commission. It should be noted that all reports, correspondence and mapping will be disseminated electronic-only.

1.3 Background

1.3.1 Airport History

The origins of MidAmerica St. Louis Airport are closely tied to the aeronautical capacity needs of the greater St. Louis metropolitan area. In the 1970's St. Louis Lambert International Airport's (STL) annual passenger count had dramatically risen to nearly 5.8 million. Throughout the subsequent decades, regional discussions focused on mutual expansion of both STL and joint-use options at BLV. It was noted during these discussions that approximately 25% of the St. Louis Metropolitan Statistical Area (MSA) population lived on the Illinois side of the Mississippi River. In 1986, IDOT released a feasibility study of Joint Military-Civilian Use of Scott Air Force Base. This study highlighted previously known capacity concerns for STL. Furthermore, the study stated that STL's airfield capacity could be constrained by the early 1990's. The report noted that locating joint-use facilities at Scott Air Force Base would help lessen congestion at Lambert, improve the local economy of southwestern Illinois and enhance the mission capabilities at SAFB.

BLV's first Airport Master Plan was prepared in 1987, and an Environmental Assessment was released in 1988. The Airport Master Plan examined various alternatives, including a "do nothing" alternative. Ultimately, the Airport Master Plan-Phase I concluded that expanding Scott Air Force Base was the preferred option to address the region's capacity issues. Phase II of the Airport Master Plan focused on forecast efforts, facility requirements, and alternatives for development. Phase II ultimately concluded with recommendations to construct a parallel Runway 14L-32R, along with a 7,000 taxiway that connected the civilian and military airside development.

In September 1991, the United States Air Force (USAF) and St. Clair County entered into a Joint Use Agreement, in which the County agreed to acquire approximately 3,800 acres immediately adjacent to Scott Air Force Base and construct a separate parallel runway 8,000-ft long by 150-ft wide. The agreement included the construction of an Airplane Design Group (ADG) V connecting taxiway, Airport Traffic Control Tower, and other airfield improvements to serve the joint use. Subsequently, St. Clair County purchased 4,175 acres of land between 1992 and 1995. Shortly after the agreements were put into place, the City of Chicago requested the reuse of the Illinois Air National Guard's facility at Chicago O'Hare International Airport as part of the O'Hare Modernization Program. Subsequently, agreements were put into place to relocate the guard unit to Scott and to extend the original planned civilian runway length from 8,000 feet to 10,000 feet.

Construction began in 1994, and officially opened in November 1998. However, shortly after opening the terminal, Trans World Airlines (TWA) was purchased by American Airlines (AA), which then closed the STL "hub" operation and severely reduced flights. BLV continued to actively pursue passenger and air cargo operators. Allegiant Airlines has emerged over the past several years as a consistent partner with BLV and passenger enplanements have increased to the point that BLV in one of the fastest growing passenger airports in the US.

METROPOLITAN DEFINITIONS

St. Clair County is included in the Federally designated St. Louis MO-IL MSA and is comprised of Bond, Calhoun, Clinton, Jersey, Macoupin, Madison and Monroe in Illinois and Franklin, Jefferson, Lincoln, St. Charles, St. Louis County, City of St. Louis, Warren, Washington and portions of Crawford in Missouri.[5] Of the 169 Combined Statistical Areas, the St. Louis CSA was ranked 19th with a population of 2,892,497 (2010)[6]. The East-West Gateway Council of Governments[7] is the Metropolitan Planning Organization (MPO) for the region, and includes four counties in Missouri (Franklin, Jefferson, St. Charles and St. Louis), three counties in Illinois (Madison, Monroe and St. Clair) and the City of St. Louis, MO.

SCOTT AIR FORCE BASE

Scott Air Force Base (SAFB)[8] is a United States Department of Defense, Department of the Air Force facility located in central St. Clair County, Illinois. SAFB is the headquarters of the United States Transportation Command, a Unified Combatant Command. SAFB is operated by 375th Mobility Wing and is also home to the Air Force Reserve Command's 932nd Airlift Wing[9] and the Illinois Air National Guard's 126th Air Refueling Wing[10]. Through a Joint Use Agreement with MidAmerica St. Louis Airport, SAFB operates the Scott Airport Traffic Control Tower (ATCT) and controls the airspace structure on and above both airfield pavements. SAFB and MidAmerica St. Louis Airport have operated as a Joint Use Airport since the initiation of civilian operations in November 1997.

FAA PASSENGER CLASSIFICATIONS

Public airports in the United States that are eligible for Federal Airport Improvement Program (AIP) funding are those included in the National Plan of Integrated Airport Systems (NPIAS). Airports in Illinois are also required to be included into the Illinois State Aviation System Plan. MidAmerica St. Louis Airport is included in both the Federal and State plans. FAA further classifies airports through passenger enplanements by total number and by percentage of annual passenger boardings on a national level.[11] Airports are classified as Primary Airports if they have more than 10,000 passenger enplanements (boardings) each year. BLV over the past several years has boarded over 10,000 passengers and is classified as a Primary Airport. FAA further defines airports as "hub" types by the airport's percentage of annual passenger enplanement of the United States passenger total. For example, an airport that boards more than 10,000 passengers, but less than 0.05% of the United States passenger total is considered a Nonhub Primary Airport. Whereas, an airport that enplanes at least 0.25% of the United States total passengers, but less than 1% (range), that airport is classified as a Medium Hub Airport. BLV is considered a Nonhub Airport and St. Louis Lambert International Airport[12] is classified as a Medium Hub Airport. An example of a large hub airport is Chicago O'Hare International Airport.

5 https://www2.census.gov/geo/maps/metroarea/stcbsa_pg/Feb2013/cbsa2013_IL.pdf
6 https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk
7 http://www.ewgateway.org/
8 http://www.scott.af.mil/
9 http://www.932aw.afrc.af.mil/
10 http://www.126arw.ang.af.mil/
11 https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/
12 2016 Passengers for STL 6,419,698. US Total 768,441,396. 0.8%.

1.4 Inventory and Description of Existing Facilities

Airport facilities are subdivided into two categories: Airside Development and Landside Development. Airside facilities are those areas on the airport directly associated with aircraft operations, such as the runways, taxiways, aircraft parking aprons, navigational aids, and airport lighting. Landside areas include those facilities that provide a transition from surface to air transportation, such as the passenger terminal building, air cargo buildings, Fixed Base Operators (FBOs), aircraft storage facilities, including T-hangars and apron areas, automobile parking, roadways and nonaeronautical land uses. Support facilities include the Airport Traffic Control Tower, Aircraft Rescue and Fire Fighting (ARFF) facilities and aircraft maintenance facilities. **Exhibit 1.4-1,** ***Existing Airport Configuration***, presents the existing configuration of BLV.

1.4.1 Airside Facilities

RUNWAYS

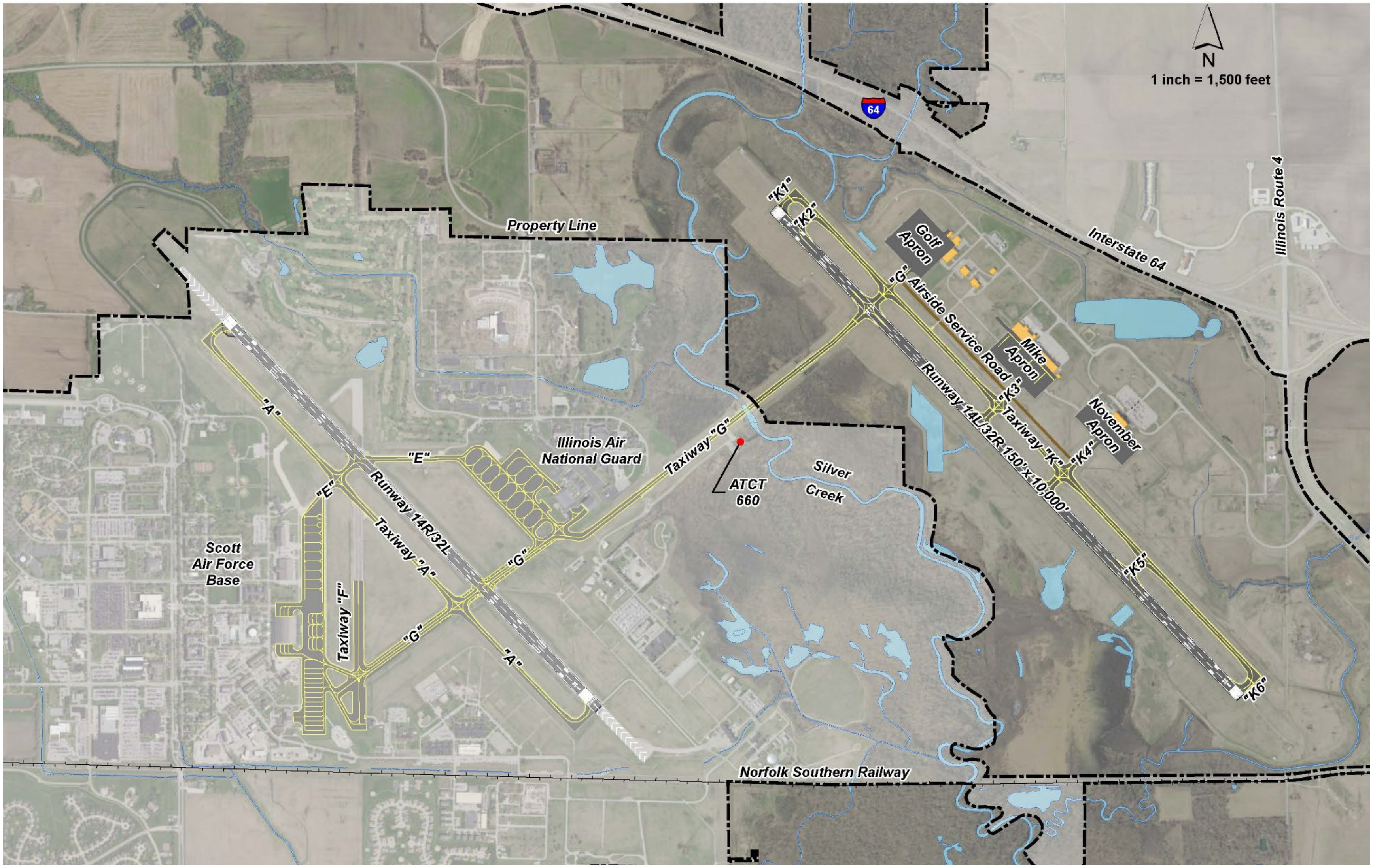
MidAmerica St. Louis Airport has one runway - Runway 14L-32R. A parallel runway, Runway 14R-32L, is located on Scott Air Force Base property. BLV's runway is 10,000 feet long and 150 feet wide and is constructed of Portland cement concrete. Runway 14R-32L, owned and operated by the US Air Force, is 8,010 feet long and a mixture of concrete and asphalt. The two runways are connected by the 7,000-foot-long Taxiway Golf. Key runway statistics are presented in **Table 1.4-1,** ***Runway Features***, and an Existing Airside Facilities Map is included in **Exhibit 1.4-2,** ***Existing Airside Facilities Map***.

Table 1.4-1: Runway Features

RUNWAY COMPONENTS	RUNWAY	
	14L-32R	14R-32L
Length	10,000 ft	8,010 ft
Width	150 ft	150 ft
Pavement	Concrete (Grooved)	Asphalt/Concrete (Grooved)
PCN	82/R/B/W/T	69/R/B/W/T
Gradient	-	0.2%
Runway High Point	441.6 ft AMSL	458.8 ft AMSL
Runway Low Point	441 ft AMSL	437 ft AMSL
Lighting	High Intensity Runway Lights	High Intensity Runway Lights
Approach Instrumentation	Precision	Precision
Runway Markings	Precision	Precision
Blast Pad Available	No	Yes
Displaced Threshold	None	209 ft

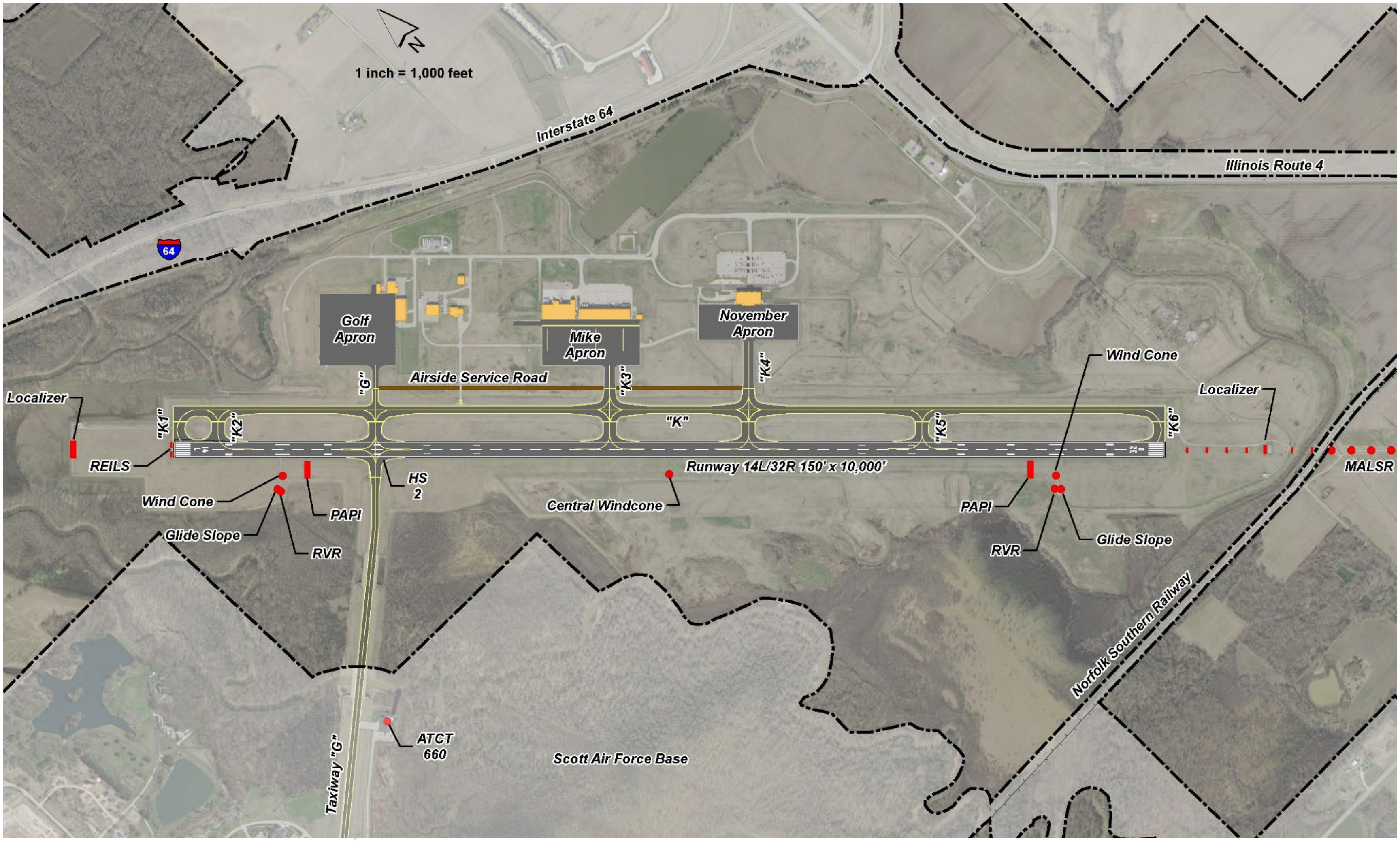
Source: FAA 5010 Records, AirNav.com/KBLV.

Exhibit 1.4-1 – Existing Airport Configuration



Source: CMT 2018.

Exhibit 1.4-2 – Existing Airside Facilities Map



Source: CMT 2018

TAXIWAYS

Runway 14L-32R is served by two primary taxiways. Taxiway Kilo is a parallel taxiway, which extends from the approach end of Runway 14L southeast to the approach end of Runway 32R, with connecting taxiways allowing access to all three aprons. Taxiway connectors are named sequentially: K1, K2, K3, K4, K5 and K6. Taxiway Golf connects the BLV Runway 14L-32R to the SAFB airfield complex including Runway 14R-32L. Taxiway Golf also crosses Silver Creek in two separate locations and is designed to handle 1.2-million-pound aircraft weight. All BLV taxiways, except Taxiway Golf east of Taxiway Kilo, are 75 feet wide with paved shoulders.

LIGHTING, MARKING AND VISUAL NAVIGATIONAL AIDS

The location and presence of the joint-use airport complex is identified by a rotating beacon that is located to the west of the main military apron at Scott Air Force Base. All runway thresholds are equipped with various types of lighting, marking and visual aids to assist approaching aircraft in identifying the runway environment. Some of the electronic and visual aids for pilots using BLV are listed herein. A review of published instrument approach procedures will be included later in this section. Refer to **Table 1.4-2, *Airport NAVAID and Visual Aid System***.

Table 1.4-2: Airport NAVAID and Visual Aid System

AIRPORT NAVAIDS/VISUAL AID SYSTEM	RUNWAY ENDS			
	14L	32R	14R	32L
Instrument Landing System Glide Slope Antenna (ILS)	Yes	Yes	Yes	Yes
Localizer	Yes	Yes	Yes	Yes
RNAV (GPS)	Yes	Yes	Yes	Yes
VOR/TACAN	N/A	N/A	TACAN	TACAN
NDB	N/A	N/A	N/A	N/A
MALSR	N/A	Yes	Yes	Yes
Visual Slope Indicator	PAPI	PAPI	PAPI	PAPI
Runway Edge Lighting	HIRL	HIRL	HIRL	HIRL
Runway Marking	Precision	Precision	Precision	Precision
Runway Visual Range	Touchdown	Rollout	Touchdown	Rollout

Source: MidAmerica St. Louis Airport. FAA Digital Chart Supplements.

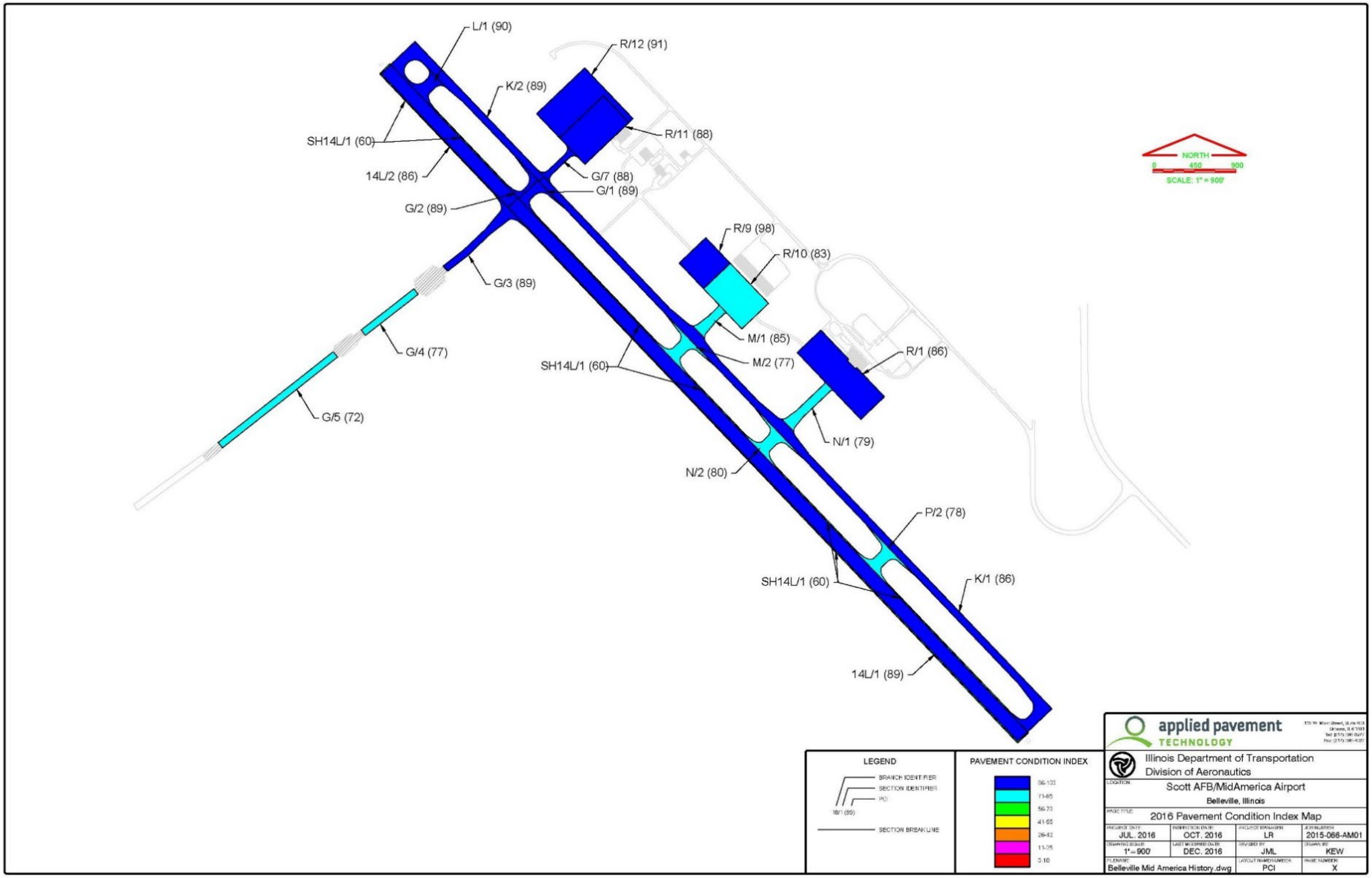
A Precision Approach Path Indicator (PAPI) is a four-box system combination of lights on the side of a runway to indicate a pilot's position relative to the desired glideslope while landing. Both BLV and Scott Air Force Base are equipped with a PAPI system. Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) are lights beyond the runway threshold that provides the pilot on an instrument approach, the runway environmental sufficient to land. Runway edge lighting is used to outline the physical runway landing surface during periods of darkness and restricted visibility. These runway edge lights are classified according to their intensity of brightness: High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), and Low Intensity Runway Lights (LIRL). Taxiway lighting, which delineates the taxiway edges, provides guidance to pilots during darkness and periods of low visibility. All taxiways at BLV are lighted with taxiway edge lights. Taxiway markings are yellow and generally include centerline markings and runway hold short lines.

PAVEMENT CONDITION SURVEYS

As per the requirements of FAR Part 139 (Airport Certification), all civilian pavements at BLV are inspected each morning by Airport staff. Pavements are inspected for safety concerns, to ensure no foreign object debris (FOD) is present, as well as inspecting for pavement distresses. These inspections may lead to pavement repair, such as crack and spall repair on concrete pavement and patching on bituminous pavement.

In addition to daily inspections, the Illinois Department of Transportation – Division of Aeronautics (IDA) conducts pavement inspections every three years to determine the Pavement Condition Index (PCI) for the BLV pavements. The latest PCI survey at BLV was conducted in October 2016 by Applied Pavement Technology. Overall, the airfield pavement is very good to excellent, with an PCI range of 72 to 98. Exhibit 1.4-3, *Pavement Condition Index Survey Map*, presents the most recent PCI Survey Map.

Exhibit 1.4-3 – Pavement Condition Index Survey Map



Source: Applied Pavement Technology 2016; Illinois Department of Transportation.

APRONS

BLV has several aprons that service various types of aircraft operations. Military aprons are not accessible to civilian aircraft and are not discussed. Currently, at BLV, there are three aprons: Golf, Mike, and November. **Table 1.4-3, *Airport Apron Areas***, lists the BLV aprons in detail.

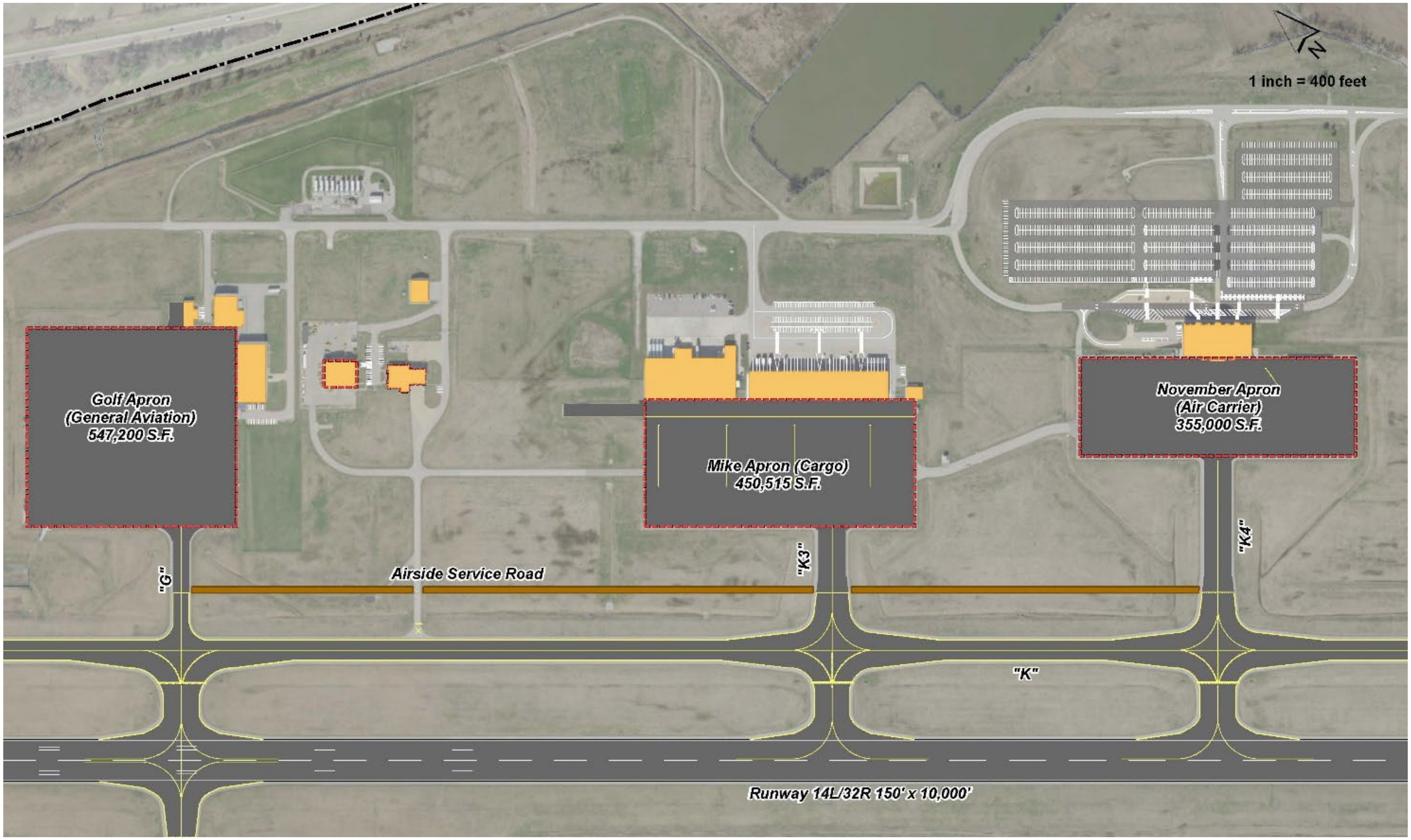
Table 1.4-3: Airport Apron Areas

APRON NAME	USE	AREA (ft^2)	PAVEMENT TYPE	PARKING SPOTS
Golf	General Aviation	547,200	Concrete	20 (tie-downs)
Mike	Air Cargo	450,515	Concrete	4
November	Air Carrier	355,000	Concrete	4

Source: CMT 2018; MidAmerica St. Louis Airport.

The Golf Apron is approximately 547,200 square feet of pavement area and provides 20 parking positions for general aviation and cargo aircraft. Directly southeast of the Golf Apron is the Mike Apron, which is of 450,515 square feet of concrete and provides parking for air cargo aircraft. The Air Carrier parking apron is called the November Apron. This apron is approximately 355,000 square feet of pavement and is used by airlines serving the terminal building. **Exhibit 1.4-4, *Airport Apron Areas***, identifies the three aprons.

Exhibit 1.4-4 – Airport Apron Areas



Source: CMT 2018; MidAmerica St. Louis Airport.

1.4.2 Landside Facilities

At BLV Landside facilities are divided into three functional areas: Passenger Terminal Area; Air Cargo Area; and General Aviation/Air Cargo Area and are presented in **Exhibit 1.4-5**, ***Existing Landside Facilities***.

PASSENGER TERMINAL AREA

The Passenger Terminal Area is in the east-central portion of the Airport. Automobile access to the area is provided via Airport Boulevard from Illinois Route 4. The Passenger Terminal Building is approximately 53,000 square feet and consists of three floors: Main Level, Upper Level and Basement. The Passenger Terminal Building levels are depicted in **Exhibit 1.4-6,** ***Passenger Terminal Building Main Level***, **Exhibit 1.4-7,** ***Passenger Terminal Building Upper Level***, and **Exhibit 1.4-8,** ***Passenger Terminal Building Basement Level***.

The Main Level of the terminal complex is comprised of the lobby/queuing, ticketing, rental car, baggage screening, baggage claim, airport administration offices, restrooms and other public space. The northern section of the Main Level is the airline ticket offices/passenger services, outbound baggage, passenger circulation, baggage screening and administrative offices. The southern section of the main terminal building is comprised primarily of baggage claim, rental car facilities and Republic Parking management. The baggage claim area includes two baggage conveyors and public seating. This level includes access to ground-level boarding Gates 2 and 3.

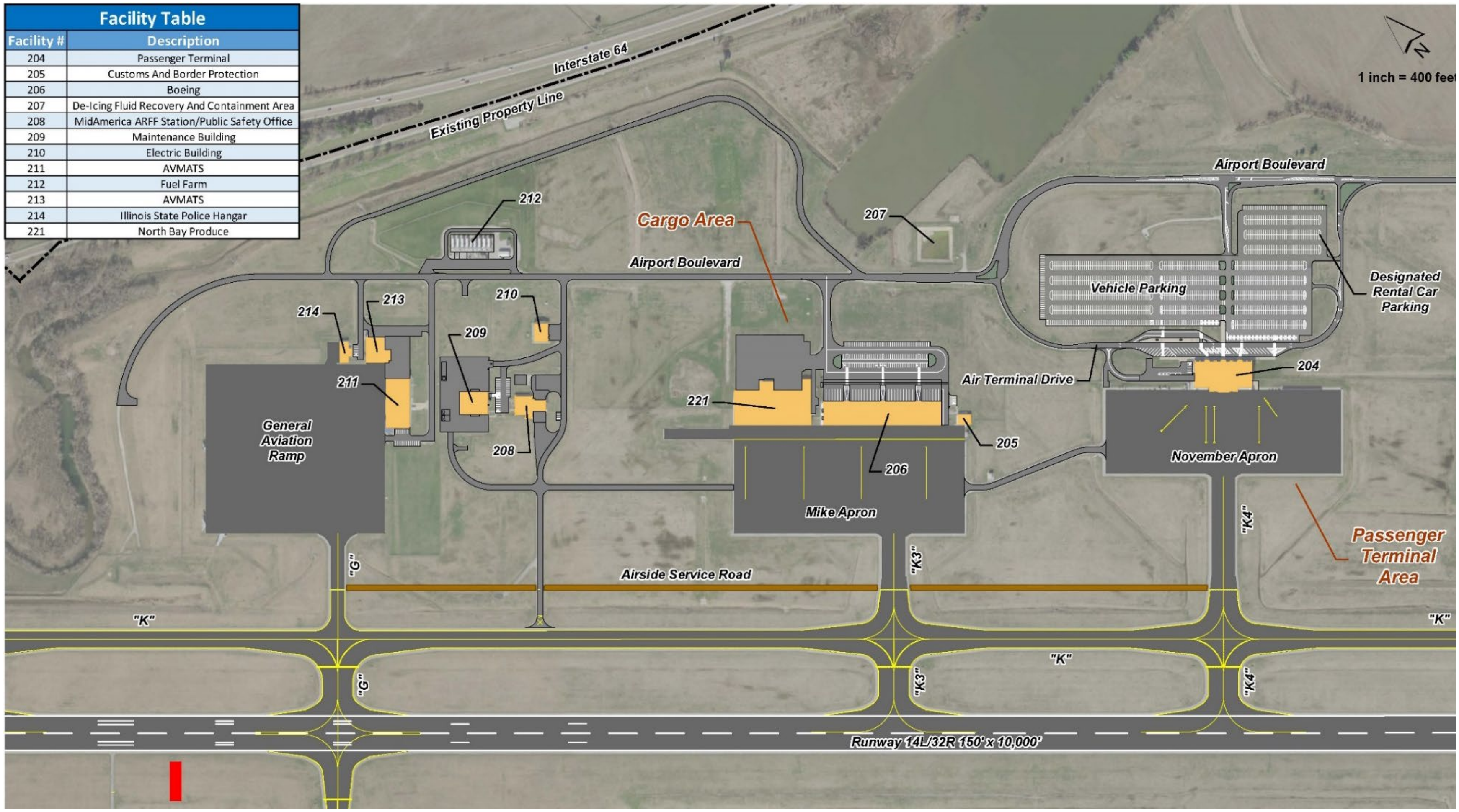
Access to the Upper Level (second floor) is through two escalators and two stairs in the center of the lobby. An elevator is also located adjacent to the southern end of the airline ticketing desk. The US Department of Homeland Security, Transportation Security Administration (TSA) passenger security checkpoint is in the mezzanine of the Upper Level between the main terminal building (non-secure side) and the concourse (secure/sterile area side). The two-lane TSA security checkpoint enters at the midpoint of the Upper Level concourse and the TSA security exit. The Upper Level Concourse includes Gates 1 and 4. Both gates have jetway access to aircraft and associated passenger hold rooms. Stairs and elevator access to the ground level boarding Gates 2 and 3 are located at the midpoint on this level. There is also a food concessionaire and restrooms located across and adjacent to the TSA passenger security checkpoint. The Basement level includes areas for storage and circulation. There also is a loading dock located on the northwestern end of the basement floor. Space allocation for all three floors are listed in **Table 1.4-4,** ***Air Passenger Terminal Space Allocation*.**

Table 1.4-4: Air Passenger Terminal Space Allocation

TERMINAL FUNCTION	SPACE ALLOCATION		
	FIRST LEVEL (ft^2)	SECOND LEVEL (ft^2)	BASEMENT LEVEL (ft^2)
Airline Office Area	3,180	-	-
Airport Administration	2,090	-	-
Baggage Claim	4,720	-	-
Baggage Screening	480	-	-
Circulation	8,930	5,400	2,190
Concessions	-	1,530	-
Hold Room	-	4,930	-
Inbound Baggage	1,540	-	-
Loading Dock	-	-	500
Outbound Baggage	2,170	-	-
Rental Car	490	-	-
Restrooms	750	1,300	-
Security	-	2,360	-
Storage/Mechanical	940	2,190	3,530
Ticketing	2,460	-	-
Total by Level	**27,750**	**17,710**	**6,220**

Source: MidAmerica St. Louis Airport.

Exhibit 1.4-5: Existing Landside Facilities Map

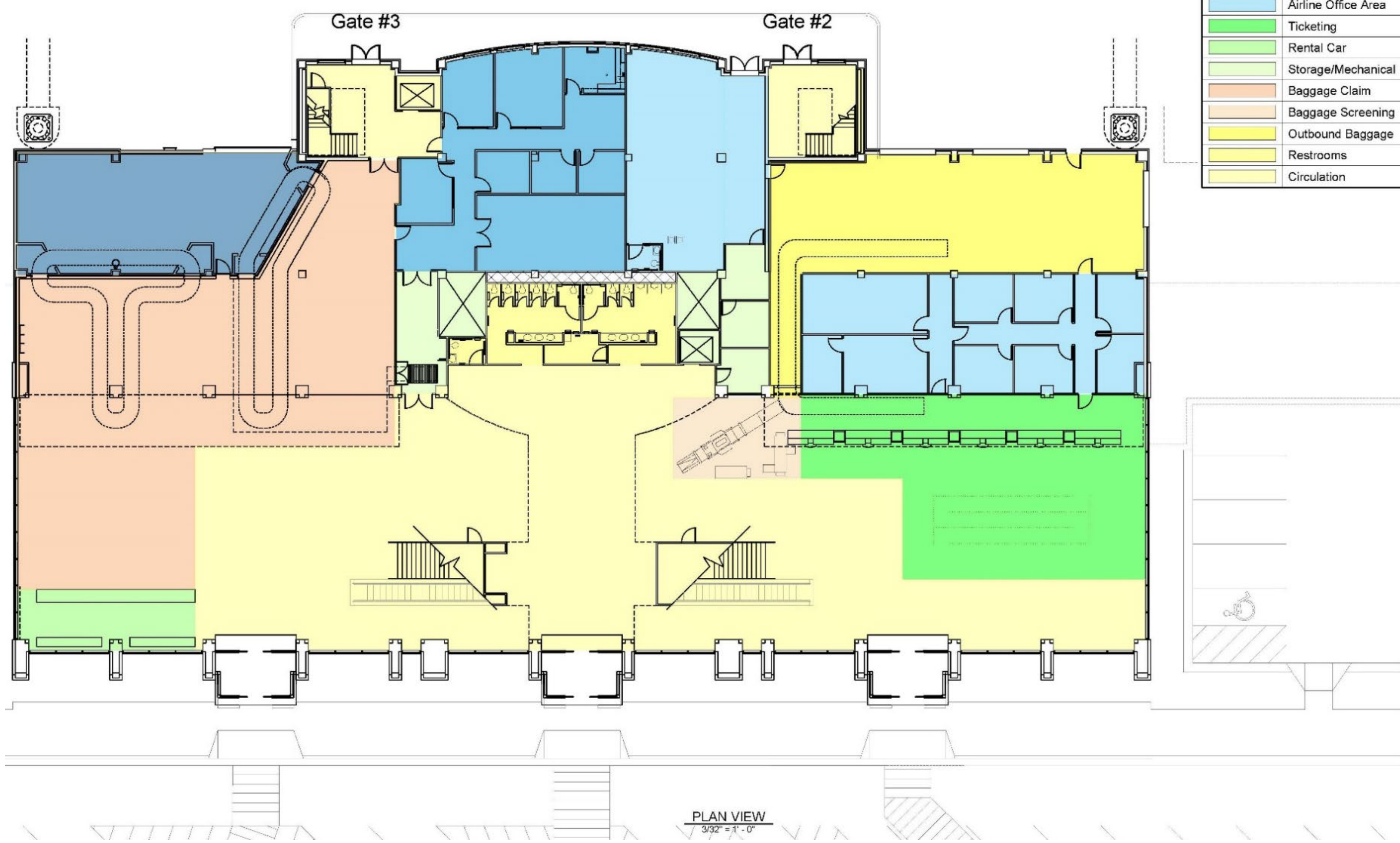


Facility Table

Facility #	Description
204	Passenger Terminal
205	Customs And Border Protection
206	Boeing
207	De-Icing Fluid Recovery And Containment Area
208	MidAmerica ARFF Station/Public Safety Office
209	Maintenance Building
210	Electric Building
211	AVMATS
212	Fuel Farm
213	AVMATS
214	Illinois State Police Hangar
221	North Bay Produce

Source: CMT 2018.

Exhibit 1.4-6: Passenger Terminal Building Main Level

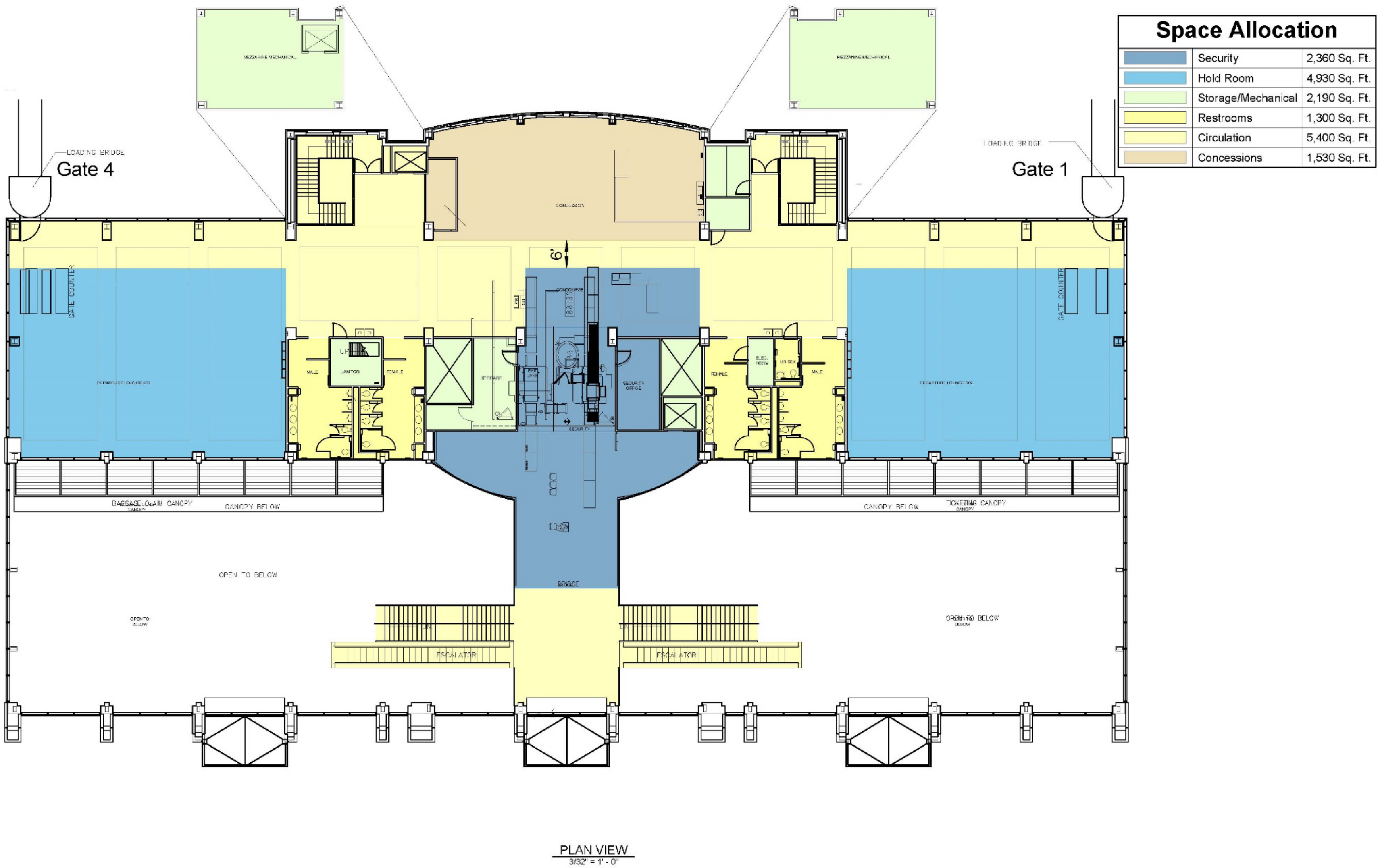


Space Allocation

	Inbound Baggage	1,540 Sq. Ft.
	Airport Administration	2,090 Sq. Ft.
	Airline Office Area	3,180 Sq. Ft.
	Ticketing	2,460 Sq. Ft.
	Rental Car	490 Sq. Ft.
	Storage/Mechanical	940 Sq. Ft.
	Baggage Claim	4,720 Sq. Ft.
	Baggage Screening	480 Sq. Ft.
	Outbound Baggage	2,170 Sq. Ft.
	Restrooms	750 Sq. Ft.
	Circulation	8,930 Sq. Ft.

Source: CMT 2018.

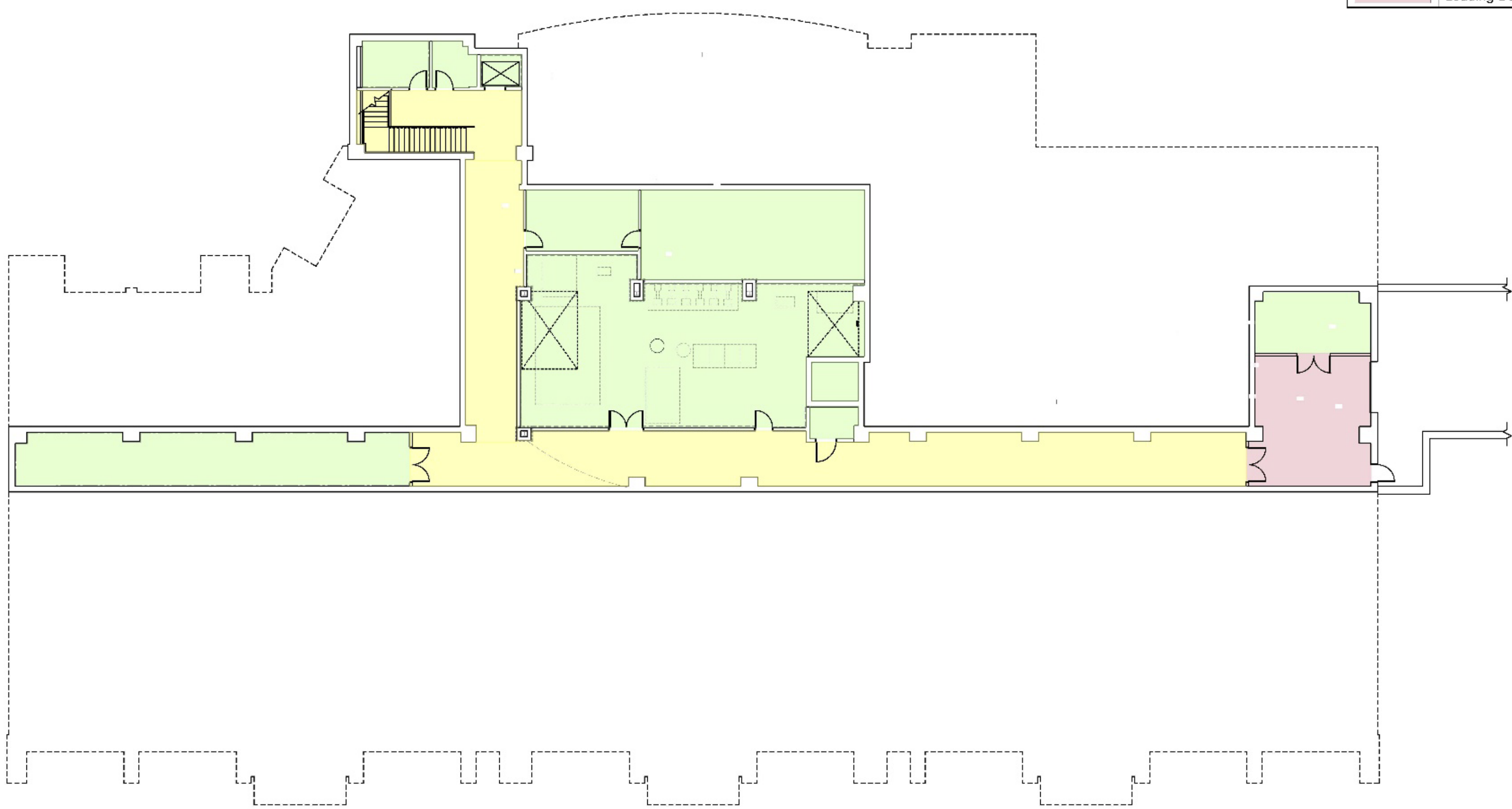
Exhibit 1.4-7: Passenger Terminal Building Upper Level



Source: CMT 2018.

Exhibit 1.4-8: Passenger Terminal Building Basement Level

Space Allocation	
Storage/Mechanical	3,530 Sq. Ft.
Circulation	2,190 Sq. Ft.
Loading Dock	500 Sq. Ft.



PLAN VIEW
3/32" = 1' - 0"

Source: CMT 2018.

AUTO AND TRUCK ACCESS

Auto and truck access to the Air Passenger Terminal, Air Cargo buildings, General Aviation area, and Support Facilities (except for the ATCT) are via Illinois Route 4 on the eastern airfield boundary. The BLV ATCT is not reachable by the public and can only be accessed through local roads on Scott Air Force Base. Additional roadways that provide vehicle access to the Airport include Interstate 64 to the north, Illinois Route 161 on the south and Illinois Route 158 on the western edge of MidAmerica St. Louis/Scott Air Force Base. Recently, a new interchange was opened on Interstate 64, Exit 21-Rieder Road. This interchange provides access to BLV's northwestern quadrant. There is no direct auto/truck access between MidAmerica St. Louis Airport and Scott AFB. Access into Scott AFB is only through the following gates:.[13]

- Shiloh Gate (Scott AFB main gate on Seibert Road and location of the Visitor Control Center) connects to Illinois Route 158 with follow on to Interstate 64. The Shiloh Gate is the only 24-hour access point for Scott AFB.
- Belleville Gate is on the south side of the base connecting with Illinois Route 161, the Belleville Gate is closed nightly from 10:00 PM to 5:30 AM
- Mascoutah Gate/Commercial Inspection Station will be open Monday through Friday 6AM-4PM.
- Patriot's Landing Gate is normally closed to all traffic.
- MidAmerica (Cardinal Creek) Gate: Open weekdays inbound 6-8 AM and outbound 3-5 PM. Closed Federal holidays/family days.

CIRCULATION AND PARKING

Only one airport entrance road provides access to almost *all* (except ATCT) BLV landside facilities (i.e. Air Passenger Terminal, Air Cargo area, General Aviation area, and Support Facilities) and is from Illinois Route 4 on the east. Airport Boulevard starts at Illinois Route 4 and proceeds past the intersection with Air Terminal Drive and northwest past Boeing, North Bay Produce and to AVMATS where it ends. Local streets that come off Airport Boulevard include: Avmats Drive that leads to the General Aviation area; Air Service Drive which provides access to the ARFF and Maintenance Area; and Richard Brauer Road which provides access to Boeing and North Bay Produce. The roadway that passes in front of the Air Passenger Terminal Building is known as Air Terminal Drive. All roadways listed herein are two lane roads, with appropriate turn lanes and in fair condition.

13 https://www.dodhousingnetwork.com/air-force/scott-afb/gates

Metro[14] operates MetroBus and Metrolink - these transportation modes do not presently access MidAmerica St. Louis Airport property. However, MetroBus connects Lebanon and Mascoutah with continuing service to the Shiloh/Scott Air Force Base Metrolink station (North and Southbound Service-Route Number 17X). The bus stops to drop off and pick up passengers on the side of Illinois Route 4, near the Airport's entrance road. Public transportation regarding taxi, limo/livery and ride sharing are also accessible.

In 2017, a single on-airfield service roadway was constructed that connects Taxiways G, K3 and K4. The previous access road that connects the Mike and November aprons remains in place, though a mechanical swing gate has been placed across the road and is under padlock and chain. The road may still be used, but the Airport has restricted access.

Airport parking is in multiple locations and serves a variety of facilities. See **Table 1.4-5, *Summary of Landside Auto Parking***. Rental car parking is located within the main terminal parking lot. The Air Passenger Terminal Parking lot is a pay parking facility.

Table 1.4-5: Summary of Landside Auto Parking

LANDSIDE LOCATION	NUMBER OF PARKING SPACES
Air Passenger Terminal Main Lot – South Lot	515 spaces / 18 ADA spaces
Air Passenger Terminal Main Lot – North Lot	721 spaces / 6 ADA spaces
Air Passenger Terminal Main Lot – Rental Car Spaces	52 spaces
Air Passenger Terminal Main Lot – Short Term Spaces	18 spaces / 3 ADA spaces
Air Passenger Terminal Main Lot – Employee Lot	6 spaces / 1 ADA space
Air Passenger Terminal Parking Subtotal	1,340 spaces
Boeing	108 spaces / 5 ADA spaces
North Bay Produce	58 spaces / 3 ADA spaces
US Customs and Border Patrol	5 spaces / 1 ADA space
Air Cargo Parking Subtotal	180 spaces
ARFF / Airport Maintenance Building	21 spaces / 1 ADA space / 4 secure spaces
AVMATS Paint Hangar	24 spaces
Illinois State Police	4 spaces / 1 ADA space
AVMATS	16 spaces
ARFF / GA Facilities Parking Subtotal	71 spaces
Department of Engineering and Planning	21 spaces / 1 ADA space
Total Number of Parking Places	**1,613**

Source: MidAmerica St. Louis Airport. ADA – Americans With Disabilities Act.

14 https://www.metrostlouis.org/

1.4.3 Air Cargo Facilities

North Bay Produce[15] is an international, fresh produce marketing and distribution cooperative, headquartered in Traverse City, Michigan. The MidAmerica St. Louis Airport location provides warehousing services, oversees quality and distributes North Bay Produce's imported and domestic fresh produce. This location handles cargo from North Bay Produce production facilities in Latin America and Mexico approximately ten months of the year. Additionally, it serves as an overflow packing, cold-storage and distribution center for U.S. production counter-seasonally. Being located at MidAmerica St. Louis Airport, the North Bay Produce facility is the only cold storage warehouse located on a runway north of Huntsville Alabama. Services include forced-air cooling (40 pallet unit), short and long-term storage (1,215 positions), USDA approved Cold Treatment and Fumigation services, Air Cargo pallet build up and loading, both fresh and RTE (ready-to-eat) blueberry packing lines.

Boeing, at BLV, is a manufacturing facility. The facility is 50,000 square-feet and is the only Illinois manufacturing facility for Boeing. Boeing employees perform assembly and subassembly work on the F/A-18 Super Hornet and F-15 Eagle fighter jets, as well as CH-47 Chinook military helicopter and the Boeing 777.

1.4.4 General Aviation Facilities

Ramp services are provided for tie-down of General Aviation aircraft at BLV. Additionally, BLV provides facilities for two (2) tenants: Aviation Material and Technical Support (AVMATS),[16] a Maintenance Repair and Overhaul (MRO) facility and the Illinois State Police (ISP). Table 1.4-6, ***Summary of Airport Hangars***, presents a summary of the General Aviation hangars at BLV.

Table 1.4-6: Summary of Airport Hangars

HANGAR	SIZE (ft^2)	TYPE
AVMATS MX. Hangar	21,000	FBO
AVMATS Paint Hangar	10,207	FBO
Illinois State Police Hangar	3,715	Public

Source: MidAmerica St. Louis Airport.

15 https://northbayproduce.com/
16 http://avmats.com/en-us/

1.4.5 Fixed Base Operator (FBO) Facilities

AVMATS currently provides FBO services to general aviation and corporate aviation aircraft at BLV. AVMATS is a MRO facility that offers: engine and airframe, avionics, painting, interior modifications, accessory repair, fuel, parking, hangars, passenger terminal and lounge, aircraft charters, oxygen services, maintenance, parts and accessories, and aircraft sales as well as FBO services.

AVMATS consists of two (2) aircraft hangars totaling approximately 31,207 square feet. The main facility is approximately 21,000 square feet and includes waiting areas, a conference room, and weather information. The second facility is smaller,10,207 square feet, and is used for stripping and painting aircraft.

1.4.6 Support Facilities

AIRPORT TRAFFIC CONTROL TOWER

The SAFB ATCT is located just south of Taxiway Golf and equidistant between the two parallel runways at MidAmerica St. Louis Airport/Scott Air Force Base. The tower is approximately 217 feet, 5 inches above ground level (AGL). Air traffic separation services for both civilian and military aircraft are provided on a 24/7 by United States Air Force personnel. The Airspace structure about the facility is categorized as Class D.

The St. Louis Terminal Radar Approach Control (T75) (TRACON) is located in St. Charles, Missouri. T75 provides aircraft separation services into and out of BLV, the entire St. Louis Airspace system, portions of southwestern Illinois and eastern Missouri. Kansas City Air Route Traffic Control Center (ZKC) (ARTCC), located in Olathe, Kansas, is responsible for enroute control of all aircraft operating in parts of Kansas, Oklahoma, Illinois, Arkansas, Nebraska, Iowa, Texas, New Mexico, Colorado, and Missouri, including operations into BLV.

AIRPORT MAINTENANCE BUILDING

The Airport offers a full staff for airfield and building maintenance, including snow removal duties. The maintenance facility is located south of the Golf Apron and is approximately 11,759 square feet. Part of the maintenance facility is used as Snow Removal Equipment (SRE) facility. Table 1.4-7, *BLV Snow Removal Equipment List*, lists the Airport's SRE.

Table 1.4-7: BLV Snow Removal Equipment List

TYPE	EQUIPMENT #	DESCRIPTION
SRE		
Plow	10	Oshkosh 4x4 truck (48,000 lbs GVW) with 17-foot power-reversible plow and 8-cubic yard dry material spreader
Plow	9*	Oshkosh 4x4 truck (48,000 lbs GVW) with 17-foot power-reversible plow
Loader	19	Case Front-End loader with 15-foot ramp plow
Broom	8*	Sweepster 18-foot Power Broom/Air Blast on Oshkosh 4x4 Carrier Vehicle (48,000 lbs GVW)
Broom	42	Sweepster 18-foot Power Broom/Air Blast on Oshkosh 4x4 Carrier Vehicle (43,000 lbs GVW) and interchangeable Oshkosh rotary plow (4,000 tons per hour capacity)
Truck	16*	2,000 gallon Liquid De-ice Truck
Truck	4	4x4 Pick-up with Street Plows and 2 cubic-yard dry material spreaders
Truck	29	4x4 Pick-up with Street Plows and 2 cubic-yard dry material spreaders
Truck	84	4x4 Pick-up with Street Plows
Truck	85	4x4 Pick-up with Street Plows
Aircraft Deicing Equipment		
Truck	27	International 4900 Global De-Icing Truck with 2,000 Gallon Type I and Type IV fluid capability
Truck	86	Freightliner Global De-Icing Truck w/85 ft. extended reach - Type I and Type IV fluid capacity and hot air capability

** Note: Broom #8, Plow #9, and Deicing Truck #16 are designated as joint use*

Source: MidAmerica Snow and Ice Control Plan.

SECURITY AND PUBLIC SAFETY DEPARTMENT

Since BLV serves scheduled passenger operations where TSA conducts passenger screening, it is required to maintain an Airport Security Program (ASP) as described in 49 CFR Part 1542/1540, Airport Security. This program is designed to control access to the Air Operations Area (AOA), control the movement of persons and ground vehicles on the AOA, and to promptly detect and act to control entrance of the AOA by unauthorized individuals. BLV maintains security fencing around the perimeter of the facility.

In 2012 BLV improved and upgraded the Airport's security systems. This project included improvements and upgrades to the Airport's access control system, video surveillance and monitoring system, ID badging facilities, and security network. These improvements were made to upgrade security measures to the Airport's passenger terminal building, U.S. Customs and Border Protection (CBP) facilities, the ARFF station, the maintenance building and the electronic perimeter gates. The security upgrades and improvements largely enhanced the Airport Operations Center (AOC), which is inside the ARFF station, and serves as "central command" to track and monitor security related events at BLV, as well as perform all ID badging functions.

The Airport maintains a public safety department, staffed by cross-trained airport staff, that serve as public safety officers who provide 24/7 security to the Airport facilities. In the event of security related issues which rise above the ability of the public safety officers the St. Clair County Sheriff and City of Mascoutah police department are the responding authorities for security related concerns. Additionally, the St. Clair County Sheriff's Department is frequently present during scheduled airline operations.

AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) FACILITIES

BLV maintains a FAA Airport Operating Certificate under 14 CFR Part 139, as it is served by scheduled operations by air carrier aircraft seating more than 30 passengers. BLV is identified under the FAA classification system in Part 139 as a Class I airport. The Airport maintains an ARFF Index B and has the capability to become Index C upon request. The length of air carrier aircraft serving the Airport with five or more average daily departures determines the ARFF Index. SAFB has its own emergency response equipment that is utilized for emergencies on the Air Force side of the airport. Therefore, the BLV ARFF serves the civilian side of the Airport.

The BLV ARFF facility is located northwest of the North Bay Produce Building, and adjacent to AVMATS. This facility is approximately 9,163 square feet and provides storage space for the Airport's primary ARFF vehicles, which includes an Oshkosh T-1500 and Oshkosh T-3000. Cross-trained airport staff provides continuous ARFF coverage operating on 24-hour shifts. A detailed list of the ARFF equipment is listed in Table 1.4-8, *Airport Rescue and Firefighting (ARFF) Equipment*.

Table 1.4-8: Airport Rescue and Firefighting (ARFF) Equipment

VEHICLE	NAME	WATER (gal.)	AFFF (gal.)	DRY-CHEMICAL (lbs.)	REMARKS
Oshkosh T-1500	Crash 3	1,500	210	450	Roof Agent/Bumper Turret
Oshkosh T-3000	Crash 2	3,000	420	450	Roof Agent/Bumper Turret

Source: MidAmerica St. Louis Airport.

U.S. DEPARTMENT OF HOMELAND SECURITY, CUSTOMS AND BORDER PROTECTION (CBP)

The U.S. CBP has offices located southwest and adjacent to Boeing. CBP is operational from 5AM to 1PM Central. The BLV facility is considered as a Port of Entry in Illinois.

OIL, DE-ICING FLUID AND FUEL STORAGE

Oil storage containers and deicing fluid storage tanks are located within the fenced limits of the BLV maintenance facility. **Table 1-9**, *Summary of Oil/Petroleum Storage Container and Deicing Storage*, presents a listing of those containers.

Table 1.4-9: Summary of Oil/Petroleum Storage Containers and Deicing Storage

OIL/PETROLEUM STORAGE			
STORAGE CONTAINER	LOCATION	TYPE OF OIL/PETROLEUM	CAPACITY (gal.)
Drum of Motor Oil	Maintenance Facility	Motor Oil 10W30	55
Drum of Motor Oil	Maintenance Facility	Motor Oil 15W40	55
Drum of Motor Oil	Maintenance Facility	Heavy Duty Diesel Engine Oil	55
Drum of Automatic Transmission Fluid	Maintenance Facility	Automatic Transmission Fluid	55

DEICING FLUID STORAGE			
DEICING APPLICATION	LOCATION	TYPE OF FLUID	CAPACITY (gal.)
Aircraft Deicing Fluid	Maintenance Facility Yard	Type I	9,000
Aircraft Deicing Fluid	Maintenance Facility Yard	Type IV	Totes
Runway Deicer	Maintenance Facility Yard	Potassium Acetate	30,000

Source: MidAmerica St. Louis Airport.

BLV has a collection system in place to capture used aircraft deicing fluid. There is a holding basin northeast of the Air Passenger Terminal parking lot on the east side of Airport Boulevard, which has a capacity of 796,500 gallons and collects the used deicing fluid from the Mike and November aprons via trench drains on the aprons. The collected deicing fluid is sent to the City of Mascoutah's Sanitary System.

The primary aircraft fuel storage area, the Fuel Farm, is located on Airport Boulevard across the street from the BLV Maintenance and General Aviation/Corporate Aviation area. All fuel storage at the Fuel Farm is stored in Aboveground Storage Tanks (AST), and are owned and maintained by Illinois Pipeline. The Fuel Farm also has two Jet A recovery tanks. There are no Underground Storage Tanks at BLV.

The majority of mobile fuel trucks are owned by BLV and are operated by Airport Terminal Services (ATS).

Airport owned vehicles, ARFF equipment, and SRE utilize gasoline and diesel combustible fuels. BLV maintains two AST's for gasoline and diesel fuel storage at the maintenance facility.

Table 1.4-10, *Summary of Fuel Type and Capacity in the Fuel Farm*, provides a summary of the fuel tank numbers, locations, fuel types and capacities at BLV.

Table 1.4-10: Summary of Fuel Type and Capacity in the Fuel Farm

AIRCRAFT FUEL			
TANK NUMBER	TANK LOCATION	FUEL TYPE	CAPACITY (gal.)
301	Fuel Farm	Jet A	30,000
302	Fuel Farm	Jet A	30,000
303	Fuel Farm	Jet A	30,000
304	Fuel Farm	Jet A	30,000
305	Fuel Farm	Jet A	30,000
306	Fuel Farm	Jet A	30,000
307	Fuel Farm	Jet A	30,000
308	Fuel Farm	Jet A	30,000
Total			240,000
1201	Fuel Farm	AvGas/100LL	12,000
Total			12,000
Recovery Tank	Fuel Farm	Jet A	1,600
Recovery Tank	Fuel Farm	Jet A	400
Total			2,000

VEHICLE AND EQUIPMENT FUEL			
TANK NUMBER	TANK LOCATION	FUEL TYPE	CAPACITY (gal.)
Tank Number 1	Maintenance Facility Yard	Unleaded Gasoline	2,000
Total			2,000
Tank Number 2	Maintenance Facility Yard	Diesel	2,000
Parkan Fuel Cart	Maintenance Facility	Diesel	300
Total			2,300

MOBILE FUEL TRUCKS			
TANK NUMBER	TANK LOCATION	FUEL TYPE	CAPACITY (gal.)
Mobile Refueler Truck Number 17	Typically parked on the November Apron	AvGas/100 LL	750
Total			750
Mobile Refueler Truck Number 18	Typically parked on the November Apron	Jet A	5,000
Mobile Refueler Truck Number 38	Typically parked on the November Apron	Jet A	8,000
Mobile Refueler Truck Number 92	Typically parked on the November Apron	Jet A	5,000
Total			18,000

Source: MidAmerica St. Louis Airport.

1.4.7 Inventory of Utilities

A major element of the Airport's infrastructure includes the utilities that service the Airport. An inventory of utilities includes the electric, natural gas, water, sanitary, and telecommunications services. The following local utility providers serve BLV:

- **Electric:** Ameren
- **Gas:** Ameren
- **Water:** Cities of Mascoutah and O'Fallon, and Summerfield, Lebanon, and Mascoutah Water Commission (SLM)
- **Sanitary:** City of Mascoutah and Village of Shiloh
- **Telecommunications:** Frontier Communications, Clearwave Communications and AT&T

This section will describe the existing utilities which will establish a baseline for subsequent sections of this report. The focus of this section will be the Airport utilities (Airport owned facilities), with only a slight mention of Scott Air Force Base utility systems. In addition to the aforementioned utilities, this section will also examine storm water and sewage drainage, as well as the fire suppression water supply, while also summarizing utility infrastructure that has not changed which was previously outlined in the 2007 Master Plan Update (2007 MPU).

ELECTRIC

The electrical infrastructure has not changed much since the 2007 MPU. Ameren remains the Airport's service provider for electrical utilities. To summarize the electric infrastructure from the 2007 MPU:

- Northwest section of the Airport has restricted electric service limited to old overhead lines running parallel to roadway (previously servicing residential housing that was present before the Airport acquired the land, and demolished the homes)
- There is a 12-KV 3-Phase electrical feed that runs overhead and underground parallel to an Ameren gas line traversing the northwest section of the Airport's property
- Ameren provides primary and secondary feeders (circuits 297 and 248 respectively), each being a 12-KV 3-Phase underground, with three 750 MCM AL-ECN in six-inch PVC with spare
- The electrical service enters the property from the east, passes through a series of transformers and regulators in the electrical vault, and then feeds electrical power to the airfield powering airfield lighting, signs, and NAVAIDS
- Power lines pass through to the east via the utility corridor, and a power loop is completed with lines continuing to the west of the runway; power lines also parallel the crossover taxiway providing power to the ATCT (the utility corridor generally runs parallel to the Airport entrance road which carries utilities to this developed area of the Airport)
- The power loop also serves various FAA NAVAIDS and facilities
- The Airport's Engineering and Planning building receives electrical service via a residential power feed from Route 4

NATURAL GAS

The natural gas infrastructure has similarly remained the same since the 2007 MPU, and a summary of this utility is as follows:

- Ameren continues to provide natural gas to BLV
- Ameren has a 10-inch steel transmission line running east to west across this section of the Airport, which continues east across Silver Creek providing service to the developed portion of the Airport
- Ameren also runs a gas line on the west side of Old Illinois Route 158
- Within the utility corridor west of the ARFF and south of the terminal, a 4-inch plastic distribution line taps the 10-inch transmission line to bring gas to the developed areas, which are individually metered
- The Airport's Engineering and Planning building is served through a plastic residential feed from Illinois Route 4, the ATCT is served by a 2-inch main line from Scott Air Force Base (which pays for the ATCT's gas service) and then a 1-1/4-inch plastic service line, located south of the crossover taxiway

WATER

This section will describe the potable and non-potable water supply utilities that serve the Airport. The Airport is provided potable water supply utilities from the City of O'Fallon and the City of Mascoutah. While most of water supply infrastructure is the same, there have been a few modifications since the 2007 MPU.

The potable water supply is summarized below:

- The northwest section of the Airport, including the Illinois Army National Guard MidAmerica Readiness Center that was constructed in 2009, is served by the City of O'Fallon water main that runs north and south on the east side of Old Illinois Route 158 – this section of the Airport falls within the boundaries of both the City of O'Fallon and the Village of Shiloh, which could each provide future water service
- In 2011 Scott Air Force Base surrendered owner/operator status of the on-base water system (water towers, storage, mains and line) to American Water who is now the provider of potable water to the Air Force base
- The developed area of the Airport is supplied with potable water from the City of Mascoutah, while the Engineering and Planning building is supplied potable water from the Summerfield Lebanon Mascoutah Water Commission (SLM)
- Important to note is that the facilities near the northern end of the developed area experience issues regarding water pressure – future expansion or construction should consider this issue

- A 12-inch PVC water main taps into the 16-inch water main which brings the supply to the Meter and Valve Vault (north of the Engineering and Planning building), at which point an 8-inch distribution main travels north and splits to form a loop along the terminal building access road, ultimately converging north of the terminal and continuing north and west just past the ARFF
- 6-inch or smaller service lines provide supply to the Boeing and the North Bay Produce facilities, as well as the ARFF and maintenance buildings, fuel farm, AVMATS maintenance and paint hangars, Illinois State Police hangar, and the CBP facility – tenants are sub-metered
- The ATCT is provided potable water by Scott Air Force Base via a 3-inch PVC water line located south of Taxiway Golf
- Fire protection provided to the AVMATS hangars is fed through this water supply
- Fire hydrants along the access road system also tap into this water supply line

Non-potable water at the Airport serves the Fire Suppression Water Supply, and is summarized below:

- The fire suppression water supply feeds the sprinkler systems at the ATCT, ARFF, Boeing, North Bay Produce, CBP, fuel farm, Passenger Terminal, and a few hydrants. This system originates at a 1-million-gallon storage tank located on the East side of Scott Air Force Based south of the cross-over taxiway
- Previous efforts used to maintain this 1-million-gallon storage tank as potable water, but has recently been converted to a non-potable supply and is managed by American Water
- In 2016 the Airport removed a backflow preventer since the storage tank is no longer maintained as potable water
- A 12-inch ductile iron suction line brings the water from the storage tank to a pump station, then the water is brought from the pump station to the developed area of the Airport via a 12-inch ductile fire water line that runs east parallel to the cross-over taxiway, up to the ARFF, and ultimately ending south of the passenger terminal building
- In 2010, in efforts to rectify high pressure and water hammering issues in the fire suppression system, the Airport installed a pressure relief valve west of Runway 14L-32R which eliminated most of this issue

SANITARY SEWER

The sanitary sewage infrastructure at the Airport is generally the same since the 2007 MPU, except for new construction in several areas. Various communities provide sanitary sewer service to the Airport. The northwest area of the Airport is provided sanitary service by the Village of Shiloh, while all other areas of the Airport are provided sanitary services from the City of Mascoutah. The following summarizes the existing sanitary sewage utilities at the Airport:

- The northwest section of the Airport has a limited sanitary sewer system. There is a Village of Shiloh sewer main that runs to a lift station at the corner of Old Illinois Route 158 and Wherry Road – recent construction extended this sewer main from the lift station south to a development at the corner of Seibert Rd. and Old Illinois Route 158, which ultimately discharges to the City of O'Fallon's wastewater system
- The Engineering and Planning building's sanitary needs are being fulfilled by a septic tank, and the Illinois Army National Guard's sanitary needs are being fulfilled by a holding tank
- The developed portion of the airfield is supplied sanitary sewer service which starts as an 8-inch PVC gravity line at the utility corridor between the ARFF and maintenance building, and while traveling south to the terminal area the sewer line increases to 12-inch PVC gravity line
- The 12-inch gravity line reduces to a 6-inch PVC force main after passing through a lift station along the terminal loop road at the intersection of Air Terminal Drive and Airport Boulevard, and from the terminal building the sewer line continues south, reverting to 12-inch line near Old Illinois Route 4, ultimately connecting into the City of Mascoutah's 18-inch sewer main identified as the Mascoutah Joint Use Interceptor which is located on the east side of relocated Illinois Route 4
- The glycol pond, located east of Airport Boulevard, provides the storage of recovered glycol used on the Mike and November Aprons
- An additional trench drain collection point was added to the Mike Apron during a recent ramp expansion project
- A sewer grinder station that processes waste from aircraft is located near the maintenance building
- The ATCT is connected to Scott Air Force Base's sewer system by 2-1/2-inch PVC force main

STORM SEWER AND DRAINAGE

The storm sewer and drainage system at the Airport has not changed since the 2007 MPU, and is summarized in the below section:

- The storm drainage system in the northwest section of the Airport consists of drainage ditches located parallel to roadways, tile drains in the farm field, and ditches and field tile which drain to tributaries of Silver Creek and Ash Creek
- The developed area is service by a drainage system that consists of swales, ditches, concrete inlets, 12-inch to 66-inch reinforced concrete pipe, limited HDPE and CSP corrugated steel pipe, and detention ponds
- Storm water that is collected is routed through either the I-64 interchange borrow pond or the three detention ponds west of the runway – all ultimately discharging to Silver Creek
- The Silver Creek floodplain also receives drainage from east of Illinois Route 4 via Crooked Creek which was relocated around the south end of Runway 14L-32R

TELECOMMUNICATIONS

Telecommunication utilities at the Airport have undergone a few changes since the 2007 MPU. This section will summarize the telecommunications section from the 2007 MPU as well as describe the changes that have taken place since:

- The northwest section of the Airport is primarily served by AT&T. This section of the Airport has abandoned infrastructure which the whereabouts may not be known
- In the developed section of the Airport telephone services are provided by Frontier Communications – infrastructure consists of six incoming and eight outgoing trunk lines, and a Nortel Option 61C Meridian Switch
- Communication infrastructure at and between Airport facilities includes copper cabling, fiber optic and wireless technologies. Multi-mode and single-mode infrastructure is run between Airport facilities. Cat 5 or greater single and multi-mode fiber runs to a communication closet in each facility
- In 2016, the Airport contracted Clearwave Communications to provide internet services and a fiber optic cable was brought onsite
- The Airport maintains centralized public address and paging stations which provides public address announcements
- The Airport also maintains a full suite of communications services including voice mail, email and internet connectivity throughout Airport property, limited multi-user flight information display system which inform passengers of flight information, and a state-of-the-art access control, video surveillance and radio systems which monitors and controls access into secure areas

1.4.8 Inventory of Non-Aeronautical Land Uses

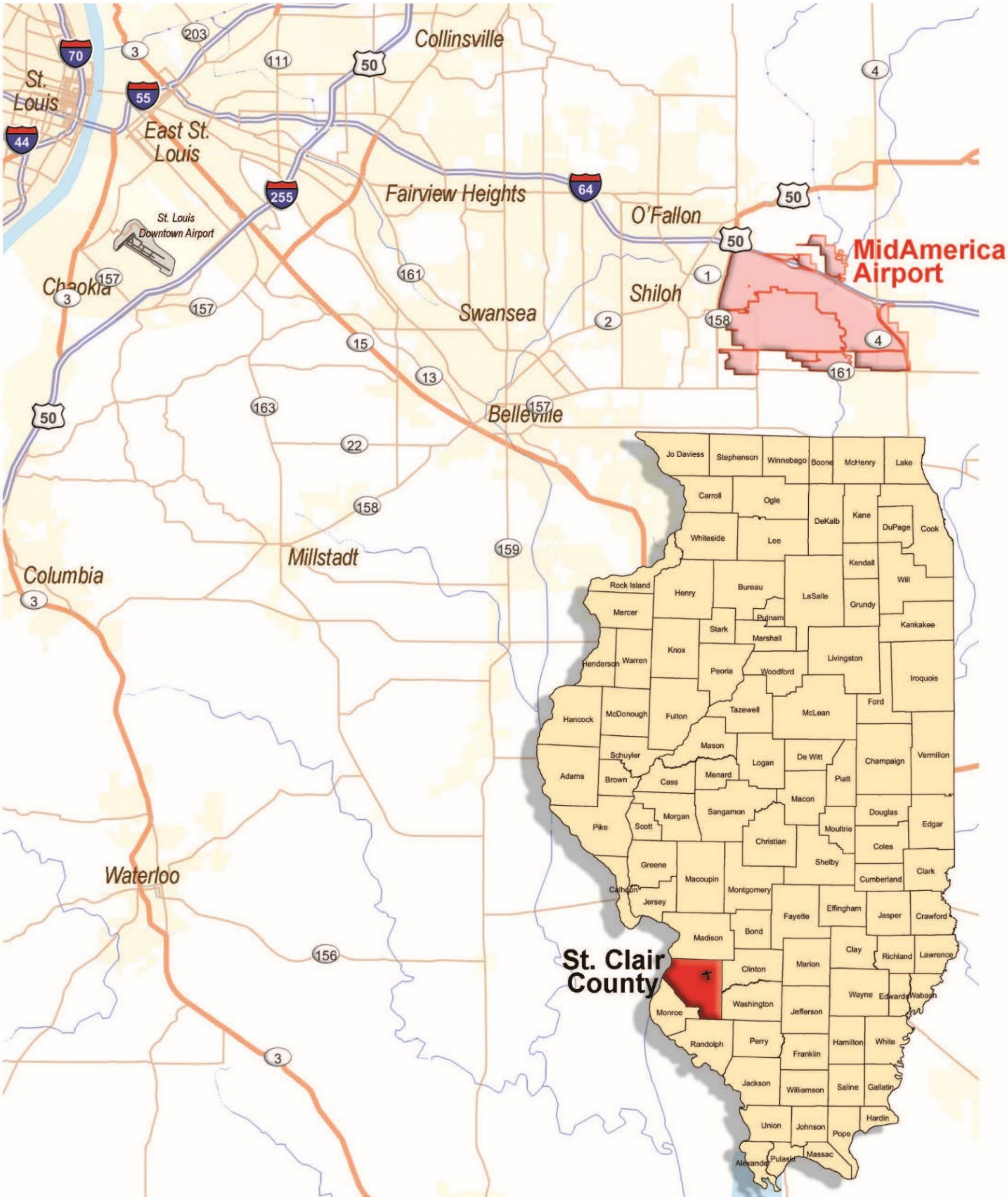
Presently there is limited non-aeronautical land uses such as recreational facilities, industrial parks, or non-airport retail businesses located on BLV. However, there is agricultural production in certain portions of the Airport that is considered non-aeronautical. Also, several advertising signs along Illinois Route 158 are on non-aeronautical/Airport property and provide revenue to the County. The previously approved Airport Layout Plan also identified locations within the northwestern portion of the airfield, bounded by Interstate 64, Illinois Route 158 and Wherry Road, as non-aeronautical.

1.5 Regional Setting and Land Use

MidAmerica St. Louis Airport is geographically located east of St. Louis, Missouri in St. Clair County, Illinois.[17] The County of St. Clair is in southwestern Illinois and within the St. Louis MO Metropolitan Statistical Area. Exhibit 1.5-1, *Location Map*, presents a map identifying the general location of BLV. The Airport is directly served by Illinois Route 4 and is adjacent to Interstate 64, and Illinois Route 158 and Illinois Route 161. Exhibit 1.5-2, *Vicinity Map*, presents the location of the Airport in the county. The communities that surround the Airport include: City of Belleville, City of Mascoutah, Village of Shiloh, City of Lebanon, City of O'Fallon and unincorporated St. Clair County. Exhibit 1.5-3, *Local Communities Surrounding the Airport*, identifies the Local Communities Surrounding the airfield.

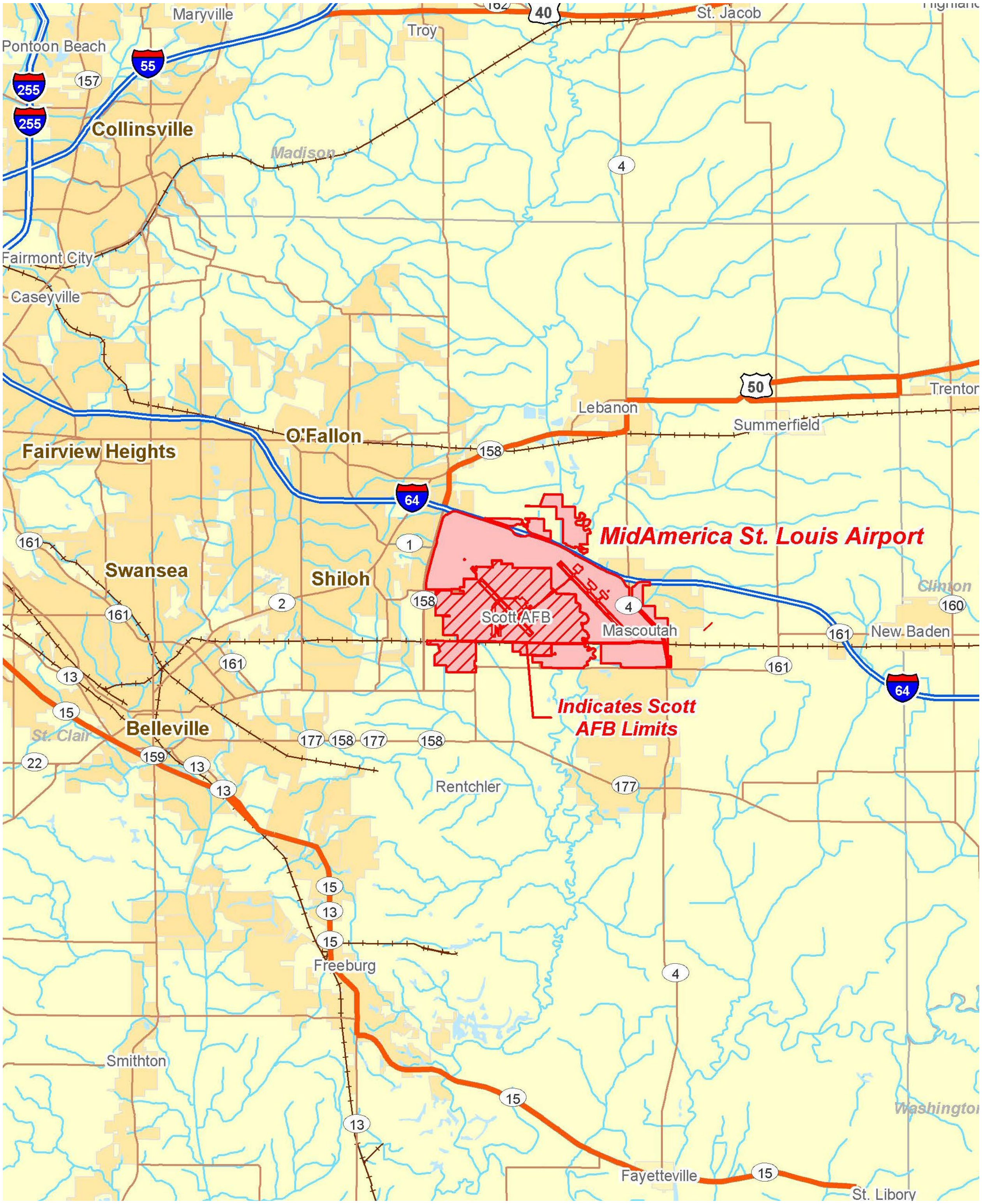
17 http://www.co.st-clair.il.us/Pages/default.aspx

Exhibit 1.5-1 – Location Map



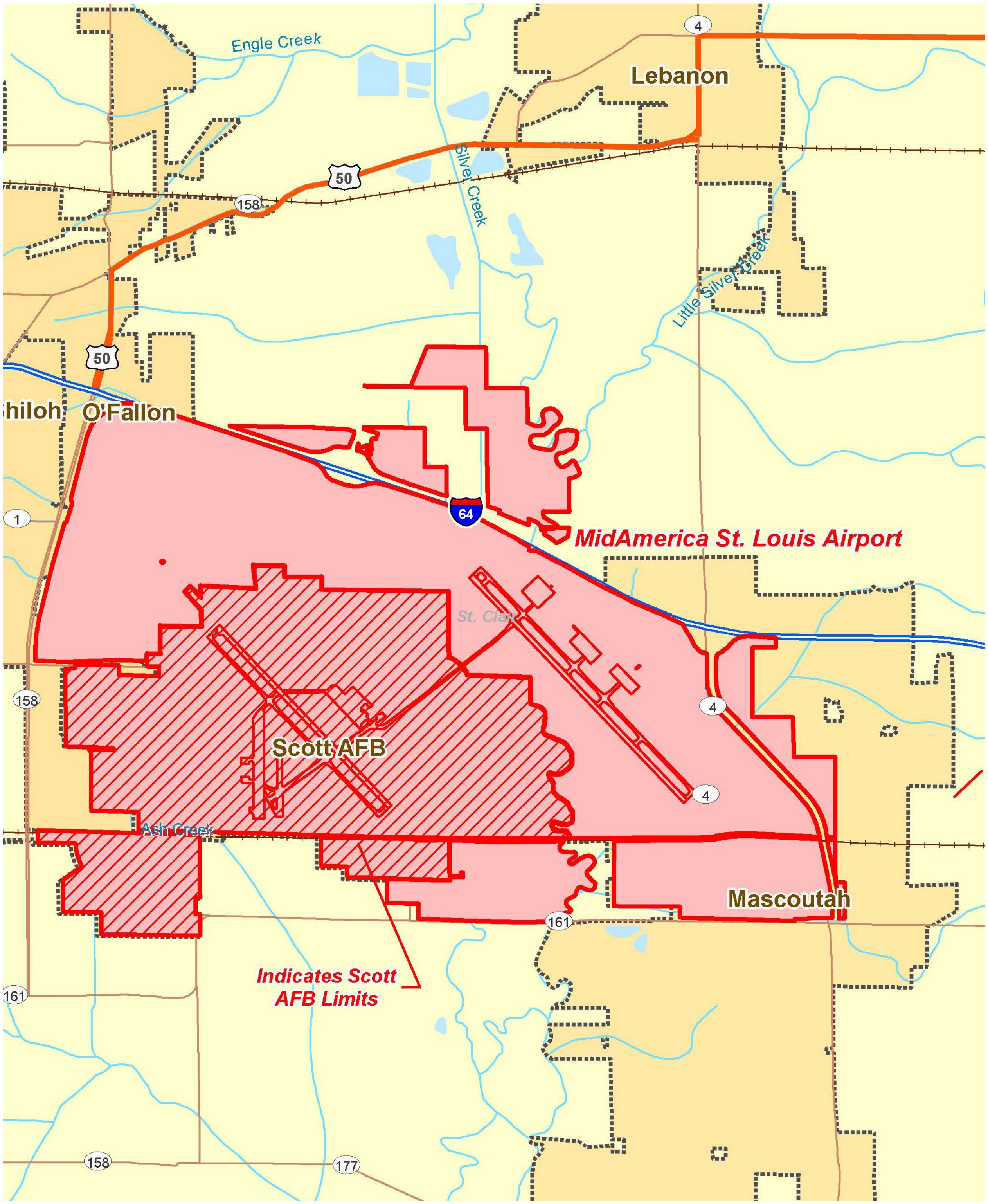
Source: CMT 2018.

Exhibit 1.5-2 – Vicinity Map



Source: CMT 2018.

Exhibit 1.5-3: Local Communities Surrounding The Airport



Source: CMT 2018.

1.5.1 Airspace

MidAmerica St. Louis Airport/Scott Air Force Base is located within the airspace structure of the Greater St. Louis area. Specifically, Class B airspace starts at the surface level of St. Louis Lambert International Airport. The airspace structure continues upward and outward from STL in the shape of an inverted (upside down) wedding cake. As the levels get further from STL, the airspace restrictions become less. BLV is located under that portion of the STL Class B airspace where aircraft flying between 4,500 feet (floor) Above Mean Sea Level (AMSL) and 8,000 feet AMSL (ceiling) need to be in contact with St. Charles TRACON. BLV is also within the 30-nautical mile Mode C veil. All aircraft operating within this airspace must have an altitude reporting Mode C transponder in operation. Aircraft flying within the Class D airspace structure over BLV (ground to 3,000 AGL) must be in direct radio contact with Scott ATCT.

Airports that are open to the public, and are within a 40 nautical mile area of BLV and/or that are located within the MPO's service area.[18] are listed in **Table 1.5-1, *Regional St. Louis Metropolitan Airports***, and depicted on **Exhibit 1.5-4, *Regional St. Louis Metropolitan Airports***. The following is a list of those airports that includes the airport's runway features and direction and distance from BLV.

18 http://www.ewgateway.org/wp-content/uploads/2017/08/AirTransFacilities.pdf

Table 1.5-1: Regional St. Louis Metropolitan Airports

AIRPORT	ID	LOCATION	LONGEST RUNWAY LENGTH (ft.)	DISTANCE (nm)	DIRECTION
St. Louis Metro-East/Shafer Field Airport	3K6	St. Jacob, IL	2,662′	11	N
St. Louis Downtown Airport	CPS	Cahokia/St. Louis	7,002′	15	W
Highland-Winet Airport	H07	Highland, IL	2,200′	17	NE
Sackman Field Airport	H49	Columbia, Il	2,450′	20	W
St. Louis Regional Airport	ALN	Alton, IL	8,099’	23	NW
Sparta Community/Hunter Field Airport	SAR	Sparta, IL	2,958′	25	S
Greenville Airport	GRE	Greenville, IL	4,002′	28	NE
St. Louis Lambert International Airport	STL	St. Louis, MO	11,019′	28	NW
Festus Memorial Airport	FES	Festus, MO	2,202′	33	SW
Creve Coeur Airport	1H0	St. Louis, MO	4,500′	33.4	NW
Centralia Municipal Airport	ENL	Centralia, IL	5,001′	35	E
St. Charles County Smartt Airport	SET	St. Charles, MO	3,800′	36.2	NW
Litchfield Municipal Airport	3LF	Litchfield, IL	4,002′	37.8	NE
Spirit of St. Louis Airport	SUS	St. Louis, MO	7,485′	38.9	W
Perryville Regional Airport	PCD	Perryville, MO	7,003′	40.6	S
Pinckneyville-Du Quoin Airport	PJY	Pinckneyville, IL	3,999’	40.7	SE
Vandalia Municipal Airport	VLA	Vandalia, IL	3,751’	41.2	NE
Salem-Leckrone Airport	SLO	Salem, IL	4,098’	41.3	E
Mount Vernon Outland Airport	MVN	Mount Vernon, IL	6,496’	47.8	ESE
St. Clair Regional Airport	K39	St. Clair, MO	3,198′	55	SW
Sullivan Regional Airport	UUV	Sullivan, MO	4,500′	65	SW

Source: Airnav.com 2018.

Exhibit 1.5-4: Regional St Louis Metropolitan Airports

Source: CMT 2018.

1.5.2 Approach and Departure Instrumentation

Flights into and out of the BLV are conducted using both Instrument Flight Rules (IFR) and Visual Flight Rules (VFR). Runways 14L and 32L have published left-hand traffic patterns and Runways 14R and 32R have published right-hand pattern. There are several published Standard Instrument Approach Procedures (SIAP) that serve MidAmerica St. Louis Airport/Scott Air Force Base. Table 1.5-2, *Standard Instrument Approach Procedures (SIAP) at MidAmerica St. Louis Airport*, provides a summary of each instrument approach type and associated minimums for the various aircraft classes.

Table 1.5-2: Standard Instrument Approach Procedures (SIAP) at MidAmerica St. Louis Airport

STANDARD INSTRUMENT APPROACH PROCEDURES (SIAP)	AIRCRAFT CATEGORY AND SIAP MINIMUMS				
	CAT A AGL (ft.) – VISIBILITY (sm)	CAT B AGL (ft.) – VISIBILITY (sm)	CAT C AGL (ft.) – VISIBILITY (sm)	CAT D AGL (ft.) – VISIBILITY (sm)	CAT E AGL (ft.) – VISIBILITY (sm)
S-ILS or LOC Runway 14L	200 - ¾	200 - ¾	200 - ¾	200 - ¾	200 - ¾
S-LOC Runway 14L	500 - 1¼	500 - 1¼	500 - 1 3/8	500 - 1 3/8	500 - 1 3/8
C-Circling Runway 14L	600 - 1	700 - 1	800 - 2 ¼	800 - 2 ½	800 - 2 3/4
S-ILS Runway 14R	200 - ½	200 - ½	200 - ½	200 - ½	200 - ½
S-LOC Runway 14R	600 - ½	600 - ½	600 - 1¼	600 - 1¼	600 - 1½
C-Circling Runway 14R	600 - 1	700 - 1	800 - 2 ¼	800 - 2 ½	800 - 2 ¾
S-ILS Runway 32R	200 - ½	200 - ½	200 - ½	200 - ½	200 - ½
S-LOC Runway 32R	400 - ½	400 - ½	400 - 5/8	400 - 5/8	400 - 5/8
C-Circling Runway 32R	600 - 1	700 - 1	800 - 2 ¼	800 - 2 ½	800 - 2 ¾
S-ILS Runway 32L	200 - ½	200 - ½	200 - ½	200 - ½	200 - ½
S-LOC Runway 32L	500 - ½	500 - ½	500 - 1	500 - 1	500 - 1
C-Circling Runway 32L	600 - 1	700 - 1	800 - 2 ¼	800 - 2 ½	800 - 2 ¾
RNAV (GPS) Runway 14L - LPV	200 - ¾	200 - ¾	200 - ¾	200 - ¾	-
RNAV (GPS) Runway 14L - LNAV/VNAV	500 - 1 5/8	500 - 1 5/8	500 - 1 5/8	500 - 1 5/8	-
RNAV (GPS) Runway 14L - LNAV	500 - 1¼	500 - 1¼	500 - 1 3/8	500 - 1 3/8	-
RNAV (GPS) Runway 14L - Circling	600 - 1	700 - 1	800 - 2¼	800 - 2½	-
RNAV (GPS) Runway 14R - LNAV	700 - ½	700 - ½	700 - 1 3/8	700 - 1½	-
RNAV (GPS) Runway 14R - Circling	700 - 1	700 - 1	800 - 2 ¼	800 - 2 ½	-
RNAV (GPS) Runway 32L - LNAV	500 - ½	500 - ½	500 - 1	500 - 1	-
RNAV (GPS) Runway 32L - Circling	600 - 1	700 - 1	800 - 2¼	800 - 2½	-
RNAV (GPS) Runway 32R - LPV	200 - ½	200 - ½	200 - ½	200 - ½	-
RNAV (GPS) Runway 32R - LNAV/VNAV	400 - ¾	400 - ¾	400 - ¾	400 - ¾	-
RNAV (GPS) Runway 32R - LNAV	400 - ½	400 - ½	400 - ¾	400 - ¾	-
RNAV (GPS) Runway 32R - Circling	600 - 1	700 - 1	800 - 2¼	800 - 2½	-
TACAN-A - Circling	800 - 2¼	800 - 2¼	800 - 2¼	800 - 2½	800 - 2 3/4
TACAN Runway 14R	700 - ½	700 - ½	700 - 1 3/8	700 - 1 3/8	700 - 1 3/8
TACAN Runway 14R Circling	700 - 1	700 - 1	800 - 2¼	800 - 2½	800 - 2 3/4
TACAN Runway 32L	500 - ½	500 - ½	500 - 1	500 - 1	500 - 1¼
TACAN Runway 32L Circling	600 - 1	700 - 1	800 - 2¼	800 - 2½	800 - 2 3/4
ASR Runway 32L	500 - ½	500 - ½	500 - 7/8	500 - 7/8	500 - 7/8
ASR Runway 32R	500 - ½	500 - ½	500 - 1	500 - 1	500 - 1
ASR Runway 14L	600 - 1¼	600 - 1¼	600 - 1 5/8	600 - 1 5/8	600 - 1 5/8
ASR Runway 14R	700 - ½	700 - ½	700 - 1 3/8	700 - 1 3/8	700 - 1 3/8
ASR Circling All Runways	700 - 1	700 - 1	800 - 2¼	800 - 2 ½	800 - 2 ¾

Source: FAA. ILS-Instrument Landing System. LOC-Localizer. RNAV-Area Navigation. GPS-Global Positioning System.

In certain complex metropolitan airspace, the FAA uses published instrument approach procedures known as Standard Terminal Arrival (STARs) to facilitate aircraft flow into specific airports in the region. MidAmerica St. Louis Airport/Scott Air Force Base presently has five STARs: BUUDD TWO ARRIVAL (RNAV), CENTRALIA TWO ARRIVAL (RNAV); DELMA THREE ARRIVAL (RNAV), DIXEE THREE ARRIVAL (RNAV), and FARMR THREE ARRIVAL (RNAV). By the same token, FAA uses published Standard Instrument Departure (SID) procedures to facilitate aircraft flow out of specific airport within complex airspace areas. BLV has six published SIDs including: BLUES SIX DEPARTURE, CARDS ONE DEPARTURE, GATEWAY NINE DEPARTURE, LINDBERGH SIX DEPARTURE, OZARK SEVEN DEPARTURE and PLESS FIVE DEPARTURE. Appendix A display all Instrument Approach Procedures, STARs, Departure Procedures, Radar Instrument Approach Minimums and IFR Alternate Airport Minimums.

1.5.3 FAR Part 77 Approach Surfaces

Regulations for the protection of airspace around a public-use civilian airport are specified in 14 CFR Part 77. These defined surfaces are used by the FAA to identify obstructions to airspace around an airport facility. Runway approach surfaces are a critical component of Part 77 as they control objects located in the glide path to a specified runway. Approach surfaces are established 200 feet from the end of each runway threshold at the threshold elevation and extend at a specified slope and distance dependent upon the type of aircraft that operate at the facility. Table 1.5-3, *Part 77 Approach Surfaces*, provides dimensional information on each existing Part 77 Approach Surface at BLV.

Table 1.5-3: Part 77 Approach Surfaces

PART 77 APPROACH SURFACE FEATURE	RUNWAY			
	14L	32R	14R	32L
Slope	50:1	50:1	50:1	50:1
Width at Inner End	1,000′	1,000′	1,000′	1,000′
Width at Outer End	16,000′	16,000′	16,000′	16,000′
Length	50,000′	50,000′	50,000′	50,000′

Note: For Runways 4, 13 and 31, approach slope is 50:1 for first 10,000' and 40:1 for next 40,000'

Source: FAA Part 77.

1.5.4 Climate

Aviation and airport use is subject to the benefits and constraints of the weather. Conditions such as visibility, height of clouds and wind speed and direction affect airport operation daily. Weather in aviation are defined in two conditions: Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). Aircraft, as defined by the FAA, can fly under either Visual Flight Rules or Instrument Flight Rules. Visual flight is conducted on a see and be seen method and weather conditions includes cloud heights greater than 1,000 feet above the surface and more than three miles visibility.

Specifics of weather also impact aviation. The following is a list of those items:

- BLV (St. Louis Region) Average Maximum Daily Temperature during the hottest month of the year - July and 88 degrees Fahrenheit.
- BLV (St. Louis Region) highest average temperature (combination of all temperatures throughout the day in the hottest month determined previously - July 21, 2017 and 102 degrees Fahrenheit.
- BLV (St. Louis Region) lowest average temperature (combination of all temperatures throughout the day in the coldest month - December 24 degrees Fahrenheit.
- BLV annual precipitation for the year - Annual Sum 34.15 inches. Average rainfall 12 inches.

Table 1.5-4, *Runway Wind Coverage*, shows the percentage of time the runway(s) meet the crosswind and tailwind component conditions specified by FAA. The source and dates of the Wind Rose data comes from a FAA database[19] and are dated April 17, 2018. **Exhibits 1.5-5, through 1.5-7** present the Wind Rose for Visual Meteorological Conditions, Instrument Meteorological Conditions and All Weather, respectively.

Table 1.5-4: Runway Wind Coverage[20]

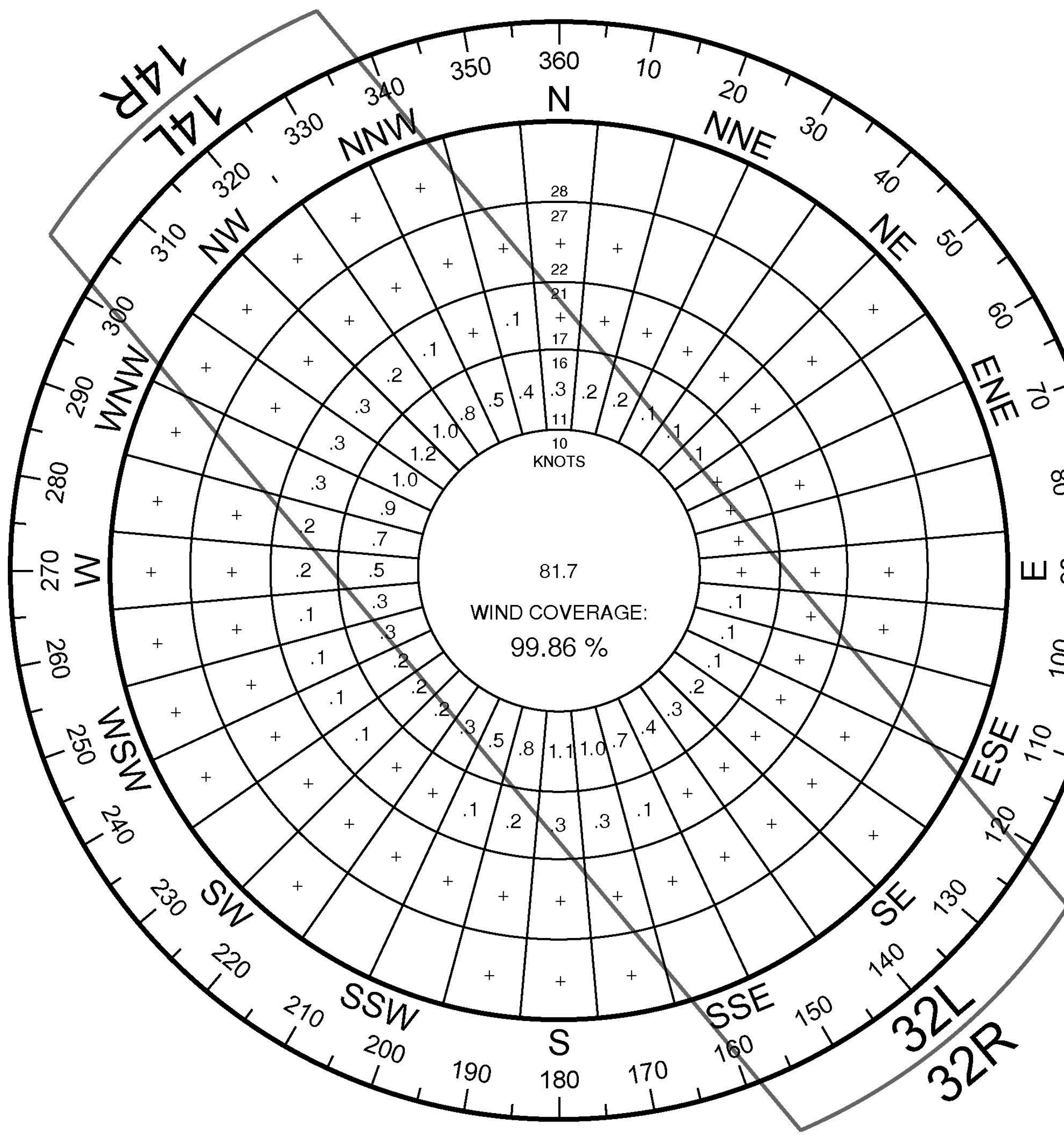
CROSSWIND SPEED	ALL WEATHER			VISUAL METEOROLOGICAL CONDITIONS			INSTRUMENT METEOROLOGICAL CONDITIONS		
	RWY 14	RWY 32	TOTAL	RWY 14	RWY 32	TOTAL	RWY 14	RWY 32	TOTAL
10.5 Knots	57.55%	58.20%	95.36%	56.39%	58.01%	95.03%	61.06%	59.20%	96.68%
13 Knots	58.81%	59.36%	97.78%	57.81%	59.20%	97.64%	61.71%	60.24%	98.37%
16 Knots	59.64%	60.15%	99.39%	58.72%	60.02%	99.36%	62.20%	60.94%	99.55%
20 Knots	59.86%	60.41%	99.87%	58.97%	60.28%	99.87%	62.29%	61.16%	99.86%

Source: Wind Data by National Oceanic and Atmospheric Administration – Integrated Surface Database (ISD) 2008-2017; Wind Analysis by FAA Windrose Analysis Tool.

19 https://airports-gis.faa.gov/public/index.html

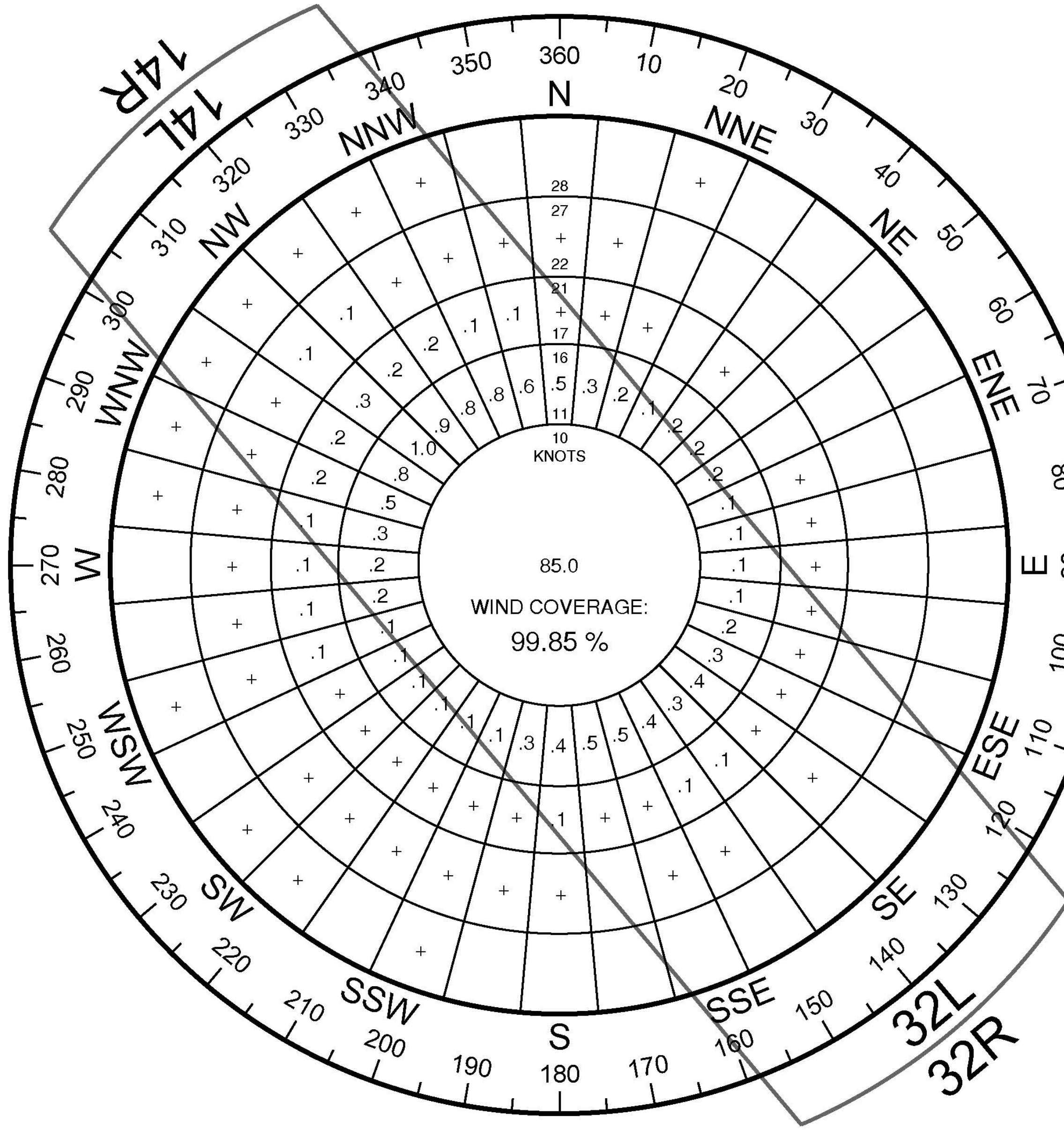
20 Runways 14L-32R and 14R-32L both have the same true runway heading and therefore the data presented in the above table is applicable to both runways.

Exhibit 1.5-5 - VFR Wind Rose – Runways 14L-32R and 14R-32L



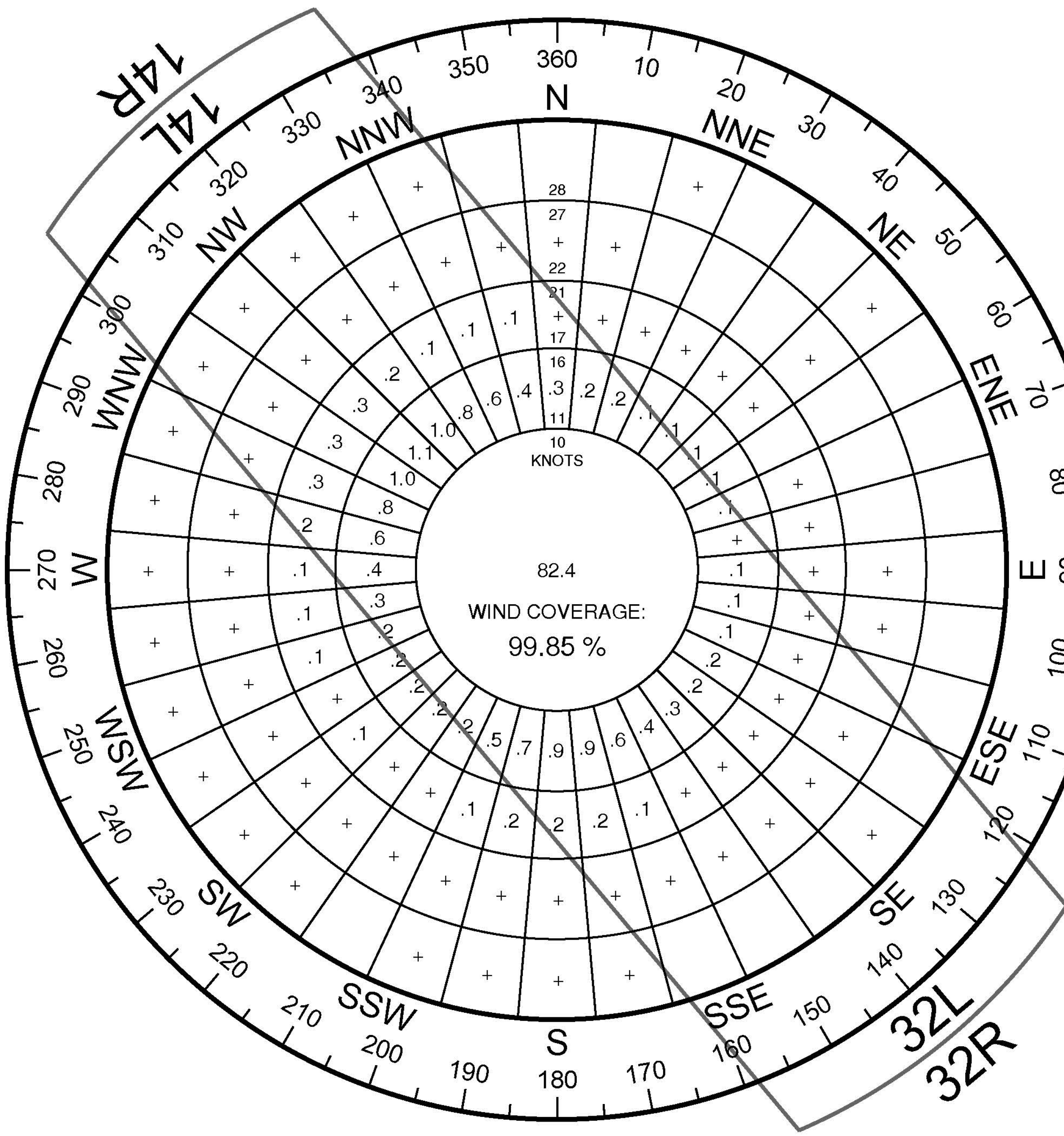
Source: CMT 2018; FAA Wind File Generator.

Exhibit 1.5-6 - IFR Wind Rose – Runways 14L-32R and 14R-32L



Source: CMT 2018; FAA Wind File Generator.

Exhibit 1.5-7 - All Weather Wind Rose – Runways 14L-32R and 14R-32L



Source: CMT 2018; FAA Wind File Generator.

1.6 Environmental Overview

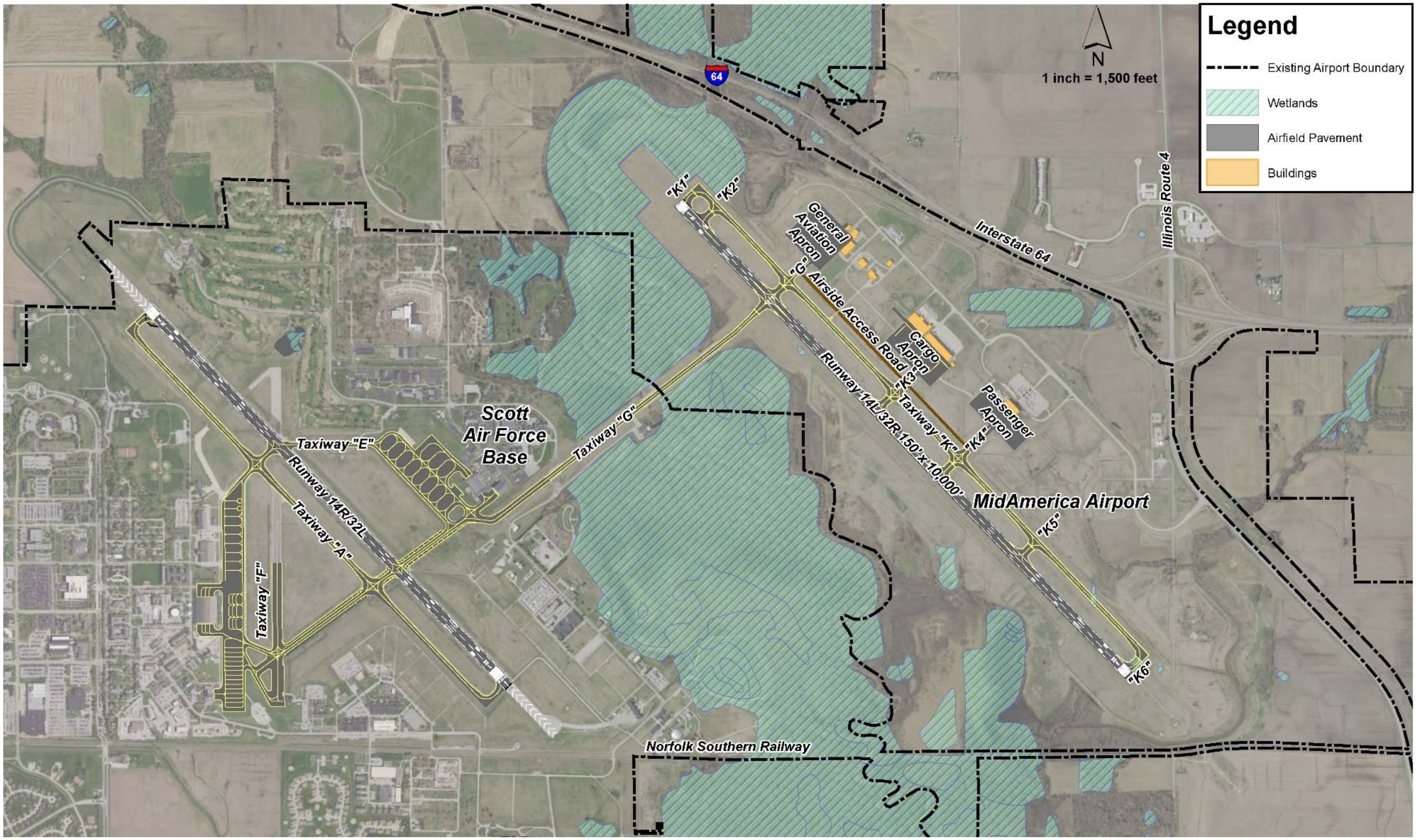
The FAA's Airport Master Plan Advisory Circular states that "The principal objective of an environmental overview is to document environmental conditions that should be considered in the identification and analysis of airport development alternatives." Future airfield improvements defined in this master plan will assist in preparing purpose and need statements in follow-up NEPA actions. Major environmental elements that have been reviewed in past airport improvement actions include: wetlands; floodplains; noise, threatened and/or endangered species; air quality; historic, archeological, cultural and architectural issues; farmland; and water quality. A list of environmental actions approved by FAA and IDOT since the original airport construction can be found at the end of this document in Appendix B.

Federal guidance documents used for review and approval of environmental actions are defined in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures.[21] and FAA Order 5050.4B National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions..[22] The original construction of MidAmerica St. Louis Airport was approved under a co-signed Record of Decision (ROD) by and between the Federal Aviation Administration, US Department of the Air Force and the County of St. Clair. The ROD was based on a jointly prepared Environmental Impact Statement (EIS). Most of the airfield facilities at BLV today were approved under that environmental action.

From the original approved Record of Decision to the most recent Categorical Exclusion, all NEPA elements have been addressed and found compliant. Exhibit 1.6-1, *Wetlands Map*, identifies the known wetlands for both MidAmerica St. Louis Airport and Scott Air Force Base. The Floodplain Map is depicted in Exhibit 1.6-2, *Floodplain Map*. Due to the Airport's excellent oversight and continuing on-site monitoring of the original wetland mitigation, the US Army Corps of Engineers has determined no additional wetland monitoring, as prescribed by the ROD, is required.

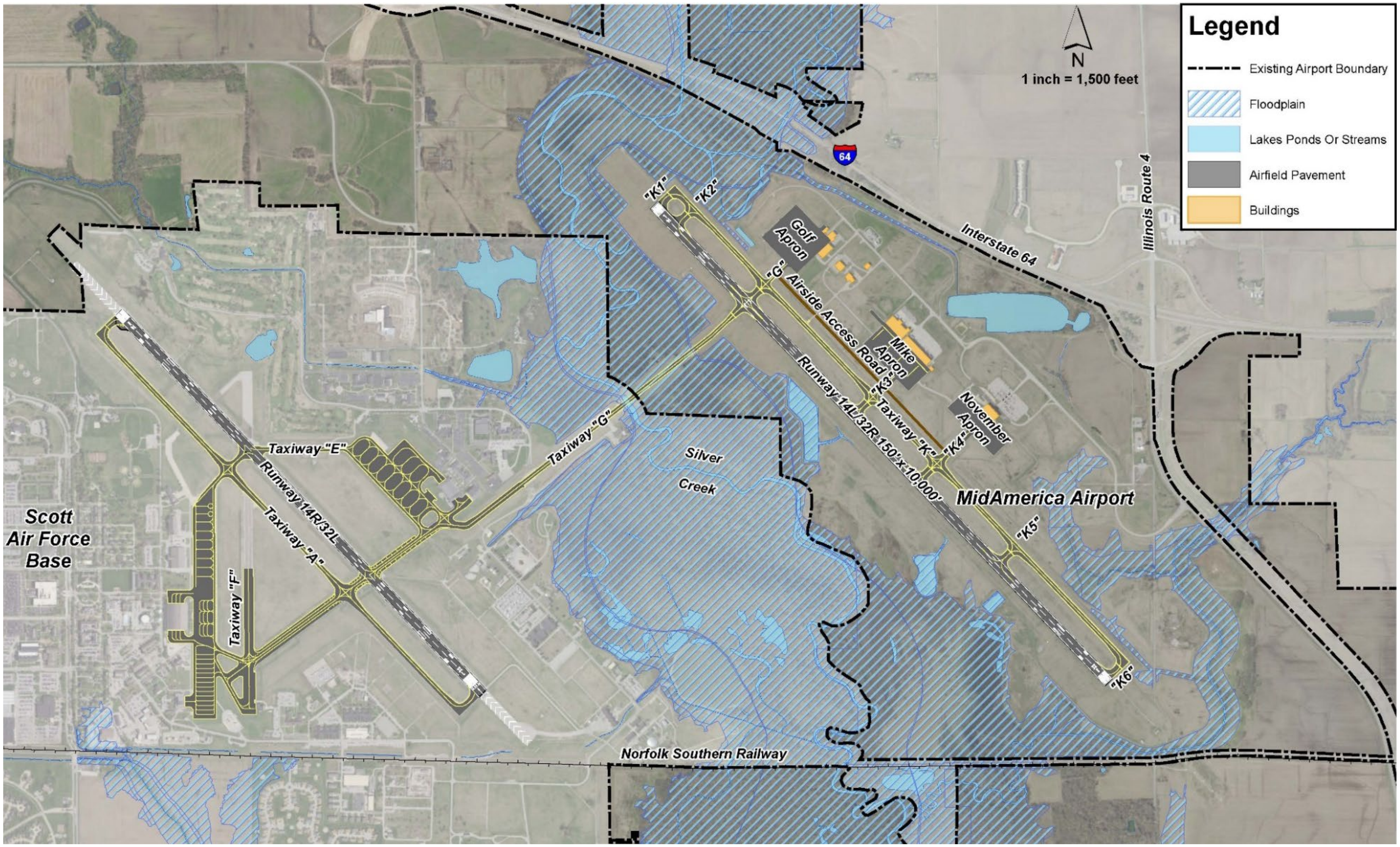
21 https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf
22 https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/media/5050-4B_complete.pdf

Exhibit 1.6-1 - Wetland Map



Source: CMT 2018.

Exhibit 1.6-2 - Floodplain Map

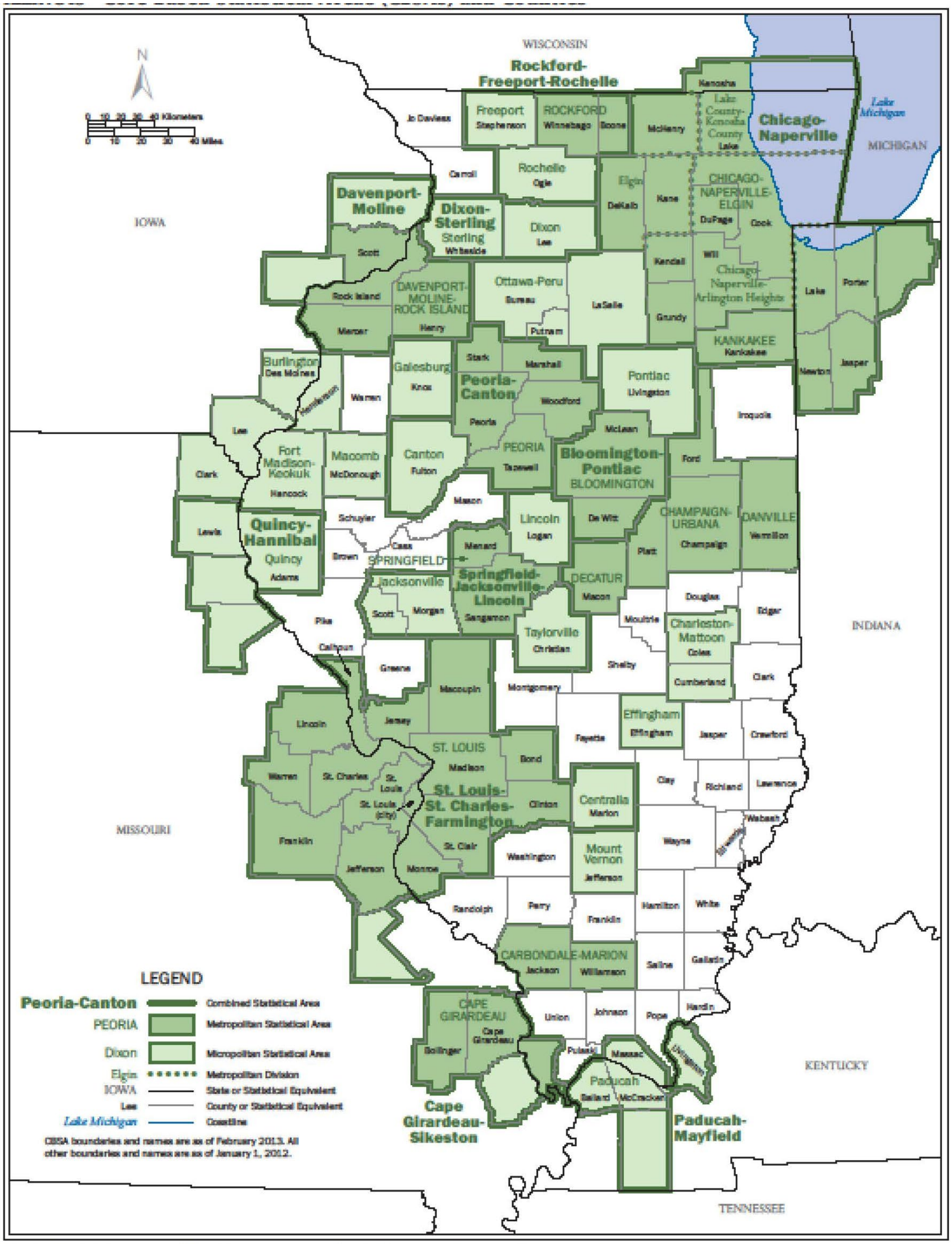


Source: CMT 2018.

1.7 Socioeconomic Data

This section includes the collation of socioeconomic data (population, demographics, income, etc.) that help provide a focus on the customers and users of BLV. Data sources include: US Bureau of the Census, State of Illinois, St. Clair County, East-West Gateway Council of Governments and Woods and Poole. The socioeconomic data contained herein covers eight counties in Illinois (Bond, Calhoun, Clinton, Jersey, Macoupin, Madison, Monroe, and St. Clair) and eight counties in Missouri (Franklin, Jefferson, Lincoln, St. Charles, St. Louis County City of St. Louis, Warren, Washington, and a portion of Crawford County) that comprise the St. Louis-St. Charles-Farmington, MO-IL Combined Metropolitan Statistical Area (St. Louis CSA). The St. Louis CSA is presented in Exhibit 1.7-1, *Combined Metropolitan Statistical Area Map*.

Exhibit 1.7-1 - Combined Metropolitan Statistical Area Map



Source: U.S. Department of Commerce; Economics and Statistics Administration 2018.

1.7.1 Population

The St. Louis CSA has grown at 0.3% per year since 2005, whereas the United States has experienced a growth rate of 0.9% for the same period. Projected growth in population from 2022 to 2027 is forecast at an average rate of 0.4% per year, while the population of the United States is expected to grow at a rate of 0.9% per year. St. Louis CSA households have grown at a rate of 0.6% per year. Table 1.7-1, *Historical and Projected Population – St. Louis CSA and United States*, presents an overview of the historical and projected population for both he St. Louis CSA and the United States.

Table 1.7-1: Historical and Projected Population – St. Louis CSA and United States

YEAR	ST. LOUIS CSA*	YEAR OVER YEAR INCREASE	
		ST. LOUIS CSA [23]	UNITED STATES
2005	2,832,555	--%	--%
2006	2,847,219	0.50%	1.00%
2007	2,859,115	0.40%	1.00%
2008	2,871,850	0.40%	1.00%
2009	2,883,733	0.40%	0.90%
2010	2,895,015	0.40%	0.80%
2011	2,898,346	0.10%	0.80%
2012	2,901,867	0.10%	0.80%
2013	2,905,683	0.10%	0.70%
2014	2,910,622	0.20%	0.80%
2015	2,916,447	0.20%	0.80%
2016	2,927,383	0.40%	0.90%
2017	2,940,489	0.40%	0.90%
Compound Annual Growth Rate 2005-2017		0.30%	0.90%
PROJECTED POPULATION IN 2022 AND 2027			
2017-2022	3,006,465	0.40%	0.90%
2022-2027	3,071,568	0.40%	0.90%

Source: Woods and Poole Data 2017.

[23] Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area.

Households are expected to grow at a similar rate of 0.7% through 2022, then slowing to 0.3% per year from 2022 to 2027. **Table 1.7-26, *Historical and Projected Households – St. Louis CSA***, presents a summary of historical and project households for the St. Louis CSA.

Table 1.7-2: Historical and Projected Households – St. Louis CSA

YEAR	HOUSEHOLDS	YEAR OVER YEAR INCREASE
2005	1,138,927	--%
2006	1,145,255	0.60%
2007	1,155,624	0.90%
2008	1,157,271	0.10%
2009	1,155,145	-0.20%
2010	1,150,591	-0.40%
2011	1,166,567	1.40%
2012	1,172,135	0.50%
2013	1,179,480	0.60%
2014	1,182,148	0.20%
2015	1,190,193	0.70%
2016	1,204,631	1.20%
2017	1,217,095	1.00%
Compound Annual Growth Rate 2005-2017		0.60%
PROJECTED HOUSEHOLDS IN 2022 AND 2027		
2017-2022	1,258,745	0.70%
2022-2027	1,279,289	0.30%

Source: Woods and Poole Data 2017.

1.7.2 Employment.

Table 1.7-3, *Historical and Projected Employment – St. Louis CSA and United States*, summarizes historical and projected employment for the St. Louis CSA and the United States. As shown, employment growth of 0.5% per year in the CSA has been lower than the national average of 1.1% from 2005 to 2017. It is projected that the CSA's employment will increase by an average of 1.0% per year through 2027, a slightly slower rate of growth than the United States as a whole, which is expected to experience employment annual growth of 1.4% from 2017 to 2022 and 1.3% from 2022 to 2027.

Table 1.7-3: Historical and Projected Employment – St. Louis CSA and United States

YEAR	ST. LOUIS CSA*	YEAR OVER YEAR INCREASE	
		ST. LOUIS CSA [24]	UNITED STATES
2005	1,719,230	--%	--%
2006	1,741,871	1.30%	2.10%
2007	1,767,493	1.50%	2.10%
2008	1,768,353	0.00%	-0.10%
2009	1,715,281	-3.00%	-3.00%
2010	1,694,041	-1.20%	-0.70%
2011	1,713,817	1.20%	1.90%
2012	1,718,831	0.30%	1.60%
2013	1,736,757	1.00%	1.90%
2014	1,752,384	0.90%	2.10%
2015	1,785,124	1.90%	2.20%
2016	1,806,430	1.20%	1.50%
2017	1,827,516	1.20%	1.50%
Compound Annual Growth Rate 2005-2017		0.50%	1.10%
Projected Employment in 2022 and 2027			
2017-2022	1,928,833	1.10%	1.40%
2022-2027	2,028,495	1.00%	1.30%

Source: Woods and Poole Data 2017.

[24] Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area.

1.7.3 Per Capita Income.

Table 1.7-4, *Historical and Projected Per Capita Income – St. Louis CSA and United States*, presents $45,903 (2009 U.S. dollars) per capita personal income in the St. Louis CSA is slightly higher than the average of $45,308 across the nation. The St. Louis CSA has experienced a growth rate slightly lower than the national average, with average annual growth of 1.1% compared to the national increase of 1.3% per year. However, per capita personal income in the CSA is projected to increase at 1.6% compared to 1.5% for the United States as whole.

Table 1.7-4: Historical and Projected Per Capita Income – St. Louis CSA and United States

YEAR	PER CAPITA PERSONAL INCOME		YEAR OVER YEAR INCREASE	
	ST. LOUIS CSA [25]	UNITED STATES	ST. LOUIS CSA*	UNITED STATES
2005	$40,170	$38,916	--%	--%
2006	$41,563	$40,266	3.50%	3.50%
2007	$42,109	$41,010	1.30%	1.80%
2008	$42,455	$41,055	0.80%	0.10%
2009	$40,844	$39,376	-3.80%	-4.10%
2010	$41,174	$39,622	0.80%	0.60%
2011	$41,467	$40,762	0.70%	2.90%
2012	$43,130	$41,714	4.00%	2.30%
2013	$42,108	$41,348	-2.40%	-0.90%
2014	$42,868	$42,523	1.80%	2.80%
2015	$44,205	$43,924	3.10%	3.30%
2016	$45,176	$44,637	2.20%	1.60%
2017	$45,903	$45,308	1.60%	1.50%
Compound Annual Growth Rate 2005-2017			1.10%	1.30%
PROJECTED PER CAPITA INCOME IN 2022 AND 2027				
2017-2022	$49,688	$48,803	1.60%	1.50%
2022-2027	$53,558	$52,347	1.50%	1.40%

Source: Woods and Poole Data 2017.

[25] Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area. Note: All incomes shown in 2009 dollars.

Table 1.7-5, *St. Clair County Jobs by Employer*, presents a listing of St. Clair County jobs by employer. As noted previously, Scott Air Force Base has a large influence on the employment sector of the county. The next largest segment of jobs in the county is health care and education. One of the largest MRO's in Illinois, Jet Aviation has a significant presence at St. Louis Downtown Airport.

Table 1.7-5: St. Clair County Jobs by Employer

EMPLOYER	INDUSTRY	EMPLOYMENT
More than 10,000 Employees		
Scott Air Force Base	Military	13,000
1,000 to 9,999 Employees		
Memorial Hospital	Health Care	2,800
St. Elizabeth Hospital	Health Care	1,300
Southwestern Illinois College	Health Care	1,200
500 to 999 Employees		
Jet Aviation (General Dynamics)	Aircraft Repair	900
St. Clair County	County Government	834
East St. Louis School District 189	Education	800
Southern IL Healthcare Foundation	Health Care	631
Casino Queen	Leisure/Hospitality	600
Belleville School District 118	Education	575
Cahokia School District 187	Education	565
Allsup	Disability Claims Services	510
Belleville School District 201	Education	500

Source: St. Clair County, Economic Development Quick Facts.

1.8 Financial Data

The following provides an inventory of Airport financial data made available through the County of St. Clair for the Airport Master Plan update. Actual financial documentation is not included in this report. Available information sources include:

- General Rates and Charges Model
- Accounts and Fund
- Airport Use and Lease Agreements
- Fiscal Year 2018 Budget
- Fiscal Year 2017 Actual
- Grant History Over Past Three Federal Grant Years
- Passenger Facility Charges
- Debt Service
- Transportation Improvement Program

ABBREVIATIONS

ACRONYM	DEFINITION
AC	Advisory Circular
AFFF	Aqueous Film Forming Foams
AGIS	Airport Geographic Information System
AGL	Above Ground Level
AIP	Airport Improvement Program
AMSL	Above Mean Sea Level
AOA	Air Operations Area
AOC	Airport Operations Center
ARFF	Aircraft Rescue and Fire Fighting
ARTCC	Air Route Traffic Control Center
ASP	Airport Security Program
ASR	Airport Surveillance Radar
ATADS	Air Traffic Activity Data System
ATCT	Airport Traffic Control Tower
ATS	Airport Terminal Services
AVMATS	Aviation Material and Technical Support
BLV	MidAmerica St. Louis Airport
CBP	Customs and Border Protection
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FBO	Fixed Base Operator
FOD	Foreign Object Debris
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IDA	Illinois Division of Aeronautics
IDOT	Illinois Department of Transportation
IFR	Instrument Flight Rules
IL	Illinois
IMC	Instrument Meteorological Conditions
ISP	Illinois State Police
KS	Kansas
LIRL	Low Intensity Runway Lights
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
MIRL	Medium Intensity Runway Lights
MO	Missouri
MPO	Metropolitan Planning Organization
MRO	Maintenance Repair and Overhaul
NEPA	National Environmental Protection Act

ABBREVIATIONS (CONT.)

ACRONYM	DEFINITION
NPIAS	National Plan of Integrated Airport Systems
PAPI	Precision Approach Path Indicator
PBC	Public Building Commission
PCI	Pavement Condition Index
RNAV	Area Navigation
ROD	Record of Decision
SAFB	Scott Air Force Base
SIAP	Standard Instrument Approach Procedure
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival
STL	St. Louis Lambert International Airport
TRACON	Terminal Radar Approach Control Facility
TSA	Transportation Security Administration
USAF	United States Department of the Air Force
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

ABBREVIATIONS (CONT.)

ACRONYM	DEFINITION
NPIAS	National Plan of Integrated Airport Systems
PAPI	Precision Approach Path Indicator
PBC	Public Building Commission
PCI	Pavement Condition Index
RNAV	Area Navigation
ROD	Record of Decision
SAFB	Scott Air Force Base
SIAP	Standard Instrument Approach Procedure
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival
STL	St. Louis Lambert International Airport
TRACON	Terminal Radar Approach Control Facility
TSA	Transportation Security Administration
USAF	United States Department of the Air Force
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

Chapter Two

Demand Projections

2.1 Introduction

The Demand Forecast (Forecast) section of an Airport Master Plan (Master Plan) is a critical element that supports future airport development, financial planning, and other key decisions affecting the future of an airport. It also provides the groundwork for subsequent sections of this report, including Facility Requirements, Development Alternatives, and the Airport Financial Plan. The Forecast section of the Airport Master Plan provides a reasonable estimate of future aviation activity over the 20-year planning period (2017-2037). The goal of this section will be to provide MidAmerica St. Louis Airport (BLV) with a forecast that reflects local influence and aviation demand, relevant historical Airport activity and current aviation industry trends.

The forecast is created using guidelines and methodologies that are established in Federal Aviation Administration (FAA) *Advisory Circular 150/5070-6B Airport Master Plans* (AC 6B). As stated in AC 6B, a forecast should be realistic, be based upon the latest available data, be supported by information in the study, and provide an adequate justification for airport planning and development[1]. The forecast is not only an FAA required component in a Master Plan, but it also is submitted and approved by FAA as well. FAA will compare the submitted forecast to the FAA Terminal Area Forecast (TAF) and verify that the presented forecast appears reasonable and consistent to their forecast. The approved forecast is then used as a justification document for future Airport planning and funding needs.

The forecast prepared for BLV will project future aviation activity levels including enplaned passengers, air cargo tonnage and aircraft operations. The aircraft operations and cargo forecast were developed by InterVISTAS Consulting Group (InterVISTAS), a subconsultant on the Airport Master Plan Team. Following subsections will summarize the InterVISTAS forecast, while the complete report can be viewed in Appendix C. Additionally, this Forecast section will also review the forecast process, aviation industry trends, outlooks and forecasts, and discuss the factors that affect aviation demand at an airport. This determination of aviation activity will allow BLV to anticipate the appropriate level of planning required to make the necessary facility improvements to accommodate the projected aviation demand.

2.2 Forecasting Process

AC 6B and the FAA report *Forecasting Aviation Activity By Airport* [2] are used to identify key components and necessary steps in the forecast process. Generally, there are two philosophies that have become accepted in aviation forecasting:

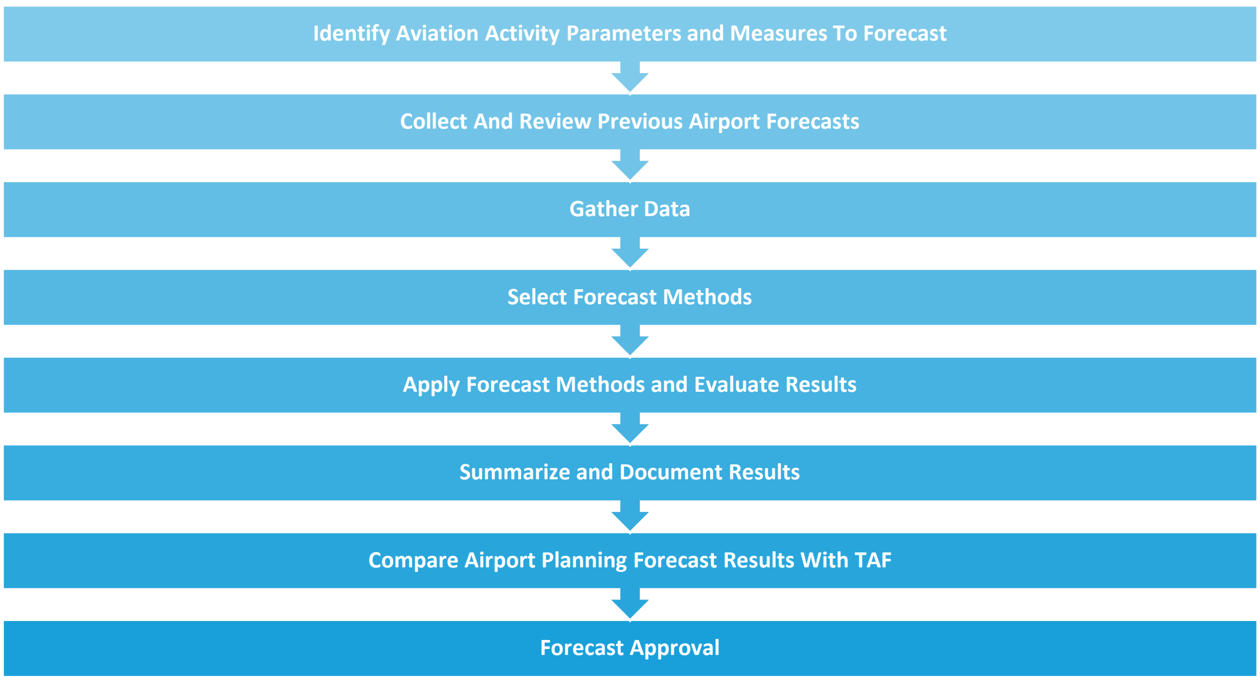
[1] https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5070-6B_with_chg_1&2.pdf

[2] https://www.faa.gov/data_research/aviation_data_statistics/

1. That aviation activity itself, and the use of historical performance trends, are alone sufficient to project future activity
2. That economic, social, and technological factors are presumed to influence future aviation demand

Regardless of the philosophy or approach used, the size of an airport, or the scope of the project, the process used in the forecast is largely the same. Exhibit 2.2-1 shows a flowchart of the steps used in aviation forecasting followed by a description of the steps.

Exhibit 2.2-1: Aviation Forecasting Process



Source: Forecasting Aviation Activity By Airport, FAA 2001; CMT 2018.

2.2.1 Identify Aviation Activity Parameters and Measures To Forecast

The first step in the forecasting processing is to identify the parameters to be used in the forecast. In the case of the BLV Forecast, the parameters identified were enplaned passengers, air cargo tonnage, and aircraft operations.

2.2.2 Collect and Review Previous Airport Forecasts

Reviewing BLV's previous forecast from the 2007 Master Plan Update and the most recent FAA TAF is important to the new forecast. Reviewing these documents is not only useful to obtain historic data, but it can also provide important information about the previous economic outlook and aviation demand projections.

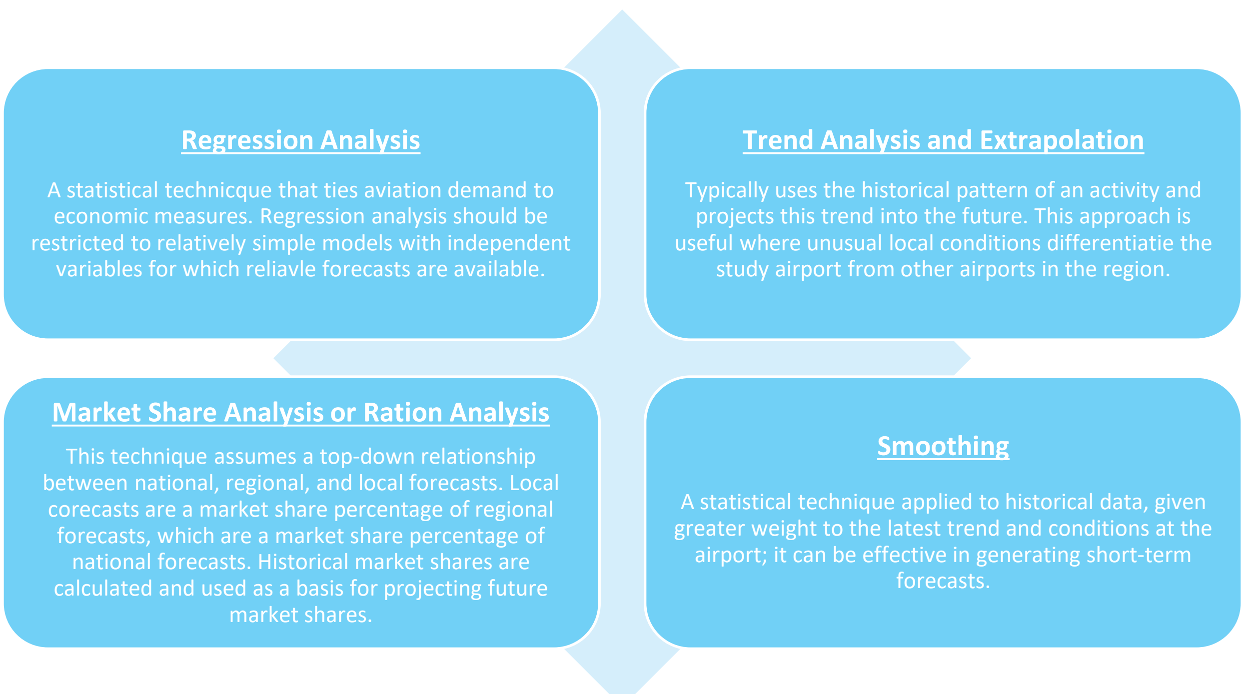
2.2.3 Gather Data

A vital step in the forecasting processes is gathering and obtaining recent and relevant data. Consideration should be given to collecting data at the local, regional, national and global levels. This can include, but is not limited to, historical aviation trends, FAA forecasts (TAF and Aerospace Forecast), industry publications, outlooks and forecasts, socioeconomic data and labor statistics. Additionally, FAA offers several resources that are used as the official databases for historical counts, forecast of aviation activity and delay statistics.

2.2.4 Select Forecast Method

There are numerous methodologies that can be used when forecasting. As stated in AC 6B, the most common methodologies used in aviation activity forecasting include regression analysis, trend analysis and extrapolation, market share analysis or ratio analysis, and smoothing. These methods are explained in Exhibit 2.2-2.

Exhibit 2.2-2: Forecasting Methodologies



Source: FAA Advisory Circular 150/5070-6B Airport Master Plans; CMT 2018.

2.2.5 Apply Forecast Methods and Evaluate Results

This step is where the actual forecast is created. Once the parameters are defined, data has been collected and reviewed, and the appropriate methodology selected, the forecast is formed. It is possible that a forecast could utilize a combination of methodologies, therefore showing significantly different growth rates. Additionally, analyzing forecast results with differing assumptions may also be useful. It is important to then evaluate the forecast results for practicality and reject any forecast that do not appear reasonable.

2.2.6 Summarize and Document Results

Once the forecast has been created and determined to be reasonable, the next step in the forecasting process is to summarize the forecast in a report-style write up. The report should include the various elements of the forecast, explain the methodologies used, and highlight any significant assumptions. Additionally, tables and graphs are typically used to illustrate the historic data and the forecast projections.

2.2.7 Compare Airport Planning Forecast Results With TAF

Upon the conclusion of the forecast results, the next step in the forecast process should be a comparison to the FAA TAF. The FAA creates a TAF for all airports in the National Plan of Integrated Airport System (NPIAS). The TAF is developed by FAA economists which assume a demand driven forecast that is based upon local and national economic conditions, as well as industry publications and trends. It should be noted that the most recent FAA TAF for BLV (issued January 2018) shows no growth across all categories of enplanements and aircraft operations. Consequently, according to FAA Order 5090.3C, the prepared forecast should not vary significantly (more than 10%) from the TAF.

2.2.8 Forecast Approval Process

Once the forecast and report have been developed, a draft copy will be sent to BLV staff to verify that the forecast appears reasonable and realistic. Upon BLV approving the draft forecast, it is then officially submitted to FAA and Illinois Department of Transportation, Division of Aeronautics (IDA) for review and approval. Once approved by FAA and IDA, the approved forecast becomes the groundwork for subsequent sections of the Master Plan report.

2.3 Factors Affecting Demand

AC 6B states that planners should consider the following when building a forecast: socioeconomic data, demographics, disposable income, geographic attributes, and external factors such fuel costs and local attitudes towards aviation. It is imperative to understand how all of these factors can influence the demand at an airport, and consideration should be given when developing the forecast. Industry trends and forecasts typically incorporate many of these factors into their forecast, especially on the national and global level.

2.4 Industry Trends and Published Forecasts

When preparing an aviation forecast, it is imperative to collect, review and analyze industry trends, publications, and forecasts. Industry stakeholders, such as FAA, Boeing, Airbus, and Bombardier, create forecasts each year based on factors such as historical trends, aircraft sales, tourism trends, oil prices, economic outlooks and many other influences. Reviewing these types of documents will ultimately aid in shaping an aviation forecast. The following subsections will summarize a few of the most recent industry publications available; mainly focused on commercial aviation.

2.4.1 2018 FAA Aerospace Forecast

The FAA's Aerospace Forecast is released annually and provides information on historical, existing, and future trends of air traffic. The 2018 FAA forecast calls for U.S. carrier passenger growth over the next 20 years with an average 1.9% per year increase. Revenue Passenger Miles (RPMs) are projected to increase 2.3% per year through 2038. The uptick in passenger growth in 2016-2017 will continue into 2018 spurred on by favorable economic conditions in the U.S. and the world.

Despite the uncertainty in the world (oil prices rising, uncertainty surrounding the "Brexit", recession in Russia and Brazil, among others) the U.S. economy is showing sign of accelerating, powered by gains in the stock market and should see a stimulus in 2018 with the passing of the tax bill cut in December 2017. The regional airlines are facing pilot shortages and tighter regulations regarding pilot training. Their labor costs are increasing as they raise wages to combat the pilot shortage while their capital costs have increased in the short-term as they continue to replace their 50 seat regional jets with more fuel-efficient 70 seat jets. Between 2017 and 2038 the number of jets in the U.S. mainline carrier fleet is forecast to grow from 4,155 to 5,101, a net average of 45 aircraft a year as carriers continue to remove older, less fuel-efficient narrow body aircraft.

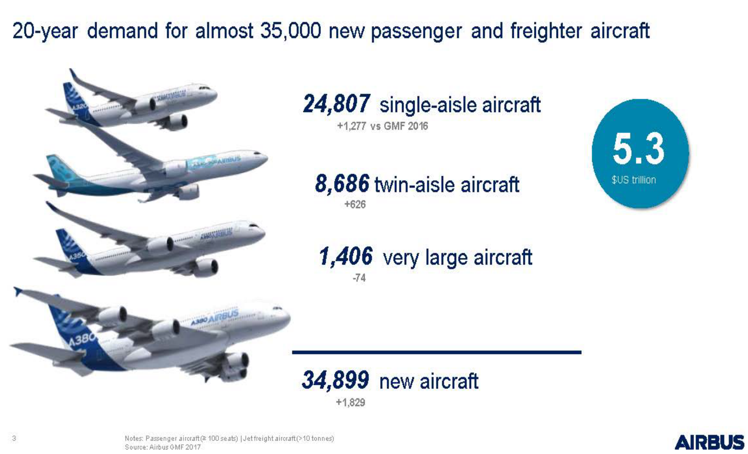


Figure 1 Airbus Fleet Forecast

The narrow body fleet (including E-series aircraft at JetBlue and C-series at Delta) is projected to grow 27 aircraft a year as carriers replace the

757 fleet and current technology 737 and A320 family aircraft with the next generation MAX and Neo families. The wide-body fleet grows by an average of 15 aircraft a year as carriers add 777-8/9, 787s, A350s to the fleet while retiring 767-300 and 777-200 aircraft. In total the U.S. passenger carrier wide-body fleet increases by 61 percent over the forecast period.[3]

2.4.2 Airbus: Growing Horizons Global Market Forecast 2017-2036

Airbus, being one of the world's top manufacturers of commercial aircraft, publishes it's 20-year market forecast every year. Airbus categorizes their forecast in three segments: single-aisle aircraft, twin-aisle aircraft, and very large aircraft. Airbus recognizes that oil prices will recover over time (although they may not reach peak levels of the past) and also recognizes the airline densification trend. The densification trend is essentially airlines choosing cabin enablers (ability to change to cabin layout) *to increase seat count beyond 180 seats*. Airbus has several cabin options/layouts to achieve this on their new aircraft.

From an economic standpoint, the Airbus forecast believes the commercial passenger growth *is strong and resilient*, anticipates the middle-class population to *nearly double over the next 20 years*, and states that *air traffic doubles every 15 years.*

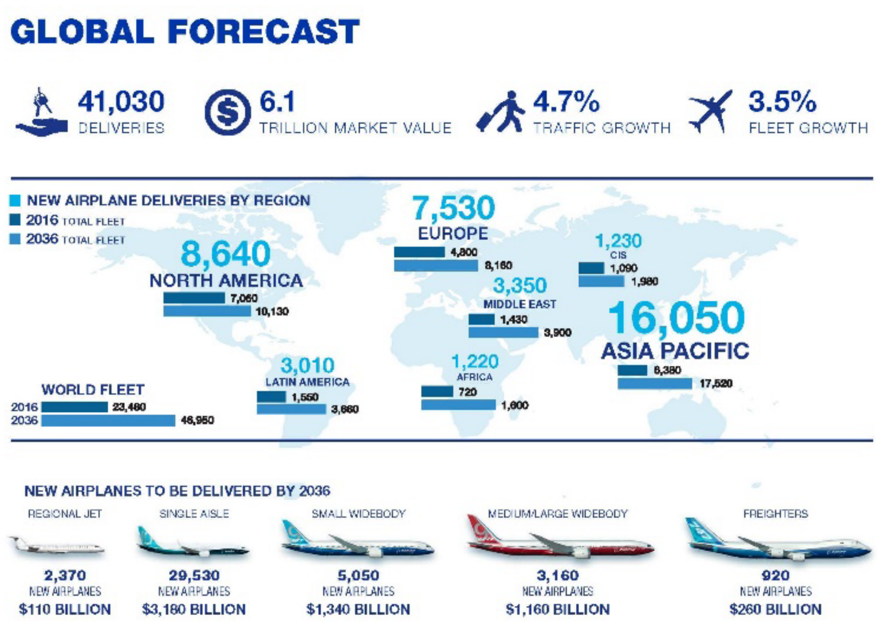


Figure 2 Boeing Global Outlook

From a fleet standpoint, the Airbus forecast states that there will be *34,900 new aircraft deliveries by 2036 – 40% to replace existing fleet and 60% for growth*. In 2016 the existing fleet was 18,890 and Airbus projects this number to increase to 40,120 in 2036. The projected fleet growth is expected to consist 71% of new aircraft deliveries to be single-aisle aircraft over

[3] https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/FY2018-38_FAA_Aerospace_Forecast.pdf

2.4.3 Boeing Current Market Outlook 2017-2036

The Boeing Market Outlook considers three broad categories when creating their forecast: 1) The underlying demand for air travel, 2) The regulatory, infrastructure, and technology environment 3) The strategies and products airlines offer in the marketplace. According to the Boeing forecast, air travel demand is expected to increase. Year-over-year passenger travel growth for the past 5 years has averaged 6.2%. This growth is expected to continue due to global GDP growth, low air fares, higher living standards with a growing middle class in large emerging markets, and the growth of tourism and travel relative to total consumer spending in major economies are all driving the strength in the demand for air travel.

The Boeing forecast also projects 41,030 total new aircraft deliveries over the 20-year planning period. Single-aisle aircraft are expected to account for 74% of future aircraft deliveries. [4]

Figure 3 Bombardier Market Forecast

2.4.4 2017-2036 Bombardier Business Market Forecast

The Bombardier Commercial Aircraft forecast focuses on the 60-150 seat aircraft business model in the Small Regional Aircraft market, creating two segments in their commercial aircraft forecast: large regional aircraft, and small single-aisle aircraft. With price being the main influence factor in customer decision-making, airlines are more focused on optimizing revenue and cost. This means airlines will be "right sizing" their fleets to maximize profits.

Large Regional Aircraft: *As regional jets are critical to the hub and spoke system*, smaller regional jets could be replaced by large regional aircraft.

Small Single-Aisle Aircraft: *An increase in this segment is expected due to point-to-point flying on short- to medium-haul routes*. By 2036 86% of the current fleet in this segment will be retired, requiring new small single-aisle aircraft.

Bombardier anticipates small regional aircraft will up gauge aircraft due to lack of options and the regional pilot shortages. Direct replacement of small regional aircraft with narrow bodies is expected to occur in mature markets. Bombardier projects the 60-150 seat segment fleet to increase from 6,900 active aircraft in 2016 to an active aircraft fleet of 14,250 aircraft in 2036. [5]

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[4] http://www.boeing.com/resources/boeingdotcom/commercial/market/current-market-outlook-2017/assets/downloads/cmo-2018-2-22.pdf

[5] https://ir.bombardier.com/var/data/gallery/document/01/87/55/05/15/BCA-2017-2036-Market-Forecast-EN.pdf

2.5 General Aviation Activity

General aviation activity is limited at BLV. Operations are anticipated to increase at a growth rate of 1.1% annually, through the end of the planning horizon, consistent with historical activity from 2000 to 2017. The general aviation operations forecast is included in **Table 2.6-1**.

According to the FAA Airport Master Record 5010 there are four reported based general aviation aircraft at BLV. The FBO has 2-3 aircraft based at their facility, and the Illinois State Police (ISP) has one based aircraft. While the FAA TAF shows that there are 24 based aircraft at BLV, it projects zero growth over the planning period. Utilizing the Airport Master Record of four based aircraft and the flat growth rate from the TAF, BLV anticipates four based general aviation aircraft over the planning period. This is, however, subject to general aviation demand.

2.6 InterVISTAS Forecast Summary

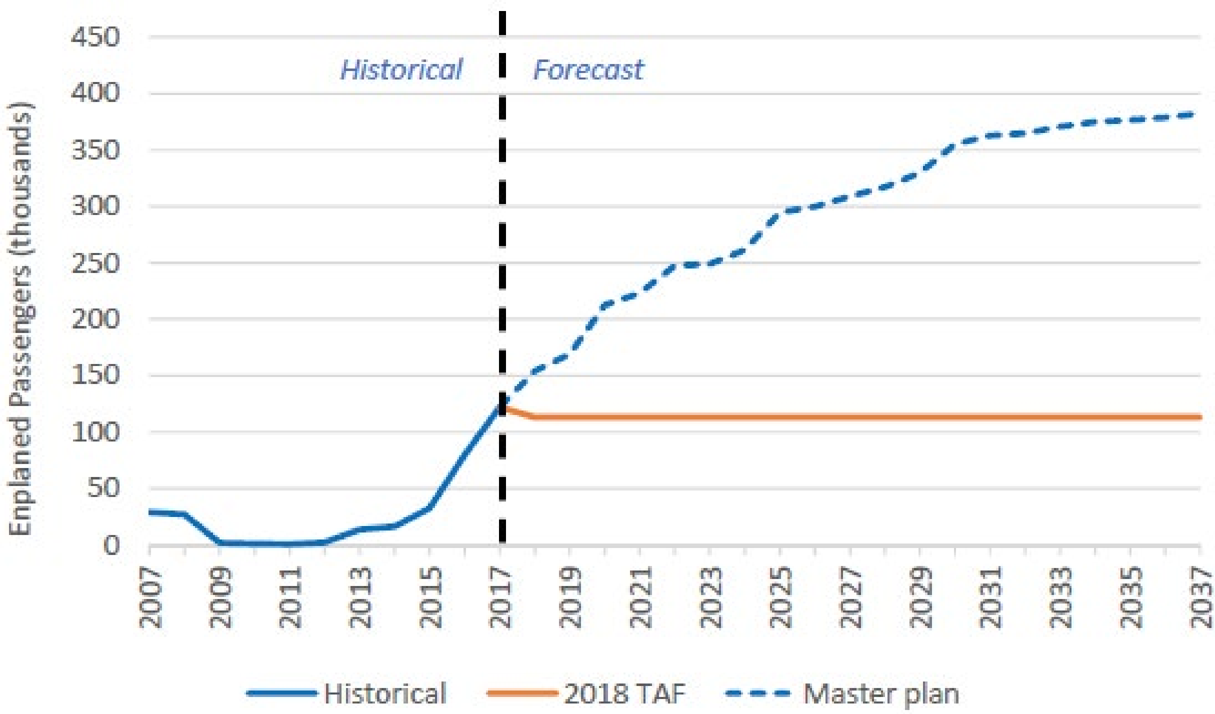
This section will summarize the forecast report that was created by InterVISTAS. As previously stated, the full report can be viewed in the Appendix section of the Master Plan.

The InterVISTAS forecast provides historical airline traffic counts, a demographic and economic background, forecasts of aviation activity (enplaned passengers, air cargo tonnage, and aircraft operations), a comparison to the FAA TAF, and an explanation of the forecast scenarios used. The forecast is provided with a base year of 2017 and projects a 20-year planning period through 2037.

2.6.1 Enplaned Passengers

InterVISTAS enplaned passengers forecast assumed there were no constraints that would affect passenger airline service. The forecast was created using multiple scenarios rather than relying on economic factors and historical data (due to the volatility of historic activity). The scenario created to represent the enplaned passengers forecast assumes Allegiant Air would open an aircraft and flight crew base at BLV, and would add an A319 that would supplement the existing 2017 airline service for the first five years and add a second aircraft within the first ten years. The projected enplaned passengers would increase at a compound annual growth rate (CAGR) 5.9% between 2017 and 2037, representing an increase from 122,158 enplanements in 2017 to 382,500 in 2037. As shown in **Exhibit 2.6-1**, the enplaned passengers forecast differs significantly from the no-growth TAF.

Exhibit 2.6-1: Enplaned Passengers Forecast



Source: InterVISTAS Consulting Group – Aviation Demand Forecast MidAmerica St. Louis Airport, February 15, 2018.

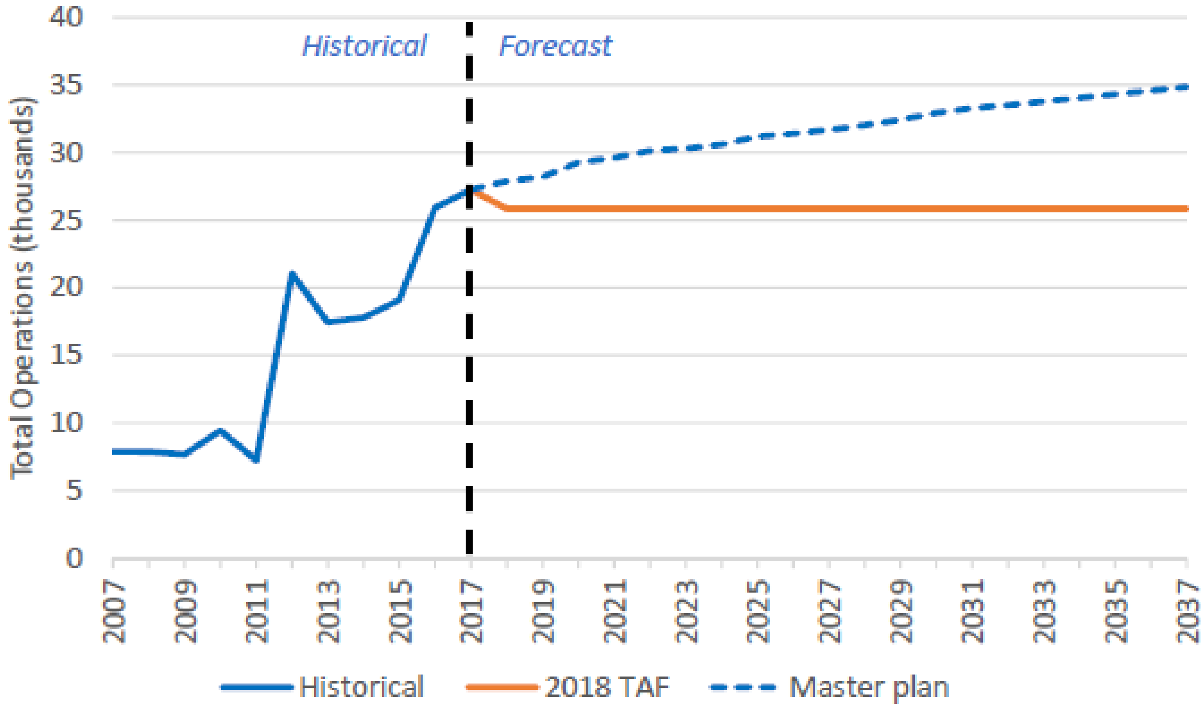
2.6.2 Aircraft Operations

InterVISTAS aircraft operations forecast includes commercial passenger aircraft, air cargo, general aviation and military aircraft. Operational assumptions for each aircraft category where developed and applied to the base year. For the passenger aircraft category, Allegiant Air's changing fleet mix was taken into consideration as the MD-80 aircraft are being phased out and replaced with A319 and A320 aircraft. The Airbus 220 (formerly the Bombardier CSeries) may also play a role the future fleet mix, as potential second tier airlines such as Republic Airlines, with partner links to Delta Connection, United Express or American Eagle, are a possibility.

Passenger aircraft operations are forecast to increase at a 5.9% CAGR to 5,320 operations in 2037.

The cargo aircraft category scenario assumed continued ad-hoc cargo flights and a U.S. cargo airline would be based at BLV by 2020. Cargo operations are forecast to increase at 9.8% CAGR to nearly 1,400 operations and 56,000 tons of cargo by 2037. General aviation operations are expected to grow at a modest 1.1% CAGR to 12,796 operations in 2037. Military operations are assumed to be consistent with the FAA TAF and remain constant through the planning period. Exhibit 2.6-2 illustrates the aircraft operations forecast for all categories of aircraft.

Exhibit 2.6-2: Aircraft Operations Forecast



Source: InterVISTAS Consulting Group – Aviation Demand Forecast MidAmerica St. Louis Airport, February 15, 2018.

In Summary, the InterVISTAS forecast projected enplaned passengers to increase at 5.9% CAGR to 382,500 passengers, aircraft operations to increase at 1.2% CAGR to nearly 35,000 operations, and cargo tonnage to increase at a 9.8% CAGR to nearly 55,000 tons during the planning period. A summary of the BLV master plan forecast is shown in Table 2.6-1.

Table 2.6-1: BLV Master Plan Forecast Summary

	HISTORICAL (ESTIMATED)	FORECAST				
	2017	2018	2022	2027	2032	2037
Passenger enplanements						
Air Carrier	122,158	154,200	247,500	309,000	364,900	382,500
Commuter	-	-	-	-	-	-
Total	122,158	154,200	247,500	309,000	364,900	382,500
Compound annual growth rate	-	26.2%	12.6%	4.5%	3.4%	0.9%
AIRCRAFT OPERATIONS						
Air carrier	1,708	2,182	3,943	4,873	6,026	6,685
Commuter/air taxi	-	-	-	-	-	-
Total commercial	1,708	2,182	3,943	4,873	6,026	6,685
General aviation	10,198	10,315	10,794	11,424	12,091	12,796
Military	15,348	15,400	15,400	15,400	15,400	15,400
Total operations	27,254	27,897	30,137	31,696	33,517	34,881
Compound annual growth rate	-	2.4%	1.9%	1.0%	1.1%	0.8%
Cargo/mail (metric tons)	9	480	13,361	21,323	34,092	54,588
Compound annual growth rate		-%	129.7%	9.8%	9.8%	9.9%

Source: InterVISTAS Consulting Group – Aviation Demand Forecast MidAmerica St. Louis Airport, February 15, 2018.

Chapter Three

Facility Requirements

This chapter presents the future requirements for airport facilities to provide capacity sufficient to accommodate the projected demand throughout the planning period at the MidAmerica St. Louis Airport (BLV). In addition to providing sufficient capacity, consideration has been given throughout to providing acceptable levels of service to all airport users.

The requirements presented herein are primarily based on the traffic projections presented in Chapter 2 – *Forecasts of Aviation Demand* of this master plan document. The requirements were calculated using Federal Aviation Administration (FAA) standards where applicable as well as established industry planning standards. For the purposes of master planning, the requirements presented in this chapter are tied to demand for various Planning Activity Levels (PALs). These PALs while associated with a projected point in time based on the Forecast of Aviation Demand (5, 10, 15, and 20 years in the future), allow the Airport flexibility in the implementation of future projects based on actual growth in demand. In essence, these triggers speak to the Airport's needs at the time certain activity levels are hit, not forecasting exactly when those activity levels will be hit. Table 3.0-1 *Planning Activity Levels*, presents the four PALs, their respective traffic volumes, and the projected point in time when they are to occur.

Table 3.0-1: Planning Activity Levels

PAL	PROJECTED YEAR	TOTAL ANNUAL ENPLANEMENTS	TOTAL ANNUAL OPERATIONS	TOTAL PEAK HOUR PASSENGERS	TOTAL PEAK HOUR OPERATIONS
Existing	2018	154,200	27,897	473	2
PAL 1	2022	247,500	30,100	502	3
PAL 2	2027	309,000	31,700	599	4
PAL 3	2032	364,900	33,500	670	4
PAL 4	2037	382,500	34,900	670	4

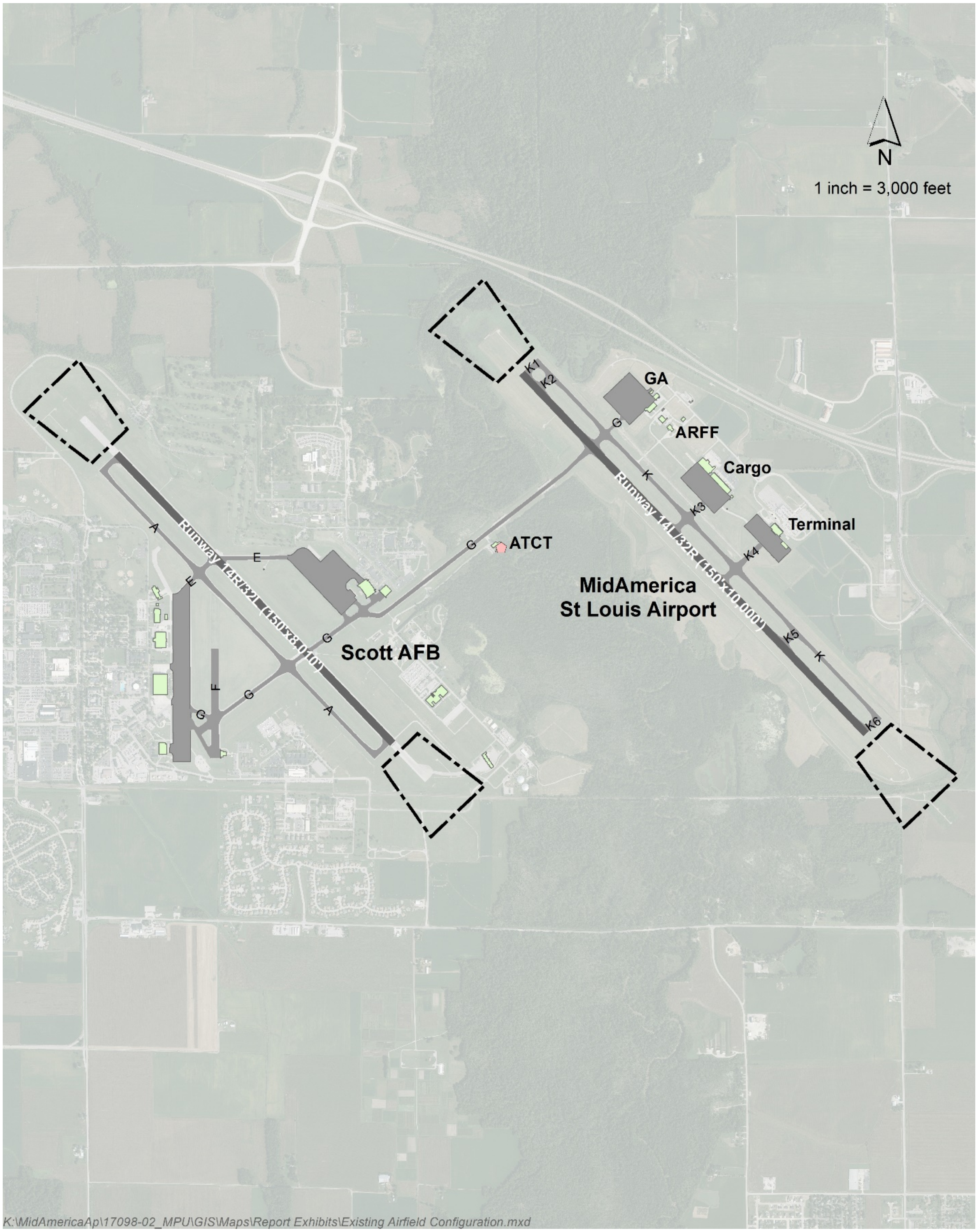
Source: InterVistas, CMT 2018

3.1 Airfield Demand/Capacity

The purpose of the BLV airfield demand/capacity analysis was to determine the capacity of the airfield in terms of the maximum number of operations that can be accommodated. This capacity was then compared to projected demand through PAL 4 to identify if and when additional airfield capacity may be needed.

The airport's runway system is the central component in the assessment of airfield operational capacity. Airports that utilize a single runway or intersecting runway systems to accommodate their demand generally have lower operational capacity than airports that have parallel runways. Because of the Joint Use Agreement in place between BLV and Scott Air Force Base (SAFB), the airfield demand/capacity analysis includes the airfield infrastructure provided by SAFB. All subsequent sections of this report only consider the needs of BLV infrastructure. The existing combined runway configuration presented in Exhibit 3.1-1, *Existing Airfield Configuration*, is comprised of two parallel paved runways designated as Runway 14L/32R and Runway 14R/32L. These two runways are separated by 7,000 feet centerline to centerline.

Exhibit 3.1-1: Existing Airfield Configuration



Source: CMT

3.1.1 Methodology

The "Handbook Method," or the methodology prescribed in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, was used to determine the capacity of the existing airfield system at BLV. This methodology relies upon the projected fleet mix of aircraft and the number of operations projected by each aircraft classification in the fleet mix. **Table 3.1-1, *BLV Aircraft Classifications***, presents the aircraft classifications as defined by the FAA for the determination of airfield capacity and aligns these classifications with the projected fleet mix type from the Forecast of Aviation Demand.

Table 3.1-1: BLV Aircraft Classifications

BLV FORECAST FLEET MIX TYPE	AC 150/5060-5 AIRCRAFT CLASSIFICATIONS			
	CLASS	MTOW (LBS)	ENGINES	WAKE TURBULENCE CLASSIFICATION
Piston	A		Single	
Turbo Prop	B			
Light Jet	B	< 12,500		Small
Small Jet	B			
Medium Jet	B		Multi	
Large Jet	C	12,500 – 300,000		Large
Commercial	C			
N/A	D	> 300,000		Heavy

Source: FAA AC 150/5060-5, CMT

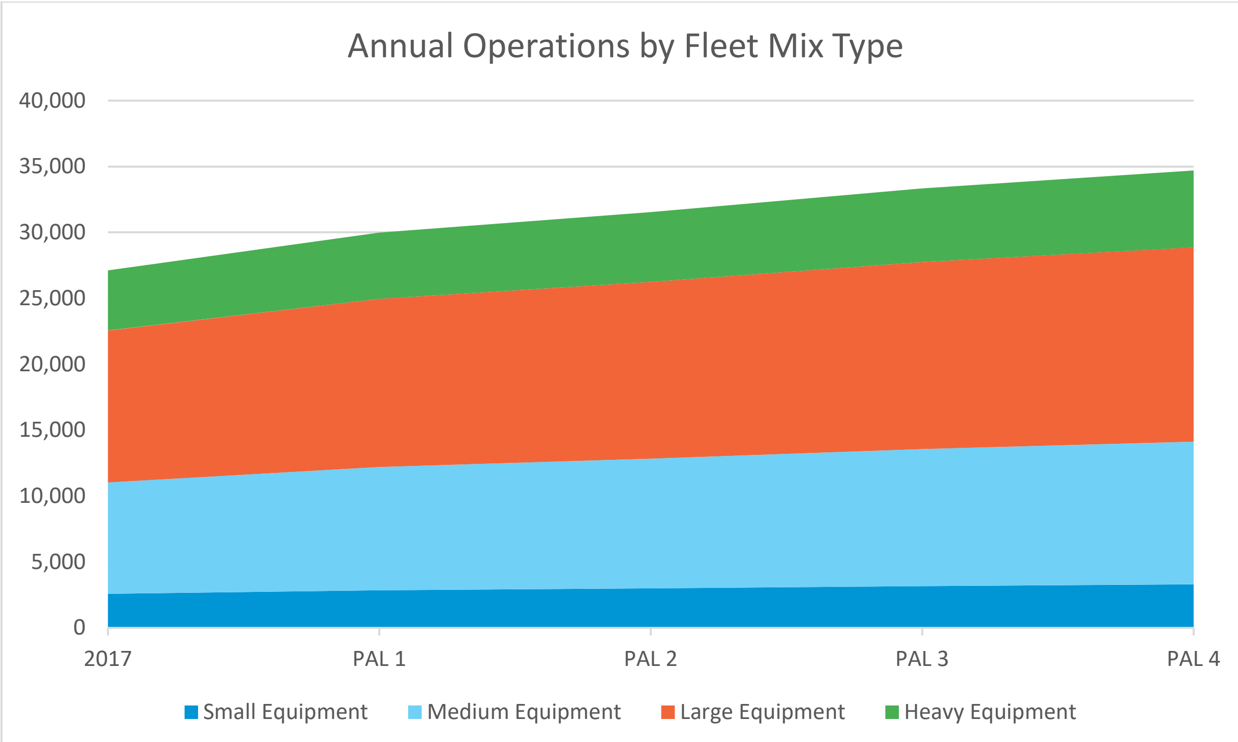
3.1.2 Airfield Demand/Capacity Results

The Mix Index is determined by the relative percentage of operations conducted or projected by each of the four classes of aircraft (A, B, C, and D) as defined in Table 3.1-1. The percentages of each class of operations is then applied to the formula Mix Index= %C+(3*%D).[1]. For the purposes of this analysis, all Commercial Air Carrier operations are assumed to be Class C aircraft. **Exhibit 3.1-2, *Annual Operations by Fleet Mix Type***, presents the projected number of annual operations by each fleet mix type. These projections were utilized to determine the Mix Index[2].

[1] C is the percentage of aircraft over 12,500 pounds but less than 300,000 pounds. D is the percentage of aircraft over 300,000 pounds.

[2] Note: Military Aircraft that use the MidAmerica St. Louis Airport Runway consists normally of the KC-135 Stratotanker, C-40 Clipper and the C-17 Globemaster III.

Exhibit 3.1-2: Annual Operations by Fleet Mix Type



Source: InterVistas, CMT

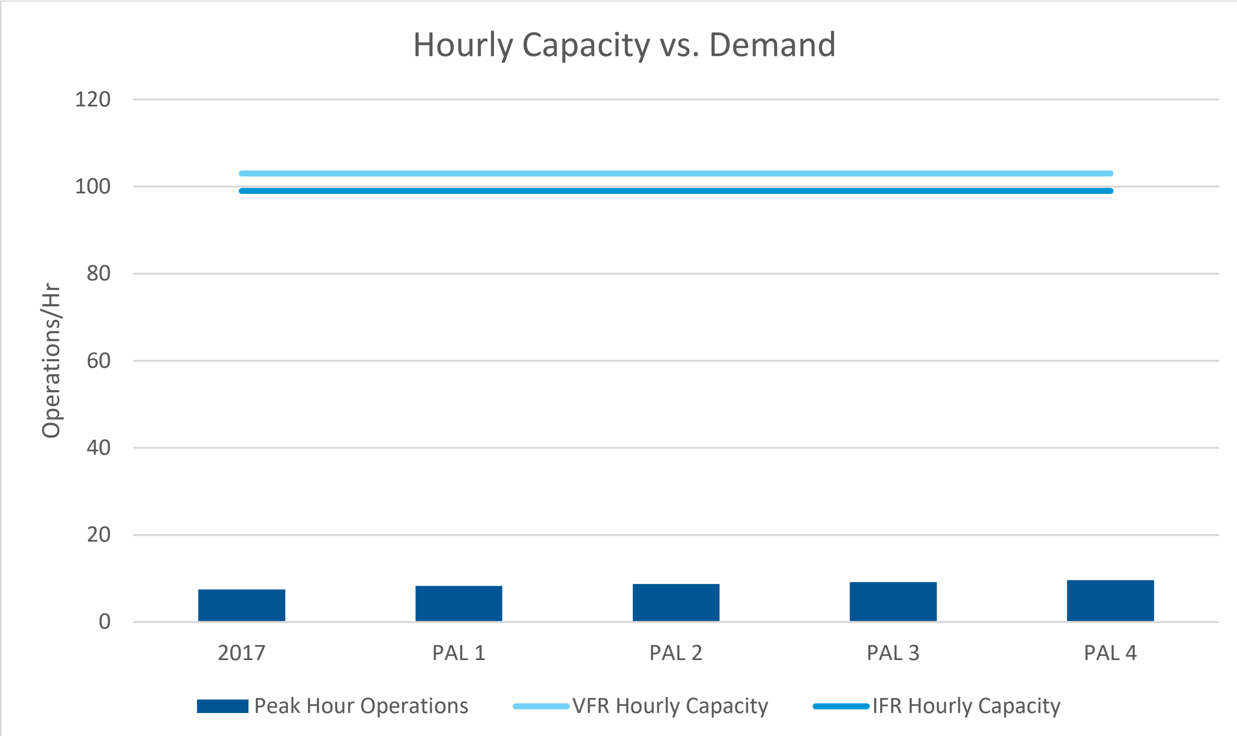
Table 3.1-2, *BLV Airfield Capacity*, presents the Mix Index for each PAL and the resulting airfield capacities. The results of this analysis indicate that the existing airfield configuration provides sufficient annual and hourly capacity in both Visual Flight Rules (VFR) under Visual Meteorological Conditions (VMC) and Instrument Flight Rules (IFR) under Instrument Meteorological Conditions (IMC) throughout the planning period. **Exhibit 3.1-3, *Demand/Capacity Results*** presents peak hour operations for each PAL as well as VFR and IFR operational capacity.

Table 3.1-2: BLV Airfield Capacity

MIX INDEX (%C+3D)	HOURLY CAPACITY (ops/hr)		ANNUAL SERVICE VOLUME (ops/yr)
	VFR	IFR	
0 to 20	197	119	370,000
21 to 50	149	113	320,000
51 to 80	126	111	305,000
81 to 120	111	105	315,000
121 to 180 (*PAL 1 thru 4)	103	99	370,000

Source: FAA AC 150/5060-5, CMT Analysis

Exhibit 3.1-3: Demand/Capacity Results



Source: CMT

3.2 Airside Requirements

The determination of airside facility requirements falls into four broad categories:

- Runway Wind Coverage – Assess the predominate wind conditions over a period of at least ten years which is then used to determine the adequacy of the existing runway alignments at BLV.
- Runway Length – Calculates the runway length needed to accommodate the existing and projected fleet mix.
- Runway Design Standards – Compares the current runway geometry to modern runway design standards to identify where changes and updates may be necessary, this includes not only physical runway pavements, but runway safety areas and protection zones as well.
- Taxiway Design Standards – Compares the current taxiway geometry to modern taxiway design standards to identify where changes and updates may be necessary.

3.2.1 Airport Reference Code

The Airport Reference Code (ARC) is an airport designation that is used to help categorize the airport's existing airfield capability as determined by a set of design standards prescribed by the FAA. The ARC consists of two components; the first is a letter (A through E) that indicates the Aircraft Approach Category (AAC), the second is a roman numeral that indicates the Airplane Design Group (ADG). **Table 3.2-1** ***Airport Reference Codes***, presents the various levels of ARC as defined by FAA AC 150/5300-13A, *Airport Design*.

Table 3.2-1: Airport Reference Codes

AIRCRAFT APPROACH CATEGORY		AIRPLANE DESIGN GROUP		
AAC	APPROACH SPEED (KTS)	ADG	TAIL HEIGHT (FT)	WINGSPAN (FT)
A	< 91	I	< 20	< 49
B	91 to < 121	II	20 to < 30	49 to < 79
C	121 to < 141	III	30 to < 45	79 to < 118
D	141 to < 166	IV	45 to < 60	118 to < 171
E	166 or more	V	60 to < 66	171 to < 214
		VI	66 to < 80	214 to < 262

Source: FAA AC 150/5300-13A

The existing ARC at BLV is D-V. This ARC is based on the most capable runway at the Airport (Runway 14L/32R) which has a Runway Design Code (RDC) of D-V based on the critical aircraft of the Boeing B747-200. The runway is also certified for use by the Boeing 747-8 under Modification of Standards, which are detailed in Section 3.2.4.

3.2.2 Runway Wind Coverage

Wind is a key factor influencing runway orientation and the number of runways. Ideally, a runway should be aligned with the prevailing wind. Wind conditions affect all aircraft to varying degrees, but generally the smaller the aircraft, the more it is affected by wind, particularly crosswind components. Wind coverage refers to the percent of time crosswind and tailwind components are above an acceptable velocity threshold. In accordance with FAA AC 150/5300-13A, *Airport Design*, the crosswind should not exceed the velocities for the specific Runway Design Code (RDC) presented in Table 3.2-2, *Allowable Crosswind Component per Runway Design Code (RDC)*, more than five percent of the time.

Table 3.2-2: Allowable Crosswind Component per Runway Design Code (RDC)

RUNWAY DESIGN CODE (RDC)	ALLOWABLE CROSSWIND COMPONENT
A-I and B-I	10.5 knots
A-II and B-II	13.0 knots
A-III and B-III C-I through C-III D-I through D-III	16.0 knots
A-IV and B-IV C-IV through C-VI D-IV through D-VI	20.0 knots
E-I through E-VI	20.0 knots

Source: FAA AC 150/5300-13A

Based on 14L/32R's Runway Design Code D-V, crosswind components up to 20 knots on each runway end are allowable.

METHODOLOGY

The analysis performed to evaluate the wind coverage of the existing airfield geometry at BLV for this Master Plan was consistent with the guidance prescribed in FAA AC 150/5300-13A, Change 1, *Airport Design*, Appendix 2. When a runway or system of runways provides less than 95 percent coverage for the aircraft that are projected to use the runway(s) on a regular basis, an additional runway orientation may be recommended.

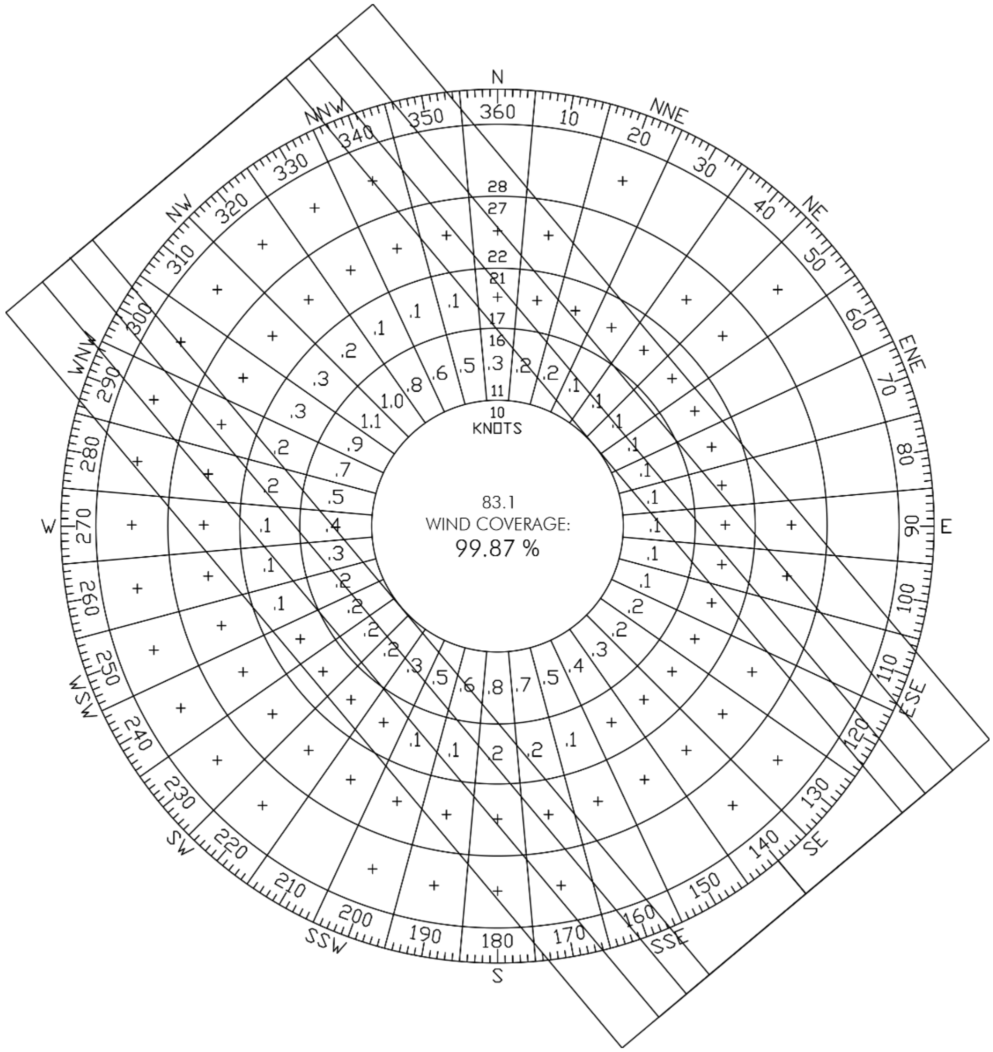
WIND COVERAGE

A wind rose provides a graphical presentation of the average wind direction and velocity observed at an airport over a period of time compared to the existing runway headings. Three wind rose analyses were developed for BLV per FAA AC 150/5300-13A, *Airport Design*, Appendix 1, *Wind Analysis*: one reflecting VMC conditions, another for IMC conditions, and another for all-weather conditions. Hourly weather data required to create the wind roses was obtained from the NCDC for the period January 1, 2008 through December 31, 2018 and included wind direction and wind speed. The wind rose diagram showing All Weather conditions is depicted in **Exhibit 3.2-1**. **Tables 3.2-3 through 3.2-5** present All Weather, IMC and VMC conditions percent wind coverage for Runway 14L/32R and 14R/32L. The wind direction, which is measured at ten-degree intervals between 0 and 360 degrees, is displayed by radial lines, with the directions labeled along the outer ring. The wind velocity is shown within the concentric circles at: zero to ten knots, 11 to 16 knots, 17 to 21 knots, 22 to 27 knots, and 28 knots or greater.

Each segment of the wind rose represents the percent occurrence of wind observations at the given direction and velocity range. Note that the center circle of the wind rose displays the percent occurrence of wind observations at zero to ten knots regardless of wind direction. Percentages were calculated and rounded to the nearest one tenth of one percent and entered in the appropriate segment of the wind rose. Plus (+) symbols are used to indicate direction and velocity combinations which occur less than one tenth of one percent of the time, but greater than zero percent of the time.

A crosswind template is overlaid on the wind rose as parallel lines that show the existing runway end directions and crosswind limits, which for this analysis are 10.5, 13.0, 16.0, and 20.0 knots. This crosswind template is used to calculate the percent coverage offered by the runway orientation at each crosswind limit. By calculating the sum of the percentages that fall within each crosswind limit for all runways, the percent coverage can be calculated. The desirable wind coverage for an airport is 95 percent. This 95 percent takes into account various factors influencing operations and the economics of providing the coverage. Based on the weather observations presented in the wind rose analysis for all weather, IMC, and VMC conditions, the Airport provides at least 95 percent coverage under the existing runway configuration.

Exhibit 3.2-1: BLV All-Weather Windrose



Source: National Climatic Data Center (NCDC) from January 1, 2008 to December 31, 2018, FAA, CMT

Table 3.2-3: All Weather – Percent Wind Coverage

ALL WEATHER	
CROSSWIND	ALL RUNWAYS
10.5 KTS	95.36%
13 KTS	97.76%
16 KTS	99.4%
20 KTS	99.87%

Source: National Climatic Data Center (NCDC) from January 1, 2008 to December 31, 2018, FAA, CMT

Table 3.2-4: IMC Weather – Percent Wind Coverage

IMC CONDITIONS	
CROSSWIND	ALL RUNWAYS
10.5 KTS	96.42%
13 KTS	98.23%
16 KTS	99.56%
20 KTS	99.87%

Source: National Climatic Data Center (NCDC) from January 1, 2008 to December 31, 2018, FAA, CMT

Table 3.2-5: VMC Weather – Percent Wind Coverage

VMC CONDITIONS	
CROSSWIND	ALL RUNWAYS
10.5 KTS	95.07%
13 KTS	97.64%
16 KTS	99.36%
20 KTS	99.87%

Source: National Climatic Data Center (NCDC) from January 1, 2008 to December 31, 2018, FAA, CMT

3.2.3 Runway Length Analysis

To understand the adequacy of the runway and its length at BLV, a runway length analysis was performed as part of the Master Plan Update Facility Requirements. The future fleet mix utilized for this analysis was consistent with the information presented in Chapter 2 – *Forecasts of Aviation Demand*. By utilizing the projected future fleet mix, the results of the analysis ensure that the runway system will be capable of accommodating the aircraft users of the Airport through PAL 4.

For each aircraft type included in the fleet, takeoff and landing length requirements were calculated following the recommended guidance in FAA AC 150/5325-4b, *Runway Length Requirements for Airport Design*. These guidelines establish the process and considerations to assess existing runways and determine adequate runway length recommendations at a planning level. It should be noted that these calculations are for airport planning purposes and can differ from more detailed calculations performed by aircraft operators using operational data, manuals, and airline specific procedures. These airline calculations are often intended for the validation of flight procedure design and airline dispatch operations, not general facility planning.

METHODOLOGY

Runway length requirement calculations are specific to the unique conditions at BLV and are based on the information provided in the *Airport Planning Manuals* published by each aircraft type in the projected fleet mix's respective manufacturer. Aircraft runway length requirements are determined using many factors including:

- Density Altitude (temperature and elevation)
- Aircraft Fleet
- Runway Characteristics

Density Altitude

Density altitude is a natural phenomenon that has an inverse relationship with aircraft and engine performance (i.e. performance decreases as density altitude increases). Density altitude is a function of the combination of the airport's temperature and field elevation. The higher the field elevation and/or temperature, the higher the density altitude and therefore the greater the effects will be on aircraft performance. Ultimately higher density altitudes drive the need for longer runway lengths to accommodate the aircraft operations and with reduced performance resulting from the impacts of higher density altitude.

The aircraft manufacturers' manuals present a series of charts/tables to calculate the takeoff runway length requirements based on temperature. Takeoff length requirements may be calculated based on International Standard Atmosphere (ISA) or a "hot day". ISA is defined as 59 degrees Fahrenheit at zero feet mean sea-level (MSL) and decreases as elevation increases. The conditions presented in the hot day charts presented by the aircraft manufacturers vary depending on the aircraft type. Typically, these "hot day" charts present conditions that range from 84 to 87 degrees Fahrenheit.

The determination of which temperature chart to use is a function of the average or typical weather conditions that exist at the airport for which the analysis is being performed. FAA guidance prescribes the use of the Airport's Mean-Max temperature for use in runway length requirement calculations. The Mean-Max temperature is defined as the average daily high temperature during the hottest month of the year. The Mean-Max temperature at BLV is 88.0 degrees Fahrenheit which correlates to the average daily high temperature during the month of July[3]. This result makes the "hot day" charts discussed the most appropriate to use for this analysis. Landing length requirements were assessed only for ISA conditions as landing operations are not susceptible to engine performance degradation resulting from higher temperatures.

The second component of density altitude being airfield elevation, was used as an input factor on the takeoff and landing charts from the aircraft manufacturer's airport planning manuals to determine accurate takeoff and landing requirements. Airfield elevation is relevant to these calculations in that the higher the field elevation, the less dense the air becomes and therefore the less efficient an aircraft's wings generate lift. With less lift being generated, the aircraft requires more speed and thereby more runway length to achieve that speed to generate a comparable amount of lift. The Airport elevation at BLV is 459 feet MSL.[4]

Projected Aircraft Fleet

The aircraft fleet operating at an airport in the future is a critical component to determining the future runway length requirements for that airport. The fleet mix used for the runway length analysis consisted of the ten most critical general aviation, commercial passenger, and military aircraft known or projected to operate at BLV and is presented in Table 3.2-6, *BLV Fleet Mix for Runway Length Analysis*.

Table 3.2-6: BLV Fleet Mix for Runway Length Analysis

MANUFACTURER	AIRCRAFT TYPE	MTOW (lbs.)	MLW (lbs.)
Airbus	A319	166,449	137,789
Airbus	A320	169,756	142,198
Beechcraft	King Air 200	15,000	15,000
Boeing	B737-700	154,500	129,200
Boeing	B747-8	987,000	763,000
Boeing	KC-135	333,600	247,000
Learjet	35/36	21,500	19,400
Cessna	Citation X	36,100	31,800
Gulfstream	G450	74,600	73,900
McDonnell Douglas	MD-83	160,000	139,500

Source: Bombardier, Cessna, Airbus, Boeing, Embraer, CMT

[3] National Climatic Data Center (NCDC), Belleville Scott AFB station, data recorded, 2019.
[4] FAA Aeronautical Information Services – National Flight Data Center (NFDC), 2019.

Runway Characteristics

Runway characteristics such as surface contamination and runway gradients are also important factors that contribute to determining runway length requirements for an airport. Runways that have surface contaminants such as rain and snow often require longer landing lengths than dry surfaces, while effective runway gradients also negatively impact takeoff lengths in uphill conditions.

FAA AC 5325-4b, Runway Length Requirements for Airport Design, requires airports to consider contaminated surfaces when calculating landing length requirements. Some aircraft manufacturers have published landing length charts for contaminated surfaces, while others do not. For those manufacturers that do not offer these charts, a standard of 15 percent is added to dry landing length requirements to account for contaminated surface conditions per FAA recommendations. The AC recommends using dry surfaces for takeoff length requirements.

RUNWAY LENGTH REQUIREMENTS

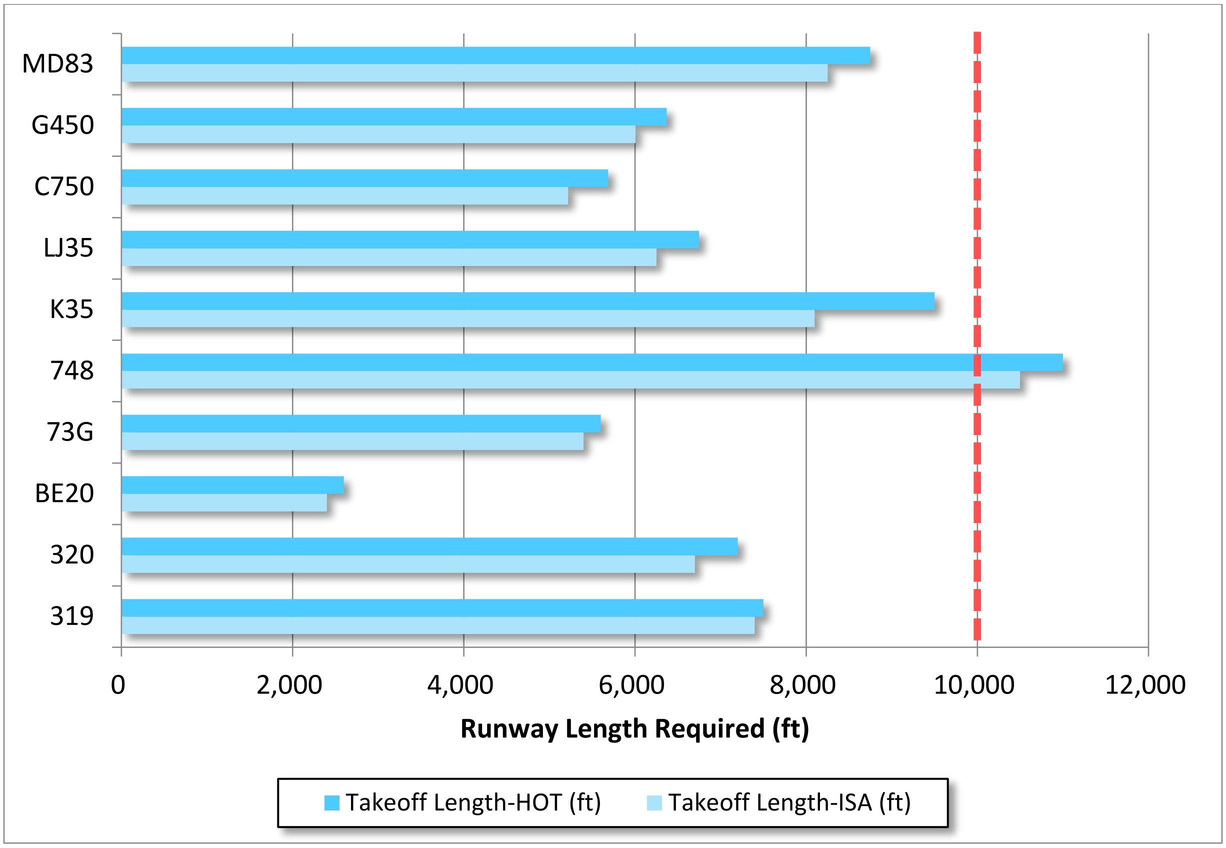
Runway length requirements for BLV were calculated using a Maximum Takeoff Weight (MTOW) and Maximum Landing Weight (MLW) analysis to determine the runway length required for the most critical condition possible (longest runway required) for each aircraft type. In addition, for the aircraft that require a longer runway than what is available at BLV to depart at MTOW, a basic takeoff weight available analysis was performed.

Takeoff Length Requirements

Takeoff lengths were calculated for each aircraft type at MTOW. One of the ten aircraft analyzed is unable to takeoff at MTOW under either condition (ISA or hot day). This aircraft is the Boeing 747-8, which requires a reduced takeoff weight to depart from BLV.

Takeoff length requirements ranged from 2,600 feet (Beechcraft King Air 200) to 11,000 feet (Boeing 747-8 in hot day conditions). While not all aircraft types in the fleet are able to depart at MTOW, the average Takeoff Weight (TOW) is 99.5% across the entire fleet. All takeoff length requirements for the entire fleet mix at MTOW are presented in Exhibit 3.2-2, *BLV MTOW Takeoff Length Requirements*.

Exhibit 3.2-2: BLV MTOW Takeoff Length Requirements

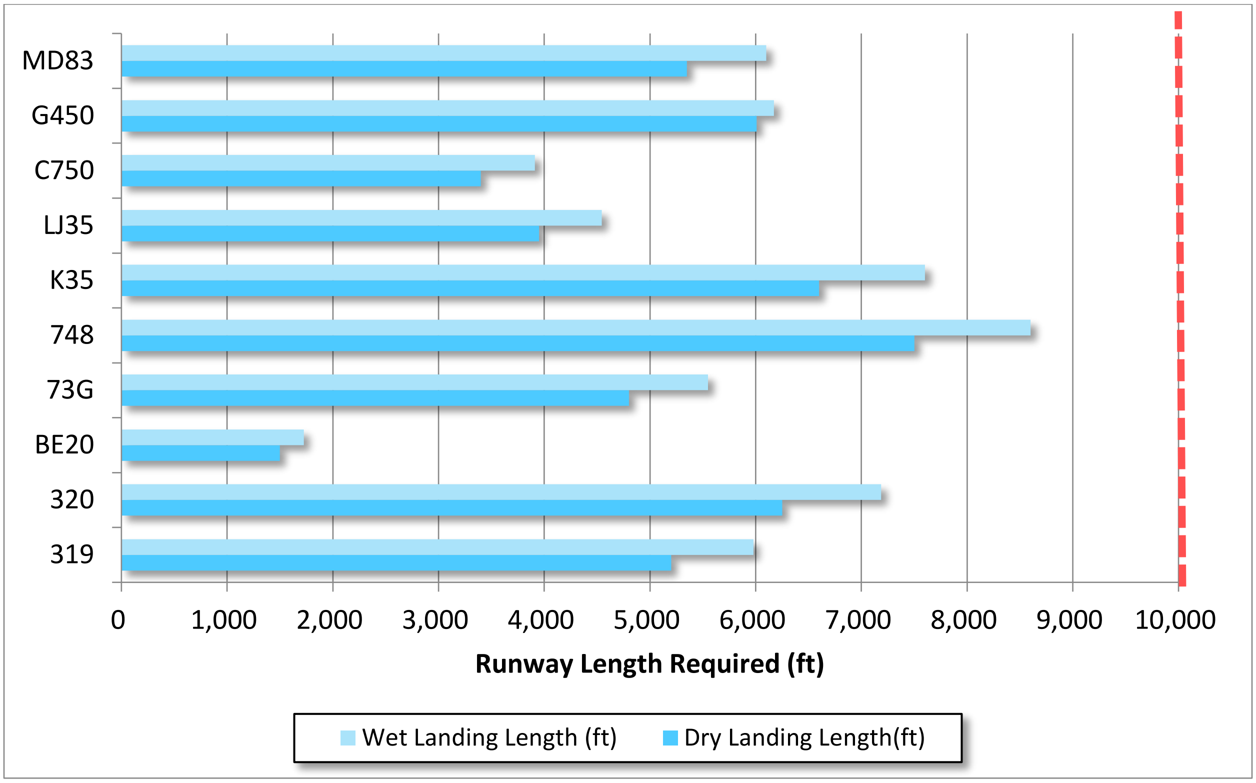


Source: Airbus, Boeing, Bombardier, Cessna, Embraer, CMT

Landing Length Requirements

Landing lengths were calculated in a MLW condition for both dry and contaminated runway conditions to approximate a worst-case scenario. Landing length results ranged from 1,725 feet (Beechcraft King Air 200 + in dry conditions) to 8,600 feet (Boeing 747-8 in contaminated conditions). The length of Runway 14L/32R is suitable for all aircraft in the fleet mix without being required to take a reduced landing weight. All landing length requirements for the fleet mix are presented in **Exhibit 3.2-3,** ***BLV MLW Landing Length Requirements***.

Exhibit 3.2-3: BLV MLW Landing Length Requirements



Source: Airbus, Boeing, Bombardier, Cessna, Embraer, CMT

RUNWAY LENGTH SUMMARY

The existing runway system at BLV is capable, in terms of runway length, of accommodating all aircraft projected to operate at the Airport on a regular basis through PAL 4. While not all aircraft types are able to depart at MTOW, it is anticipated that the amount of weight penalty required would still allow for acceptable payloads given the shorter stage lengths that are typically flown from BLV.

3.2.4 Runway Design Standards

Ideally, all runways are designed and constructed in accordance with FAA guidelines and requirements at the time of construction. These guidelines will stipulate basic geometric requirements that enable a runway or runway system to accommodate traffic by a certain type or size of aircraft and will assist in identifying any airfield constraints that require modification. The following subsections present the runway compliance constraints at BLV based on FAA AC 150/5300-13A, *Airfield Design*, and AC 150/5000-17, *Critical Aircraft and Regular Use Determination*.

CRITICAL AIRCRAFT

The specific set of guidelines to which an airfield is to comply is determined by the size and needs of the largest aircraft which operates at an airport, or the "critical aircraft." FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, defines a critical aircraft as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of an airport. Regular use of the Airport is defined as 500 annual operations, including both itinerant and local operations, but excludes touch-and-go operations. One landing is considered an operation as is one takeoff.

The FAA uses a coding system to relate airport design criteria to the operational and physical characteristics of the critical aircraft at an airport. This coding system is prescribed in FAA AC 150/5300-13A Change 1, *Airport Design*, and classifies the critical aircraft using three parameters:

- Aircraft Approach Category (AAC) – classified according to aircraft approach speeds. Refer to Section 1.102, for definitions of the AAC categories.
- Airplane Design Group (ADG) – defined by its wingspan and tail height, whichever is most restrictive. Refer to Section 1.103, for definitions of the ADG categories.

The current approved Airport Layout Plan (ALP) for BLV identifies the Boeing B747-200 as the critical aircraft for the Airport. However, given the configuration of the airfield system at BLV, various parts of the airfield provide different capabilities in terms of Critical Aircraft. Typically, each set of capabilities ties a specific runway to the set of taxiways that support that runway. Table 3.2-7, *Critical Aircraft Information*, presents the critical aircraft currently listed for Runway 14L/32R as well as that aircraft's respective design grouping information. BLV has received inquiries regarding the use of the Boeing 747-8 aircraft in the future, which would modify the critical aircraft designation. FAA has issued a Modification to Standards for the aircraft to access the airport. Future use of the aircraft is dependent on growth of air cargo activity at BLV. *Table 3.2-8, 747-8 Driven Modification of Standards*, presents the required infrastructure that the Airport will implement if the 747-8 becomes the critical aircraft in the future.

Table 3.2-7: Critical Aircraft Information

FAA PARAMETER	RUNWAY 14L/32R	
Critical Aircraft	B747-200	B747-8
AAC	D	D
ADG	V	VI
ARC	D-V	D-VI
TDG	5	5-6

Source: FAA, FAA AC 150/5300-13A, CMT

Table 3.2-8: 747-8 Driven Modification of Standards

ELEMENT	STANDARD/ REQUIREMENT	CURRENT	PROPOSED MODIFICATION
Runway Width – 14L/32R	200’	150’	• EB-74A, allows the use of a 150’ wide runway for the 747-8
Blast Pad Width – Ends of 14L/32R	280’	0’	• EB-74A, allows the use of a 220’ wide blast pad for the 747-8 • Upgraded to 220’ within 3 years
Runway Shoulder Width – 14L/32R	40’	12’	• EB-74A, 35’ shoulder within 3 years
Runway Centerline to Taxiway Centerline Separation – 14L/32R to ‘K’	500’	400’	• Restrict Taxiway K to ADG-I to ADG-IV during 747-8 ops • Ensure Taxiway ‘K’ and Rwy 14L/32R connecting taxiways have been sterilized of all aircraft when an inbound 747-8 is within 1 statute mile of landing threshold or an outbound 747-8 begins its departure roll
Taxiway Shoulder Width	30’	12’	• Upgraded to 30’ within 3 years

Source: FAA Approved Request for a Modification of Standards 02/02/2016, CMT

RUNWAY DESIGN STANDARDS

The following subsections present the evaluation of the compliance of the runways at BLV with the applicable Runway Design Standards as prescribed by the FAA.

Runway Geometry

Table 3.2-9, *Runway Geometry Standards Evaluation*, presents the runway geometry design standards as prescribed by the FAA based on the critical aircraft for Runway 14L/32R. In summary, Runway 14L/32R at BLV complies with the runway width guidance and runway-to-taxiway separation guidance; however, the runway requires enhancements in terms of runway shoulders and blast pads.

Table 3.2-9: Runway Geometry Standards Evaluation

DESIGN ELEMENT	RUNWAY 14L/32R			
	EXISTING		REQUIRED	
	14L	32R	14L	32R
Runway Width (ft)	150		150	
Runway Shoulder (ft)	12		35	
Blast Pad Width (ft)	0		220	
Blast Pad Length (ft)	0		400	

Source: FAA, FAA AC 150/5300-13A, CMT

Runway Safety Areas & Runway Object Free Areas

FAA AC 150/5300-13A Change 1 prescribes the geometric standards for Runway Safety Areas (RSAs) and Runway Object Free Areas (ROFAs) at airports in the United States. Each of these safety areas are defined as follows:

- Runway Safety Area (RSA) – A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to an aircraft in the event of an overshoot, or excursion from the runway.
- Runway Object Free Area (ROFA) – An area centered on the ground on a runway centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.

The dimensions of these safety areas are determined by the capabilities of the runway and the type of traffic the runway in intended to serve. Table 3.2-10, *Runway Safety Areas and Object Free Areas* presents a comparison of the runway at BLV and its associated RSA and ROFA to the respective dimensional guidance as prescribed by the FAA.

Table 3.2-10: Runway Safety Areas and Object Free Areas

DESIGN ELEMENT	RUNWAY 14L/32R	
	EXISTING	REQUIRED
Runway Safety Area		
Length beyond departure end (ft)	1000	1000
Length prior to arrival threshold (ft)	1000	600
Width (ft)	500	500
Runway Object Free Area		
Length beyond departure end (ft)	1000	1000
Length prior to arrival threshold (ft)	1000	600
Width (ft)	800	800

Source: FAA, FAA AC 150/5300-13A, CMT

While the RSAs and ROFAs at BLV are dimensionally compliant, there are several instances of incompatible object(s) within each of these safety areas. Mitigation of these objects may be achievable through one or a combination of operational restrictions, frangible mounting, or removal. In the instances where removal may be necessary, the Airport should evaluate the feasibility of doing so during the next upgrade or modification to the runway, visual aids or Navigational Aids (NAVAIDS). NAVAIDS typically should not be located within the RSA or ROFA, unless they are required to be in a specific location to function properly or "fixed-by-function".[5] The following subsections present the incompatibilities identified by this evaluation on a runway by runway basis.

While Runway 14L/32R is provided with a standard dimension RSA and ROFA, there are several instances of incompatible objects within these safety areas. Exhibit 3.2-4, *Runway 14L/32R RSA & ROFA*, identifies the location of the following incompatible objects within the Runway 14L/32R RSA & ROFA:

Runway 14L End

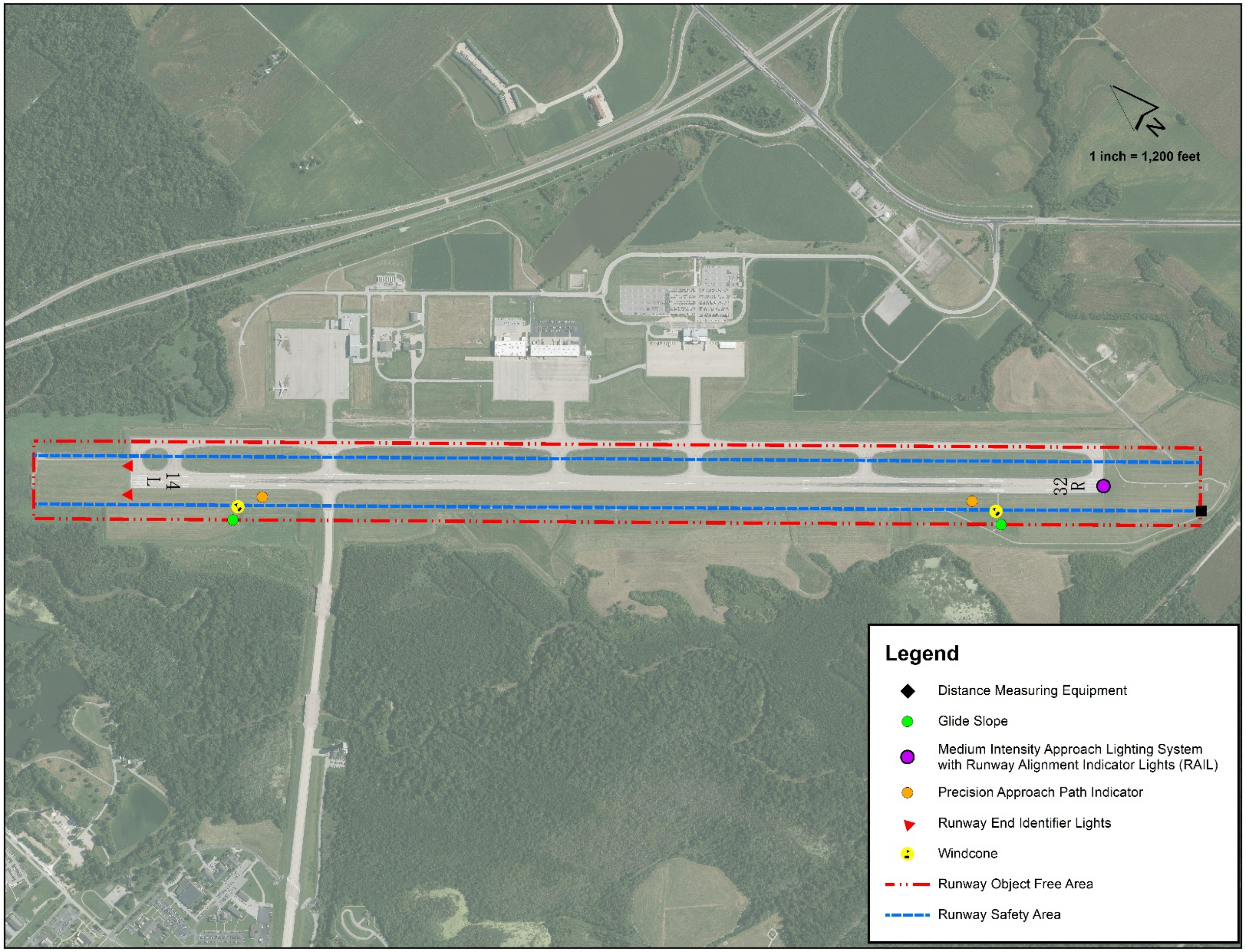
- Runway End Identifier Lights - The location of this visual aid to navigation aid is required to function properly and is thereby fixed-by-function so long as the light fixtures are mounted on frangible mounts.
- Glideslope - The location of this navigation aid is required to function properly and is thereby fixed-by-function.
- Wind Cone – Investigate mitigation during the next Runway 14L/32R upgrade. Pursue a Modification to Standards on the Airport Layout Plan.
- Precision Approach Path Indication (PAPI) - The location of this visual aid to navigation aid is required to function properly and is thereby fixed-by-function.

[5] FAA AC 150/5300-13A, Change 1, *Airport Design*, Paragraph 605a.

Runway 32R End

- Precision Approach Path Indication (PAPI) - The location of this visual aid to navigation aid is required to function properly and is thereby fixed-by-function.
- Wind Cone – Investigate mitigation during the next Runway 14L/32R upgrade. Pursue a Modification to Standards on the Airport Layout Plan.
- Glideslope - The location of this navigation aid is required to function properly and is thereby fixed-by-function.
- Medium Intensity Approach Lighting System (MALS) - The location of this visual aid to navigation aid is required to function properly and is thereby fixed-by-function.
- Distance Measuring Equipment - The location of this navigation aid is required to function properly and is thereby fixed-by-function.

Exhibit 3.2-4: Runway 14L/32R RSA & ROFA



Runway Protection Zones

The Runway Protection Zone's (RPZ) function is to enhance the protection of property and people on the ground. The RPZ is defined by the FAA as, "an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground." This is best achieved through airport owner control of the land area(s) that fall within the RPZ. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and included clearing the RPZ areas (and maintaining them clear) of incompatible objects and activities.[6]

Similar to RSAs and ROFAs, the dimensions of RPZs are determined by the capabilities of the associated runway and the size and capabilities of the aircraft which regularly use the runway. **Table 3.2-11, *BLV Runway Protection Zone Dimensions***, presents the dimensions of each RPZ at BLV based on existing conditions and classifications.

Table 3.2-11: BLV Runway Protection Zone Dimensions

RUNWAY END	INNER WIDTH (ft)	OUTER WIDTH (ft)	LENGTH (ft)
14L	1,000	1,510	1,700
32R	1,000	1,750	2,500

Source: FAA AC 150/5300-13A, FAA, CMT

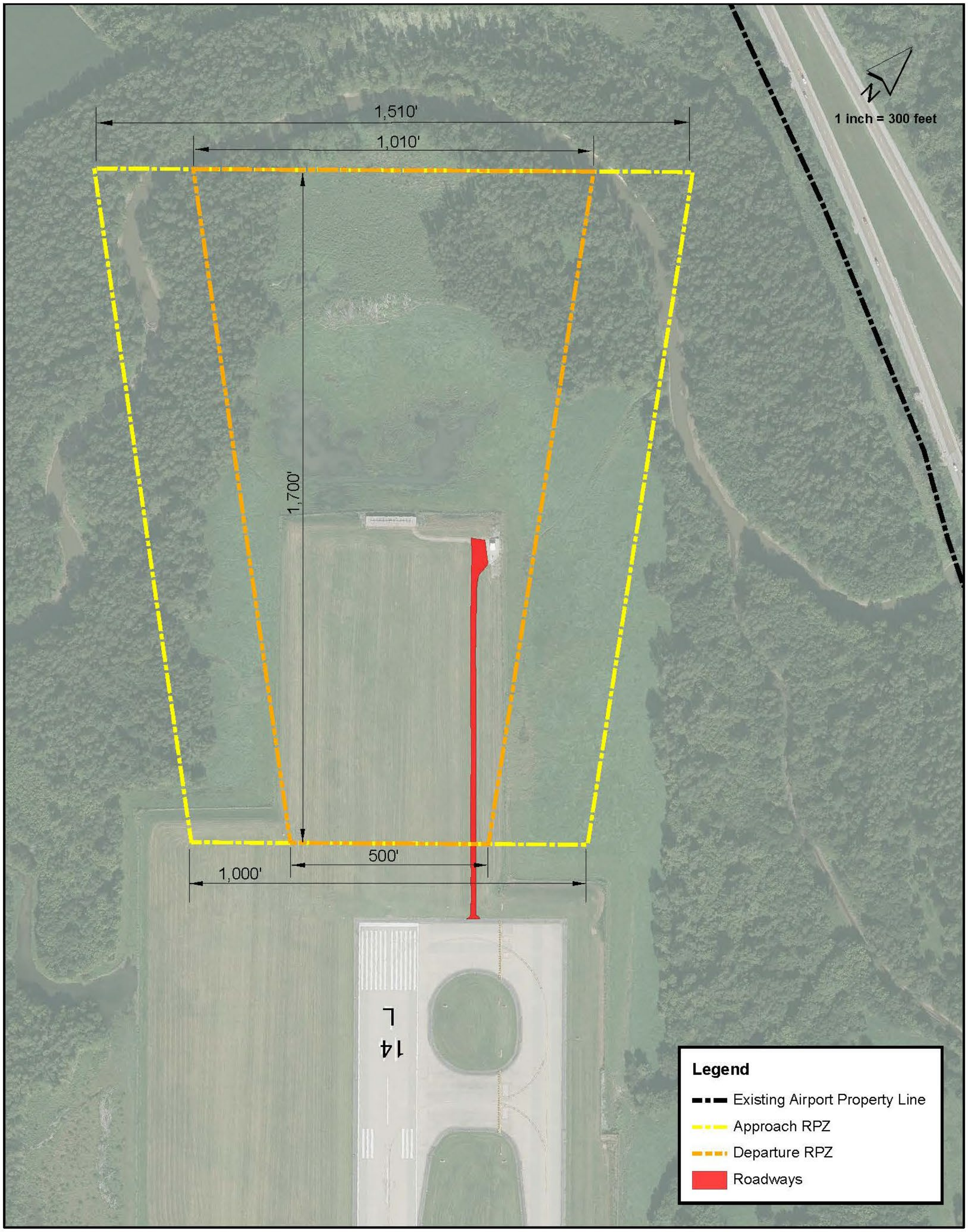
Of the two RPZs at BLV (one for each runway end), one is compliant with FAA standards of compatible uses and control.

Runway 14L

Within the Runway 14L end RPZ, one incompatible land-use has been identified. This incompatible land-use is an airport service road with controlled access that allows FAA Tech Ops access to service the Localizer Antenna Array and requires communication with the ATCT, therefore the incompatibility is allowable. **Exhibit 3.2-5, *Runway 14L RPZ***, identifies the incompatibility within the Runway 14L RPZ graphically.

[6] FAA AC 150/5300-13A, Change 1, *Airport Design*, paragraph 310.

Exhibit 3.2-5: Runway 14L RPZ



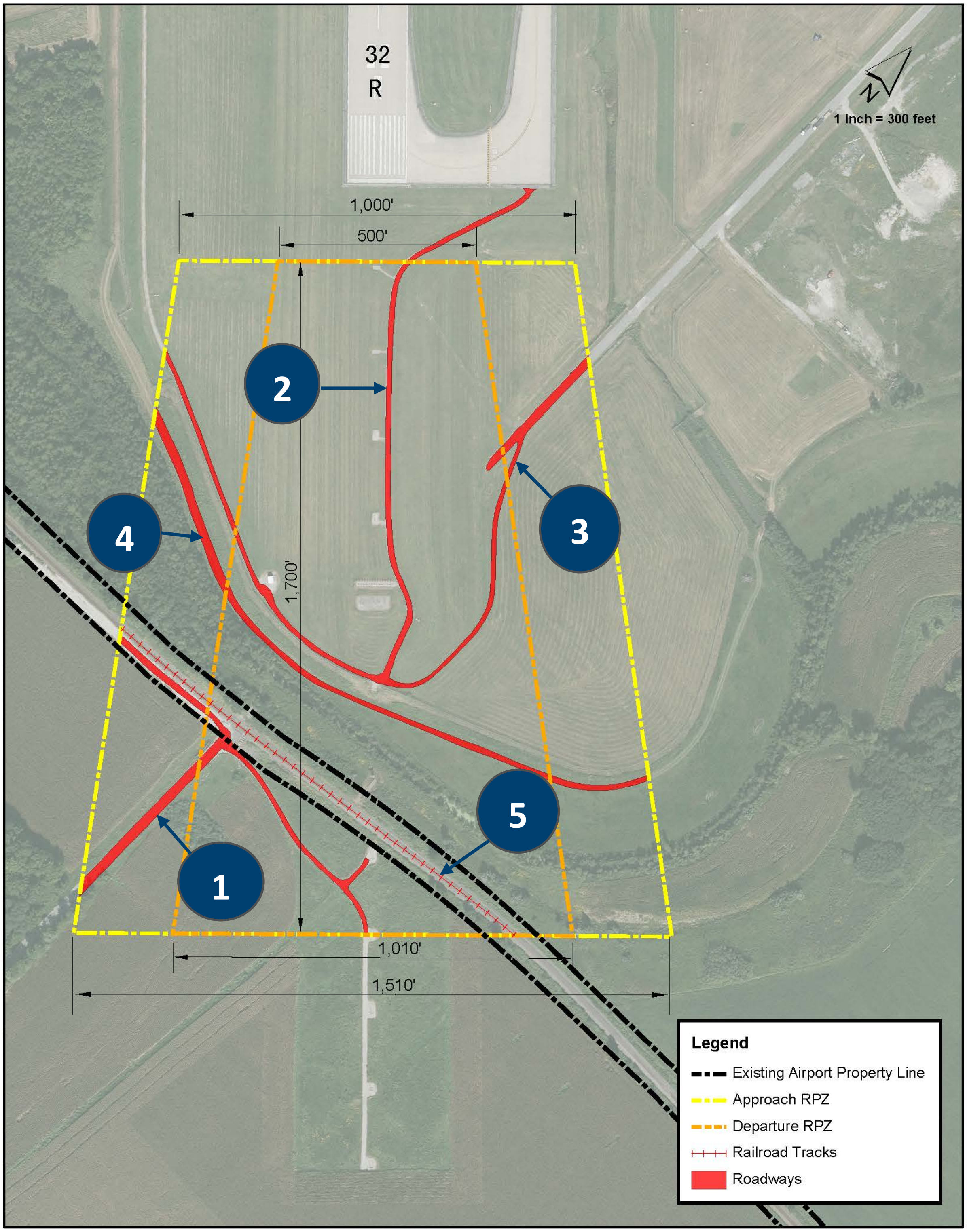
Source: Quantum Geospatial, CMT

Runway 32R

Within the Runway 32R RPZ, five instances of incompatible land-uses have been identified to exist. These incompatible land-uses are four airport service roads and one railroad track.

Of these incompatible land-uses, a portion of each one lie within the central portion of the RPZ. While the airport service road is within the central portion of the RPZ, access to it is controlled by the airport and the Airport Traffic Control Tower (ATCT), therefore mitigation of the airport service road within the Runway 32R RPZ is not required. Exhibit 3.2-6, *Runway 32R RPZ*, identifies the incompatibilities within the Runway 32R RPZ graphically and Table 3.2-12 describes each incompatibility.

Exhibit 3.2-6: Runway 32R RPZ



Source: Quantum Geospatial, CMT

Table 3.2-12: Runway 32R RPZ Incompatibilities

ID	OBJECT	DISPOSITION
1	Airport Service Road	Fixed by Function
2	Airport Service Road	
3	Airport Service Road	
4	Airport Service Road	
5	N&S Railroad	Investigate Mitigation

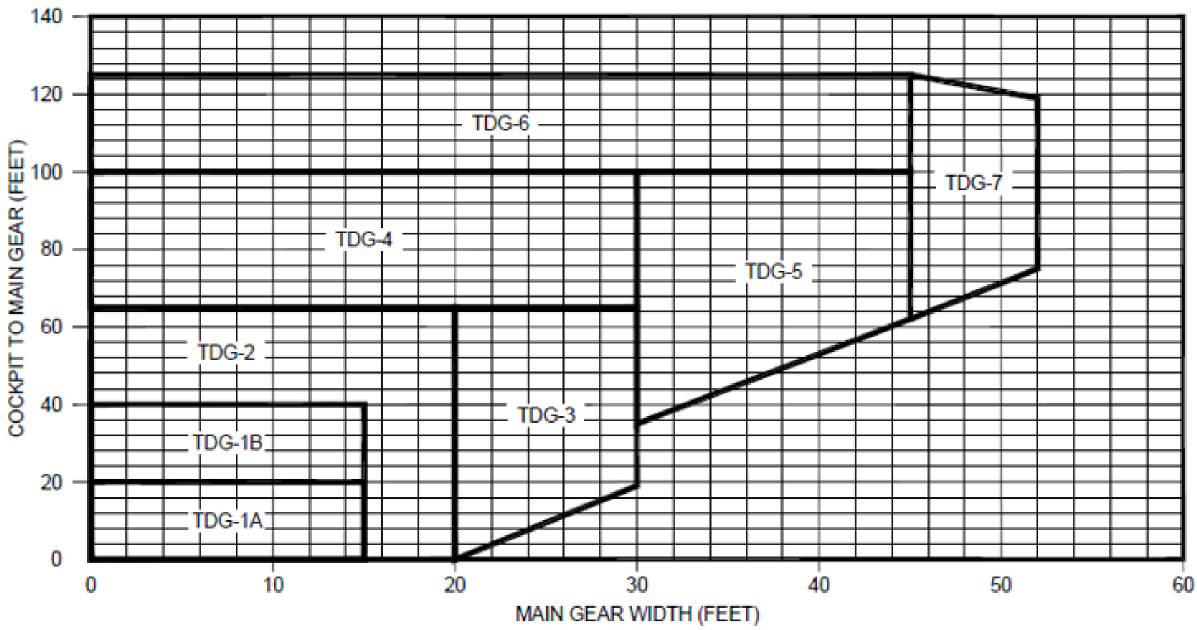
Source: Quantum Geospatial, CMT

3.2.5 Taxiway Design Standards

Taxiway design standards are set by the FAA and are a function of the size of aircraft that are intended to be using the taxiway. The FAA categorizes taxiways of varying capability using a system similar to that of the RDC discussed previously in this chapter called Taxiway Design Group (TDG). TDG is based on the dimensions of the aircraft undercarriage. The determining factors are (1) the width of its main gear[7] and (2) the distance between the cockpit and the main gear[8]. **Exhibit 3.2-7, *Taxiway Design Group (TDG) Chart***, presents how an aircraft's dimensions (relating to its main gear) determine TDG.

[7] The distance from the outer edge to outer edge of the widest set of main gear tires.
[8] The distance from the pilot's eye to the main gear turn center.

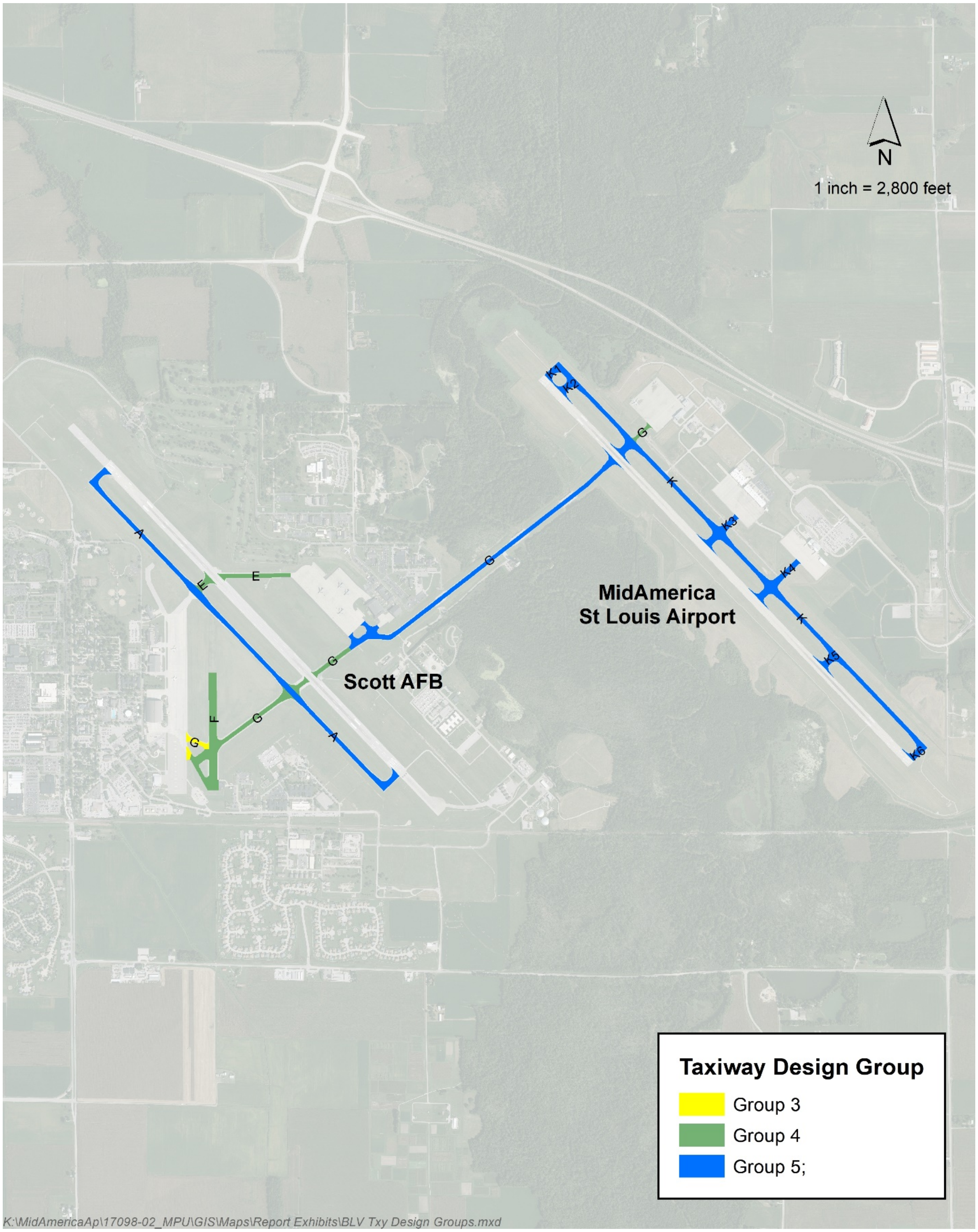
Exhibit 3.2-7: Taxiway Design Group (TDG) Chart



Source: FAA AC 150/5300-13A Change 1, Airport Design Figure 1-1

Exhibit 3.2-8, *BLV Taxiway Design Groups*, identifies the TDG of each taxiway at BLV in graphical form.

Exhibit 3.2-8: BLV Taxiway Design Groups



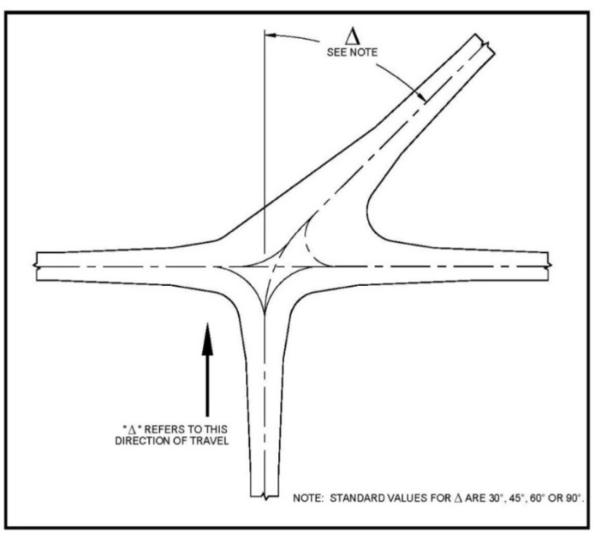
Source: CMT

TAXIWAY GEOMETRY

The FAA defines a runway incursion as "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.".[9] In recent years, the FAA has placed special emphasis on the prevention of Runway Incursions and the maintaining of pilot awareness. FAA AC 150/5300/13A Change 1, Airport Design, provides the following guidance on how to design taxiways and taxilanes in a way that enhances safety by reducing the probability of runway incursions:

- Keep taxiway systems simple by using the three-node concept. As illustrated in **Exhibit 3.2-9,** ***Three-Node Concept***, the three-node concept means a pilot should have no more than three choices at an intersection (preferably left turn, right turn, and straight).
- Avoid wide expanses of pavement with taxiway-to-runway interfaces. For example, an aircraft parking apron should not be directly connected to a runway by a taxiway.
- Reduce the need for aircraft to cross runways.
- Avoid "high-energy" intersections. High-energy intersections are intersections in the middle third of the runway.
- Provide right angle intersections (between two taxiways and between a taxiway and a runway). Do not use acute angle runway exits as a runway entrance point or as runway crossing.
- Avoid dual-purpose pavements. Do not use runways as taxiways and vice versa.
- Do not construct taxiways that lead directly from an aircraft parking apron to a runway.

Exhibit 3.2-9 – Three Node Concept



Source: FAA AC 150/5300-13A Change 1

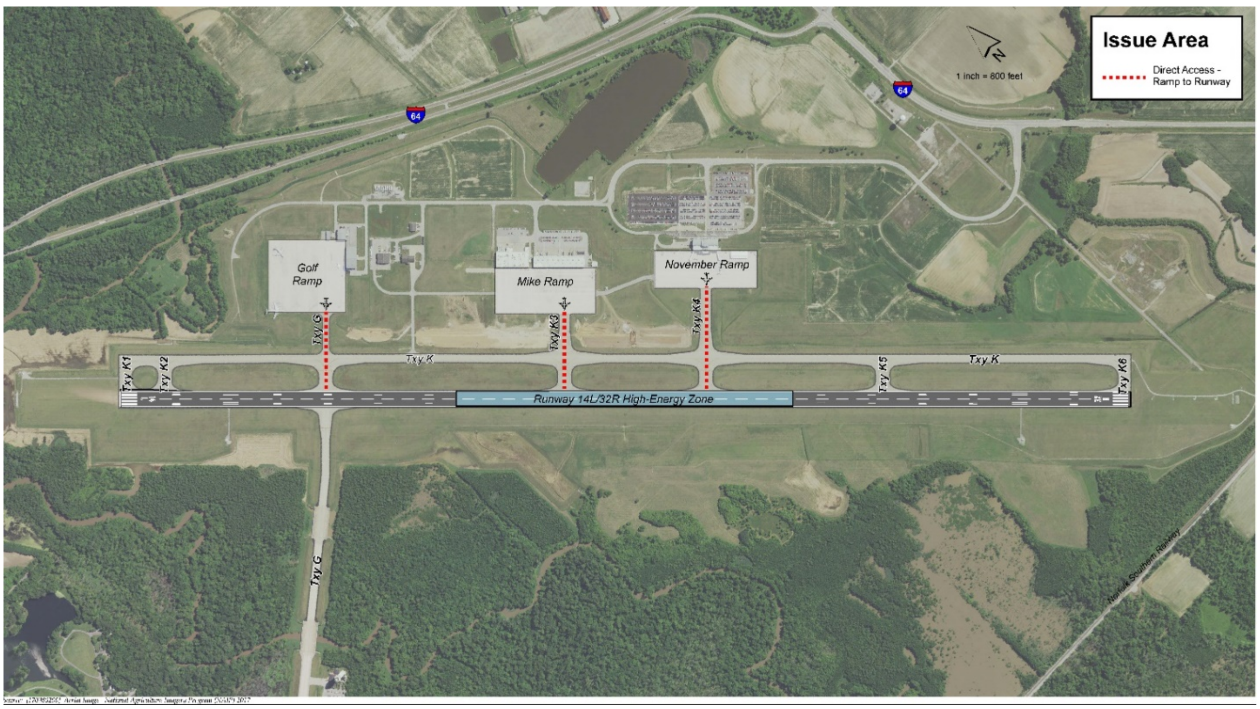
[9] https://www.faa.gov/airports/runway_safety/news/runway_incursions/

The taxiway system at BLV meets most of these criteria, with the exception for taxiways providing direct access to a runway from an aircraft parking apron.

- Taxiways G/K3/K4 – These taxiways provide direct access from their respective aprons to Runway 14L/32R. Reconfiguration of this intersection is recommended.
    - The intersection between Runway 14L/32R and Taxiway 'G' has been identified as a Hot Spot.

Each instance of these deviation is identified in Exhibit 3.2-10, *BLV Taxiway Deviations from Standards*.

Exhibit 3.2-10: BLV Taxiway Deviations from Standards



Source: Quantum Geospatial, CMT

3.3 General Aviation/Corporate Facility Requirements

General Aviation (GA) facilities at BLV consist of multiple individual facilities operated by several users at the Airport. The primary two operators are AVMATS and Illinois State Police. Existing general aviation capacity exceeds projected demand through the planning period. Any general aviation facility expansions or improvements would be by 3rd party development in a manner compatible with the ultimate land-use recommendations of the Master Plan Update.

3.4 Landside/Support Facilities

3.4.1 Access Roadways

Two major access roadways enable passengers to access the Terminal Building at BLV. These are: North Side of Airport Boulevard/Air Terminal Dr and Illinois Route 4 & Airport Boulevard. However, issues have been identified in each one of these access roadways and their intersections.

NORTH END OF AIRPORT BOULEVARD/AIR TERMINAL DR

The intersection allows for undesirable interaction between the traveling public and commercial vehicles. Exhibit 3.4-1, *North End of Airport Boulevard/Air Terminal Dr Intersection*, identifies the intersection at the north end of Airport Boulevard/Air Terminal Dr.

It is recommended that the airport make improvements to this intersection to reduce the likelihood of interactions between commercial and passenger traffic. Traffic at this intersection is projected to grow throughout the planning period and is constantly used by several of the Airport's tenants:

- Boeing: currently operates 4 trucks day on average, which circulate through this intersection.
- North Bay Produce: 7,200 trucks passed through this intersection in 2017. Three-quarters of the way through their operational season they grow to 8,200 trucks and projects further growth in operations of approximately 18% to 20% annually.
- Passenger Vehicle Traffic: vehicle traffic growth is proportionate with passenger demand growth.

The lack of wayfinding signage leading up to this intersection also presents an additional factor in the flow of traffic. The existing signage is too close to the intersection to allow for drivers to react.

Exhibit 3.4-1 – North Side of Airport Boulevard/Air Terminal Dr Intersection

Source: Quantum Geospatial, CMT

AIRPORT BLVD/IL ROUTE 4 INTERSECTION

Afternoon peak hour Level of Service (LOS) is rated as F at this intersection. This means that airport users and tenants must wait several minutes before they are able to exit the airport due to the traffic on Illinois Route 4 and lack of breaks in that traffic.

In May 2018, a traffic count showed that the intersection meets Signal Warrant 3 (Peak Hour level of traffic) as defined in the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD). The intersection meets 6 of the 8 hours for Signal Warrant 1 (8-hour vehicular volume).Based on traffic projections, it is forecasted that the intersection will meet Warrant 1 in 2022, which is of most concern to the Illinois Department of Transportation (IDOT).

Due to the level and type of traffic accessing the Airport from the south, the Airport Blvd/Illinois Route 4 Intersection requires an increase in storage length and taper length for the northbound left-turn movement. Due to the traffic volumes entering and exiting the Airport, an increase in taper length on Airport Boulevard is also required.

It is recommended that the airport seek mitigation of these issues through a modification of this intersection that comprises both geometric modifications and signalization of the intersection. **Exhibit 3.4-2,** ***Airport Blvd/Illinois Route 4 Intersection***, identifies the intersection of IL Route 4 and Airport Blvd.

Exhibit 3.4-2 – Airport Blvd/Illinois Route 4 Intersection

Source: Quantum Geospatial, CMT

3.4.2 Passenger Vehicle Parking

Passenger vehicle parking requirements were calculated for each demand level through the planning period to determine the adequacy of the existing public vehicle parking to accommodate projected demand. The existing lot currently provides 1,283 vehicle parking spaces and additional 513 new spaces were added in May 2020. Given that the circumstances at each airport are different in terms of how passengers travel to and from the airport and how long their vehicles stay, it was important to understand the relationship between passenger traffic and vehicle parking. To understand this relationship, parking data was obtained from Republic Parking for the period of April 5, 2018 through November 30, 2019 (the maximum data that was available at the time of this analysis). Table 3.4-1, *BLV Passenger Vehicle Parking Observations*, presents the information that was extracted from this set of parking data.

Table 3.4-1: BLV Passenger Vehicle Parking Observations

OBSERVATION	VEHICLES
Total number of vehicles	375,115
Busiest month of year: July 2019	30,431
Busiest day of year: 7/5/2019	1,225
Average occupancy of busiest month	982
Average busiest day of week: Saturday	700
Average slowest day of week: Tuesday	553
Average slowest month of year: January	406
Average occupancy	622

Source: Republic Parking, CMT

ASSUMPTIONS

Table 3.4-2, *Passenger Vehicle Parking Assumptions*, presents the planning assumptions used in the development of these requirements. For the purposes of planning it was determined that the desired level of demand to accommodate at BLV was 99th percentile. This allows for sufficient capacity to accommodate all regularly occurring peaks in demand notwithstanding outliers. A central assumption to this analysis was that passenger/societal behavior will change enough over time to a point that will impact demand for the passenger vehicle parking. This is evident in the assumed technology impact, that is the percentage that future demand is anticipated to be of existing demand. This impact of technology is anticipated to result from the increased utilization of Transportation Network Companies (TNC) (i.e. Uber or Lyft) and the adoption of autonomous vehicle technology in the future. In addition, an industry best practice "Search factor" was also applied to the parking requirements calculations. This search factor results in the assumption that a lot is full when it reaches 95 percent occupancy. The intent is to prevent continuous vehicle circulation in search for the final few parking spaces available.

Table 3.4-2: Passenger Vehicle Parking Assumptions

ASSUMPTION	2018	PAL 1	PAL 2	PAL 3	PAL 4
Technology impact (of existing)	100%	95%	85%	75%	70%
Search factor			0.95		

Source: CMT

REQUIREMENTS

Table 3.4-3, *Passenger Vehicle Parking Requirements*, presents the passenger vehicle parking requirements based on the previously presented methodology and planning assumptions. The results of this analysis indicate that the existing passenger vehicle parking will require additional capacity in PAL 1. However, parking demand while projected to grow to a peak during PAL 3, is projected to decrease to lower levels by PAL 4. The results of this analysis are presented for accommodating both the 99th percentile of demand as well as the 100th percentile of demand.

Table 3.4-3: Passenger Vehicle Parking Requirements

RESULT	PAL 1	PAL 2	PAL 3	PAL 4
99th Percentile of Demand				
Vehicle demand	1,705	1,905	1,985	1,942
Parking space demand	1,795	2,005	2,090	2,044
100th Percentile of Demand				
Vehicle demand	1,868	2,087	2,174	2,127
Parking space demand	1,966	2,196	2,289	2,239
Surplus/(Deficit)				
99th percentile of demand	1	(209)	(294)	(248)
100th percentile of demand	(170)	(400)	(493)	(443)

Source: CMT

CELL PHONE LOT

A cell phone lot is typically a free parking lot at an airport that allows greeters to park temporarily until a traveler is available for pickup. These lots can assist airport operators in managing curbs and they keep greeters from waiting in unsafe areas on airport roads[10].

Airport operators provide cell phone lots for a variety of reasons:

- As a customer service for greeters who would not likely wait in a parking lot or garage
- To reduce curb congestion and parking on access roads
- To improve roadway safety
- To lessen emissions by reducing circulating traffic
- To address parking space shortages in paid lots or garages by redirecting ultra-short-term customers (less than one hour) to the cell phone lot
- To meet TSA and FAA security requirements
- To satisfy customer and local government requests for a cell phone lot

When cell phone lots have fewer than 30 spaces, they may not address all of the stated objectives for operating this type of parking facility.

Assumptions

The ACRP Report *Cell Phone Lots at Airports* suggest that there is no apparent correlation between the size of a cell phone lot and other variables such as the number of arriving passengers or percent of passengers picked up in private vehicles.

However, to determine the demand for cell phone lot spaces, most airports that were part of the ACRP study reported that, often, the dimensions of an available parcel determined the capacity of the lot. Some airports managed high use of cell phone lots by opening additional spaces or deploying ground transportation crew and airport police to direct traffic. Often establishing cell phone lots involved reuse of other parking lots or staging areas. If an airport wanted to de-emphasize the cell phone lot in favor of other hourly parking options, it might limit capacity to 20–30 spaces and minimalize advertisement of the lot.

Table 3.4-4, *Ways that Airports Estimate Parking Spaces for Cell Phone Lots* shows the most common methodologies to determine the cell phone lot size. These results are coming from an ACRP survey conducted to 16 airports.

[10] ACRP Cell Phone Lots at Airports (2015)

Table 3.4-4: Ways that Airports Estimate Parking Spaces for Cell Phone Lots

APPROACH	RESPONSES
Capacity Determined by Dimensions of Available Parcel	13
Best Guess	4
Observations by Airport Staff	2
Demand Study	1
Experience with Previous Cell Phone Lot	1

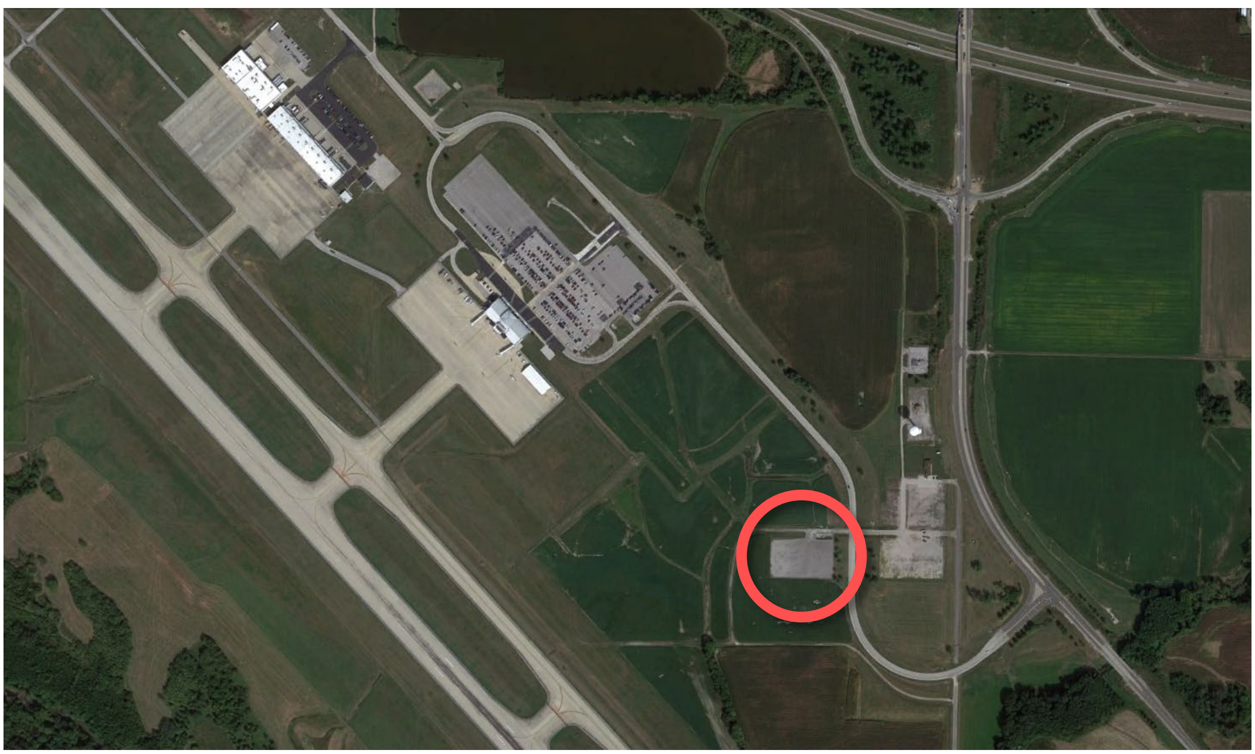
Source: ACRP Cell Phone Lots at Airports (2015)

As shown in Table 3.4-4, the most popular approach to estimate the size of cell phone lots is by analyzing the dimensions of the available parcel where the cell phone lot is located.

Requirements

The current cell phone lot at BLV is located southeast of the terminal building, in an empty lot that is accessed using Airport Blvd. **Exhibit 3.4-3, *Cell Phone Lot*** shows the location of this facility.

Exhibit 3.4-3 – Cell Phone Lot



Source: Quantum Geospatial, CMT

To determine the number of parking spaces currently available at the cell phone lot, an industry standard of the space required to accommodate an average vehicle was used (325 ft^2 per car). This space also considers the space required for circulation.

The current cell phone lot has an area of approximately 70,000 ft^2. By dividing the available area of the cell phone lot to the standard space required by a car, the total number of parking spaces available is approximately 215 spaces.

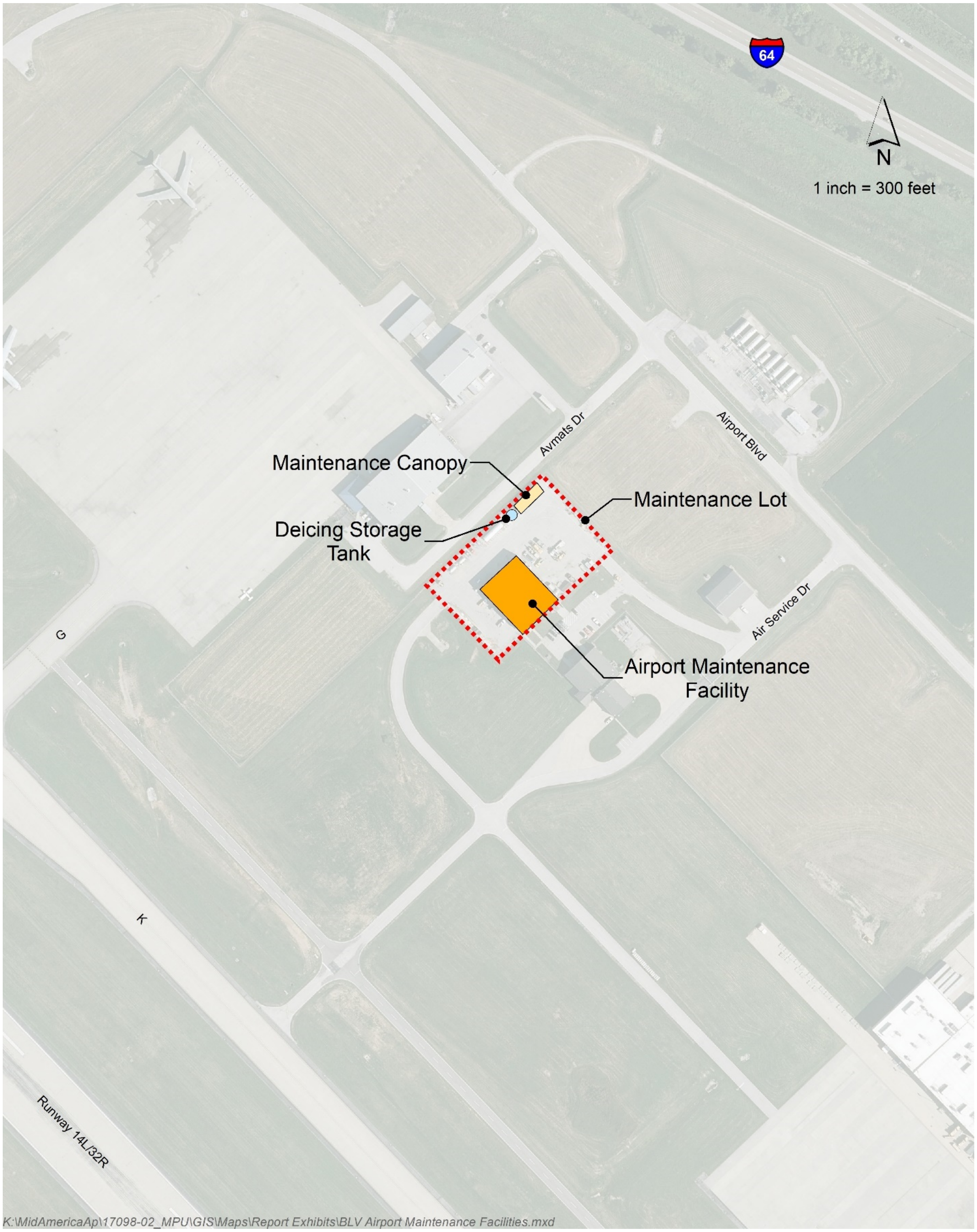
In addition, an industry best practice "search factor" was also applied to the parking requirements calculations. This search factor results in the assumption that a lot is considered to be full when it reaches 95 percent occupancy. The intent is to prevent continuous vehicle circulation in search for the final few parking spaces available. Therefore, the net current capacity of the cell phone lot is approximately 205 parking spaces.

This Master Plan Update suggest that no additional space is required in the near future to expand this cell phone lot. However, if in the future there is a need to increase the capacity of the current cell phone lot, the parking lot alternatives that have been developed in the Alternatives chapter provide flexibility so that the Airport can accommodate a section of the new proposed parking lots to additional capacity for the cell phone lot.

3.4.3 Airport Maintenance

The existing airport maintenance facilities, which are identified in Exhibit 3.4-4, *Existing BLV Airport Maintenance Facilities*, consist of one building. The primary building is approximately 12,335 square feet. The airport maintenance facility occupies an overall site of approximately 53,432 square feet.

Exhibit 3.4-4 – Existing BLV Airport Maintenance Facilities



Source: CMT

ASSUMPTIONS

Table 3.4-5, *Airport Maintenance Assumptions*, presents the planning assumptions used in the development of these requirements. These planning assumptions were based on a comparison of historical operational data at BLV with industry planning standards for airports of similar size and level of operations.

Table 3.4-5 – Airport Maintenance Assumptions

ASSUMPTION	VALUE
Operations/ft² of airport maintenance facility	1.3
Ratio of site area to total facility area	3.5
Existing utilization	175%

Source: CMT

REQUIREMENTS

Table 3.4-6, *Airport Maintenance Facility Requirements*, presents the airport maintenance facility requirements based on the previously presented methodology and planning assumptions. The results of this analysis indicate that the existing airport maintenance facility will not be sufficient in size to accommodate the projected demand in PAL 1, additional site area will also be required in PAL 1.

Table 3.4-6 – Airport Maintenance Facility Requirements

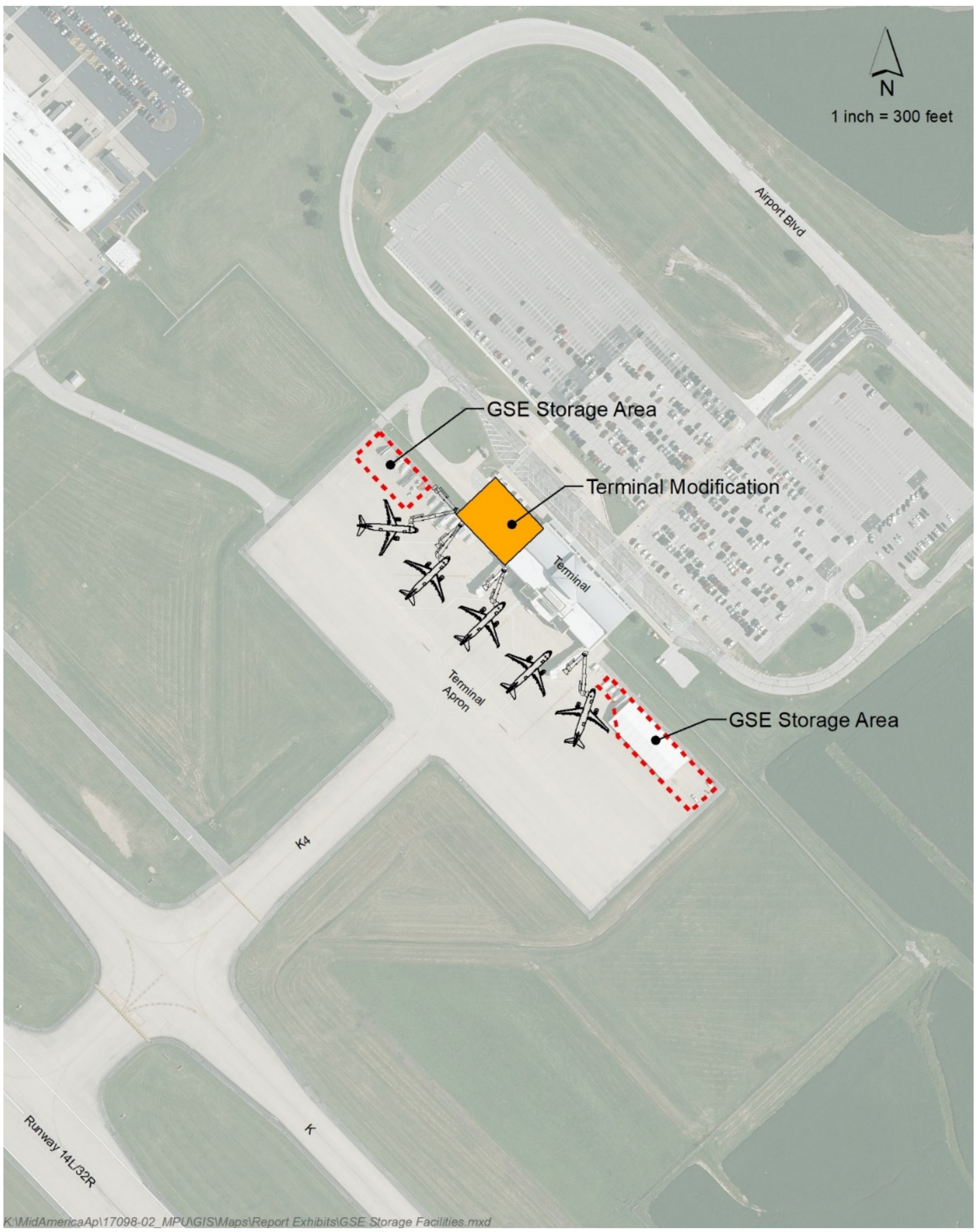
RESULT	PAL 1	PAL 2	PAL 3	PAL 4
Airport maintenance facility (ft²)	22,200	23,400	24,700	25,700
Airport maintenance site (ft²)	77,700	81,900	86,500	90,000
Surplus/(Deficit)				
Airport maintenance facility (ft²)	(9,865)	(11,065)	(12,365)	(13,365)
Airport maintenance site (ft²)	(24,268)	(28,468)	(33,068)	(36,568)

Source: CMT

3.4.4 Ground Support Equipment (GSE)

The existing GSE storage area is located on the November Apron ramp, which is identified in **Exhibit 3.4-5**, *Existing BLV Ground Support Equipment Storage*. The primary storage areas are located on the northeast and northwest corners of the ramp. The November Apron is 355,000 square feet and the current area available for GSE storage is approximately 47,112 square feet. However, due to the planned Terminal Building modification, the available area for GSE storage will be reduced to approximately 29,400 square feet.

Exhibit 3.4-5 – Existing BLV Ground Support Equipment (GSE) Storage



Source: CMT

ASSUMPTIONS

Table 3.4-7, *GSE Assumptions*, presents the planning assumptions used in the development of these requirements. These planning assumptions were based on a comparison of historical operational data at BLV with industry planning standards for airports of similar size and level of operations.

Table 3.4-7 – GSE Assumptions

ASSUMPTION	VALUE
Operations/ft² of GSE storage area	1.8
Existing utilization	50%

Source: CMT

REQUIREMENTS

Table 3.4-8, *GSE Requirements*, presents the GSE storage requirements based on the previously presented methodology and planning assumptions. The results of this analysis indicate that the existing area available for GSE storage will be sufficient in size to accommodate the projected demand throughout PAL 4.

Table 3.4-8 – GSE Storage Requirements

RESULT	PAL 1	PAL 2	PAL 3	PAL 4
GSE Storage Area (ft²)	15,900	16,700	17,700	18,400
Surplus/(Deficit)				
GSE Storage Area (ft²)	13,500	12,700	11,700	11,000

Source: CMT

3.4.5 Aircraft Fuel Storage

Aircraft fuel at BLV is currently stored in one facility which is identified in Exhibit 3.4-6, *Existing BLV Fuel Storage Facility*. The existing fuel farm provides a capacity to store 242,000 gallons of Jet A and 12,000 gallons of Avgas.

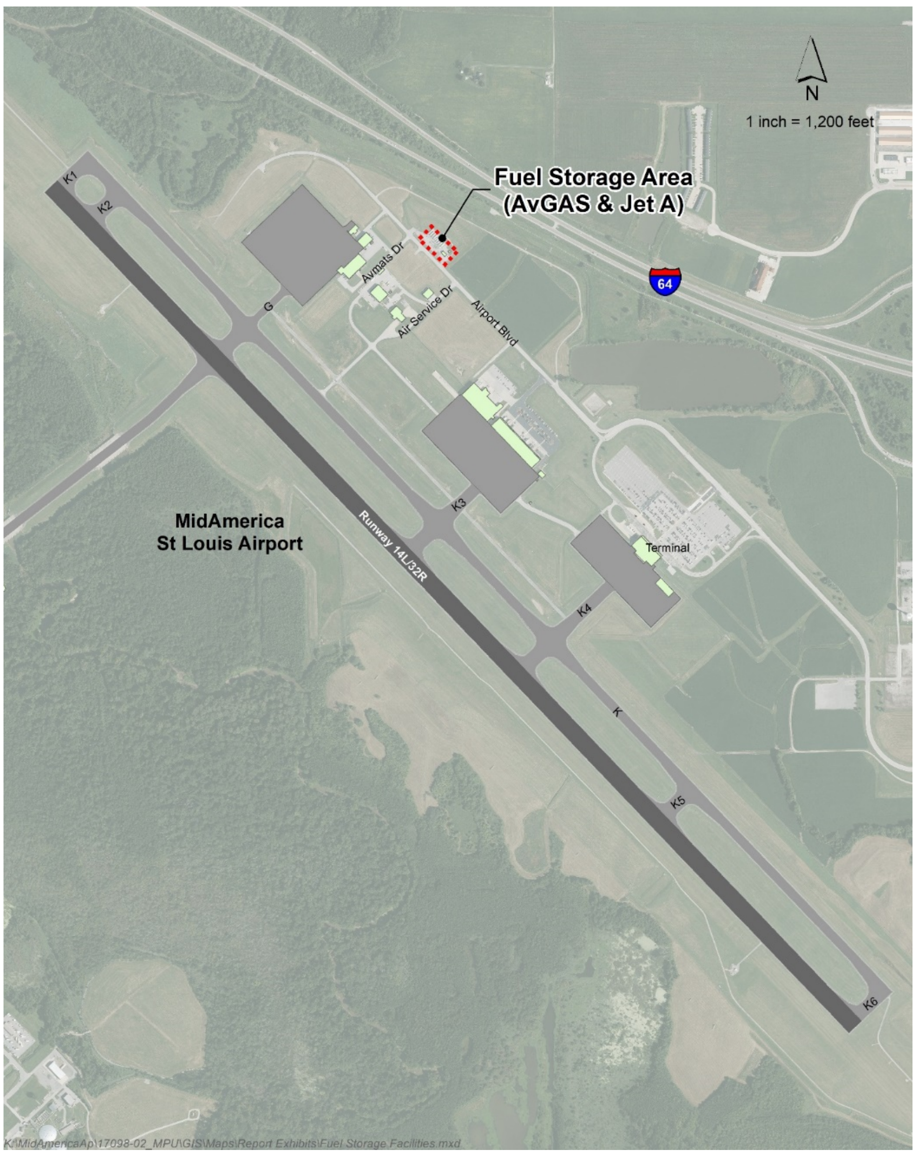
Given that the circumstances at each airport are different in terms of how fuel is consumed and dispensed, it was important to understand the relationship between aircraft operations and fuel consumption. To understand this relationship, fuel uplift data was obtained from the Airport for years 2012 to 2018. Table 3.4-9, *BLV Fuel Uplift Observations*, presents the information that was extracted from this set of fuel uplift data.

Table 3.4-9 - BLV Fuel Uplift Observations

OBSERVATION	Jet A	Avgas
Avg. Annual Uplift (gal)	1.28 million	9,493
Avg. Busiest Month (% of annual)	July (11%)	July (10%)
Avg. Slowest Month (% of annual)	Feb (6%)	April (7%)
Avg. Uplift/Month (gal)	106,694	790
Avg. Uplift/Operations (gal)	75	2

Source: BLV, CMT

Exhibit 3.4-6 – Existing BLV Fuel Storage Facility



Source: CMT

ASSUMPTIONS

Table 3.4-10, *Fuel Storage Assumptions*, presents the planning assumptions used in the development of these requirements. A central assumption for this analysis was that the percentage of GA operations by Piston Aircraft is 80%. It was also assumed that that air carrier, GA and military uplift per operation would not increase (0% per annum).

In addition, an industry standard target of having a three-day supply of fuel on hand was also applied as an objective. The purpose of this three-day supply is to maintain continuity of operations in the event of a fuel supply disruption.

Table 3.4-10 - Fuel Storage Assumptions

ASSUMPTION	PAL 1	PAL 2	PAL 3	PAL 4
Annual fuel uplift/airline operation (Jet A)	980 gal.			
Annual fuel uplift/GA operation (Jet A)	210 gal.			
Avg fuel uplift/operation (Avgas)	13 gal.			

Source: CMT

REQUIREMENTS

Table 3.4-11, *Fuel Storage Requirements*, presents the fuel storage requirements based on the previously presented methodology and planning assumptions. The results of this analysis indicate that the existing fuel storage capacity for Jet A and Avgas will be sufficient through the planning period.

Table 3.4-11 – Fuel Storage Requirements

RESULT	PAL 1	PAL 2	PAL 3	PAL 4
Daily Fuel Demand				
Jet A	30,800	36,100	42,600	46,600
Avgas	30	30	30	30
3-Day Fuel Demand				
Jet A	92,400	108,300	127,800	139,800
Avgas	90	90	90	90
Surplus/(Deficit)				
Jet A	149,600	133,700	114,200	102,200
Avgas	11,910			

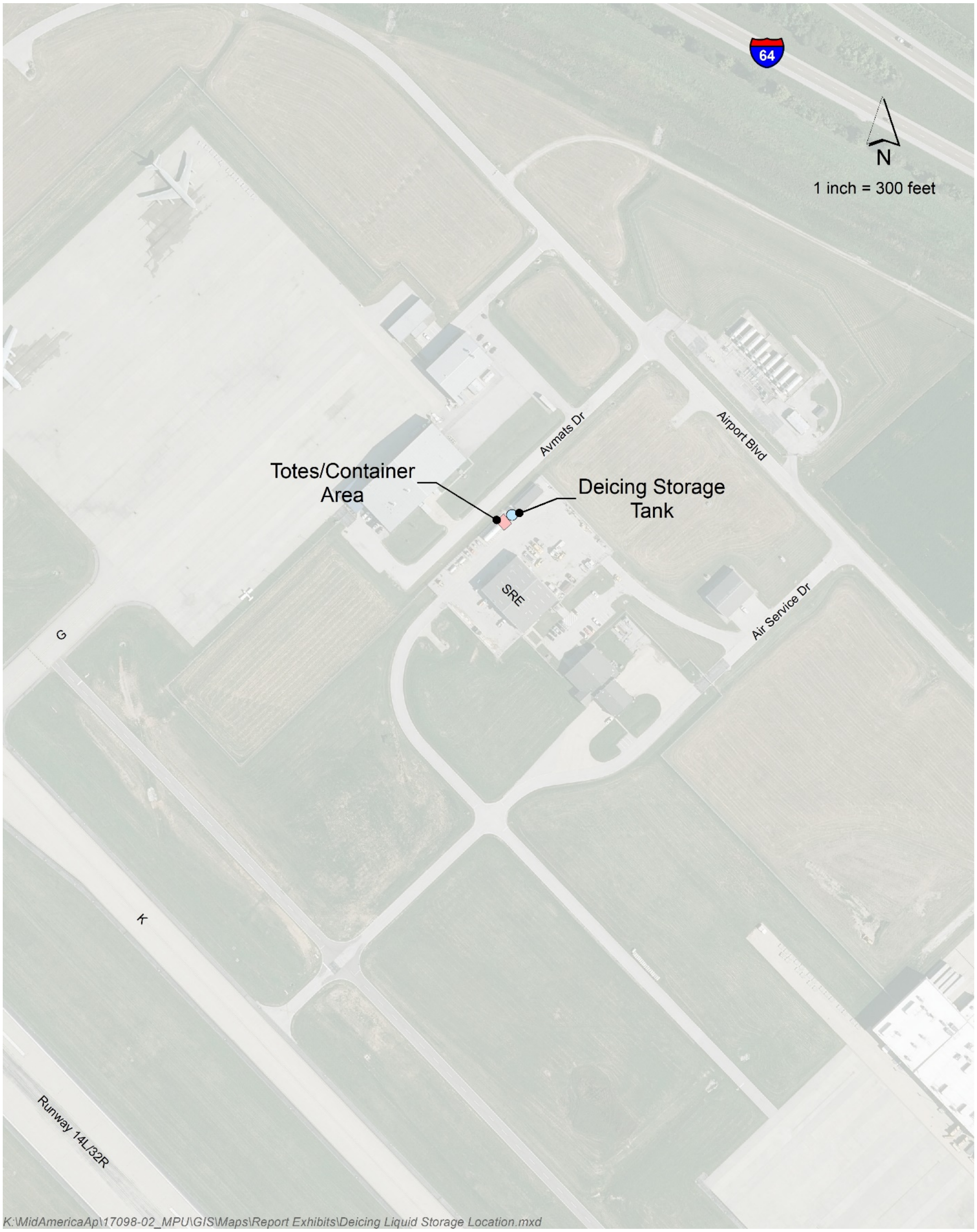
Source: CMT

3.4.6 De-icing Liquid Storage

De-icing liquid storage at BLV is currently stored north of the existing maintenance building. De-icing liquid Type I is stored in one 9,000-gallon tank and de-icing fluid Type IV is stored in totes that are located inside the Airport Maintenance Facility and empty totes are stored outside next to the Type I tank. Currently the Airport has 8 totes on hand. The storage location of the de-icing fluid is identified in Exhibit 3.4-7, *Existing BLV De-Icing Liquid Storage Location*.

Given that the circumstances at each airport are different in terms of how de-icing liquid is consumed and dispensed, it was important to understand the relationship between aircraft operations and de-icing liquid consumption. To understand this relationship, de-icing liquid usage data was obtained from the Airport for years 2015 to 2018. Table 3.4-12, *BLV De-icing Liquid Usage Observations*, presents the information that was extracted from this set of de-icing liquid usage.

Exhibit 3.4-7 – Existing BLV De-Icing Liquid Storage Location



Source: CMT

Table 3.4-12 – BLV De-Icing Liquid Usage Observations

DE-ICING LIQUID TYPE	2015	2016	2017	2018
Type I Total Usage (gal)	950	2,470	1,110	3,374
Type IV Total Usage (gal)	127	232	237	218

Source: BLV, CM

ASSUMPTIONS

Table 3.4-13, *De-icing Liquid Storage Assumptions*, presents the planning assumptions used in the development of these requirements. A central assumption for this analysis was that the percentage of 2018 operations that take place during winter (and required de-icing liquid) is 40.4%. In addition, it was assumed that of those 40.4% operations, 93% correspond to operations that use Type I fluid and the other 7% operations use Type IV fluid. It was also assumed that that air carrier, GA and military de-icing liquid usage per operation would not increase (0% per annum).

In addition, an industry standard target of having a one-season supply of de-icing liquid on hand was also applied as an objective. The purpose of this one-season supply is to maintain continuity of operations in the event of a de-icing liquid disruption. It is also industry standard to separate each manufacturer's de-icing fluid. Therefore, versatility is achieved when demand and supply dictate a specific source of fluid.

Table 3.4-13 – De-Icing Liquid Storage Assumptions

ASSUMPTION	PAL 1	PAL 2	PAL 3	PAL 4
Annual fluid usage Type I (gal/op)	3.13			
Annual fluid usage Type IV (gal/op)	3.13			

Source: CMT

REQUIREMENTS

Table 3.4-14, *De-Icing Liquid Storage Requirements*, presents the de-icing liquid storage requirements based on the previously presented methodology and planning assumptions. The results of this analysis indicate that the existing Type I liquid storage capacity will not be sufficient at PAL 1. The existing Type IV liquid storage capacity will be sufficient trough the planning period.

Table 3.4-14 – De-Icing Liquid Storage Requirements

RESULT	PAL 1	PAL 2	PAL 3	PAL 4
Average Daily Uplift (gal)				
Type I	79	94	113	124
Type IV	8	10	12	13
One Season (5 months) Liquid Demand				
Type I	11,795	14,113	16,987	18,629
Type IV	1,253	1,499	1,805	1,979
Surplus/(Deficit)				
Type I	(2,795)	(5,113)	(7,987)	(9,629)
Type IV	N/A			

Source: CMT

3.4.7 Aircraft Rescue & Firefighting (ARFF)

There are two existing ARFF stations at BLV identified in Exhibit 3.4-8, *Existing BLV ARFF Stations*. Both stations provide an ARFF Index of level B. The level of protection that is required to be provided at an airport is known as the ARFF Index. An ARFF index for the Airport is defined in 14 CFR Part 139.315, Paragraph C and is determined by the longest air carrier passenger aircraft with an average of five (5) or more daily scheduled departures. However, when there are fewer than five average daily departures of the longest air carrier aircraft serving the Airport, the Index required for the Airport will be the next lower index group than the index group prescribed for the longest aircraft..[11] The requirements for index determination are presented in Table 3.4-15, *Airport ARFF Index Determinations*.

[11] 14 CFR Part 139.315, *Aircraft Rescue and Firefighting: Index Determination, 2013.*

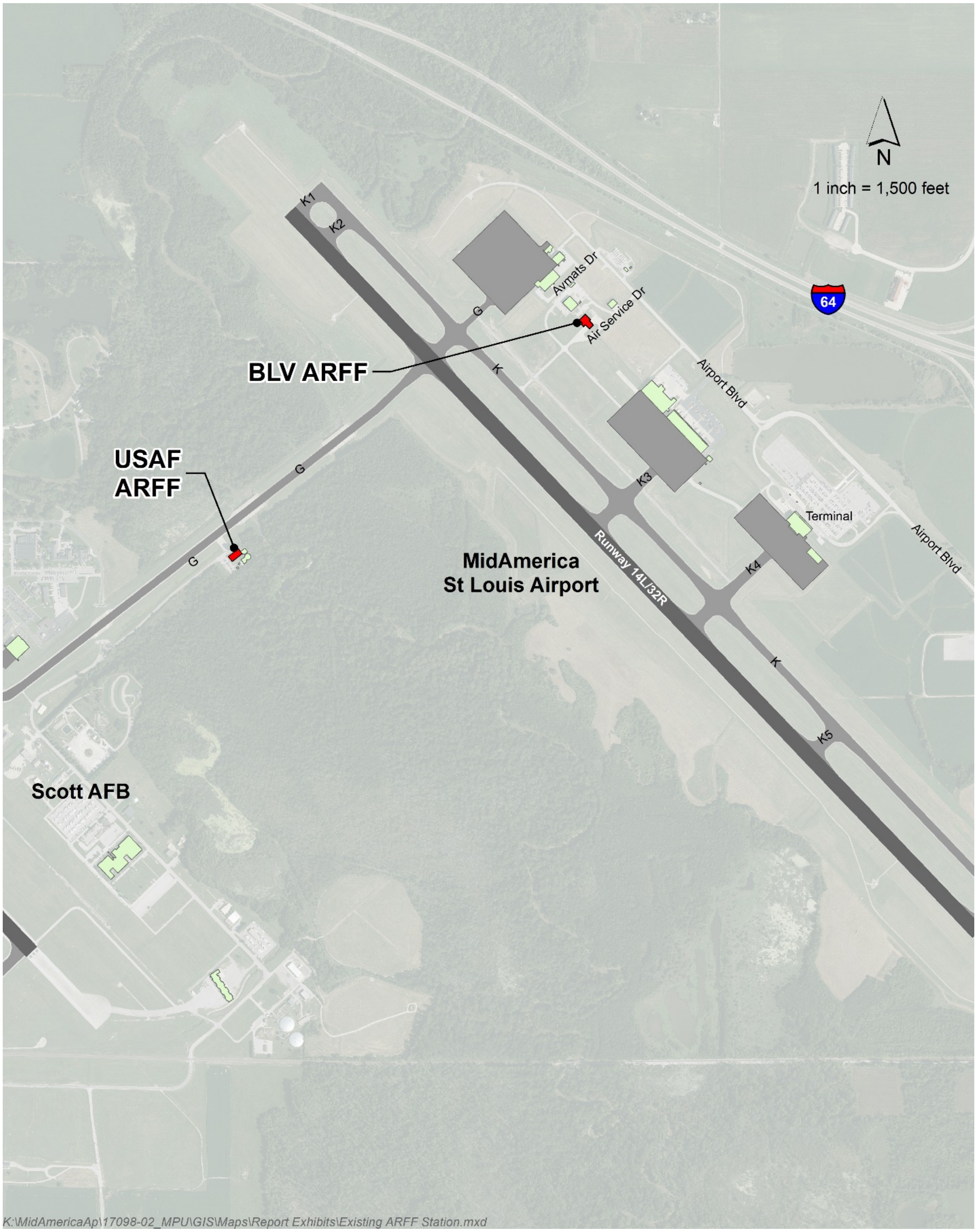
Table 3.4-15 – Airport ARFF Index Determinations

AIRPORT INDEX	LENGTH OF AIRCRAFT (ft) [12]	VEHICLES [13]		EXTINGUISHING AGENTS (gal) [14]	
		LIGHT-WEIGHT	SELF-PROPELLED	DRY CHEMICAL	WATER [15]
A	< 90	1	0	500 or 450	0 or 100
B	90 – 125.9	1	1	500	1,500
C	126 – 158.9	1	2	500	3,000
D	159 – 199.9	1	2	500	4,000
E	200 +	1	2	500	6,000

Source: 14 CFR 139.312, Aircraft Rescue and Firefighting: Index Determination, 2013

[12] Length of largest aircraft providing an average of five scheduled departures daily.
[13] Light-weight vehicle requirements for Index A are part of the total for Index B-E.
[14] The protein-based agents may be substituted for aqueous film forming foam (AFFF) and the quantities of water shown increased by a factor of 1.5. Dry chemicals in the ratio of 12.7 pounds per gallon of water may be substituted for up to 30 percent of the water specified for AFFF.
[15] Water for protein foam production.

Exhibit 3.4-8: Existing BLV ARFF Stations



Source: CMT

FAA's Part 139 Aircraft Rescue and Fire Fighting (ARFF) Airports dictates that operators of Part 139 airports must provide aircraft rescue and firefighting (ARFF) services during air carrier operations that require a Part 139 certificate. One of the requirements of Part 139 establishes that within 3 minutes from the time of the alarm, at least one required aircraft rescue and firefighting vehicle must reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or reach any other specified point of comparable distance on the movement area that is available to air carriers, and begin application of extinguishing agent.

ASSUMPTIONS

Table 3.4-16, *ARFF Stations Response Time Assumptions*, presents the planning assumptions used in the development of these requirements. These planning assumptions were based on industry planning standards for airports of similar size and level of operations. Exhibits 3.4-9 and 3.4-10 identify the path that emergency vehicles would take to reach the midpoint of Runway 14L/32R from the north and south ARFF stations respectively.

Table 3.4-16 – ARFF Stations Response Time Assumptions

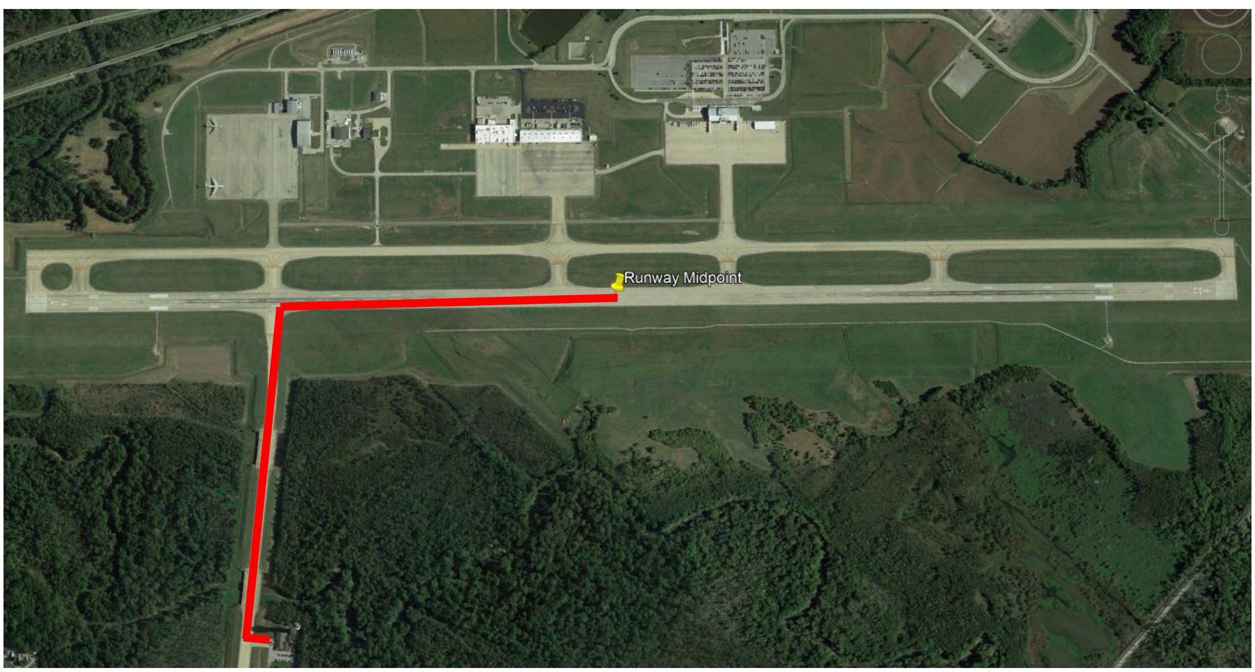
PLANNING ASSUMPTIONS	VALUE
Straight path speed (mph)	49.7
Turn path speed (mph)	34.7
Alarm to departure (seconds)	40

Source: CMT, 2019

Exhibit 3.4-9 – North ARFF Station Path

Source: CMT, 2019

Figure 3.4-10 – South ARFF Station Path



Source: CMT, 2019

REQUIREMENTS

Table 3.4-17, *ARFF Stations Response Time*, presents the total response time for both ARFF stations based on the previously presented methodology and planning assumptions. The results of this analysis indicate that both stations comply with Part 139 since the response time of an emergency vehicle to reach the midpoint of Runway 14L/32R is less than 3 minutes.

Table 3.4-17 – ARFF Stations Response Time

ARFF Station	Total Response Time (minutes : seconds)
BLV	1:28
USAF	2:01

Source: CMT, 2019

3.5 Passenger Terminal Requirements

The requirements for the passenger terminal were defined by InterVistas in a report that illustrates the methodology, assumptions, and requirements for each one of the following terminal facilities:

- Check-in Lobby
- Checked Baggage Screening and Makeup
- Security Screening Checkpoint
- Passenger Holdroom
- Passenger Aircraft Apron
- Baggage Claim
- Federal Inspection Services
- The detailed report completed by InterVistas can be found in Appendix D.

3.5.1 Methodology

The method for determining future requirements is informed by and consistent with guidance from the International Air Transport Association (IATA) Airport Development Reference Manual, 10th Edition, and Airport Cooperative Research Program (ACRP), Report 25, Airport Passenger Terminal Planning and Design. For each passenger terminal function, specific assumptions in accordance with this guidance, industry standards, and airline input are documented. For planning purposes, it is assumed that terminal facilities will be developed to meet IATA's optimum Level of Service (LOS), which is a measure of the quality of service provided inside the terminal in terms of ease of flows and delays. Optimum LOS corresponds to overall good levels of service, where flows are stable, delays are acceptable, and a good level of comfort is provided. Previous versions of IATA's Airport Development Reference Manual refer to optimum level of service as being most similar to LOS C.

To derive passenger terminal requirements, an estimate of Average Day Peak Month (ADPM) enplanements is required. Scenario-based ADPM flight schedules were developed to provide the basis for the terminal requirements. Specifically, the ADPM flight schedule provides the basis for aircraft gates and apron parking requirements. Passenger peak hour enplanements from the ADPM flight schedule drive check-in, checked baggage, security screening, and holdroom requirements. Similarly, peak hour deplanements determine the baggage claim requirements.

3.5.2 Planning Activity Levels

There is a level of uncertainty associated with long-range demand forecasting and associated planning exercises. As a result, planning activity levels (PALs) are identified to inform the future levels of passenger activity at which facilities become congested and expansion would be required. PALs help to disassociate projects from specific years as realized activity levels may occur earlier or later than the forecast predicts. PALs were chosen to represent conditions expected within the first five years, ten years, and at the end of the planning period. PAL 1 coincides with 247,500 enplanements, which the baseline forecast predicts would occur in 2022. PAL 2 represents 309,000 enplanements, which may occur in 2027, and PAL 3 coincides with 382,500 enplanements at the end of the 20-year forecast horizon. Annual and peak passenger airline flight operations and passenger data for each PAL are summarized in **Table 3.5-1**. Where appropriate, the use of PALs will be used in the identification of terminal facility requirements.

Table 3.5-1: Peak Period Activity Summary

	BASE YEAR		PLANNING ACTIVITY LEVEL (PAL)		
	2017	2018	PAL 1	PAL 2	PAL 3
Annual Enplanements	122,158	154,200	247,500	309,000	382,500
ADPM Enplanements	777	926	1,517	1,976	2,417
PEAK HOUR PASSENGERS					
Enplanements	159	315	335	440	502
Deplanements	159	315	335	440	502
Peak Hour Total Passengers	319	473	502	599	670
Annual Passenger Departures	1,708	2,182	3,943	4,873	6,685
ADPM Passenger Departures	5	6	10	13	16
PEAK HOUR PASSENGER OPERATIONS					
Departures	1	2	2	3	3
Arrivals	1	2	2	3	3
Peak Hour Total Passenger Operations	2	3	3	4	4

Source: InterVistas, March 2018

3.5.3 Passenger Terminal Requirements

Table 3.5-2 provides the results associated with the analysis of the future terminal requirements for each major function within the passenger terminal building. For details about the methodology and assumptions that were made to determine these requirements, please refer to Appendix D.

Table 3.5-2: Future Passenger Terminal Requirements

	EXISTING FACILITIES	BASE YEAR	PLANNING ACTIVITY LEVEL (PAL)		
		2017	PAL 1	PAL 2	PAL 3
CHECK-IN LOBBY REQUIREMENTS					
Number of Check-In Desks	12	7	7	10	11
Queue Area (ft^2)	n/a	920	980	1,140	1,620
BAGGAGE SCREENING REQUIREMENTS					
Number of EDS Units	1	1	2	2	2
Makeup Area (ft^2)	2,712	1,400	2,700	4,100	4,100
SECURITY SCREENING REQUIREMENTS					
Number of Lanes	2	2	2	2	2
Security Screening Area (ft^2)	2,362	2,800	2,850	3,150	3,300
HOLDROOM REQUIREMENTS					
Peak Hour Departures	n/a	1	2	3	3
Holdroom Area (ft^2)	5,200	3,200	6,300	9,500	9,500
BAGGAGE CLAIM REQUIREMENTS					
Peak Hour Deplanements	n/a	315	335	440	502
Claim Devices (each)	2	2	2	2	2

Source: InterVistas, March 2018

3.5.4 Federal Inspection Services

The Airport currently does not have a Federal Inspection Services (FIS) facility and cannot support scheduled or charter international service unless it originates at a US Preclearance facility. To support these services in the future, analysis of a potential FIS was prepared.

Facility requirements are based on current Customs and Border Protection (CBP) design standards and expected passenger demand. The four major components of the FIS facility are immigration (primary passport screening), international baggage claim, customs (secondary screening), and CBP administrative offices. The CBP administrative and support areas are prescriptive and traditionally account for a large proportion of the overall area requirement.

The following assumptions were utilized to determine the FIS facility requirements:

- One international arrival with 200 passengers, as the minimum CBP requirements standards are 200 passengers during the peak hour.
- A passenger processing rate of 60 seconds per passenger to reflect market conditions specific to MidAmerica.
- A maximum queue time of 10 minutes, per IATA optimum LOS.
- The international baggage claim device operates independently from the domestic baggage claim devices and has a device occupancy time of 20 minutes.

These assumptions result in requirements of four primary immigration inspection desks; one international baggage claim device with approximately 45 linear feet of frontage; and one secondary screening x-ray lane to accommodate one international arrival in the peak hour.

When combined with CBP office and support areas, the total FIS facility is expected to require between 10,000 square feet and 13,000 square feet depending on orientation and passenger flow.

3.6 Summary of Facility Requirements (Non-Terminal)

Table 3.6-1, *BLV Facility Requirements Summary*, provides an overall summary of the net change in facility requirements for the Airport when compared to existing conditions.

Table 3.6-1: BLV Facility Requirements Summary

RESULTS	PAL 1	PAL 2	PAL 3	PAL 4
Airside Requirements				
Airfield Capacity	-			
Wind Coverage	-			
Length – Runway 14L/32R	+500 ft.			
Width – Runway 14L/32R	-			
Shoulders – Runway 14L/32R	+23 ft.			
Blast Pad – Runway 14L/32R	+220 ft. (width) x +400 ft. (length)			
Runway to Taxiway Separation	-			
RSA & ROFA – Runway 14L/32R	Investigate relocation of windcone in 14L end and windcone in 32R end			
RPZ – Runway 14L end	-			
RPZ – Runway 32R end	Investigate mitigation of public road south of runway end and N&S Railroad			
Taxiway G – Direct Access	Relocate taxiway to avoid direct access to Runway 14L/32R			
Taxiway K3 – Direct Access	Relocate taxiway to avoid direct access to Runway 14L/32R			
Taxiway K4 – Direct Access	Relocate taxiway to avoid direct access to Runway 14L/32R			

Source: CMT

Table 3.5-1: BLV Facility Requirements Summary (continued)

RESULTS	PAL 1	PAL 2	PAL 3	PAL 4
Landside/Support Facilities Requirements				
North Side of Airport Boulevard/Air Terminal Dr intersection	Reconfiguration recommended			
IL Route 4 & Airport Blvd/Air Terminal Dr Intersection	Reconfiguration recommended			
Passenger Vehicle Parking (spaces)	+170	+400	+493	+443
Airport Maintenance Facility Area	+24,268 ft^2	+28,468 ft^2	+33,068 ft^2	+36,568 ft^2
Airport Maintenance Building Area	+9,865 ft^2	+11,065 ft^2	+12,365 ft^2	+13,365 ft^2
Ground Support Equipment Storage Area	-			
Aircraft Fuel Demand 3-day Storage Jet A (gal)	-			
Aircraft Fuel Demand 3-day Storage Avgas (gal)	-			
De-icing Liquid Type I (gal)	+2,795	+5,113	+7,987	+9,629
De-icing Liquid Type IV (gal)	-			

Source: CMT

Chapter Four

Alternatives

This chapter presents the Alternatives Development section of the Master Plan that identifies and evaluates scenarios and concepts (known as alternatives) needed to accommodate the facility requirements presented in the preceding chapter. As an essential component in the planning process, this chapter will review alternatives MidAmerica St. Louis Airport (BLV or Airport) could develop to meet the needs of airport users, satisfy future demand and conform to Federal Aviation Administration (FAA) design criteria.

The alternatives presented herein are based on the requirements identified in Chapter 3 – *Facility Requirements*. The guidelines prescribed in FAA Advisory Circular (AC) 150/5070-6B, Change 2, *Airport Master Plan,* were utilized to ensure the elements and processes outlined by FAA was followed. Additionally, standards set forth in FAA AC 150/5300-13A, Change 1, *Airport Design* (AC 13A), were applied to airfield design alternatives to identify compliance.

There are endless possibilities of scenarios and concepts that can be developed during the Alternatives Development phase. Therefore, professional judgment and experience have been applied to identify alternatives with the greatest potential for implementation. As such, the alternatives scenarios presented in this section are organized by facility type:

1. Airfield – Recognizing the current airfield is in good condition and generally meets the design intent of the applicable advisory circulars, no conceptual runway layouts were required for airfield facilities over the 20-year planning horizon. However, other airside improvement needs are analyzed herein.
2. Air Cargo
3. General Aviation/Corporate
4. Access Roadways
5. Landside Access and Parking Alternatives
6. Support Facilities

Through an evaluation process, alternatives were analyzed, ultimately identifying a Preferred Development concept. The Preferred Development concept will be used in the development of the Airport Layout Plan (ALP).

As this MidAmerica St. Louis Airport's (BLV) Master Plan Update was commissioned, BLV was experiencing exponential growth in air passenger traffic. The existing Air Passenger Terminal opened prior to 9/11 with two at-grade gates and two second level boarding bridges and little security screening area. Recent air passenger growth triggered the Airport in pursuing a phased Airport Master Plan. Phase I of the Airport Master Plan focused solely on the Air Passenger Terminal Building and ancillary improvements. Phase II of the Master Plan focused on the remainder of the Airport's facilities. Phase I included aeronautical projections needed to satisfy the Terminal Modification Program and beyond. The Terminal Modification Program is subsumed into the ultimate terminal expansion footprint as depicted on the approved Airport Layout Plan. The Airport Master Plan Update continues that methodology, based on the Forecasts prepared in Phase 1 and will include that depiction in the Airport Layout Plan.

4.1 Airfield

Generally, an airport master plan would include an analysis of alternatives that provide additional runway capacity to meet the forecasted demand for the 20-year planning period. However, as identified in the previous chapter, the current runway configuration provides sufficient capacity to meet the aviation demand identified through the Master Plan's planning period. Therefore, this section of airside alternatives analysis for BLV has concentrated on three areas:

1. Runway Design Standards Review
    - The Facility Requirements chapter found that the majority of BLV's runway design is compliant with FAA design standards, however, there were a few areas where deficiencies were identified specifically related to runway shoulder widths and blast pad dimensions.
    - The Facility Requirements chapter identified several FAA design standards deficiencies, particularly with regards to the Runway Safety Area (RSA) and Runway Object Free Area (ROFA). The goal of the alternatives analysis is to identify alternatives that will mitigate these deficiencies.
    - The Alternatives chapter will evaluate the effects of adhering to requirements related to Runway Protection Zones (RPZ) as published in AC 13A as well as FAA Memorandum dated September 27, 2012 *Interim Guidance on Land Uses Within a Runway Protection Zone*.
2. Taxiway Design Standards Review
    - The Facility Requirements chapter found that the majority of BLV's taxiway system is compliant with FAA design standards, however, there were a few areas where deficiencies were identified. This section evaluates the effects of meeting non-direct access requirements relating to Taxiway Geometry Incompatibilities as published in AC 13A. The goal of the taxiway analysis is to identify alternatives that mitigate these deficiencies.

4.1.1 Runway Design Standards

Table 4.1-1, *Runway Geometry Standards Evaluation*, presents the runway design standards that do not meet FAA 13A criteria based on the Runway Design Code (RDC) for Runway 14L/32R, and subsequently identifies the level of deficiency. In summary, Runway 14L/32R at BLV does not comply with the runway shoulders and blast pads dimension requirements based on the RDC of D-V, as previously identified in this Master Plan Update.

Table 4.1-1: Runway Geometry Standards Evaluation

DESIGN ELEMENT	RUNWAY 14L/32R			
	EXISTING		REQUIRED	
	14L	32R	14L	32R
Runway Shoulder (ft)	12		35	
Blast Pad Width (ft)	0		220	
Blast Pad Length (ft)	0		400	

Source: FAA AC 150/5300-13A, CMT

As detailed in Chapter 3 of this document, the FAA has issued a Modification of Standards (MOS) for the operation of the Boeing 747-8 aircraft on the airfield. This Master Plan Update suggests that runway modifications needed to remedy the MOS and comply with these requirements should be completed during a subsequent runway rehabilitation program.

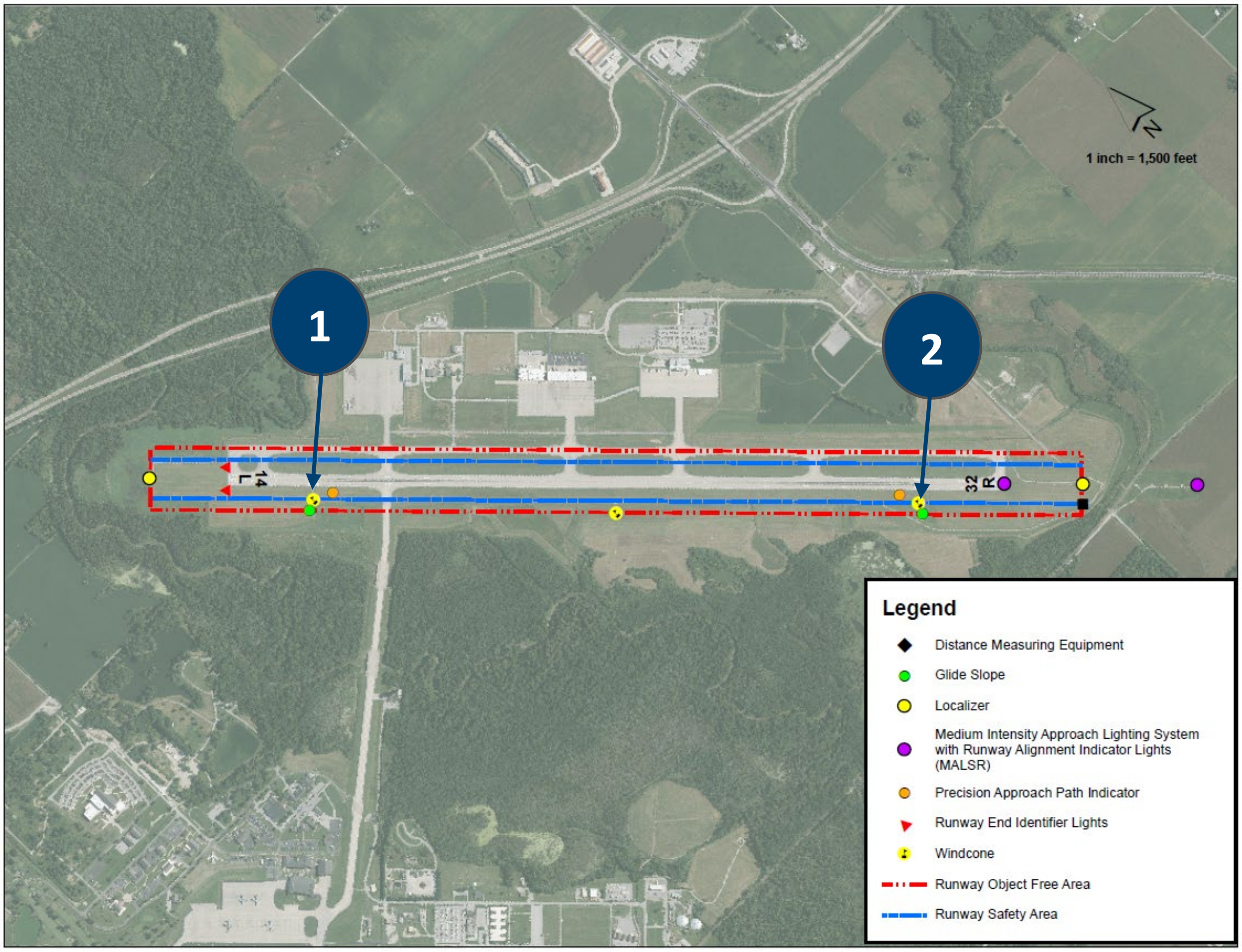
4.1.2 Runway Safety Areas and Protection Zones

RUNWAY SAFETY AREAS (RSA)/RUNWAY OBJECT FREE AREA (ROFA)

The Facility Requirements chapter showed that while Runway 14L/32R meets the dimensional standards for RSA and ROFA compliance, there are several instances of objects inside the RSA and ROFA that do not meet FAA criteria. As noted in Chapter 3, there are two wind cones for Runway 14L-32R that are located inside the ROFA. Based on Table 6-1 from FAA AC 150/5300-13A, wind cones are not considered "fixed-by function" if inside the ROFA. Therefore, these objects require a Modification to Standards (MOS) or a relocation. All other objects found inside the RSA and ROFA are considered fixed-by-function according to Table 6-1 from FAA AC 13A. Exhibit 4.1-1, *Runway 14L/32R RSA & ROFA*, identifies the location of the different objects within the Runway 14L/32R RSA & ROFA; the elements which require a MOS or relocation (wind cones) are identified with the numbers 1 and 2 on Exhibit 4.1-1. The midfield wind cone that appears on Exhibit 4.1-1 is located outside the ROFA.

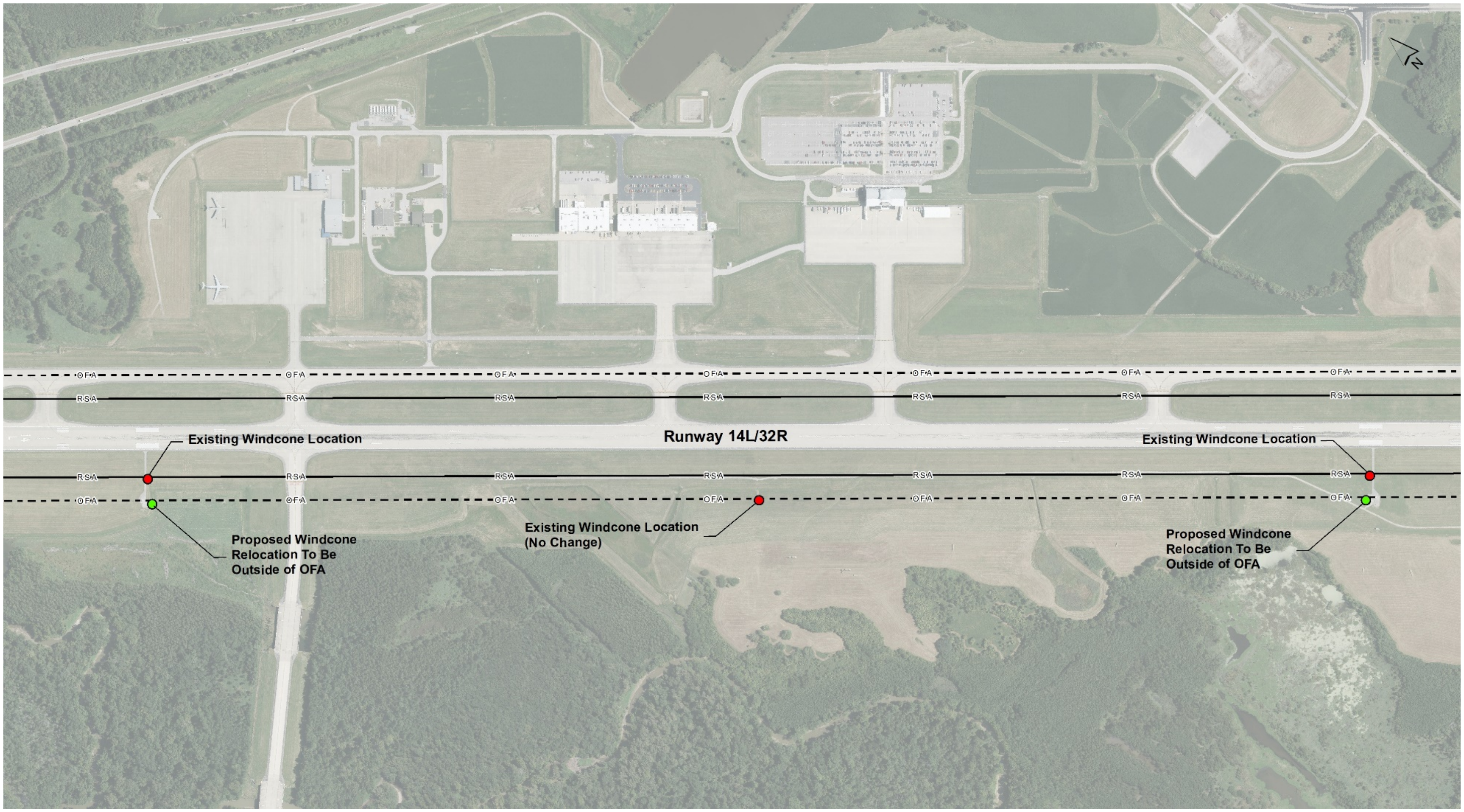
It is recommended to relocate the two wind cones shown in Exhibit 4.1-1 to a new location outside the ROFA. Exhibit 4.1-2 shows the potential locations where these wind cones may be relocated.

Exhibit 4.1-1 Runway 14L/32R RSA & ROFA



Source: Quantum Geospatial, CMT

Exhibit 4.1-2 Runway 14L/32R wind cones relocation



RUNWAY PROTECTION ZONES (RPZ)

RPZ Alternatives Evaluation Criteria

The criteria used in the evaluation of the alternatives utilized a red, amber, green (RAG) analysis scoring method. The RAG analysis gives a red score for a negative (-) result, an amber score for a neutral/not applicable result, and a green score for a positive (+) result. If a red negative (-) is given to any of the evaluation criteria categories in the "fatal flaws" section, the alternative is deemed not feasible. The evaluation criteria are presented in **Table 4.1-2**, ***RPZ Alternatives Evaluation Criteria.***

Table 4.1-2: RPZ Alternatives Evaluation Criteria

CRITERIA	DETAIL
All RPZ alternatives are compatible	Evaluates if the alternative provides an object-free RPZ.
Operational Evaluation	Evaluates the alternatives based on the calculated distances for each of the following operational characteristics: • Takeoff Run Available (TORA) • Accelerate-Stop Distance Available (ASDA) • Landing Distance Available (LDA)
Minimum Acceptable ASDA	Evaluates if the alternative has 10,000 feet ASDA. • Less is considered fatal flaw
Minimum Acceptable LDA	Evaluates if the alternative has 8,600 feet LDA, which accommodates 100% of fleet mix in wet conditions. • Less is considered fatal flaw

Source: CMT

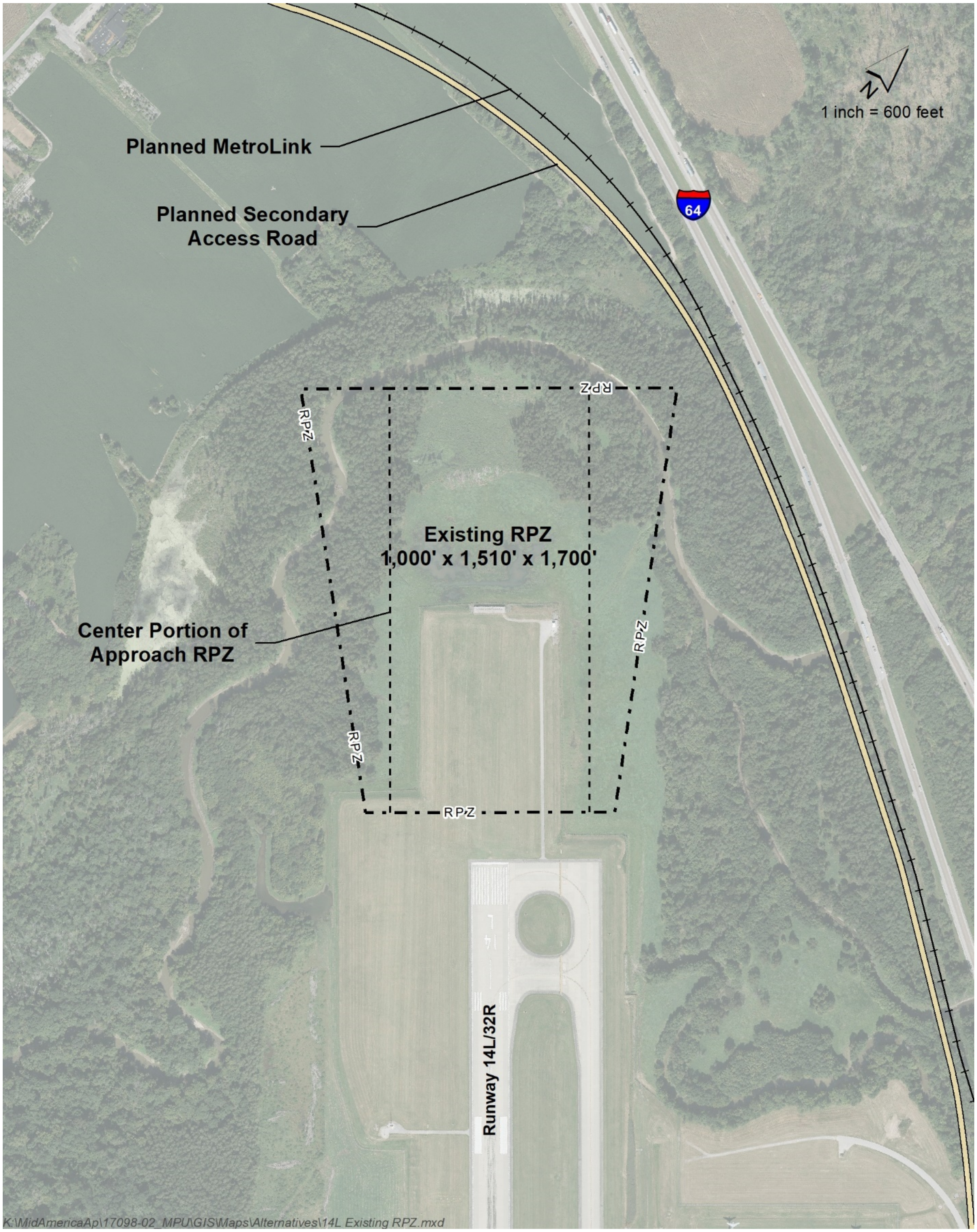
Runway 14L Alternatives

The Facility Requirements chapter identified one incompatible land-use within the Runway 14L arrival RPZ. This incompatible land-use is an airport service road with controlled access and requires communication with the ATCT. Because access to the service road requires ATCT communication, the incompatibility is considered acceptable and therefore no further action is recommended.

Alternative 1

Alternative 1 depicts the existing condition of Runway 14L arrival RPZ and is considered the "do-nothing" alternative. This alternative maintains the existing condition and assumes that an Approach Lighting System (ALS) will not be installed in the future. Currently, the 14L end has Runway End Identifier Lights (REIL) and this alternative assumes that no change will occur in the future to the approach minimums for 14L. Should these upgrades be required, this alternative is no longer valid as the reduction in Runway 14L approach minimums would dictate a larger RPZ. This alternative does not prohibit the installation of an ALS, it just assumes that approach minimums will stay at ¾ mile of above. **Exhibit 4.1-3**, ***14L RPZ Alternative 1*** presents Alternative 1. **Table 4.1-3**, ***14L RPZ Alternative 1 Evaluation*** lists the evaluation of this alternative.

Exhibit 4.1-3: 14L RPZ Alternative 1



Source: CMT

As identified in Exhibit 4.1-3, this alternative provides a clear central portion of the RPZ, an overall clear RPZ, and keeps existing Interstate 64 and the future MetroLink rail line outside the RPZ. Because the RPZ is clear, there is no need for modification.

Table 4.1-3: 14L RPZ Alternative 1 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
Interstate 64	+1
MetroLink	+1
ALS Impacts	0
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

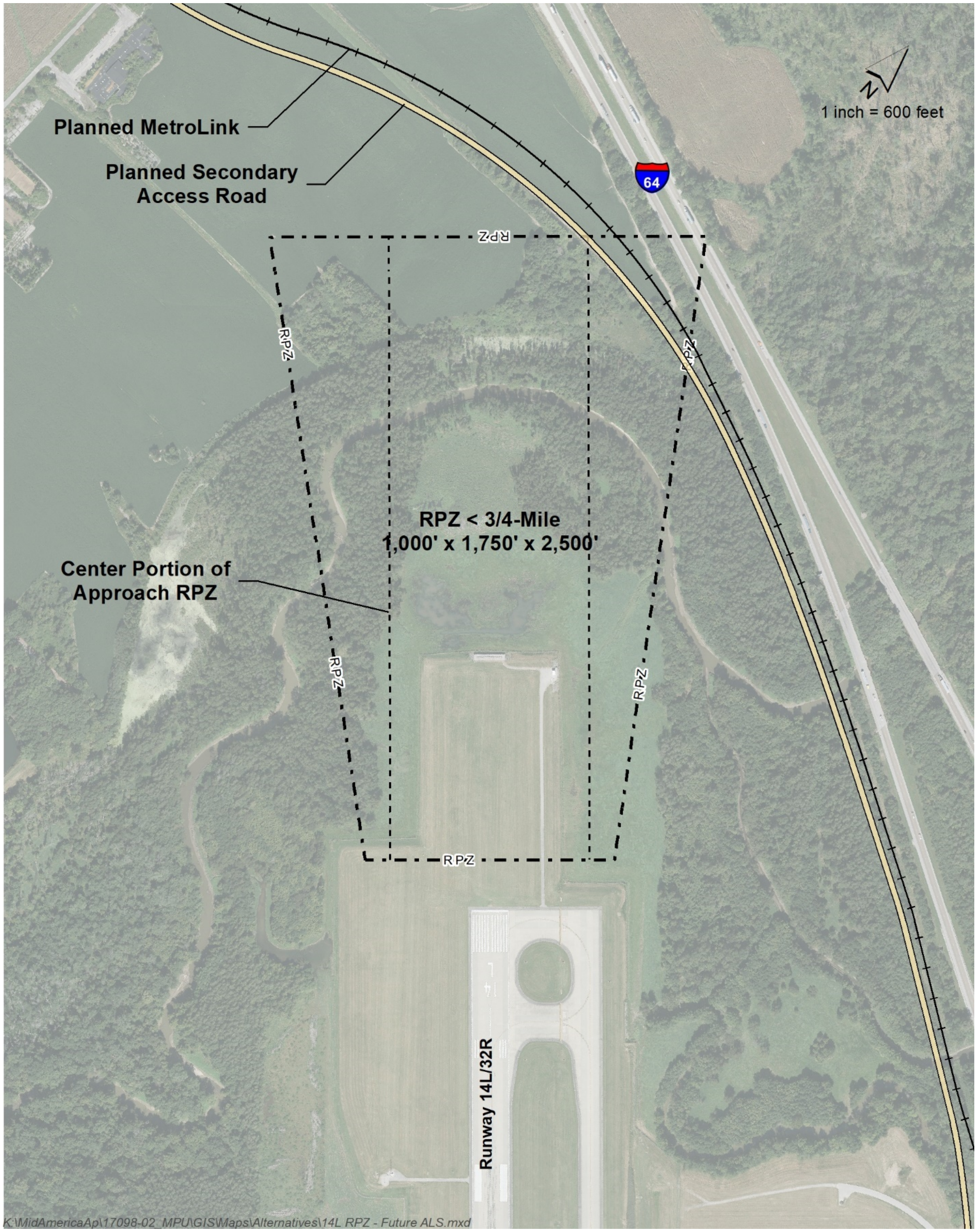
Source: CMT

Alternative 2

Alternative 2 assumes the existing conditions plus a new ALS. Installation of a Medium Intensity Approach Light System-Runway Alignment Indicator Lights (MALSR) will generate reduced approach minimums (<3/4 mi). Exhibit 4.1-4*, 14L RPZ Alternative 2* depicts the alternative. Table 4.1-4, *14L RPZ Alternative 2 Evaluation* shows the evaluation of this alternative.

The reduction of instrument approach minimums requires the use of a larger RPZ as shown in Exhibit 4.1-4. This alternative provides an overall clear central portion of the RPZ; however, a section of the proposed secondary access road is inside the top right corner of the central portion. This alternative does not provide an overall clear outer RPZ that extends over a portion of Interstate 64 and the proposed MetroLink rail line.

Exhibit 4.1-4: 14L RPZ Alternative 2



Source: CMT

Table 4.1-4: 14L RPZ Alternative 2 Evaluation

EVALUATION	SCORE
Clear Central Portion	0
Clear RPZ	-1
Interstate 64	0
MetroLink	0
ALS Impacts	+1
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

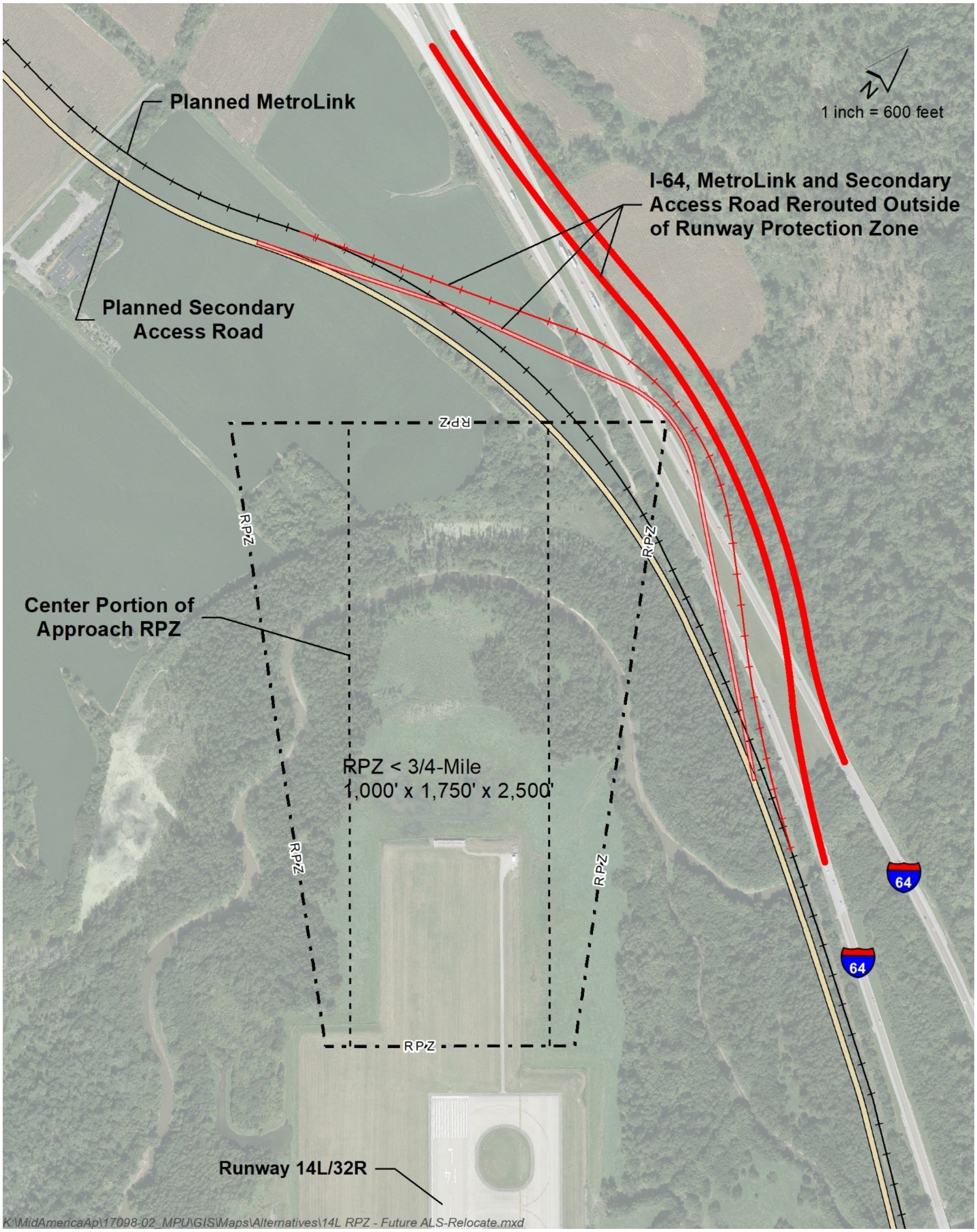
Source: CMT

Alternative 3

Alternative 3 assumes reduced minimums (<3/4 mi) with an improved/new ALS, plus the reroute of Interstate 64 and MetroLink line. **Exhibit 4.1-5*, 14L RPZ Alternative 3*** depicts the alternative. **Table 4.1-5, *14L RPZ Alternative 3 Evaluation*** shows the evaluation of this alternative.

As shown in the exhibit below, this alternative provides a clear central portion of the RPZ, and a clear RPZ overall due to the relocation of Interstate 64 and the proposed MetroLink line. This alternative requires significant construction to relocate Interstate 64, and the proposed MetroLink rail line. However, it enables an improvement to the standard instrument approach procedure on 14L. There is no impact to the 14L and 32R arrivals and departures available runway distance.

Exhibit 4.1-5: 14L RPZ Alternative 3



Source: CMT

Table 4.1-5: 14L RPZ Alternative 3 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
Interstate 64	-1
MetroLink	-1
ALS Impacts	+1
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

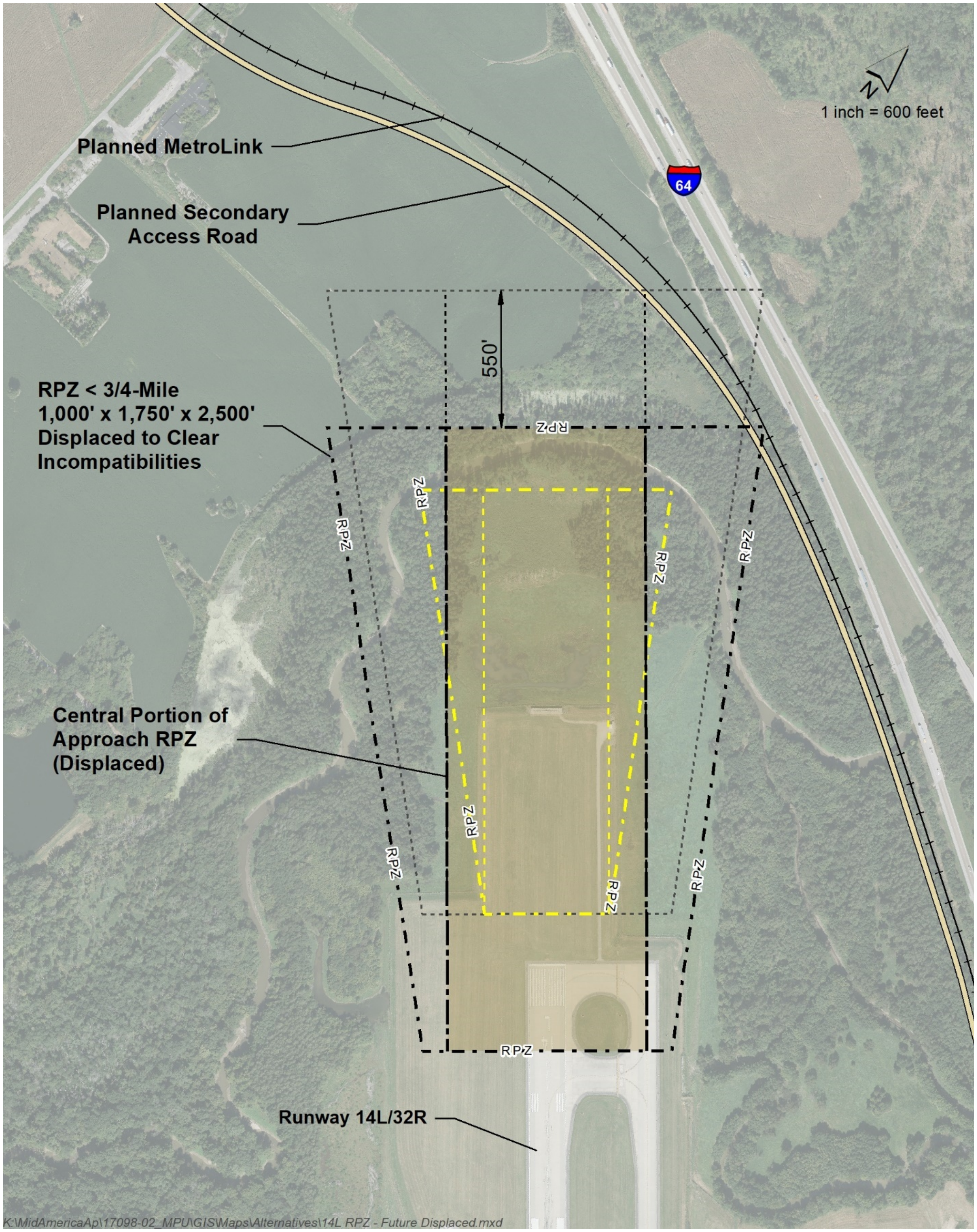
Source: CMT

Alternative 4

Alternative 4 assumes a displaced 14L arrival threshold of 550 feet, plus reduced minimums (<3/4 mi) with a new ALS. **Exhibit 4.1-6*, 14L RPZ Alternative 4*** depicts the alternative. **Table 4.1-6, *14L RPZ Alternative 4 Evaluation*** shows the evaluation of this alternative.

As seen in the exhibit below, this alternative provides a clear central portion of the new RPZ, and a clear RPZ overall due to the relocation of the new RPZ as an outcome of displacing the Runway 14L arrival threshold. This alternative does not require any work to be done to Interstate 64, and the proposed MetroLink rail line. However, it enables an improvement to the standard instrument approach procedure on 14L. There is a reduction to the 14L arrivals landing distance due to the displaced arrival threshold.

Exhibit 4.1-6: 14L RPZ Alternative 4



Source: CMT

Table 4.1-6: 14L RPZ Alternative 4 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
Interstate 64	+1
MetroLink	+1
ALS Impacts	+1
14L Departures	0
14L Arrivals	-1
32R Departures	0
32R Arrivals	0

Source: CMT

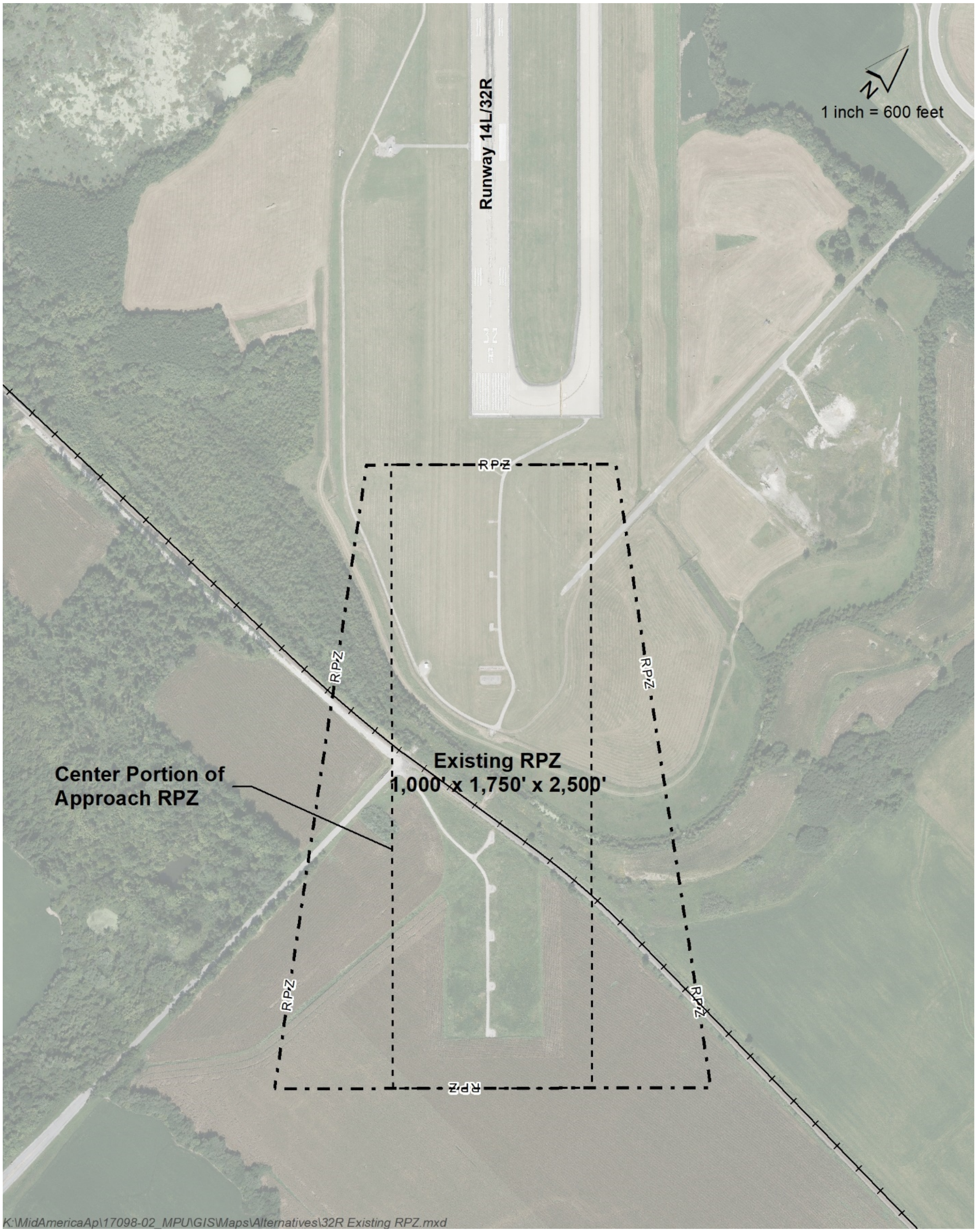
Runway 32R Alternatives

The Facility Requirements chapter identified one major incompatible land-use within the Runway 32R end RPZ. This incompatible land-use is the N&S railroad.

Alternative 1

Alternative 1 depicts the existing condition of Runway 32R RPZ and is considered the "do-nothing" alternative. This alternative assumes that no upgrade to the Approach Lighting System (ALS) will occur in the future. Because this alternative assumes that no upgrade will occur to the current ALS, it also means that no change will occur with the approach minimums for 32R. Should these upgrades occur, this alternative is no longer valid as the reduction in Runway 32R approach minimums would dictate a larger RPZ. This alternative also assumes no change to the N&S Railroad. Exhibit 4.1-7, *32R RPZ Alternative 1* depicts the alternative. Table 4.1-7, *32R RPZ Alternative 1 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-7: 32R RPZ Alternative 1



Source: CMT

As shown in this exhibit, this alternative does not provide a clear central portion of the existing RPZ, and it does not provide a clear RPZ overall due to the presence of the N&S Railroad inside the RPZ. Because this is the "do nothing" alternative, no work is proposed to clear the RPZ of the N&S Railroad. It does not impact the existing ALS and there is no change to 14L and 32R arrivals and departures.

Table 4.1-7: 32R RPZ Alternative 1 Evaluation

EVALUATION	SCORE
Clear Central Portion	-1
Clear RPZ	-1
N&S Railroad	0
ALS Impacts	0
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

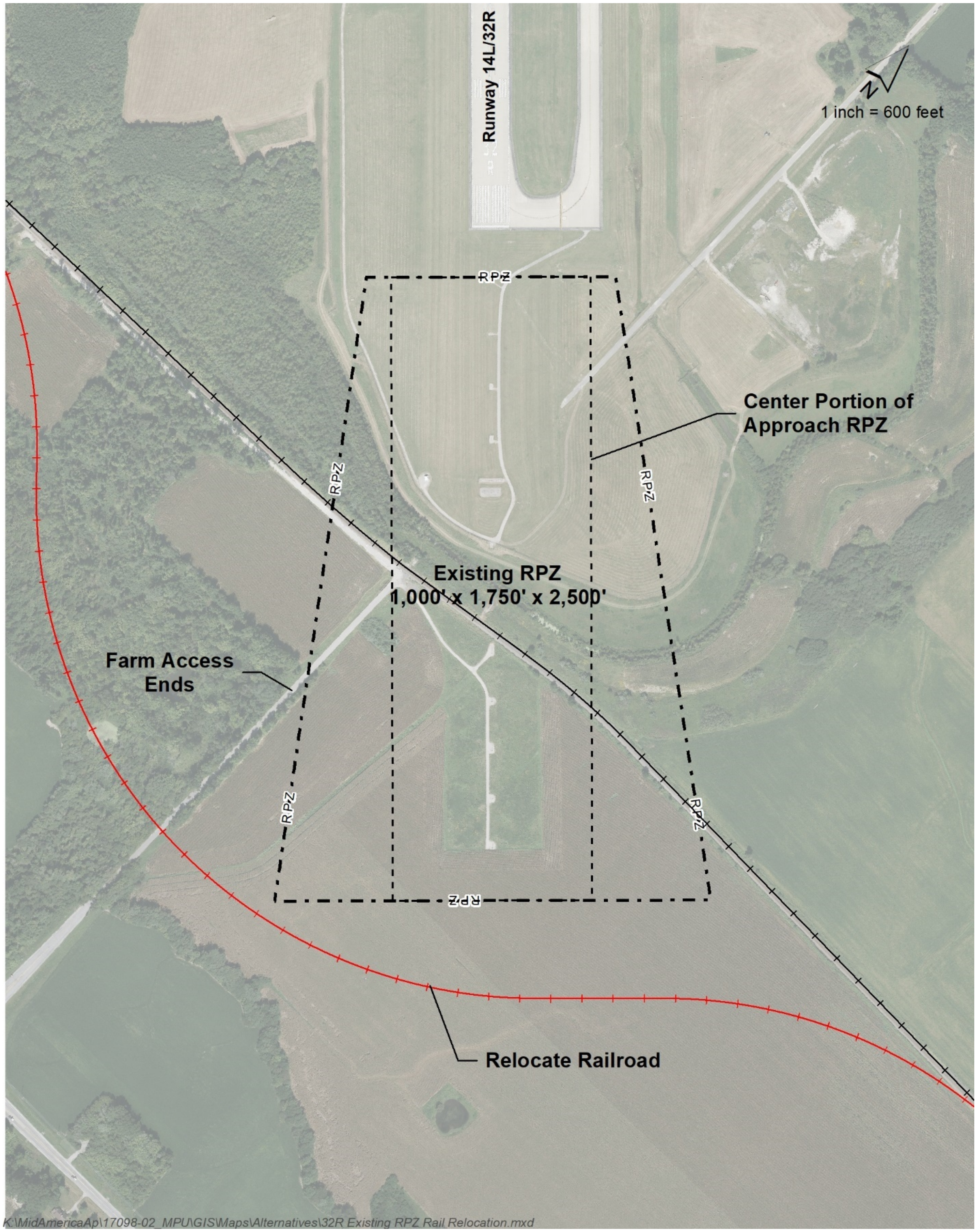
Source: CMT

Alternative 2

Alternative 2 assumes a realignment of the N&S Railroad line outside of the existing RPZ. This alternative also eliminates the Agricultural Path north of the rerouted rail line while extending the airside VSR full length of ALS. **Exhibit 4.1-8**, ***32R RPZ Alternative 2*** depicts the alternative. **Table 4.1-8**, ***32R RPZ Alternative 2 Evaluation*** shows the evaluation of this alternative.

As shown in the exhibit below, this alternative does provide a clear central portion of the existing RPZ, and a clear RPZ overall due to the relocation of the N&S Railroad outside the RPZ. This alternative does require realignment of the N&S Railroad, but it does not impact the existing ALS and there is no change to 14L and 32R arrivals and departures.

Exhibit 4.1-8: 32R RPZ Alternative 2



Source: CMT

Table 4.1-8: 32R RPZ Alternative 2 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
N&S Railroad	-1
ALS Impacts	0
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

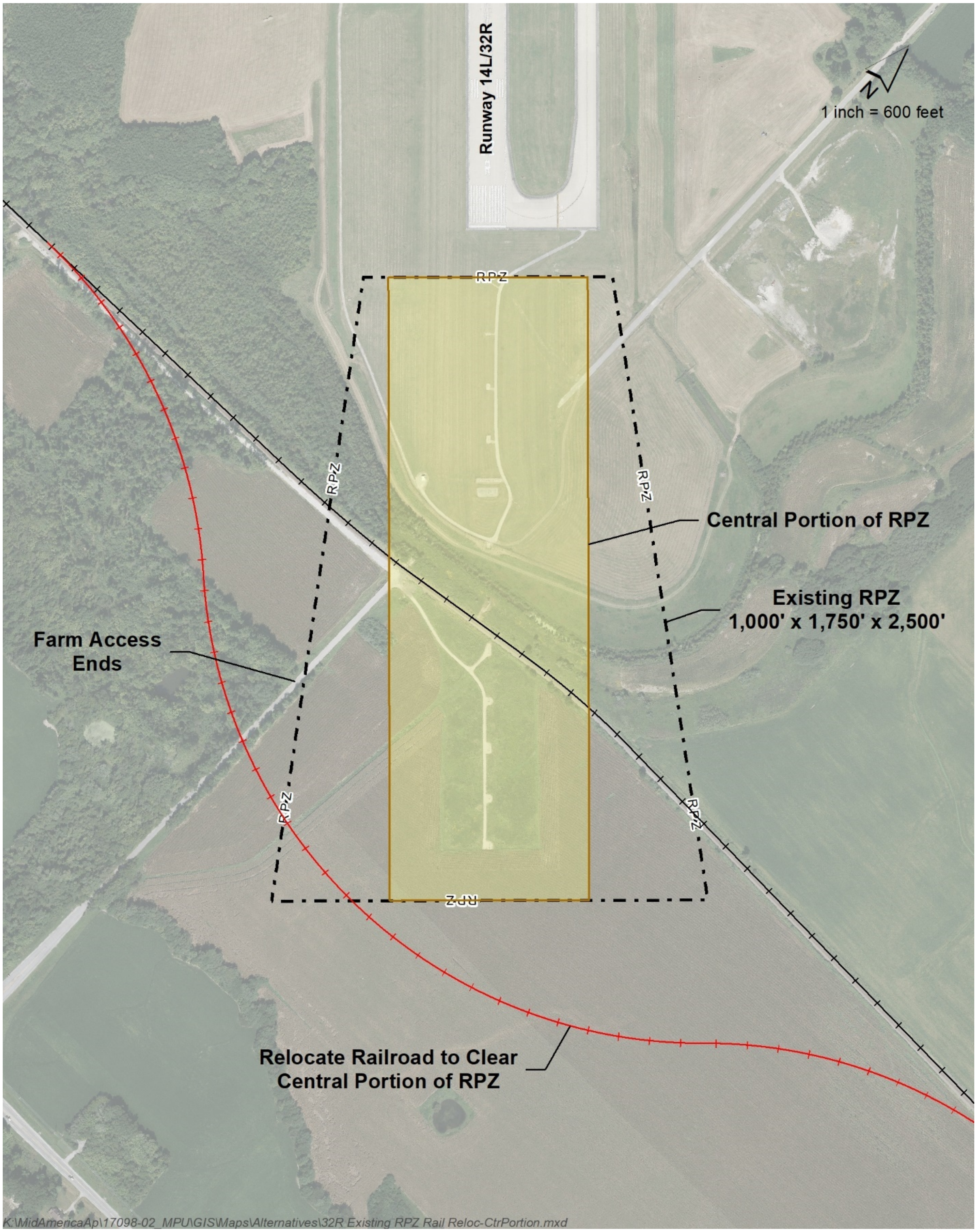
Source: CMT

Alternative 3

Alternative 3 assumes a realignment of the N&S Railroad line outside of the central portion of the RPZ and it extends the airside VSR full length of ALS. **Exhibit 4.1-9*, 32R RPZ Alternative 3*** depicts the alternative. **Table 4.1-9, *32R RPZ Alternative 3 Evaluation*** shows the evaluation of this alternative.

As shown in the exhibit below, this alternative does provide a clear central portion of the existing RPZ, but it does not provide a clear RPZ overall since the realignment of the N&S Railroad still places the railroad inside the out portion of the RPZ. This alternative does require realignment of the N&S Railroad, but it does not impact the existing ALS and there is no change to 14L and 32R arrivals and departures.

Exhibit 4.1-9: 32R RPZ Alternative 3



Source: CMT

Table 4.1-9: 32R RPZ Alternative 3 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	-1
N&S Railroad	-1
ALS Impacts	0
14L Departures	0
14L Arrivals	0
32R Departures	0
32R Arrivals	0

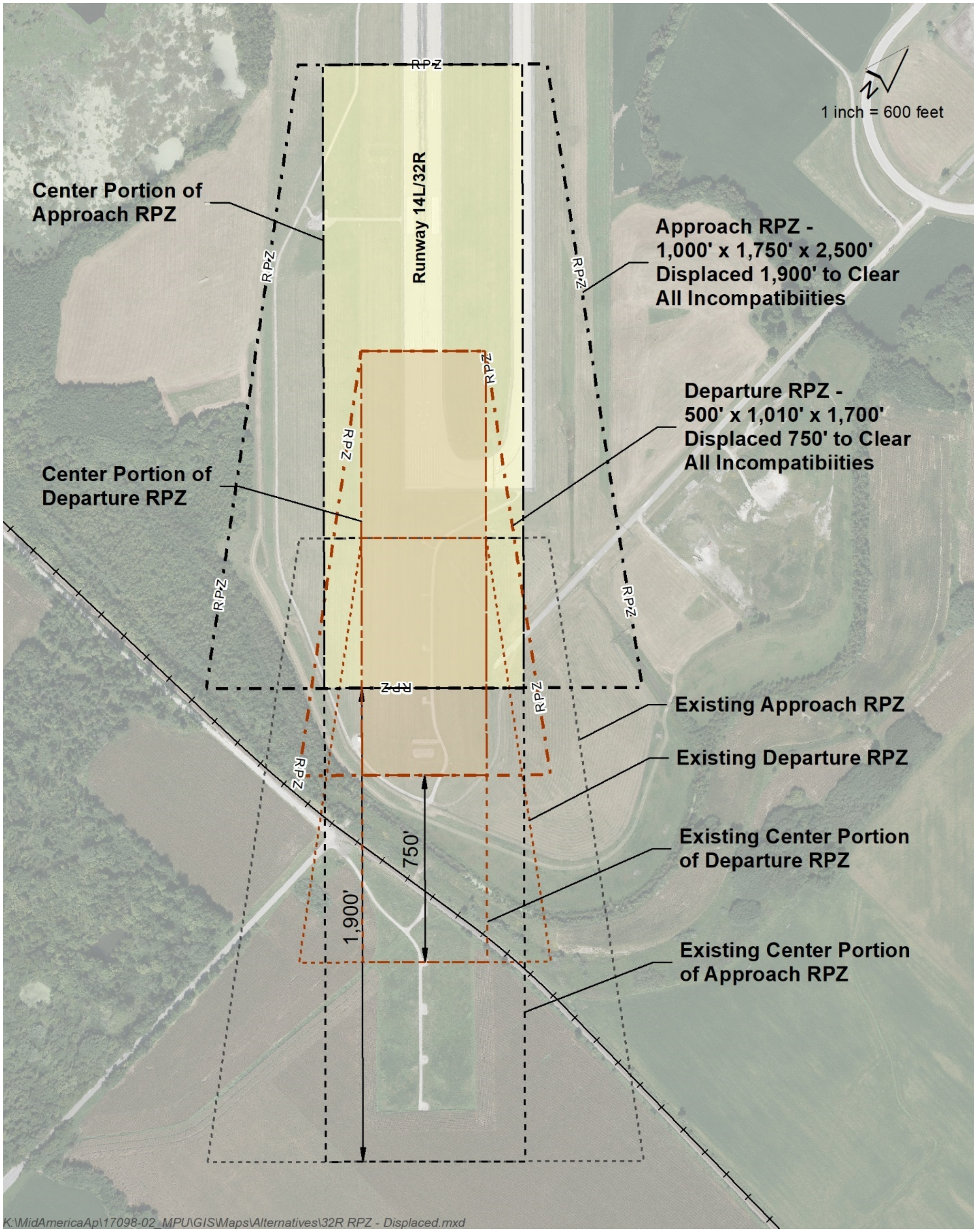
Source: CMT

Alternative 4

Alternative 4 assumes a displacement of the 32R arrival threshold of 1,900 feet and a displacement of the 14L departure threshold of 750 feet. Exhibit 4.1-10*, 32R RPZ Alternative 4* depicts the alternative. Table 4.1-10, *32R RPZ Alternative 4 Evaluation* shows the evaluation of this alternative.

As shown in the exhibit below, this alternative does provide a clear central portion of the new arrival RPZ and a clear arrival RPZ overall. The result of displacing the 32R arrival threshold, and the 14L departure threshold, will make 32R arrival RPZ to move forward, which makes the N&S Railroad not to be inside the new arrival RPZ. This alternative does not require any construction or realignment of the N&S Railroad. It also has the added benefit of clearing the new approach and departure RPZs due to the displaced thresholds. However, this alternative does require a relocation of the existing ALS and it will impact 14L departures and 32R arrivals.

Exhibit 4.1-10: 32R RPZ Alternative 4



Source: CMT

Table 4.1-10: 32R RPZ Alternative 4 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
N&S Railroad	+1
ALS Impacts	-1
14L Departures	-1
14L Arrivals	0
32R Departures	0
32R Arrivals	-1

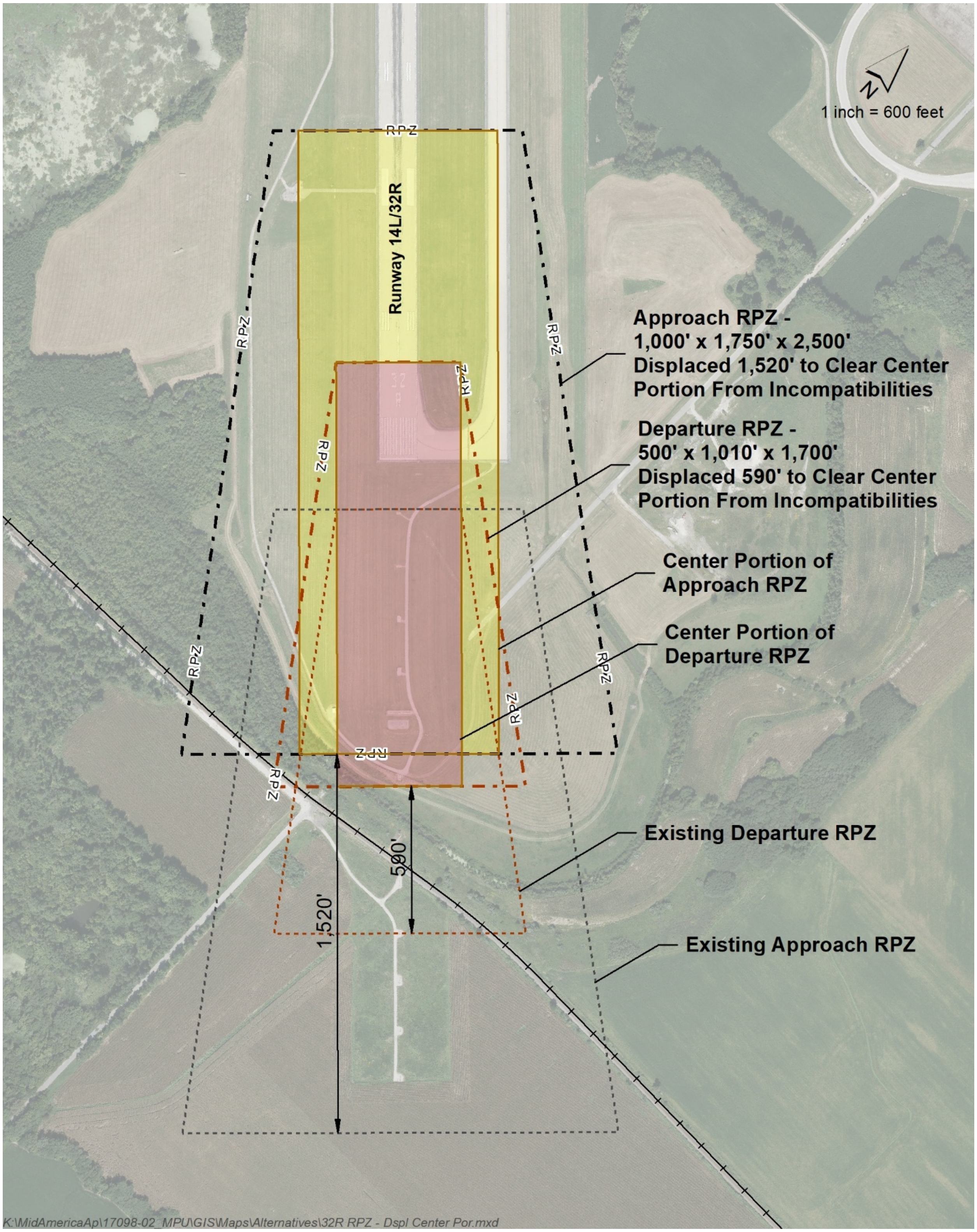
Source: CMT

Alternative 5

Alternative 5 assumes a displacement of the 32R arrival threshold of 1,520 feet and a displacement of the 14L departure threshold of 590 feet. **Exhibit 4.1-11**, ***32R RPZ Alternative 5*** depicts the alternative. **Table 4.1-11**, ***32R RPZ Alternative 5 Evaluation*** shows the evaluation of this alternative.

As shown in the exhibit below, this alternative provides a clear central portion of the new arrival RPZ, and a clear arrival RPZ overall. The displacement of the 32R arrival threshold and the 14L departure threshold will make 32R RPZ to move forward, which makes the N&S Railroad not to be inside the new RPZ. This alternative does not require work to be done to the N&S Railroad, plus it helps to keep the road outside the new RPZ. However, this alternative does require a relocation of the existing ALS and it will impact 14L departures and 32R arrivals.

Exhibit 4.1-11: 32R RPZ Alternative 5



Source: CMT

Table 4.1-11: 32R RPZ Alternative 5 Evaluation

EVALUATION	SCORE
Clear Central Portion	+1
Clear RPZ	+1
N&S Railroad	+1
ALS Impacts	-1
14L Departures	-1
14L Arrivals	0
32R Departures	0
32R Arrivals	-1

Source: CMT

Runway 14L and 32R RPZ Alternatives Summary

Table 4.1-12, *14L RPZ Alternatives Summary* and Table 4.1-13, *32R RPZ Alternatives Summary* show the qualitative evaluation and total score for every alternative discussed previously.

Table 4.1-12: 14L RPZ Alternatives Summary

EVALUATION	14L-1	14L-2	14L-3	14L-4
Clear Central Portion	+1	0	+1	+1
Clear RPZ	+1	-1	+1	+1
Interstate 64	+1	0	-1	+1
MetroLink	+1	0	-1	+1
ALS Impacts	0	+1	+1	+1
14L Departures	0	0	0	0
14L Arrivals	0	0	0	-1
32R Departures	0	0	0	0
32R Arrivals	0	0	0	0
Total Score	+4	0	+1	+4

Source: CMT

As shown in this table, alternatives 1 and 4 are the two with the highest score. These are selected to move forward to an operational evaluation.

Table 4.1-13: 32R RPZ Alternatives Summary

EVALUATION	32R-1	32R-2	32R-3	32R-4	32R-5
Clear Central Portion	-1	+1	+1	+1	+1
Clear RPZ	-1	+1	-1	+1	+1
N&S Railroad	0	-1	-1	+1	+1
Agricultural Path	0	-1	-1	+1	+1
ALS Impacts	0	0	0	-1	-1
14L Departures	0	0	0	-1	-1
14L Arrivals	0	0	0	0	0
32R Departures	0	0	0	0	0
32R Arrivals	0	0	0	-1	-1
Total Score	-2	0	-2	+1	+1

Source: CMT

As shown in this table, alternatives 4 and 5 are the two with the highest score. These are selected to move forward to an operational evaluation.

Runway 14L and 32R RPZ Top Alternatives Operational Evaluation

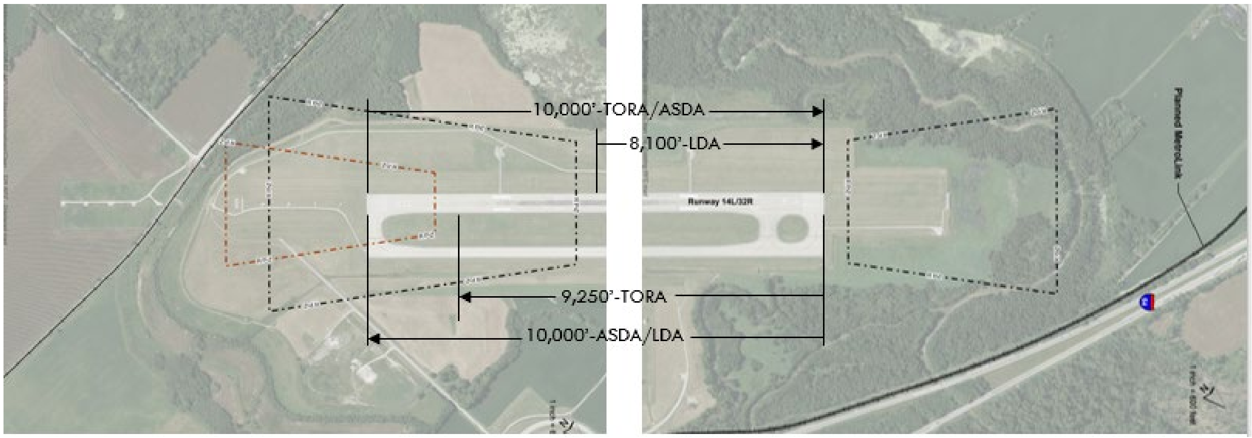
The following section will discuss an operational evaluation of Runway 14L RPZ alternatives 1 and 4, and Runway 32R RPZ alternatives 4 and 5. This will be done through a combination of the different alternatives.

Combination 1: 14L-1 & 32R-4

Combination 1 consists of combining Alternative 14L-1 with Alternative 32R-4. As was discussed previously, Alternative 14L-1 consists of maintaining the existing conditions of 14L RPZ with no reduced minimums; Alternative 32R-4 consists of displacing 32R threshold to clear the RPZ of the N&S Rail line. Exhibit 4.1-12, *RPZ's Combination 1 Alternative* depicts this combination. With the combination of these two alternatives, the operational impacts are the following:

- 14L Departure Length – 9,250 feet
- 32R Arrival Length – 8,100 feet

Exhibit 4.1-12: RPZ's Combination 1 Alternative



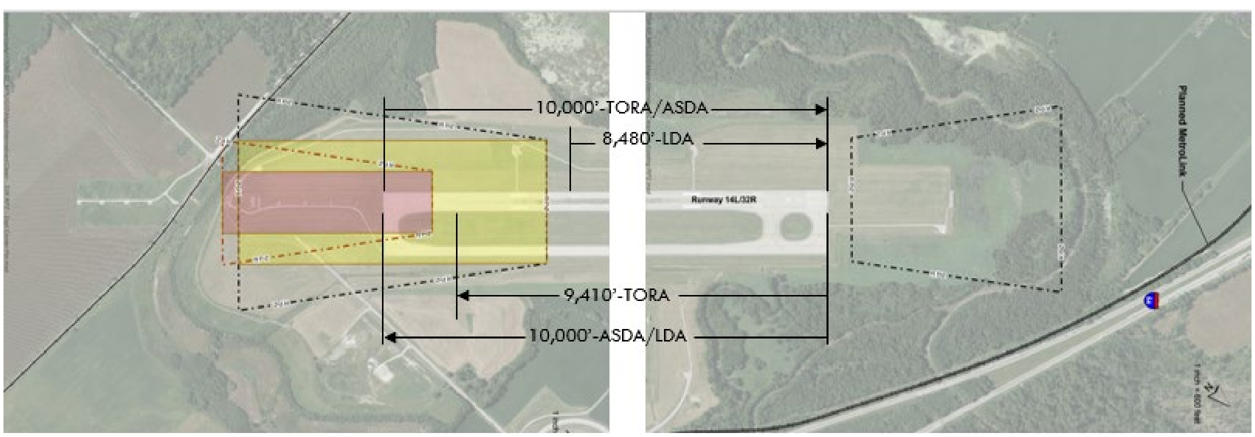
Source: CMT

Combination 2: 14L-1 & 32R-5

Combination 2 consists of combining Alternative 14L-1 with Alternative 32R-5. As was discussed previously, Alternative 14L-1 consists of maintaining the existing conditions of the Runway 14L RPZ with no reduced minimums; Alternative 32R-5 consists of displacing the Runway 32R threshold to clear only the RPZ central portion. **Exhibit 4.1-13,** ***RPZ's Combination 2 Alternative*** depicts this combination. With the combination of these two alternatives, the operational impacts are the following:

- 14L Departure Length – 9,410 feet
- 32R Arrival Length – 8,480 feet

Exhibit 4.1-13: RPZ's Combination 2 Alternative



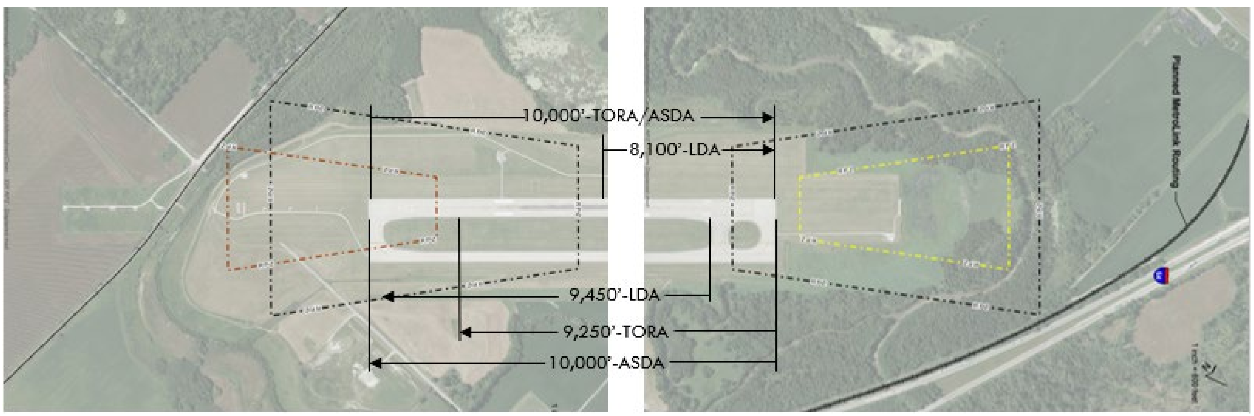
Source: CMT

Combination 3: 14L-4 & 32R-4

Combination 3 consists of combining Alternative 14L-4 with Alternative 32R-4. As was discussed previously, Alternative 14L-4 consists of decreasing the minimums on the Runway 14L end which results in a larger RPZ requirement, plus a displaced threshold to clear the RPZ of MetroLink and Interstate 64; Alternative 32R-4 consists of displacing the Runway 32R threshold to clear the RPZ. **Exhibit 4.1-14, *RPZ's Combination 3 Alternative*** depicts this combination. With the combination of these two alternatives, the operational impacts are the following:

- 14L Departure Length – 9,250 feet
- 14L Arrival Length – 9,450 feet
- 32R Arrival Length – 8,100 feet

Exhibit 4.1-14: RPZ's Combination 3 Alternative



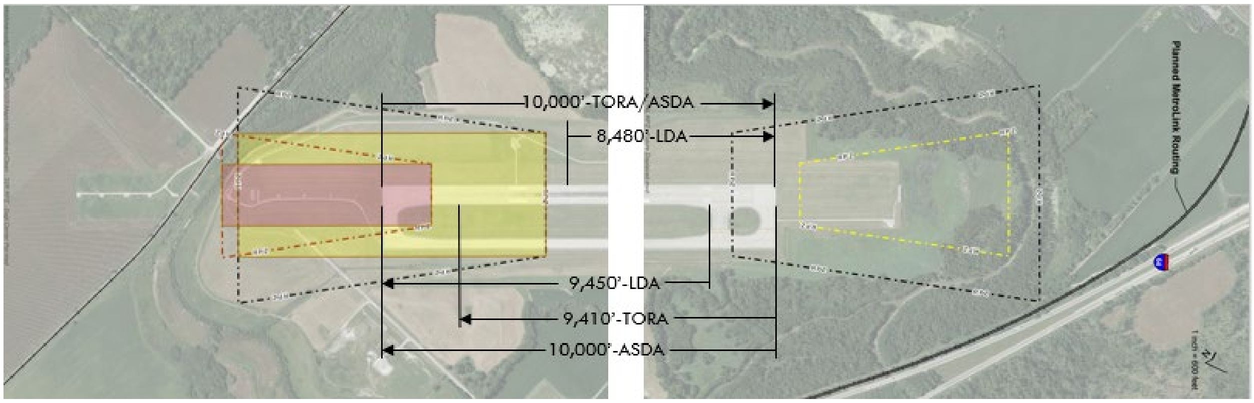
Source: CMT

Combination 4: 14L-4 & 32R-5

Combination 4 consists of combining Alternative 14L-4 with Alternative 32R-5. As was discussed previously, Alternative 14L-4 consists of decreasing the minimums on the Runway 14L end which results in a larger RPZ requirement, plus a displaced threshold to clear the RPZ of MetroLink and Interstate 64; Alternative 32R-5 consists of displacing 32R threshold to clear only the RPZ central portion. **Exhibit 4.1-15, *RPZ's Combination 4 Alternative*** depicts this combination. With the combination of these two alternatives, the operational impacts are the following:

- 14L Departure Length – 9,410 feet
- 14L Arrival Length – 9,450 feet
- 32R Arrival Length – 8,480 feet

Exhibit 4.1-15: RPZ's Combination 4 Alternative



Source: CMT

RPZ Combination Alternatives Summary

Table 4.1-14, *RPZ Combination Alternatives Summary* shows a summary of the operational impact of each of the four combination alternatives discussed

Table 4.1-14: RPZ Combination Alternatives Summary

ALT.	FLOW	14L-1			14L-4		
		TORA	ASDA	LDA	TORA	ASDA	LDA
32R-4	14L	9,250	10,000	10,000	9,250	10,000	9,450
	32R	10,000	10,000	8,100	10,000	10,000	8,100
32R-5	14L	9,410	10,000	8,480	9,410	10,000	9,450
	32R	10,000	10,000	10,000	10,000	10,000	8,480

Source: CMT

As shown in this table, Combination Alternative 2 (14L-1 & 32R-5) is the combination alternative that results in the fewest operational impacts. This means Combination Alternative 2 is the alternative which provides the least effect to declared distances (TORA, ASDA, LDA). This alternative also precludes the addition of an ALS on 14L. However, it does not provide the operational length required for the B747-8, which was discussed in the previous chapter as the potential critical aircraft at BLV.

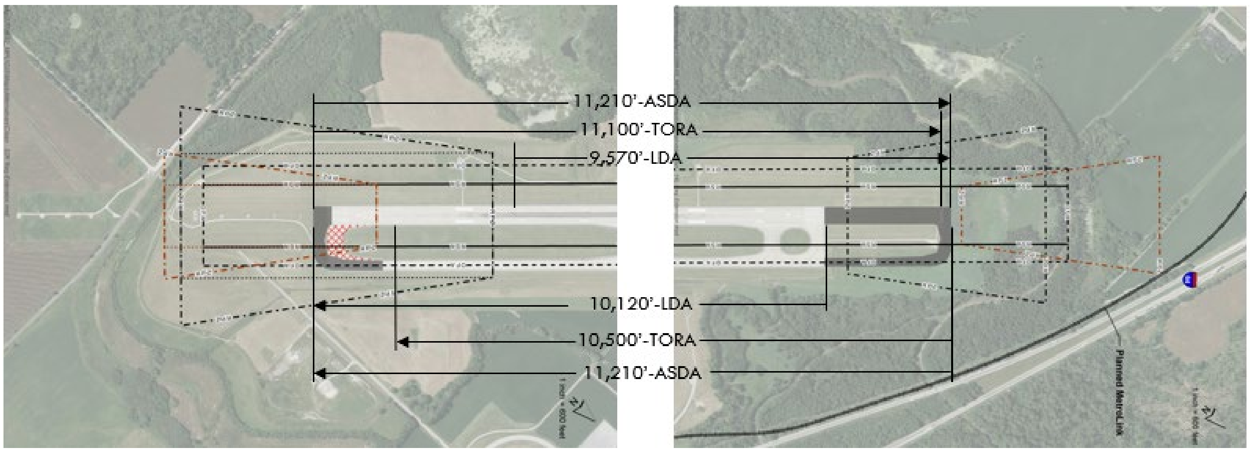
To provide the operational length required by the B747-8, runway extensions are required. The requirements are the following:

- Runway 14L end: +1,090 feet
- Runway 32R end: +120 feet

Exhibit 4.1-16, *RPZ's Combination 2 Alternative with Extensions* shows how Combination Alternative 2 looks with the runway extensions required by the B748-8F.

This study believes it is possible that the Runway 32R end extension may not be needed with a more advanced aircraft operational characteristics analysis. The elimination of this extension would remove the alternative's impact on the alignment of the 32R ALS. It is important to note that FAA acceptance is required for non-compliant land-uses in the outer portion of 32R RPZ's.

Exhibit 4.1-16: RPZ's Combination 2 Alternative with Extensions



Source: CMT

RPZ Alternatives Recommendation

- The recommendation of this Master Plan is to maintain the existing RPZ conditions until a point in time which the runway is altered or a reconstruction/rehabilitation is required due to pavement conditions. At this time, that is anticipated to be beyond the planning period of this study.
- Should an extension of the runway be shown, a full RPZ study will likely be required subsequent to the Master Plan Update to determine the most feasible level of compliance possible while accommodating the extension. This will require an FAA Safety Risk Assessment Panel (SRMP) and summary document.

4.1.3 Taxiway Geometry

The Facility Requirements chapter showed that there are three direct access incompatibilities to Runway 14L/32R. These are:

- The direct access from Golf Ramp to Runway 14L/32R through Taxiway G
- Direct access from Mike Ramp to Runway 14L/32R through Taxiway K3
- Direct access from November Ramp to Runway 14L/32R through Taxiway K4.

DIRECT ACCESS ALTERNATIVES EVALUATION CRITERIA

The criteria used in the evaluation of the alternatives utilized a red, amber, green (RAG) analysis scoring method. The RAG analysis gives a red score for a negative (-) result, an amber score for a neutral/not applicable result, and a green score for a positive (+) result. If a red negative (-) is given to any of the evaluation criteria categories in the "fatal flaws" section, the alternative is deemed not feasible. The evaluation criteria are presented in Table 4.1-15, *Direct Access Alternatives Evaluation Criteria.*

Table 4.1-15: Direct Access Alternatives Evaluation Criteria

CRITERIA	DETAIL
Taxi Route Flexibility	Evaluates if the alternative allows aircraft to have alternate taxi routes when entering or exiting the apron.
Runway Operational Impact	Evaluates if the alternative requires closure of Runway 14L/32R during construction.
Taxiway Operational Impact	Evaluates if the alternative impacts the ability to taxi to apron(s) during construction. This refers to the limitation to the largest airframes when construction equipment/vehicles are present.
Pavement Impacts	Evaluates the amount of pavement that requires modification.
Compatibility with Future Expansions	Evaluates if the alternative is compatible with future apron expansion/modification: • It enables configuration optimization of current infrastructure • Measures if the alternative requires long-term modification to satisfy future expansions geometry
Taxi Operations on Runway	Evaluates if the alternative will impact Taxiway G which allows a connection between Scott AFB and Runway 14L/32R. • Forces aircraft to/from Scott AFB to taxi on Runway 14L/32R

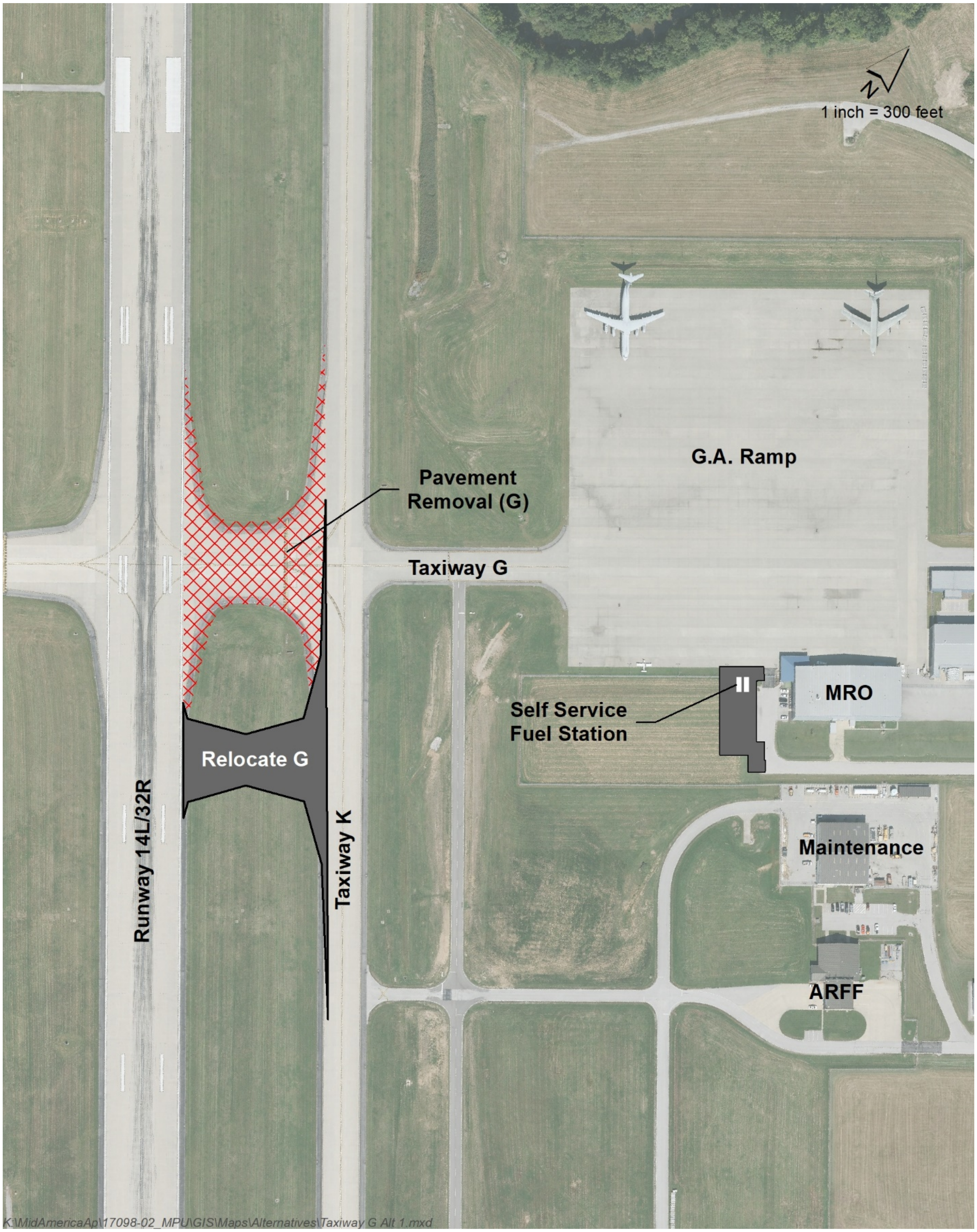
Source: CMT

GOLF APRON DIRECT ACCESS ALTERNATIVES

Alternative 1

Alternative 1 assumes a closure/removal of the existing Taxiway 'G' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet southeast of the existing Taxiway 'G'. Exhibit 4.1-17*, Golf Alternative 1* depicts the alternative. Table 4.1-16, *Golf Alternative 1 Evaluation* shows the evaluation of this alternative. This alternative also depicts the addition of a self-service fuel station.

Exhibit 4.1-17: Golf Alternative 1



Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future expansions, and it will not affect the location of the proposed self-service fuel station. However, the relocation of the taxiway connector will force aircraft to/from Scott AFB to taxi on Runway 14L/32R.

Table 4.1-16: Golf Alternative 1 Evaluation

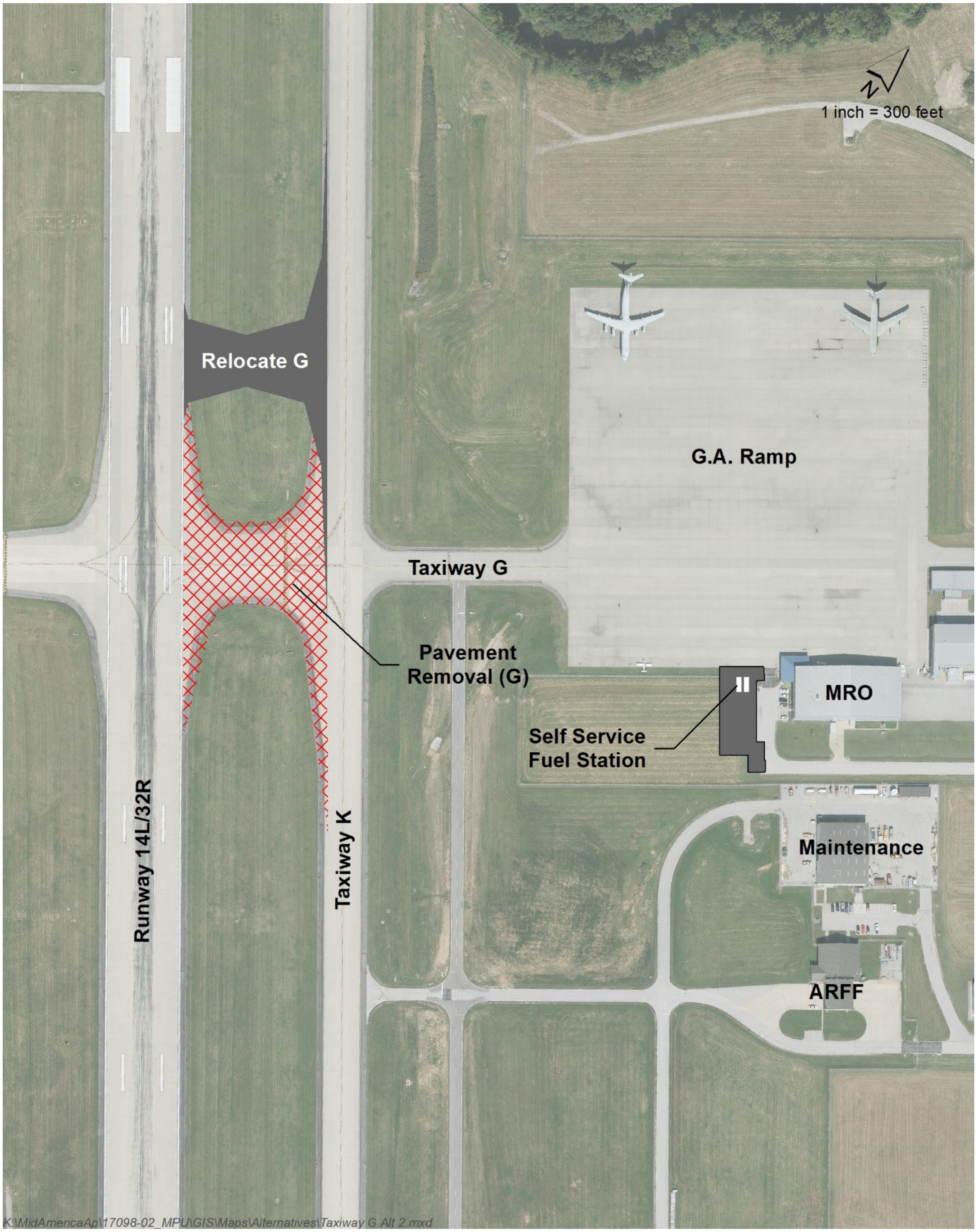
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	-1

Source: CMT

Alternative 2

Alternative 2 assumes a closure/removal of the existing Taxiway 'G' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet northwest of the existing Taxiway 'G'. Exhibit 4.1-18, *Golf Alternative 2* depicts the alternative. Table 4.1-17, *Golf Alternative 2 Evaluation* shows the evaluation of this alternative. This alternative also depicts the addition of a self-service fuel station.

Exhibit 4.1-18: Golf Alternative 2



Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future expansions, and it will not affect the location of the proposed self-service fuel station. However, the relocation of the taxiway connector will force aircraft to/from Scott AFB to taxi on Runway 14L/32R.

Table 4.1-17: Golf Alternative 2 Evaluation

EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	-1

Source: CMT

Alternative 3

Alternative 3 assumes a closure/removal of the existing Taxiway 'G' between Golf Apron and Taxiway 'K'. It includes a new taxiway connector located 160 feet southeast of the existing Taxiway 'G'. Exhibit 4.1-19*, Golf Alternative 3* depicts the alternative. Table 4.1-18, *Golf Alternative 3 Evaluation* shows the evaluation of this alternative. This alternative also depicts the addition of a self-service fuel station.

Exhibit 4.1-19: Golf Alternative 3

Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector is not enough to prevent a taxiway operational impact, which may require coordination between big airframes and construction crew to taxi into the apron. The amount of pavement that needs to be added/removed during construction is substantial compared with the previous alternatives. This alternative may affect future apron expansions, but it will not affect the location of the proposed self-service fuel station. The relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB since aircraft moving between SAFB and Runway 14L/32R will not be required to taxi on the runway to reach the apron.

Table 4.1-18: Golf Alternative 3 Evaluation

EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	-1
Pavement Impacts	-1
Compatibility with Future Expansions	-1
Taxi Operations on Runway	+1

Source: CMT

Alternative 4

Alternative 4 assumes a closure/removal of the existing Taxiway 'G' between Golf Apron and Taxiway 'K'. It includes a new taxiway connector located 180 feet northwest of the existing Taxiway 'G'. **Exhibit 4.1-20***, Golf Alternative 4* depicts the alternative. **Table 4.1-19, *Golf Alternative 4 Evaluation*** shows the evaluation of this alternative. This alternative also depicts the addition of a self-service fuel station.

Exhibit 4.1-20: Golf Alternative 4

Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector is enough to prevent a taxiway operational impact during construction, but the amount of pavement that needs to be added/removed during construction is substantial in comparison with previous alternatives. This alternative will not conflict with the location of the proposed self-service fuel station. The relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB since aircraft moving between SAFB and Runway 14L/32R will not be required to taxi on the runway to reach the apron.

Table 4.1-19: Golf Alternative 4 Evaluation

EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	0
Pavement Impacts	-1
Compatibility with Future Expansions	0
Taxi Operations on Runway	+1

Source: CMT

Golf Apron Direct Access Alternatives Summary

Table 4.1-20, *Golf Alternatives Summary* presents the qualitative evaluation and total score for every alternative discussed previously. As shown in this table, Alternatives 4 has the highest scores and therefore it is selected as the preferred alternative. Alternative 4 will not impact the operations of Runway 14L/32R and Taxiway G while under construction, compared to the other alternatives.

Table 4.1-20: Golf Alternatives Summary

EVALUATION	G-1	G-2	G-3	G-4
Taxi Route Flexibility	0	0	0	0
Runway Operational Impact	-1	-1	+1	+1
Taxiway Operational Impact	+1	+1	-1	0
Pavement Impacts	+1	+1	-1	-1
Compatibility with Future Expansions	0	0	-1	0
Taxi Operations on Runway	-1	-1	+1	+1
Total Score	0	0	-1	+1

Source: CMT

Golf Apron: Self-Service Fuel Station Alternative Location

Exhibit 4.1-20 showed the preferred alternative for the Golf Apron connector relocation. This alternative shows the self-service fuel station location on the east side of the apron. An alternative location to this self-service fuel station is on the west side of the apron. Exhibit 4.1.1-20 shows this alternative location in the preferred Golf Apron alternative.

Exhibit 4.1.1-20: Golf Apron Self-Service Fuel Station Alternative Location

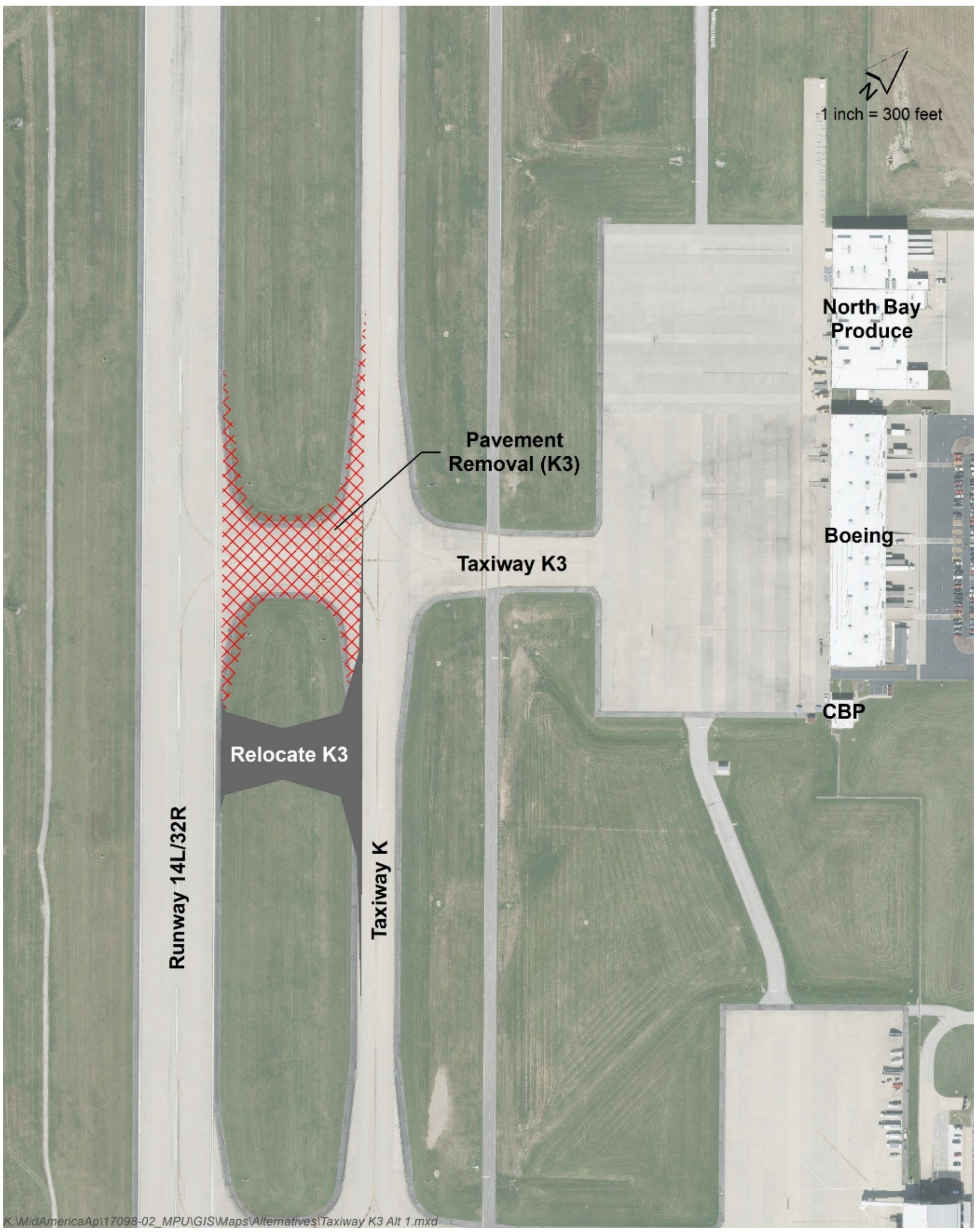
Source: CMT

MIKE APRON DIRECT ACCESS ALTERNATIVES

Alternative 1

Alternative 1 assumes a closure/removal of the existing Taxiway 'K3' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet southeast of the existing Taxiway 'K3'. Exhibit 4.1-21*, Mike Alternative 1* depicts the alternative. Table 4.1-21, *Mike Alternative 1 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-21: Mike Alternative 1



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future apron expansions and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-21: Mike Alternative 1 Evaluation

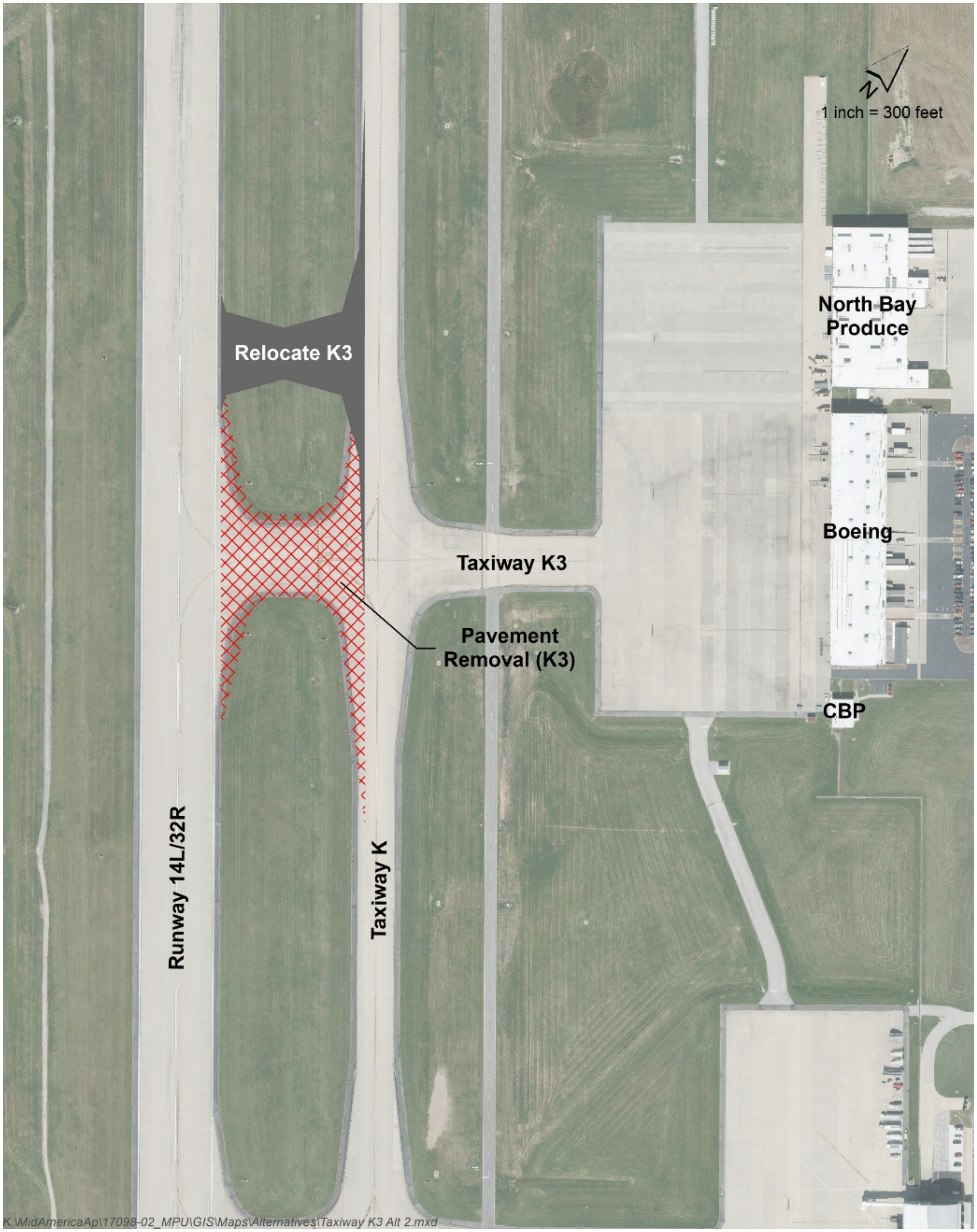
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Alternative 2

Alternative 2 assumes a closure/removal of the existing Taxiway 'K3' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet northwest of the existing Taxiway 'K3'. Exhibit 4.1-22*, Mike Alternative 2* depicts the alternative. Table 4.1-22, *Mike Alternative 2 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-22: Mike Alternative 2



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future apron expansions, and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-22: Mike Alternative 2 Evaluation

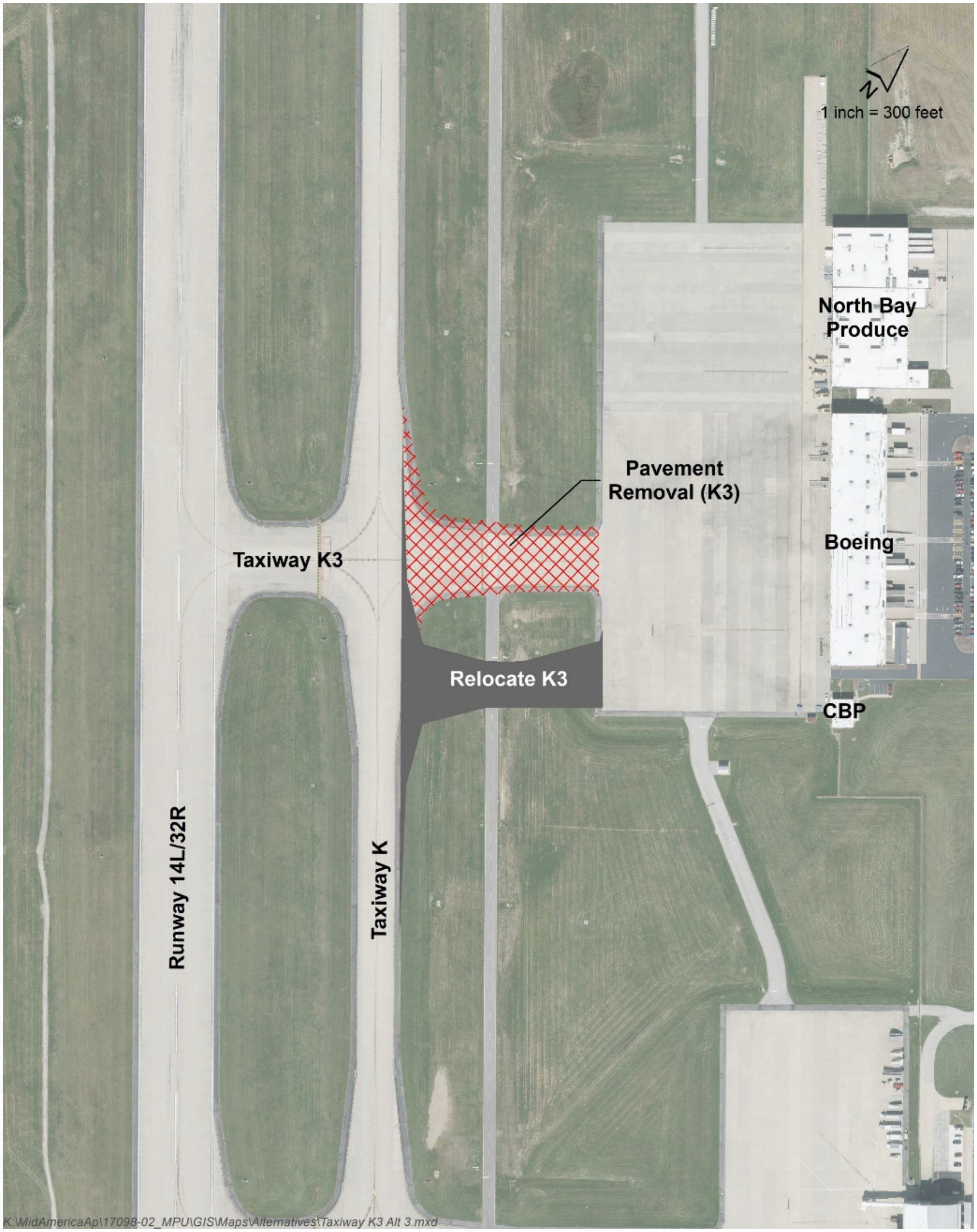
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Alternative 3

Alternative 3 assumes a closure/removal of the existing Taxiway 'K3' between Mike Apron and Taxiway 'K'. It includes a new taxiway connector located 260 feet southeast of the existing Taxiway 'K3'. **Exhibit 4.1-23*, Mike Alternative 3*** depicts the alternative. **Table 4.1-23, *Mike Alternative 3 Evaluation*** shows the evaluation of this alternative.

Exhibit 4.1-23: Mike Alternative 3



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector is not enough to prevent a taxiway operational impact, which may require coordination between big airframes and construction crew to taxi into the apron, and the amount of pavement that needs to be added/removed during construction is substantial compared with the previous alternatives. This alternative will not affect future apron expansions, and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-23: Mike Alternative 3 Evaluation

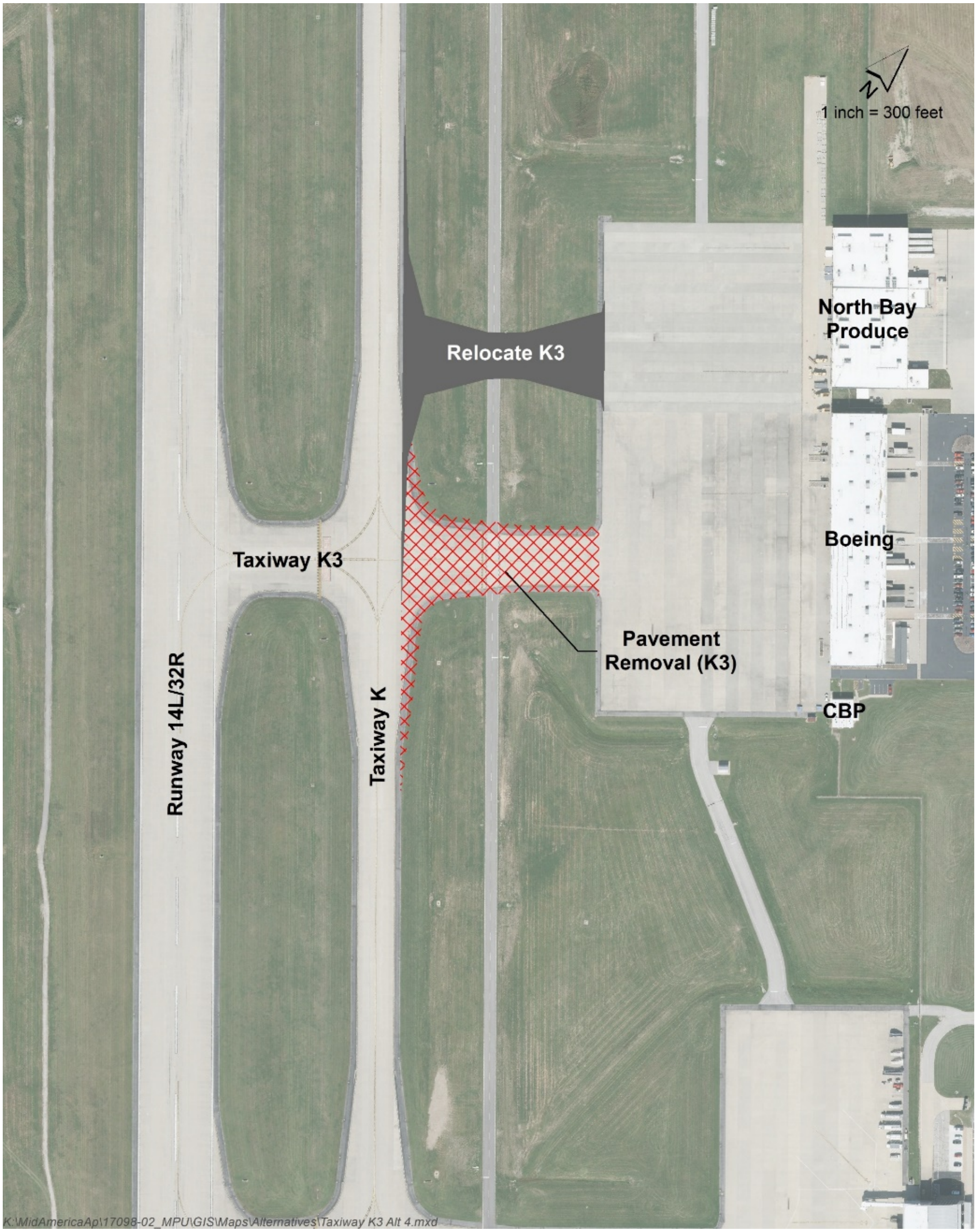
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	-1
Pavement Impacts	-1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Alternative 4

Alternative 4 assumes a closure/removal of the existing Taxiway 'K3' between Mike Apron and Taxiway 'K'. It includes a new taxiway connector located 400 feet northwest of the existing Taxiway 'K3'. Exhibit 4.1-24*, Mike Alternative 4* depicts the alternative. Table 4.1-24, *Mike Alternative 4 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-24: Mike Alternative 4



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector is enough to prevent a taxiway operational impact, but the amount of pavement that needs to be added/removed during construction is substantial compared with the previous alternatives. This alternative will not affect future apron expansions, and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-24: Mike Alternative 4 Evaluation

EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	+1
Pavement Impacts	-1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Mike Apron Direct Access Alternatives Summary

Table 4.1-25, *Mike Alternatives Summary* show the qualitative evaluation and total score for every alternative discussed previously.

Table 4.1-25: Mike Alternatives Summary

EVALUATION	M-1	M-2	M-3	M-4
Taxi Route Flexibility	0	0	0	0
Runway Operational Impact	-1	-1	+1	+1
Taxiway Operational Impact	+1	+1	-1	+1
Pavement Impacts	+1	+1	-1	-1
Compatibility with Future Expansions	0	0	0	0
Taxi Operations on Runway	0	0	0	0
Total Score	+1	+1	-1	+1

Source: CMT

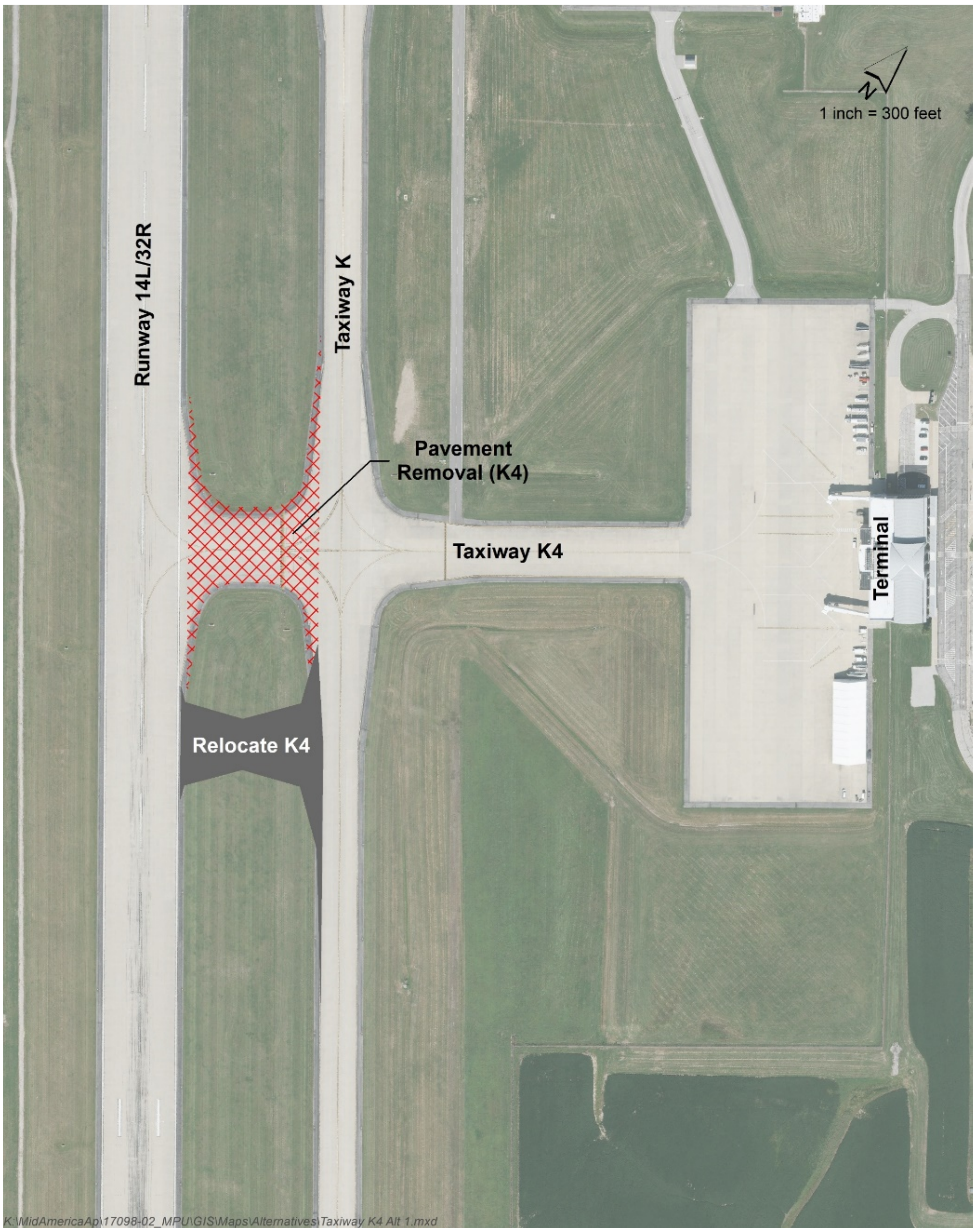
As shown in this table, Alternatives 1, 2 and 4 are the alternatives with the highest scores. However, this study believes that the preferred alternative should not impact Runway 14L/32R operations, which eliminates alternatives 1 and 2 as candidates for the preferred alternative. This makes alternative 4 the preferred alternative.

NOVEMBER APRON DIRECT ACCESS ALTERNATIVES

Alternative 1

Alternative 1 assumes a closure/removal of the existing Taxiway 'K4' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet southeast of the existing Taxiway 'K4'. Exhibit 4.1-25*, November Alternative 1* depicts the alternative. Table 4.1-26, *November Alternative 1 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-25: November Alternative 1



Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future apron expansions, and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-26: November Alternative 1 Evaluation

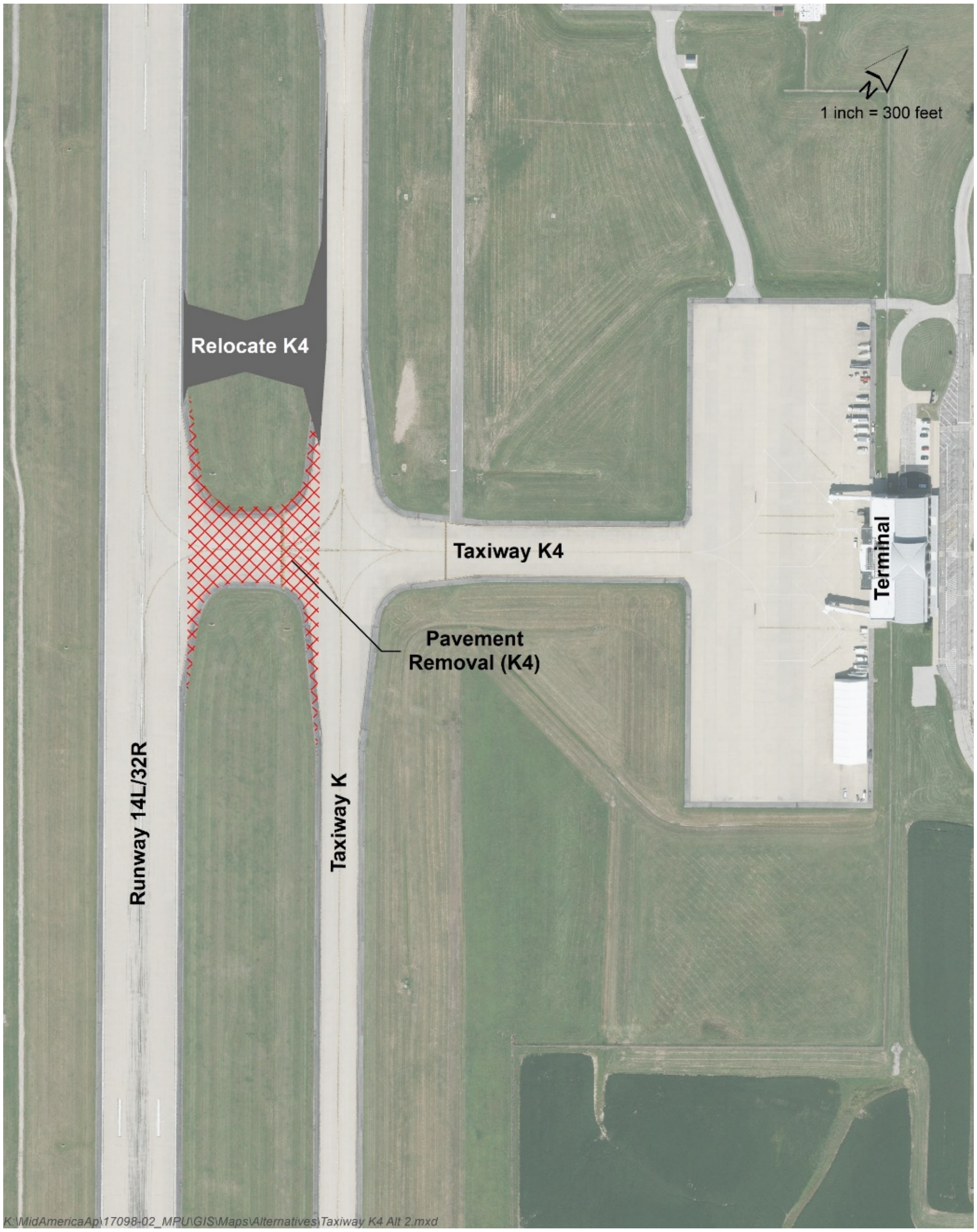
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Alternative 2

Alternative 2 assumes a closure/removal of the existing Taxiway 'K4' between Runway 14L/32R and Taxiway 'K'. It includes a new taxiway connector located 400 feet northwest of the existing Taxiway 'K4'. Exhibit 4.1-26, *November Alternative 2* depicts the alternative. Table 4.1-27, *November Alternative 2 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-26: November Alternative 2



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, but it does require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, and the amount of pavement that needs to be added/removed during construction is not substantial. This alternative will not affect future apron expansions, and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-27: November Alternative 2 Evaluation

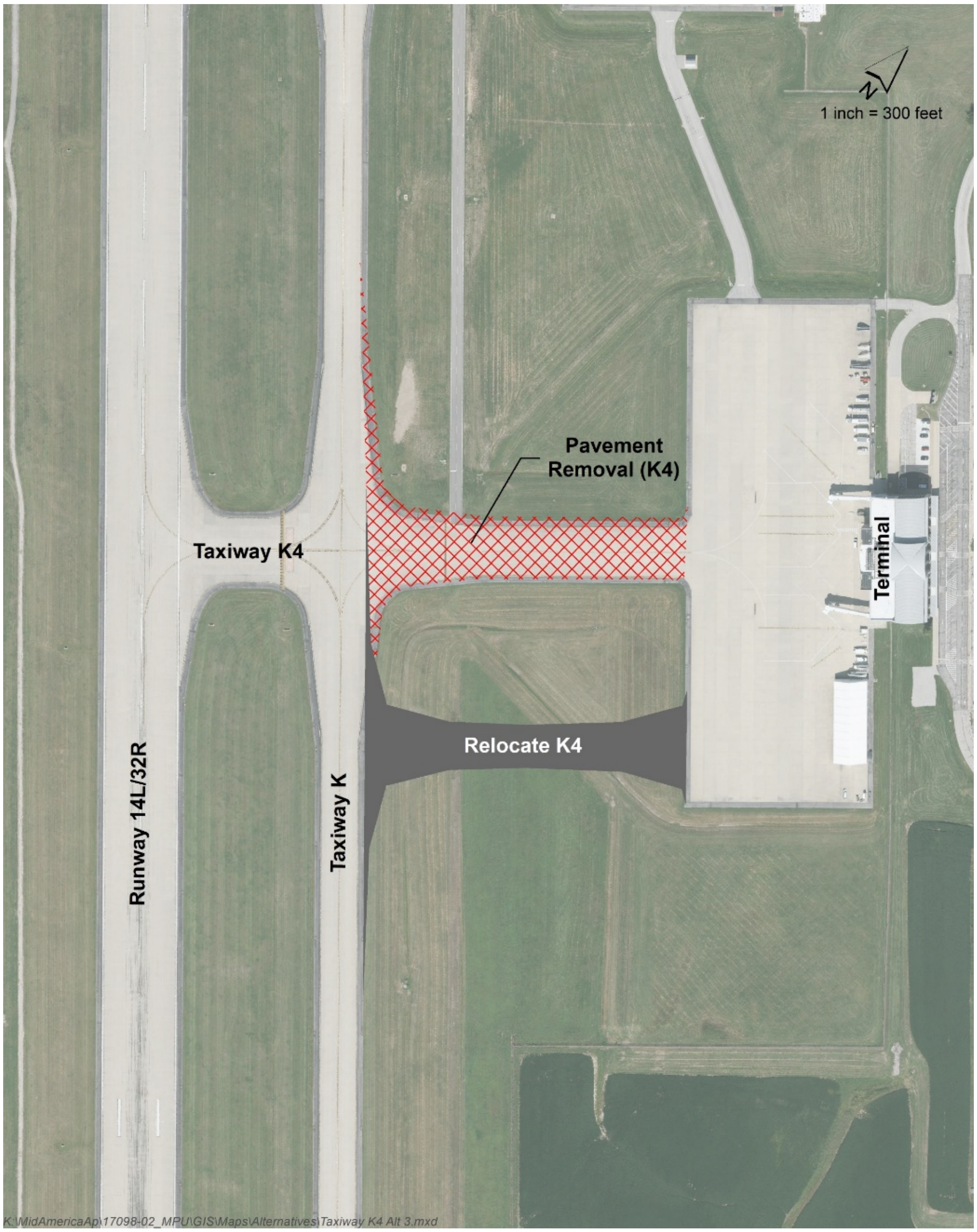
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	-1
Taxiway Operational Impact	+1
Pavement Impacts	+1
Compatibility with Future Expansions	0
Taxi Operations on Runway	0

Source: CMT

Alternative 3

Alternative 3 assumes a closure/removal of the existing Taxiway 'K4' between November Apron and Taxiway 'K'. It includes a new taxiway connector located 400 feet southeast of the existing Taxiway 'K4'. Exhibit 4.1-27, *November Alternative 3* depicts the alternative. Table 4.1-28, *November Alternative 3 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-27: November Alternative 3



Source: CMT

As shown in the exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, but the amount of pavement that needs to be added/removed during construction is substantial compared to previous alternatives. This alternative is compatible with future apron expansions (Terminal Modification), and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-28: November Alternative 3 Evaluation

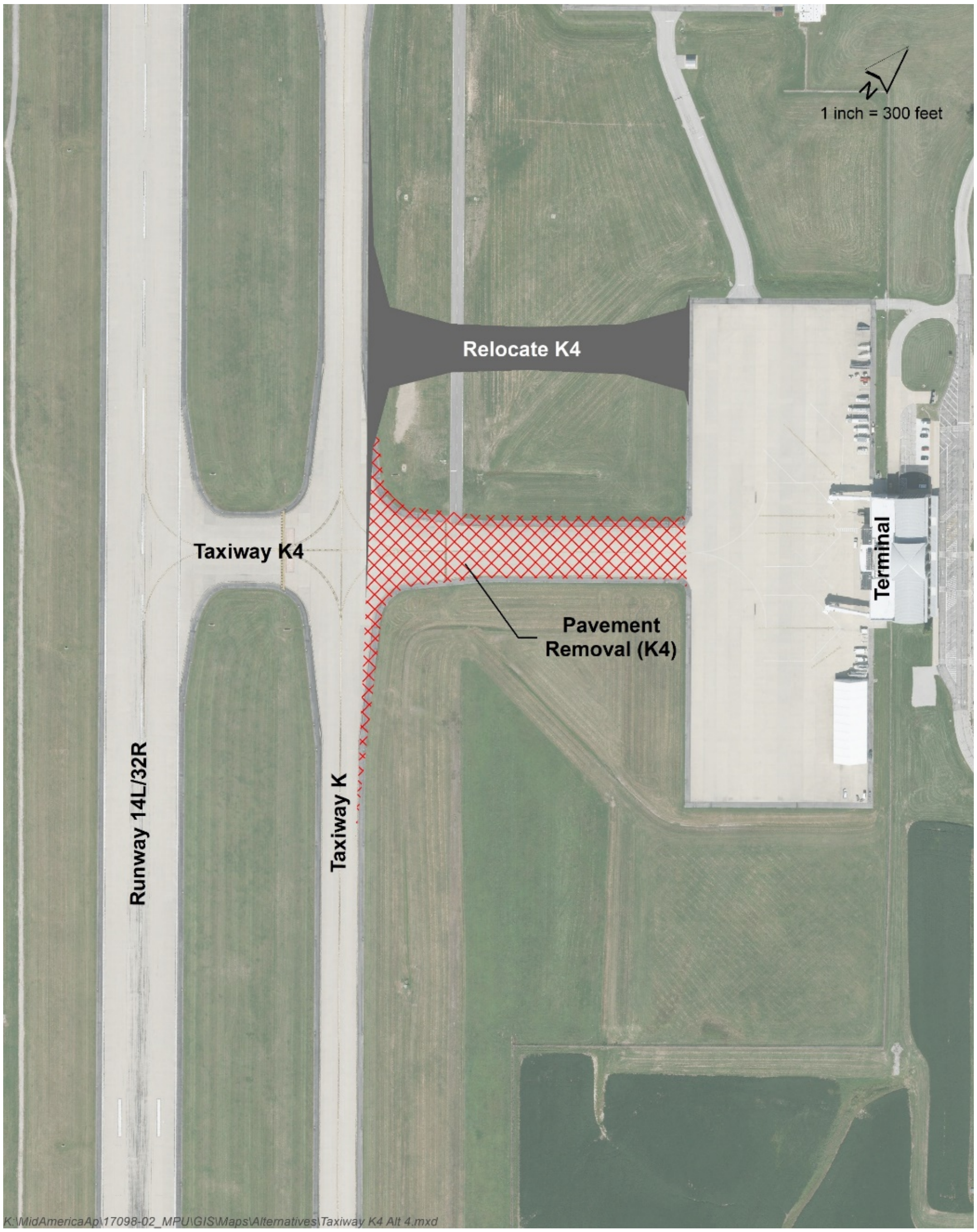
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	+1
Pavement Impacts	-1
Compatibility with Future Expansions	+1
Taxi Operations on Runway	0

Source: CMT

Alternative 4

Alternative 4 assumes a closure/removal of the existing Taxiway 'K4' between November Apron and Taxiway 'K'. It includes a new taxiway connector located 400 feet northwest of the existing Taxiway 'K4'. Exhibit 4.1-28*, November Alternative 4* depicts the alternative. Table 4.1-29, *November Alternative 4 Evaluation* shows the evaluation of this alternative.

Exhibit 4.1-28: November Alternative 4



Source: CMT

As shown in this exhibit, this alternative does not affect current taxi route flexibility at the apron, and it does not require Runway 14L/32R to be closed during construction. The separation between the existing and new taxiway connector prevents any taxiway operational impact, but the amount of pavement that needs to be added/removed during construction is substantial compared to previous alternatives. This alternative is compatible with future apron expansions (Terminal Modification), and the relocation of the taxiway connector will not affect aircraft movement to/from Scott AFB.

Table 4.1-29: November Alternative 4 Evaluation

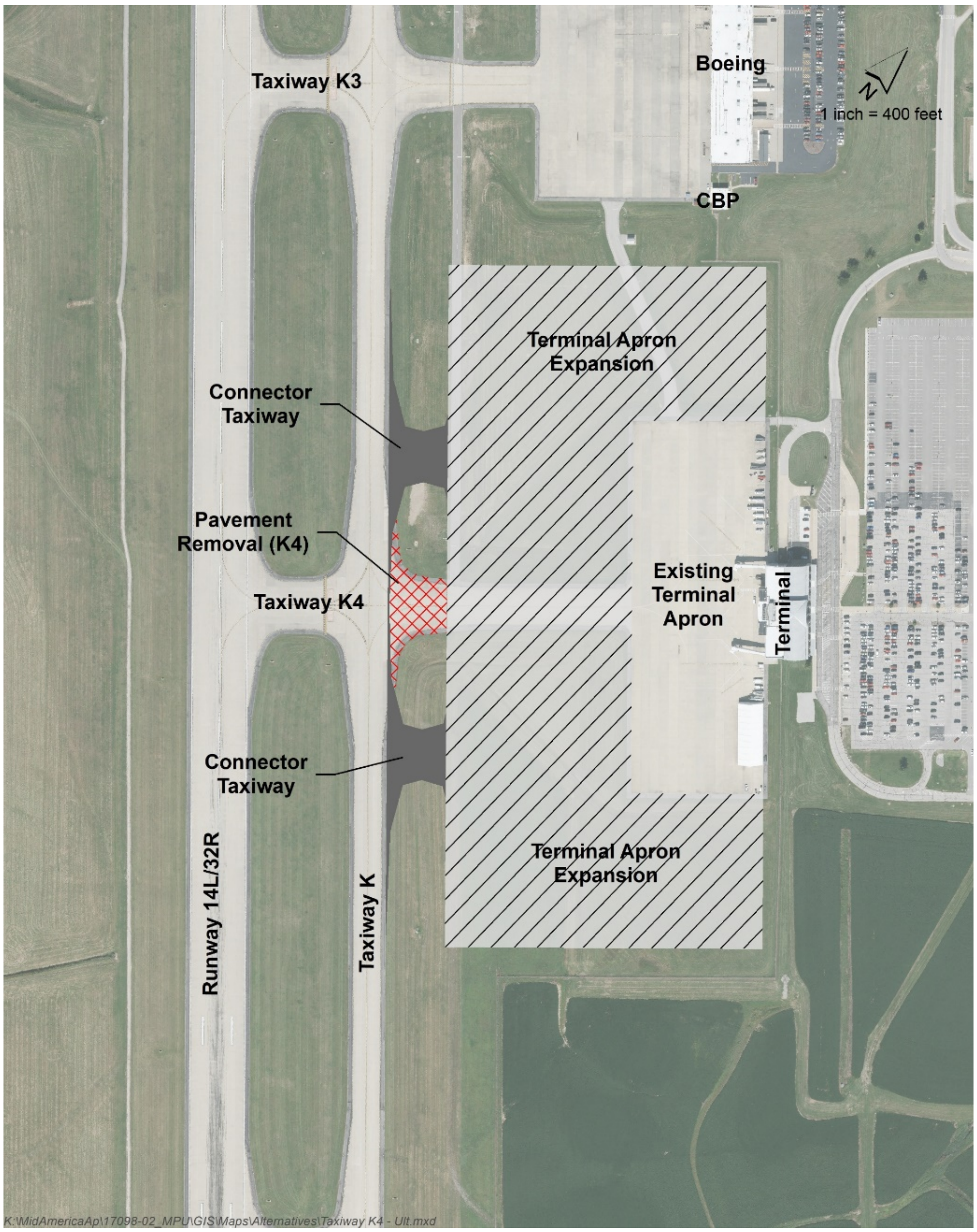
EVALUATION	SCORE
Taxi Route Flexibility	0
Runway Operational Impact	+1
Taxiway Operational Impact	+1
Pavement Impacts	-1
Compatibility with Future Expansions	+1
Taxi Operations on Runway	0

Source: CMT

November Apron Ultimate Configuration

The ultimate apron configuration assumes a close/removal of the existing Taxiway 'K4' between November Apron and Taxiway 'K'. It includes a new taxiway connector located 400 feet southeast of the existing Taxiway 'K4', and an additional taxiway connector located 400 feet northwest of the existing Taxiway 'K4'. This is not considered an alternative as this is the suggested future configuration for November Apron, which would be part of the future apron expansion plan (Terminal Modification). Exhibit 4.1-29*, November Ultimate Configuration* depicts the suggested configuration.

Exhibit 4.1-29: November Ultimate Configuration



Source: CMT

November Apron Direct Access Alternatives Summary

Table 4.1-30, *November Alternatives Summary*, presents the qualitative evaluation and total score for every alternative discussed previously.

Table 4.1-30: November Alternatives Summary

EVALUATION	N-1	N-2	N-3	N-4
Taxi Route Flexibility	0	0	0	0
Runway Operational Impact	-1	-1	+1	+1
Taxiway Operational Impact	+1	+1	+1	+1
Pavement Impacts	+1	+1	-1	-1
Compatibility with Future Expansions	0	0	+1	+1
Taxi Operations on Runway	0	0	0	0
Total Score	+1	+1	+2	+2

Source: CMT

The recommendation of this Master Plan is to implement either Alternative 3 or Alternative 4. Either of these alternatives provide the mitigation required to alleviate the issue of direct access, while being compatible in the long-term with the ultimate layout of the terminal apron at which time both taxiway connectors will be required.

APRONS NEW IDENTIFICATION NAMES

The previous section identified the three aprons in the civilian side of the airfield as Golf Apron, Mike Apron, and Terminal Apron. The Airport has chosen to rename two of these aprons to reflect the nature of their activities. The Golf Apron will remain unchanged, the Mike Apron will be renamed Cargo Apron, and the November Apron will be renamed Terminal Apron. These name changes will be reflected in the updated Airport Layout Plan (ALP).

4.1.4 Airfield Service Roads

Paved airfield service roads connect the maintenance facility, the ARFF facilities, and the public roadways with Taxiway K and the Mike and Golf aprons. The service roads are located inside the AOA and are only accessible through security gates.

The airfield service roads recommendations from the previous BLV Master Plan were reviewed, and it was determined that these recommendations still hold true for the planning period. However, implementation will be dependent on the ultimate recommendations made in this chapter.

Based on the review completed during this Master Plan Update, it appears that the complete service road that goes around Runway 14L/32R is needed to meet criteria contained in FAA Part 139 Certification Manual. This would be depicted on the future Airport ALD Sheet.

4.2 Air Cargo & General Aviation/Corporate Facilities

The Facility Requirements chapter identified that the existing cargo and GA/Corporate facilities capacity exceed the projected demand through the planning period. Any cargo and GA/Corporate facility expansions or improvements should be completed by 3rd party development in a manner compatible with the ultimate land-use recommendations of the Master Plan Update.

The Master Plan Land Use Development chapter will show a detailed view of different layouts and zones where air cargo and GA/Corporate facilities may be developed to accommodate demand through the 20-year planning horizon.

4.3 Access Roadways

In Chapter 3 – Facility Requirements, access roadway requirements were analyzed, and two major traffic intersection concerns were identified: Airport Boulevard/Air Terminal Drive and Illinois Route 4 & Airport Boulevard. The following sections will discuss alternatives to remedy issues for each intersection.

4.3.1 Airport Boulevard/Air Terminal Drive Intersection

The Facility Requirements Chapter noted how Airport Boulevard/Air Terminal Drive intersection promotes undesirable interaction between the traveling public and commercial vehicles. Three alternatives have been developed to increase the traffic flow separation between the traveling public and commercial vehicles.

AIRPORT BOULEVARD/AIR TERMINAL DRIVE ALTERNATIVES EVALUATION CRITERIA

The criteria used in the evaluation of the alternatives utilized a red, amber, green (RAG) analysis scoring method. The RAG analysis gives a red score for a negative (-) result, an amber score for a neutral/not applicable result, and a green score for a positive (+) result. If a red negative (-) is given to any of the evaluation criteria categories in the "fatal flaws" section, the alternative is deemed not feasible. The evaluation criteria are presented in Table 4.3-1, *Airport Boulevard/Air Terminal Drive Alternatives Evaluation Criteria.*

Table 4.3-1: Airport Boulevard/Air Terminal Drive Alternatives Evaluation Criteria

CRITERIA	DETAIL
Continuous Flow	Evaluates if the alternative provides for continuous flow for passenger traffic.
Crossing Traffic	Evaluates if the alternative requires a crossing traffic pattern.
Flow Segregation	Evaluates if the alternative separates passenger traffic from commercial traffic.
Landscape Opportunity	Evaluates if the alternative provides a landscaping opportunity.
Land-use Impacts	Evaluates is the alternative deviates from existing roadway alignment.

Source: CMT

AIRPORT BOULEVARD/AIR TERMINAL DRIVE ALTERNATIVES

Alternative 1

Alternative 1 is the "do nothing" or no modification alternative which consists of maintaining the current layout of Airport Boulevard/Air Terminal Drive intersection. **Exhibit 4.3-1*, Airport Boulevard/Air Terminal Drive-Alternative 1*** depicts the current layout of this intersection. **Table 4.3-2, *Airport Boulevard/Air Terminal Drive-Alternative 1 Evaluation*** shows the evaluation of this alternative.

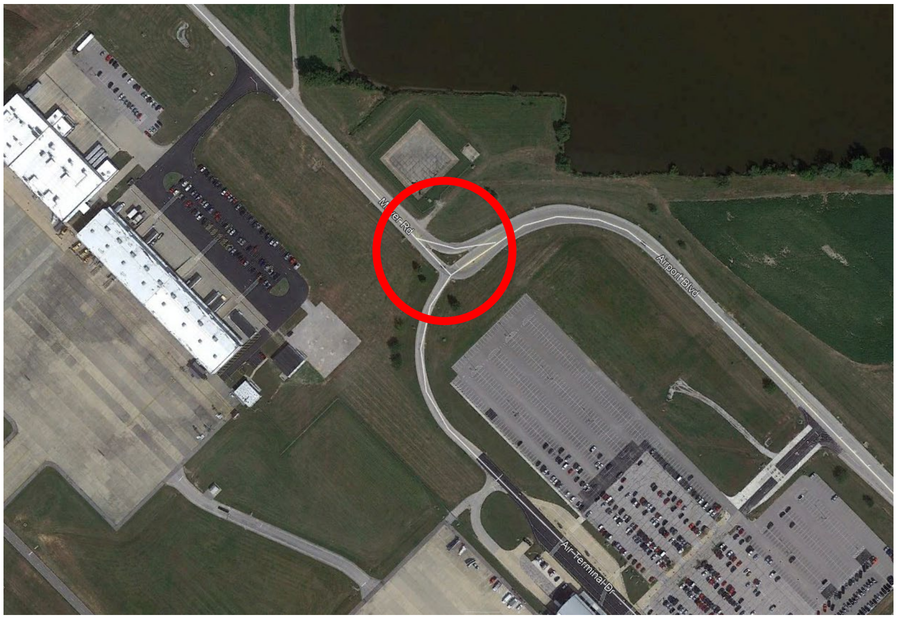
As shown in the exhibit, this alternative does not allow for continuous flow of traffic, and it does require a crossing traffic pattern. This alternative does not separate passenger from commercial traffic. Since this alternatives involves no changes to the current intersection, there is no landscaping opportunities. This alternative has no impacts on adjacent lands or roadways.

Table 4.3-2: Airport Boulevard/Air Terminal Drive-Alternative 1 Evaluation

EVALUATION	SCORE
Continuous Flow	-1
Crossing Traffic	-1
Flow Segregation	-1
Landscape Opportunity	-1
Land-use Impacts	0

Source: CMT

Exhibit 4.3-1: Airport Boulevard/Air Terminal Drive-Alternative 1



Source: CMT

Alternative 2

Alternative 2 proposes a new roundabout given the available land, desire to maximize the use of existing pavement and to promote landscape areas. Exhibit 4.3-2*, Airport Boulevard/Air Terminal Drive-Alternative 2* depicts the alternative. Table 4.3-3, *Airport Boulevard/Air Terminal Drive-Alternative 2 Evaluation* shows the evaluation of this alternative.

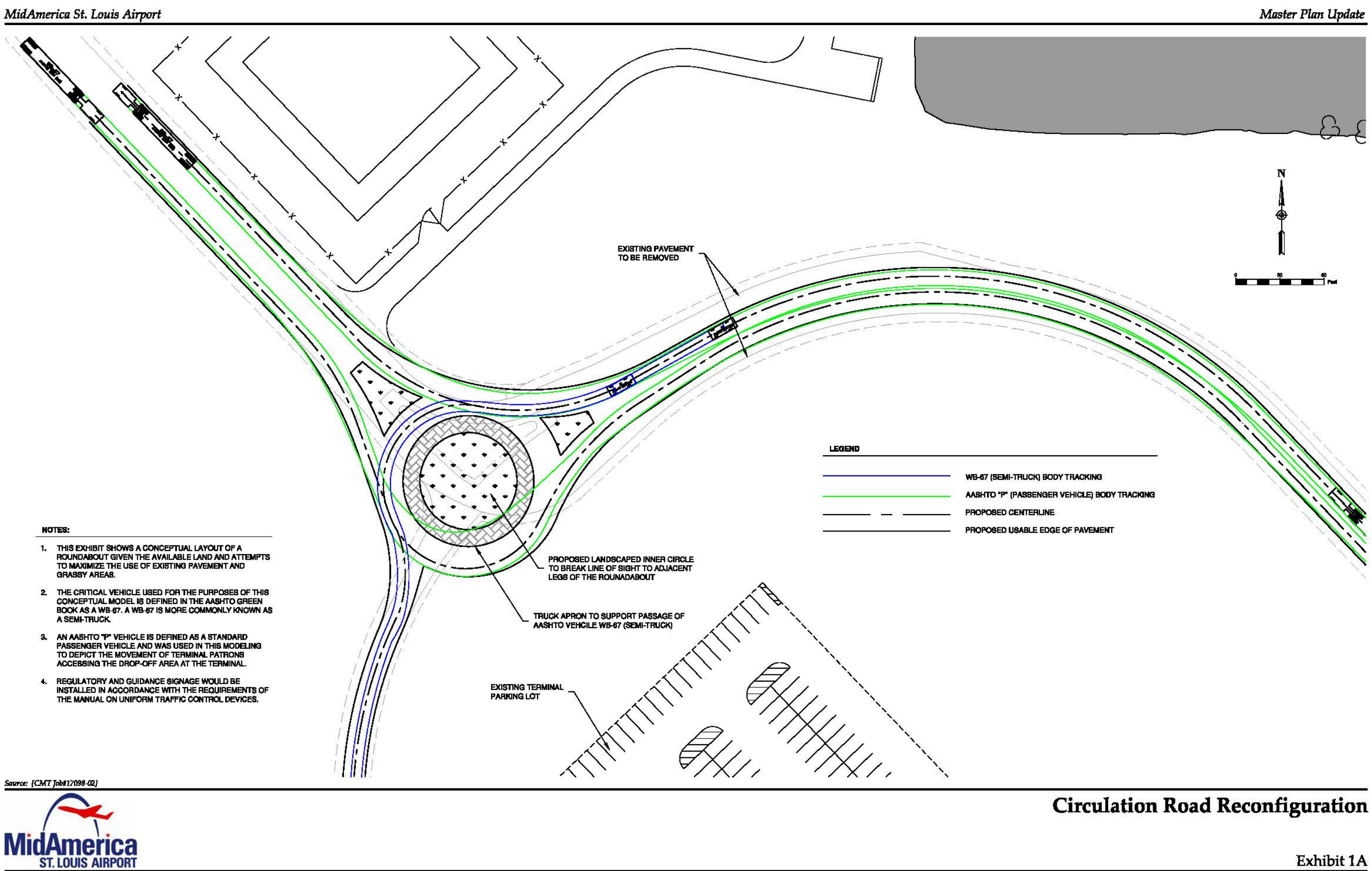
As shown in the exhibit, this alternative allows for continuous flow of traffic, and it does not require a crossing traffic pattern. This alternative, however, does not completely separate passenger from commercial traffic. The roundabout gives the Airport an opportunity to realize landscaping opportunities, and it also facilitates the development of future surrounding land due to its minimal footprint.

Table 4.3-3: Airport Boulevard/Air Terminal Drive-Alternative 2 Evaluation

EVALUATION	SCORE
Continuous Flow	+1
Crossing Traffic	+1
Flow Segregation	-1
Landscape Opportunity	+1
Land-use Impacts	+1

Source: CMT

Exhibit 4.3-2: Airport Boulevard/Air Terminal Drive-Alternative 2



Source: CMT

Alternative 3

Alternative 3 considers an expanded version of the current intersection that provides additional separation between the passenger and commercial operations. Exhibit 4.3-3*, Airport Boulevard/Air Terminal Drive - Alternative 3* depicts the alternative. Table 4.3-4, *Airport Boulevard/Air Terminal Driver - Alternative 3 Evaluation* shows the evaluation of this alternative.

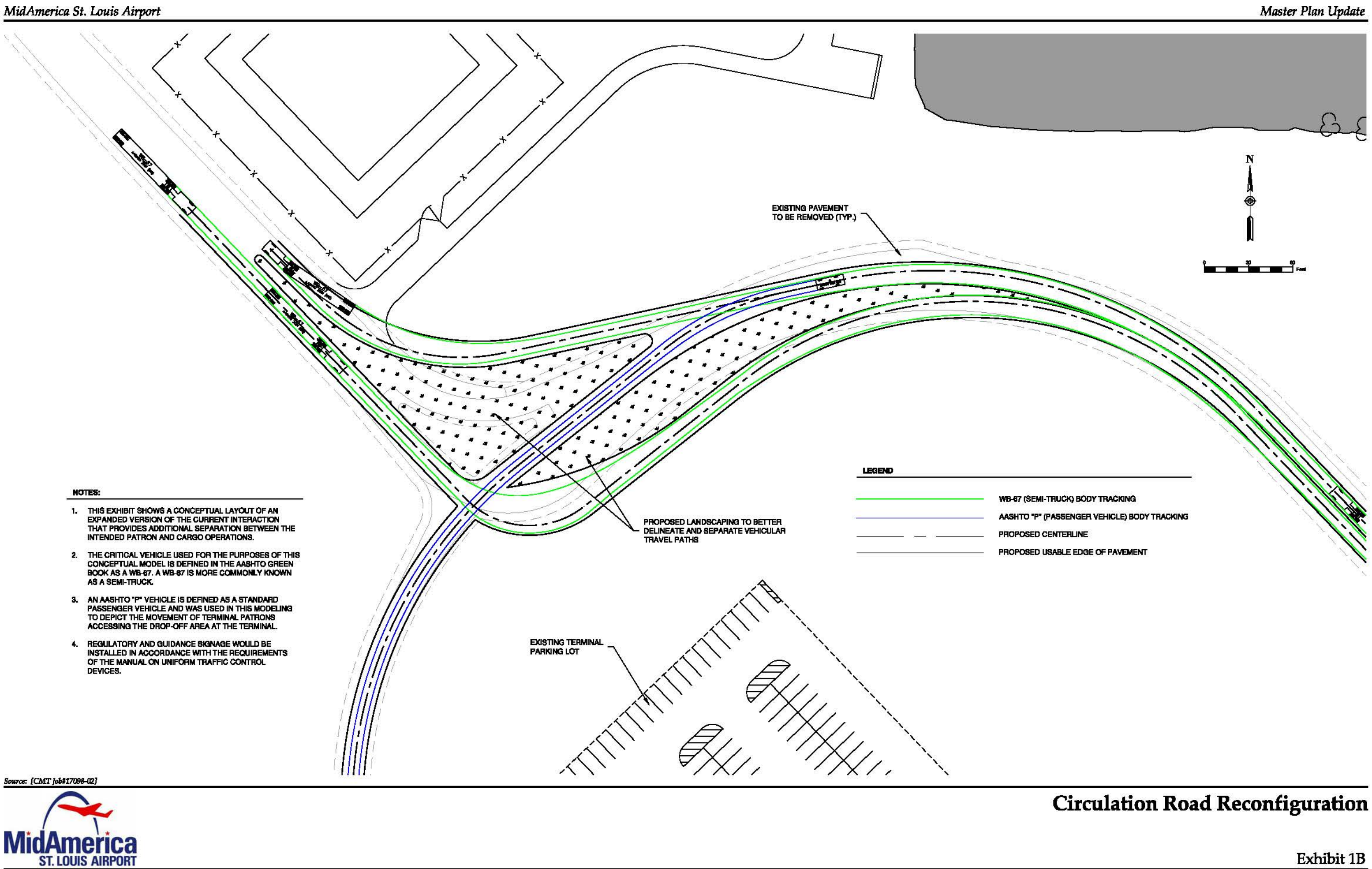
As shown in the exhibit, this alternative allows for continuous flow of traffic, but it requires a crossing traffic pattern. This alternative does not affect the existing separation between passenger traffic from commercial traffic. The expanded version of the current traffic interaction also does not create an opening to develop landscaping opportunities, but this alternative does take more land which may impact the Airport's ability to develop of future projects in the surrounding area.

Table 4.3-4: Airport Boulevard/Air Terminal Drive-Alternative 3 Evaluation

EVALUATION	SCORE
Continuous Flow	+1
Crossing Traffic	-1
Flow Segregation	0
Landscape Opportunity	0
Land-use Impacts	-1

Source: CMT

Exhibit 4.3-3: Airport Boulevard/Air Terminal Drive-Alternative 3



Source: CMT

Alternative 4

Alternative 4 assumes a modified intersection that provides additional separation between the passenger and commercial operations. This alternative will allow for semi-truck operations and passenger interactions to almost entirely separate. **Exhibit 4.3-4**, ***Airport Boulevard/Air Terminal Drive-Alternative 4*** depicts the alternative. **Table 4.3-5**, ***Airport Boulevard/Air Terminal Drive-Alternative 4 Evaluation*** shows the evaluation of this alternative.

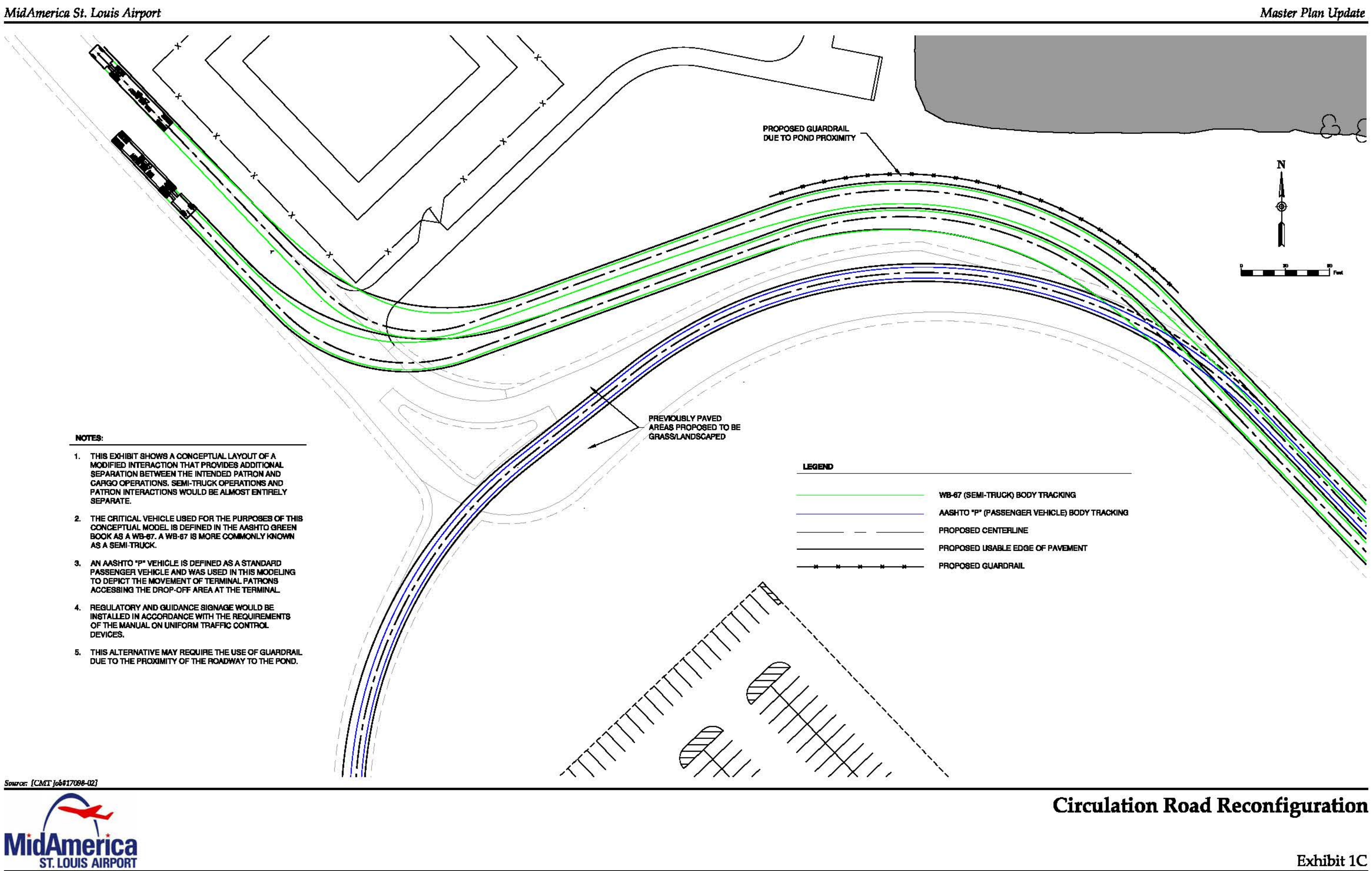
As shown in the exhibit below, this alternative allows for continuous flow of traffic, but it requires a crossing traffic pattern. This alternative does increase the existing separation between passenger traffic from commercial traffic but creates other traffic safety concerns such as head-on interaction. The expanded separation between passenger and commercial operations does not impact the opportunity to develop landscaping opportunities, but this alternative does take more land which may impact the Airport's ability to develop of future land-use projects in the surrounding area.

Table 4.3-5: Airport Boulevard/Air Terminal Drive-Alternative 4 Evaluation

EVALUATION	SCORE
Continuous Flow	+1
Crossing Traffic	-1
Flow Segregation	+1
Landscape Opportunity	0
Land-use Impacts	-1

Source: CMT

Exhibit 4.3-4: Airport Boulevard/Air Terminal Drive-Alternative 4



Source: CMT

Airport Boulevard/Air Terminal Drive Alternatives Summary

Table 4.3-6, *Airport Boulevard/Air Terminal Drive Alternatives Summary* show the qualitative evaluation and total score for every alternative discussed previously.

Table 4.3-6: Airport Boulevard/Air Terminal Drive Alternatives Summary

EVALUATION	ALT 1	ALT 2	ALT 3	ALT 4
Continuous Flow	-1	+1	+1	+1
Crossing Traffic	-1	+1	-1	-1
Flow Segregation	-1	-1	0	+1
Landscape Opportunity	-1	+1	0	0
Land-use Impacts	0	+1	-1	-1
Total Score	-4	+3	-1	0

Source: CMT

As shown in Table 4.3-6, Alternative 2 is the alternative with the highest score, and therefore the recommended alternative for this intersection.

4.3.2 Airport Boulevard/Illinois Route 4 Intersection Alternative

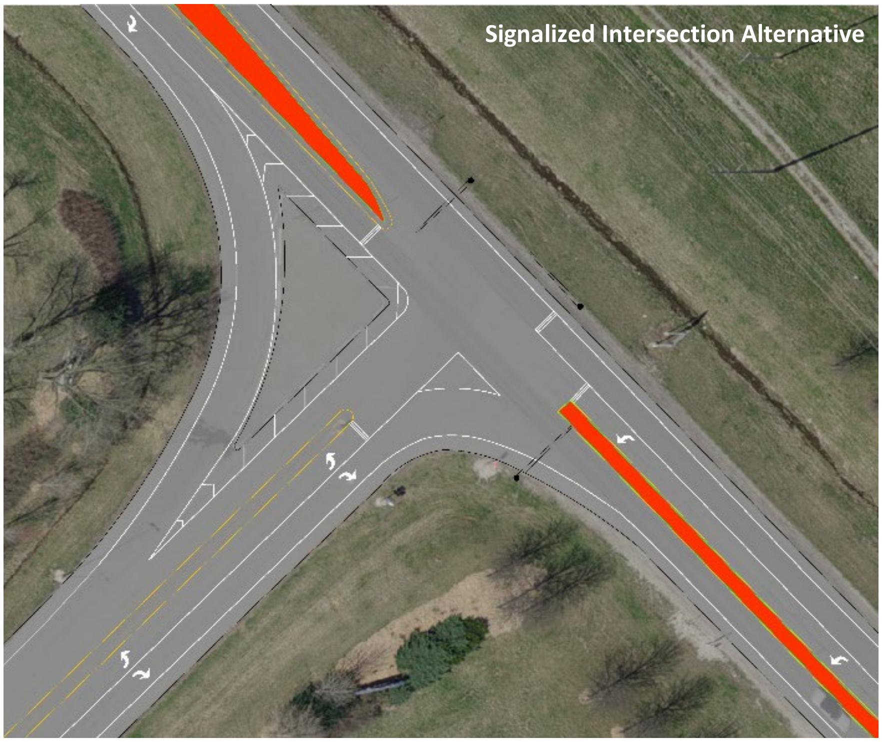
The previous chapter - Facility Requirements, shows how the afternoon peak hour Level of Service (LOS) accessing Illinois Route 4 from Airport Blvd is rated as F. This means that airport users and tenants must wait several minutes before they are able to exit the airport due to the traffic on Illinois Route 4, and lack of breaks in that traffic. There are two alternatives that have been analyzed to seek mitigation of these issues through a modification of this intersection.

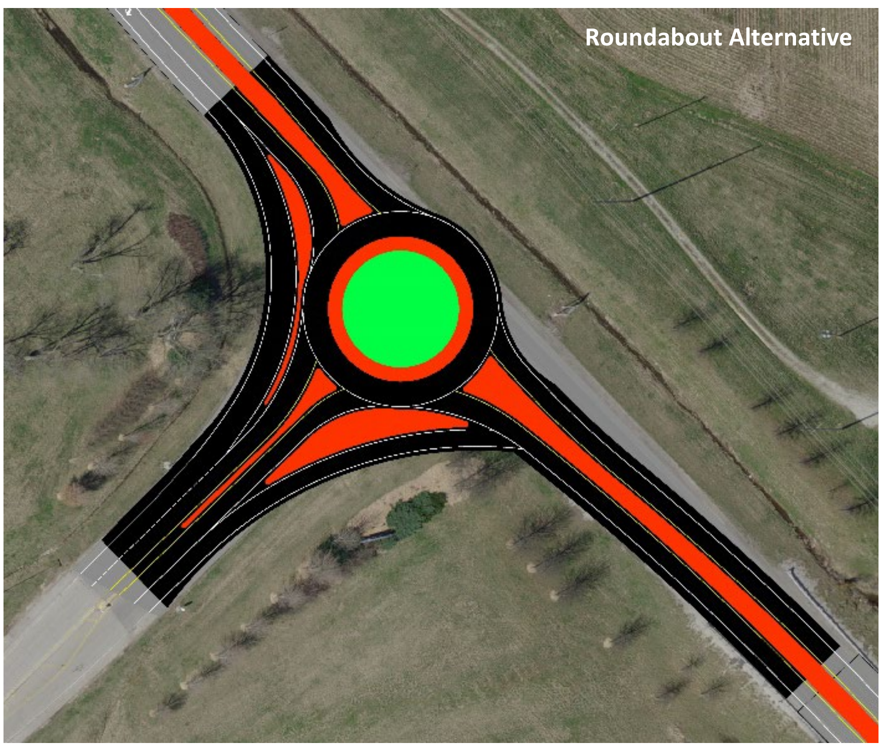
Alternatives

The intersection of IL 4 and Airport Boulevard was analyzed as both a signalized intersection and a roundabout intersection to evaluate the relative benefits of the two intersection types, as shown in Exhibit 4.3-5. The *signalized option* does not require any additional geometric improvements, only the addition of traffic signals. The *roundabout configuration* that was considered is a single lane roundabout with right turn by-pass lanes on the southbound and eastbound approaches to match the current lane configuration of IL 4 and Airport Boulevard. Based upon the 12-hour counts collected in 2018, and expected 2022 traffic volumes, the intersection of IL 4 and Airport Boulevard it is expected to meet Warrant 1 (Eight-Hour Vehicular Volume) and Warrant 2 (Four-Hour Vehicular Volume).

Table 4.3-7 presents the evaluation criteria for these alternatives. Table 4.3-8 and Table 4.3-9 show the evaluation of both alternatives. Table 4.3-10 shows the qualitative evaluation and total score for every alternative discussed previously.

Exhibit 4.3-5: Airport Boulevard/Illinois Route 4 Alternatives





Source: Quantum Geospatial, CMT

Table 4.3-7: Airport Boulevard/Illinois Route 4 Alternatives Evaluation Criteria

CRITERIA	DETAIL
Level of Service	Evaluates the level of service of the alternative based on the BLV Aerospace Development Traffic Study.
Continuous Flow	Evaluates if the alternative provides for continuous flow for passenger traffic.
Crossing Traffic	Evaluates if the alternative requires a crossing traffic pattern.
Required Geometric Improvements	Evaluates the alternative's required additional geometric improvements for construction.
Construction Costs	Evaluates the average construction cost of the alternative.

Source: CMT

Alternative 1 – Signalized Intersection – Evaluation

Based on the Aerospace Development Traffic Study for the Airport, the signalized intersection alternative will improve the level of service for traffic by reducing the waiting time when cars arrive at the intersection. This alternative does not generate any significant change to the current traffic flow, and it does not affect the current crossing traffic. This signalized intersection does not require any additional geometric improvements, only the addition of traffic signals. Lastly, based on professional judgement, the construction cost of this alternative will likely be significantly lower than the construction cost of Alternative 2. **Table 4.3-8** presents the quantitative evaluation of this alternative.

Table 4.3-8: Airport Boulevard/Illinois Route 4 Alternative 1 Evaluation

EVALUATION	SCORE
Level of Service	+1
Continuous Flow	0
Crossing Traffic	0
Required Geometric Improvements	+1
Construction Costs	+1

Source: CMT

Alternative 2 – Roundabout – Evaluation

Based on the Aerospace Development Traffic Study for the Airport, the roundabout alternative will improve the level of service for traffic by reducing the waiting time when cars arrive at the intersection. This alternative will improve the continuous flow of traffic, and it eliminates crossing traffic. This roundabout will also require additional geometric improvements during construction. Based on professional judgement, the construction cost of this alternative will likely be significantly higher than the construction cost of Alternative 1. Table 4.3-9 presents the quantitative evaluation of this alternative.

Table 4.3-9: Airport Boulevard/Illinois Route 4 Alternative 2 Evaluation

EVALUATION	SCORE
Level of Service	+1
Continuous Flow	+1
Crossing Traffic	+1
Required Geometric Improvements	-1
Construction Costs	-1

Source: CMT

Airport Boulevard/Illinois Route 4 Alternatives Summary

Table 4.3-10 show the qualitative evaluation and total score for every alternative discussed previously.

Table 4.3-10: Airport Boulevard/Illinois Route 4 Alternatives Summary

EVALUATION	ALT 1	ALT 2
Level of Service	+1	+1
Continuous Flow	0	+1
Crossing Traffic	0	+1
Required Geometric Improvements	+1	-1
Construction Costs	+1	-1
Total Score	+3	+1

Source: CMT

As shown in this table, the *signalized intersection* alternative has the highest score in the evaluation, which is why this is the recommended alternative to implement in the Airport Boulevard/Illinois Route 4 intersection.

4.4 Landside Access and Parking Alternatives

In the previous Master Plan chapter, Chapter 3 – Facility Requirements, the Landside Access and Parking requirements were identified. The Landside Access and Parking requirements analyzed Passenger Vehicle Parking. The subsequent section will analyze the different alternatives for this element.

4.4.1 Passenger Vehicle Parking

The previous chapter - Facility Requirements, shows that there is a need to increase the number of parking spaces at BLV. The previous chapter identified the Airport's capacity of passenger vehicle parking is 1,283 spaces. 513 new spaces were constructed in May 2020 adjacent to the existing parking lots to increase capacity. This brings the current parking capacity to 1,796 parking spaces.

The previous chapter shows a requirement of 2,044 parking spaces in PAL 4. Four alternatives have been developed to increase the number of parking spaces to meet the demand through the planning period.

PASSENGER VEHICLE PARKING ALTERNATIVES EVALUATION CRITERIA

The criteria used in the evaluation of the alternatives utilized a red, amber, green (RAG) analysis scoring method. The RAG analysis gives a red score for a negative (-) result, an amber score for a neutral/not applicable result, and a green score for a positive (+) result. If a red negative (-) is given to any of the evaluation criteria categories in the "fatal flaws" section, the alternative is deemed not feasible. The evaluation criteria are presented in **Table 4.4-1,** ***Passenger Vehicle Parking Alternatives Evaluation Criteria.***

Table 4.4-1: Passenger Vehicle Parking Alternatives Evaluation Criteria

CRITERIA	DETAIL
Proximity to Terminal	Evaluates if the alternative requires passenger conveyance from the proposed parking lot to the terminal
Expansion Capability	Evaluates if the alternative provides the ability for contiguous incremental expansion of the lot
Parking Stratification	Evaluates if the alternative provides flexibility to stratify the parking lot into short-term and long-term parking
Impact to Airport Boulevard and/or Air Terminal Drive	Evaluates if the alternative requires the re-routing of any of these roads to accommodate additional parking
Meets PAL 4 Demand	Evaluates if the alternative provides the total number of 2,044 parking spaces required in PAL 4

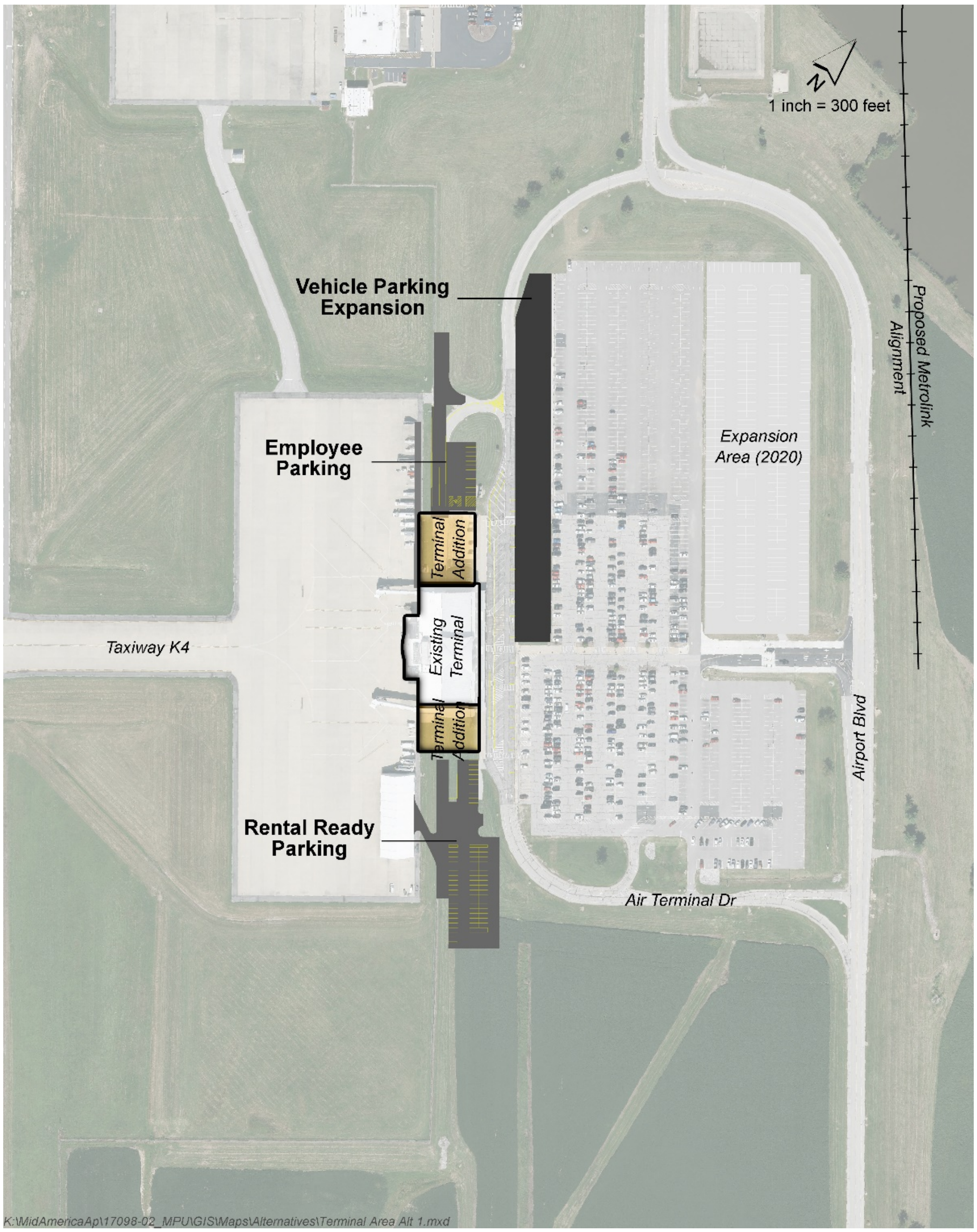
Source: CMT

All alternatives assume a new location for the employee parking and rental ready parking. These two parking lots will be located adjacent to the terminal building (new Terminal Modification) and are depicted in the exhibits below.

Alternative 1

Alternative 1 assumes a new parking lot which will provide 159 additional parking spaces, located next to the terminal building. Exhibit 4.4-1, *Passenger Vehicle Parking Alternative 1* depicts the alternative. Table 4.4-2, *Passenger Vehicle Parking Alternative 1 Capacity* shows the dimension of the alternative, and Table 4.4-3, *Passenger Vehicle Parking Alternative 1 Evaluation* shows the evaluation of this alternative.

Exhibit 4.4-1: Passenger Vehicle Parking Alternative 1



Source: CMT

Table 4.4-2: Passenger Vehicle Parking Alternative 1 Capacity

POTENTIAL NUMBER OF ADDITIONAL PARKING SPACES	VALUE
Total New Pavement Area (ft^2)	51,623
New Parking Spaces	159
Existing Spaces	1,796
Total	1,955

Source: CMT, Republic Parking

As shown in the exhibit, the parking expansion is located close to the terminal so that no passenger conveyance is needed for passenger transport. The alternative does not provide expansion capability as the proposed project area is limited by surrounding existing facilities. The alternative's total area does not provide the possibility for parking stratification due to the limited number of new parking spaces, but there is no re-routing to Airport Blvd and Air Terminal Dr to accommodate the new parking spaces. The alternative does not meet PAL 4 demand.

Table 4.4-3: Passenger Vehicle Parking Alternative 1 Evaluation

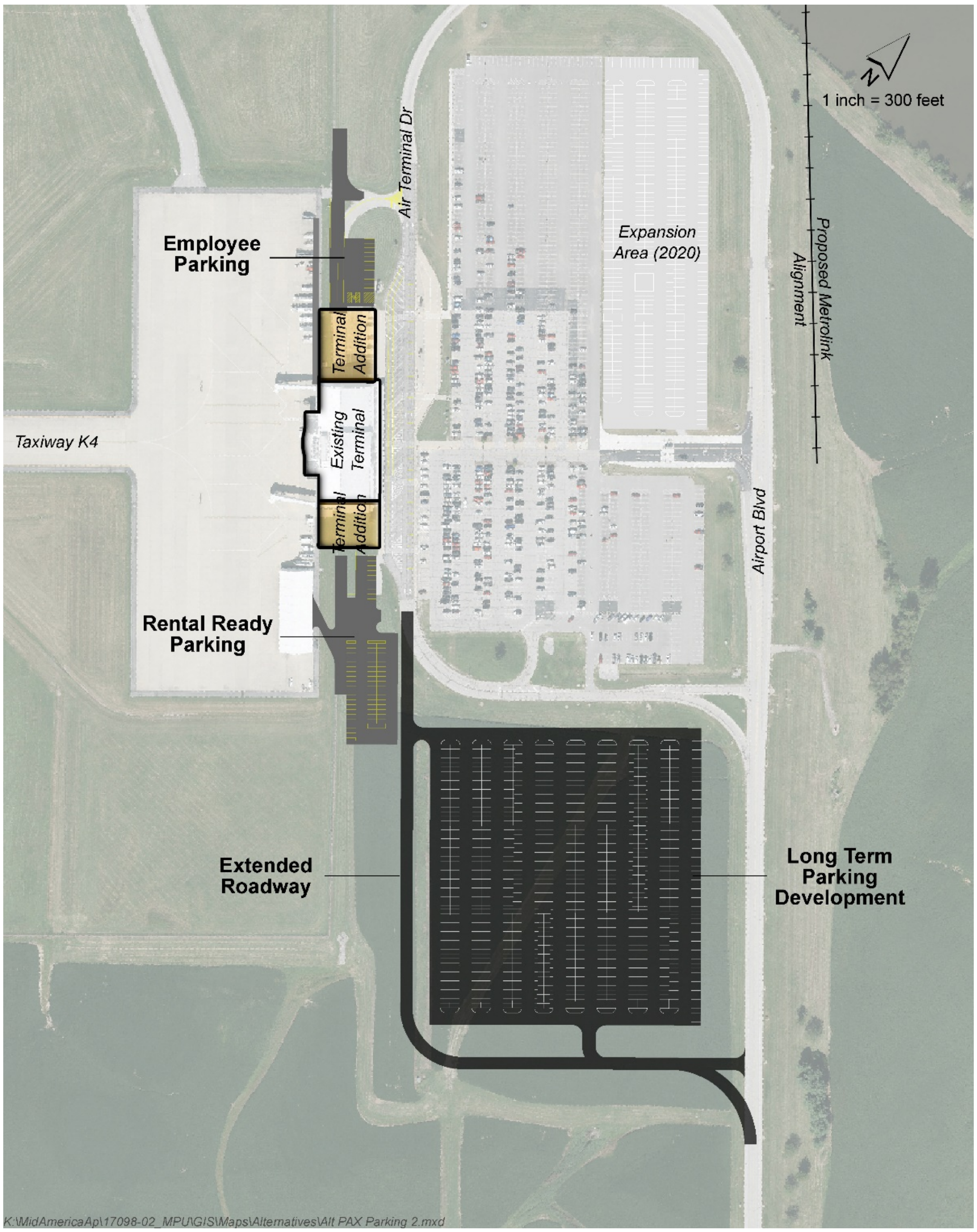
EVALUATION	SCORE
Proximity to Terminal	+1
Expansion Capability	-1
Parking Stratification	-1
Airport Boulevard/Air Terminal Drive Impact	+1
PAL 4 Demand	-1

Source: CMT

Alternative 2

Alternative 2 assumes a new parking lot which will provide 1,078 additional parking spaces, located east of the terminal building. **Exhibit 4.4-2**, *Passenger Vehicle Parking Alternative 2* depicts the alternative. **Table 4.4-4**, *Passenger Vehicle Parking Alternative 2 Capacity* shows the dimension of the alternative, and **Table 4.4-5**, *Passenger Vehicle Parking Alternative 2 Evaluation* shows the evaluation of this alternative.

Exhibit 4.4-2: Passenger Vehicle Parking Alternative 2



Source: CMT

Table 4.4-4: Passenger Vehicle Parking Alternative 2 Capacity

POTENTIAL NUMBER OF ADDITIONAL PARKING SPACES	VALUE
Total New Pavement Area (ft^2)	324,975
New Parking Spaces	1,078
Existing Spaces	1,796
Total	2,874

Source: CMT, Republic Parking

As shown in this exhibit, the parking expansion is not located close to the terminal, so passenger conveyance is likely needed for passenger transport. The alternative does provide expansion capability as the proposed project area does not have major facilities nearby, so an expansion would be feasible in the future. The alternative's total area does provide the possibility for parking stratification due to the broad number of new parking spaces. However, an extension of Air Terminal Dr is required to accommodate the new parking spaces. The alternative meets PAL 4 demand.

Table 4.4-5: Passenger Vehicle Parking Alternative 2 Evaluation

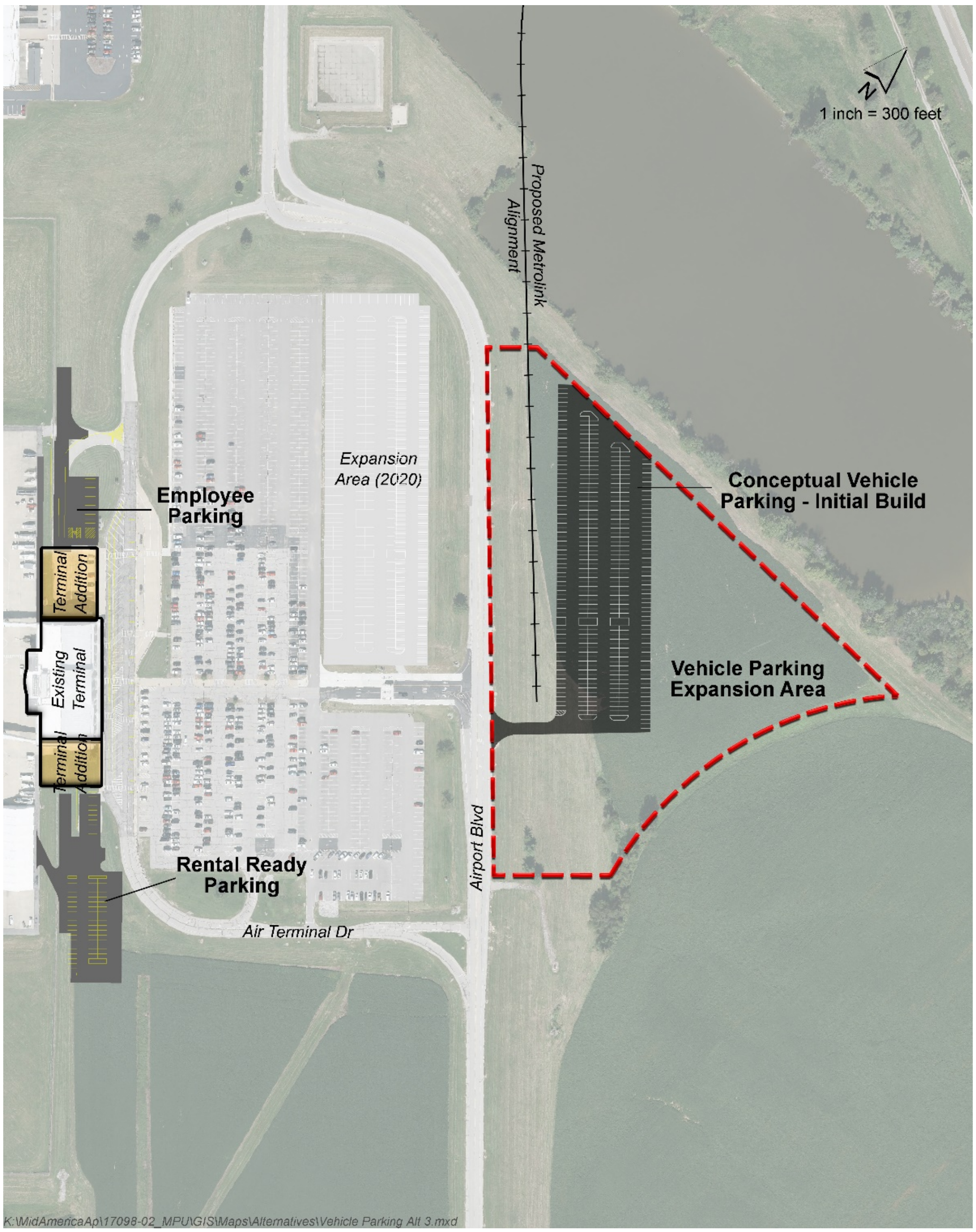
EVALUATION	SCORE
Proximity to Terminal	-1
Expansion Capability	+1
Parking Stratification	+1
Airport Boulevard/Air Terminal Drive Impact	-1
PAL 4 Demand	+1

Source: CMT

Alternative 3

Alternative 3 assumes a new parking lot which will provide 486 additional parking spaces, located northeast of the terminal building. Exhibit 4.4-3*, Passenger Vehicle Parking Alternative 3* depicts the alternative. Table 4.4-6, *Passenger Vehicle Parking Alternative 3 Capacity* shows the dimension of the alternative, and Table 4.4-7, *Passenger Vehicle Parking Alternative 3 Evaluation* shows the evaluation of this alternative.

Exhibit 4.4-3: Passenger Vehicle Parking Alternative 3



Source: CMT

Table 4.4-6: Passenger Vehicle Parking Alternative 3 Capacity

POTENTIAL NUMBER OF ADDITIONAL PARKING SPACES	VALUE
Total New Pavement Area (ft^2)	132,524
New Parking Spaces	486
Existing Spaces	1,796
Total	2,282

Source: CMT, Republic Parking

As shown in the exhibit, the parking location is not located close to the terminal so that passenger conveyance is needed for passenger transport. The alternative does provide expansion capability as the proposed project area does not have major facilities nearby, so an expansion would be feasible in the future. The alternative's total area does provide the possibility for parking stratification due to the broad number of new parking spaces. There is no major re-routing to Airport Blvd and Air Terminal Dr to accommodate the new parking spaces, but it is expected to see traffic disruptions on Airport Blvd during construction, which is why this criterion receives as zero. The alternative meets PAL 4 demand.

Table 4.4-7: Passenger Vehicle Parking Alternative 3 Evaluation

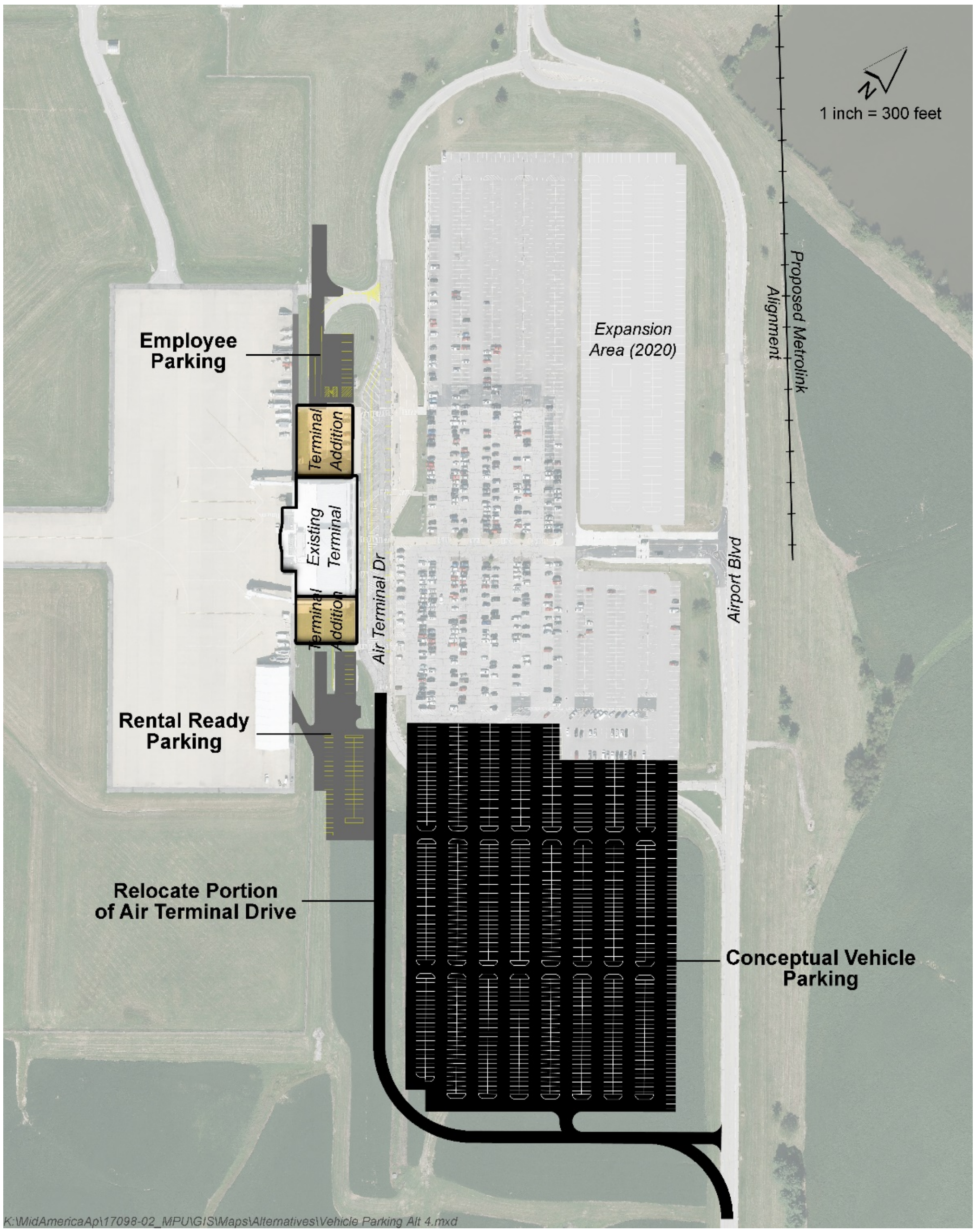
EVALUATION	SCORE
Proximity to Terminal	-1
Expansion Capability	+1
Parking Stratification	+1
Airport Boulevard/Air Terminal Drive Impact	0
PAL 4 Demand	+1

Source: CMT

Alternative 4

Alternative 4 assumes a new parking lot which will provide 1,068 additional parking spaces, located east of the terminal building. **Exhibit 4.4-4, *Passenger Vehicle Parking Alternative 4*** depicts the alternative. **Table 4.4-8, *Passenger Vehicle Parking Alternative 4 Capacity*** shows the dimension of the alternative, and **Table 4.4-9, *Passenger Vehicle Parking Alternative 4 Evaluation*** shows the evaluation of this alternative.

Exhibit 4.4-4: Passenger Vehicle Parking Alternative 4



Source: CMT

Table 4.4-8: Passenger Vehicle Parking Alternative 4 Capacity

POTENTIAL NUMBER OF ADDITIONAL PARKING SPACES	VALUE
Total New Pavement Area (ft^2)	350,900
New Parking Spaces	1,158
Existing Spaces	1,796
Total	2,954

Source: CMT, Republic Parking

As shown in the exhibit, the alternative is located close to the terminal so that passenger conveyance is not needed for passenger transport. The alternative does provide expansion capability as the proposed project area does not have major facilities nearby, so an expansion would be feasible in the future. The alternative's total area does provide the possibility for parking stratification due to the broad number of new parking spaces. However, an extension of Air Terminal Dr is required to accommodate the new parking spaces. The alternative meets PAL 4 demand.

Table 4.4-9: Passenger Vehicle Parking Alternative 4 Evaluation

EVALUATION	SCORE
Proximity to Terminal	+1
Expansion Capability	+1
Parking Stratification	+1
Airport Boulevard/Air Terminal Drive Impact	-1
PAL 4 Demand	+1

Source: CMT

Passenger Vehicle Parking Alternatives Summary

Table 4.4-10, *Passenger Vehicle Parking Alternatives Summary* show the qualitative evaluation and total score for every alternative discussed previously.

Table 4.4-10: Passenger Vehicle Parking Alternatives Summary

EVALUATION	ALT 1	ALT 2	ALT 3	ALT 4
Proximity to Terminal	+1	-1	-1	+1
Expansion Capability	-1	+1	+1	+1
Parking Stratification	-1	+1	+1	+1
Airport Blvd/Air Terminal Dr Impact	+1	-1	0	-1
PAL 4 Demand	-1	+1	+1	+1
Total Score	-1	+1	+2	+3

Source: CMT

As shown in this table, Alternative 4 is the alternative with the highest score. This alternative has a positive outcome in all evaluation criteria that were analyzed, except for the impact it may have on Air Terminal Drive during construction. Therefore, this is the recommended alternative for Passenger Vehicle Parking.

4.5 Support Facilities

In the previous Master Plan chapter, Chapter 3 – Facility Requirements, the Support Facilities requirements were identified. The Support requirements analyzed three elements of landside operations: Airport Maintenance & Snow Removal Equipment (SRE), Aircraft Fuel Storage and De-Icing Fluid Storage. The subsequent sections will analyze the different alternatives for each one of these elements.

4.5.1 Airport Maintenance & Snow Removal Equipment (SRE) Expansion

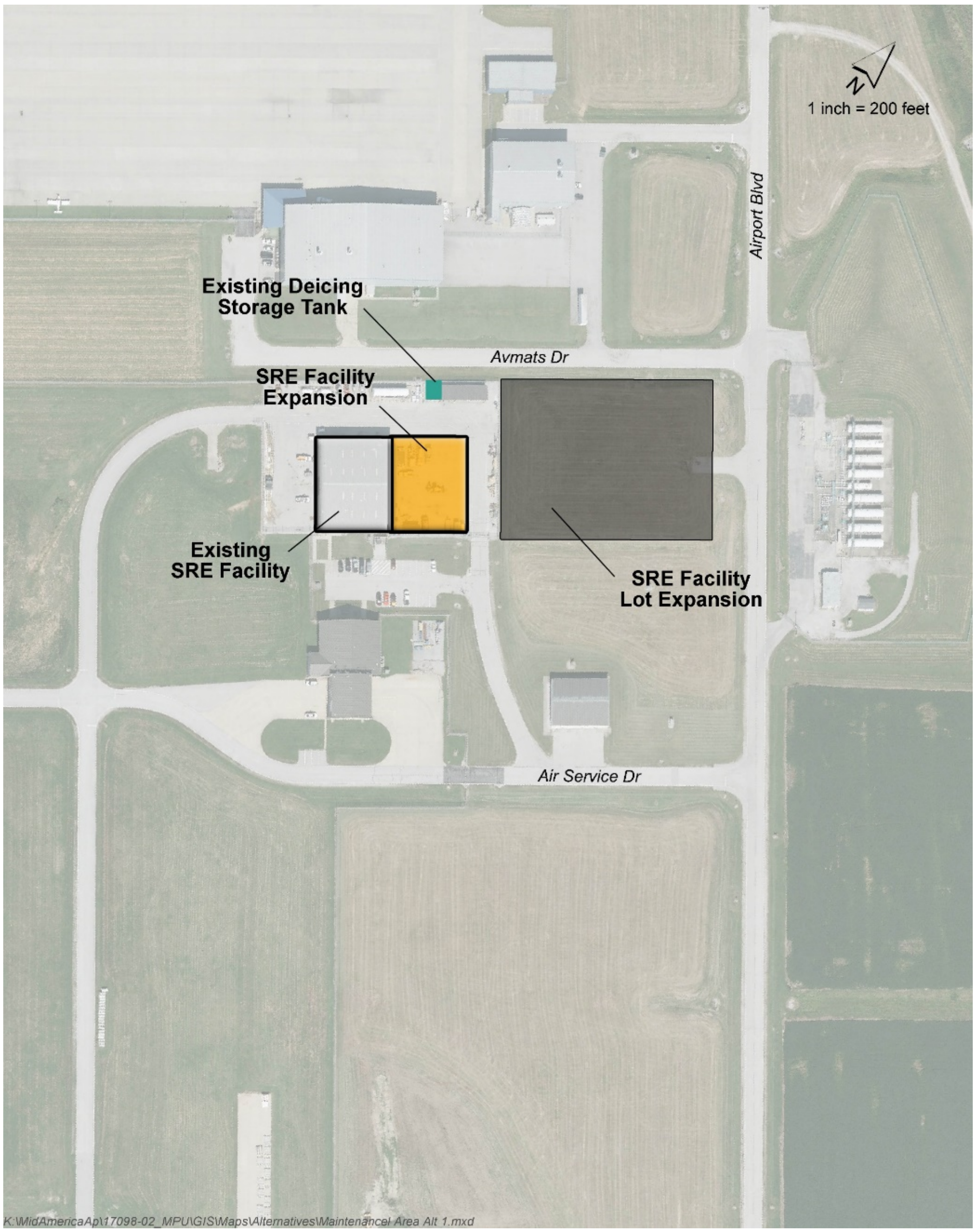
The previous chapter - Facility Requirements, shows that there is a need to increase the current Airport Maintenance Facility Site and current Airport Maintenance Facility Building at BLV. The previous chapter identified the current Airport Maintenance Site area is 53,432 ft^2 and the Maintenance Building area is 12,335 ft^2. The previous chapter shows that a 90,000 ft^2 Maintenance Site area and 25,700 ft^2 Maintenance Building are needed to meet PAL 4 requirements. Two alternatives have been developed to increase the capability of the Airport Maintenance & SRE storage.

When comparing the two alternatives, there are no major differences between Alternative 1 and 2 except for the location of the new Airport Maintenance Building. For this reason, a qualitative evaluation is not required.

Alternative 1

Alternative 1 assumes the new SRE Facility will be an expansion of the current building, and the SRE Facility Lot expansion will be located next to the building. This alternative will provide a 100,894 ft^2 site area and a 24,725 ft^2 building area. **Exhibit 4.5-1**, *Airport Maintenance & SRE Alternative 1* depicts the alternative. **Table 4.5-1**, *Airport Maintenance & SRE Alternative 1 Capacity* shows the dimension of the alternative.

Exhibit 4.5-1: Airport Maintenance & SRE Alternative 1



Source: CMT

Table 4.5-1: Airport Maintenance & SRE Alternative 1 Capacity

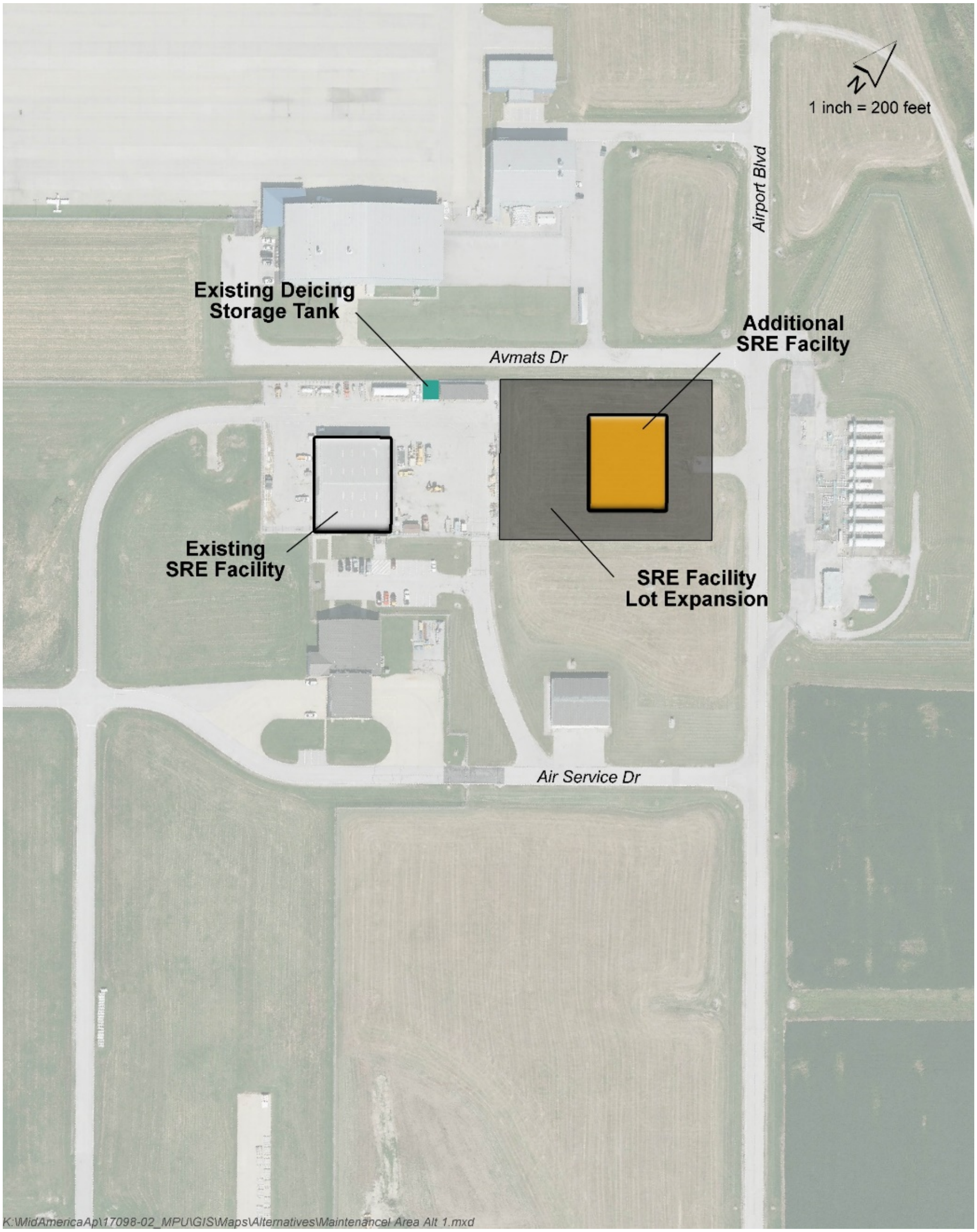
ALTERNATIVE 1	VALUE
New Site Area (ft^2)	59,852
New Building Area (ft^2)	12,390
EXISTING CAPACITY WITH ALTERNATIVE 1	**VALUE**
Site Area (ft^2)	41,042
Building Area (ft^2)	12,335
TOTAL	**VALUE**
Site Area (ft^2)	100,894
Building Area (ft^2)	24,725

Source: CMT

Alternative 2

Alternative 2 assumes the new SRE Facility will be separate from the existing facility, and the SRE Facility Lot expansion will be located next to the existing building. This alternative will provide a 100,894 ft^2 site area and a 24,725 ft^2 building area. Exhibit 4.5-2*, Airport Maintenance & SRE Alternative 2* depicts the alternative. Table 4.5-2, *Airport Maintenance & SRE Alternative 2 Capacity* shows the dimension of the alternative.

Exhibit 4.5-2: Airport Maintenance & SRE Alternative 2



Source: CMT

Table 4.5-2: Airport Maintenance & SRE Alternative 2 Capacity

ALTERNATIVE 2	VALUE
New Site Area (ft^2)	47,462
New Building Area (ft^2)	12,390
EXISTING CAPACITY WITH ALTERNATIVE 2	**VALUE**
Site Area (ft^2)	53,432
Building Area (ft^2)	12,335
TOTAL	**VALUE**
Site Area (ft^2)	100,894
Building Area (ft^2)	24,725

Source: CMT

As shown in Exhibits 4.5-1 and 4.5-2, both alternatives are the same in terms of the extra storage capacity that they will provide. The only difference is the location of the additional SRE Facility.

4.5.2 Aircraft Fuel Storage

The previous chapter - Facility Requirements, identified a geometric access issue for trucks when they deliver fuel to the existing fuel farm at BLV. The alternative developed for this element focuses on solving the access issue while considering potential development of an additional fuel farm in the future.

For this item, since there is one alternative, a qualitative evaluation is not required.

Fuel Truck Storage Alternative

The alternative assumes the construction of a new truck access roadway that will allow trucks to enter the existing fuel farm without the need to back up on Airport Blvd. Currently, due the lack of road space to turn, trucks must back up on Airport Blvd to access the farm.

The alternative also assumes that a piece of land located next to the existing fuel farm will serve as the potential location of a second fuel farm in the future. The potential land for fuel farm expansion has an area of 13,395 ft^2 and the new access roadway will have an area of 12,104 ft^2. Exhibit 4.5-3*, Aircraft Fuel Storage Alternative* depicts the alternative.

Exhibit 4.5-3: Aircraft Fuel Storage Alternative

Source: CMT

4.5.3 De-icing Fluid Storage

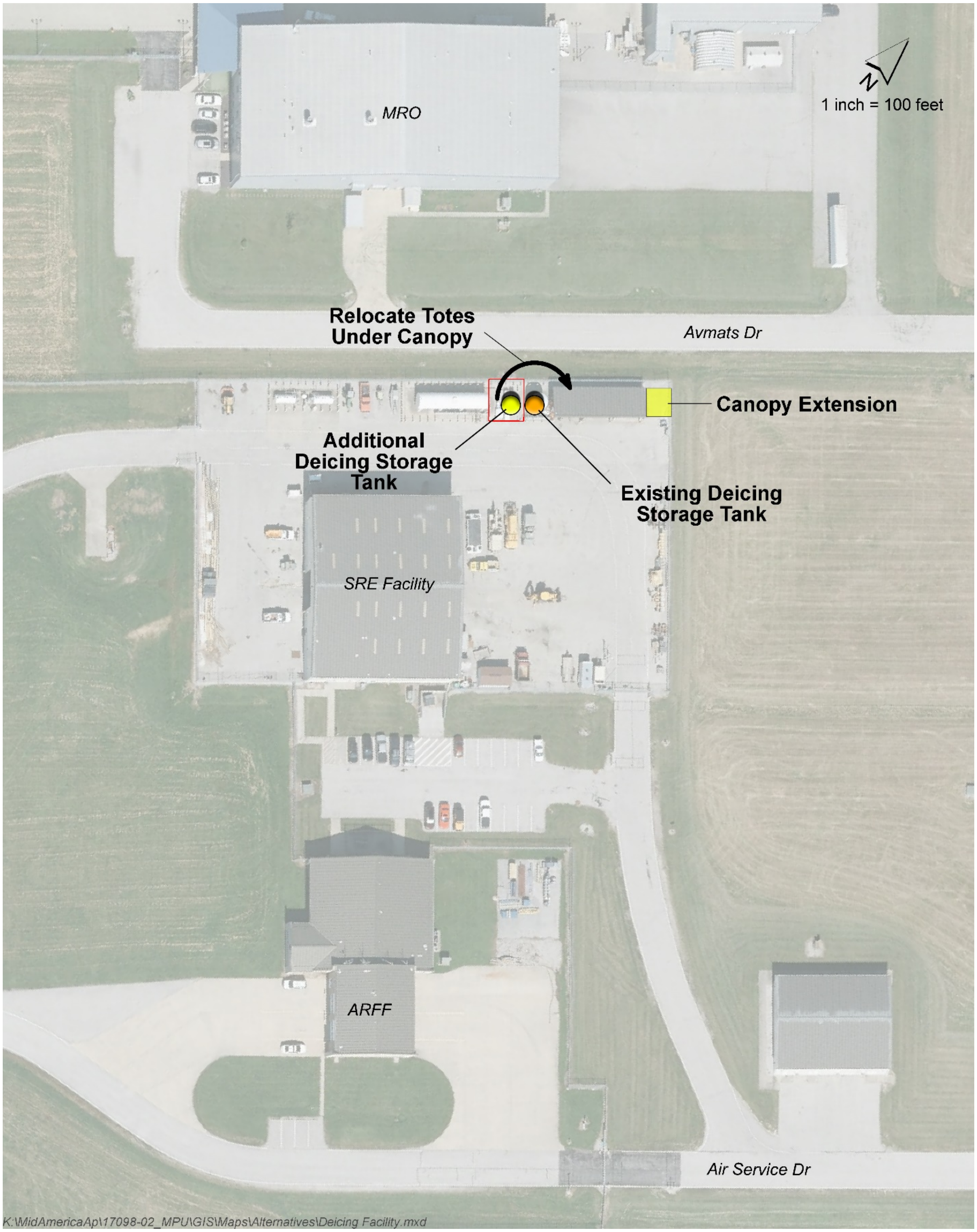
The previous chapter - Facility Requirements, identified that Type I de-icing fluid will have a demand of 18,629 gallons in PAL 4. Currently, BLV has one 9,000 gallons tank to store Type I de-icing Fluid. The previous chapter also showed that Type IV de-icing fluid is currently stored in totes, which will cover the demand for this type of fluid through the planning period.

For this item, since there is one alternative, a qualitative evaluation is not required.

De-icing Fluid Storage Alternative

The alternative assumes the addition of a second tank for Type I de-icing fluid. This tank will be located next to the existing tank. The totes which store Type IV de-icing fluid will be relocated under the existing canopy. However, at this moment there is no spare capacity beneath the existing canopy for tote storage. For this reason, the existing canopy will have to be expanded to the east side to create additional space for tote storage. This alternative also consists of storing the de-icing equipment inside the new Airport Maintenance Facility during non-de-icing season. Exhibit 4.5-4*, De-icing Fluid Storage Alternative* depicts the alternative.

Exhibit 4.5-4: De-icing Fluid Storage Alternative



Source: CMT

4.6 Ancillary Airport Discussion Topics

An airport is a community's long-term transportation investment in itself and in its future. Numerous development items can impact an airfield of which some are not in the Airport's direct control. The following action items are noted herein for future review. Their development within this Airport Master Plan planning horizon is unclear at the time this report is being prepared.

4.6.1 MetroLink

The Bi-State Development Agency is the operator of the Metro public transportation system for the greater St. Louis region. MetroLink is the light-rail component of that system and serves both Illinois and Missouri. Presently, Metrolink's last system stop is at Shiloh/Scott Air Force Base. There are plans to extend the Metrolink rail system from Shiloh/Scott to the MidAmerica St. Louis Airport's Air Passenger Terminal Core. Almost the entire Metrolink right of way will be on MidAmerica St. Louis Airport property and will cross numerous roads and the Silver Creek floodplain. In 2020, the State of Illinois approved $96 million to initiate the Metrolink extension efforts. To date the Airport has had discussions with the St. Clair County Transit District, the operator for Metro in Illinois and proposed a new terminus for the extension. Presently the planning efforts in the Airport Master Plan Update and the proposed MetroLink project appear to be compatible. **Exhibit 4.6-1** shows the proposed MetroLink alignment.

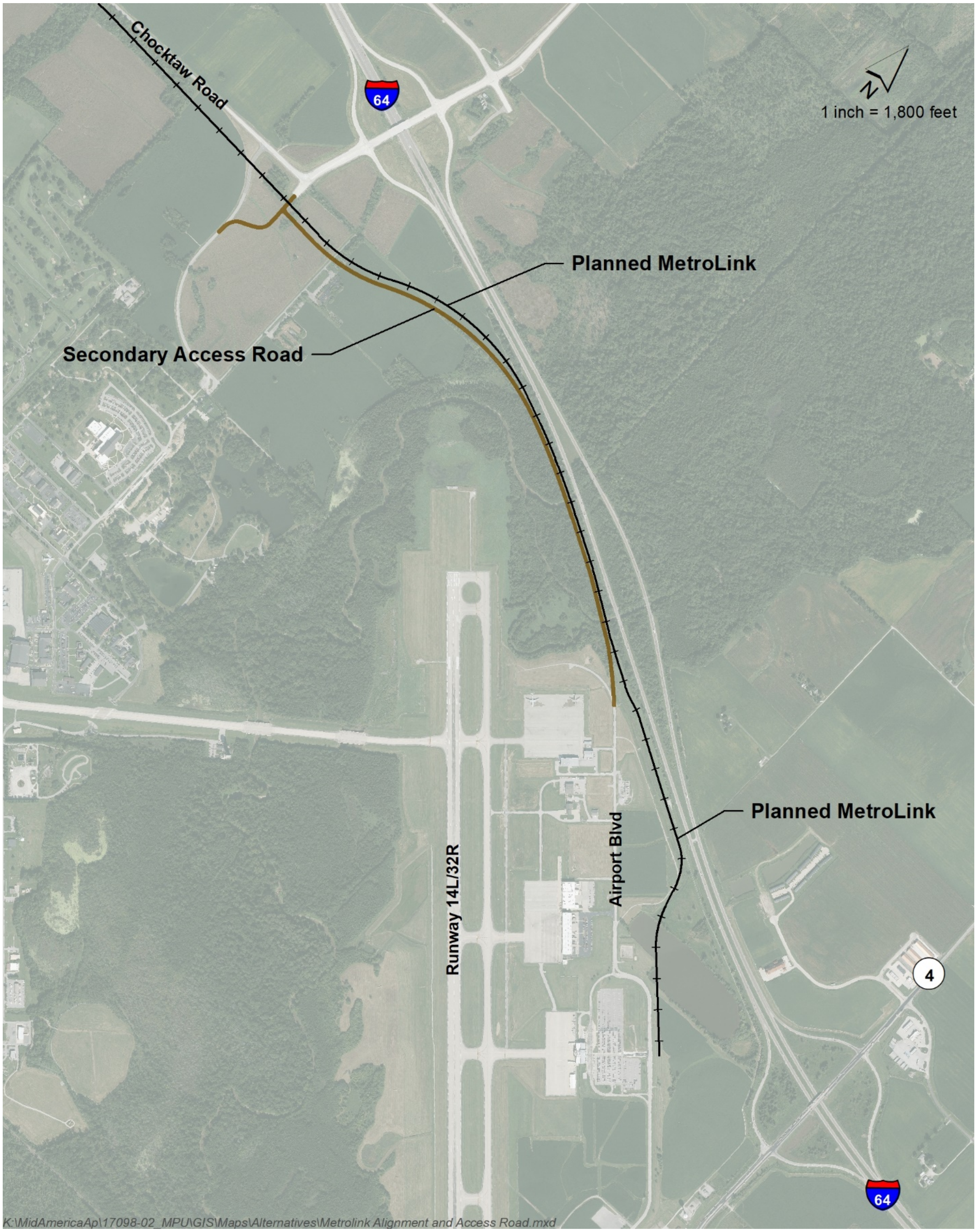
4.6.2 Secondary Access Roadway

All landside facilities (Air Passenger Terminal, Boeing, North Bay Produce, AVMATS, Illinois State Police, etc.) at MidAmerica St. Louis Airport are served by a single access roadway, Airport Boulevard. Airport Boulevard is in essence an airport cul-de-sac. The Airport has in the past expressed security and safety concerns regarding the limited access, specifically regarding first responders. MidAmerica St. Louis Airport has proposed on numerous occasions that a Secondary Access Roadway be constructed to the west to connect with Rieder Road. This new roadway would start at the present terminus of Airport Boulevard near the Illinois State Police Hangar and cross over the Silver Creek floodplain. The Secondary Access Roadway alignment could then use now abandoned Choctaw right-of-way to then reach Rieder Road. As part of the previously discussed MetroLink discussion, an access roadway will be constructed to parallel the light-rail alignment for safety and security. Since the roadway is a part of the MetroLink effort, the Airport Master Plan and the Secondary Access Roadway project appear to be compatible. **Exhibit 4.6-1** shows the proposed Secondary Access Roadway.

4.6.3 SA CAT II SIAP Runway 32R

The FAA has approached the Airport on commissioning a Special Approach Category II Standard Instrument Approach Procedure (SIAP) for Runway 32R. The FAA has offered airports with runways over 8,000 feet, and which presently have 2 Runway Visual Range (RVRs), to install this SIAP. It is anticipated that an additional RVR would need to be installed for this SIAP to be viable. It is unclear at the time this report is being prepared as to the timeline for such a development. Presently the planning efforts in the Airport Master Plan Update and the addition of a SA CAT II SIAP for Runway 32R appear to be compatible.

Exhibit 4.6-1: MetroLink Alignment and Proposed Secondary Access Roadway



Source: CMT

4.7 Next Steps: Airport Layout Plan (ALP)

After the recommended alternatives have been established in Chapter Four of this Master Plan Update, the next is to develop the Airport Layout Plan (ALP).

An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor 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.

BLV's ALP will depict existing airport facilities and the proposed developments as determined from this Master Plan Update review of the aviation activity forecasts, facility requirements, and alternatives analysis.

Chapter Five

Implementation Plan

The following section presents a description of the long-term physical development program for MidAmerica St. Louis Airport (BLV). The facility improvements identified in the previous sections as potentially being necessary over the 20-year planning period to accommodate aviation demand will be added to the Capital Improvement Plan (CIP). Many of the projects identified in the CIP are required to either meet existing demand due to substantial airline passenger growth or to meet the needs of existing and future aeronautical users. The following implementation plan has been developed using 2020 dollars. Implementation of individual projects within their specific development years may require adjustments for inflation and specific funding resources that are available.

5.1 Capital Improvement Plan (CIP) and Schedule

The long-term physical development program for the Airport has been separated into three planning phases, short-term (0-5 years), medium-term (6-10 years) and long-term (11-20 years) and demand driven. The demand driven planning phase included with the long-term projects represents a group of improvements that address capacity issues associated with potential future aviation demand but are still very speculative in terms of the exact timing of the trigger point. While this group of projects has not been slotted into a program timeframe, estimated costs have been provided to understand the potential magnitude of the projects. As demand approaches the need for these improvements, it is recommended that a reevaluation be conducted to the most appropriate improvement and a more specific timeframe for implementation.

5.1.1 Short-Term CIP

The focus of the short-term CIP includes various airfield projects, facility improvements, equipment acquisitions and obstruction mitigation efforts. A large emphasis is placed on addressing on-going modifications to the passenger terminal building as well as infrastructure development to support existing and new aeronautical users. Assuming successful completion of the 2021 and 2022 projects shown in Table 5.1-1, *Short-Term CIP Project Table* and Figure 5.1-1, *Short-Term CIP Project Map*, significant investments will have been made between 2019 and 2022 to BLV's passenger terminal building, while providing critical infrastructure, both airside and landside, to allow for aeronautical growth. Within these first two years a tree obstruction removal program will be completed allowing for unobstructed view from the Air Traffic Control Tower (ATCT) and mitigation efforts to clear obstacles identified on the Airport Layout Plan (ALP). Additional projects within the first two years include lighted airfield sign improvements, airport access roadway improvements, airfield service road improvements, and acquisition of two aircraft rescue and firefighting (ARFF) vehicles.

The remaining three years of the short-term CIP shift the focus from the passenger terminal building and new aeronautical infrastructure to the airfield and support facilities. While the overall pavement condition of the airfield is generally in good condition, a surface overlay on Taxiway Golf is needed in areas of the taxiway over the tunnels. Additional airfield improvements include continuing airfield service road improvements, the design and construction to expand the Terminal Apron and widening of the Runway 14L/32R shoulders and constructing new blast pads at each runway end. A new snow removal equipment (SRE) facility will be constructed to expand upon the existing maintenance building while additional pieces of SRE will be acquired to replace existing equipment scheduled for retirement. Airport access roadway widening, and intersection improvements will also continue. Additionally, the construction of a general aviation (GA) community hangar will be developed, a passenger terminal building expansion to accommodate a Federal Inspection Services (FIS) facility, and the installation of backup power generators at the ARFF building and airfield electrical vault have been identified.

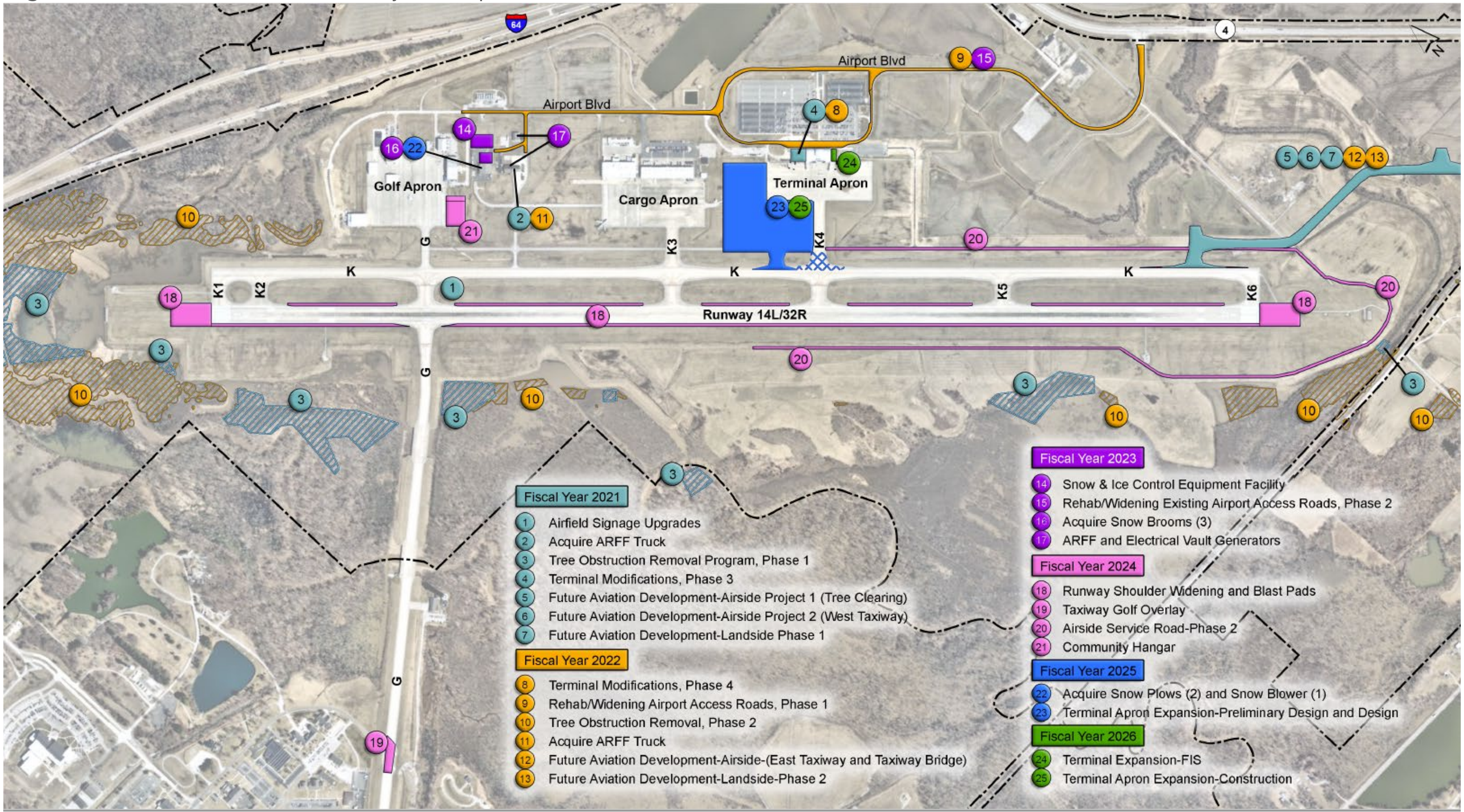
Total development cost for projects identified in the short-term CIP are estimated at approximately $134.5 million. The estimated costs for the airfield and airside aeronautical development projects (approximately $80.6 million) and to complete the passenger terminal building modifications (approximately $33.9 million) are the largest project elements identified in the short-term CIP. Table 5.1-1, *Short-Term CIP Project Table* and Figure 5.1-1, *Short-Term CIP Project Map* provide a list of projects identified in the short-term CIP with total project costs. Also included is an anticipated detailed cost allocation table (federal, state, local participation) for the short-term CIP projects.

Table 5.1-1 – Short-term CIP Project Table

Project Number	Year	Project Title	Total Estimated Project Cost	Funding Source	Federal Entitlement Share	Federal Discretionary Share	State Share	Local Share
1	2021	Airfield Signage Upgrades	$134,000	F/S/L	-	$120,600	$6,700	$6,700
2	2021	Acquire ARFF Truck	$1,508,000	S	-	-	$1,508,000	-
3	2021	Tree Obstruction Removal Program (Phase 1)	$465,000	F/L	$418,500	-	-	$46,500
4	2021	Terminal Modifications - Phase 3	$7,298,816	F/L	$1,580,000	$4,918,816	-	$800,000
5	2021	Future Aviation Development - Airside Project 1 (Tree Clearing)	$100,000	S	-	-	$100,000	-
6	2021	Future Aviation Development - Airside Project 2 (West Taxiway)	$9,200,000	S	-	-	$9,200,000	-
7	2021	Future Aviation Development - Landside - Phase 1	$760,000	S	-	-	$760,000	-
8	2022	Terminal Modifications - Phase 4	$8,531,601	F/L	$1,610,000	$5,921,601	-	$1,000,000
9	2022	Rehab / Widen Existing Airport Access Roads-Ph 1	$1,205,000	F/S/L	-	$1,084,500	$60,250	$60,250
10	2022	Tree Obstruction Removal Program (Phase 2)	$485,000	F/L	-	$436,500	-	$48,500
11	2022	Acquire ARFF Truck (MAP Request)	$1,000,000	F/L	$900,000	-	-	$100,000
12	2022	Future Aviation Development - Airside - Project 3 (East Taxiway & Taxiway Bridge)	$32,200,000	S	-	-	$32,200,000	-
13	2022	Future Aviation Development - Landside - Phase 2	$1,916,000	S	-	-	$1,916,000	-
14	2023	Snow & Ice Control Equipment Facility	$5,190,000	F/L	$1,610,000	$3,061,000	-	$519,000
15	2023	Rehab / Widen Existing Airport Access Roads-Ph 2	$2,500,000	F/S/L	-	$2,250,000	$125,000	$125,000
16	2023	Acquire Snow Brooms (3) (Map Request)	$2,261,000	F/L	-	$2,034,900	-	$226,100
17	2023	ARFF and Electrical Vault Generators	$283,000	F/L	-	$254,700	-	$28,300
18	2024	Runway Shoulder Widening & Blast Pads	$5,700,000	F/S/L	$610,372	$4,519,628	$285,000	$285,000
19	2024	Taxiway Golf Overlay	$225,000	F/S/L	-	$202,500	$11,250	$11,250
20	2024	Airside Service Road, Phase 2 (Map Request)	$2,123,000	F/S/L	-	$1,910,700	$106,150	$106,150
21	2024	Community Hangar	$10,363,000	S/L	-	$0	$5,181,500	$5,181,500
22	2025	Acquire Snowplows (2) & Snow Blower (1)	$2,436,000	F/L	-	$2,192,400	-	$243,600
23	2025	Terminal Apron Expansion – Pre-Design and Design	$1,490,000	F/S/L	$1,341,000	-	$74,500	$74,500
24	2026	Terminal Expansion - FIS	$18,140,000	F/L	$1,879,000	$14,447,000	-	$1,814,000
25	2026	Terminal Apron Expansion - Construction	$19,070,000	F/S/L	-	$17,163,000	$953,500	$953,500

Source: CMT April 2021. F-Federal. S-State. L-Local.

Figure 5.1-1 – Short-Term CIP Project Map



Source: CMT April 2021

5.1.2 Medium-Term CIP

The medium-term CIP is intended to shift the focus from the terminal and support facilities outlined in the short-term CIP, to airfield geometry and pavement rehabilitation projects. Several of the rehabilitation projects in the medium-term CIP could be candidates for inclusion in the short-term CIP should funding become available (Taxiway Golf, Kilo 3, Kilo 4 and Kilo 5 rehabilitation). Specific years or priorities are not assigned to these projects to provide BLV with the flexibility to configure future medium-term CIP's as future conditions require.

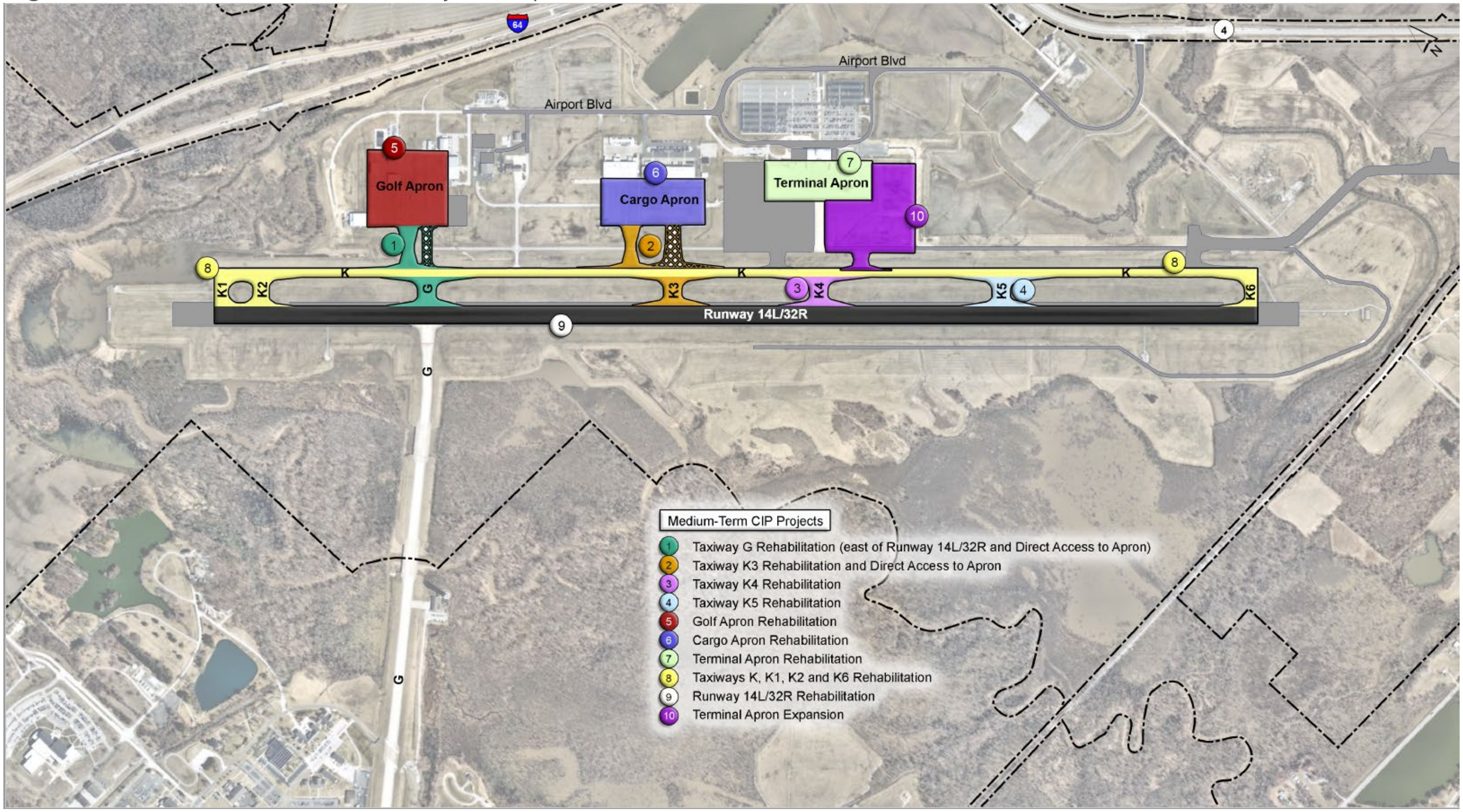
Total estimated development cost for projects identified in the medium-term CIP equals nearly $14 million. The two largest projects of the medium-term CIP include rehabilitating the parallel taxiway (Kilo) and associated connector taxiway pavements, and rehabilitating part of Taxiway Golf while realigning the portion that provides direct access from the apron to the runway (FAA designated Hot Spot 2), account for approximately $9.0 million of the total development cost for the medium-term CIP. **Table 5.1-2, *Medium-Term CIP Project Table*** and **Figure 5.1-2, *Medium-Term CIP Project Map*** provide a list of projects identified in the medium-term CIP with total estimated project costs. Detailed cost allocations will not be provided for the medium-term CIP due to likelihood of changes in funding levels and participation levels/eligibility in future federal and state regulations. Anticipated funding sources, however, have been included. Additionally, information is provided to show the origin of the project as well as assumptions made regarding project elements or funding. The table below also shows the trigger as to the appropriate time to begin the planning process; the last column shows that most rehabilitation projects will be triggered when the PCI falls below a score of 70.

Table 5.1-2 – Medium-Term CIP Project Table

Project Number	Project Title	Total Estimated Project Cost	Anticipated Funding Source	Notes/Comments
1	Taxiway Golf Rehabilitation (east of Runway 14L/32R) and Direct Access to Apron	$3,890,000	F/S/L	Removes direct access geometry (Hot Spot 2). Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
2	Taxiway Kilo 3 Rehabilitation and Direct Access to Apron	$1,440,000	F/S/L	Removes direct access geometry. Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
3	Taxiway Kilo 4 Rehabilitation	$120,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
4	Taxiway Kilo 5 Rehabilitation	$120,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
5	Golf Apron Rehabilitation	$630,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
6	Cargo Apron Rehabilitation	$520,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
7	Terminal Apron Rehabilitation & Expansion	$450,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
8	Taxiways Kilo, Kilo 1, Kilo 2, and Kilo 6 Rehabilitation	$5,190,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.
9	Runway 14L-32R Rehabilitation	$1,390,000	F/S/L	Pavement maintenance project. PCI deterioration rate assumed. Assumed State funding below 70 PCI.

Source: CMT 2021. F-Federal. S-State. L-Local. PCI-Pavement Condition Index.

Figure 5.1-2 – Medium-Term CIP Project Map



Source: CMT 2021.

5.1.3 Long-Term & Demand Driven CIP

The long-term CIP project includes the installation of an Approach Lighting System (ALS) while the demand driven CIP includes Master Plan projects that have been slotted in this timeframe due to project trigger points at higher demand levels. The demand levels which will trigger the development of the long-term CIP projects are referred to as PAL 4 and are depicted in **Table 5.1-3** below.

Table 5.1-3 – Planning Activity Levels

PAL	PROJECTED YEAR	TOTAL ANNUAL ENPLANEMENTS	TOTAL ANNUAL OPERATIONS	TOTAL PEAK HOUR PASSENGERS	TOTAL PEAK HOUR OPERATIONS
Existing	2018	154,200	27,897	473	2
PAL 1	2022	247,500	30,100	502	3
PAL 2	2027	309,000	31,700	599	4
PAL 3	2032	364,900	33,500	670	4
PAL 4	2037	382,500	34,900	670	4

Source: InterVistas, CMT

The focus of the long-term CIP is to improve instrument approach capabilities and minimums by installing a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) to Runway 14L. The majority of this project would be the installation of facilities prior to the runway threshold, with additional improvements needed to the runway which include installing the lighting cabling and light elements; the physical in-pavement light receptacles (light cans) have previously been installed. In addition, the long-term CIP also includes the development of the passenger parking facilities in two different phases. The total estimated development cost for the project identified in the long-term CIP equals approximately $7.3 million. **Table 5.1-4,** ***Long-Term & Demand Driven CIP Project Table*** **and Figure 5.3-1,** ***Long-Term & Demand Driven CIP Project Map*** provide the project identified in the long-term CIP with total estimated project cost. Similar to the medium-term CIP, detailed cost allocations will not be provided for the long-term CIP, but anticipated project funding sources, project origin information and general assumptions are included in the Table.

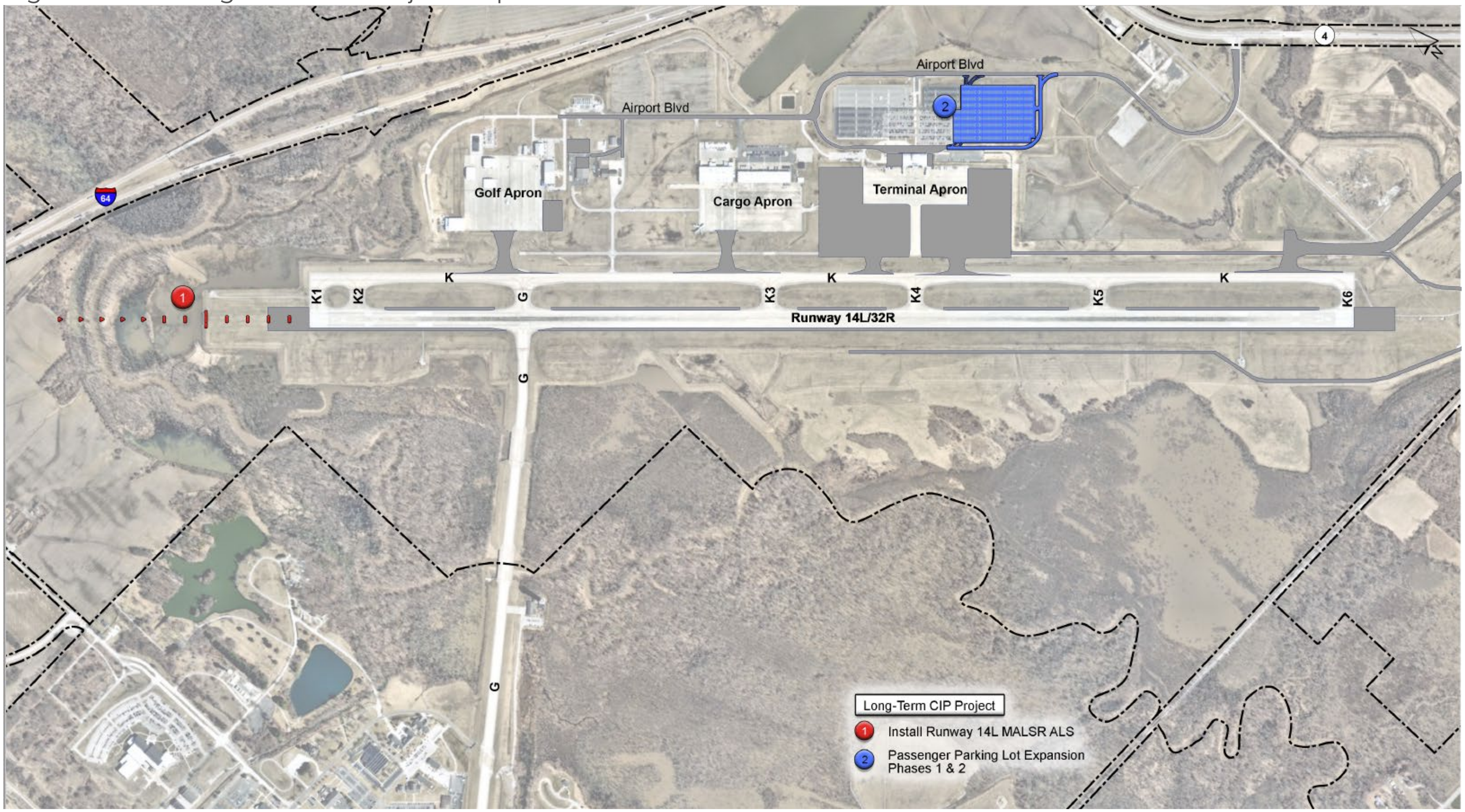
The demand-driven CIP projects, General Aviation (GA) development, represent projects with uncertain timeframes, justifications and funding sources that will be required if aviation demand warrants their implementation. Total estimated development costs for the projects identified in the demand-driven CIP are approximately $15.5 million. **Table 5.1-4,** ***Long-Term & Demand Driven CIP Project Table*** provides a list of projects identified in the demand-driven CIP with total estimated project costs.

Table 5.1-4 – Long-Term and Demand Driven CIP Project Table

Project Number	Project Title	Total Estimated Project Cost	Anticipated Funding Source	Notes/Comments
Long Term (11-20 years)				
1	Install 14L MALSR ALS	$1,110,000	Federal / State / Local	Master Plan project / Potentially fully federally funded
2	Passenger Parking Lot Expansion Phase 1	$2,100,000	Federally Eligible	Master Plan project
3	Passenger Parking Lot Expansion Phase 2	$4,120,000	Federally Eligible	Master Plan project
Demand Driven				
1	Golf Apron GA Development Phase 1 (Taxiway, Apron and Parking)	$5,030,000	Federally Eligible	Master Plan project
2	Golf Apron GA Development Phase 2 (Access Roads, Parking and Apron)	$4,420,000	Federally Eligible	Master Plan project
3	Golf Apron GA Development Phase 3 (Taxilane and Apron)	$6,090,000	Federally Eligible	Master Plan project

Source: CMT 2021.

Figure 5.1-3 – Long-Term CIP Project Map



5.2 Financial Plan

The following section will provide information on the financial framework of the Airport, potential funding sources, and a detailed cost allocation analysis for projects identified in the short-term CIP.

5.2.1 Financial Framework

The Airport is owned and operated by St. Clair County (County). The St. Clair County Department of Public Building Commission (PBC) directly oversees the Airport and is responsible for its financial oversight as well. The PBC is responsible for managing all County Buildings and BLV facilities.

5.2.2 Funding Sources

The following funding sources may be utilized during the implementation of the Airport's CIP.

AIRPORT IMPROVEMENT PROGRAM (AIP)

Airports such as BLV rely heavily on the AIP to finance airport development. AIP is a cost-sharing program that assists in the development of a nationwide system of public-use airports by providing funding for airport planning and development projects, including runways, taxiways, aprons, land purchases, airport access roads, safety and security projects, and certain terminal development. Funds obligated for AIP are drawn from the Airport and Airway Trust fund, which is supported by ticket taxes, fuel taxes, and other similar revenues sources.

AIP funding is administered through both entitlement and discretionary grant programs. The entitlement program for primary commercial service airports is apportioned based on their annual passenger enplanement levels. Discretionary grants are distributed based upon a system of set-aside categories and national priority ratings. Airport projects must compete for these funds based upon their national priority, a value based upon both the type of project and airport. AIP funding can only be used on construction and planning related projects. AIP funding cannot be used for maintenance items, operating expenses or debt repayment. The federal share of eligible projects seeking AIP entitlement and/or discretionary funding is currently 90% for non-hub airports like BLV.

STATE OF ILLINOIS FUNDING

The primary State funding agency for Airports in Illinois is the Illinois Department of Transportation (IDOT), Division of Aeronautics (IDA). IDA provides an additional funding source for all federally eligible aviation developments and may provide certain levels of funding for ineligible or low priority projects. In normal activities, IDA uses several funding options. Additional description of these options is as follows:

- State Matching on Federal Fund Sources (AIP entitlement and discretionary funds) – These funding options can be used to reduce the Airport Sponsor's total financial participation. Normally, funding percentages (percentages can vary) are 90% Federal Share, 5% State Share and 5% Local Share. These funding percentage options can vary depending on the availability of State funds.

- State-Local Funding Using General Revenue Funds – In the past, State-Local funds have come from the State's General Revenue source of funding. However, several years ago, IDA stepped away from using General Revenue funds (GRF) due to the State's poor financial condition. The use of GRF funds has been a small source of State-Local project funding. For ineligible or low priority projects which will not receive federal funding, IDA has historically funded Planning and Environmental projects at 50%-50%, State-Local and Airport development options ranging from 75% to 90%, depending on the type of airport requesting funding. The timing of past State-Local funding programs has been somewhat inconsistent, and it is unclear when and/or if additional future programs can be anticipated.
- State-Local Funding Using Capital Bill Funding – The Capital Bill, approved in 2019, identified a $144M portion to be administered by IDA and used on Airports throughout Illinois. Currently, IDA has developed policy and procedures associated with distribution of these funds which is under internal review. Specific criteria for these funds are unknown at this time but there appears to be consensus on distributing the $144M over several years.

PASSENGER FACILITY CHARGE (PFC)

In 1990, Congress passed the Aviation Safety and Expansion Act. In this legislation, sponsoring public agencies of airports were authorized to collect a PFC subject to rules and regulations set forth by the Secretary of Transportation. The legislation authorized a maximum charge of $3.00 to be imposed by an airport on originating and connecting enplaning passengers (later raised to $4.50 through legislation). The revenues derived from PFCs may be used as a funding source for the local airport share of eligible capital project costs directly or they may be used to pay debt service on bonds issued to finance eligible airport projects. Legislation has been historically debated in the U.S. Congress to increase the PFC amount from $4.50 to $7.50, but there does not appear to be significant political momentum to revise legislation raising the PFC cap at this time.

The Airport has an active PFC program that has historically been used to service debt. BLV Staff has indicated that administration of the Airport's PFC Program will be handled separately, and the projects listed in the various PFC applications will not be included in this Master Plan. Presently, the Airport is in the process reviewing its PFC application program.

CUSTOMER FACILITY CHARGE (CFC)

A CFC is a user fee imposed by an Airport Sponsor on each rental car user, collected by various rental car companies. CFC collection processes can vary, with revenues collected based on each rental car transaction or by each rental car day. CFC revenues are generally used for capital and financing costs of rental car-related projects, such as consolidated rental car facilities or rental car quick turnaround facilities (QTA) and related roadway and parking facilities.

CFC's are regulated at the state level instead of the federal level. Therefore, the authorization, collection and project eligibility vary from state to state. In Illinois, CFC's regulated by the following Illinois statute: 625 ILCS 5/6-305 from Ch. 95 1/2, par. 6-305.

Similar to the PFC's, BLV Staff has indicated that administration of the CFC Program will be handled separately, and associated projects will not be included in this Master Plan.

5.2.3 Bonds

An airport sponsor may obtain the required local share of a project through bonds. The following section has been included as a reference. It is based on common industry standards and practices.

The airport sponsor will select the appropriate bond to acquire the necessary financing based upon the number of projects requiring local share monies and the type of airport. Airports typically use one of two types of bonds to fund capital development projects:

- General Obligation Bonds (GOB) – Payments to the bondholders are secured by the full faith, credit, and taxing power of the issuing governmental entity. An advantage of general obligation bonds is that they are typically issued at a lower interest rate due to the governmental guarantee. However, there are typically limits on the amount of general obligation debt that can be incurred, and many states require voter approval before issuing general obligation debt. In addition, typically general obligation bonds can only be financed for 10-15 years, increasing the monthly payment.
- General Revenue Bonds (GARB) – The debt service from these bonds is paid solely from the revenue received from the facility that was constructed with the proceeds of the bonds. This type of financing presents an opportunity to construct facilities without increasing the debt burden of the airport, since the debt is backed solely by the revenue generated by the facility. Because these bonds are not backed by an additional government guarantee and are therefore perceived as a greater risk, they typically have interest rates that are higher than general obligation bonds. One advantage of GARBs is they typically can be financed for a greater amount of time (25–30-year terms) resulting in lower monthly debt payments.

5.2.4 Local Funding

The balance of capital project costs, after consideration has been given to FAA grants, PFCs, and other funding sources, must be funded through airport resources. The future share of local costs identified in the short-term CIP is anticipated to be funded partially with airport funds derived from user charges and direct funding from the County.

5.2.5 Cost Allocation (Short-Term CIP)

As indicated previously, project cost allocations were only developed for projects identified in the short-term CIP. Table 5.1-1, *Short-Term CIP Project Table* provides a breakdown of funding levels by source for each project. The local share represents a range of funding sources the Airport may use (bonds, operating revenues, etc.).

Based on 2020 enplanement data, the Airport received approximately $1.5 million in FAA AIP entitlement funds for 2021. As enplanements (and entitlement revenues) grow, additional federal funds may become available which will require a periodic reevaluation of development goals and funding sources and uses. For the purpose of the short-term CIP, it is assumed that FAA discretionary funding levels will remain constant, but it is recommended that the Airport be prepared to re-evaluate the CIP should anticipated discretionary funding levels change.

5.3 Key Actions and Responsibilities

5.3.1 Project Development Tasks

Capital improvements at airports require a number of steps to be completed prior to construction activities begin. The following actions with associated responsibility are required:

- Sponsor Approval – depending on agreements signed with air carriers and/or tenants, the Airport may be required to receive approval by the air carriers and/or tenants for the proposed capital improvement project.
- Funding Applications – the Airport or their representing engineering firm must submit federal and state applications for funding well in advance of the anticipated construction date. Federal funding for capital improvement projects at airports is extremely competitive.
- Environmental Documentation – the Airport, under the National Environmental Protection Act (NEPA), and in accordance with FAA policies, must submit the necessary environmental documentation and receive approval by the appropriate agencies prior to federal funding being allocated to the proposed capital improvement project. Environmental documentation should be submitted early in the planning/design stage of a project due to the amount of time required to complete the environmental review process.
- Aeronautical Study Determination – the FAA must formally approve the airspace for Airport development/improvement projects. The Airport must submit the necessary airspace information and receive approval from the FAA as part of the FAA's grant assurances. Similar to environmental documentation, the airspace submittal should also be submitted early in the project planning/design stage due to the lengthy airspace review process.
- Land Acquisition – the Airport must secure any additional land resources (fee simple or avigation easement) necessary for the proposed capital improvement project prior to construction beginning. The Airport should begin the land acquisition process as soon as practicable as this process can take anywhere from 9 months to 2 or 3 years to complete depending on level of complexity.
- Project Design – this process involves the design of the proposed capital improvement project and typically takes between 36 and 60 weeks to complete depending on the level of complexity and the level of agency coordination.
- Agency Coordination Activities – depending on the size and complexity of the proposed capital improvement project, coordination and permitting with a number of agencies may be required. The time to complete coordination and permitting efforts with agencies is dependent on specific project details.
- Public Coordination Activities – depending on the size and complexity of the proposed capital improvement project (i.e., new runway or runway expansion), the Airport may need to complete a public outreach program to identify the benefits of the project and allow the public to provide critical feedback on potential impacts. The level of effort necessary to conduct a public outreach program is dependent on specific project details.

Chapter Six

Land Use Compatibility Plan

6.1 Introduction

Effective land use planning at an airport encourages land uses that are considered "compatible" to aeronautical activities to be located around an airport and strives to guide "incompatible" land uses away from an airport. The purpose of land use planning is to protect the public's health by minimizing noise exposure and safety hazards, and to ultimately safeguard the operations of the airport. There are two types of land use planning: on-airport and off-airport. It is the goal of both types of land use planning to promote land use compatibility between the land surrounding an airport and the aeronautical activities of an airport.

The MidAmerica St. Louis Airport (Airport or BLV), which is owned and operated by St. Clair County (County), is collocated with Scott Air Force Base (SAFB) and shares airfield facilities under a joint-use agreement. SAFB is a United States Department of Defense (DOD or military), Department of the Air Force (USAF) facility operated by the 375th Air Mobility Wing. In 2017 BLV recorded approximately 27,000 total aircraft operations (the military accounting for approximately 15,000 operations). In addition to military operations, BLV accommodates commercial air service, cargo operators, and general aviation (GA) activity.

Over the past 20 years there has been significant land use planning efforts led by the Airport, the DOD and the County, as well as cooperative joint initiatives comprising of the DOD, the Airport and the surrounding municipalities of unincorporated St. Clair County, City of Lebanon, City of Mascoutah, City of O'Fallon, and Village of Shiloh. These past land use planning efforts have set the framework for existing Airport land use controls that all the local municipal jurisdictions have adapted. Additionally, these planning efforts have led to the development of several land use planning documents that are currently used by the adjacent municipalities to safeguard the Airport and the communities. These documents and land use controls will be discussed in subsequent sections.

FAA recommends coordination between the airport planning and land use planning processes. This report chapter is intended to develop a high-level, general land use compatibility review that incorporates existing land use planning elements into the larger Airport Master Plan project, which is consistent with FAA's recommendation. The goal of this review is to determine if there are any incompatible land uses when compared to existing land use controls. This chapter is not intended to be a comprehensive, detailed assessment of land use around BLV. Should BLV desire a more focused analysis of land use in the surrounding environment, it is recommended that a separate study be conducted.

This chapter of the Master Plan will review prior land use planning initiatives, documents and zoning control mechanisms, and evaluate whether existing land use controls currently provide sufficient compatible land use protection for BLV and SAFB. The goals of this chapter are as follows:

- Provide overview of a land use compatibility plan
- Review existing land use initiatives and regulatory controls
- Identify surrounding municipal limits
- Identify the Airport Influence Area (AIA)
- Conduct high-level land use compatibility assessment
- Develop Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis
- Provide land use compatibility planning recommendations

6.2 Overview of a Land Use Compatibility Plan

Commercial service airports (and air force bases) are vital elements to a region's economy, as well as the national transportation system. Airport sponsors should strive to promote compatible land uses to be located around airports, while encouraging that incompatible land uses be located away from airports. It is important to understand the two types of land uses that will be evaluated – compatible and incompatible land uses. Identifying the types of land uses around an airport helps address potential airport compatibility impacts related to noise, safety, airspace protection and aircraft overflight.

6.2.1 Incompatible Land Uses

Incompatible land uses around airports jeopardize the safety and efficiency of aeronautical activities, and the quality of life of the community's residents. Incompatible land uses can include wildlife-attracting land uses such as wetlands and landfills, cell towers and antennae transmitting signals that interfere with radio transmissions and/or navigational aids, lights that may be disorienting to a pilot, and tall structures including towers and construction cranes that may impact an airport's airspace.

Common incompatible airport land uses comprise:

- Residential development
- Schools
- Community centers and libraries
- Hospitals
- Buildings used for religious services
- Tall structures
- Smoke and electrical signal generators
- Landfills and other bird/wildlife attractants

Residential development, particularly high-density development, is not compatible with airport operations due to aircraft noise impacts and safety reasons. Within an airport's noise impact areas, residential and public facilities such as schools, churches, public health facilities, and concert halls are sensitive to high noise levels and can affect the development of the airport.

In some cases, the airport sponsor has not purchased or protected sufficient lands around the airport to prohibit the infringement of incompatible land uses. Conversely, incompatibility may occur because an airport project has expanded in proximity of an existing residential neighborhood.

Land use decisions that conflict with aeronautical activity and airport facilities can result in undue constraints being placed on an airport. In order to enable this sector of the economy to continue to expand, to provide for a wide variety of job opportunities for local citizens, and to meet the needs of the traveling public, it is vitally important that airports operate in an environment that maximizes the compatibility of the airport with off-airport development.

6.2.2 Compatible Land Uses

As mentioned above, the objective of compatible land use planning is to encourage land uses that are generally considered to be incompatible with airports (such as residential, schools, and churches) to be located away from airports. In a similar way, compatible land use planning encourages land uses that are more compatible with an airport environment, such as industrial and commercial uses, to be located around airports.

Common compatible airport land uses comprise:

- Motels/Hotels
- Restaurants
- Warehouses
- Shipping Agencies
- Aircraft-related industries
- Aeronautical-related companies
- Industries that benefit from the access to the airport

Other uses that may be compatible with airports are:

- Large parks
- Conservatory areas and other open spaces
- Forestry services
- Landscape services
- Golf courses

These land uses are created for public purposes and are opportunities for local government bodies to provide facilities that serve another public purpose to protect airport operations.

Agriculture is another land use that is compatible with airport operations so long as the use is not a wildlife attractant. Agricultural use of land near an airport permits the owner of the property to efficiently use land while providing an additional benefit to the community for airport protection.

6.3 Existing Land Use Initiatives & Regulatory Controls

Federal land use planning guidelines exist for both military and civilian airports. The DOD establishes these guidelines for military airports while the Federal Aviation Administration (FAA) sets the guidelines for civilian airports. Throughout past planning efforts, the guidelines set forth by the DOD and FAA have guided the various land use initiatives BLV, SAFB and the surrounding municipalities have been engaged in.

Within the past 20 years there are three documents that have been developed as the result of Airport land use planning at BLV and SAFB: Joint Land Use Study (JLUS) 2008; Air Installation Compatible Use Zone (AICUZ) 2010 (originally developed 2001); and the St. Clair County Comprehensive Plan 2011 (Comprehensive Plan). These three documents represent 20+ years of active land use planning around the Airport in efforts to prevent the incompatibility of surrounding land. Furthermore, St. Clair County utilized these various documents to establish a zoning district, known as the Airport Overlay (AO), for which the intent is to provide for uses and unique design requirements for lands adjacent to and within runway protection zones (RPZ), accident potential zones (APZ), airspace zones, and noise zones for the environs of Scott Air Force Base and the MidAmerica St. Louis Airport[1]. The conclusions and recommendations of the three documents mentioned above have resulted in all the adjacent municipalities adopting land use controls in the form of municipal zoning code. This AO is the governing land use control mechanism in place that safeguards the Airport against incompatible land use.

The following sections will review the existing land use initiatives and zoning ordinances that are currently implemented around BLV and SAFB as a means of land use control. This will include a review of the 2008 JLUS, 2010 AICUZ, and 2011 St. Clair County Comprehensive Plan, as well as reviewing the existing land use controls set forth by the St. Clair County Zoning Ordinance.

It should be noted that these past land use planning initiatives utilized regulatory and Airport specific criteria at the time the various land use planning documents were published. As such, over time, FAA criteria, as well as Airport specific design criteria (i.e Runway Design Codes (RDC), Runway Protection Zone (RPZ), etc.) dimensions may have changed. These changes may require revisions to the various land use mechanism tools implemented by the County and surrounding municipal jurisdictions, such as the shapes and sizes of a zoning district.

6.3.1 Existing Zoning Ordinances and Land Use Initiatives

As mentioned, BLV and SAFB have a long history of land use planning, spanning at least two decades. Both the Airport and the military have invested significant time and resources into ensuring the compatibility of surrounding land uses. The JLUS, AICUZ, and Comprehensive Plan illustrate three planning initiatives to date that demonstrate the Airport's, military's, and county's acknowledgement of the importance of land use planning near the Airport. The guidelines and recommendations of these three planning initiatives are generally utilized by the local municipalities as a means of preventing incompatible land near the Airport. These documents can also be used to aid local jurisdictions in

[1] St. Claire County Zoning Ordinance, revised January 1, 2020

developing local zoning ordinances. The following section will review the three planning documents, as well as review the zoning maps of the adjacent municipalities.

6.3.2 Land Use Initiatives

JOINT LAND USE STUDY (JLUS) 2008

The Scott Air Force Base/MidAmerica St. Louis Airport 2008 Joint Land Use Study (JLUS) is a cooperative land use planning initiative between the U.S. Air Force and the surrounding communities in the region. Partners in the JLUS include: The City of Lebanon, the City of Mascoutah, MidAmerica St. Louis Airport, the City of O'Fallon, Scott Air Force Base, the Village of Shiloh, and St. Clair County. This document serves as an ongoing guide to local governments and Air Force actions to enhance compatibility around Scott AFB and MidAmerica St. Louis Airport and strengthen the military-civilian relationship.

The purpose of the 2008 JLUS was to evaluate potential impacts of the military and civilian airport operations on surrounding communities and to create land use compatibility guidance and tools for assessing development around the Airport. The long-term goal of the 2008 JLUS was to reduce potential encroachment, accommodate growth, and sustain the regional economy. The 2008 JLUS planning initiative was intended to increase communication amongst the military and Airport, and the surrounding communities. As a result, the 2008 JLUS produced a coordinated zoning code adopted by all surrounding communities.

The recommendations of this plan included specific regulations relating to land use, intensity of use, communication, and other operational regulations. The recommendations were intended to address a variety of land use, operational and communication issues based on physical proximity to BLV and SAFB to promote compatible land uses near the Airport.

Because the JLUS zoning limits have been established and adopted in the local zoning codes of the surrounding communities and are the key to the joint compatibility planning between SAFB, BLV, and surrounding communities, the following sections will provide a summary of this agreement.

JLUS Purpose and Goals

The purpose of the JLUS is to ensure that surrounding communities can sustain economic activity without degrading the military readiness activities of Scott Air Force Base and civilian airport operations at the MidAmerica St. Louis Airport.

The goals of the study are to[2]:

- Clarify existing land use compatibility guidance and develop effective tools for assessing development around the base and Airport
- Increase communication among the military, the Airport, and surrounding communities

[2] St. Clair County Comprehensive Plan - 2011

- Evaluate the potential impacts of current and future military and airport operations on surrounding communities
- Evaluate the potential impacts of community growth on the long-term viability of Scott AFB and the Airport
- Recommend action items to reduce encroachment and facilitate future collaboration

Communication and Coordination Strategy

The main component of the JLUS is to increase communication among surrounding communities, Scott AFB, and MidAmerica St. Louis Airport. The JLUS process encourages residents, local decision-makers, military representatives, and airport operators to examine issues of compatibility and encroachment in an open and transparent forum, balancing both military and civilian interests.

The JLUS Report include a coordination strategy to guide decision makers and the public through the current planning process and to build the framework for successful implementation and monitoring.

JLUS Recommended Approach

The JLUS provided recommendations on several levels regarding land use, building codes, activity density, site layout, and building design as development occurs.

The largest geography or area defined in the JLUS for recommending policy is the **Primary Planning Influence Area**. Within the Primary Planning Influence Area lies the **Protection Area** which provides for several overlapping zones with increasing levels of land use compatibility guidance. All areas described in the JLUS agreement can be observed in **Exhibit 6.3-1**. The zones included in the JLUS report are the following[3]:

- Primary Planning Influence Area: lies within the larger JLUS study area with its boundary following natural and man-made features such as roads to assist local planners and officials in defining its limits. The recommendations for the Planning Influence Area deal primarily with standards for avigation easements and lighting and include:
  - Adopt outdoor lighting requirements.
  - Provide development permits to Scott AFB for review and advisory opinion.
  - Require real estate disclosure of proximity to Scott AFB or Airport to potential buyers.
  - Require avigation easements on all major subdivisions or rezoning approvals.
  - Adopt height restrictions as delineated by the Scott AFB/Airport approach and departure model.

[3] St. Clair County Comprehensive Plan - 2011

- Protection Area: lies within the Planning Influence Area and is divided into several sub-areas based on noise contours, safety and risk zones, and proximity to the base. Separate recommendations are made for military (Scott AFB) and civilian (MidAmerica St. Louis Airport) safety and risk zones based on the different requirements for each.
  - **Installation Perimeter Buffer Area:** includes all land within 1,500 feet of Scott AFB. The recommendations for the Installation Perimeter Buffer are listed below:
    - Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, a meeting of the Regional Advisory Board is triggered.
    - No structures greater than 3 stories, or 35 feet above ground level, should be permitted.
    - Mobile home parks, multi-family residential, group homes or hotels should not be permitted.
    - Provide a maximum density of two single-family dwelling units per acre.
  - **Military Runway Clear Zone:** is defined as the area at the end of a military runway that has the greatest risk of experiencing an aircraft accident. The area of the clear zone is 3,000 feet by 3,000 feet. Within the Military Clear Zone, no uses should be permitted except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space.
  - **Accident Potential Zone 1 (APZ 1):** is 3,000 feet wide by 5,000 feet long and is located immediately beyond the Clear Zone. The recommendations for APZ 1 were as follows:
    - Prohibit all residential uses, hotels, hospitals and clinics, nursing homes, childcare centers, schools, movie theaters and auditoriums, churches and places of worship, sports arenas, restaurants, and other places of large assembly.
    - The maximum gross acreage coverage for buildings on a lot should be 10% and the maximum assembly should be less than 25 people per acre per hour and not more than 50 at any one time. A sliding scale of employment density per shift and maximum acreage coverage should be utilized for industrial uses.
  - **Accident Potential Zone 2 (APZ 2):** is 3,000 feet wide by 7,000 feet long and is located at the end of APZ 1. General recommendations for APZ 2 are listed below:
    - Prohibit all residential uses, hospitals and clinics, nursing homes, childcare centers, schools, theaters and auditoriums, churches, sports arenas, restaurants, and other places of assembly.
    - The maximum gross acreage coverage for non-residential buildings on a lot should be 20%. and the maximum assembly should be less than 25 people per acre per hour and not more than 50 at any one time. A sliding scale of employment density per shift and maximum acreage coverage should be utilized for industrial uses.

  - Limit single-family developments to a maximum density of one dwelling unit per acre.

- **Civilian Runway Protection Zone:** is the FAA equivalent of the Military Clear Zone and the recommendations for the Runway Protection Zone are the same as for the Clear Zone—no uses should be permitted except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space.

- **Military (Scott AFB) Noise Contours:** Military Noise Contours reflect relative noise levels with each noise contour mathematically representing the average sound level, by decibel, over a 24-hour period. The recommendations for Noise Contours are numerous, but generally provide for a range of uses and noise mitigation (or attenuation) requirements for each 5-decibel interval from 65 on the low end to 80 and above on the high end.

  - Require noise easements to be granted to the local jurisdiction on all major subdivisions and rezoning requests. Require notes on all subsequent subdivision plats that property is near an airport and therefore subject to operational noise impacts.

  - Within Noise Contours 65-69 (NZ-1), single-family residential use should be limited to one unit per acre. Require sound attenuation standards to achieve a noise reduction level (NRL) of at least 25 dB on all new or expanded construction.

  - Within Noise Contours 70-74 (NZ-2), all residential uses should be prohibited. Require sound attenuation standards to achieve a noise reduction level (NRL) of at least 25 dB on all new or expanded construction.

  - Within Noise Contours 75-79 (NZ-3), all residential uses, amphitheaters, hospitals, clinics, nursing homes, childcare centers, schools, theaters, auditoriums, and churches should be prohibited. Require sound attenuation standards to achieve a noise reduction level (NRL) of at least 30 dB on all new or expanded construction.

  - Within Noise Contours 80+ (NZ-4), prohibited uses and sound attenuation should be generally the same as in NZ-3, with primarily trade and services uses prohibited in this higher noise zone.

- **MidAmerica St. Louis Airport Noise Contours**: are the relative noise levels for the MidAmerica St. Louis Airport runway and the recommendations are the same as for the Military (Scott AFB) Noise Contours—land use prohibitions and indoor noise reduction level requirements for uses within the 65 dB and above Noise Contours.

- Height Hazard Areas which are located both within and outside the Primary Planning Influence Area.

All the protection areas described in the JLUS agreement can be observed in Exhibit 6.3-1.

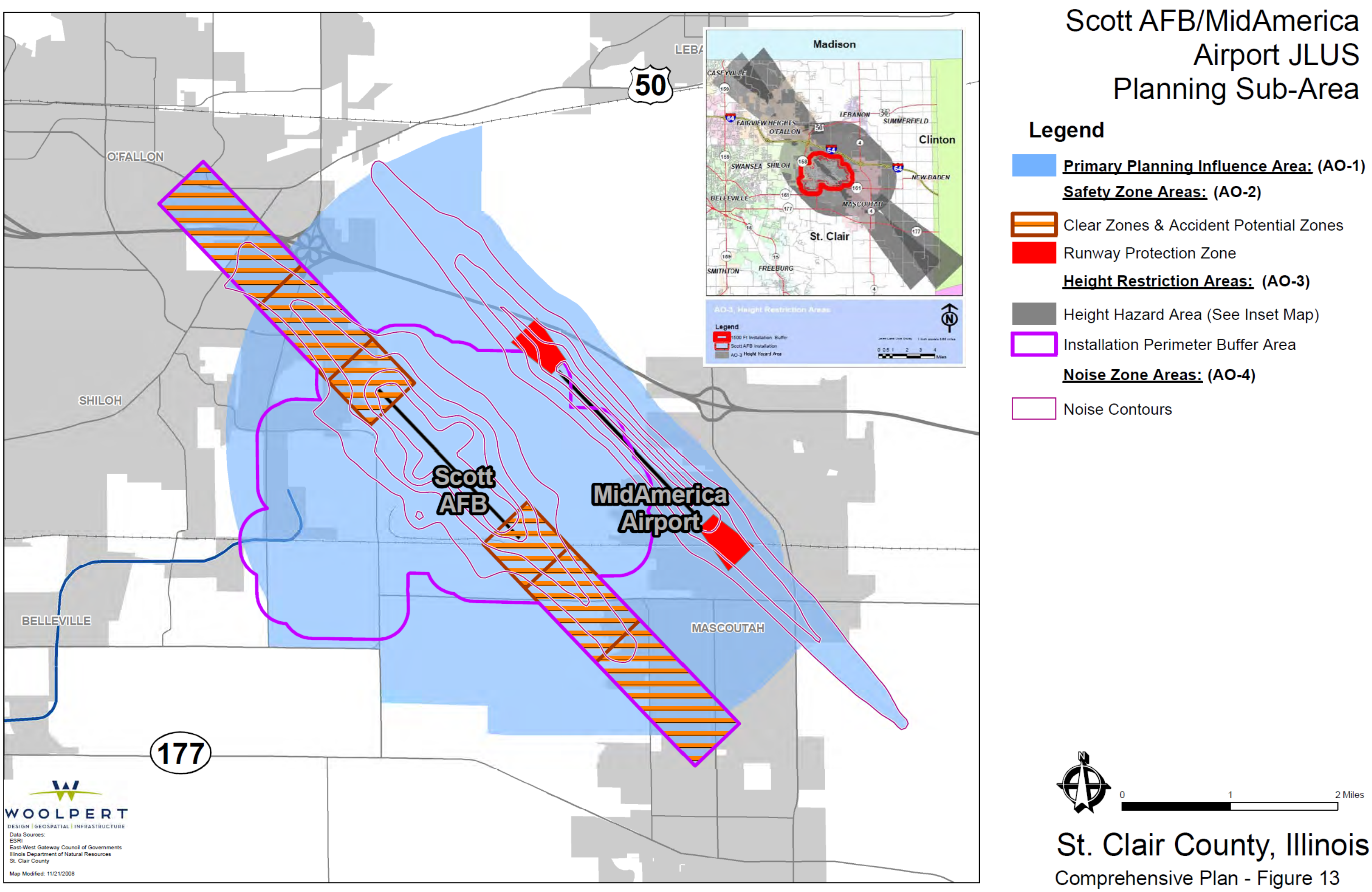
The report suggested that the communities affected by the JLUS recommendations create and adopt a board whose purpose is to review development applications within the Primary Planning Influence Area that have potential incompatibilities.

The JLUS Outcome

The Scott AFB and MidAmerica St. Louis Airport joint use airfield complex is an enormous economic engine for St. Clair County and the entire St. Louis metropolitan area. The protection of the airfield complex from unnecessary encroachment is essential. Through the Joint Land Use Study, the leadership of the military Air Base, the civilian Airport, St. Clair County, and the four surrounding municipalities were able to come together to map out a coordinated, cooperative approach to ensuring the long-term functional viability of the airfields. The JLUS report proposes that The County and participating communities should move ahead with modifications to their respective Zoning Ordinances and adopt the recommendations of the JLUS.[4].

[4] St. Clair County Comprehensive Plan - 2011

Exhibit 6.3-1: JLUS Planning Sub-areas



Source: St. Clair County Comprehensive Plan- 2011

AIR INSTALLATION COMPATIBLE USE ZONE (AICUZ) 2010

The 2010 AICUZ study was an update to the original 2001 AICUZ study. The updated AICUZ was attributed to changes in the military aircraft using SAFB, the implementation of the 2005 Base Realignment and Closure (BRAC) action, and a change in the DOD noise modeling software used to model the noise contours of military aircraft. The AICUZ studies were authored by the USAF and purpose was to promote compatible land development in areas subject to aircraft noise and accident potential due to aircraft overflight operations. Additionally, the program was initiated to protect the public's health, safety, and welfare and to protect military airfields from encroachment by incompatible uses and structures[5].

While the AICUZ study did evaluate flight patterns to both the military runway as well as the civilian runway, the focus of the AICUZ was limited to military aircraft operations only. As such, it was not the intent of the AICUZ to be a joint planning effort with BLV, or any other authority outside of the military. The AICUZ study, and findings from the AICUZ, however, allowed military input and data related to land use compatibility around BLV and SAFB to be available during other local land use planning initiatives.

The 2010 AICUZ recognized the 2008 JLUS study, and the AICUZ recommendations corroborated the same recommendations and incompatible land uses as documented in the 2008 JLUS. Additionally, the 2010 AICUZ acknowledged different sizes and shapes to the noise zones analyzed in the AICUZ versus the JLUS. The difference in size and shape is attributed to the 2010 AICUZ using an updated fleet mix of aircraft when analyzing noise contours. This prompted a recommendation that the land use analysis in the 2010 AICUZ Study be compared to the 2008 JLUS analysis during local planning activities.

ST. CLAIR COUNTY COMPREHENSIVE PLAN 2011

The St. Clair County Comprehensive Plan 2011 was an update to the previous comprehensive plan created in 2001. The 2011 updated plan was prompted by continued movement of population from west to east and suburban to rural within the County, development pressures within the I-64 development corridor and the traditionally rural south-west and south-central portions of the County, and the completion of MidAmerica St. Louis Airport and opening of the MetroLink light rail system[6]. While the 2011 updated plan was used to establish a logical guidebook of land use, transportation, infrastructure and economic development policies of the entire County, a significant portion of the plan focused on the County's transportation system, specifically, BLV and SAFB.

The 2011 St. Clair County Comprehensive Plan was used as an opportunity to recommend that the County, and surrounding municipalities, incorporate the findings and recommendations of the JLUS study into their zoning ordinance.

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[5] Scott AFB AICUZ Study 2010
[6] St. Clair County Comprehensive Plan 2011

While Airport specific land use zoning controls were established prior to the 2011 plan, the additional zoning districts from the JLUS study have been adopted to protect the Airport from incompatible land uses.

ST. CLAIR COUNTY ZONING ORDINANCE

Based on the recommendations of the St. Clair County Comprehensive Plan 2011, the County formally adopted additional layers of land use protection into its zoning ordinance.

Incorporating land use recommendations into the zoning ordinance provided the Airport a land use mechanism (legislative regulation) to ensure compatible land use development and appropriate commercial development around BLV and SAFB.

The Zoning Ordinance, County of St. Clair, Illinois, revised January 1, 2020, includes an AO District that is comprised of four subarea districts. The four subareas that make up the AO District include: AO-1 Primary Planning Influence Area, AO2-Safety Zones Area, AO-3 Height Restriction Area, and AO4-Noise Zones Area. Each of these subareas serve a unique purpose and, collectively, are designed to provide an enhanced level of protection to support the aeronautical operations and airspace of BLV and SAFB. Lands that fall within the boundaries of each subarea are subject to the land use controls of each respective land use zoning district.

The purpose of each of the four AO subarea districts are described in **Table 6.3-1**. **Exhibits 6.3-2** and **Exhibit 6.3-3** show St. Clair County AO district zones.

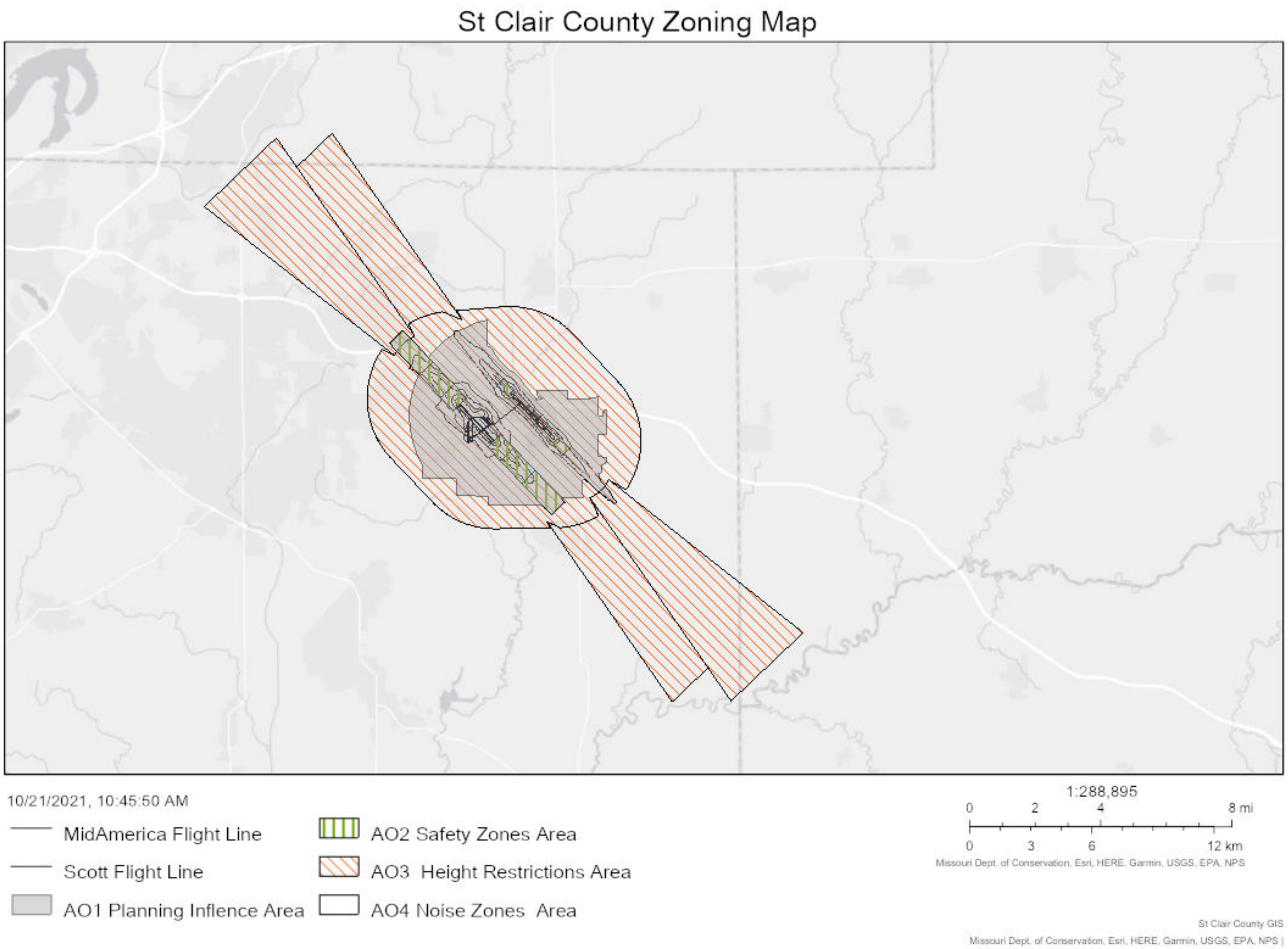
Table 6.3-1: St. Clair County AO District - Airport Impact Zones

AO Subarea District:	Description:
AO-1 Primary Planning Influence Area	The Primary Planning Influence Area designates the subarea that primarily includes standards for avigation easements and lighting as described in Subdivision 5 of this Division.
AO-2 Safety Zone Area	The Safety Zones Area designates the subarea that primarily includes standards for land use, density, and design as designated in Subdivision 6 of this Division. The boundary of this area is determined by FAA and DoD Imaginary Surfaces definitions for military and civilian airfields (Clear Zone, Runway Protection Zone, Accident Potential Zone 1 and Accident Potential Zone 2) in effect on the effective date of this Division in conjunction with any other relevant safety area data obtained by the Director.
AO-3 Height Restriction Area	The Height Restriction Area designates the subarea that primarily includes standards for controlling height as described in subdivision 7 of this Division. The boundary of this area is determined by a combination of measurements including a 1,500 foot buffer around Scott Air Force Base and Imaginary Surfaces definitions for military and civilian airfields in effect on the effective date of this Division, in conjunction with any other relevant Height Restriction data obtained by the Director.
AO-4 Noise Zones Area	The Noise Zones Area designates the subarea that primarily includes standards for the attenuation of noise and residential land use controls as specified in Subdivision 8 of this Division. This boundary is determined by applying the noise contours published by the DoD for Scott Air Force Base in conjunction with any other relevant noise data obtained by the Director.

Source: St. Clair County Zoning Ordinance, January 1, 2020

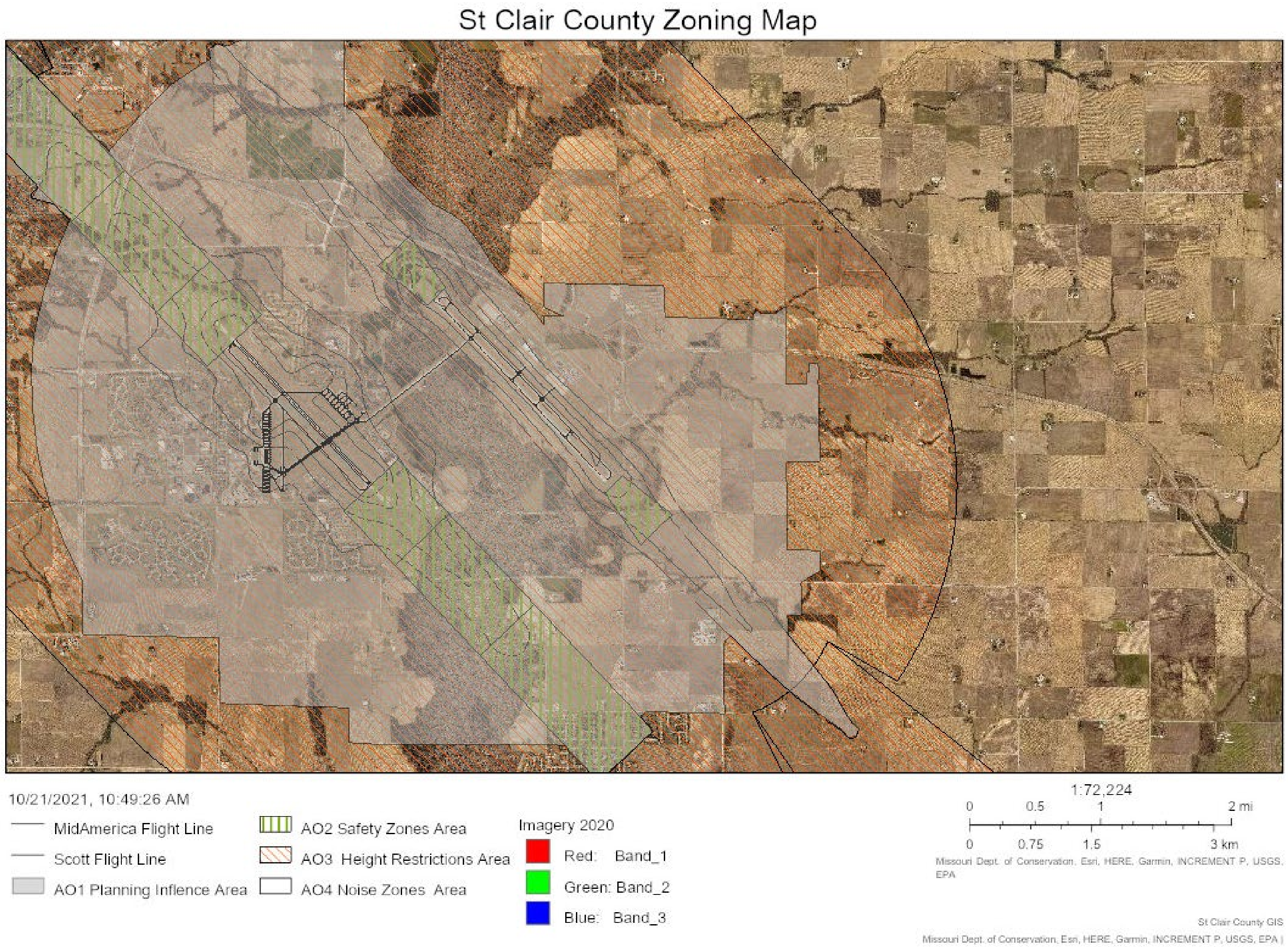
The AO District is the primary means of land use protection that is enforceable by the County. The boundaries of the subarea districts were determined by the 2008 JLUS, and over time, should be evaluated to see if there is a need to adjust the boundaries or revise the subarea districts based on changes in the Airport's operating environment.

Exhibit 6.3-2: St. Clair County AO District



Source: St. Clair County Zoning Ordinance – Map Viewer

Exhibit 6.3-3: St. Clair County AO District



Source: St. Clair County Zoning Ordinance – Map Viewer

6.3.3 Existing Wildlife Management Control

Commercial service airports within the United States, such as BLV, are required to maintain a Federal Aviation Regulation (FAR) Part 139 operating certificate. Part 139 establishes certification requirements for airports serving scheduled air carrier operations. One requirement of a Part 139 airport is to have an FAA approved Airport Certification Manual (ACM). A chapter within the ACM reviews hazardous wildlife attractants on the airport and its environs. The initial step in determining hazardous wildlife attractants, starts with the preparation of a Wildlife Hazard Assessment (WHA). The WHA conducts an annual biological survey on the airport by a qualified wildlife biologist. The surveys then become the base document for creating a Wildlife Hazard Management Plan (WHMP). The WHMP defines actions to mitigate and/or minimize hazardous wildlife and becomes a chapter in an airport's ACM.

The WHA and WHMP have a shelf life of only five years. However, recent FAA guidance allows periodic wildlife monitoring to supersede the need to update a WHA/WHMP. USAF conducts hazardous wildlife monitoring for BLV and SAFB using the services of the United States Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services (USDA-WS), located directly on the Airport. Land uses that are incompatible with aeronautical activities at BLV and SAFB from a wildlife perspective are addressed in BLV's WHMP.

6.4 Surrounding Municipal Limits

The goal of this section is to identify the municipalities and city limits of all the cities and counties that surround MidAmerica St. Louis Airport. There are five local municipal jurisdictions that surround BLV:

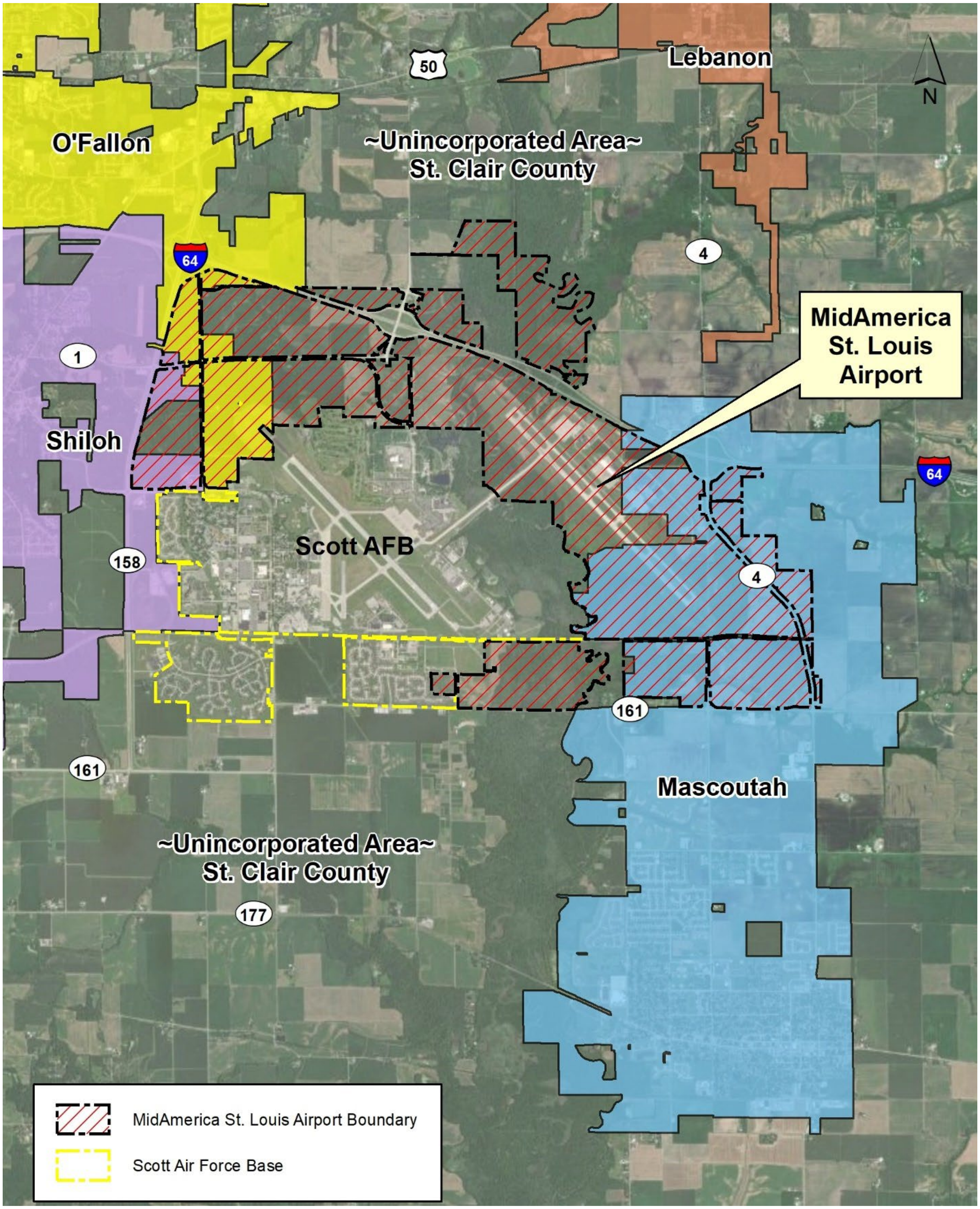
- Village of Shiloh - St. Clair County, Illinois
- City of Mascoutah - St. Clair County, Illinois
- City of O'Fallon - St. Clair County, Illinois
- City of Lebanon – St. Clair County, Illinois
- Unincorporated St. Clair County

It is important that the land use planning efforts identify the existing municipal zoning landscape that surrounds BLV. **Exhibit 6.4-1** shows the location of the five municipalities in relation to BLV.

As was mentioned previously in this chapter, the goal of the Land Use Compatibility Plan is to help the airport sponsor to communicate and coordinate with local zoning planners to prevent the development of incompatible land uses around BLV. **Exhibit 6.4-1** shows the location of all five municipalities that surround BLV, but only a few of these will be affected by some of the land use considerations evaluated as part of this chapter.

The next step of this Land Use Compatibility chapter is to define the Airport Influence Area (AIA) to identify which of the municipalities shown on the exhibit below will be affected by the aeronautical activities generated by BLV.

Exhibit 6.4-1: Local Municipal Limits



Source: CMT

6.5 Airport Influence Area (AIA)

The area in which the extents of the Airport's aeronautical operations impact the surrounding area is defined as the Airport Influence Area (AIA). The AIA is comprised of various impact zones for which each has a unique purpose of land use control (i.e., height restriction zone, no residential development zones, etc.).

The *ACRP Report 27 – Enhancing Airport Land Use Compatibility* explains that the development of an airport land use compatibility plan must take into account the geographic areas around the airport that make up the airport area of influence and focus on maintaining compatible land uses in these areas. These areas should be evaluated for land use compatibility by the surrounding municipalities. The specific size for each area (or impact zone) can depend on a number of criteria such as, but not limited to, airport classification, critical aircraft identified for the airport, aircraft traffic pattern, and individual approach types for each runway end, as well as proposed approaches, future airport development and future community development.

Based on ACRP Report 27, a comprehensive set of impact zones have been selected to capture the total area that is influenced by aeronautical activity coming from and out of BLV. This set of zones is not an exhaustive list of the areas of interest but rather a representative sample. Table 6.5-1 shows a description of the impact zones used to create the AIA for MidAmerica St. Louis Airport.

Table 6.5-1: Airport Impact Zones

Zone	Description
A	Runway Protection Zone (RPZ)
B1	Inner Approach/Departure Area
B2	Outer Approach/Departure Area
C	Aircraft Traffic Pattern Area
D	Areas Adjacent to Runway Environs

Source: ACRP Report 27 - Enhancing Airport Land Use Compatibility

The approach visibility minimums, types of instrument approaches, and fleet mix that utilizes the aeronautical facilities at BLV have been considered to determine the dimension of each one of the impact zones described in the table above. A detailed description of each one of these impact zones is presented below.

6.5.1 Impact Zones

As described above, the Airport's AIA will be comprised of several impact zones. A detailed description of each one of the impact zones presented in Table 6.5-1 is presented below.

ZONE A - RPZ

Zone A is intended to provide a clear area that is free of above ground obstructions and structures. This zone is closest to the individual runway ends. The dimensions for this zone are recommended to be the same as those utilized to evaluate the RPZ's in Chapter Three of this Master Plan - *Facility Requirements*. Most land uses within Zone A should be limited, where possible, based upon the criteria outlined by the FAA in AC 150/5300-13A. Based on AC 150/5300-13A, the following land uses are permissible without further evaluation inside an RPZ:

- Farming that meets airport design standards.
- Irrigation channels that meet the requirements of AC 150/5200-33 and FAA/USDA manual, Wildlife Hazard Management at Airports.
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator.
- Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable.
- Unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ.

Best practices should be used when determining compatible land uses such as parking lots, roadways, and open spaces in proximity to the Airport's operational areas. Construction of new structures should be prohibited, while existing structures and vegetation should be removed through the use of land acquisition and/or the purchase of avigation easements, when practical.

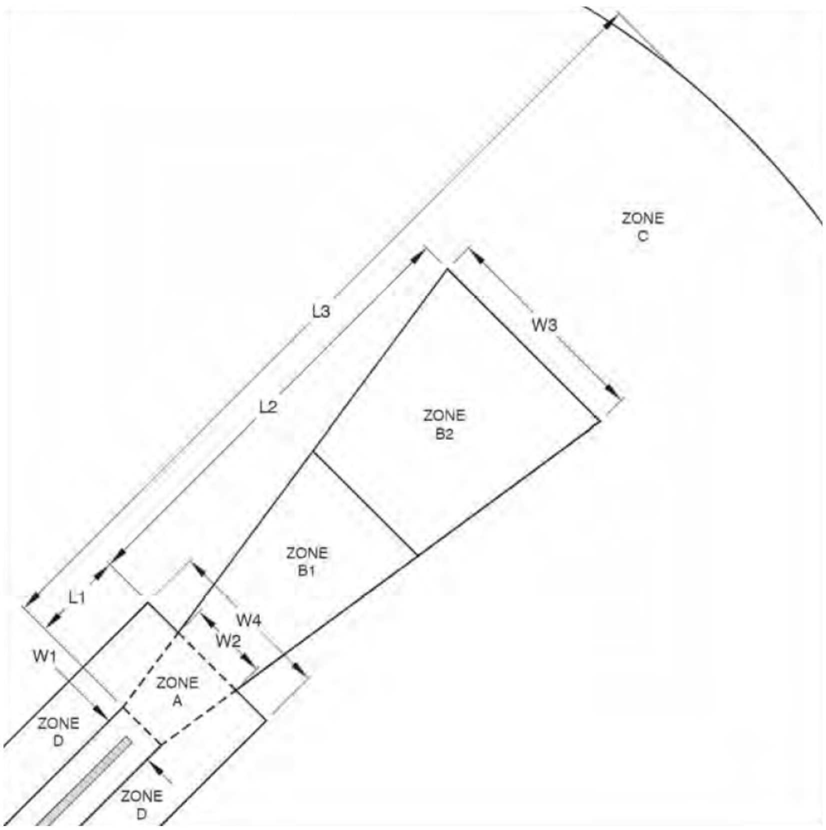
ZONES B1 AND B2 – APPROACH/DEPARTURE AREAS

Zones B1 and B2 are areas critical to the safe operation of aircraft. These areas reflect the approach and departure paths for each runway at any given airport. The dimensions of Zone B1 and Zone B2 are designed according to the approach type at a specified runway and the type/size of aircraft utilizing the runway. Based on the ACRP Report 27, the dimensions of Zones B1 and B2 are defined by the type of instrument approach used at Runway 14L/32R and Runway 14R/32L at BLV. Table 6.5-2 shows the dimensions utilized to define BLV's Zones B1 and B2.

Separation of the approach/departure areas into two parts—inner and outer—provides a local community the ability to apply more flexibility to land use limitations, as the distance between the runway end and the approach area increases.

Land uses allowed in Zone B1 and B2 may require review or conditional use to maintain compliance with land use guidelines that limit concentrations of people, wildlife attractants, visual obstructions, tall structures, and noise-sensitive developments. For example, ideally, residential developments should be discouraged from this area; however, some single-family developments, if low in density, may be permitted if it is determined that the proposed development or land use is compliant with various compatibility guidelines such as noise sensitivity, tall structures, visual structures, and wildlife and bird attractants. Exhibit 6.5-2 shows a visual example of Zones B1 and B2.

Exhibit 6.5-2: Sample Dimensional Details for Zone B1 and Zone B2



Source: ACRP Report 27 - Enhancing Airport Land Use Compatibility

ZONE C – AIRCRAFT TRAFFIC PATTERN AREA

The area that typically encompasses an aircraft traffic pattern is recommended as Zone C. This area is typically an elliptical shape, depending upon the runway types and configurations at individual airports. Figure 6.5-2 above illustrate the dimensions for Zone C. A typical airport traffic pattern is defined as a rectangular circuit that aircraft fly while waiting for clearance to land. The specific size of an airport traffic pattern varies depending upon the size of the aircraft utilizing the airport. For example, a small single engine plane has a smaller traffic pattern than the pattern of a larger corporate aircraft. These types of traffic patterns are most common at general aviation (GA) airports.

At large GA airports and commercial service airports, aircraft traffic patterns can often take on a much more linear appearance and lose the rectangular element. This is due to the much greater area needed for sequencing aircraft for landing and departure where aircraft may need up to 10 miles or more to align with the runway and develop a course for landing. Because of this difference between airport traffic patterns, it is recommended that local communities consider the flight pattern for their individual airport when establishing land use planning zones and design zones accordingly to meet the specific use patterns at their airport. For BLV, the precision instrument approach for both Runway 14L/32R and Runway 14R/32L were taken into account to determine the radius of Zone C. Table 6.5-2 shows the dimensions utilized to define BLV's Zone C.

Zone C has a substantial number of aircraft over-flights within its boundary during approach or departure at an airport. This zone should be clear of all uses that may generate visual obstructions, wildlife attractants, or tall structures because aircraft typically operate at lower altitudes and slower air speeds in this area while landing or departing the airport. If a pilot is distracted by visual obstructions, potential safety concerns can arise. Land uses that encourage congregations of people or involve development of tall structures should also be discouraged in this area. Noise-sensitive developments should also be limited.

Due to the proximity to the runway end, Zone C areas are not likely impacted by a noise level above the 65 day-night average sound level (DNL) that are FAA benchmarks. Consequently, the impact from noise in these areas is typically a perceived impact by persons on the ground in comparison to an actual impact that is defined as a higher noise level. Little can be done to mitigate noise impacts for the property owner within this area; therefore, residential development or outdoor uses should be discouraged in Zone C to reduce these impacts.

ZONE D – AREAS ADJACENT TO RUNWAY ENVIRONS

The areas within Zone D are those that parallel the runway pavement, extending away from the edge of the runway surface. It is suggested to parallel the runway and extended runway centerline to a length equal to the outer edge of Zone A and then squared to meet Zone A at a 90-degree angle. Exhibit 6.5-2 illustrates the location of Zone D. Table 6.5-2 shows the dimensions utilized to define BLV's Zone D.

Most of this area is usually owned and maintained by an airport since it often includes aviation related uses such as hangars and terminal areas that accommodate aviation needs. Ideally, this area would have structures of low height and relatively low density. Relative to the FAR Part 77 Surfaces, this area may be referred to as the transitional surface area.

Table 6.5-2: Sample Dimensions for Airport Overlay Zones B1, B2, C, and D

Dimensions shown in Figure 1.8-4	Item	Dimensional Standards (Feet)[1]					
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
				A	B		
		A	B		C	D	
W1	Width of Primary Surface, inner width of Zone A & Zone B1	250	500	500	500	1,000	1,000
W2	Outer width Zone A	Shown in Table 1.8-5					
W3	Outer width Zone B2	1,250	1,500	2,000	3,500	4,000	10,000
W4	Width of Zone D from Primary Surface	1,050	1,050	1,050	1,050	1,050	1,050
L1[2]	Length of Zone A	Shown in Table 1.8-5					
L2	Combined Length of Zone B1/B2	5,000	5,000	5,000	10,000	10,000	10,000[3]
L3	Radius Zone C	5,000	5,000	5,000	10,000	10,000	10,000

Note: [1] *Runway Classification Legend*
A – Utility runway (runway servicing aircraft weighing 12,500 pounds or less)
B – Runway larger than utility (runway servicing aircraft weighting 12,501 pounds or greater)
C – Visibility minimums greater than ¾ of a mile
D – Visibility minimums as low as ¾ of a mile
[2] Zone A and B1/B2 begin 200' from the end of the runway threshold.
[3] The length of Zone B1 and B2 combined, for a precision instrument runway is 10,000 feet for the purposes of the land use zone, it doesn't extend for the additional 40,000', as noted in FAR Part 77.

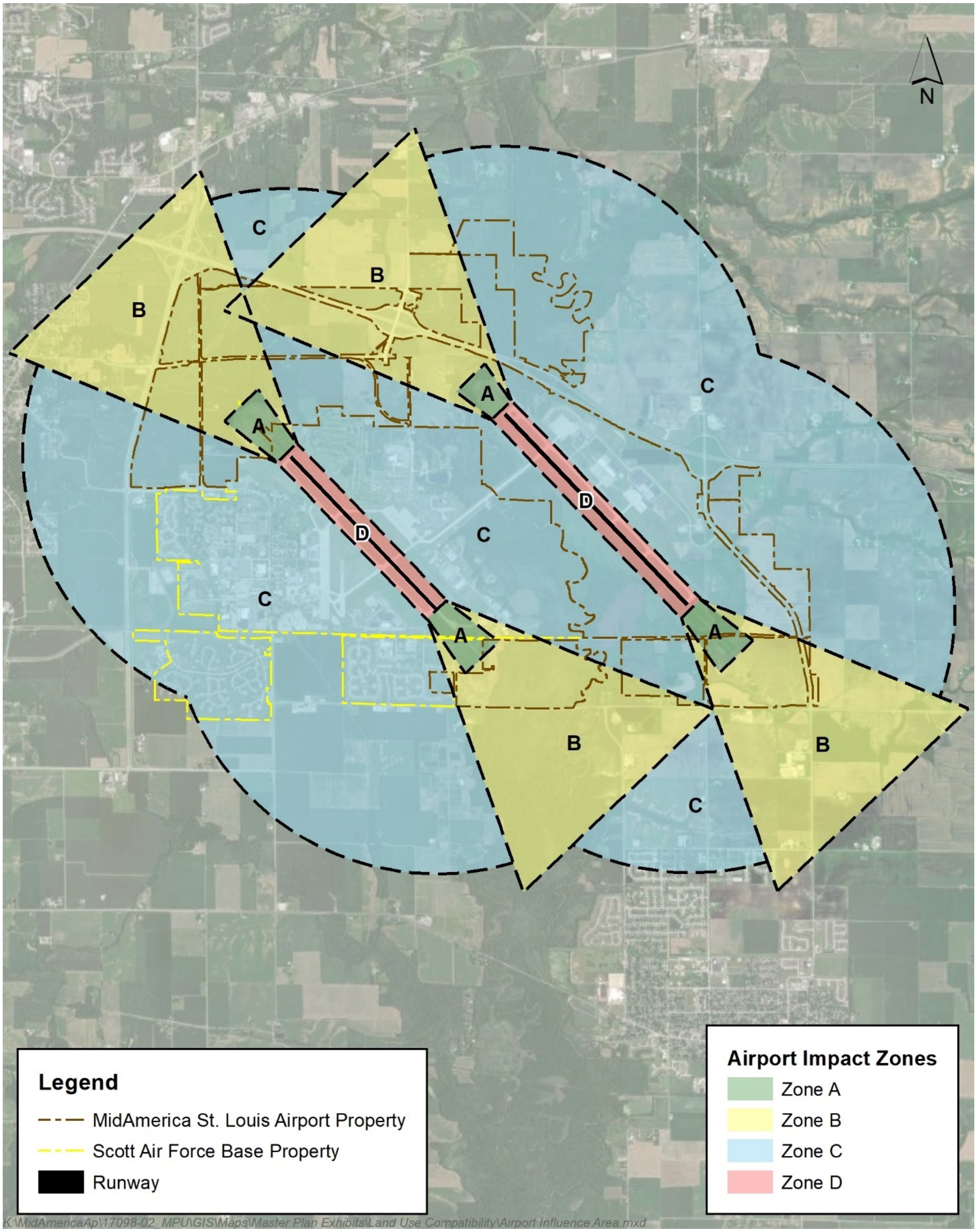
Source: ACRP Report 27 - Enhancing Airport Land Use Compatibility

6.5.2 BLV Defined AIA

As mentioned above, the Airport Influence Area (AIA) will be comprised by the five impact zones described in Table 6.5-1. The idea behind defining the AIA for BLV is to visualize the areas next to the Airport that will be impacted by aeronautical activities. Once these areas have been identified, the next step is to recognize the different land uses inside each of these zones and identify if there are any incompatible land uses.

In locations where the Airport Impact Zones are within multiple jurisdictions, representatives from each jurisdiction would be involved in the planning and implementation process. Appropriate land use zoning would be established to ensure compatibility of land uses and development densities around BLV. Land use planning would also control the construction of tall structures in the airport's airspace, electronic interference with the airport's navigation aids, and wildlife attractants around the airport. Exhibit 6.5-3 shows a graphical representation of the defined AIA at BLV.

Exhibit 6.5-3: MidAmerica St. Louis Airport AIA



Source: CMT

6.5.3 Impacted Municipalities

Section 6.4 of this chapter discussed how there are five municipalities that surround BLV:

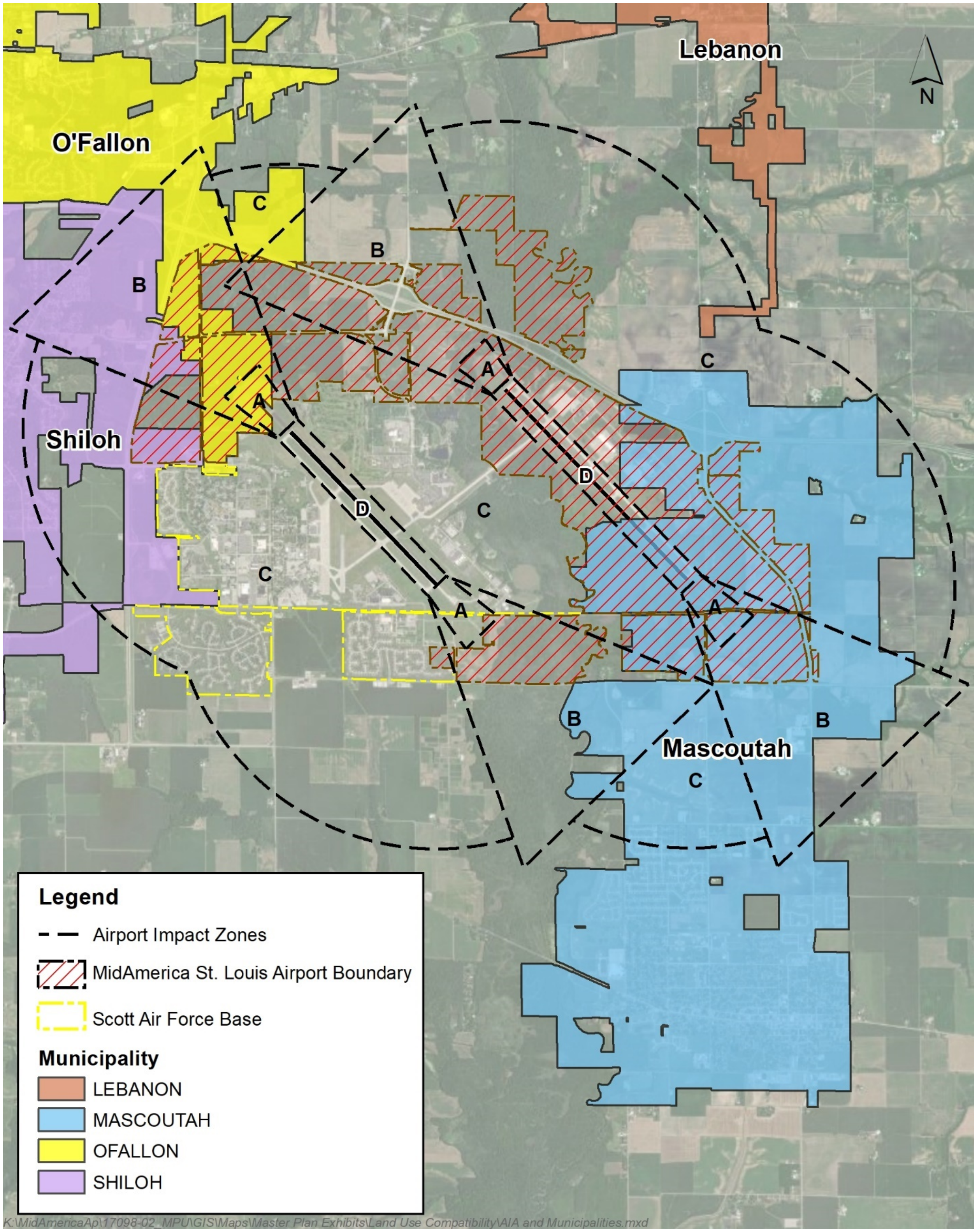
- Village of Shiloh - St. Clair County, Illinois
- City of Mascoutah - St. Clair County, Illinois
- City of O'Fallon - St. Clair County, Illinois
- City of Lebanon – St. Clair County, Illinois
- Unincorporated St. Clair County

As is shown on **Exhibit 6.5-3**, impact Zone C - *Aircraft Traffic Pattern Area* represent the outermost controlling surface that restricts land development around the Airport. **Exhibit 6.5-4** shows the Airport's AIA and the municipalities located inside this boundary.

Exhibit 6.5-4 indicates that all five municipalities discussed previously are impacted by at least the outermost impact zone (Zone C). The exhibit below also shoes that the City of Lebanon is the municipality which is impacted the least by aeronautical activities generated at BLV. A small portion of land which belongs to the City of Lebanon is located inside Zone C north of Runway 14L/32R and north of the Airport Terminal Building.

It is the Airport sponsor's responsibility to coordinate the development of compatible land with the authorities from the municipalities in the immediate vicinity with BLV.

Exhibit 6.5-4: BLV AIA & Municipalities



Source: CMT

6.6 Land Use Compatibility Assessment

Once a community defines the Airport's influence area and impact zones, the task of defining specific uses allowed with these zones must be accomplished. Each zone must have definition of allowed or compatible land uses. As with traditional zoning, creating a definitive geographic line between various land uses is often difficult, and more often, specific physical boundaries are used to separate land uses such as roads or topographic features such as rivers or streams. This often creates grey areas where various land uses can blend. Such may be the case with airport compatibility zones.

Since the zones may follow specific dimensional criteria, parcels of property are likely impacted by more than one zone in transitional zone areas. This can create inconsistencies where land use can be noted as permitted on one side of the line while requiring additional review on the opposite side of the line, consequently, additional review may be necessary in these transitional areas.

ACRP Report 27 provides land use limitation guidance based upon the suggested zones outlined previously. This guidance assumes a specific type of land use is either compatible, incompatible or conditionally compatible which means it may be found to be compatible, if certain terms or conditions are met to minimize potential adverse effects. In general terms, the following land uses should be avoided inside BLV's impact zones:

- High concentrations of people (density)
- Noise sensitive developments
- Tall structures that surpass height limitation of FAR Part 77 surfaces
- Visual obstructions
- Wildlife and bird attractants

According to the guidance of ACRP Report 27, land uses inside the five impact zones that comprise BLV's AIA should restrict uses that may be hazardous to the operational safety of aircraft operating to and from the Airport. The zones furthermore should limit population and building density in the runway approach areas to avoid concentrations of people and create sufficient open space to protect life and property in case of an accident. Additionally, the zones restrict uses that would be adversely affected by airport operational impacts, such as noise, if placed in the respective zone with or without mitigation measures.

Land use restrictions are different depending on the Airport Impact Zone. Table 6.6-1 indicates the land use restrictions in each of the impact zones that comprised the AIA at BLV.

Table 6.6-1: Airport Impact Zones Land Use Restrictions

Airport Impact Zone	Land Use Restrictions

A	• Above-ground structural hazards:
	  ○ Buildings, temporary structures
	  ○ Exposed transmission lines
	  ○ Other similar aboveground structures
	• Public assembly uses are prohibited
	• New residential uses are prohibited

B1 & B2	• Public assembly uses are prohibited
	• Multi-family residential uses
	• Mobile home parks
	• Institutional living facilities
	  ○ Nursing homes
	  ○ Senior assisted living facilities
	• Uses that represent significant fire or explosion hazards
	  ○ Fuel storage tank farms
	  ○ Above-ground fuel tanks
	  ○ Gasoline stations
	• Telecommunication and radio tower structures
	• Approvals of wind turbines and above-ground, power-generating structures shall be conditioned on whether the equipment causes any hazard to the airport due to height, electromagnetic or other interference with air traffic communications

C	Zone C shall be subject only to height restrictions set forth in FAR Part 77
D	The limitations or restrictions associated with this area will vary greatly depending upon the dimensional standards of the Airport. In many instances, this zone will be substantially located on airport owned property and will include aviation related uses (terminal buildings, hangars, apron areas, etc.) which would be considered as compatible uses.

*Public assembly = uses include, but are not limited to, churches, hospitals, schools, theaters, stadiums, hotels, motels, campgrounds, and other similar uses.
Source: ACRP Report 27 – Enhancing Airport Land Use Compatibility; CMT

It is important to remember that all airport impact zones are subject at all times to the height restrictions established by FAR Part 77.

In addition to the land use restrictions depicted in **Table 6.6-1**, the following land uses are considered prohibited uses and activities in all impact zones[7]:

- Uses that create large areas of standing water
- Uses that create electrical, navigational, or radio interference between airport and aircraft
- Uses (or structures) that emit fly ash, dust, vapor, gases, or other emissions
- Uses that foster an increase in bird population

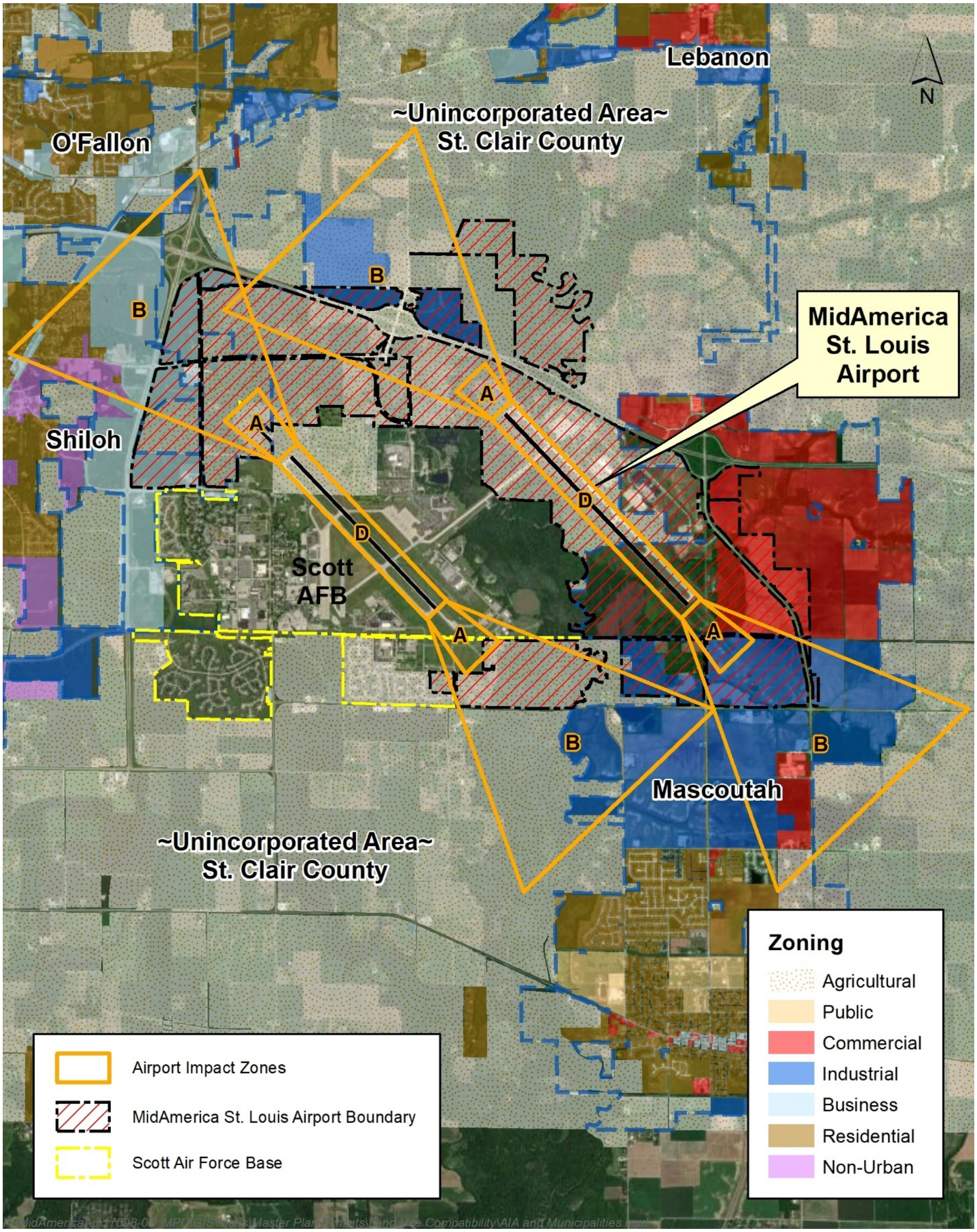
[7] ACRP Report 27 – Enhancing Airport Land Use Compatibility

- Use, device, structure that causes difficulty in distinguishing airport lights (billboards, lights, signs)
- Use, device, structure that causes glare or impairing pilot visibility
- Uses or structures that promote concentrations of flammable substances or materials
- Existing Trees that exceed the height limitations of the local Ordinance

The following evaluation will assess the existing land uses of the municipalities which are located inside BLV's AIA based on the land use restrictions presented on **Table 6.6-1**. While the land use restrictions included in **Table 6.6-1** is not an exhaustive list of land use restrictions, it represents a significant sample that serves as a land use evaluation tool. **Appendix E** shows a detailed listing of compatible and incompatibles land uses for each of the impact zones described in this chapter.

The following land use assessment will evaluate land uses in impact zones A, B1 & B2, and D. As shown in **Table 6.6-1**, the only land use restriction in Zone C is related to height restrictions set forth in FAR Part 77. **Exhibit 6.6-1** shows the existing land uses inside each impact zone of the AIA. This exhibit is utilized to perform the land use assessment.

Exhibit 6.6-1: BLV Land Use Assessment



Source: CMT

6.6.1 Runway 14L Corridor

Table 6.6-2: Runway 14L Land Use Compatibility Assessment

AIRPORT IMPACT ZONE	AIZ CATEGORY	EXISTING ZONING	IS IT COMPATIBLE?
A	Runway Protection Zone	Agricultural	Yes
B1 & B2	Inner & Outer Approach/ Departure Area	Agricultural	Yes
		Industrial	Conditional
		Business	Conditional
D	Areas Adjacent to Runway Environs	Agricultural	Yes

Source: CMT

As shown in the table above, all existing land uses identified inside the impact zones A, B1 & B2, and D on Runway 14L corridor are compatible with the land use restrictions described on ACRP Report 27. However, the construction of industrial and business developments is conditional, and the Airport needs to make sure that certain conditions are met before those kinds of developments are placed inside the AIA. These conditions are explained below.

As shown in **Exhibit 6.6-1** and in **Table 6.6-2**, there are industrial and business land uses conditionally allowed in impact zones B1 & B2. The Airport needs to make sure that even when the construction of industrial and business developments is allowed in these impact zones, future developments are compatible with aeronautical activities. This requires coordinating with local zoning to ensure that future industrial and business developments:

- Are consistent with local zoning ordinance for permitted/prohibited uses
- Do not create electrical, navigational, or radio interference between airport and aircraft
- Do not emit fly ash, dust, vapor, gases, or other emissions
- Do not contain structures that promote concentrations of flammable substances or materials

6.6.2 Runway 32R Corridor

Table 6.6-3: Runway 32R Land Use Compatibility Assessment

AIRPORT IMPACT ZONE	AIZ CATEGORY	EXISTING ZONING	IS IT COMPATIBLE?
A	Runway Protection Zone	Agricultural	Yes
		Commercial	No
		Industrial	No
B1 & B2	Inner & Outer Approach/ Departure Area	Agricultural	Yes
		Commercial	Conditional
		Industrial	Conditional
D	Areas Adjacent to Runway Environs	Agricultural	Yes

Source: CMT

As shown in **Table 6.6-3**, there is commercial and industrial zoning allowed on Impact Zone A. As explained earlier in the chapter, Zone A (RPZ) intends to provide a clear area that is free of above ground obstructions and structures. For this reason, commercial and industrial developments should not be developed inside the RPZs of Runway 32R.

Table 6.6-3 also shows that all existing land uses identified inside the impact zones B1, B2, and D on Runway 32R corridor are compatible with the land use restrictions described on ACRP Report 27. However, the construction of commercial and industrial developments is conditional, and the Airport needs to make sure that certain conditions are met before those kinds of developments are placed inside the AIA. These conditions are explained below.

As shown in **Exhibit 6.6-1**, there are industrial and commercial land uses allowed in impact zones B1 & B2. The Airport needs to make sure that even when the construction of industrial and commercial developments is allowed in these impact zones, future developments are compatible with aeronautical activities. This requires coordinating with local zoning to ensure that future industrial and commercial developments:

- Are consistent with local zoning ordinance for permitted/prohibited uses
- Are not sensitive to noise generated by aeronautical activity
- Do not create electrical, navigational, or radio interference between airport and aircraft
- Do not emit fly ash, dust, vapor, gases, or other emissions
- Do not contain structures that promote concentrations of flammable substances or materials

6.6.3 Runway 14R Corridor

Table 6.6-4: Runway 14R Land Use Compatibility Assessment

AIRPORT IMPACT ZONE	AIZ CATEGORY	EXISTING ZONING	IS IT COMPATIBLE?
A	Runway Protection Zone	Agricultural	Yes
B1 & B2	Inner & Outer Approach/ Departure Area	Agricultural	Yes
		Business	Conditional
		Residential	Conditional
		Non-Urban	Yes
D	Areas Adjacent to Runway Environs	Agricultural	Yes

Source: CMT

As shown in this table, all existing land uses identified inside the impact zones A, B1 & B2, and D on Runway 14R corridor are compatible with the land use restrictions described on ACRP Report 27. However, the construction of business and residential developments is conditional, and the Airport needs to make sure that certain conditions are met before those kinds of developments are placed inside the AIA. These conditions are explained below.

As shown in **Exhibit 6.6-1**, there are business and residential land uses conditionally allowed in impact zones B1 & B2. The Airport needs to make sure that even when the construction of business and residential developments is allowed in these impact zones, future developments are compatible with aeronautical activities. This requires coordinating with local zoning to ensure that future business and residential developments:

- Do not include multi-family residential uses or mobile home parks
- Are consistent with local zoning ordinance for permitted/prohibited uses
- Are not sensitive to noise generated by aeronautical activity
- Do not create electrical, navigational, or radio interference between airport and aircraft
- Do not emit fly ash, dust, vapor, gases, or other emissions
- Do not contain structures that promote concentrations of flammable substances or materials

6.6.4 Runway 32L Corridor

Table 6.6-5: Runway 32L Land Use Compatibility Assessment

AIRPORT IMPACT ZONE	AIZ CATEGORY	EXISTING ZONING	IS IT COMPATIBLE?
A	Runway Protection Zone	Agricultural	Yes
B1 & B2	Inner & Outer Approach/ Departure Area	Agricultural	Yes
		Industrial	Conditional
D	Areas Adjacent to Runway Environs	Agricultural	Yes

Source: CMT

As shown in the table above, all existing land uses identified inside the impact zones A, B1 & B2, and D on Runway 32L corridor are compatible with the land use restrictions described on ACRP Report 27. However, the construction of industrial developments is conditional, and the Airport needs to make sure that certain conditions are met before those kinds of developments are placed inside the AIA. These conditions are explained below.

As shown in **Exhibit 6.6-1**, there are industrial land uses conditionally allowed in impact zones B1 & B2. The Airport needs to make sure that even when the construction of industrial developments is allowed in these impact zones, future developments are compatible with aeronautical activities. This requires coordinating with local zoning to ensure that future industrial developments:

- Are consistent with local zoning ordinance for permitted/prohibited uses
- Do not create electrical, navigational, or radio interference between airport and aircraft
- Do not emit fly ash, dust, vapor, gases, or other emissions
- Do not contain structures that promote concentrations of flammable substances or materials

6.7 SWOT Analysis

This section will of the report will conduct and evaluate a SWOT analysis to better identify and understand the Airport's operating environment from a land use perspective. The SWOT analysis shown in Table 6.7-1 is intended to provide the Airport a review of the strengths, weaknesses, opportunities, and threats that can be used to frame land use potential and to ensure the aeronautical activities of BLV and SAFB are safeguarded against incompatible land uses.

Table 6.7-1: SWOT Analysis

	HELPFUL	HARMFUL
INTERNAL	STRENGTHS • Location/Access • Existing land uses around Airport • Existing zoning ordinance/protection • Abundance of Airport-owned land outside perimeter fence	WEAKNESSES • Shared airspace with USAF • Environmental constraints • Multi-jurisdictional land use entities on/around Airport
EXTERNAL	OPPORTUNITIES • Future Metrolink connection to passenger terminal area • Developable Airport owned land	THREATS • Multi-jurisdictional land use coordination • West to east urban development along Interstate 64 corridor

Source: CMT

The **Strengths** identified in the analysis were largely based on the location of the Airport and the land the Airport owns outside the perimeter fence. The Airport is located on the eastern edge of the St. Louis metropolitan region. This location is beneficial as there is access to a major metropolitan area in the middle of the Country, with also having immediate access to a major interstate highway system. This also provides access to other modes of transportation such as rail and waterway. Furthermore, as previously mentioned, the County has existing land use control mechanisms currently in place to protect the BLV and SAFB from incompatible land uses. The Airport-owned land that is outside the Airport Operations Aera (AOA) could be used for non-aeronautical purposes and as a means to generate Airport revenue.

The **Weaknesses** identified in the analysis are largely based on the operating environment around the Airport. The military operations that utilize the shared airspace between BLV and SAFB, present additional aircraft in the Airport environment that could drive land use concerns under the flight patterns generally associated with the military runway. The BLV runway is surrounded by several environmental constrains that could impact future development around the Airport. The Silver Creek floodplains, various wetland areas and tree obstacles all present development constrains. The Airport complex is within the jurisdiction of five municipal corporations: St. Clair County, the City of Lebanon, the City of Mascoutah, the City of O'Fallon, and the Village of Shiloh. These multiple jurisdictions lead to inefficient land use permitting actions and require enhanced coordination to revise local zoning ordinances.

The **Opportunities** identified in the analysis are largely based on the land use immediately adjacent to the Airport. Metrolink has a station at Shiloh/Scott and connects to downtown St. Louis and St. Louis Lambert Airport. Expansion of the Metrolink line to the BLV terminal area would provide a direct airport-to-airport connection for the region. Land is currently being preserved for the future Metrolink alignment that will connect to the BLV terminal area. The amount of developable land that it is owned by BLV could provide non-aeronautical development opportunities.

The **Threats** identified in the analysis are largely based on the operating environment around the Airport. The Airport complex is within the jurisdiction of five municipal corporations: St. Clair County, the City of Lebanon, the City of Mascoutah, the City of O'Fallon, and the Village of Shiloh. Future land development may be delayed as a result of numerous permitting actions by numerous permitting entities. Another threat identified is the west to east urban development along Interstate 64 corridor. Multiple residential and commercial developments have started to encroach toward the Airport which could potentially represent incompatible land uses to the Airport's environment.

6.8 Land Use Recommendations

The purpose of this chapter of the Master Plan presents a guide that will allow the Airport to work with the surrounding communities to implement land use and airspace control around the Airport. This document intends to serve as a tool that could provide support for future land use determinations and coordination in the vicinity of BLV and SAFB that are compatible with aeronautical activity.

Overall, it appears that local zoning ordinances provide sufficient mechanisms to safeguard the Airport and the aeronautical activities of it. The AIA that was developed to analyze the local zoning maps of the surrounding municipalities did not find any deficiencies. Therefore, no changes to the County's existing AO District are recommended. It should be noted though, that the AO-2 subarea district utilizes RPZ dimensions that are not consistent with the existing RPZ size of Runway 14L-32R. However, this larger RPZ dimension that defines the AO-2 subarea district provides additional land use protection than is needed, as such, no action is required.

It is recommended that the Airport consider updating their noise exposure maps. The noise exposure maps presently used by the County's Zoning Ordinance that define the AO-4 subarea district were based on noise contours developed in the 2001 AICUZ study. The Airport's fleet mix has changed since then which indicates new noise exposure maps are required to evaluate future land use compatibility. Updated noise exposure maps will serve as a tool to prevent construction of noise-sensitive developments in the vicinity of BLV.

This chapter provided a high-level overview of the land use characteristics on and surrounding the Airport. Therefore, it is recommended that a more detailed land use analysis of Airport owned properties outside the AOA be evaluated by a specialized real estate development service provider. This type of analysis could guide Airport management in identifying future non-aeronautical developments that are compatible with the Airport's operational environment.

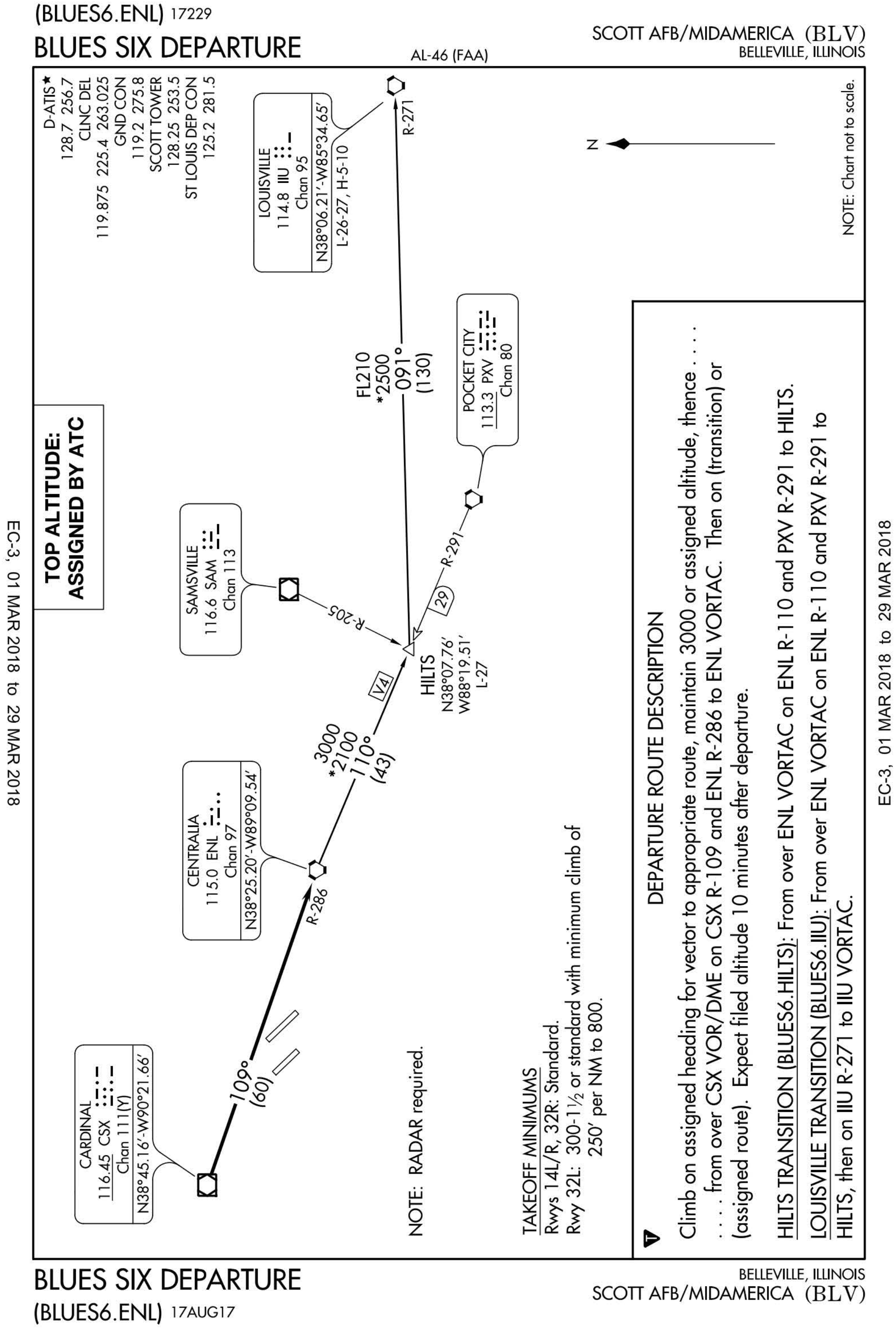
Decade's worth of Airport land use planning, as well as the numerous land use planning initiatives between the Airport, SAFB, the County and local municipalities have demonstrated to be successful. The assessment conducted in this chapter indicates that the Airport and military are currently using effective land use planning control measures. The surrounding municipal jurisdictions appear to have all implemented, to some degree, land use zoning controls to protect the aeronautical activities of BLV and SAFB. While there are no recommendations being made to the regulatory controls (zoning ordinances) and the AO district implemented by St. Clair County, continued coordination between the Airport, St. Clair County and the surrounding municipalities will help ensure future compatible land uses around the Airport.

APPENDICES

APPENDIX A

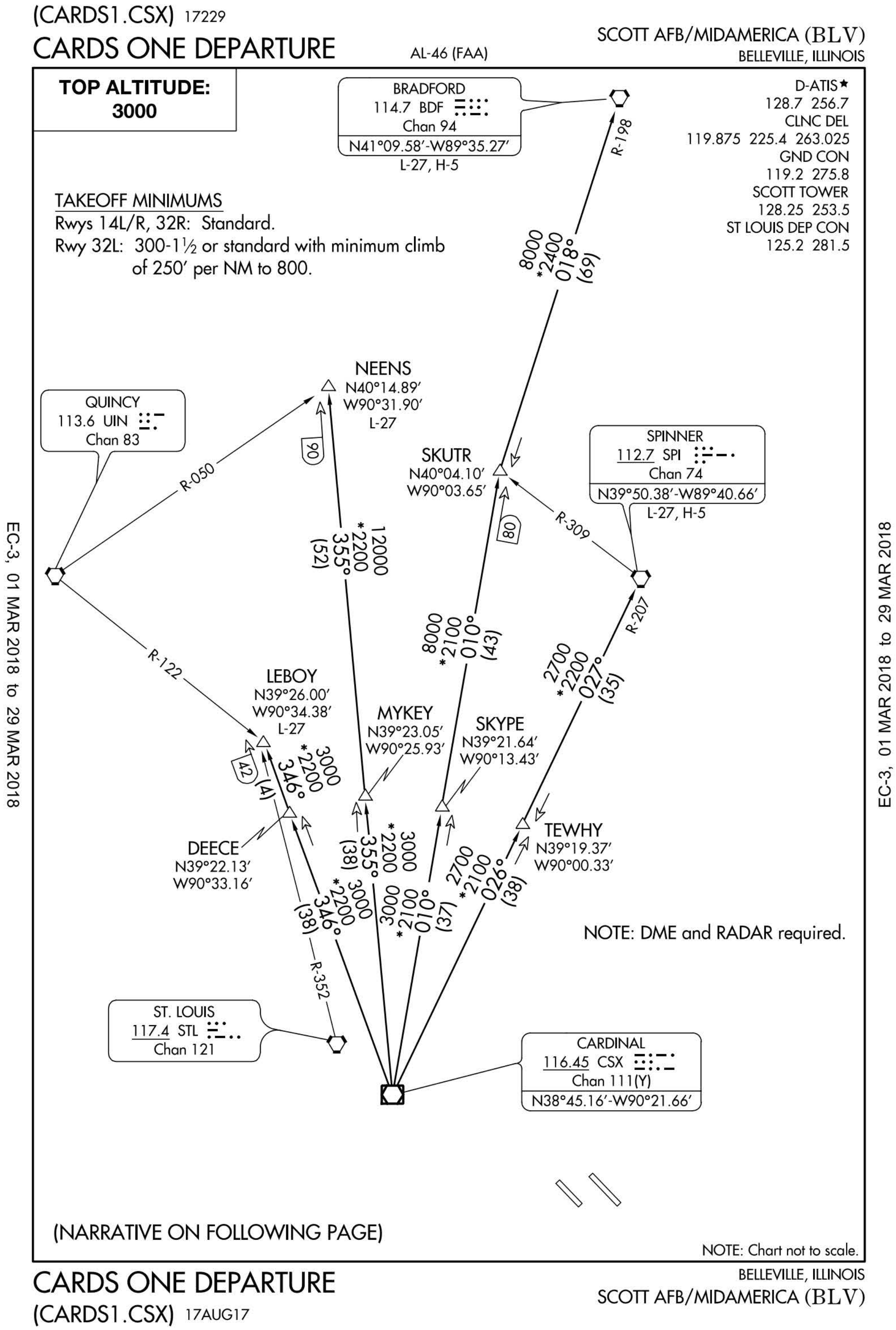
INSTRUMENT APPROACH PROCEDURES

Appendix A-1: BLUES SIX – Standard Instrument Departure Procedure



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-2: CARDS ONE – Standard Instrument Departure Procedure (1/2)



Appendix A-2: CARDS ONE – Standard Instrument Departure Procedure (2/2)

(CARDS1.CSX) 17229
CARDS ONE DEPARTURE AL-46 (FAA) SCOTT AFB/MIDAMERICA (BLV)
BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018

DEPARTURE ROUTE DESCRIPTION

Climb on assigned heading for vector to appropriate route. Maintain 3000 or assigned altitude, thence . . . .

. . . . (transition). Expect filed altitude 10 minutes after departure.

BRADFORD TRANSITION (CARDS1.BDF): From over CSX VOR/DME on CSX R-010 to SKUTR, then on BDF R-198 to BDF VORTAC.

LEBOY TRANSITION (CARDS1.LEBOY): From over CSX VOR/DME on CSX R-346 to LEBOY.

NEENS TRANSITION (CARDS1.NEENS): From over CSX VOR/DME on CSX R-355 to NEENS.

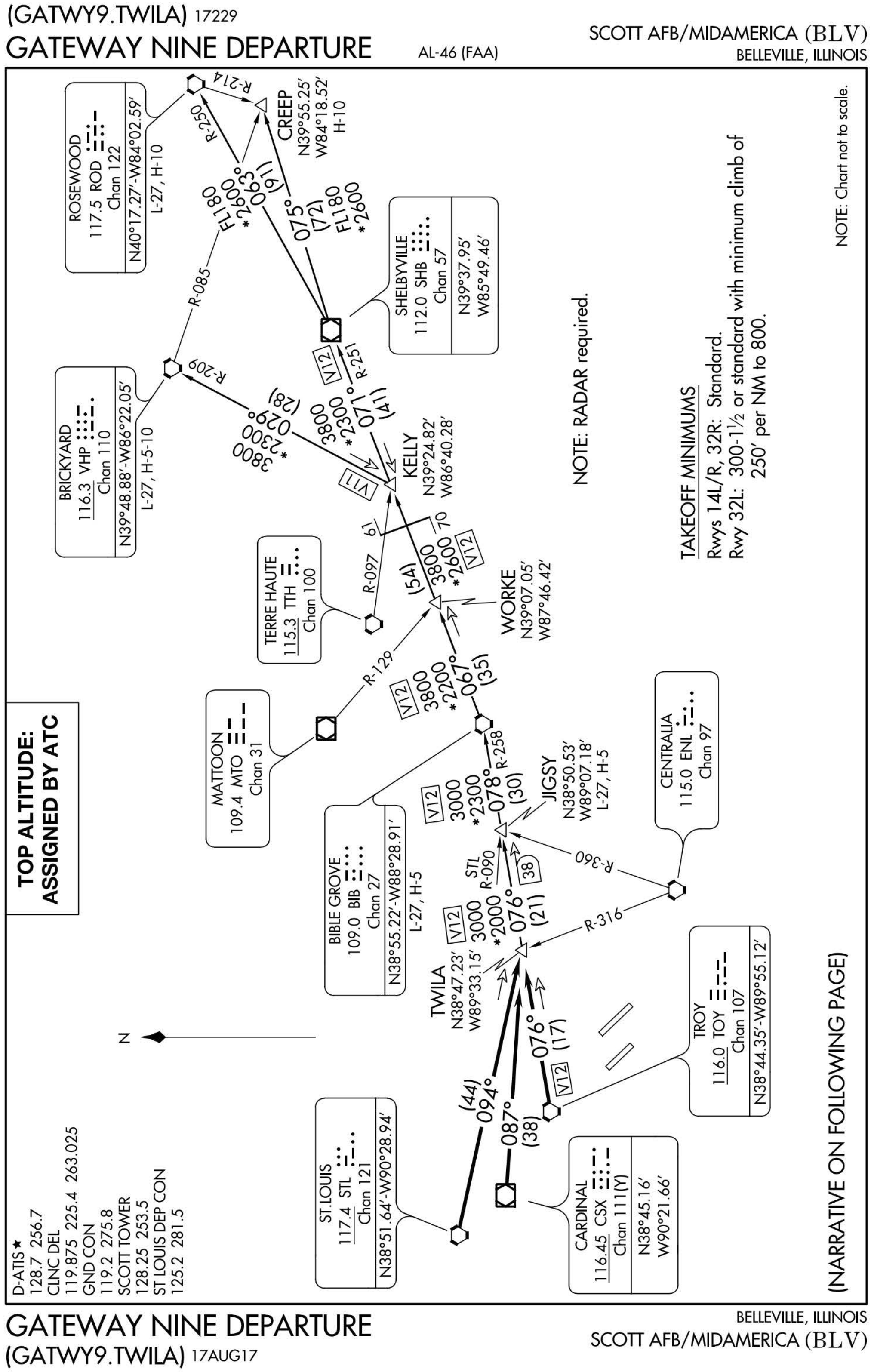
SPINNER TRANSITION (CARDS1.SPI): From over CSX VOR/DME on CSX R-026 to TEWHY, then on SPI R-207 to SPI VORTAC.

EC-3, 01 MAR 2018 to 29 MAR 2018

CARDS ONE DEPARTURE BELLEVILLE, ILLINOIS
(CARDS1.CSX) 17AUG17 SCOTT AFB/MIDAMERICA (BLV)

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-3: GATEWAY NINE – Standard Instrument Departure Procedure (1/2)



Appendix A-3: GATEWAY NINE – Standard Instrument Departure Procedure (2/2)

(GATWY9.TWILA) 17229

GATEWAY NINE DEPARTURE AL-46 (FAA)

SCOTT AFB/MIDAMERICA (BLV)
BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018

DEPARTURE ROUTE DESCRIPTION

Climb on assigned heading for vector to appropriate route. Maintain 3000 or assigned altitude, thence. . . .

. . . .from over CSX R-087 or over TOY VORTAC on TOY R-076 or over STL VORTAC on STL R-094 to TWILA INT. Then on (transition), expect clearance to filed altitude 10 minutes after departure.

BIBLE GROVE TRANSITION (GATWY9.BIB): From over TWILA on TOY R-076 to JIGSY, then on BIB R-258 to BIB VORTAC.

BRICKYARD TRANSITION (GATWY9.VHP): From over TWILA on TOY R-076 to JIGSY, then on BIB R-258 to BIB VORTAC, then on BIB R-067 to WORKE, then on BIB R-067 and SHB R-251 to KELLY, then on VHP R-209 to VHP VORTAC.

CREEP TRANSITION (GATWY9.CREEP): From over TWILA on TOY R-076 to JIGSY, then on BIB R-258 to BIB VORTAC, then on BIB R-067 to WORKE, then on BIB R-067 and SHB R-251 to KELLY, then on SHB R-251 to SHB VOR/DME, then on SHB R-075 to CREEP.

JIGSY TRANSITION (GATWY9.JIGSY): From over TWILA on TOY R-076 to JIGSY.

ROSEWOOD TRANSITION (GATWY9.ROD): From over TWILA on TOY R-076 to JIGSY, then on BIB R-258 to BIB VORTAC, then on BIB R-067 to WORKE, then on BIB R-067 and SHB R-251 to KELLY, then on SHB R-251 to SHB VOR/DME, then on SHB R-063 and ROD R-250 to ROD VORTAC.

EC-3, 01 MAR 2018 to 29 MAR 2018

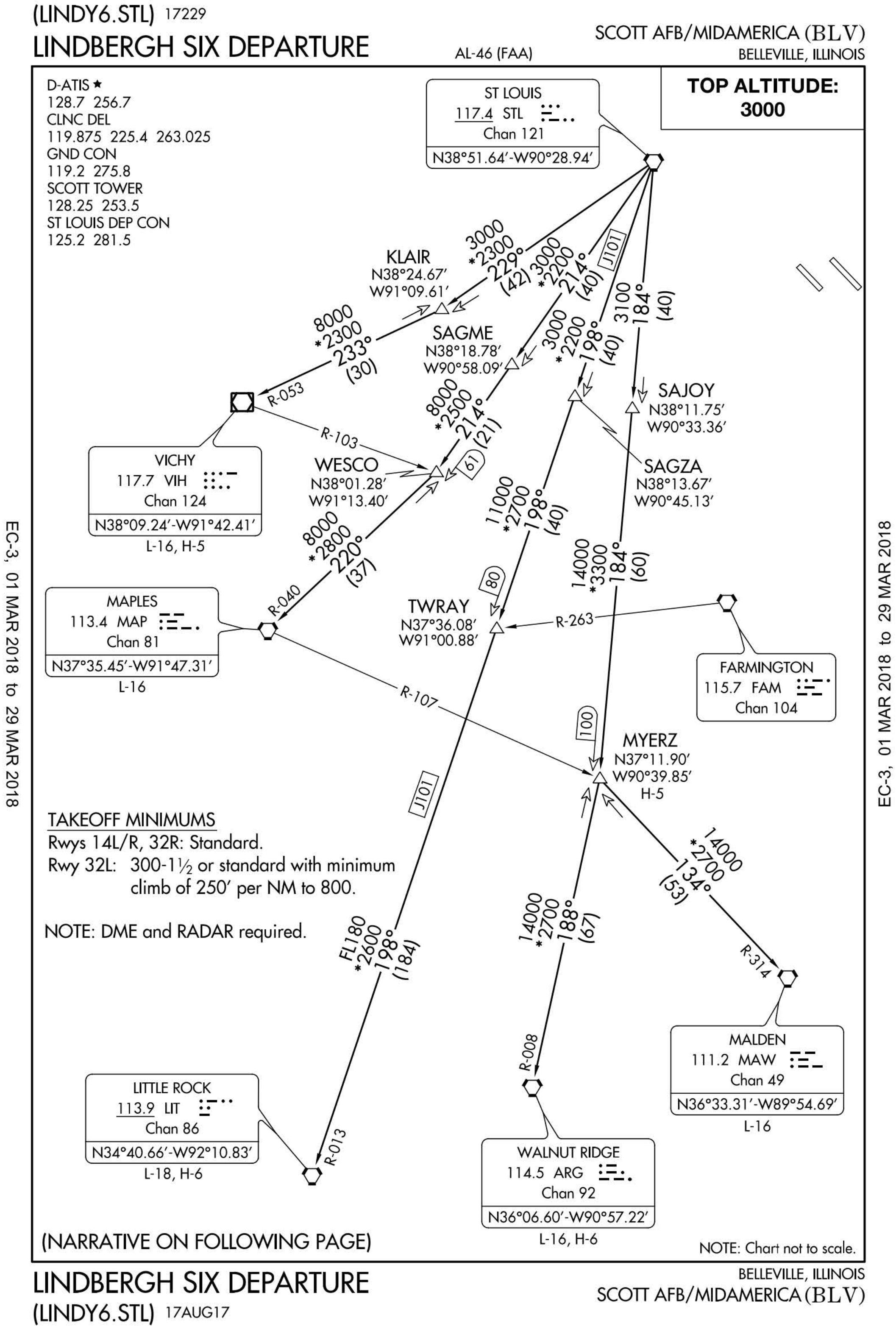
GATEWAY NINE DEPARTURE

BELLEVILLE, ILLINOIS
SCOTT AFB/MIDAMERICA (BLV)

(GATWY9.TWILA) 17AUG17

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-4: LINDBERGH SIX – Standard Instrument Departure Procedure (1/2)



Appendix A-4: LINDBERGH SIX – Standard Instrument Departure Procedure (2/2)

(LINDY6.STL) 17229

LINDBERGH SIX DEPARTURE AL-46 (FAA)

SCOTT AFB/MIDAMERICA (BLV)
BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018

DEPARTURE ROUTE DESCRIPTION

Climb on assigned heading for vector to appropriate route. Maintain 3000 or assigned altitude, thence . . . .

. . . . (transition). Expect filed altitude 10 minutes after departure.

LITTLE ROCK TRANSITION (LINDY6.LIT): From over STL VORTAC on STL R-198 to TWRAY, then on STL R-198 and LIT R-013 to LIT VORTAC.
MALDEN TRANSITION (LINDY6.MAW): From over STL VORTAC on STL R-184 to MYERZ, then on MAW R-314 to MAW VORTAC.
MAPLES TRANSITION (LINDY6.MAP): From over STL VORTAC on STL R-214 to WESCO, then on MAP R-040 to MAP VORTAC.
MYERZ TRANSITION (LINDY6.MYERZ): From over STL VORTAC on STL R-184 to MYERZ.
VICHY TRANSITION (LINDY6.VIH): From over STL VORTAC on STL R-229 to KLAIR, then on VIH R-053 to VIH VOR/DME.
WALNUT RIDGE TRANSITION (LINDY6.ARG): From over STL VORTAC on STL R-184 to MYERZ, then on ARG R-008 to ARG VORTAC.

EC-3, 01 MAR 2018 to 29 MAR 2018

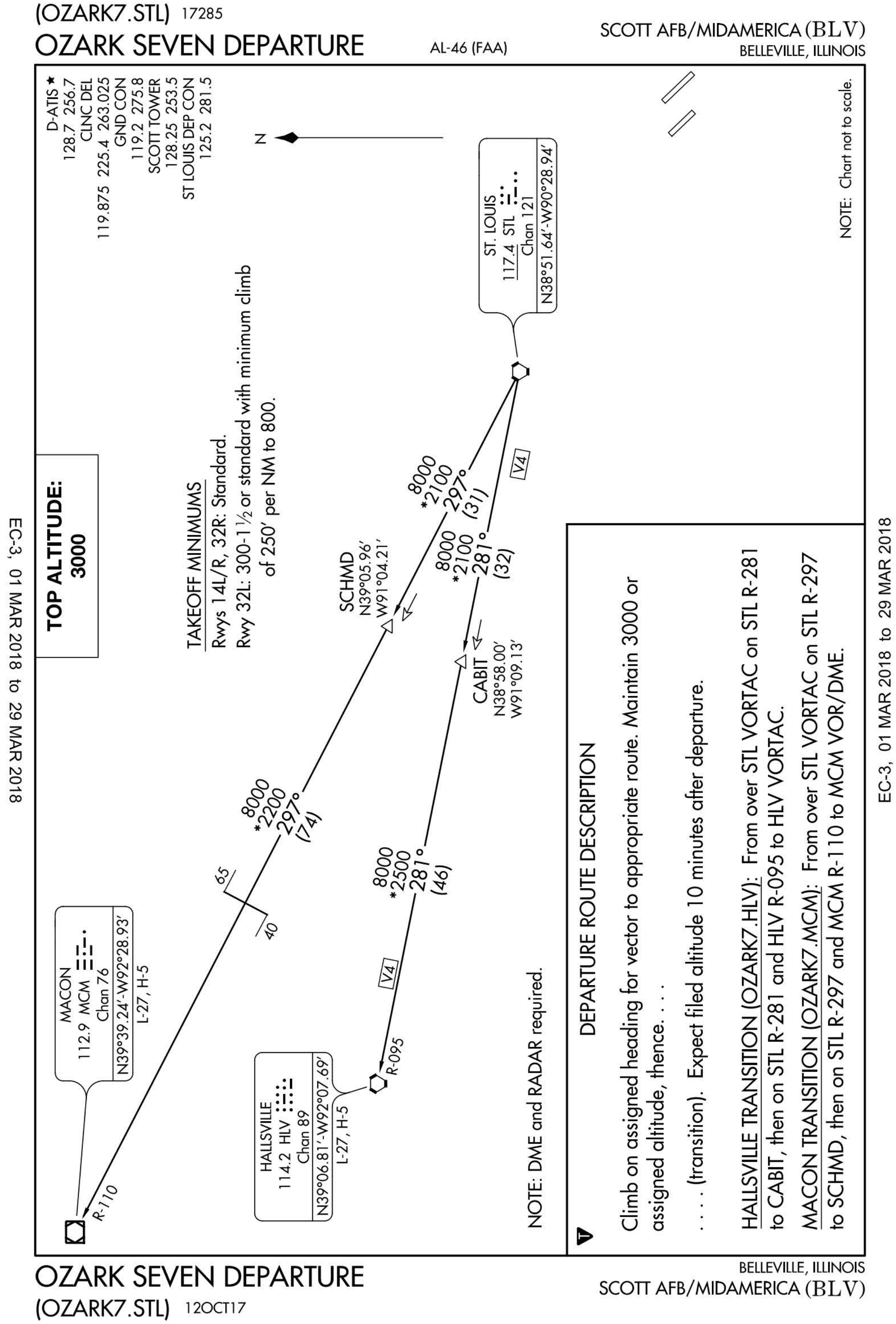
LINDBERGH SIX DEPARTURE

(LINDY6.STL) 17AUG17

BELLEVILLE, ILLINOIS
SCOTT AFB/MIDAMERICA (BLV)

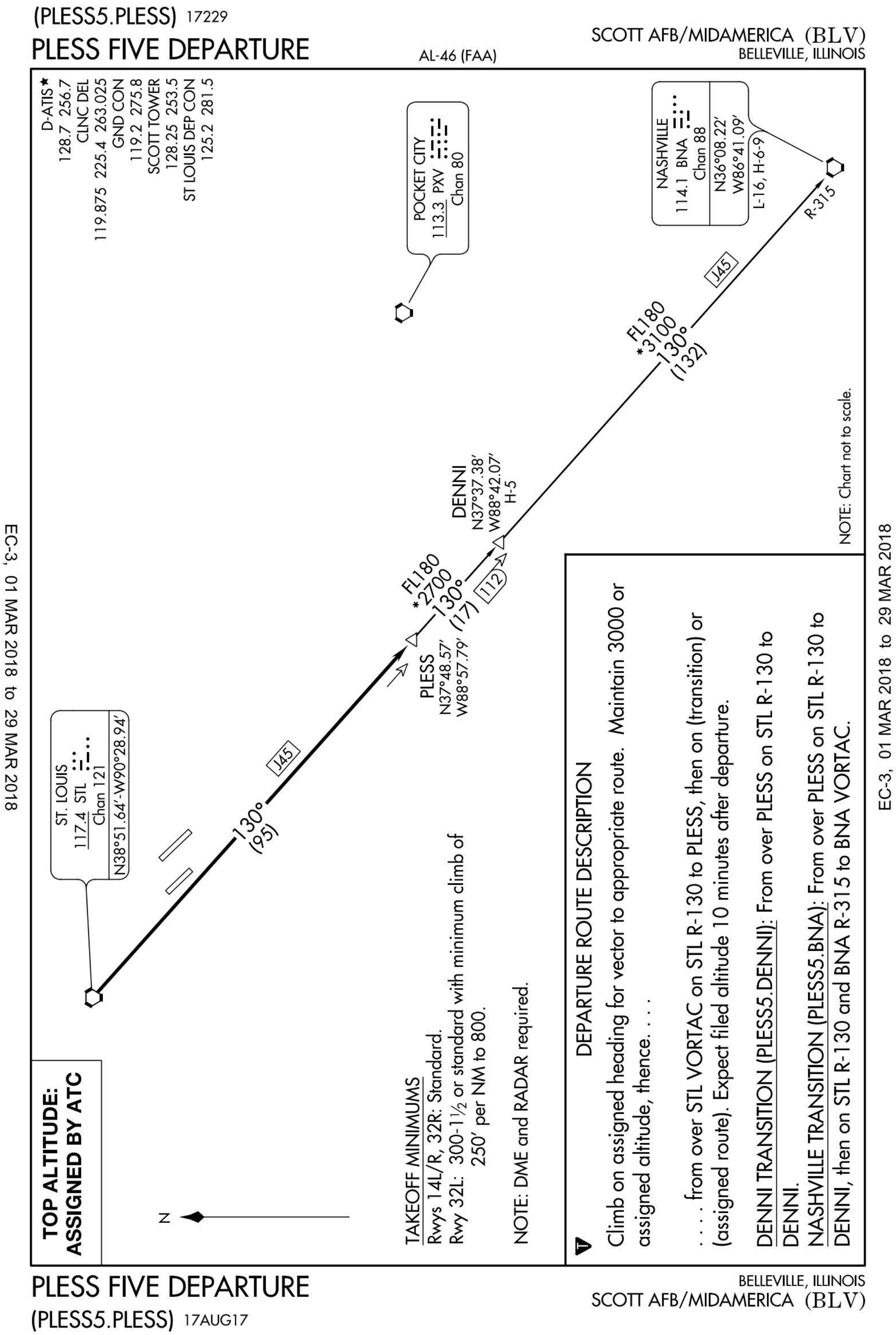
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-5: OZARK SEVEN – Standard Instrument Departure Procedure



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-6: PLESS FIVE – Standard Instrument Departure Procedure



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-7: Takeoff Minimums (Obstacle) Departure Procedures and Diverse Vector Area

TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)

BARABOO, WI

BARABOO-WISCONSIN DELLS RGNL (DLL)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

AMDT 1A 18032 (FAA)

TAKEOFF MINIMUMS: **Rwy 14,** std. w/min. climb of 225' per NM to 2700 or 1100-2½ for climb in visual conditions.

DEPARTURE PROCEDURE: **Rwy 14,** for climb in visual conditions: cross Baraboo Wisconsin Dells airport at or above 1900 before proceeding on course. **Rwy 19,** climb to 1800 before turning left.

TAKEOFF OBSTACLE NOTES: **Rwy 1,** navaid 11' from DER, 20' left of centerline, 2' AGL/969' MSL. Runway end indicator 10' from DER, 86' right of centerline, 4' AGL/969' MSL. Runway end indicator 11' from DER, 87' left of centerline, 3' AGL/970' MSL. Terrain beginning 250' from DER, 124' left of centerline, up to 984' MSL. Tree 601' from DER, 570' left of centerline, 33' AGL/1009' MSL. Trees beginning 1163' from DER, 48' left of centerline, up to 86' AGL/1054' MSL. Bushes beginning 30' from DER, 170' right of centerline, up to 2' AGL/979' MSL. Trees and terrain beginning 18' from DER, 5' right of centerline, up to 135' AGL/1111' MSL. **Rwy 14,** fence post 72' from DER, 299' left of centerline, 11' AGL/988' MSL. Trees and terrain beginning 113' from DER, 93' right of centerline, up to 75' AGL/1063' MSL. Trees and terrain beginning 61' from DER, 61' left of centerline, up to 34' AGL/1006' MSL. **Rwy 19,** navaid 9' from DER, 16' left of centerline, 4' AGL/979' MSL. Navaid 9' from DER, 19' right of centerline, 4' AGL/979' MSL. Runway end indicator 39' from DER, 112' right of centerline, 4' AGL/979' MSL. Runway end indicator 39' from DER, 110' left of centerline, 4' AGL/979' MSL. Trees and terrain beginning 245' from DER, 70' right of centerline, up to 61' AGL/1033' MSL. Terrain beginning 143' from DER, 54' left of centerline, up to 984' MSL. **Rwy 32,** terrain 102' from DER, 424' right of centerline, 974' MSL.

BELLEVILLE, IL

SCOTT AFB, MID AMERICA (BLV)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

ORIG 10210 (FAA)

TAKEOFF MINIMUMS: **Rwy 32L,** 300-1½ or std. w/ a min. climb of 250' per NM to 800.

TAKEOFF OBSTACLE NOTES: **Rwy 32L,** tree 1.24 NM from DER, 2285' left of centerline, 100' AGL/699' MSL. **Rwy 32R,** trees beginning 352' from DER, 198' left of centerline, up to 77' AGL/501' MSL. Trees beginning 1349' from DER, 439' right of centerline, up to 94' AGL/516' MSL.

BELOIT, WI

BELOIT (44C)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

ORIG 14317 (FAA)

TAKEOFF OBSTACLE NOTES: **Rwy 7,** vehicles on road beginning 11' from DER, left and right of centerline, up to 15' AGL/844' MSL. Trees beginning 13' from DER, 241' right of centerline, 75' AGL/894' MSL. Tree 20' from DER, 220' left of centerline, 75' AGL/894' MSL. Silo 86' from DER, 230' left of centerline, 100' AGL/919' MSL. Tree 146' from DER, 31' left of centerline, 75' AGL/904' MSL. Tree 278' from DER, 305' left of centerline, 75' AGL/904' MSL. Tree 827' from DER, 693' left of centerline, 75' AGL/894' MSL. Tree 4827' from DER, 1523' right of centerline, 75' AGL/944' MSL. **Rwy 25,** trees beginning 47' from DER, 35' right of centerline, 75' AGL/884' MSL. Tree 180' from DER, 237' left of centerline, 75' AGL/874' MSL.

BENTON, IL

BENTON MUNI (H96)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

ORIG 11181 (FAA)

TAKEOFF OBSTACLE NOTES: **Rwy 18,** trees and signs beginning 290' from DER, 572' left of centerline, up to 117' AGL/579' MSL. Trees, poles, and building beginning 95' from DER, 406' right of centerline, up to 100' AGL/559' MSL. **Rwy 36,** trees beginning 419' from DER, 507' left of centerline, up to 100' AGL/549' MSL. Trees beginning 420' from DER, 602' right of centerline, up to 100' AGL/539' MSL. Vehicle on road 726' from DER, 1' right of centerline, 15' AGL/464' MSL.

BLACK RIVER FALLS, WI

BLACK RIVER FALLS AREA (BCK)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

AMDT 2 12236 (FAA)

TAKEOFF MINIMUMS: **Rwy 26,** 400-3 or std. w/min. climb of 210' per NM to 1400.

TAKEOFF OBSTACLE NOTES: **Rwy 8,** trees 173' from DER, 271' right of centerline, up to 10' AGL/841' MSL. OL on WSK 300' from DER, 400' left of centerline, 23' AGL/863' MSL. Vehicle on road, 460' from DER, 606' left of centerline, 15' AGL/852' MSL. Poles 1100' from DER, left and right of centerline, up to 32' AGL/872' MSL. Trees beginning 1112' from DER, left and right of centerline, up to 53' AGL/919' MSL. **Rwy 26,** vehicle on road, 155' from DER, 440' right of centerline, 15' AGL/ 849' MSL. Fence 2' from DER, left and right of centerline, 7' AGL/827' MSL. Trees beginning 16' from DER, left and right of centerline, up to 7' AGL/1219' MSL.

BLOOMINGTON-NORMAL, IL

CENTRAL IL RGNL ARPT AT BLOOMINGTON -NORMAL (BMI)

TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES

ORIG-A 15288 (FAA)

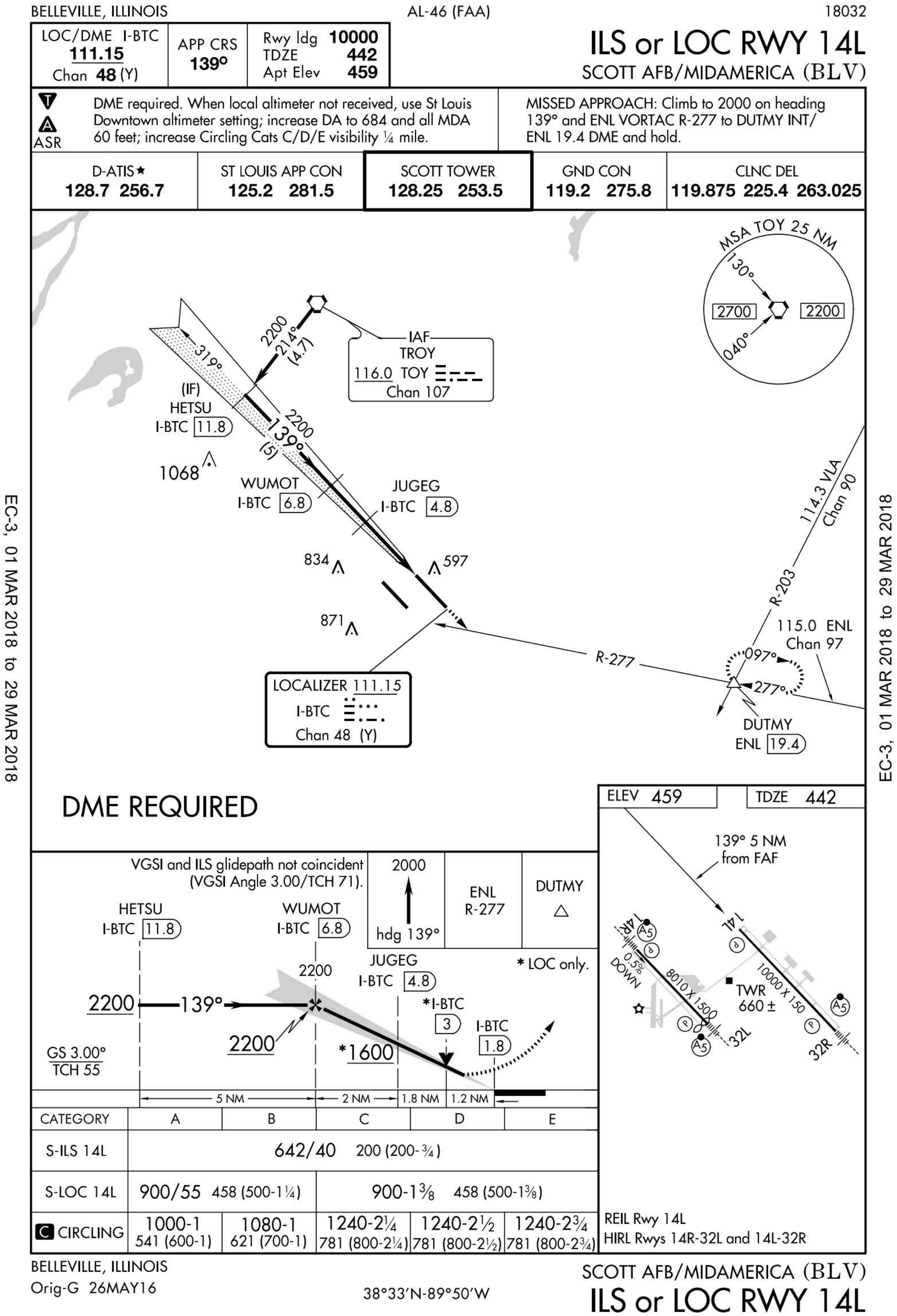
DEPARTURE PROCEDURE: **Rwy 20,** climb heading 201° to 1400 before turning left.

TAKEOFF OBSTACLE NOTES: **Rwy 2,** tower 1639' from DER, 908' right of centerline, 78' AGL/922' MSL. **Rwy 11,** trees beginning 2069' from DER, 870' right of centerline, up to 100' AGL/979' MSL. **Rwy 29,** vehicle on road 103' from DER, 471' right of centerline, 15' AGL/884' MSL. Tree 1667' from DER, 462' left of centerline, 100' AGL/979' MSL

26 APR 2018 to 24 MAY 2018

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

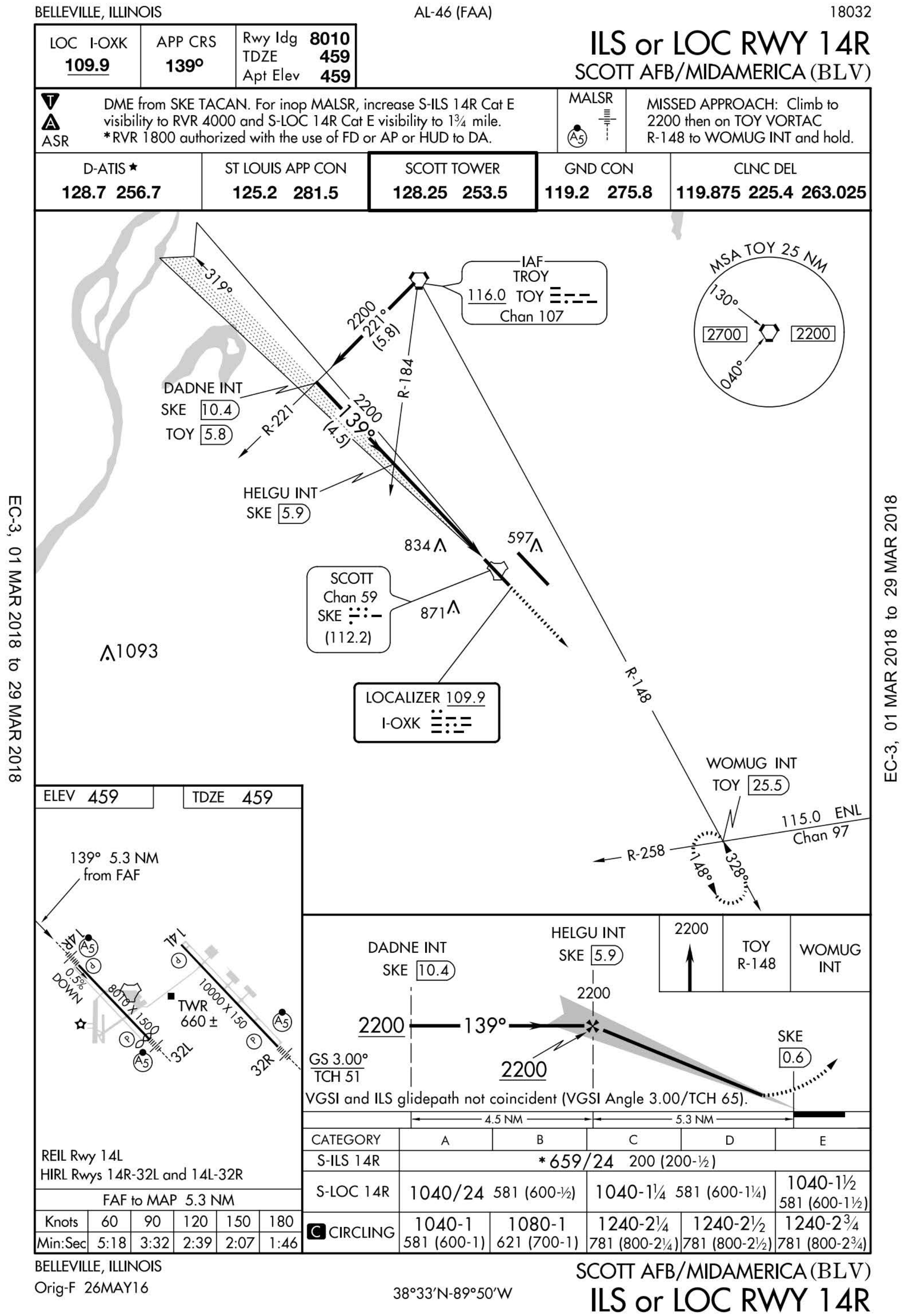
Appendix A-8: ILS or LOC Runway 14L - Standard Instrument Approach Procedure



CATEGORY	A	B	C	D	E
S-ILS 14L	642/40 200 (200-¾)				
S-LOC 14L	900/55 458 (500-1¼)		900-1⅜ 458 (500-1⅜)		
CIRCLING	1000-1 541 (600-1)	1080-1 621 (700-1)	1240-2¼ 781 (800-2¼)	1240-2½ 781 (800-2½)	1240-2¾ 781 (800-2¾)

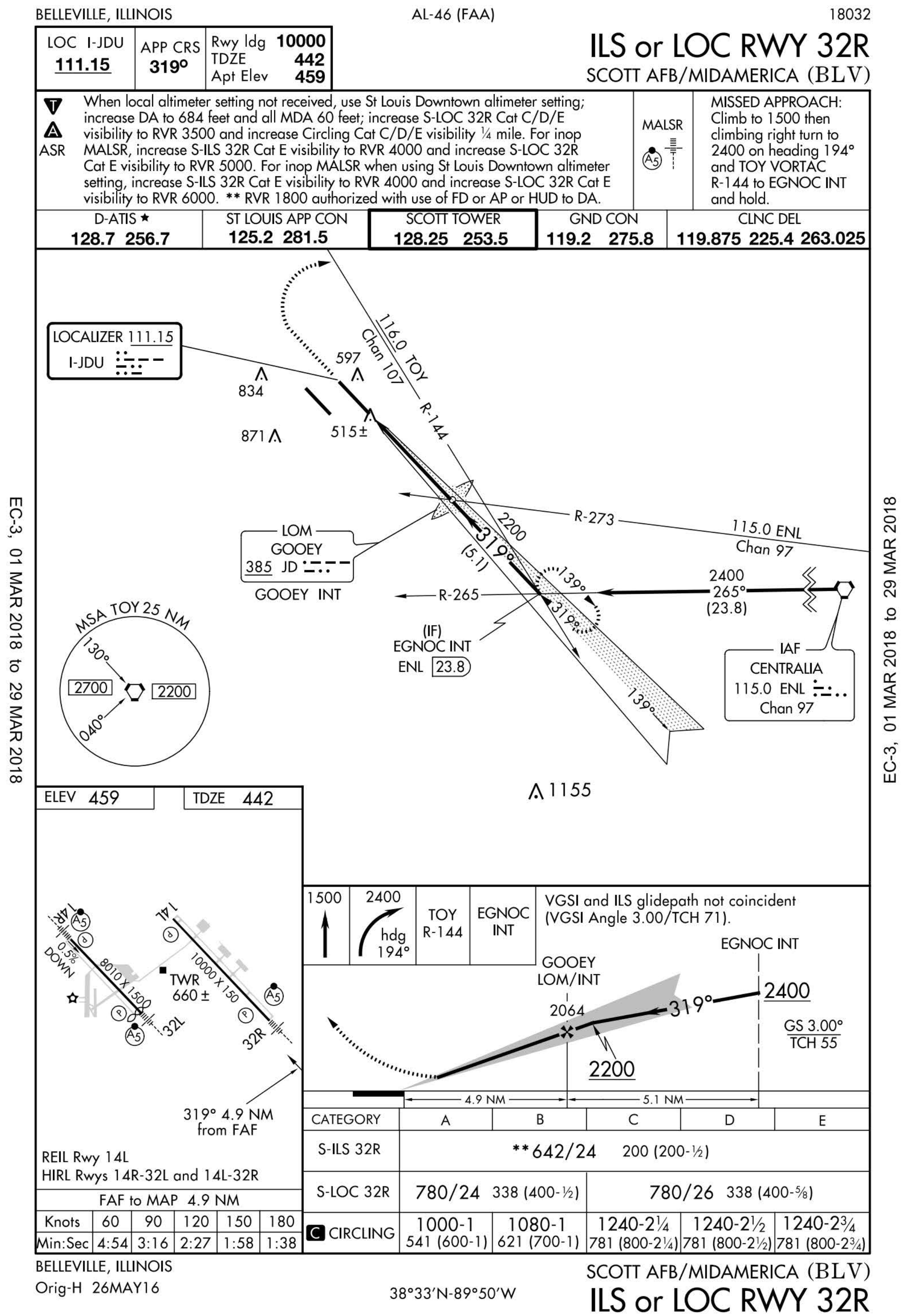
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-9: ILS or LOC Runway 14R - Standard Instrument Approach Procedure



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-10: ILS or LOC Runway 32R - Standard Instrument Approach Procedure

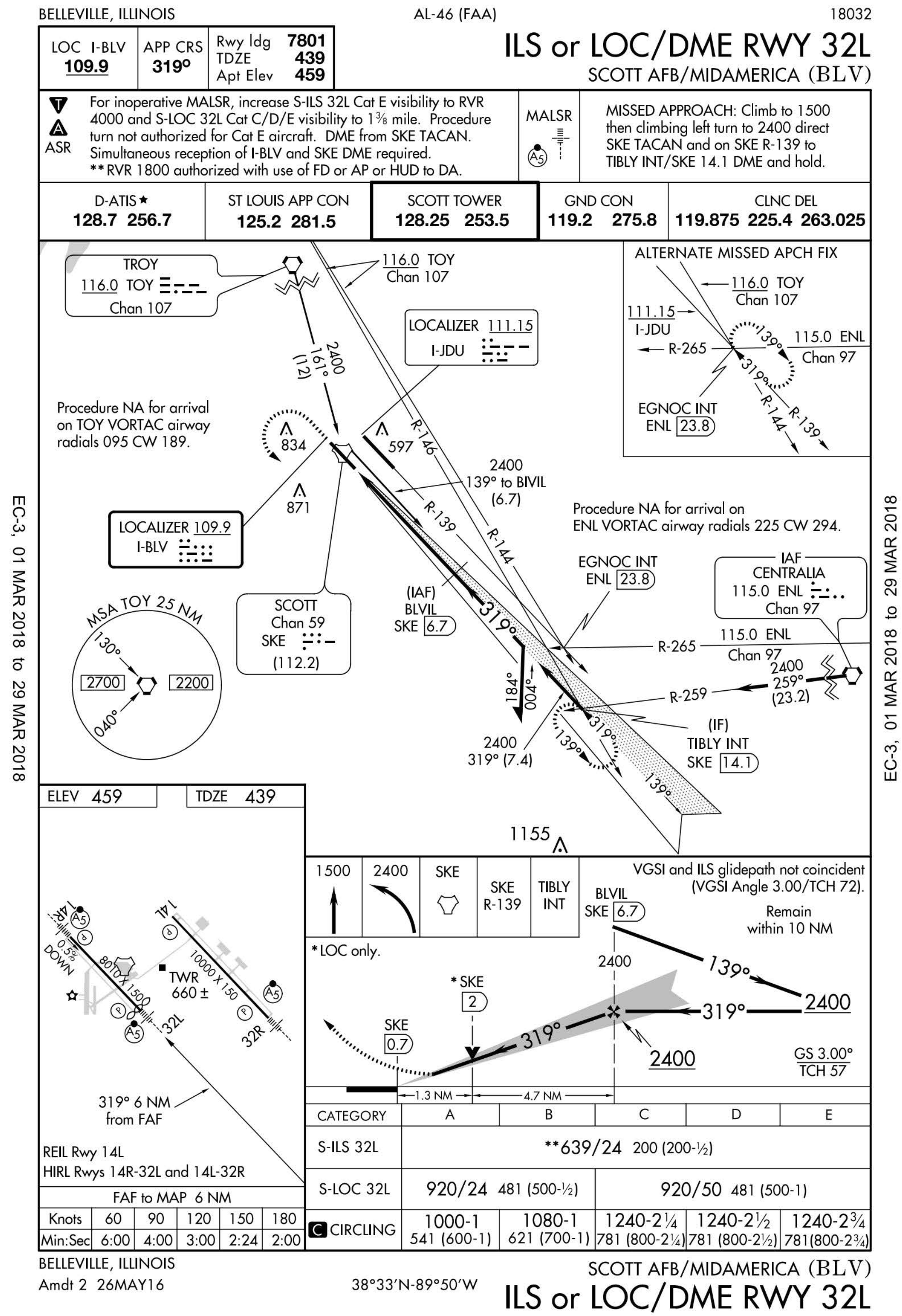


FAF to MAP 4.9 NM					
Knots	60	90	120	150	180
Min:Sec	4:54	3:16	2:27	1:58	1:38

CATEGORY	A	B	C	D	E
S-ILS 32R	**642/24 200 (200-½)				
S-LOC 32R	780/24 338 (400-½)		780/26 338 (400-⅝)		
C CIRCLING	1000-1 541 (600-1)	1080-1 621 (700-1)	1240-2¼ 781 (800-2¼)	1240-2½ 781 (800-2½)	1240-2¾ 781 (800-2¾)

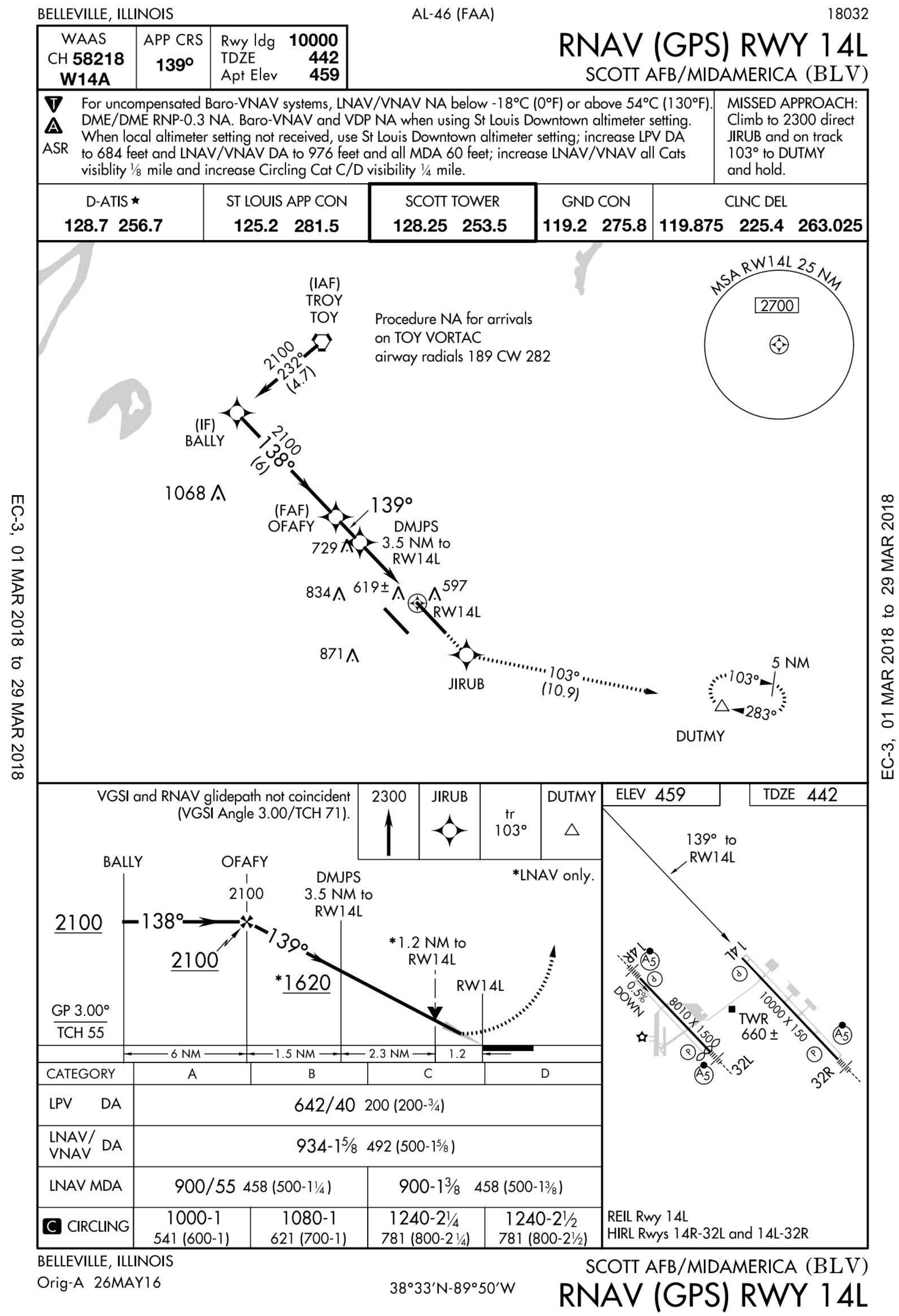
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-11: ILS or LOC/DME Runway 32L - Standard Instrument Approach Procedure



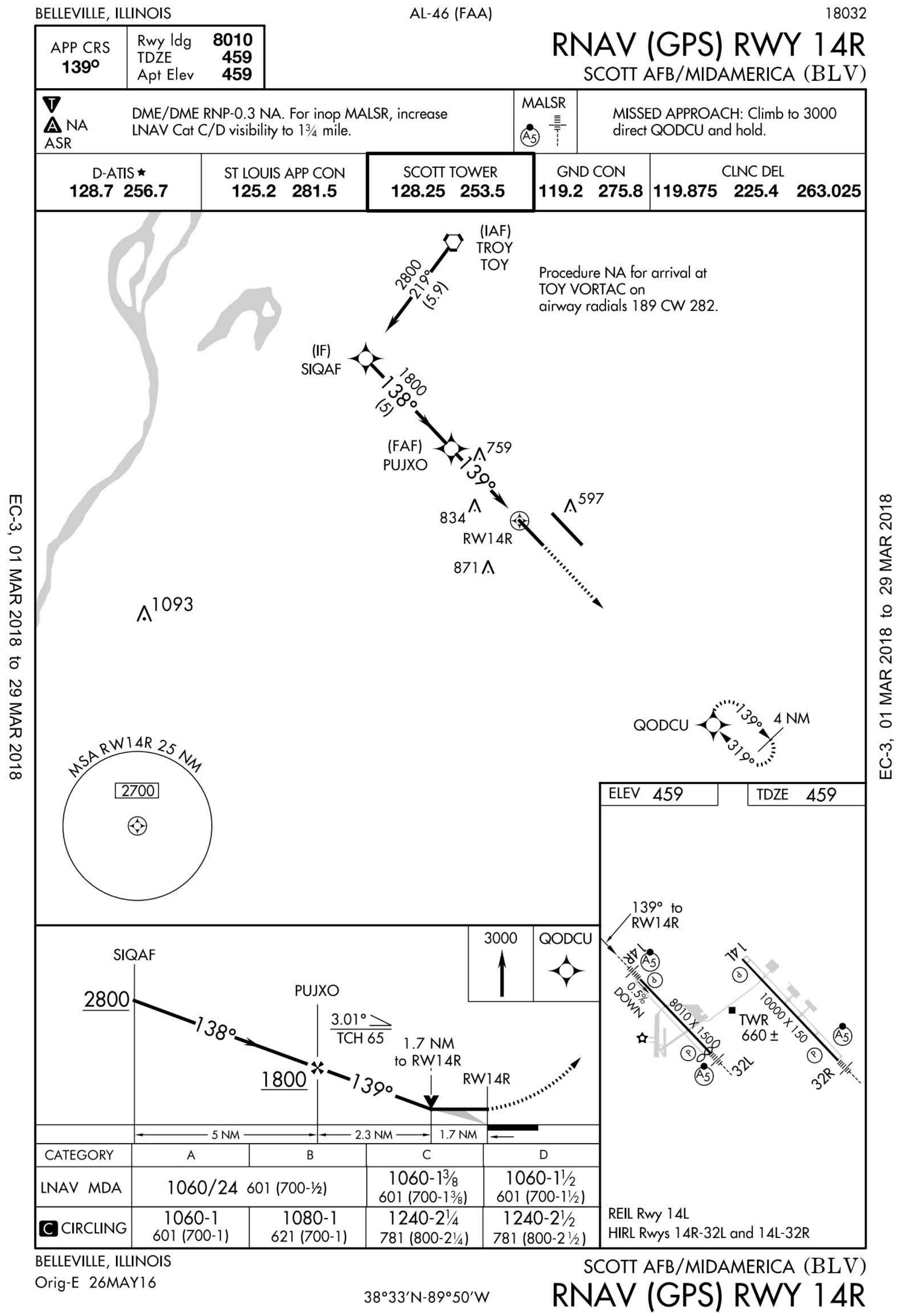
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-12: RNAV (GPS) Runway 14L - Standard Instrument Approach Procedure



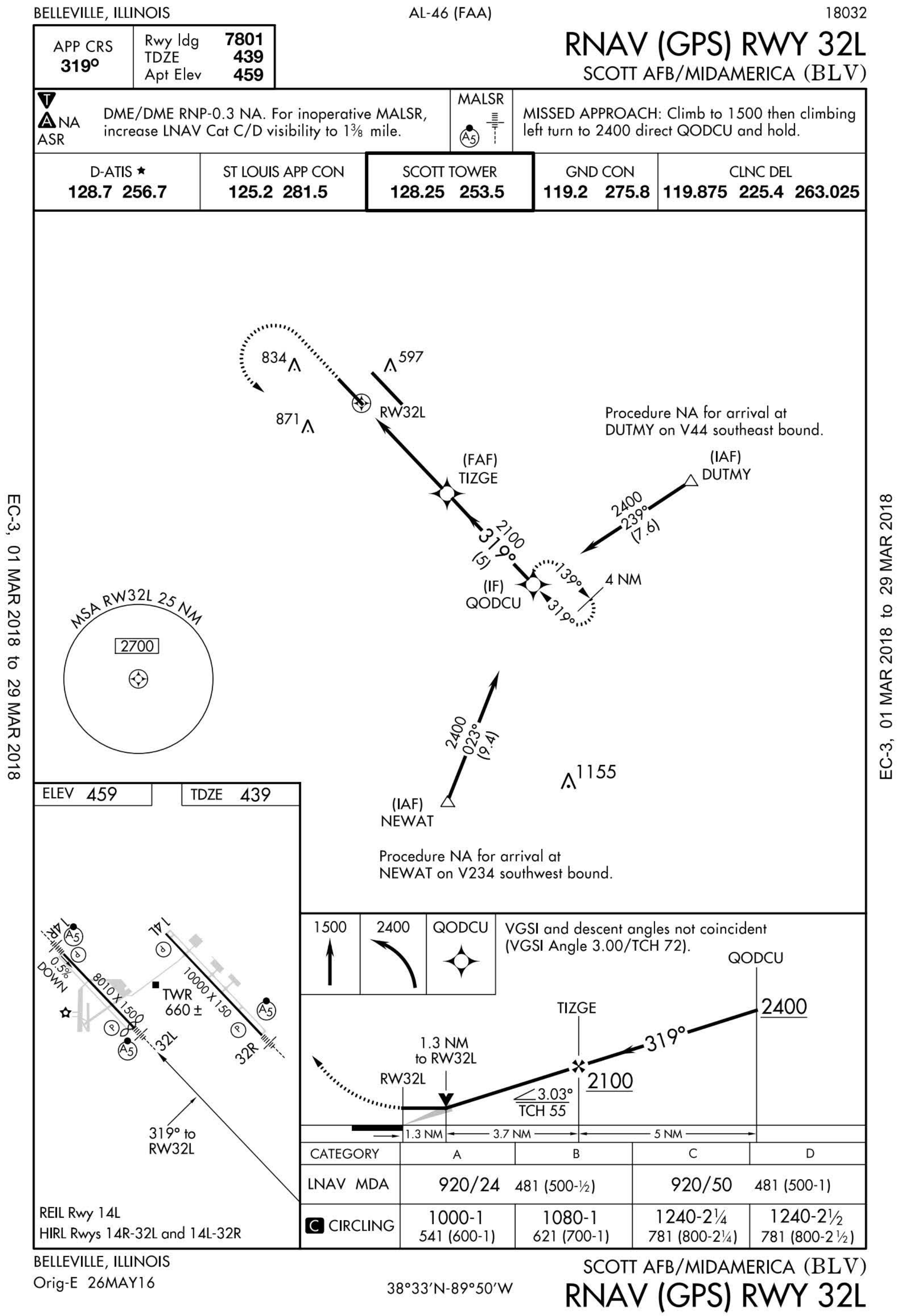
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-13: RNAV (GPS) Runway 14R - Standard Instrument Approach Procedure



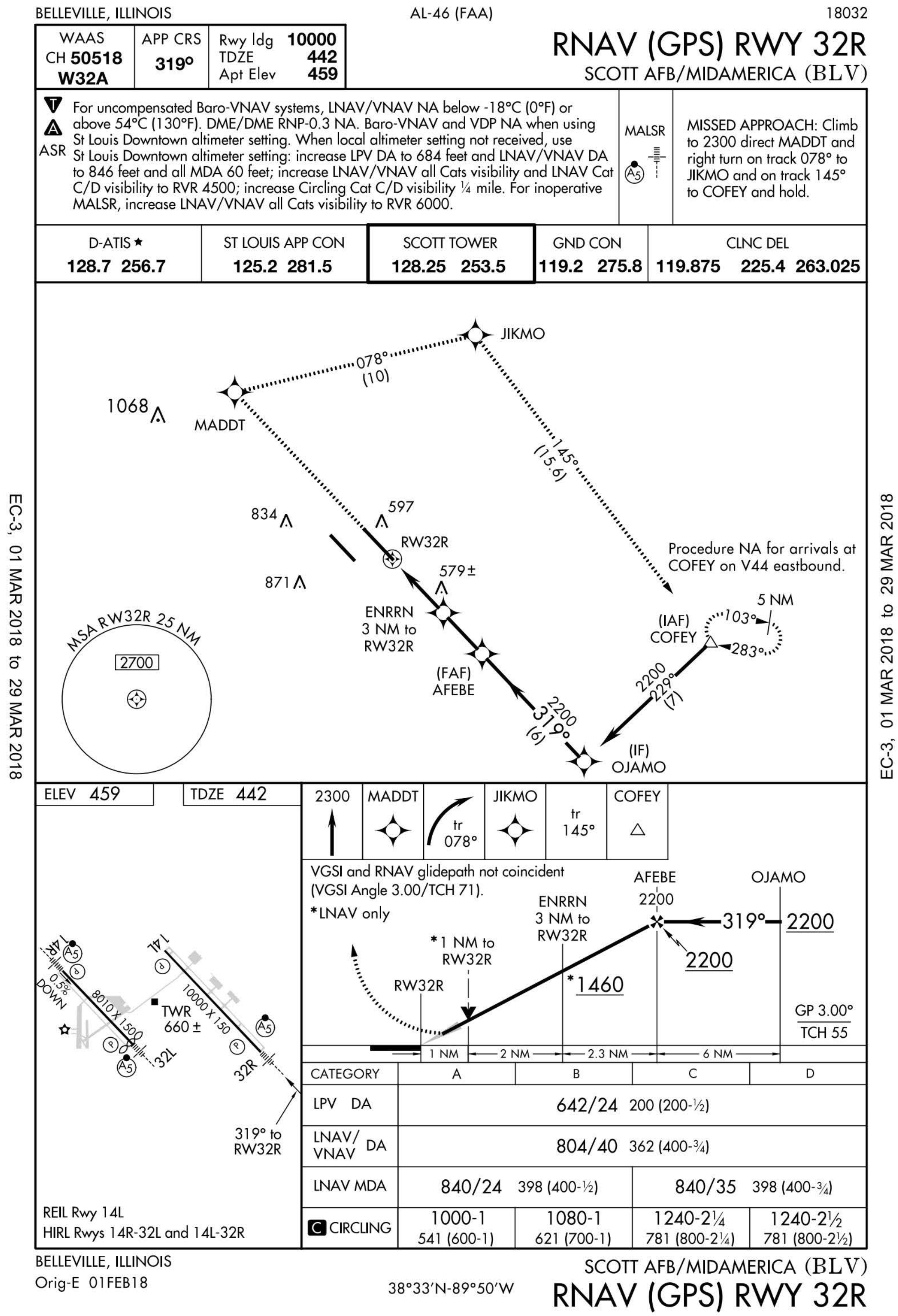
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-14: RNAV (GPS) Runway 32L - Standard Instrument Approach Procedure



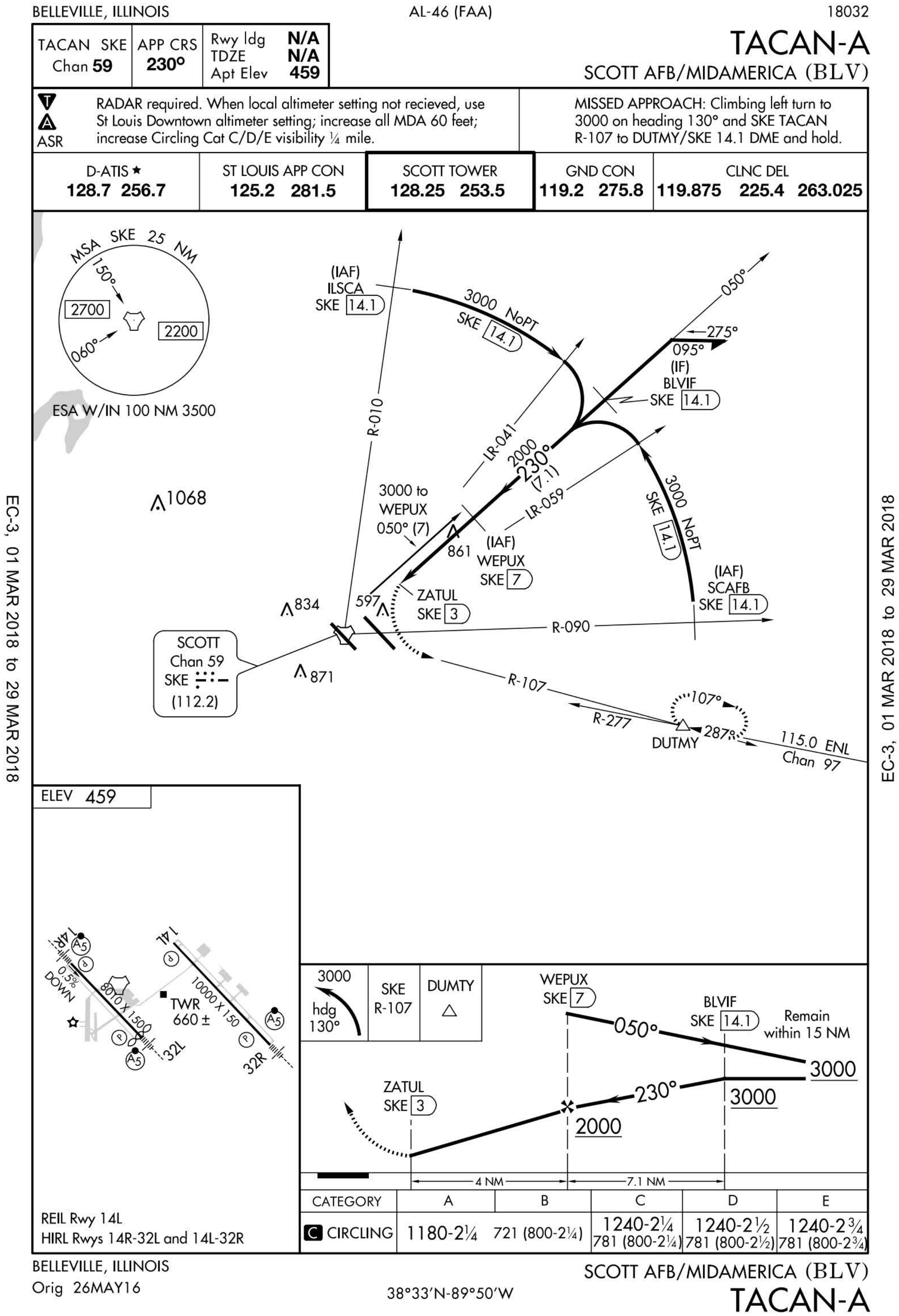
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-15: RNAV (GPS) Runway 32R - Standard Instrument Approach Procedure



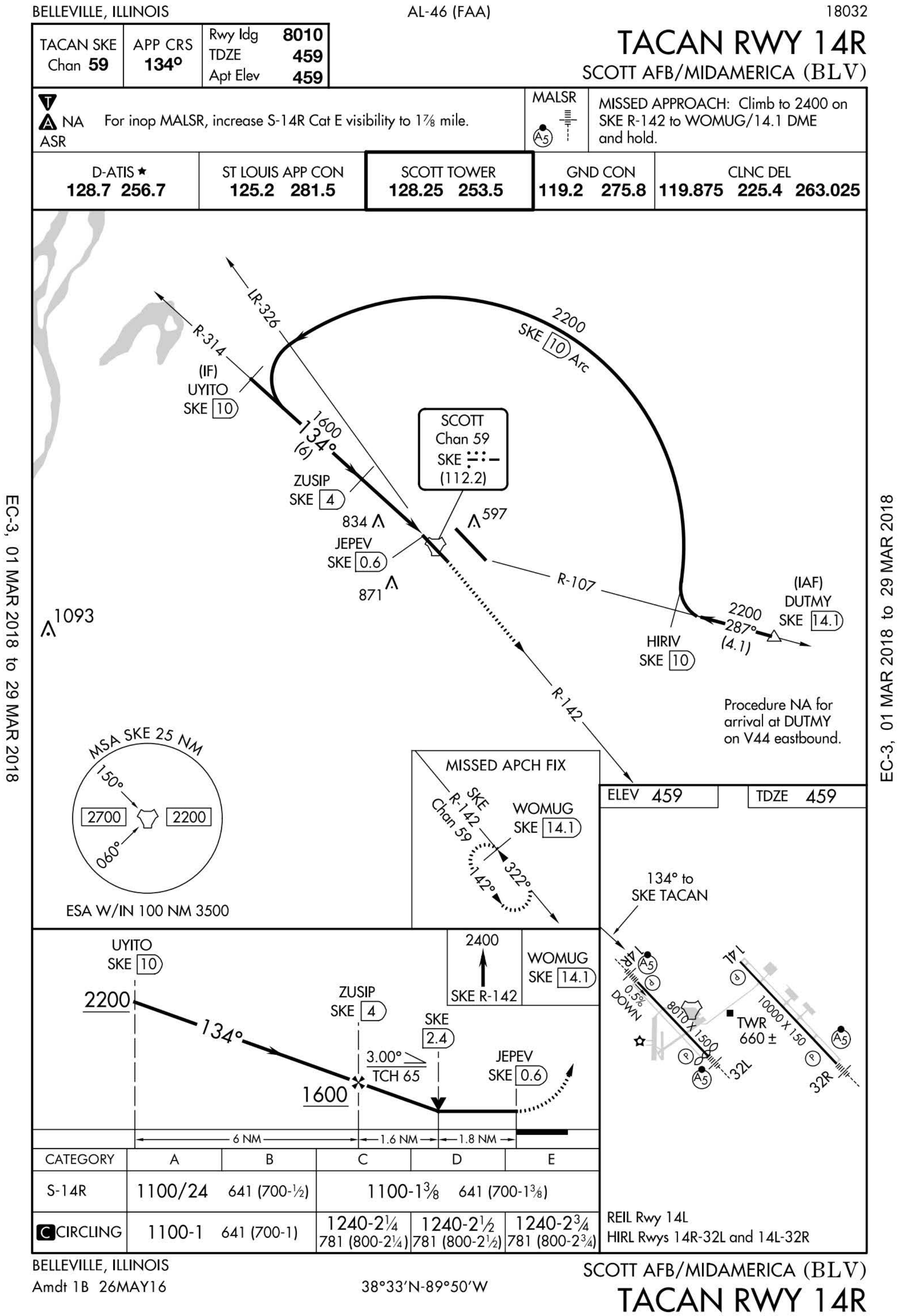
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-16: TACAN-A - Standard Instrument Approach Procedure (Military)



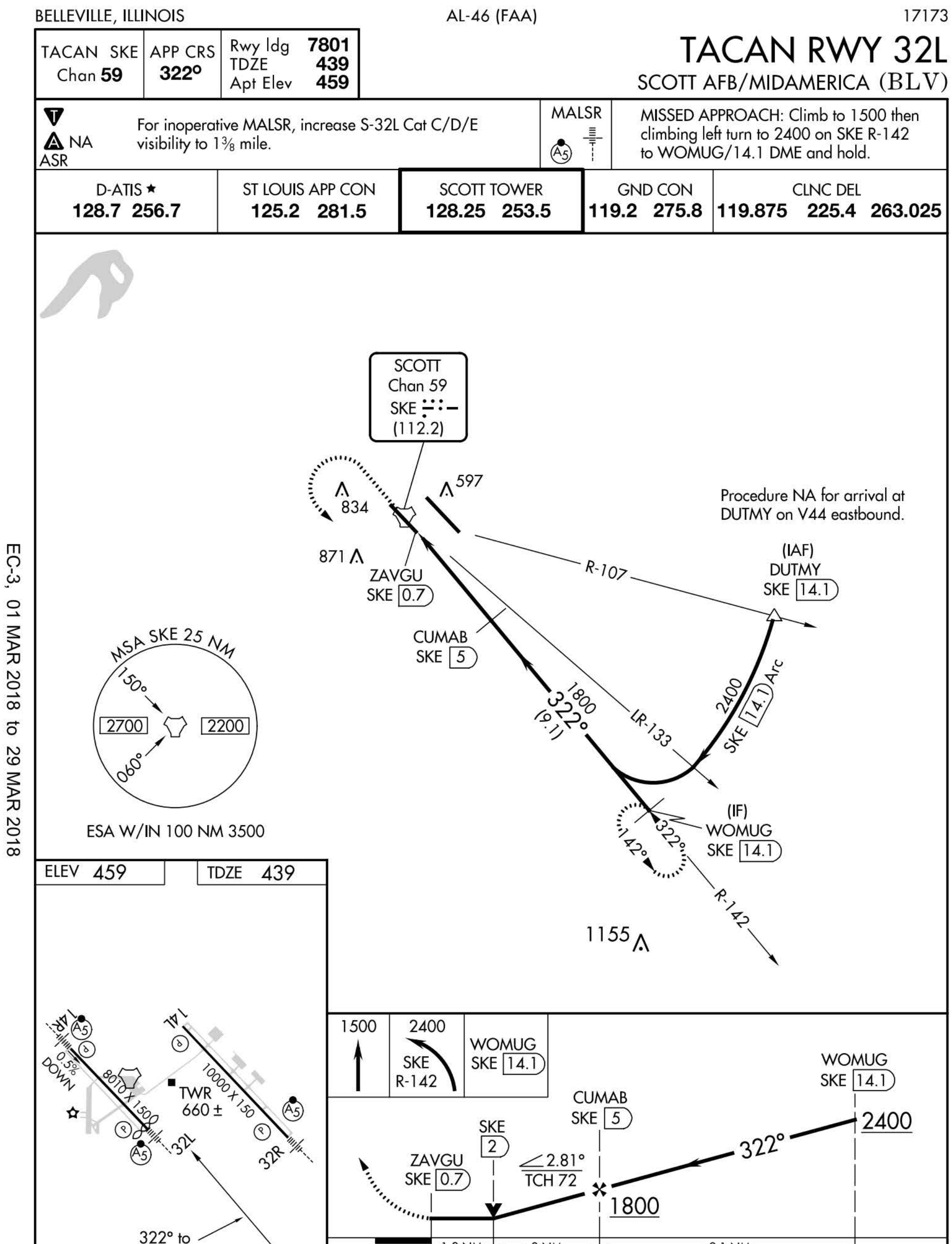
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-17: TACAN Runway 14R - Standard Instrument Approach Procedure (Military)



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-18: TACAN Runway 32L - Standard Instrument Approach Procedure (Military)



CATEGORY	A	B	C	D	E
S-32L	920/24 481 (500-½)		920/50 481 (500-1)		920/60 481 (500-1¼)
CIRCLING	1000-1 541 (600-1)	1080-1 621 (700-1)	1240-2¼ 781 (800-2¼)	1240-2½ 781 (800-2½)	1240-2¾ 781(800-2¾)

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-19: Radar (ASR) Instrument Approach Minimums

N1

RADAR MINS
17229

RADAR INSTRUMENT APPROACH MINIMUMS

01 MAR 2018 to 29 MAR 2018

BELLEVILLE, IL
Orig, 26MAY16 (16147) (FAA) ELEV **459**

SCOTT AFB / MIDAMERICA (BLV)
RADAR-1 125.2 281.5 T A

	RWY	GP/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS
ASR	32L		AB	**880**/24	441	(500-½)	CDE	**880**/45	441	(500-⅞)
	32R		AB	**920**/24	478	(500-½)	CDE	**920**/50	478	(500-1)
	14L		AB	**1020**/55	578	(600-1¼)	CDE	**1020**-1⅝	578	(600-1⅝)
	14R		AB	**1100**/24	641	(700-½)	CDE	**1100**-1⅜	641	(700-1⅜)
C CIRCLING	ALL RWY		AB	**1100**-1	641	(700-1)	C	**1240**-2¼	781	(800-2¼)
			D	**1240**-2½	781	(800-2½)	E	**1240**-2¾	781	(800-2¾)

For inoperative MALSR, increase S-14R CAT E visibility to 1⅞ mile.
For inoperative MALSR, increase S-32L CAT E visibility to 1⅜ mile.
For inoperative MALSR, increase S-32R CAT E visibility to 1⅜ mile.

CHAMPAIGN/URBANA, IL
Amdt 6C, 12NOV15 (15316) (FAA) ELEV **755**

UNIVERSITY OF ILLINOIS-WILLARD (CMI)
RADAR-1 (316°-135°) 121.35 285.65 (136°-315°) 132.85 290.225 A

	RWY	GP/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS
ASR	32R		ABC	**1180**/40	430	(500-¾)	D	**1180**/50	430	(500-1)
	14L		AB	**1200**-1	445	(500-1)	CD	**1200**-1⅜	445	(500-1⅜)
CIRCLING	ALL RWY		AB	**1240**-1	485	(500-1)	C	**1500**-2¼	745	(800-1¼)
			D	**1500**-2½	745	(800-2½)				

When control tower closed ASR and alternate minimums NA.

01 MAR 2018 to 29 MAR 2018

CHICAGO/ROCKFORD, IL
Amdt 10A, 21DEC06 (17229) (FAA) ELEV **742**

CHICAGO/ ROCKFORD INTL (RFD)
RADAR-1 121.0 327.0 T

	RWY	GP/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS
ASR	1		AB	**1160**/24	431	(500-½)	C	**1160**/40	431	(500-¾)
			D	**1160**/50	431	(500-1)				
	7		AB	**1180**/24	438	(500-½)	C	**1180**/40	438	(500-¾)
			D	**1180**/50	438	(500-1)				
	25		AB	**1220**-1	485	(500-1)	C	**1220**-1¼	485	(500-1¼)
			D	**1220**-1½	485	(500-1½)				
CIRCLING	ALL RWY		A	**1220**-1	478	(500-1)	B	**1240**-1	498	(500-1)
			C	**1240**-1½	498	(500-1½)	D	**1320**-2	578	(600-2)

EC-3

RADAR INSTRUMENT APPROACH MINIMUMS

RADAR MINS
17229 N1

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-20: IFR Alternate Airport Minimums

INSTRUMENT APPROACH PROCEDURE CHARTS

IFR ALTERNATE AIRPORT MINIMUMS

Standard alternate minimums for non-precision approaches and approaches with vertical guidance [NDB, VOR, LOC, TACAN, LDA, SDF, VOR/DME, ASR, RNAV (GPS) or RNAV (RNP)] are 800-2. Standard alternate minimums for precision approaches (ILS, PAR, or GLS) are 600-2. Airports within this geographical area that require alternate minimums other than standard or alternate minimums with restrictions are listed below. NA - means alternate minimums are not authorized due to unmonitored facility, absence of weather reporting service, or lack of adequate navigation coverage. Civil pilots see FAR 91. IFR Alternate Minimums: Ceiling and Visibility Minimums not applicable to USA/USN/USAF. Pilots must review the IFR Alternate Minimums Notes for alternate airfield suitability.

NAME ALTERNATE MINIMUMS

ALTON/ST.LOUIS, IL

ST. LOUIS RGNL (ALN)..........**ILS or LOC Rwy 29**[1]
LOC BC Rwy 11[1]
NDB Rwy 17[2]
RNAV (GPS) Rwy 11
RNAV (GPS) Rwy 17
RNAV (GPS) Rwy 29
RNAV (GPS) Rwy 35
VOR-A

NA when local weather not available.
[1]NA when control tower closed.
[2]Categories A,B, 900-2; Category C, 900-2½; Category D, 900-2¾.

ANTIGO, WI

LANGLADE COUNTY (AIG)......................**RNAV (GPS) Rwy 9**
RNAV (GPS) Rwy 17
RNAV (GPS) Rwy 27
RNAV (GPS) Rwy 35

NA when local weather not available.

APPLETON, WI

APPLETON INTL (ATW)............................**ILS or LOC Rwy 3**[1]
RNAV (GPS) Rwy 3
RNAV (GPS) Rwy 12
RNAV (GPS) Rwy 21
RNAV (GPS) Rwy 30

NA when local weather not available.
[1]NA when control tower closed.

ASHLAND, WI

JOHN F. KENNEDY MEMORIAL (ASX)..................**RNAV (GPS) Rwy 2**
RNAV (GPS) Rwy 13
RNAV (GPS) Rwy 20
RNAV (GPS) Rwy 31

NA when local weather not available.
Category D, 800-2¼.

NAME ALTERNATE MINIMUMS

BARABOO, WI

BARABOO-WISCONSIN DELLS RGNL (DLL)..........................**RNAV (GPS) Rwy 1**
RNAV (GPS) Rwy 19[1]
VOR-A

NA when local weather not available.
[1]Category D, 900-2¾.

BELLEVILLE, IL

SCOTT AFB/MIDAMERICA (BLV)..................................**ILS or LOC Rwy 14L**[12]
ILS or LOC Rwy 14R[1]
ILS or LOC/DME Rwy 32L[1]
ILS or LOC Rwy 32R[12]
RADAR-1[4]
RNAV (GPS) Rwy 14L[23]
RNAV (GPS) Rwy 32R[23]
TACAN-A[25]

[1]ILS, Category B, 700-2; C, 800-2¼; Category D, 800-2½; Category E, 800-2¾; LOC, Category C, 800-2¼; Category D, 800-2½; Category E, 800-2¾.
[2]NA when local weather not available.
[3]Category C, 800-2¼; Category D, 800-2½.
[4]Category C, 800-2¼; Category D, 800-2½; Category E, 800-2¾.
[5]Categories A, B, C, 800-2¼; Category D, 800-2½; Category E, 800-2¾.

BLACK RIVER FALLS, WI

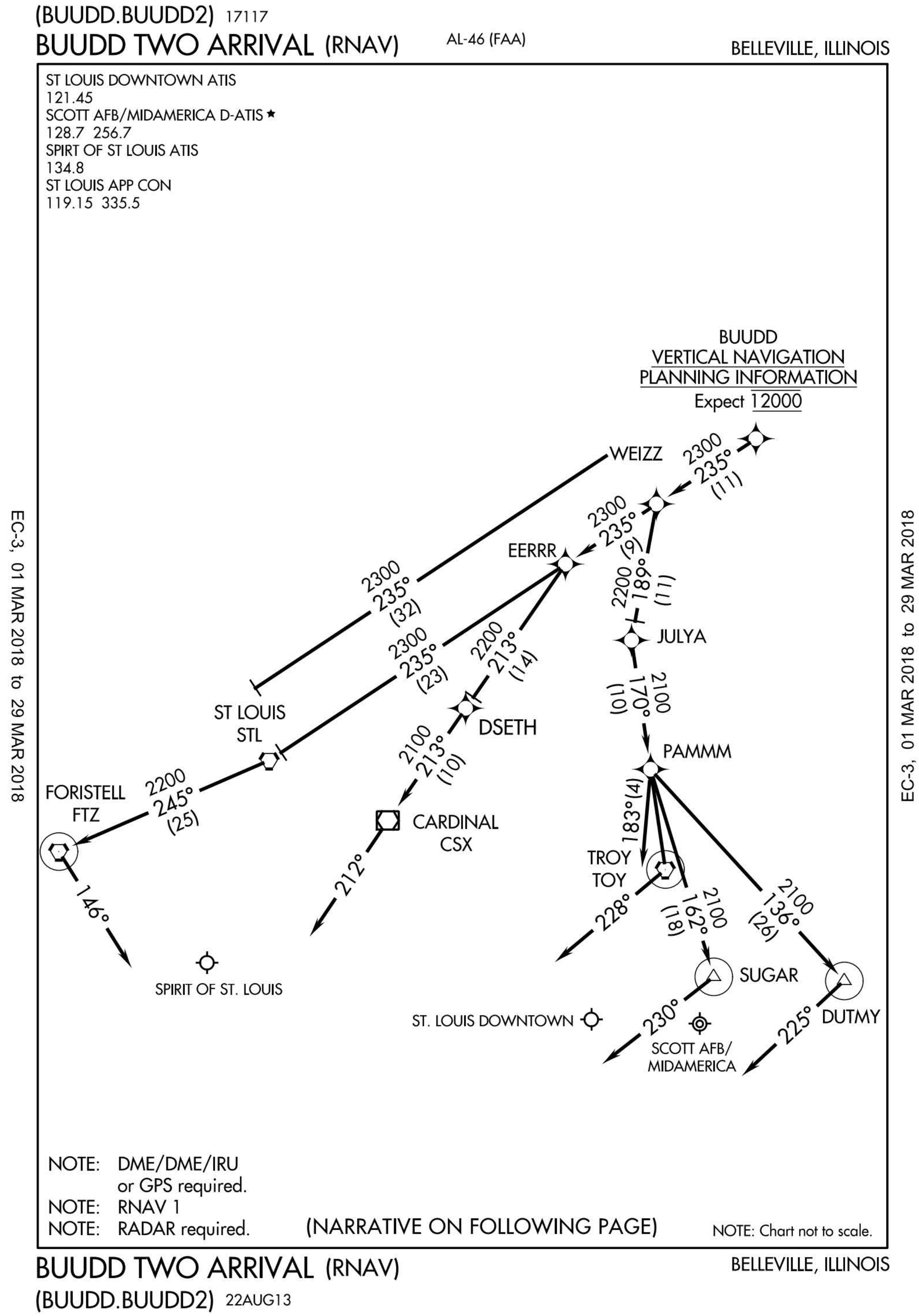
BLACK RIVER FALLS AREA (BCK)............................**RNAV (GPS) Rwy 8**
RNAV (GPS) Rwy 26

NA when local weather not available.

01 MAR 2018 to 29 MAR 2018

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-21: BUUDD TWO Arrival (RNAV) - Standard Terminal Arrival Procedure (Military) (1/2)



Appendix A-21: BUUDD TWO Arrival (RNAV) - Standard Terminal Arrival Procedure (Military) (2/2)

(BUUDD.BUUDD2) 17117

BUUDD TWO ARRIVAL (RNAV) AL-46 (FAA) BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018

ARRIVAL ROUTE DESCRIPTION

LANDING RWYS 8L/R AT SPIRIT OF ST. LOUIS:
From BUUDD on track 235° to WEIZZ, then on track 235° to STL VORTAC, then on track 245° to FTZ VORTAC. Expect radar vectors prior to FTZ VORTAC, if no heading received, track 146°.

LANDING RWYS 26L/R AT SPIRIT OF ST. LOUIS:
From BUUDD on track 235° to WEIZZ, then on track 235° to EERRR, then on track 213° to DSETH, then on track 213° to CSX VOR/DME. Expect radar vectors prior to CSX VOR/DME, if no heading received, track 212°.

LANDING RWY 14L/R AT SCOTT AFB/MIDAMERICA:
From BUUDD on track 235° to WEIZZ, then on track 189° to JULYA, then on track 170° to PAMMM, then on track 170° to TOY VORTAC. Expect radar vectors prior to TOY VORTAC, if no heading received, track 228°.

LANDING RWY 12R AT KCPS:
From BUUDD on track 235° to WEIZZ, then on track 189° to JULYA, then on track 170° to PAMMM. Expect radar vectors prior to PAMMM, if no heading received, track 183°.

LANDING RWY 30L/R AT CAHOKIA/ST. LOUIS DOWNTOWN:
From BUUDD on track 235° to WEIZZ, then on track 189° to JULYA, then on track 170° to PAMMM, then on track 162° to SUGAR. Expect radar vectors prior to SUGAR, if no heading received, track 230°.

LANDING RWY 32L/R AT SCOTT AFB/MIDAMERICA:
From BUUDD on track 235° to WEIZZ, then on track 189° to JULYA, then on track 170° to PAMMM, then on track 136° to DUTMY. Expect radar vectors prior to DUTMY, if no heading received, track 225°.

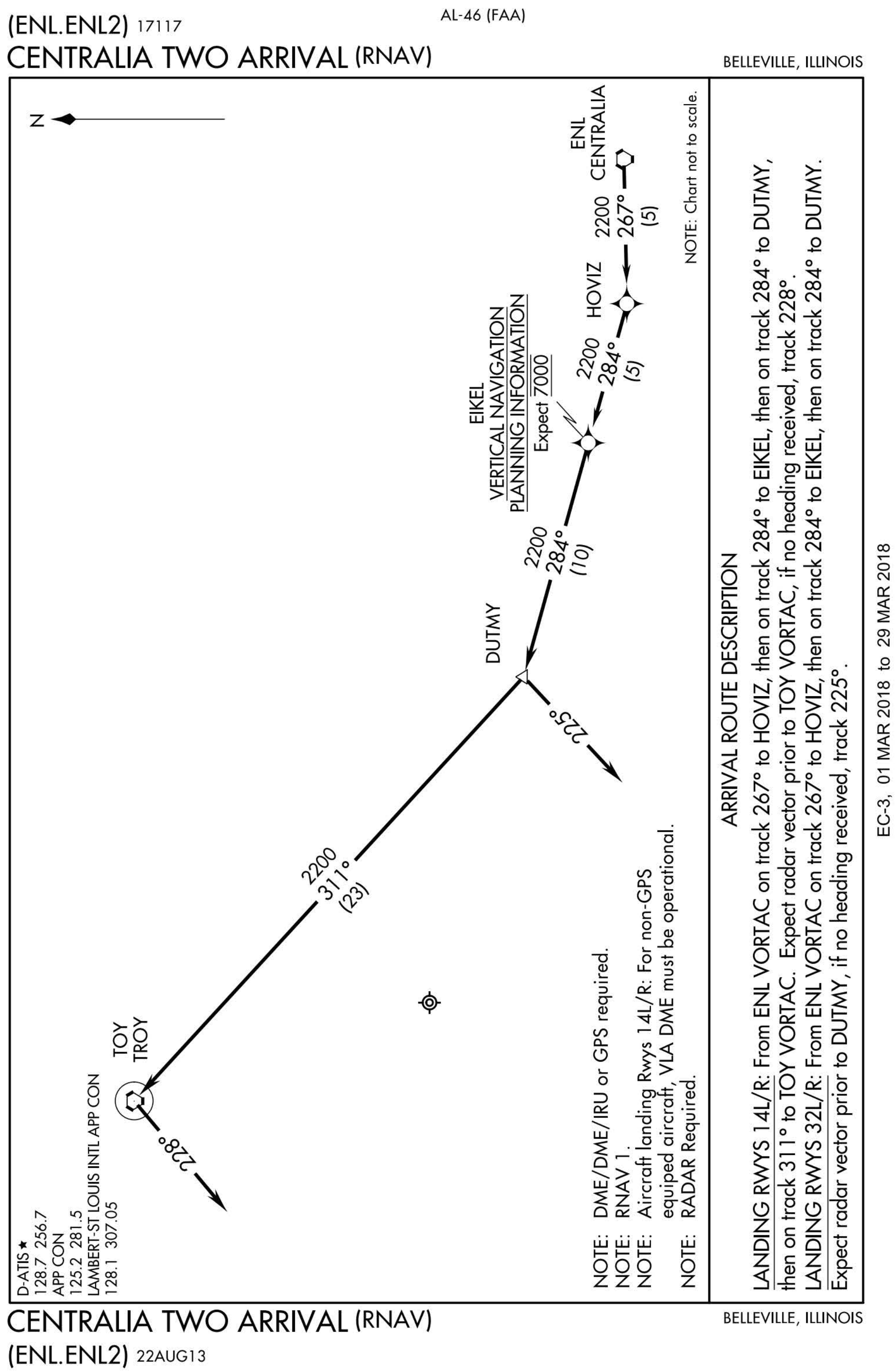
EC-3, 01 MAR 2018 to 29 MAR 2018

BUUDD TWO ARRIVAL (RNAV) BELLEVILLE, ILLINOIS

(BUUDD.BUUDD2) 22AUG13

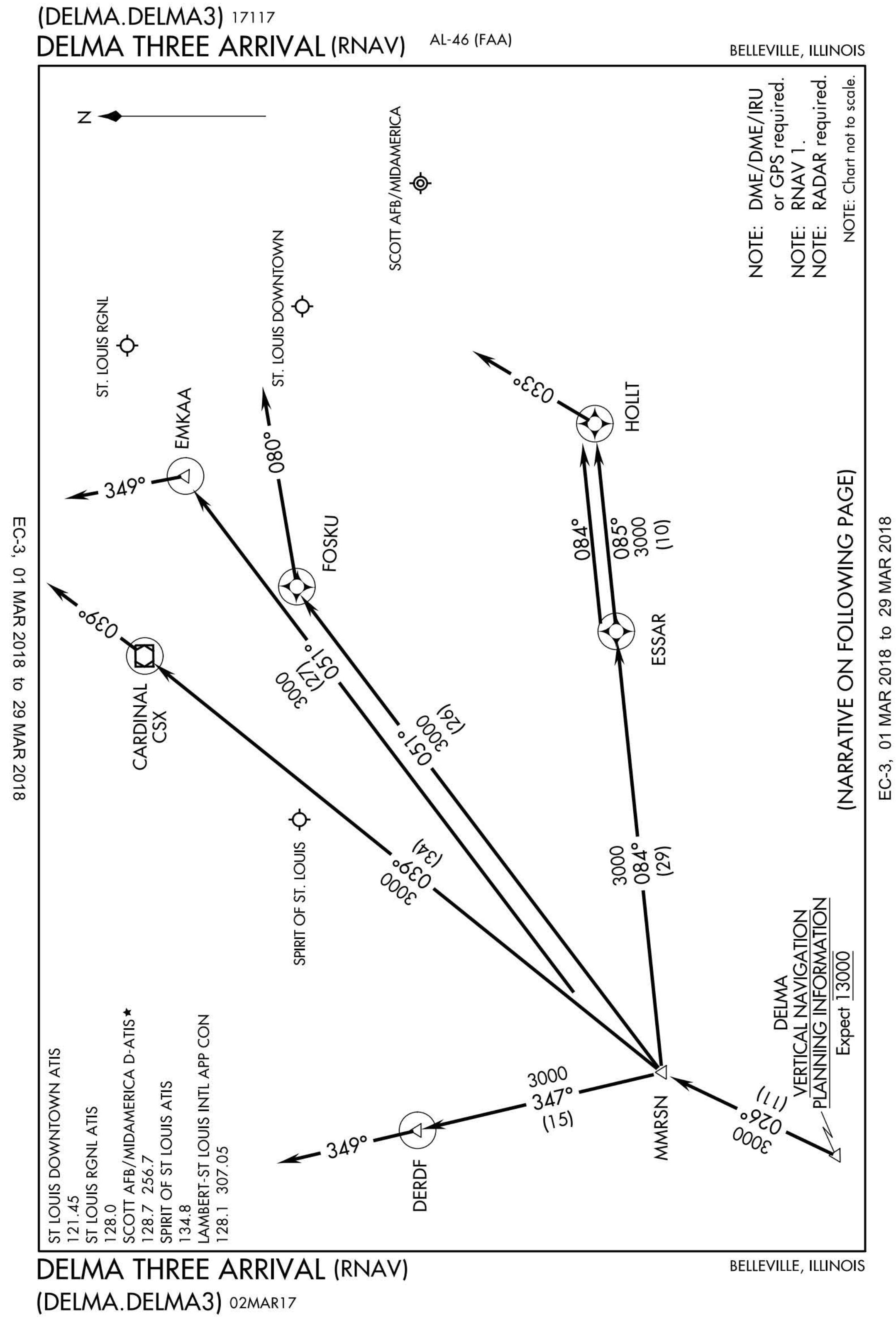
Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-22: CENTRALIA TWO Arrival (RNAV) - Standard Terminal Arrival Procedure (Military)



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-23: DELMA THREE Arrival (RNAV) - Standard Terminal Arrival Procedure (Military) (1/2)



Appendix A-23: DELMA THREE Arrival (RNAV) - Standard Terminal Arrival Procedure (Military) (2/2)

(DELMA.DELMA3) 17117

DELMA THREE ARRIVAL (RNAV) AL-46 (FAA)

BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018

ARRIVAL ROUTE DESCRIPTION

SPIRIT OF ST. LOUIS:
LANDING RWY 08L/R: From DELMA on track 026° to MMRSN, then on track 347° to DERDF, expect radar vectors to final approach. If no heading received, track 349°.
LANDING RWY 26L/R: From DELMA on track 026° to MMRSN, then on track 051° to EMKAA, expect radar vectors to final approach. If no heading received, track 349°.

ST. LOUIS DOWNTOWN:
LANDING RWY 12R: From DELMA on track 026° to MMRSN, then on track 051° to FOSKU, expect radar vectors to final approach. If no heading received, track 080°.
LANDING RWY 30L/R: From DELMA on track 026° to MMRSN, then on track 084° to ESSAR, then on track 085° to HOLLT, expect radar vectors to final approach. If no heading received, track 033°.

SCOTT AFB/MIDAMERICA:
LANDING RWY 14L/R, 32L/R: From DELMA on track 026° to MMRSN, then on track 084° to ESSAR. Expect radar vectors to final approach. If no heading received, track 084°.

ST. LOUIS RGNL:
LANDING RWY 11, 17, 29, 35: From DELMA on track 026° to MMRSN, then on track 039° to CSX VOR/DME. Expect radar vectors to final approach. If no heading received, track 039°.

EC-3, 01 MAR 2018 to 29 MAR 2018

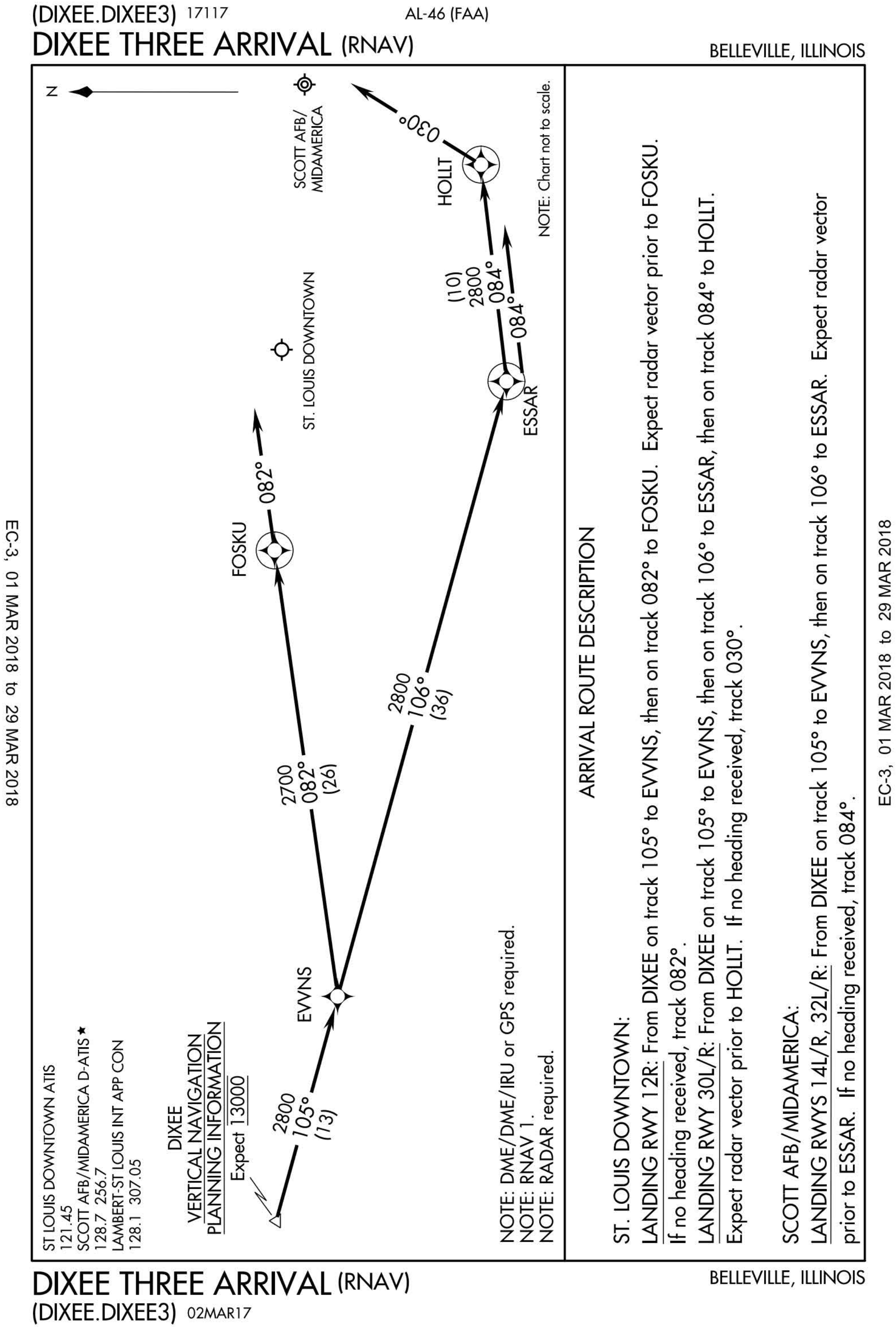
DELMA THREE ARRIVAL (RNAV)

BELLEVILLE, ILLINOIS

(DELMA.DELMA3) 02MAR17

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

Appendix A-24: DIXEE THREE Arrival (RNAV) - Standard Terminal Arrival Procedure (Military)



Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

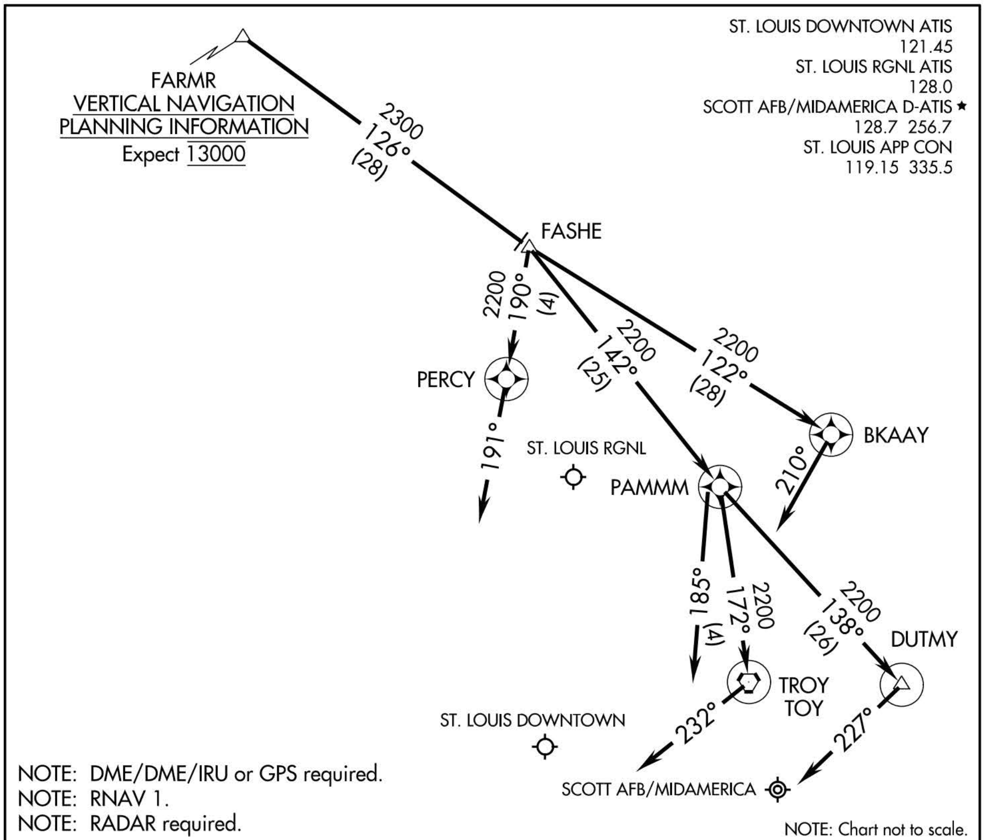
Appendix A-25: FARMER THREE Arrival (RNAV) - Standard Terminal Arrival Procedure (Military)

(FARMR.FARMR3) 17117

FARMR THREE ARRIVAL (RNAV)

AL-46 (FAA) BELLEVILLE, ILLINOIS

EC-3, 01 MAR 2018 to 29 MAR 2018



EC-3, 01 MAR 2018 to 29 MAR 2018

ARRIVAL DESCRIPTION

ST. LOUIS DOWNTOWN:

LANDING RWY 12R, 30L/R: From FARMR on track 126° to FASHE, then on track 142° to PAMMM. Expect radar vector prior to PAMMM. If no heading received, track 185°.

SCOTT AFB/MIDAMERICA:

LANDING RWYS 14L/R: From FARMR on track 126° to FASHE, then on track 142° to PAMMM, then on track 172° to TOY VORTAC. Expect RADAR vector prior to TOY VORTAC. If no heading received, track 232°.

LANDING RWYS 32L/R: From FARMR on track 126° to FASHE, then on track 142° to PAMMM, then on track 138° to DUTMY. Expect radar vector prior to DUTMY. If no heading received, track 227°.

ST. LOUIS RGNL:

LANDING RWY 11: From FARMR on track 126° to FASHE, then on track 190° to PERCY. Expect radar vector prior to PERCY. If no heading received, track 191°.

LANDING RWY 29: From FARMR on track 126° to FASHE, then on track 122° to BKAAY. Expect radar vector prior to BKAAY. If no heading received, track 210°.

FARMR THREE ARRIVAL (RNAV) BELLEVILLE, ILLINOIS

(FARMR.FARMR3) 02MAR17

Source: U.S. Terminal Procedures Publication, East Central (EC) Vol. 3 of 3, March 2018.

APPENDIX B

ENVIRONMENTAL ACTIONS APPROVED BY FAA & IDOT

Appendix B-1: Environmental Approval Actions (1/3)

AIRFIELD DEVELOPMENT	NEPA ACTION	DATE
Land Acquisition; Primary Runway Construction; Parallel & Connecting Taxiway Construction; Apron Construction; Wetland Replacement; Floodplain Mitigation; Construct Terminal & Cargo Buildings; Relocate Illinois Route 4; Rehabilitate United States Air Force Runway; Relocate United States Air Force Facility/Housing.	102(2)(c) EIS Record of Decision	09/03/1991 (USAF) 09/05/1991 (FAA)
Revised Connecting Taxiway Alignment	Supplemental ROD	01/18/1994 (USAF)
Construct General Aviation Apron, taxiway, access road, parking lot, security fence relocation, taxiway and apron edge lighting, a communications duct bank extension, temporary construction road and appurtenant activities.	Categorical Exclusion	02/15/2002 (FAA)
Taxiway Kilo Stabilization Project	Categorical Exclusion	06/13/2007
Design and construction of a project to repair the joints for the PCC Runway 14L/32R and taxiways	Categorical Exclusion	03/4/2008
Replacement of airfield lighting control and monitoring system inside the air traffic control tower and electrical vault building.	Categorical Exclusion	02/24/2009
Acquisition of Mobile Extended Reach Deicing Vehicle	Categorical Exclusion	03/25/2009
Planning and Design of an Addition to the Mike Apron (Cargo)	Categorical Exclusion	09/25/2009
Silver Creek Floodplain Management Project Runway 14L (North End Safety Area)	Categorical Exclusion	12/18/2009
Fire Protection Improvements, Phase I	Categorical Exclusion	04/13/2010
Replacement of Runway 14 End Runway End Identifier Lights (REILs)	Categorical Exclusion	08/6/2010
This project is being installed by the United States Department of Defense, Department of the Air Force and consists of installing two (2) FMQ-19 Automatic Meteorological Stations near the Glide Slope Antennas for both ends of Runway 14L-32R.	Categorical Exclusion	12/15/2010*
Construction of an Addition to Mike Apron (Cargo).	Categorical Exclusion	02/04/2011*
Removal Fill Dirt, Site Grading and Site Restoration.	Categorical Exclusion	05/04/2011*
Removal Fill Dirt, Site Grading and Site Restoration – Expanded Acreage (Inside)	Categorical Exclusion	06/03/2011*

Appendix B-2: Environmental Approval Actions (2/3)

AIRFIELD DEVELOPMENT	NEPA ACTION	DATE
Construct a Refrigerated Air Cargo Facility. The project consists of the planning, design and construction of a refrigerated air cargo facility for importing perishable products from international markets and subsequent truck distribution to markets throughout the United States and Canada. The 30,000 sq. ft. building is a single tenant facility. The overall structural footprint is 200 ft. airside length by 150 ft. in depth. The building will be constructed of tilt-up insulated concrete walls. The interior space will be totally refrigerated and divided into several zones for product storage, processing and distribution. The landside of the site includes an access roadway, an employee parking lot, a truck court with seven depressed truck docks and one ramp level dock, parking lot lighting, storm drainage structures and pavement markings. The airside consists of one airside overhead receiving door, exterior lighting on the building, ground support equipment, support facilities, and a 60 ft. (depth) x 100 ft. (length) addition to the ground support equipment apron to provide access to and from the existing cargo apron to the air cargo facility. Extension of utility services for both landside and airside will be provided in the project. All environmental standards and applicable building codes required by federal, state and local statutes will be incorporated into the project design.	Categorical Exclusion	09/29/2011*
Erection of two monopole billboard structures (10ft. 6in. by 36ft in sign area at a height of 38ft. AGL) on leased MidAmerica St. Louis Airport property designated as concurrent non-aeronautical on the current Airport Layout Plan. The leased area for each sign location is approximately 60ft. by 60ft.	Categorical Exclusion	05/01/2012*
The project includes the replacement of a sewer lift station, construction of a new lift station, construction of approximately 5,350 linear feet of force main, construction of approximately 2,400 linear feet of gravity sewer and the granting of an easement for this work.	Categorical Exclusion	10/16/2012*
Project includes hardware and software replacement and upgrades to the security Access Control System (ACS) and video surveillance system throughout the Airport. The ACS replacement will include new electronic ACS components (card readers, etc.) at all automatic gates and the following buildings: ARFF, AVMATS Hangar, AVMATS Paint Hangar, CBP Facility, ISP Hangar, Maintenance Facility, and the Passenger Terminal. The new ACS components will require coordination with the North Bay Produce building. The video surveillance system replacement will include new cameras throughout the airport.	Categorical Exclusion	01/04/2013*
North Bay Produce Facility Expansion.	Categorical Exclusion	02/22/2013*
The project consists of the planning, design and construction of improvements to the existing airfield lighting including: Replacing PAPIs, updating airfield signage as recommended by the FAA and replacing deteriorated airfield lighting cable.	Categorical Exclusion	08/01/2013*
Exit 21 Interchange Construction and Land Release.	Condensed EA	12/10/2013*
Rehabilitate Airfield (runway, taxiways and apron) Shoulders.	Categorical Exclusion	12/19/2013*
Construct Airside Service Road from Gulf Ramp.	Categorical Exclusion	01/09/2014*

Appendix B-3: Environmental Approval Actions (3/3)

AIRFIELD DEVELOPMENT	NEPA ACTION	DATE
Airside Access Road Phase 2. The project consists of the planning, design and construction of a service road connecting the November (passenger) Apron to Air Service Drive.	Categorical Exclusion	12/11/2015*
Replacement of two (2) 2,000-gallon aboveground fuel tanks, associated piping, and fuel dispensers at the existing airport maintenance facility. The existing tanks are single walled with secondary containment whereas the proposed tanks are double-walled. One tank contains diesel fuel and the other unleaded gasoline.	FONSI	12/24/2015
Rehabilitate Airport Access Roads.	Categorical Exclusion	12/28/2015
Parking Lot Expansion.	Categorical Exclusion	03/15/2016
Miscellaneous improvements to the passenger terminal including: passenger loading bridge safety improvements, public address system modernization, interior/exterior lighting modernization, etc.	Categorical Exclusion	06/16/2016
Project includes design and construction to rehabilitate and expand the Passenger Terminal parking lot. The planned lot includes +/- 404 new parking spaces to meet increased passenger activity. The project includes grading, asphalt pavement, and parking lot lighting.	Categorical Exclusion	02/10/2017
Erection of one monopole billboard structure (10 ft. 6 in. by 36 ft. in sign area at a height of 38 ft. AGL) on leased MidAmerica St. Louis Airport property. The leased area for sign location is approximately 60 ft. by 60 ft.	Categorical Exclusion	04/20/2017

*Source: MidAmerica St. Louis Airport. * IDOT Approved under State Block Grant Program.*

APPENDIX C

InterVISTAS Aviation Demand Forecast

Aviation Demand Forecast
MidAmerica St. Louis Airport

PREPARED FOR
MidAmerica St. Louis Airport

PREPARED BY
Inter*VISTAS* Consulting Inc

February 15, 2018

Contents

1 Introduction

This report summarizes the master plan forecasts of enplaned passengers, air cargo, and aircraft operations at MidAmerica St. Louis Airport (BLV or the Airport). With a base year of 2017, forecasts were prepared for 2018, 2022, 2027, 2032, and 2037, using scenario methodology.

MidAmerica St. Louis Airport (BLV or the Airport) serves the greater St. Louis, Missouri region. The Airport served approximately 244,000 total passengers in 2017, with non-stop flights to nine U.S. cities. The Federal Aviation Administration (FAA) classifies the Airport as a non-hub primary airport based on calendar year (CY) 2016 data. A non-hub primary airport is defined as an airport that serves more than 10,000 but less than 0.05% of the annual passenger boardings of the U.S. certificated route air carriers within the 50 states, the District of Columbia, and territorial possessions of the United States.

The forecast is provided for the following years:

Base Year	2017
Base Year +1	2018
Base Year +5	2022
Base Year +10	2027
Base Year +15	2032
Base Year +20	2037

This chapter provides an overview of the historical traffic at the Airport, and the methodology for developing the forecasts for enplaned passengers, air cargo, and aircraft operations. In the last section, the forecasts are compared to the published FAA 2018 Terminal Area Forecast (TAF).

Table 1 summarizes the results of the master plan forecast. From 2017 to 2037, enplaned passengers are expected to grow at a compound annual growth rate of 5.9% to approximately 382,500 passengers. Total aircraft operations are forecast to grow by an average rate of 1.2% per year from 2017 to 2037 to approximately 35,000 operations, while cargo tonnage is forecast to increase at a compound annual growth rate of 9.8% from 2020 to 2037 to approximately 55,000 tons.

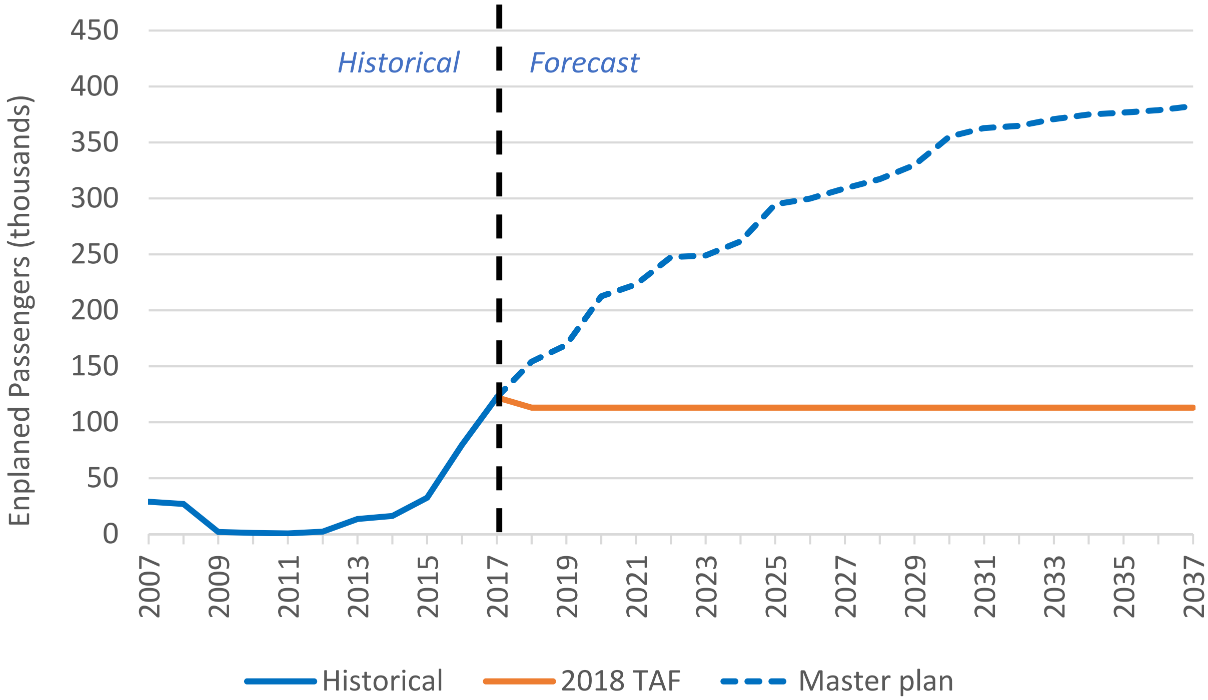
Table 1: BLV Master Plan Forecast Summary

	Historical (estimated)	Forecast				
	2017	2018	2022	2027	2032	2037
Passenger enplanements						
Air carrier	122,158	154,200	247,500	309,000	364,900	382,500
Commuter	-	-	-	-	-	-
Total	122,158	154,200	247,500	309,000	364,900	382,500
Compound annual growth rate	-	26.2%	12.6%	4.5%	3.4%	0.9%
Aircraft operations						
Air carrier	1,708	2,182	3,943	4,873	6,026	6,685
Commuter/air taxi	-	-	-	-	-	-
Total commercial	1,708	2,182	3,943	4,873	6,026	6,685
General aviation	10,198	10,315	10,794	11,424	12,091	12,796
Military	15,348	15,400	15,400	15,400	15,400	15,400
Total operations	27,254	27,897	30,137	31,696	33,517	34,881
Compound annual growth rate	-	2.4%	1.9%	1.0%	1.1%	0.8%
Cargo/mail (metric tons)	9	480	13,361	21,323	34,092	54,588
Compound annual growth rate		-%	129.7%	9.8%	9.8%	9.9%

Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

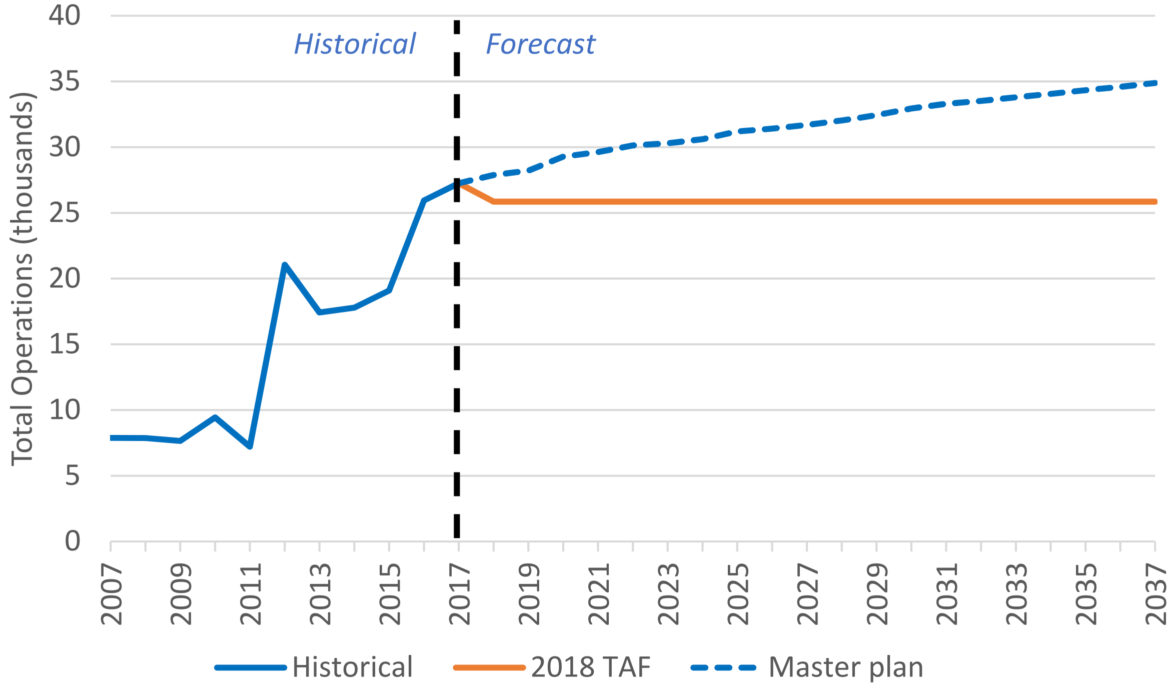
Figure 1 shows the master plan forecast for enplaned passengers and its variance from the FAA 2018 Terminal Area Forecast (TAF), while **Figure 2** shows the total operations forecast and its variance from the TAF.

Figure 1: Enplanements Forecast Comparison



Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

Figure 2: Total Operations Forecast Comparison



Source: Historical data from MidAmerica St. Louis Airport, FAA, and Scott Air Force Base records, January 2018; forecast data from Inter*VISTAS*, February 2018.

2 Historical Airline Traffic

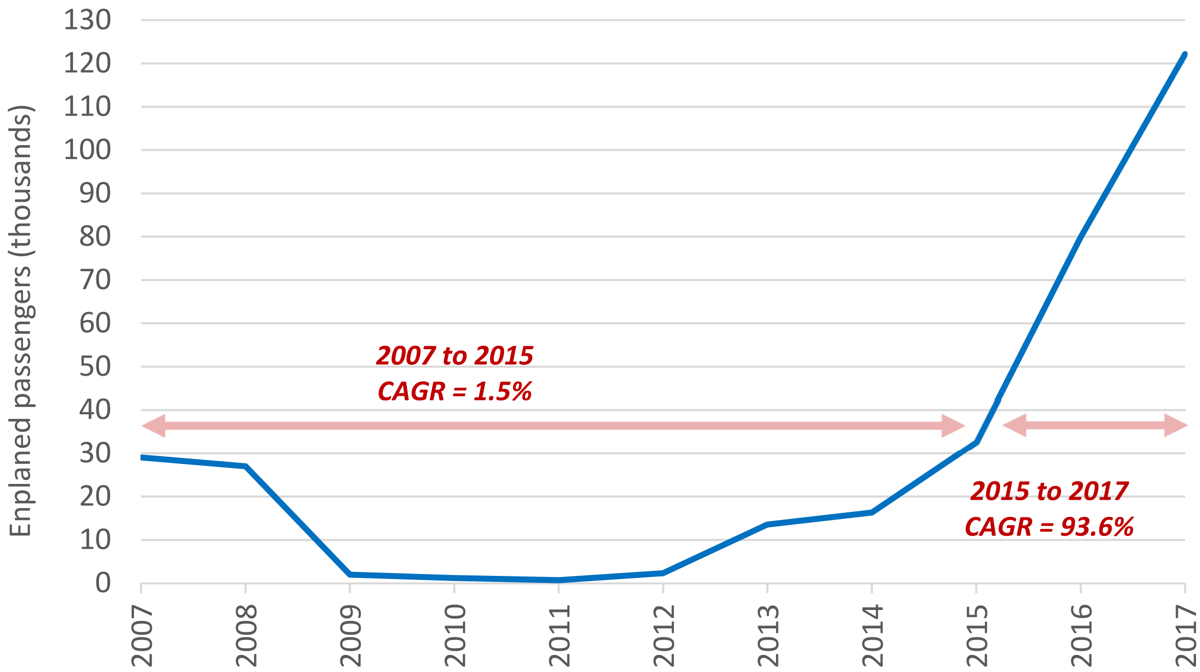
The historical traffic development at MidAmerica St. Louis Airport is described in this section in terms of passenger activity, major markets, airfares, and airline market share. The seasonality of traffic at the Airport, and air cargo data are also presented.

2.1 Passenger Activity: 2007 to 2017

As shown in **Figure 3**, the historical passenger traffic at BLV grew from 2007 to 2015 at a compound annual growth rate (CAGR) of 1.5%. However, since 2015, the airport's air service offerings have grown to result in rapid growth in enplanements of 93.6%, with a record year in 2017 finishing with over 122,000 enplanements. In 2017, Allegiant Air added service to three new destinations at discounted fares, contributing to a year-over-year increase in passengers of 52.9% from 2016 to 2017.

Starting in 2015, the airport has been growing at a rapid pace, with passenger traffic increasing at a compound annual growth rate of 93.6% through 2017. Recent growth in enplanements can be attributed to the growth of Allegiant Air's service offerings at the Airport. Annual growth rates and enplaned passengers from 2007 to 2017 are shown in **Table 2.**

Figure 3: Historical Enplaned Passengers: MidAmerica St. Louis Airport



Source: MidAmerica St. Louis Airport records, January 2018.

Table 2: BLV Historical Enplaned Passengers & Change from Year to Year

Year	Enplaned passengers	Year- over-year change
2007	29,019	--
2008	27,002	(7.0%)
2009	1,964	(92.7%)
2010	1,183	(39.8%)
2011	706	(40.3%)
2012	2,314	227.8%
2013	13,542	485.2%
2014	16,328	20.6%
2015	32,589	99.6%
2016	79,888	145.1%
2017	122,158	52.9%

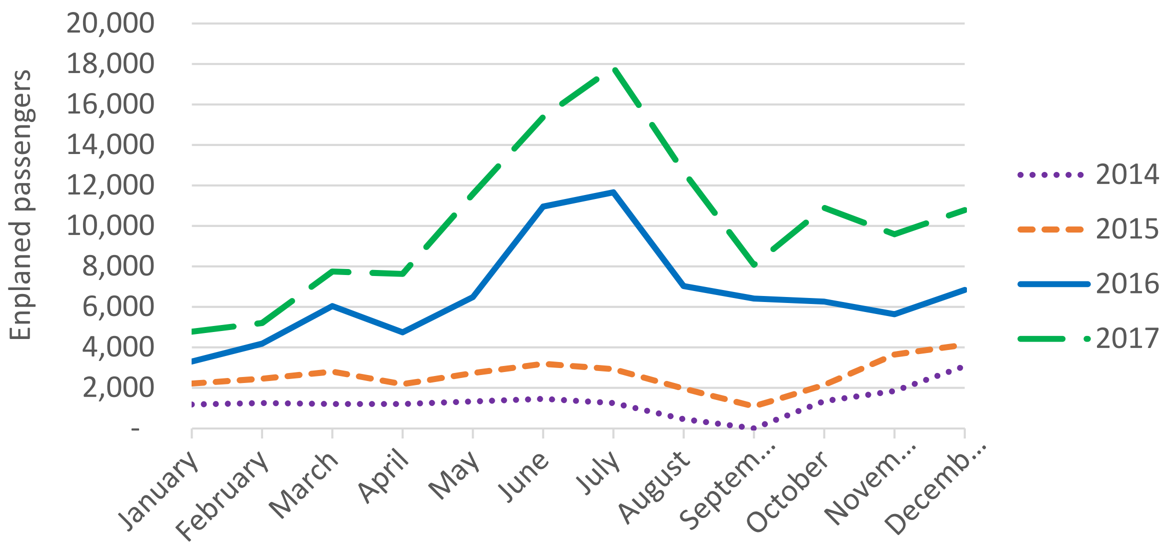
Compound annual growth rates		
2007 – 2017	15.5%	
2013 – 2017	73.3%	

Source: MidAmerica St. Louis Airport records, January 2018.

2.2 Seasonality

Figure 4 shows the seasonal traffic patterns at MidAmerica between 2014 and 2017. Historically, traffic is lowest in September. In July 2017, the Airport accommodated approximately 18,000 passengers, representing approximately 14.5% of the annual total for calendar year 2017.

Figure 4: Enplaned Passengers by Month



Source: MidAmerica St. Louis Airport records, January 2018.

2.3 Air Cargo

Table 3 shows the Airport's historic air cargo activity from 2005 to 2013. Notably, air cargo activity at the airport has been volatile, peaking in 2010 with over 1,600 metric tons (bi-directional) and 71 departures.

Table 3: Historical Air Cargo Activity, 2005 to 2013

Year	Metric tons	Departures
2005	2.8	3
2006	-	-
2007	502.4	12
2008	148.6	16
2009	1246.0	70
2010	1639.9	71
2011	87.0	6
2012	55.6	3
2013	50.9	2

Source: US DOT T100 data accessed in February 2018.

3 Demographic and Economic Background

This section provides an overview of the historical and projected demographic and economic trends that impact the MidAmerica St. Louis Airport. The Airport is located approximately 20 miles east of downtown St. Louis, and immediately southwest of the intersection of Interstate 64 and Illinois Route 4. Interstate 64 is a major east-west transportation corridor stretching from the St. Louis metro area to Norfolk, Virginia. Interstate 64 provides access to the closest medium hub airport, St. Louis Lambert International Airport. The catchment area for MidAmerica, as shown in **Figure 5**, extends westward through St. Charles County Missouri; northward to Springfield, Illinois; eastward along Interstate 64 toward the Illinois-Indiana state line, and southward along the Mississippi River toward the Lead Belt region.

Figure 5: Regional Geography and Catchment Area

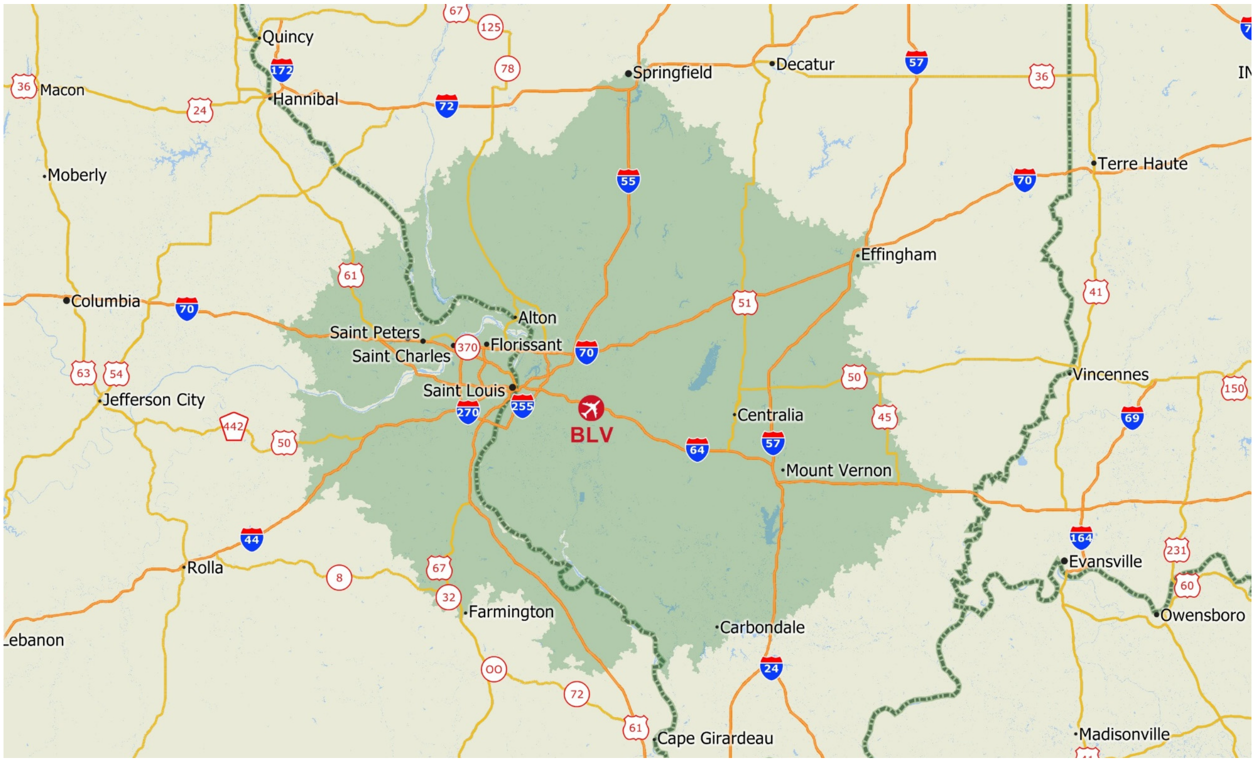


Table 4 and **Table 5** compare the air service and fares for MidAmerica and Lambert.

As shown in **Table 4,** there are nine non-stop destinations served from MidAmerica, all of which are domestic destinations. St. Louis Lambert International Airport (STL) serves 63 domestic and two international non-stop destinations in the month of July 2017. As shown in **Table 5,** The airfares at MidAmerica are significantly lower than those at STL, due to Allegiant Air's low-cost carrier pricing. Average fares to Jacksonville, Florida, for example, were only $36 from MidAmerica as opposed to $176 from STL (YE Q3 2017).

Table 4: Comparison of Air Service Offerings for July 2017

	MidAmerica St. Louis Airport (BLV)	St. Louis Lambert International Airport (STL)
Non-stop destinations served		
Domestic	8	63
International	0	2
Total	8	65
Scheduled Carriers		
United States Flag	1	8
Foreign Flag	0	1
Total	1	9
Average daily departures	4	242
Average daily departure seats	640	26,618

Source: Diio Mi Schedules, accessed in February 2018.

Table 5: Comparison of Air Fares at MidAmerica and Lambert

Market	MidAmerica St. Louis Airport (BLV)	St. Louis Lambert International Airport (STL)
Orlando[a]	$ 57	$ 108
Tampa[b]	$ 64	$ 180
Las Vegas	$ 68	$ 119
Fort Myers / Punta Gorda	$ 69	$ 129
Destin / Fort Walton Beach	$ 58	$ 188
Jacksonville	$ 36	$ 176
Myrtle Beach	$ 45	$ 212
Fort Lauderdale / Miami[c]	$ 46	$ 175
Phoenix[d]	-	$ 143

a Includes Orlando International and Orlando Sanford airports
b Included Tamp International, St. Pete-Clearwater, and Sarasota airports
c Includes Miami International, Fort Lauderdale, and Palm Beach International airports
d Includes Phoenix Sky Harbor and Phoenix-Mesa airports
Source: U.S. DOT Origin and Passenger Destination Survey YE Q3 2017 via Diio Mi, February 2018

3.1 Population

As shown in **Table 6**, the population of the St. Louis-St. Charles-Farmington, MO-IL Combined Statistical Area (hereafter referred to as the St. Louis CSA) has grown at 0.3% per year since 2005, whereas the United States as a whole has experienced a growth rate of 0.9% for the same period. Projected growth in population from 2022 to 2027 is forecast at an average rate of 0.4% per year, while the population of the United States is expected to grow at a rate of 0.9% per year.

Shown in **Table 7**, households in the St. Louis CSA have grown at a rate of 0.6% per year. Households are expected to grow at a similar rate of 0.7% through 2022, then slowing to 0.3% per year from 2022 to 2027.

Table 6: Historical and Projected Population – St. Louis CSA and United States

		Year-over-year increase	
Year	St Louis CSA[a]	St Louis CSA[a]	United States
2005	2,832,555	--%	--%
2006	2,847,219	0.5%	1.0%
2007	2,859,115	0.4%	1.0%
2008	2,871,850	0.4%	1.0%
2009	2,883,733	0.4%	0.9%
2010	2,895,015	0.4%	0.8%
2011	2,898,346	0.1%	0.8%
2012	2,901,867	0.1%	0.8%
2013	2,905,683	0.1%	0.7%
2014	2,910,622	0.2%	0.8%
2015	2,916,447	0.2%	0.8%
2016	2,927,383	0.4%	0.9%
2017	2,940,489	0.4%	0.9%
Compound annual growth rate 2005 to 2017		**0.3%**	**0.9%**
Projected population in 2022 and 2027			
2017 – 2022	3,006,465	0.4%	0.9%
2022 – 2027	3,071,568	0.4%	0.9%

a Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area.
Source: Woods & Poole, 2017.

Table 7: Historical and Projected Households – St. Louis CSA

Year	Households	Year-over-year increase
2005	1,138,927	--%
2006	1,145,255	0.6%
2007	1,155,624	0.9%
2008	1,157,271	0.1%
2009	1,155,145	-0.2%
2010	1,150,591	-0.4%
2011	1,166,567	1.4%
2012	1,172,135	0.5%
2013	1,179,480	0.6%
2014	1,182,148	0.2%
2015	1,190,193	0.7%
2016	1,204,631	1.2%
2017	1,217,095	1.0%
Compound annual growth rate 2005 to 2017		**0.6%**
Projected households in 2022 and 2027		
2017 – 2022	1,258,745	0.7%
2022 – 2027	1,279,289	0.3%

Source: Woods & Poole, 2017

3.2 Employment

Table 8 summarizes historical and projected employment for the St. Louis CSA and the United States. As shown, employment growth of 0.5% per year in the CSA has been lower than the national average of 1.1% from 2005 to 2017. It is projected that the CSA's employment will increase by an average of 1.0% per year through 2027, a slightly slower rate of growth than the United States as a whole, which is expected to experience employment annual growth of 1.4% from 2017 to 2022 and 1.3% from 2022 to 2027.

Table 8: Historical and Projected Employment – St. Louis CSA and United States

		Year-over-year increase	
Year	St Louis CSA[a]	St Louis CSA[a]	United States
2005	1,719,230	--%	--%
2006	1,741,871	1.3%	2.1%
2007	1,767,493	1.5%	2.1%
2008	1,768,353	0.0%	-0.1%
2009	1,715,281	-3.0%	-3.0%
2010	1,694,041	-1.2%	-0.7%
2011	1,713,817	1.2%	1.9%
2012	1,718,831	0.3%	1.6%
2013	1,736,757	1.0%	1.9%
2014	1,752,384	0.9%	2.1%
2015	1,785,124	1.9%	2.2%
2016	1,806,430	1.2%	1.5%
2017	1,827,516	1.2%	1.5%
Compound annual growth rate 2005 to 2017		**0.5%**	**1.1%**
Projected employment in 2022 and 2027			
2017 – 2022	1,928,833	1.1%	1.4%
2022 – 2027	2,028,495	1.0%	1.3%

a Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area.

Source: Woods & Poole, 2017

3.3 Per Capita Income

As shown in **Table 9**, at $45,903 (2009 U.S. dollars) per capita personal income in the St. Louis CSA is slightly higher than the average of $45,308 across the nation. The St. Louis CSA has experienced a growth rate slightly lower than the national average, with average annual growth of 1.1% compared to the national increase of 1.3% per year. However, per capita personal income in the CSA is projected to increase at 1.6% compared to 1.5% for the United States as whole.

Table 9: Historical and Projected Per Capita Income – St. Louis CSA and United States

	Per capita personal income		Year-over-year increase	
Year	St. Louis CSA[a]	United States	St. Louis CSA[a]	United States
2005	$40,170	$38,916	--%	--%
2006	$41,563	$40,266	3.5%	3.5%
2007	$42,109	$41,010	1.3%	1.8%
2008	$42,455	$41,055	0.8%	0.1%
2009	$40,844	$39,376	-3.8%	-4.1%
2010	$41,174	$39,622	0.8%	0.6%
2011	$41,467	$40,762	0.7%	2.9%
2012	$43,130	$41,714	4.0%	2.3%
2013	$42,108	$41,348	-2.4%	-0.9%
2014	$42,868	$42,523	1.8%	2.8%
2015	$44,205	$43,924	3.1%	3.3%
2016	$45,176	$44,637	2.2%	1.6%
2017	$45,903	$45,308	1.6%	1.5%
Compound annual growth rate 2005 to 2017			**1.1%**	**1.3%**
Projected per capita income				
2017 – 2022	$49,688	$48,803	1.6%	1.5%
2022 – 2027	$53,558	$52,347	1.5%	1.4%

Note: all incomes shown in 2009 dollars

a Comprised of the St. Louis, MO-IL Metropolitan Statistical Area, the Farmington, MO Micropolitan Statistical Area, and the Centralia, IL Micropolitan Statistical Area.

Source: Woods & Poole, 2017

4 Forecasts of Aviation Activity

This section describes the methodology and forecast results for enplaned passengers, air cargo, and aircraft operations at the Airport. Due to the volatility of historical activity in terms of passengers and air cargo, the methodologies relied on the development of multiple scenarios.

It was assumed that airline service at the Airport will not be constrained by the availability of aviation fuel, limitations in airline fleet capacity, limitations in the capacity of the air traffic control system or the Airport, charges for the use of aviation facilities, or government policies or actions that restrict growth.

4.1 Enplaned Passengers

The MidAmerica Airport passenger forecasts methodology relied on scenarios rather than econometrics or historical activity. The scenarios were informed by other airports with similar annual seats where Allegiant Air is the only operating airline, including: Rickenbacker (LCK), Rockford (RFD), Stockton (SCK), and Concord (USA). **Table 10** shows service levels at Allegiant Air stations in 2017. Markets in which Allegiant has recently based aircraft at an airport, and how the basing of aircraft changes the block times associated with service to various markets was also analyzed. These markets included: Cincinnati (CVG), Pittsburgh (PIT), and Indianapolis (IND). Additional insight was obtained through teleconferences with representatives of Allegiant Air, as well as local air service development consultants.

Table 10: Allegiant Air Stations with 2017 Departing Seats Between 100,000 and 200,000

Airport	Departing Operations	Departing Seats	Airport	Departing Operations	Departing Seats
AVL	1,063	180,816	ABE	803	137,952
OAK	1,063	167,758	SGF	733	121,380
PIT	995	157,220	**SCK** [a]	**732**	**118,959**
AUS	940	160,988	SAV	724	118,292
VPS	927	158,747	EWR	719	117,878
LEX	924	160,647	PIA	711	119,397
MYR	915	150,167	FSD	705	115,656
LCK [a]	**908**	**156,775**	MSY	690	115,403
CLE	906	155,605	CID	684	114,107
BLV [a]	**853**	**146,260**	**RFD** [a]	**670**	**112,902**
GRR	842	142,252	SBN	657	110,632
USA [a]	**828**	**146,183**	**PVU** [a]	**641**	**100,276**
DSM	820	137,287	MEM	630	106,735

a Airports where Allegiant is the only schedule carrier.

Source: Diio Mi Schedules, accessed in February 2018.

Several critical assumptions concerning Allegiant's operation and fleet guided development of the scenario forecast. Allegiant operates a limited narrowbody fleet mix, comprised of two aircraft variants and three seating configurations, starting in 2019. The MD-80s currently in the fleet are completely removed by the end of 2018. When up-gauging aircraft serving existing markets at MidAmerica, 156 seat A319s are replaced with A320s in either a standard configuration of 177 seats or a max configuration of 186 seats. Based on recently investor filings by the airline, A319s are expected to comprise roughly 34% of Allegiant's fleet by 2020.

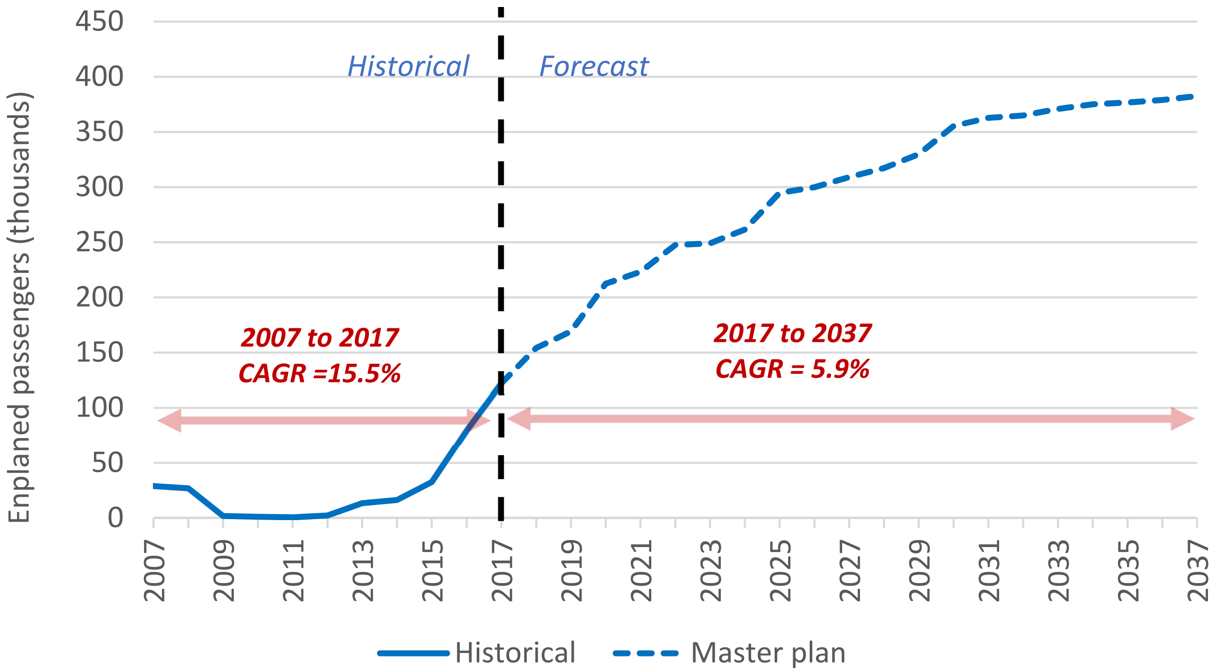
When Allegiant adds a market to MidAmerica, it is assumed that approximately 13,000 to 15,000 annual enplanements would result in a calendar year. This number of enplanements is based upon an assumed frequency of twice per week (104 annual departures), an initial load factor between 80% and 85%, and the number of seats on the aircraft. As the load factors grow during the forecast period to accommodate increased passenger demand, some markets served with limited frequencies (i.e., two days per week) are expanded to reflect additional weekly frequencies.

Allegiant flight schedules from comparable airports described above were reviewed to identify appropriate block times for the markets included the forecast. These airline block and aircraft ground times drove utilization assumptions for the aircraft serving MidAmerica.

The forecast assumes that Allegiant opens an aircraft and flight crew base at MidAmerica within the first five years of the forecast period (2020). The operation would consist of one based A319 aircraft to supplement the existing 2017 airline service. The base would grow to a second aircraft within the first ten years of the forecast (2025). The future flight schedules were informed by other recently opened aircraft and flight crew bases of similar sizes such as Cincinnati (CVG), Pittsburgh (PIT), and Indianapolis (IND). Nine additional markets are assumed to be added over the planning horizon, relative to those served in 2017, including: Baltimore (BWI) and Austin (AUS) in 2019; Denver (DEN), Newark (EWR), Los Angeles (LAX), and Oakland (OAK) in 2020; New Orleans (MSY) in 2022; San Diego (SAN) in 2025; and Savannah (SAV) in 2028.

Figure 6 and **Table 11** summarizes the enplaned passengers by year, along with the compound annual growth rates for the future planning periods. From 2017 to 2027 enplaned passengers are forecast to grow at a compound annual growth rate of 9.7%, and at 5.9% from 2017 to through 2037.

Figure 6: Enplaned Passenger Forecast



Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

Table 11: BLV Historical and Projected Enplaned Passengers

Historical			Forecast		
Year	Enplanements	Year-over-year increase	Year	Enplanements	Year-over-year increase
2007	29,019	--	2018	154,200	26.2%
2008	27,002	(7.0%)	2019	169,100	9.7%
2009	1,964	(92.7%)	2020	212,500	25.7%
2010	1,183	(39.8%)	2021	223,200	5.0%
2011	706	(40.3%)	2022	247,500	10.9%
2012	2,314	227.8%	2023	249,000	0.6%
2013	13,542	485.2%	2024	261,600	5.1%
2014	16,328	20.6%	2025	294,800	12.7%
2015	32,589	99.6%	2026	299,900	1.7%
2016	79,888	145.1%	2027	309,000	3.0%
2017	122,158	52.9%	2028	317,300	2.7%
			2029	329,800	3.9%
			2030	355,300	7.7%
			2031	362,800	2.1%
			2032	364,900	0.6%
			2033	370,800	1.6%
			2034	375,000	1.1%
			2035	376,700	0.5%
			2036	378,900	0.6%
			2037	382,500	1.0%
Compound annual growth rates					
2007-2017				15.5%	
2017-2022				15.2%	
2017-2027				9.7%	
2017-2032				7.6%	
2017-2037				5.9%	

Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

4.2 Air Cargo Tonnage

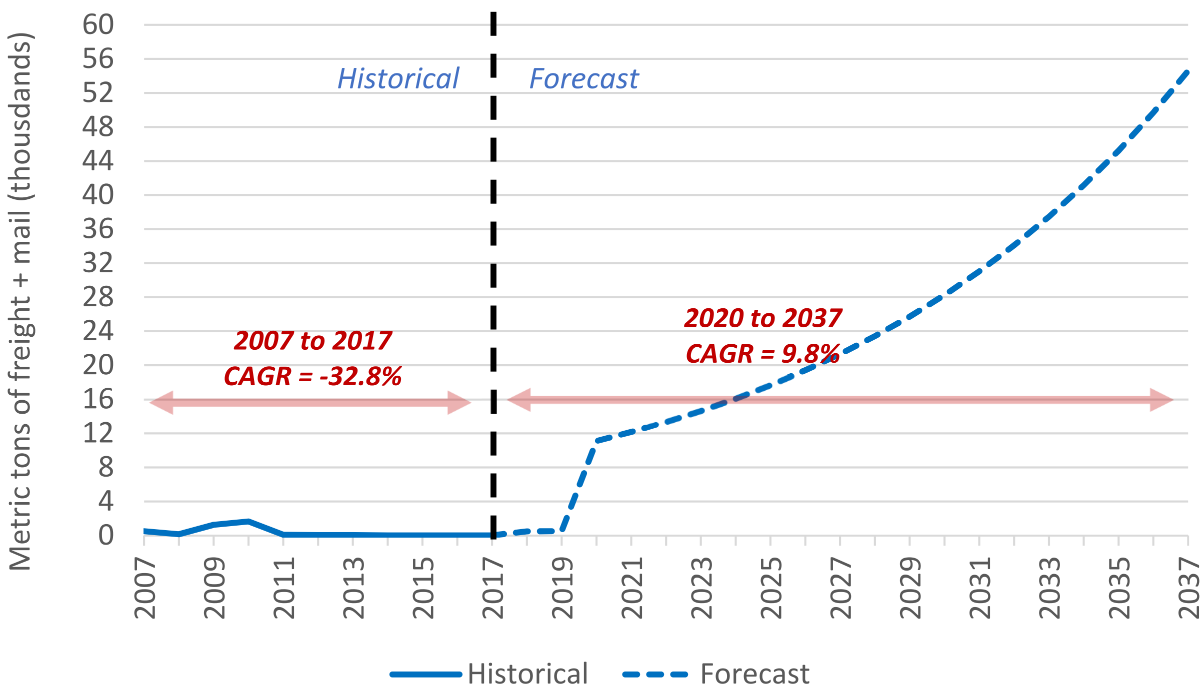
Historical air cargo tonnage at the Airport has been highly variable in recent years. Given this history, regression and trend analysis cannot provide insight into future activity. Like the passenger forecast, a scenario drive approach was used. The cargo forecast scenarios are described in the Appendix to this report. The scenario selected for the forecast combines continued ad-hoc cargo flights and additional cargo charter activity with a U.S. cargo airline basing an aircraft at MidAmerica.

The primary assumptions for this scenario include:

- Continued ad-hoc cargo flights, with about 2 operations per month, with approximately 40 tons per operation and an annual growth rate of 5% for the foreseeable future
- A U.S. cargo airline would base aircraft at MidAmerica around 2020, with about 20 operations per month, and approximately 40 tons per departure and a 5% growth rate thereafter

The resulting air cargo forecast for inbound and outbound freight and mail is shown in **Figure 7** and projects cargo tonnage growing by 9.8% per year to approximately 54,588 tons in 2037. For further information on the cargo forecasts, please refer to the Appendix to this report.

Figure 7: Historical and Forecast Air Cargo Tonnage



Source: Historical data from US DOT T100 data, January 2018; forecast data from Inter*VISTAS*, February 2018.

4.3 Aircraft Operations

Aircraft operations were forecast for commercial passenger aircraft, air cargo, general aviation, and military aircraft. This section describes the methodology and results of the aircraft operations forecast.

4.3.1 Commercial Passenger Aircraft Operations

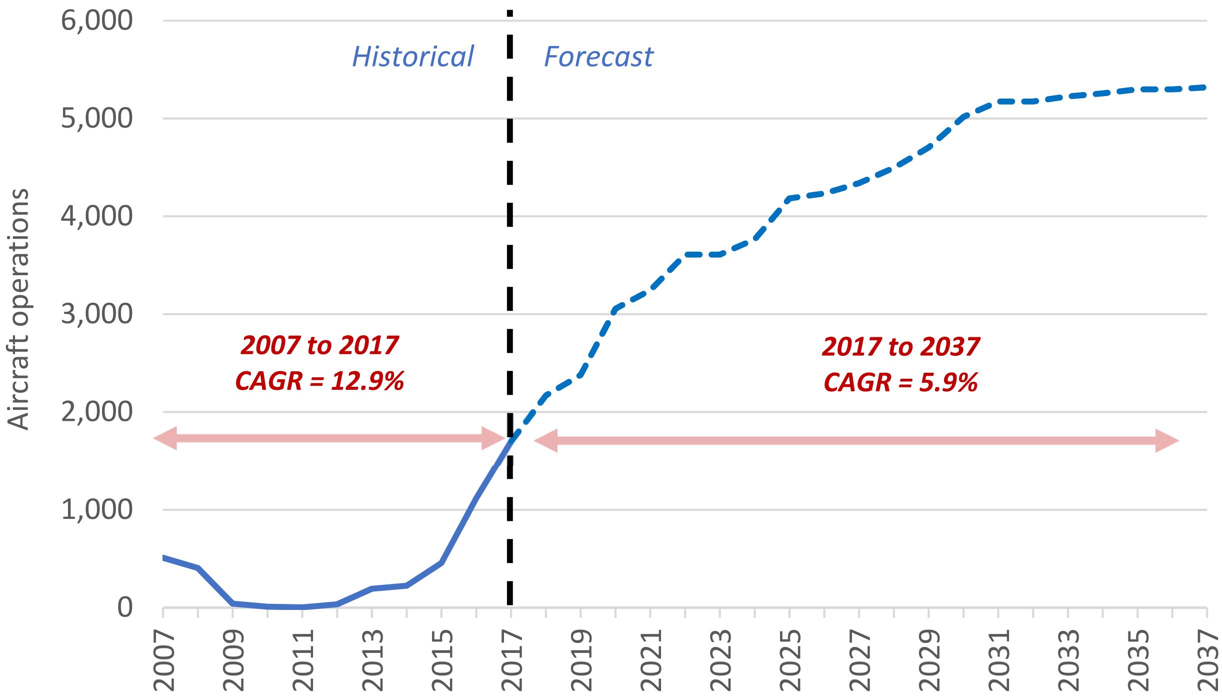
Passenger aircraft operations were derived based on the enplaned passenger forecast, as well as assumptions regarding the aircraft fleet mix and passenger load factors. The forecast enplaned passengers were assigned to mainline jets, given the fleet mix of Allegiant Air. Notably, the FAA defines "air carrier" operations as those operations of aircraft with more than 60 seats, thereby including the current and future fleet mix of Allegiant Air which includes Airbus A319, Airbus A320, and MD-80. "Commuter" aircraft operations are defined as those operations of aircraft with less than 60 seats (e.g. Canadair CRJ200).

Operational assumptions for the future planning years were developed for each aircraft category, including average seats per departure, load factors, and the resulting passengers per departure. Using these passengers per departure assumptions, operations for each aircraft category were calculated from the enplaned passengers forecast.

Overall, the passenger aircraft fleet mix is anticipated to evolve from one that was once dominated by the MD-80 with 177 seats to one comprised of a mix of Airbus A319 and A320 aircraft. The seating configuration used for the A319 was 156 seats; 177 seats for a standard A320; and 186 seats for a dense A320 (based on Allegiant Air configurations).

Specifically, from 2017 to 2037 passenger air carrier operations are forecast to increase at a compound annual growth rate of 5.9% to 5,320 operations in 2037. The resulting passenger aircraft operations forecast is shown in **Figure 8**.

Figure 8: Historical and Forecast Passenger Aircraft Operations

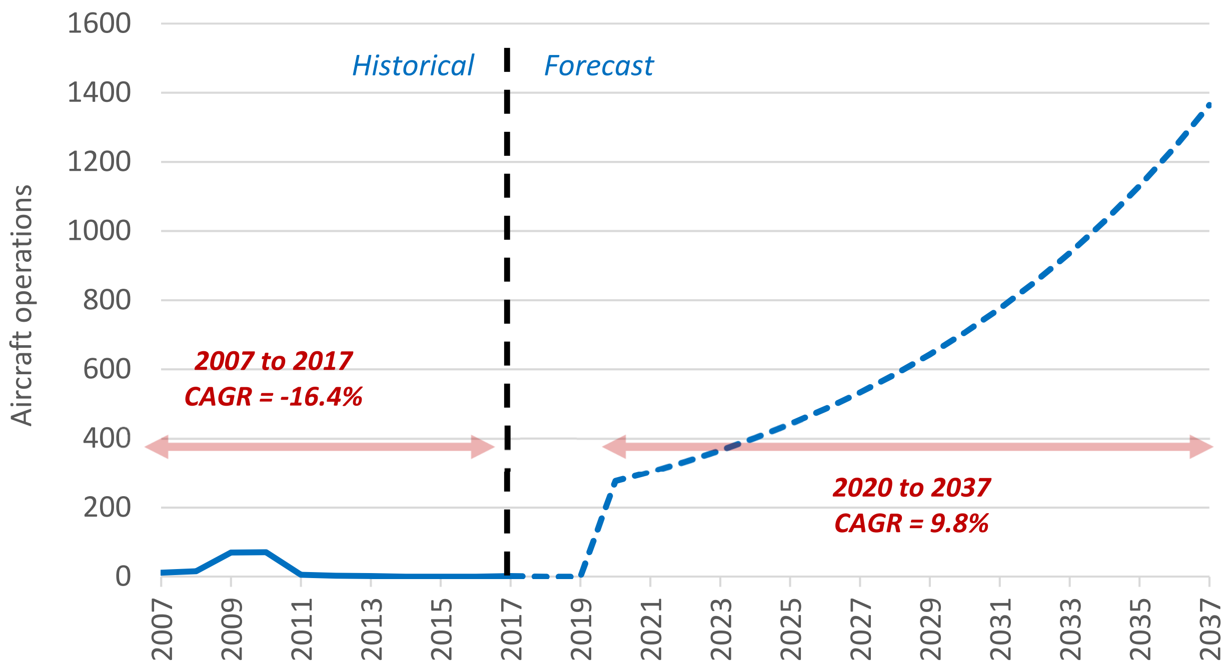


Source: Historical data from US DOT T100 and MidAmerica St. Louis Airport data, January 2018; forecast data from Inter*VISTAS*, February 2018.

4.3.2 Air Cargo Aircraft Operations

Figure 9 depicts the forecast for all-cargo aircraft operations, which are derived based on the tons per operation as described in Section 4.2 in this report.

Figure 9: Historical and Forecast Air Cargo Aircraft Operations

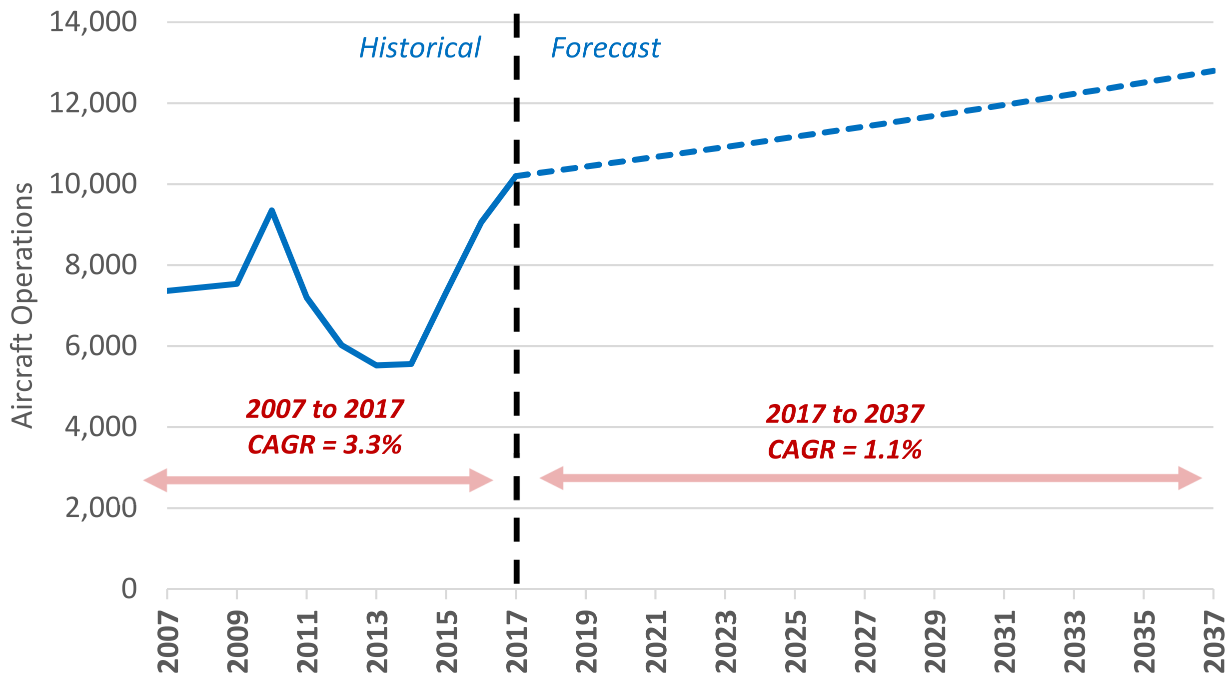


Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

4.3.3 General Aviation Aircraft Operations

General aviation aircraft operations are anticipated to increase at a modest growth rate of 1.1% per year through the end of the planning horizon, consistent with historical activity from 2000 to 2017. **Figure 10** shows the total historical and forecast general aviation aircraft operations.

Figure 10: Historical and Forecast General Aviation Aircraft Operations

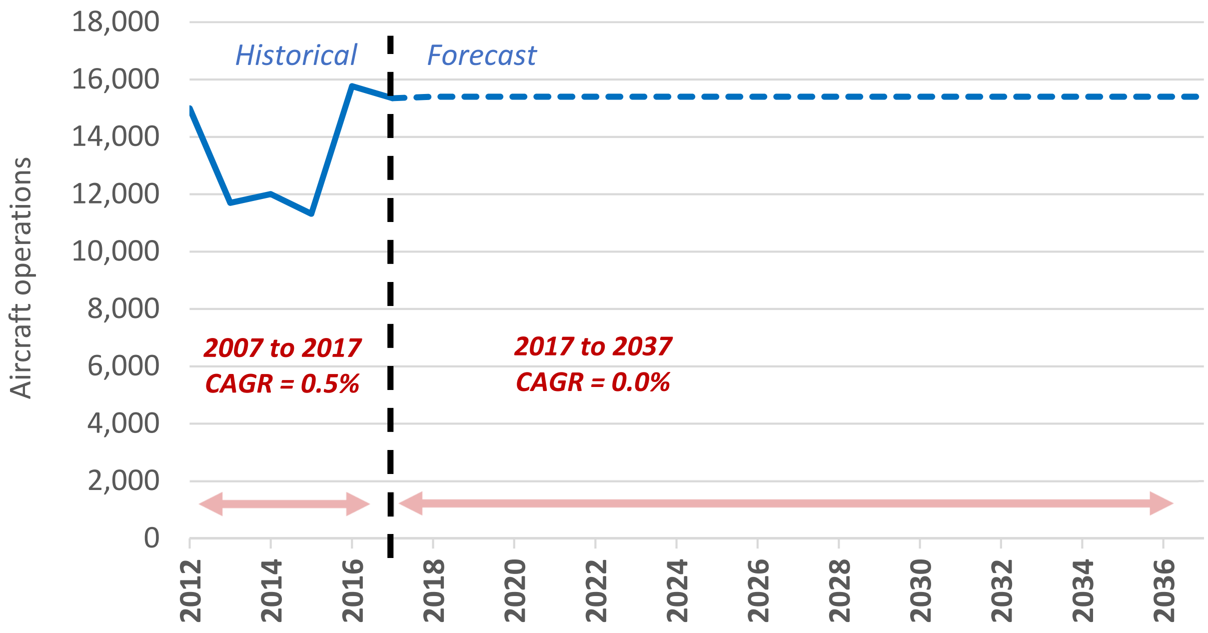


Source: Historical data from MidAmerica St. Louis Airport and Scott Air Force Base records, January 2018; estimate shown for 2017; forecast data from Inter*VISTAS*, February 2018.

4.3.4 Military Aircraft Operations

Military aircraft operations were assumed to remain constant throughout the planning period, as shown in the FAA's published 2018 TAF for the year 2017 onwards. **Figure 11** below shows the historic and forecast military aircraft operations.

Figure 11: Historical and Forecast Military Aircraft Operations



Source: Historical data from MidAmerica St. Louis Airport and Scott Air Force Base records, January 2018; estimate shown for 2017; forecast data from Inter*VISTAS*, February 2018.

4.3.5 Total Aircraft Operations

Total aircraft operations are summarized in **Table 12**. As shown, total operations are expected to grow from approximately 27,200 in 2017 to over 34,800 in 2037, at a compound annual growth rate of 1.2% for the same period.

Table 12: Summary of Historical and Forecast Aircraft Operations

	Historical	Forecast				
	2017	2018	2022	2027	2032	2037
Aircraft operations						
Air carrier	1,708	2,182	3,943	4,873	6,026	6,685
Commuter/air taxi	0	0	0	0	0	0
Total commercial	1,708	2,182	3,943	4,873	6,026	6,685
General aviation	10,198	10,315	10,794	11,424	12,091	12,796
Military	15,348	15,400	15,400	15,400	15,400	15,400
Total operations	27,254	27,897	30,137	31,696	33,517	34,881
Compound annual growth rate	-	2.4%	1.9%	1.0%	1.1%	0.8%

Note: air carrier operations include all-cargo operations; commuter operations include air taxi operations. 2017 is an estimate based on data through July.

Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

5 Comparison to the FAA Terminal Area Forecast

Table 13 presents a comparison of the aviation demand forecasts prepared for the BLV master plan with the FAA's published 2018 Terminal Area Forecast (TAF). As required, the results are presented for the base year of 2017 and the forecast years equal to the base year plus 1, 5, 10, and 15 years (2018, 2022, 2027, and 2032). **Table 14** provides a summary of the forecast enplanements, aircraft operations, cargo, based aircraft, and operational factors for each forecast year, along with average compound annual growth rates from the base year through each forecast year.

Tables 13 and **14** are based upon templates provided from the FAA's *Forecasting Aviation Activity by Airport*, July 2001. The key findings of the comparison with the FAA 2018 TAF are:

- The forecasts of enplaned passengers are within 119 percent and 173 percent at the five- and ten-year planning horizons, with the greatest variance occurring in 2032.
- The forecasts of commercial operations are within 610 percent and 778 percent at the five- and ten-year planning horizons, with the greatest variance occurring in 2032.
- The forecasts of total aircraft operations are within 16.6 percent and 22.6 percent at the five- and ten-year planning horizons, with the greatest variance occurring in 2032.

Master plan forecasts of enplanements and operations are considered consistent with the TAF if they differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period. Because the BLV TAF forecasts *no growth* for both enplanements and aircraft operations, the master plan forecast is *by definition* inconsistent with the 2018 TAF.

The wide variances shown between passenger enplanements and operations largely reflect the relatively small base of activity for both measures of activity. The commercial operations were based upon informed assumptions regarding passenger per operation and air cargo tonnage per operation. Given the enplanements forecast assumes continued growth by Allegiant Air and their fleet of narrowbody aircraft, average seat size per departure is relatively flat, as shown in **Table 14.**

Table 13: BLV FAA TAF Forecast Comparison

	Year	Master plan forecast	2018 FAA TAF	Master plan vs. 2018 TAF (% variance)
Passenger enplanements				
Base year	2017	122,158	113,017	8.1%
Base year + 1	2018	154,200	113,017	36.4%
Base year + 5	2022	247,500	113,017	119.0%
Base year + 10	2027	309,000	113,017	173.4%
Base year + 15	2032	364,900	113,017	222.9%
Commercial operations				
Base year	2017	1,708	555	207.7%
Base year + 1	2018	2,170	555	291.0%
Base year + 5	2022	3,943	555	610.5%
Base year + 10	2027	4,873	555	778.0%
Base year + 15	2032	6,026	555	985.8%
Total Operations				
Base year	2017	27,254	25,854	5.4%
Base year + 1	2018	27,885	25,854	7.9%
Base year + 5	2022	30,137	25,854	16.6%
Base year + 10	2027	31,696	25,854	22.6%
Base year + 15	2032	33,517	25,854	29.6%

Source: Base Year – MidAmerica St. Louis Airport Records, February 2018
Master plan forecast prepared by Inter*VISTAS*, February 2018
2018 FAA TAF – FAA website, https://taf.faa.gov, accessed January 2018

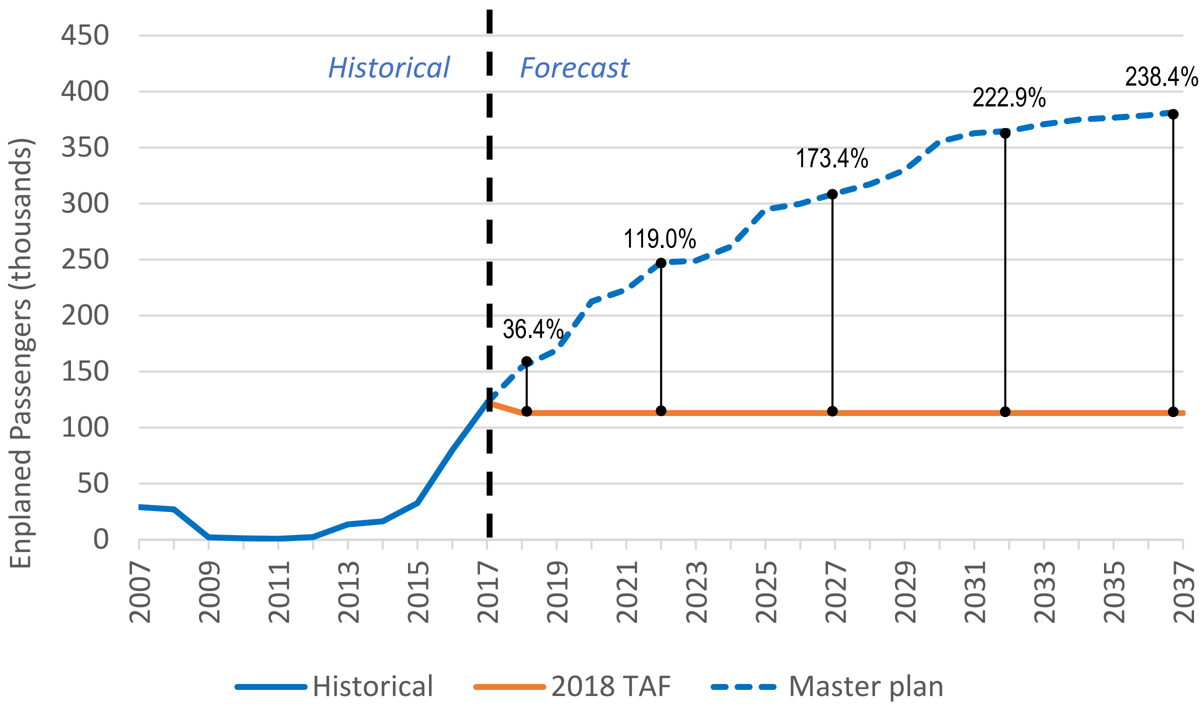
Table 14: BLV Master Plan Forecast Summary Sheet

	Historical	Forecast				Compound annual growth rates			
	2017	2018	2022	2027	2032	2017 – 2018	2017 – 2022	2017 – 2027	2017 – 2032
Passenger enplanements									
Air carrier	122,158	154,200	247,500	309,000	364,900	26.2%	15.2%	9.7%	7.9%
Commuter	0	0	0	0	0	-	-	-	-
Total	122,158	154,200	247,500	309,000	364,900	26.2%	15.2%	9.7%	7.9%
Aircraft operations									
Air carrier	1,708	2182	3943	4873	6026	27.7%	18.2%	11.1%	9.5%
Commuter/air taxi	0	0	0	0	0	-	-	-	-
Total commercial	1,708	2182	3943	4873	6026	27.7%	18.2%	11.1%	9.5%
General aviation	10,198	10,315	10,794	11,424	12,091	1.1%	1.1%	1.1%	1.5%
Military	15,348	15,400	15,400	15,400	15,400	0.3%	0.1%	0.0%	0.0%
Total operations	27,254	27,897	30,137	31,696	33,517	2.4%	2.0%	1.5%	1.7%
Cargo/mail (tons)	9	480	13,361	21,323	34,092	-	-	-	-
Operational factors									
Average aircraft size (seats)									
Air carrier	171	171	166	168	167				
Commuter	--	--	--	--	--				
Average enplaning load factor									
Air carrier [a]	83.0%	83.0%	82.5%	84.9%	84.4%				
Commuter	--	--	--	--	--				

Notes: a Includes large regional jets (aircraft with more than 60 seats)
Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

Figure 12 shows the variance between the master plan enplanement forecast and the 2018 TAF for BLV. The master plan forecast projects enplanements to grow to over 380,000 by the year 2037, at a compound annual growth rate of 5.9% from 2017 to 2037.

Figure 12: Enplanements Forecast Comparison



Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

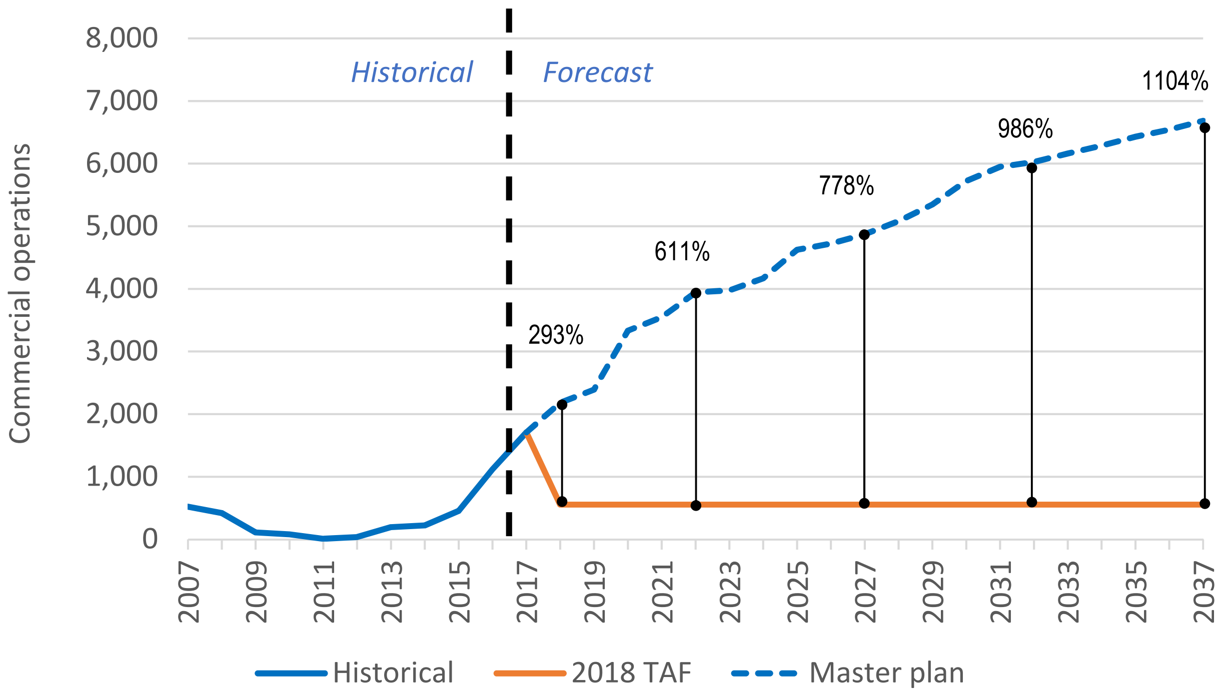
The difference between the master plan forecast and the 2018 TAF for commercial operations and total operations are shown in **Figure 13** and **Figure 14**. As is the case with enplanements, operations are forecast to be flat in the 2018 TAF.

In the case of commercial operations, the compound average growth rate is 16.8 percent for the period from 2017 to 2037, reflecting growing passenger and air cargo activity. While the variance from the TAF is significant with regard to commercial operations, the forecast is founded upon reasonable expectations for growth in both segments of the market.

With respect to total operations, the compound average growth rate is 2.0 percent for the period from 2017 to 2037, which demonstrates that the master plan forecast in terms of general aviation and military operations is consistent.

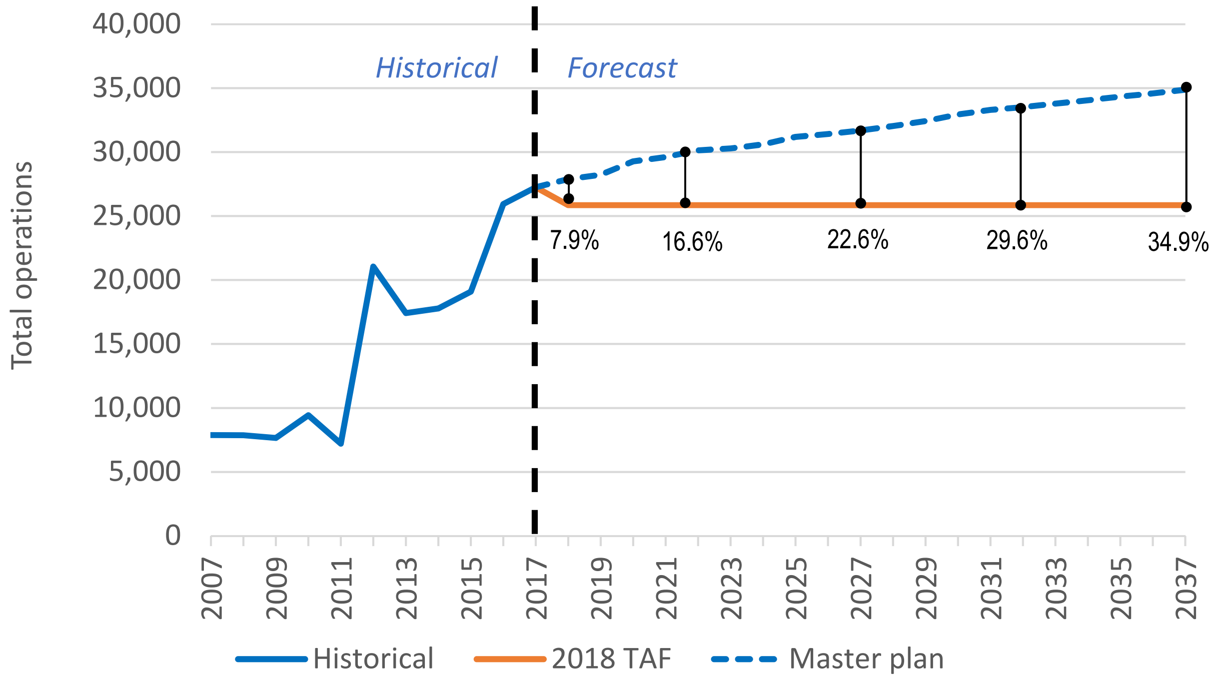
The FAA's TAF for BLV, published in January 2018, is shown in **Table 15.**

Figure 13: Commercial Operations Forecast Comparison



Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

Figure 14: Total Operations Forecast Comparison



Source: Historical data from MidAmerica St. Louis Airport records, January 2018; forecast data from Inter*VISTAS*, February 2018.

Table 15: FAA 2018 TAF for BLV

	ENPLANEMENTS			Itinerant Operations					Local Operations				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total	Civil	Military	Total	Total Ops	Based Aircraft
1990	478	-	478	10	-	-	-	10	-	-	-	10	3
1991	-	-	-	-	-	-	-	-	-	-	-	-	3
1992	-	-	-	4	-	-	-	4	-	-	-	4	3
1993	272	-	272	10	-	-	-	10	-	-	-	10	3
1994	406	-	406	10	-	-	-	10	-	-	-	10	3
1995	83	-	83	5	50	2,795	27,584	30,434	-	-	-	30,434	3
1996	135	-	135	5	42	6,356	20,334	26,737	-	-	-	26,737	3
1997	204	-	204	5	42	6,356	20,334	26,737	-	-	-	26,737	3
1998	428	-	428	5	42	6,356	24,600	31,003	-	-	-	31,003	3
1999	1,333	-	1,333	5	42	6,356	30,467	36,870	-	-	-	36,870	9
2000	5,592	-	5,592	240	42	6,356	30,467	37,105	-	-	-	37,105	9
2001	33,417	-	33,417	520	42	6,502	30,467	37,531	-	-	-	37,531	40
2002	1,913	-	1,913	55	42	6,658	30,467	37,222	-	-	-	37,222	40
2003	1,505	-	1,505	60	42	6,814	30,467	37,383	-	-	-	37,383	40
2004	2,880	-	2,880	100	2,000	6,968	30,467	39,535	-	-	-	39,535	36
2005	24,602	-	24,602	320	57	7,189	30,467	38,033	-	-	-	38,033	36
2006	24,875	-	24,875	320	57	7,275	30,467	38,119	-	-	-	38,119	27
2007	28,967	-	28,967	320	57	7,362	30,467	38,206	-	-	-	38,206	35
2008	26,671	126	26,797	336	57	7,450	30,467	38,310	-	-	-	38,310	34
2009	5,300	43	5,343	353	57	7,539	30,467	38,416	-	-	-	38,416	34
2010	585	-	585	198	-	-	12,423	12,621	9,353	-	9,353	21,974	6
2011	-	-	-	51	-	-	14,256	14,307	7,201	-	7,201	21,508	-
2012	40	-	40	-	176	-	16,777	16,953	10,841	-	10,841	27,794	23
2013	11,148	-	11,148	218	108	-	11,700	12,026	5,307	-	5,307	17,333	23
2014	13,442	2	13,444	218	108	-	11,700	12,026	5,307	-	5,307	17,333	23
2015	28,472	-	28,472	218	140	-	12,005	12,363	5,339	-	5,339	17,702	4
2016	71,039	-	71,039	555	-	9,530	15,769	25,854	-	-	-	25,854	24

2017*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2018*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2019*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2020*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2021*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2022*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2023*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2024*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2025*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2026*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2027*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2028*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2029*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2030*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2031*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2032*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2033*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2034*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2035*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2036*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2037*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2038*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2039*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2040*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2041*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2042*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2043*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2044*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24
2045*	113,017	-	113,017	555	-	9,530	15,769	25,854	-	-	-	25,854	24

Source: FAA website accessed in February 2018.

6 Appendix – Forecast Scenarios

6.1 Passenger Forecast Scenarios

Three passenger forecast scenarios were considered as described below. Note that Scenario 2 was included in the main body of this report as the baseline forecast to inform the master planning effort.

Scenario 1 – In this scenario, the forecast assumes that Allegiant will continue to grow in a pattern similar to that experienced at peer airports. This scenario includes higher levels of growth in the short-term and more modest levels of growth in the long-term as the market matures. Peer Allegiant-only airports with similar enplanements such as Rickenbacker, Rockford, Stockton, and Concord were used to inform the growth pattern at MidAmerica. Organic growth including increased frequencies and new destinations were considered. Four additional markets are assumed to be added over the planning horizon, relative to those served in 2017, including: MSY in 2019, SAV in 2021, BWI in 2023, and AUS in 2025. Obviously, these markets are included to be indicative of potential service to inform the peaking characteristics associated with such a schedule, driving requirements, such as the security checkpoint and passenger holdrooms.

Scenario 2 – In this scenario, the forecast assumes that Allegiant opens an aircraft and pilot base at MidAmerica within the first five years of the forecast period (2020). The operation would consist of one based aircraft to supplement the existing 2017 airline service. The base would grow to a second aircraft within the first ten years of the forecast (2025). The future flight schedules were informed by other recently opened bases of similar sizes such as Cincinnati, Pittsburgh, and Indianapolis. Nine additional markets are assumed to be added over the planning horizon, relative to those served in 2017, including: BWI and AUS in 2019; DEN, EWR, LAX, and OAK in 2020; MSY in 2022; SAN in 2025; and SAV in 2028.

Scenario 3 – In this scenario, the forecast introduces international airline service above the demand projected within Scenario 1. The potential service would likely serve the Caribbean/Mexico market and may be operated by scheduled airlines or scheduled charters (e.g., Swift Air on behalf of Apple Vacations or Frontier). Six additional markets are assumed to be added over the planning horizon, relative to those served in 2017.

Table 16 summarizes the results of the three scenarios side by side.

Table 16: Passenger Forecast Scenarios

	Scenario 1		Scenario 2		Scenario 3	
Year	Enplanements	Year-over-year increase	Enplanements	Year-over-year increase	Enplanements	Year-over-year increase
2018	154,200	--%	154,200	--%	154,200	--%
2019	170,000	10.2%	169,100	9.7%	170,000	10.2%
2020	171,000	0.6%	212,500	25.7%	171,000	0.6%
2021	189,300	10.7%	223,200	5.0%	189,300	10.7%
2022	190,400	0.6%	247,500	10.9%	199,700	5.5%
2023	206,000	8.2%	249,000	0.6%	215,400	7.9%
2024	207,200	0.6%	261,600	5.1%	216,700	0.6%
2025	223,300	7.8%	294,800	12.7%	232,700	7.4%
2026	224,600	0.6%	299,900	1.7%	234,100	0.6%
2027	225,900	0.6%	309,000	3.0%	240,900	2.9%
2028	231,700	2.6%	317,300	2.7%	246,800	2.4%
2029	243,700	5.2%	329,800	3.9%	258,900	4.9%
2030	250,000	2.6%	355,300	7.7%	265,200	2.4%
2031	261,100	4.4%	362,800	2.1%	277,800	4.8%
2032	267,700	2.5%	364,900	0.6%	284,500	2.4%
2033	270,900	1.2%	370,800	1.6%	287,900	1.2%
2034	280,800	3.7%	375,000	1.1%	297,900	3.5%
2035	283,400	0.9%	376,700	0.5%	303,600	1.9%
2036	290,300	2.4%	378,900	0.6%	310,500	2.3%
2037	292,000	0.6%	382,500	1.0%	312,400	0.6%
Compound annual growth rates						
2007-2017	15.5%		15.5%		15.5%	
2017-2022	9.3%		15.2%		10.3%	
2017-2027	6.3%		9.7%		7.0%	
2017-2032	5.4%		7.6%		5.8%	
2017-2037	4.5%		5.9%		4.8%	

Source: Forecast data from Inter*VISTAS*, February 2018.

6.2 Cargo Forecast Scenarios

Five passenger forecast scenarios were considered as described below. Note that Scenario 3 was included in the main body of this report as the baseline forecast to inform the master planning effort.

MidAmerica Airport has actively marketed itself as a base for cargo flights or other technical operations since its inception. In their efforts, airport management has approached a wide range of businesses and government agencies. Some of these efforts have been widely publicized, including: (1) development as a cargo hub focused on connecting South American with Asia; (2) site as a location for manufacture of a light cargo aircraft; (3) location as the western headquarters for the National Geospatial-Intelligence Agency; (4) base for aircraft serving the South American fresh-produce market. Airport management has also actively marketed the airport for cargo and industrial uses that have not received significant coverage in the press.

However, it is important to recognize that MidAmerica joins many other US airports that have seen uneven growth, require active marketing efforts, and depend on a mix of cargo, industrial and passenger operations to succeed. It is a very competitive environment, and each airport brings a mix of advantages and disadvantages, as well as very varied histories of expansion and sometimes dramatic contraction as major tenants have experienced financial difficulty and reduced operation.

MidAmerica Airport is one of a number of regional US airports that strive to develop cargo operations as a major component of their economic success. These airports differ widely in their competitive advantages and approach to attracting business. Examples of such airports include: (1) Wilmington Ohio (former hub for DHL and Airborne Express); (2) Alliance Airport (cargo focused reliever near DFW); (3) Rickenbacker (cargo and passenger alternative to Columbus Ohio). To this list should be added many other airports such as those in Melbourne, FL and Greensboro, NC and Savannah, GA which strive to combine industrial and passenger operations as major components to their economic success.

What unites all these airports is a location that does not support sufficient passenger traffic to rely primarily on passenger operations to be profitable. Each airport's economic rationale varies, but generally include a mix of: (1) proximity to a major airport that is capacity constrained; (2) availability of land for development; (3) low costs; (4) availability of a trained and lower-cost employment pool; (5) proximity or co-location with a military facility; (6) geographic location that is desirable for cargo traffic flows. In its history, MidAmerica has advertised all of these factors, to greater or lesser extents in its efforts to attract business.

Forecasting future levels of traffic at airports such as MidAmerica has always been difficult. Even more so than at major passenger airports, one cannot rely on simple models of economic growth in the region. The growth (and sometimes decline) at these airports is often dramatically affected by competitive forces, and the economic success of a major tenant. Of course, these factors are significant for major airports also. For example, STL, Newark, Cincinnati, Pittsburgh, Indianapolis, Kansas City and Raleigh-Durham are all examples of major airports that have seen major reductions in service and revenue with the elimination of a hub by a major carrier, or the bankruptcy of the operator that was responsible for the airport's growth. However, for smaller airports the variability of operations is often more extreme. Reductions of close to 100% in operations (such as at Wilmington, OH with the pull-out of DHL) occur.

Mid America airport currently has no regular cargo service, and no technical or industrial operations that require regular air service. The airport management has been pursuing a number of opportunities to attract more air transport activity.

In the past, analyses have identified St. Louis as a cost-effective alternative to Chicago for a significant share of import traffic (most particularly from China), that arrives via all-cargo aircraft. However, St. Louis has failed to develop as a major air cargo hub. Clearly, overall cost effectiveness for a share of traffic flows has been an insufficient advantage to attract major cargo service development in the area.

Perhaps most tellingly, two major initiatives to develop freighter traffic at St. Louis Lambert International Airport have so far not been successful, despite encouragement from the airport and the State of Missouri. These plans, aimed at service to China and Mexico, respectively, were supported by the airport as part of their stated focus on freight service in 2015, and as part of their re-development plans for approximately 600 acres. The reasons for the failure (or at least postponement) of these plans can be debated. However, any reasonable assessment of the potential for MidAmerica development as a base for freighter flights must take into account competition from its larger neighbor. STL is currently well under capacity, has good highway connections, and is more conveniently located than MidAmerica with regards to St. Louis area industrial activity, population growth and recent growth of distribution warehouses. Moreover, STL airport has planned investment of more than $25 million in taxi-way and roadway improvements in order to support air cargo development.

Overall, three factors combine to argue for a very conservative forecasting approach to cargo services at MidAmerica:

- Relatively slow economic growth of the St. Louis region;
- Available capacity at Lambert Field, an airport with significant geographical advantages for servicing the region.
- History of significant marketing programs by both MidAmerica and Lambert that have thus far failed to attract a significant investment by a cargo carrier.

Furthermore, the position of MidAmerica as opposed to Lambert suggest that the most likely successful venture for MidAmerica will be a smaller operation with special circumstances that make MidAmerica more attractive than Lambert for the operator. Although the high costs of Lambert might give MidAmerica some advantage, what has been made clear from the much -publicized efforts to attract China cargo service at MidAmerica and St. Louis is that any major marketing successes at MidAmerica, once made public, likely will be matched by competing economic incentives being offered by Missouri and Lambert.

These arguments for a conservative and measured approach to MidAmerica cargo development could be reversed quickly if the region's overall relative growth were to improve. At some point, the region's location as a cost-effective site for servicing many Midwest points will likely result in the introduction of both Chinese and Latin American cargo services. The validation of the region's economic advantages that will occur with this activity will help both MidAmerica and Lambert. Cargo operators will most likely view the more established airport at Lambert as the lower risk location at which to start services.

Recognizing the realities of forecasting for smaller airports, as well as the specifics of the MidAmerica-Lambert Field history, leads the prudent planner to an approach that: (1) looks to a wide variety of sources for possible growth; (2) attempts to develop plans that retain the flexibility to take advantage of low-probability favorable events when they present themselves.

Placing probabilities of success for these opportunities is difficult; however, a reasonable ranking from most likely to least likely follows.

1. **Continued ad-hoc specialty flights.** In the past few years Volga-Dnepr has used MidAmerica to load and transport oversized cargo, specifically refurbished helicopters, using An124 aircraft.

2. **Attraction of an airframe MRO facility.** The long runway, uncongested facility at MidAmerica and the employee base of the St. Louis Area would recommend the facility as an effective location for an aircraft MRO facility.

3. **Additional cargo charter activity following the basing of one or more aircraft by a US cargo airline.**_An assessment of the likelihood of this scenario depends on further discussions with potential tenants.

4. **Service by a Chinese all-cargo carrier, with connections to/from Latin America being provided by Lan Chile, Centurion, Avianca, or another cargo airline focused on the region.** Both MidAmerica and Lambert Field have extensively marketed themselves for this purpose. Our assessment is that it is more likely to happen first at Lambert.

5. **Use of MidAmerica instead of or in addition to STL by a major small package carrier**. Major metropolitan areas often have small package freight air service at more than one airport. However, current services at STL are adequate for the region.

These scenarios are summarized in **Table 17.**

The logic behind this ranking is the assessment of which operators that would be most attracted by MidAmerica’s strengths (low costs, good runway and infrastructure, lack of congestion), and least affected by the airport’s disadvantages (lack of connections to other carriers, longer drive times than STL to regional population and industry centers). There are also synergies between some of the uses, as the location becomes more attractive for cargo operators if there are other operators on the airport that can share resources, especially during abnormal operations.

A final use for the airport, as a small package hub, has been analyzed in the past. However, a review of current hubs for FedEx, UPS, DHL and Amazon make use of MidAmerica as an additional hub extremely unlikely. The geography of those hubs and economics of trucking vs. airfreight rule out use of MidAmerica as a hub for domestic small packages. Although a new entrant in the business is possible, especially given Amazon’s recent moves into the air delivery business and attempts by Amazon competitors (e.g. Walmart) to better compete. However, there is no evidence of plans to develop competing air-service hubs by any new entrant.

Table 17: Cargo Forecast Scenarios

Scenario	Probability of Occurrence	Initial Monthly Operations	Tons per Departure	Likely Start Year	Growth Rate
1. Continued ad-hoc flights	80-100%	1	40	Existing	5%
2. Development of MRO activity	30%	6	N/A	2020	5%
3. Base for cargo operator	25%	20	40	2020	5%
4. Service to China/Latin America	25%	17	70	2024	15%
5. Service by small package carrier	20%	40	20	2025	10%

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APPENDIX D

InterVISTAS Passenger Terminal Requirements

Passenger Terminal Requirements MidAmerica St. Louis Airport

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Contents

1 Introduction

This report summarizes the passenger terminal requirements at MidAmerica for the 20-year planning horizon from 2017 through 2037.

1.1 Methodology

The method for determining future requirements is informed by and consistent with guidance from the International Air Transport Association (IATA) *Airport Development Reference Manual*, 10th Edition, and Airport Cooperative Research Program (ACRP), Report 25, *Airport Passenger Terminal Planning and Design*. For each passenger terminal function, specific assumptions in accordance with this guidance, industry standards, and airline input are documented. For planning purposes, it is assumed that terminal facilities will be developed to meet IATA's optimum Level of Service (LOS), which is a measure of the quality of service provided inside the terminal in terms of ease of flows and delays. Optimum LOS corresponds to overall good levels of service, where flows are stable, delays are acceptable, and a good level of comfort is provided. Previous versions of IATA's Airport Development Reference Manual refer to optimum level of service as being most similar to LOS C.

To derive passenger terminal requirements an estimate of Average Day Peak Month (ADPM) enplanements is required. Scenario-based ADPM flight schedules were developed to provide the basis for the terminal requirements. Specifically, the ADPM flight schedule provides the basis for aircraft gates and apron parking requirements. Passenger peak hour enplanements from the ADPM flight schedule drive check-in, checked baggage, security screening, and holdroom requirements. Similarly, peak hour deplanements determine the baggage claim requirements.

1.2 Planning Activity Levels

There is a level of uncertainty associated with long-range demand forecasting and associated planning exercises. As a result, planning activity levels (PALs) are identified to inform the future levels of passenger activity at which facilities become congested and expansion would be required. PALs help to disassociate projects from specific years as realized activity levels may occur earlier or later than the forecast predicts. PALs were chosen to represent conditions expected within the first five years, ten years, and at the end of the planning period. PAL 1 coincides with 247,500 enplanements, which the baseline forecast predicts would occur in 2022. PAL 2 represents 309,000 enplanements, which may occur in 2027, and PAL 3 coincides with 382,500 enplanements at the end of the 20-year forecast horizon. Annual and peak passenger airline flight operations and passenger data for each PAL are summarized in **Table 1.** Where appropriate, the use of PALs will be used in the identification of terminal facility requirements.

Table 1: Peak Period Activity Summary

	Base Year		Planning Activity Level (PAL)		
	2017	2018	PAL 1	PAL 2	PAL 3
Annual enplanements	122,158	154,200	247,500	309,000	382,500
ADPM enplanements	777	926	1,517	1,976	2,417
Peak hour passengers					
Enplanements	159	315	335	440	502
Deplanements	159	315	335	440	502
Peak hour total passengers	319	473	502	599	670
Annual passenger departures	1,708	2,182	3,943	4,873	6,685
ADPM passenger departures	5	6	10	13	16
Peak hour passenger operations					
Departures	1	2	2	3	3
Arrivals	1	2	2	3	3
Peak hour total passenger operations	2	3	3	4	4

Source: Inter*VISTAS*, March 2018.

1.3 Activity Profiles

The activity profiles associated with the flight schedules for passenger and aircraft operations are shown in **Figure 1** and **Figure 2**, respectively.

Figure 1: Arriving and Departing Passenger Activity Profile

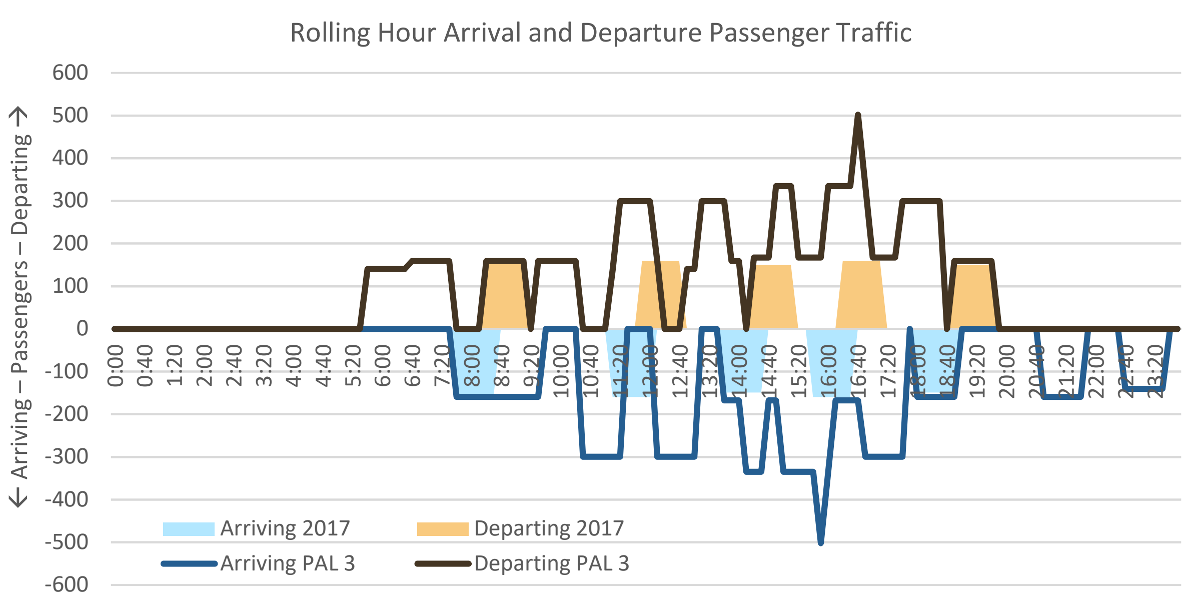
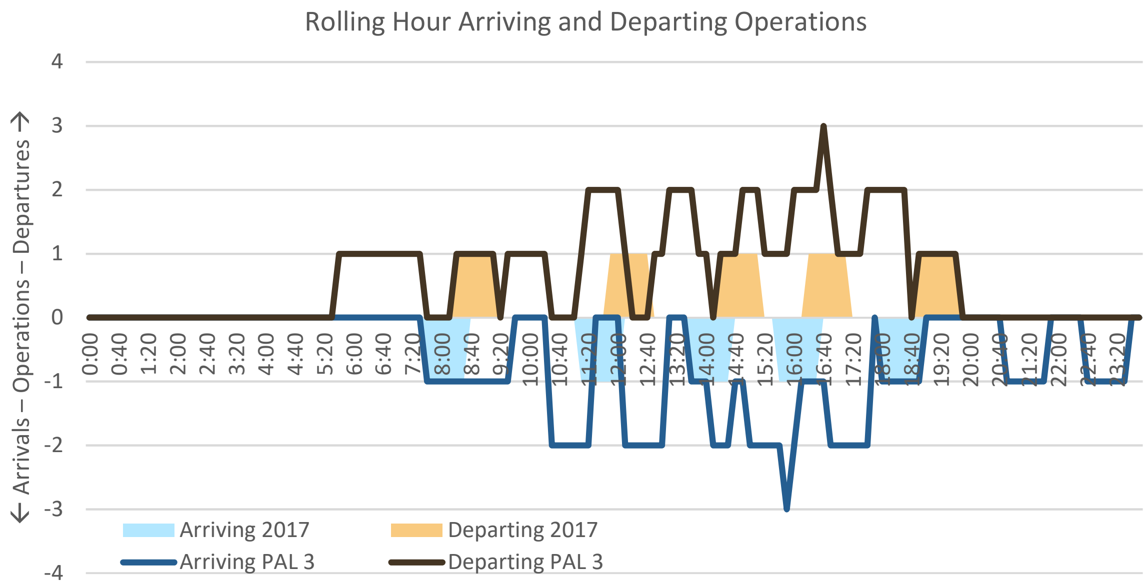


Figure 2: Arriving and Departing Flight Activity Profile



2 Passenger Terminal Requirements

This section provides the assumptions, methodology, and results associated with the analysis of the future terminal requirements for each major function within the passenger terminal building.

2.1 Check-in Lobby

The size of the check-in lobby and the number of ticket counter positions are typically a function of the number of peak departing flights; the number of peak enplaning passengers; the distribution of passenger arrival time to the terminal; and the ratio of passengers checking in at ticket counters, self-service kiosks, and online/remote. The ticket lobby currently has 12 ticketing counter positions and occupies an area of approximately 2,500 square feet. Allegiant often staffs three counters during normal operations. There are no self-service kiosks. The following assumptions regarding check-in behavior were used to determine future requirements:

- 90% of passengers utilize check-in desks, while the remaining 10% utilize mobile check-in and do not have baggage to check
- A maximum queue time of 15 minutes, per IATA optimum LOS
- A transaction time of 90 seconds per passenger, based on airport site surveys and industry averages
- 14 square feet per passenger in queue, per IATA optimum LOS

Based on the above assumptions, the existing check-in lobby and the number of check-in desks can accommodate passengers throughout the planning period. The required number of desks and check-in queue area are shown in **Table 2**.

Table 2: Check-in Lobby Requirements

	Existing Facilities	Base Year	Planning Activity Level (PAL)		
		2017	PAL 1	PAL 2	PAL 3
Number of check-in desks	12	7	7	10	11
Queue area (SF)	n.a.	920	980	1,140	1,620

Source: Inter*VISTAS*, March 2018.

Sensitivity analysis: If the 15-minute wait time standard is increased to 20 minutes due to airline staffing restrictions, then 10 check-in desks and a queue of 1,840 square feet would be required. Three additional desks would be required if the processing time increases from 90 seconds per passengers to 125 seconds per passenger. If a fourth peak hour departure is introduced and the number of peak hour departing passengers increases to 600 from about 500 at PAL 3, then 13 check-in desks would be required. Given the ticketing lobby is approximately 2,500 square feet in size, no expansion of the ticketing lobby is necessary to accommodate demand.

2.2 Checked Baggage Screening and Makeup

All checked baggage screening is performed using a stand-alone CT-80DR EDS machine located in the check-in lobby. The following planning factors are based on the Transportation Security Administration's (TSA) *Planning Guidelines and Design Standards for Checked Baggage Inspection Systems* (PGDS, v5.0) to evaluate baggage screening requirements:

- The average number of checked bags per passenger is 0.9, based on industry averages and calibrated against local conditions
- The certified throughput rate for the CT-80DR in a stand-alone configuration is 230 bags per hour, with an expected throughput increase to 250 bags per hour

As shown in **Table 3**, two stand-alone EDS machines relocated back-of-house with a minimum certified throughput of 250 bags per hour are required by PAL 3.

In the existing condition, baggage is loaded onto carts after screening to be transported to the aircraft. The number of checked bags, the size of aircraft, and the number of departures in the peak two hours impact the number of carts required. Typically, a single cart can handle 60 bags on average given the size and type of bags checked at the Airport. The number of carts required is also a function of passenger arrival times and how early check-in begins before scheduled departure time.

The following planning factors used to determine baggage makeup requirements are based on ACRP Report 25 guidance and the demand forecast:

- Ten perpendicular carts require approximately 70 feet of linear belt frontage
- Each cart requires 600 square feet of space

The average number of passengers per departure in PAL 3 is estimated to be 157, and there are 0.9 checked bags per passenger. Based on these assumptions, approximately 4,100 square feet is required for the baggage makeup area in PAL 3. The requirement in PAL 2 is the same as PAL 3 because the number of carts associated with 440 enplanements is the same as that associated with 502 enplanements.

Table 3: Baggage Screening Requirements

	Existing Facilities	Base Year 2017	Planning Activity Level (PAL)		
			PAL 1	PAL 2	PAL 3
Number of EDS units	1	1	2	2	2
Makeup area (SF)	2,712	1,400	2,700	4,100	4,100

Source: Inter*VISTAS*, March 2018.

2.3 Security Screening Checkpoint

The area dedicated to passenger security screening currently occupies approximately 2,400 square feet. This area includes two security lanes and space for passenger queueing over onto the bridge. The following assumptions regarding passenger security screening were used to determine future requirements:

- A passenger processing rate that reduces from 30 seconds per passenger (120 passengers per hour) to 18 seconds per passenger (200 passengers per hour) over the planning horizon, due to technology improvements. Regular lanes, on average, process 160 passenger per hour today while Pre✓® lanes process over 205 passengers. The lower throughput is assumed to account for local market conditions specific to MidAmerica.
- A maximum queue time of 10 minutes, per IATA optimum LOS
- Each security lane is 15 feet wide by 70 feet long, as recommended in the TSA *Checkpoint Design Guidelines* (CDG) v6.1
- 10 feet is provided behind the recomposure area of the security checkpoint to allow for passenger egress

Two security screening lanes are sufficient throughout the entire planning period. While two lanes are provided in the existing condition, these lanes should be reconfigured to be larger with additional queueing and circulation space for a more pleasant experience and optimal throughput levels. In PAL 3, approximately 3,300 square feet of area is required to accommodate queuing, screening, and egress. Requirements for each planning activity level are shown in **Table 4**. Accordingly, expansion plans should provide at least 3,300 square feet of space for the security checkpoint, with some consideration given to the possibility of a third lane beyond the planning horizon.

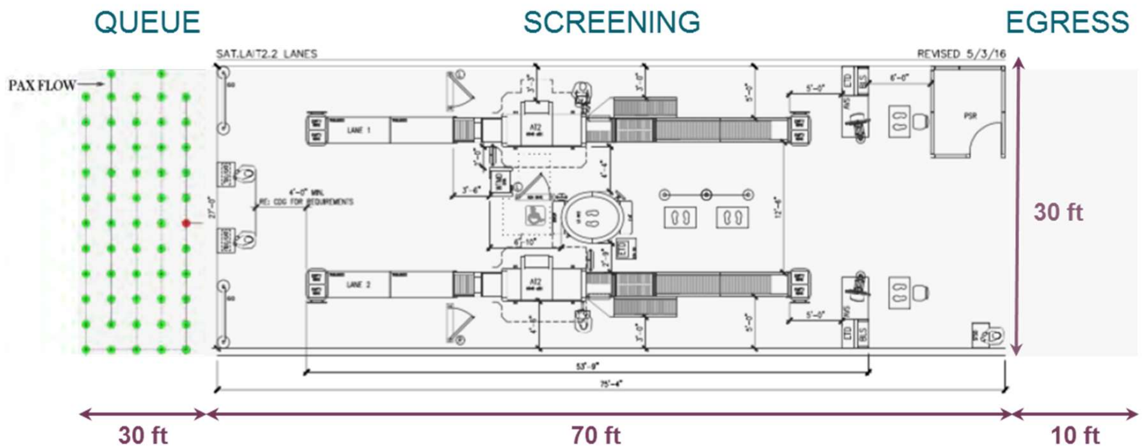
Table 4: Security Screening Requirements

	Existing Facilities	Base Year	Planning Activity Level (PAL)		
		2017	PAL 1	PAL 2	PAL 3
Number of lanes	2	2	2	2	2
Security screening area (SF)	2,362	2,800	2,850	3,150	3,300

Source: Inter*VISTAS*, March 2018.

The security checkpoint lane is segmented into three regions as shown in **Figure 3**: queue, screening, and egress. At each planning level, the area of the screening and egress remains constant, as does the width of the checkpoint; however, the queue depth grows at each planning level to accommodate the additional passenger demand at the 10-minute level of service wait time standard.

Figure 3: PAL 3 Security Checkpoint Layout



Source: TSA Checkpoint Design Guidelines v6.1, modified by Inter*VISTAS*, March 2018

Sensitivity analysis: A third lane would be required at the end of the planning horizon if the passenger throughput achieved is less than 180 passengers per hour or if the volume of peak hour departing passengers increased to 565 (from the forecast of 502).

If the 10-minute wait time standard is increased to 15-minutes, the passenger throughput could decrease to 150 passengers per hour or the volume of peak hour passengers can be increased to 660 before a third lane is required. A peak hour volume of approximately 660 enplanements would be consistent with growth to a fourth departure.

2.4 Passenger Holdroom

Holdroom requirements are derived from the design aircraft for each gate as well as the number of departures in the peak hour. Accounting for circulation space, the existing holdroom encompasses approximately 5,200 square feet. Based on the ADPM flight schedules, the design aircraft is an Airbus A320 with 177 seats and an 85% load factor. There are three departures anticipated to occur in the peak hour by PAL 3. IATA optimum LOS recommends that 50%-70% of passengers are seated in the holdroom, but given the overall size of the secure space within the terminal, lack of other space to accommodate passengers, and local passenger behavior, it is assumed that 75% of passengers will be seated. The remaining 25% of passengers are assumed to be standing, visiting the concessions, or utilizing other facilities in the holdroom. Eighteen square feet is assumed to be provided for each seated passenger and 13 square feet for each standing passenger, which is consistent with IATA optimum LOS. A 5% buffer is added to the seat requirement to account for passenger belongings that are often placed on adjacent seats. Further, the space requirement associated with passengers standing and seated is increased by 20% to account for the requirement to accommodate boarding operations, queueing, and the gate service counter.

As shown in Table 5, using these assumptions, approximately 9,500 square feet of holdroom is required to serve the PAL 3 demand.

Sensitivity analysis: If four aircraft were on ground with all the passengers associated with each flight in the holdroom, the requirement would increase to 12,700 square feet. Further, if we assume that 90% of the passengers are seated with the three peak hour departures in PAL 3, the requirement would increase from 9,500 square feet to 10,100 square feet.

Table 5: Holdroom Requirements

	Existing Facilities	Base Year	Planning Activity Level (PAL)		
		2017	PAL 1	PAL 2	PAL 3
Peak hour departures	n/a	1	2	3	3
Holdroom area (SF)	5,200	3,200	6,300	9,500	9,500

Source: Inter*VISTAS*, March 2018.

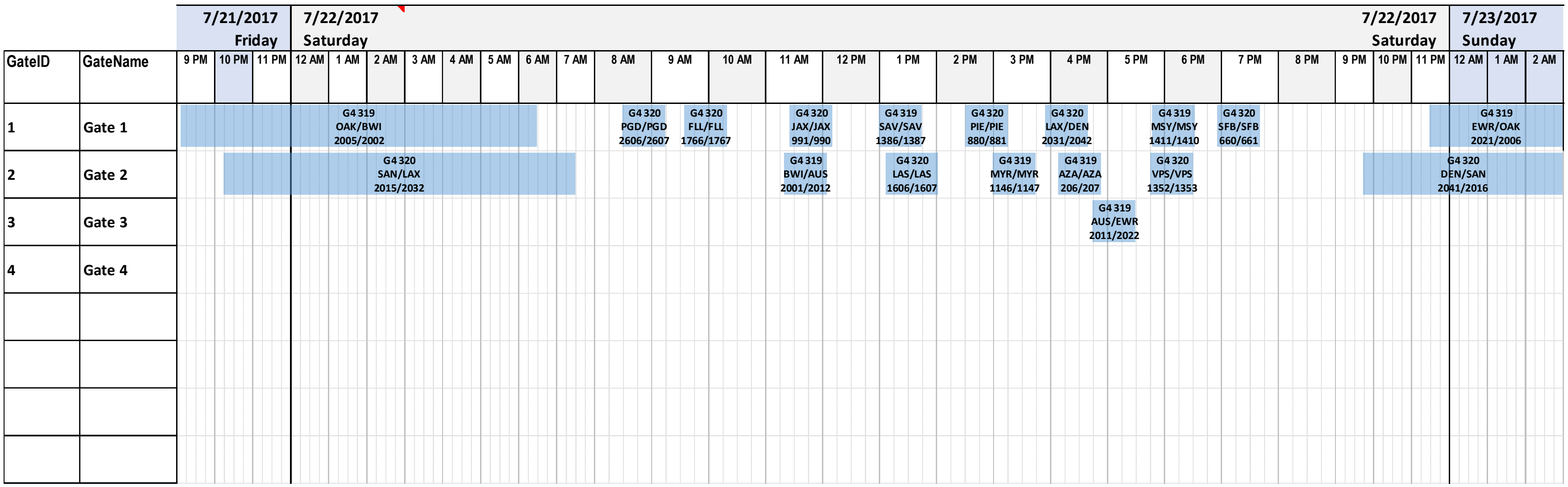
2.5 Passenger Aircraft Apron

The number of aircraft parking positions are a key component of evaluating the size and configuration of a passenger terminal. The existing passenger aircraft apron provides three Airplane Design Group (ADG) III parking positions, of which two are boarding bridge enabled. (Most narrowbody aircraft are ADG III, such as the Airbus A320 and Boeing 737 aircraft.)

Figure 4 shows the design day flight schedule for PAL 3. As shown, there are three peak hour arrivals and three peak hour departures. A 15-minute buffer is assumed to exist between each operation. This allows for aircraft towing and flight schedule delays. An analysis of peak month departure and arrival delays in July 2017 is provided in the Appendix to this report.

Three aircraft parking positions are required to accommodate the PAL 3 design day flight schedule. If severe schedule perturbations were to occur during the afternoon, then four aircraft parking positions would be required to accommodate demand. Given this possibility, the plan for PAL 3 should provide 4 parking positions.

Figure 4: Design Day Flight Schedule for PAL 3



Source: Inter*VISTAS*, December 2017

2.6 Baggage Claim

Baggage claim requirements are a function of peak hour deplanements, the concentration of arriving passengers within the peak 30-minutes, and the number of passengers with checked baggage. In the existing condition, two flat-plate claim devices are existing in the baggage claim. The following assumptions were utilized to determine the baggage claim device requirements:

- Three feet of claim frontage per passenger, based on ACRP 25 guidelines
- 90% of passengers are assumed to check bags to reflect market conditions specific to MidAmerica
- An average claim device occupancy time of 15 minutes per flight, based on airport site surveys and the short walking distance between aircraft and baggage claim
- A retrieval area between 10 to 12 feet deep around the baggage claim device to allow for active claiming of bags and maneuvering

Two baggage claim devices are sufficient to accommodate the demand generated by the three peak hour arrivals in the ADPM schedule.

Sensitivity analysis: Given the short device occupancy time, the two devices can also accommodate a fourth peak hour arrival that may occur due to irregular operations (such as delayed aircraft, or flight diversions).

Table 6: Baggage Claim Requirements

	Existing Facilities	Base Year	Planning Activity Level (PAL)		
		2017	PAL 1	PAL 2	PAL 3
Peak hour deplanements	n/a	315	335	440	502
Claim devices (each)	2	2	2	2	2

Source: Inter*VISTAS*, March 2018.

2.7 Federal Inspection Services

The Airport currently does not have a Federal Inspection Services (FIS) facility and cannot support scheduled or charter international service unless it originates at a US Preclearance facility. In order to support these services in the future, analysis of a potential FIS was prepared.

Facility requirements are based on current Customs and Border Protection (CBP) design standards and expected passenger demand. The four major components of the FIS facility are immigration (primary passport screening), international baggage claim, customs (secondary screening), and CBP administrative offices. The CBP administrative and support areas are prescriptive and traditionally account for a large proportion of the overall area requirement.

The following assumptions were utilized to determine the FIS facility requirements:

- One international arrival with 200 passengers, as the minimum CBP requirements standards are 200 passengers during the peak hour.
- A passenger processing rate of 60 seconds per passenger to reflect market conditions specific to MidAmerica
- A maximum queue time of 10 minutes, per IATA optimum LOS
- The international baggage claim device operates independently from the domestic baggage claim devices and has a device occupancy time of 20 minutes

These assumptions result in requirements of four primary immigration inspection desks; one international baggage claim device with approximately 45 linear feet of frontage; and one secondary screening x-ray lane to accommodate one international arrival in the peak hour.

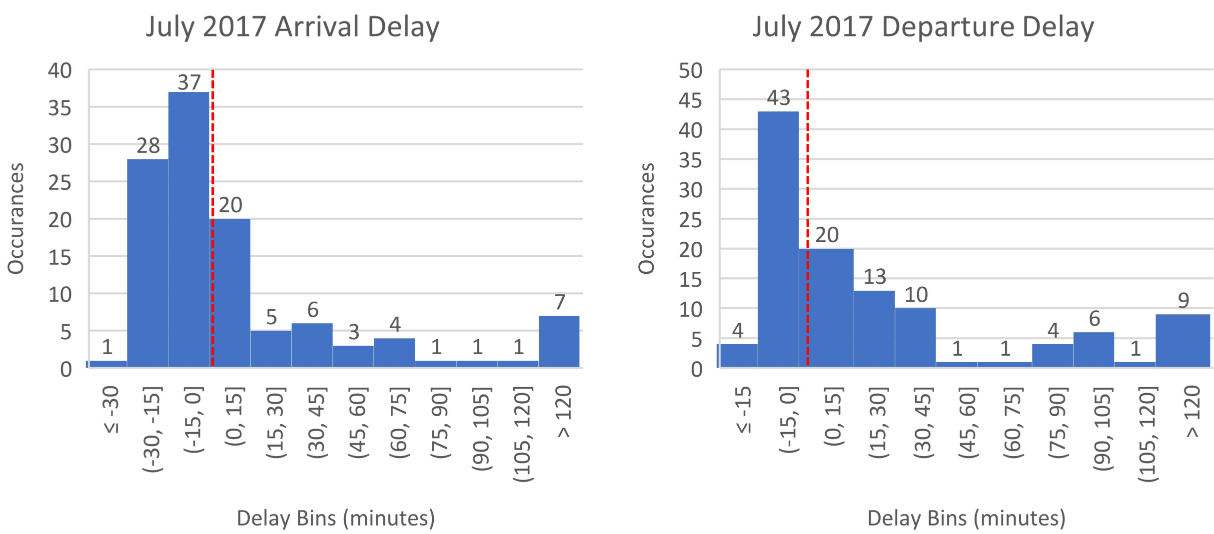
When combined with CBP office and support areas, the total FIS facility is expected to require between 10,000 square feet and 13,000 square feet depending on orientation and passenger flow.

3 Appendix - Analysis of July 2017 Aircraft Turns

This appendix provides an analysis of existing schedule data to understand the frequency and impact of irregular operations or schedule delays that would change the requirements from that presented in the report.

A record of the ground time of every operation at the Airport in 2017 was provided by airport management. As July is the busiest month with the most aircraft ground records, it was selected for analysis to determine the extent to which delays were experienced. One hundred seventeen (117) aircraft turns were recorded in the ground time data. Each flight departure and arrival time was compared against the scheduled departure and arrival time. The differences were separated into 15-minute bins and plotted, such that negative times represented flights arriving and departing early and positive times represented those arriving and departing late. Arrival and departure delays are presented in **Figure 5**.

Figure 5: July 2017 Arrival and Departure Delay Histograms



The Bureau of Transportation Statistics (BTS) considers a flight as on-time if it operates less than 15 minutes later than its scheduled time. Approximately 50% of arrivals and 56% of departure operated between 15 minutes early and 15 minutes late. 11% of arrivals and 19% of departures operated more than 60 minutes behind schedule. Nationally, according to BTS, 76.9% of flights arrived on-time in July 2017. At MidAmerica, on-time arrivals were slightly lower at 75.4%.

During July 2017, there were 16 instances of two aircraft on the ground at the same time. Eight of those instances occurred as scheduled, and the other eight were a result of aircraft delays. There was one instance of three aircraft on the ground simultaneously, but this was the result of an MD-80 mechanical delay lasting over three hours.

Given these results, we recommend that the planning of terminal alternatives provide some measure of flexibility for schedule perturbation and irregular operations. Where prudent, plans should be made to account for the airport terminal functionality in the event that these types of events do not deteriorate the level of service to an untenable degree.

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APPENDIX E

ACRP REPORT 27 – ENHANCING AIRPORT LAND USE COMPATIBILITY

Enhancing Airport Land Use Compatibility, Volume 1: Land Use Fundamentals and Implementation Resources (2010)

DETAILS

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i. As reasonably necessary to aid in the decision-making body's determination, the applicant shall submit substantial evidence, including studies and reports prepared by qualified professionals, to support the application for approval of the use. This may include, but is not limited to an FAA Form 7460-1, bird strike studies, and noise studies.

d. *Conditions Required to Achieve Compatibility*
A use may be subject to applicable conditions in order to achieve compatibility within the airport land use compatibility zone. A number entered with the table entry refers to one or more conditions described in the last column of the table titled "Conditions Required to Achieve Compatibility." For example, if a table cell shows "CC-1" as the entry, the condition numbered "1" in the last table column applies to that use in that zone. The decision-making body shall only approve the use if it complies with all stated conditions in Table 7-C.

2. *Table of Land Uses Allowed in the Airport Land Use Compatibility Zones*
The following **TABLE 7-C** states the compatible, conditionally compatible, and incompatible uses in the four airport land use compatibility zones.

TABLE 7-C: AIRPORT LAND USE COMPATIBILITY BY ZONE					
Use Categories and Specific Use Types	**Compatibility Zones**				**Conditions Required to Achieve Compatibility**
	Zone A	**Zone B**	**Zone C**	**Zone D**	
ϴ = Incompatible use - recommend that local jurisdictions prohibit in the Zone C = Compatible use - recommend that local jurisdictions allow in the Zone CC = Conditionally compatible use - may be made compatible through compliance with indicated conditions. Recommend that local jurisdictions require discretionary local review and/or conformance with standards.					
GENERALLY PROHIBITED USES AND ACTIVITIES IN ALL ZONES					
Uses that create large areas of standing water	ϴ	ϴ	ϴ	ϴ	See Section 7(C)(3), *General Performance Standards*.
Uses that create electrical, navigational, or radio interference between airport and aircraft	ϴ	ϴ	ϴ	ϴ	
Uses (or structures) that emit fly ash, dust, vapor, gases or other emissions	ϴ	ϴ	ϴ	ϴ	
Uses that foster an increase in bird population	ϴ	ϴ	ϴ	ϴ	
Use, device, structure that causes difficulty in distinguishing airport lights (billboards, lights, signs)	ϴ	ϴ	ϴ	ϴ	
Use, device, structure that causes glare or impairing pilot visibility	ϴ	ϴ	ϴ	ϴ	

TABLE 7-C: AIRPORT LAND USE COMPATIBILITY BY ZONE					
Use Categories and Specific Use Types	Compatibility Zones Zone A	Zone B	Zone C	Zone D	Conditions Required to Achieve Compatibility
ϴ = Incompatible use - recommend that local jurisdictions prohibit in the Zone C = Compatible use - recommend that local jurisdictions allow in the Zone CC = Conditionally compatible use - may be made compatible through compliance with indicated conditions. Recommend that local jurisdictions require discretionary local review and/or conformance with standards.					
Uses or structures that promote concentrations of flammable substances or materials	ϴ	ϴ	ϴ	ϴ	
EXISTING STRUCTURES AND USES IN ALL ZONES					
Existing residential structures, including residential accessory structures	C-1, 2	C-1, 2	C-1, 2	C-1, 2	1: Existing structures may remain unless determined to pose an imminent danger to public safety. 2: Existing structures that do not meet the applicable standards for a new use are subject to Section 11, *Treatment of Non-conforming Structures and Uses*.
Existing non-residential uses	C-1, 2	C-1, 2	C-1, 2	C-1, 2	
Existing Trees that exceed the height limitations of this Ordinance	ϴ	ϴ	ϴ	ϴ	
NEW RESIDENTIAL AND ACCOMMODATION USES					
Residential Uses					
Single Family, Two-Family, Duplex Dwellings	ϴ	CC-1, 2	CC-1, 2	CC-2	1: Limit density per Section 7(C)(6). 2: Construct to reduce interior noise to safe level.[2]
Multi-Family Dwellings	ϴ	ϴ	CC-1,2	CC-2	
Nursing Homes and Other Group Living	ϴ	ϴ	CC-1,2	CC-2	
Permanent Mobile Home Parks and Courts	ϴ	ϴ	CC-1	CC-2	
Accommodation Uses					
Hotels & motels	ϴ	ϴ	CC-1, 2	CC-2	1: Limit density per Section 7(C) (6). 2: Construct to reduce interior noise to safe level.
Transient mobile home parks courts (RV Parks) or lodgings	ϴ	ϴ	CC-1	CC-2	
NEW PUBLIC, CIVIC, AND INSTITUTIONAL USES					
Educational Uses					
Schools and Other Educational Services	ϴ	ϴ	CC-1, 2	CC-2	1: Limit density per Section 7(C) (6). 2: Construct to reduce interior noise to safe level.
Day Care Facilities	ϴ	ϴ	CC-1, 2	CC-2	
Institutional and Assembly Uses					
Correctional Institutions	ϴ	ϴ	CC-1, 2	C-2	1: Limit density per Section 7(C) (6). 2: Construct to reduce interior noise to safe level.
Government Offices	ϴ	CC-1	CC-1, 2	C	

[2] **[BP]** COMMENTARY: In jurisdictions where noise monitoring is feasible, this note would be better if more specific, such as "Construct so that interior noise level is not greater than 45 DNL." FAA guidance suggests, and State of California noise law requires, that residential and other noise sensitive land uses can be compatible in moderately noisy environments if construction techniques reduce interior noise levels to not greater than 45 DNL. In areas where airport noise impacts are not greater than 65 DNL, standard modern building practices typically achieve an interior noise level not greater than 45 DNL. In areas with greater noise impacts, noise sensitive uses are not recommended but may be allowed with enhanced construction techniques.

TABLE 7-C: AIRPORT LAND USE COMPATIBILITY BY ZONE					
Use Categories and Specific Use Types	Compatibility Zones				Conditions Required to Achieve Compatibility
	Zone A	Zone B	Zone C	Zone D	
ϴ = Incompatible use - recommend that local jurisdictions prohibit in the Zone C = Compatible use - recommend that local jurisdictions allow in the Zone CC = Conditionally compatible use - may be made compatible through compliance with indicated conditions. Recommend that local jurisdictions require discretionary local review and/or conformance with standards.					
Hospitals	ϴ	ϴ	CC-1, 2	CC-2	
Libraries	ϴ	ϴ	CC-1, 2	CC-2	
Religious or Cultural Assembly Uses (Outdoor or Indoor)	ϴ	ϴ	CC-1, 2	CC-2	
Other Miscellaneous Public, Civic, or Institutional Uses Not Specifically Listed	ϴ	CC-1	CC-1, 2	CC-2	
Other Public Uses					
Cemeteries	CC-1	C	C	C	1: No buildings, structures, or other above-ground objects hazardous to airport operations are allowed.
Parks and Nature Exhibitions	CC-2, 3	CC-1, 3	CC-3	C	1: Limit density per Section 7(C) (6). 2: No public facilities, above-ground structures, spectator facilities, or parking allowed. 3: Minimize wildlife attractants.
NEW COMMERCIAL USES					
Business & Professional Offices					
Medical & Other Health Care Offices Or Clinics	ϴ	CC-1	CC-1	C	1: Limit density per Section 7(C)(6).
All Other Business and Professional Offices	ϴ	CC-1	CC-1	C	
Retail Sales or Services					
Shopping Malls & Centers	ϴ	ϴ	CC-1	C	1: Limit density per Section 7(C)(6).
All Other Retail Sales or Service Uses, Including Repairs and Personal Services	ϴ	CC-1	CC-1	C	
Eating and/or Drinking Establishment					
Eating and drinking places	ϴ	CC-1	CC-1	C	1: Limit density per Section 7(C)(6).
Amusement, Entertainment, and Recreation Establishments					
Fairgrounds, Amusement Parks, Theaters, Amphitheaters, and All Other Amusement, Entertainment, and Recreation Establishments Not Specifically Listed (Indoor or Outdoor)	ϴ	ϴ	CC-1	C	1: Limit density per Section 7(C)(6). 2: No spectator facilities, clubhouses, or locker rooms allowed. 3: Minimize wildlife attractants. 4: No public facilities or parking allowed.
Golf Courses, Driving Ranges, Riding Stables and Water Recreation Establishments	CC-2, 3, 4	CC-1, 2, 3	CC-3	C	
Recreational Vehicle Accommodations And Campgrounds	ϴ	ϴ	ϴ	C	
Zoos	ϴ	CC-1, 3, 4	CC-3	C	
Vehicle Sales, Rental, or Service Establishment					
Vehicle Body Repair Shops, Parts and Supply Distributors, Sales and Service	ϴ	CC-1, 2, 3	CC-1	C	1: Limit density per Section 7(C)(6). 2: Allow only if accessory to rental and related sales. 3: Subject to airport approval.
Automobile Rental/Leasing Agencies	CC-1, 3	CC-1, 3	CC-1	C	

TABLE 7-C: AIRPORT LAND USE COMPATIBILITY BY ZONE					
Use Categories and Specific Use Types	**Compatibility Zones**				**Conditions Required to Achieve Compatibility**
	Zone A	**Zone B**	**Zone C**	**Zone D**	
ϴ = Incompatible use - recommend that local jurisdictions prohibit in the Zone C = Compatible use - recommend that local jurisdictions allow in the Zone CC = Conditionally compatible use - may be made compatible through compliance with indicated conditions. Recommend that local jurisdictions require discretionary local review and/or conformance with standards.					
NEW INDUSTRIAL, WHOLESALE TRADE AND STORAGE USES					
Manufacturing, Assembly, or Processing Uses					
Chemicals and Allied Production, Liquefied & Bottled Gas Production or Distribution, Rubber & Misc. Plastics Manufacturing, Primary Metal Industries, Fabricated Metal Production	ϴ	CC-1, 2	CC-1, 2	CC-2	1: Limit density per Section 7(C)(6). 2: Review for compliance with general performance standards in Section 7(C)(3).
Explosives and Pyrotechnic Production	ϴ	ϴ	CC-1, 2	CC-2	
General Industry, Heavy – Not Otherwise Listed	ϴ	CC-1, 2	CC-1, 2	C	
General Industry, Light – Not Otherwise Listed	ϴ	CC-1	C	C	
Mail Order House	ϴ	CC-1	C	C	
Mini-Storage Warehouse	ϴ	CC-1	C	C	
Petroleum Refining & Related Industries (Gasoline, Diesel & Heating Oil)	ϴ	ϴ	CC-1, 2	CC-2	
Building and Contracting					
Building Materials And Hardware, Construction, General Building Contractors, Building Materials Supply	ϴ	CC-1	C	C	1: Limit density per Section 7(C)(6).
Manufactured/Mobile Home – Sales Only	ϴ	CC-1	C	C	
Wholesale Trade					
Wholesale Trade	ϴ	CC-1	C	C	1: Limit density per Section 7(C)(6).
Automotive, Marine & Aircraft Accessories	ϴ	CC-1	C	C	
Warehouse and Storage Services					
Warehousing And Storage Services	ϴ	CC-1	C	C	1: Limit density per Section 7(C)(6). 2: Review for compliance with general performance standards in Section 7(C)(3).
Explosives Storage	ϴ	ϴ	CC-1, 2	CC-2	
Waste and Salvage Uses					
Hazardous Waste Facility	ϴ	CC-1, 2	CC-1, 2	CC-2	1: Limit density per Section 7(C)(6). 2: Review for compliance with general performance standards in Section 7(C)(4).
Landfills, Solid Waste Facility	ϴ	ϴ	CC-1, 2	CC-2	
Recycling Collection Facility	ϴ	CC-1, 2	CC-1, 2	CC-2	
Refuse Hauling Facility	ϴ	CC-1, 2	CC-1, 2	CC-2	
Salvage or Junk Yard	ϴ	CC-1, 2	CC-1, 2	CC-2	

TABLE 7-C: AIRPORT LAND USE COMPATIBILITY BY ZONE					
Use Categories and Specific Use Types	**Compatibility Zones**				**Conditions Required to Achieve Compatibility**
	Zone A	**Zone B**	**Zone C**	**Zone D**	
Ө = Incompatible use - recommend that local jurisdictions prohibit in the Zone C = Compatible use - recommend that local jurisdictions allow in the Zone CC = Conditionally compatible use - may be made compatible through compliance with indicated conditions. Recommend that local jurisdictions require discretionary local review and/or conformance with standards.					
NEW TRANSPORTATION, PARKING, AND UTILITY USES					
Transportation Facilities (Railways, Highways/Roads, Terminals)	CC-4, 2	C	C	C	1: Limit density per Section 7(C)(6). 2: Lights, buildings, structures, above-ground pipelines, utility lines, and transmission lines are prohibited. 3: Subject to airport authority approval. 4: Allow only if no practicable alternatives exist and/or use is directly related to airport operations. 5: Condition as applicable per Section 7(C)(5) 6: Above ground-structures are prohibited except as necessary for lighting and access control. 7: Allow only if accessory to an allowed primary use.
Passenger Facilities	Ө	CC-1,3	CC-1, 3	C	
Cargo-Freight Facilities	Ө	CC-1, 3	C	C	
Communications / Telecommunications / Broadcast Communications	CC-2	CC-1,3	CC-3	C	
Utilities, Including Large Wind Energy Conversion Facilities	CC-2, 3, 4, 5	CC-1, 2, 3, 5	CC-1, 5	C	
Vehicle Parking, Primary	Ө	CC-6	C	C	
Vehicle Parking, Accessory	CC-6, 7	CC-7	C	C	
NEW AGRICULTURAL AND RESOURCE EXTRACTION USES					
Agricultural Uses					
Agriculture, General (Except Livestock)	CC-2,3	CC-1	CC-1	C	1: Limit density per Section 7(C)(6). 2: Above-ground structures prohibited. 3: Minimize wildlife attractants (e.g., discouraged cereal grain crops) and substantially mitigate hazards if allowed.
Agricultural Accessory Housing	Ө	CC-1	CC-1	C	
Agricultural Related and Support Activities	CC-2	CC-1	C	C	
Forestry Activities & Related Services	CC-2	CC-1	C	C	
Fishing and Hunting Activities & Related Services	C-2, 3	CC-1, 2	CC-3	CC-3	
Greenhouses	Ө	CC-1	C	C	
Livestock Farms And Ranches Not Otherwise Listed	CC-2, 3	CC-1	C-2	C	
Poultry And Small Mammal Production/Breeding	Ө	CC-1	C	C	
Resource Extraction Uses					
Mining Activities And Related Services	Ө	CC-1, 2	C	C	1: Limit density per Section 7(C)(6). 2: Activities involving water impoundment shall mitigate wildlife/bird attractants.
Oil & Natural Gas Wells	Ө	I	CC-2	CC-2	
Stone & Mineral Quarries	Ө	CC-1, 2	CC-2	CC-2	
OTHER NEW USES					
Water Areas	Ө	CC-2	CC-2	CC-2	1: Public facilities and above-ground structures prohibited. 2: Consider/minimize wildlife/bird attractant issues.
Open Space	CC-1, 2	C-2	C	C	
Surface Stormwater Detention Facilities Accessory to Another Use	Ө	CC-2	CC-2	CC-2	
Undeveloped and Vacant Land	C	C	C	C	